# Hydrogen Affirmative

## 1AC

### 1AC — PLAN

Resolved: The United States federal government should substantially increase its transportation infrastructure investment in the United States.

Plan: The United States federal government should invest in hydrogen fuel dispensers for fuel stations in the United States

### 1AC — Economy Advantage

#### Observation 2 — Economy

#### The economy is faltering – No turnaround is in sight

Washington Post 6/28/12 [“Economy growing too slowly to lift US job market; another weak month of hiring expected,” Associated Press, Updated: Thursday, June 28, 6:05 PM, pg. http://www.washingtonpost.com/business/economy/economy-growing-too-slowly-to-lift-us-job-market-another-weak-month-of-hiring-expected/2012/06/28/gJQA2ctO9V\_print.html]

WASHINGTON — The U.S. economy is growing too slowly to pull the job market out of a slump, according to the latest data that suggest June has been another weak month for hiring.

Applications for unemployment benefits stayed above a level last week that is generally considered too high to lower the unemployment rate. And the annual growth rate for the U.S. economy in the January-March quarter was unchanged at a tepid 1.9 percent.

Two government reports released Thursday added to the picture of an economy that is faltering for the third straight year after a promising start. Job growth has tumbled, consumers are less confident and Europe’s financial crisis has dampened demand for U.S. exports.

Most economists don’t see growth accelerating much from the first-quarter pace, although some are hopeful that lower gas prices could help lift consumer spending over the summer.

Growth of around 1.9 percent typically generates roughly 90,000 jobs a month. That’s considered too weak to lower the unemployment rate, which was 8.2 percent last month.

Slow improvement in the economy threatens President Barack Obama’s re-election hopes. He is likely to face voters with the highest unemployment rate of any president since the Great Depression.

The Federal Reserve last week downgraded its outlook for 2012 growth. The Fed now predicts the economy will grow between 1.9 percent and 2.4 percent this year — a half a percentage point lower than its forecast in April. And it doesn’t see the unemployment rate falling much lower this year.

Hiring hasn’t likely improved in June, based on the level of people applying for unemployment benefits.

Weekly applications fell only slightly last week to a seasonally adjusted 386,000, the Labor Department said. Applications have climbed nearly 5 percent in the past two months.

When applications are above 375,000, it generally means that hiring isn’t strong enough to rapidly lower the unemployment rate.

Economists are predicting that 100,000 jobs were added in June and the unemployment rate did not change, according to a survey by FactSet. The government will issue the June employment report on July 6.

“Jobless claims are still too high and show that employment growth is slowing and no progress is being made,” said Jennifer Lee, an economist at BMO Capital Markets.

Employers added an average of only 73,000 jobs a month in April and May after averaging 226,000 a month in the first three months of the year.

The report on the first quarter’s economic growth showed that U.S. corporate profits fell, the first quarterly decline since the final three months of 2008.

U.S. corporations earned less profit overseas, the report said. That’s likely a result of Europe’s economic woes and slowing growth in countries like China and India. Lower overseas profits could discourage U.S. employers from adding some jobs in the second half of the year.

“With global weakness continuing ... corporate profits are likely to remain under pressure, a development that is unlikely to help the employment outlook,” said Jeremy Lawson, an economist at BNP Paribas.

Other recent indicators have painted a mixed picture of the economy.

A closely watched private survey released this week showed consumer confidence fell in June for the fourth straight month. The Conference Board said worries about the job market outweighed lower gas prices and steady improvement in the housing market.

#### Infrastructure investments boost the economy

New America Foundation 10 — New America Foundation—“a nonprofit, nonpartisan public policy institute that invests in new thinkers and new ideas to address the next generation of challenges facing the United States,” 2010 (“The Case for an Infrastructure-Led Jobs and Growth Strategy,” February 23rd, Available Online at http://www.newamerica.net/publications/policy/the\_case\_for\_an\_infrastructure\_led\_jobs\_and\_growth\_strategy, Accessed 06-09-2012)

As the Senate takes up a greatly scaled down $15 billion jobs bill stripped of all infrastructure spending, the nation should consider the compelling case for public infrastructure investment offered by Governors Arnold Schwarzenegger (R-CA) and Ed Rendell (D-PA). Appearing on ABC’s "This Week" on Sunday, the bipartisan Co-Chairs of Building America's Future explained why rebuilding America’s infrastructure is the key to both job creation in the short and medium term and our prosperity in the longer term.

Rather than go from one negligible jobs bill to the next, the administration and Congress should, as the governors suggest, map out a multi-year plan of infrastructure investment and make it the centerpiece of an ongoing economic recovery program.

Here is why:

With American consumers constrained by high household debt levels and with businesses needing to work off overcapacity in many sectors, we need a new, big source of economic growth that can replace personal consumption as the main driver of private investment and job creation. The most promising new source of growth in the near to medium term is America’s pent-up demand for public infrastructure improvements in everything from roads and bridges to broadband and air traffic control systems to a new energy grid. We need not only to repair large parts of our existing basic infrastructure but also to put in place the 21st-century infrastructure for a more energy-efficient and technologically advanced society. This project, entailing billions of dollars of new government spending over the next five to ten years, would generate comparable levels of private investment and provide millions of new jobs for American workers.

More specifically, public infrastructure investment would have the following favorable benefits for the economy:

Job Creation. Public infrastructure investment would directly create jobs, particularly high-quality jobs, and thus would help counter the 8.4 million jobs lost since the Great Recession began. One study estimates that each billion dollars of spending on infrastructure can generate up to 17,000 jobs directly and up to 23,000 jobs by means of induced indirect investment. If all public infrastructure investment created jobs at this rate, then $300 billion in new infrastructure spending would create more than five million jobs directly and millions more indirectly, helping to return the economy to something approaching full employment.

A Healthy Multiplier Effect. Public infrastructure investment not only creates jobs but generates a healthy multiplier effect throughout the economy by creating demand for materials and services. The U.S. Department of Transportation estimates that, for every $1 billion invested in federal highways, more than $6.2 billion in economic activity is generated. Mark Zandi, chief economist at Moody’s Economy.com, offers a more conservative but still impressive estimate of the multiplier effect of infrastructure spending, calculating that every dollar of increased infrastructure spending would generate a $1.59 increase in GDP. Thus, by Zandi’s conservative estimates, $300 billion in infrastructure spending would raise GDP by nearly $480 billion (close to 4 percent).

A More Productive Economy. Public infrastructure investment would not only help stimulate the economy in the short term but help make it more productive over the long term, allowing us to grow our way out of the increased debt burdens resulting from the bursting of the credit bubble. As numerous studies show, public infrastructure increases productivity growth, makes private investment more efficient and competitive, and lays the foundation for future growth industries. In fact, many of the new growth sectors of the economy in agriculture, energy, and clean technology require major infrastructure improvements or new public infrastructure.

Needed Investments that Will Pay for Themselves. New infrastructure investment can easily be financed at historically low interest rates through a number of mechanisms, including the expansion of Build America Bonds and Recovery Zone bonds (tax-credit bonds that are subsidized by favorable federal tax treatment) and the establishment of a National Infrastructure Bank. Public infrastructure investment will pay for itself over time as a result of increased productivity and stronger economic growth. Several decades of underinvestment in public infrastructure has created a backlog of public infrastructure needs that is undermining our economy’s efficiency and costing us billions in lost income and economic growth. By making these investments now, we would eliminate costly bottlenecks and make the economy more efficient, thereby allowing us to recoup the cost of the investment through stronger growth and higher tax revenues.

#### Alternative fuel market is uniquely stimulating

SSEB 06 [The Southern States Energy Board, AMERICAN ENERGY SECURITY BUILDING A BRIDGE TO ENERGY INDEPENDENCE AND TO A SUSTAINABLE ENERGY FUTURE, July 2006

This study demonstrates that embarking on a national mission to achieve liquid transportation fuels independence will substantially reduce economic and national security risks and lower oil prices and oil price volatility. It will also facilitate a U.S. industrial rebirth. The American Energy Security plan will facilitate an industrial boom. It will create millions of jobs, foster new technology, enhance economic growth, help eliminate the trade and budget deficits, and establish a reliable domestic energy base upon which to rebuild U.S. industries to be globally competitive – see Table EX-1.

By 2020, here are some of the annual benefits generate by the AES initiatives (2005 dollars):

• Domestic alternative liquid fuel production plus transportation efficiency savings of 8.4 million barrels per day

• New investments of $100 billion

• Nearly 200 billion dollars in increased industry sales

• Nearly 900,000 new jobs

• $8 billion in profits

• Nearly $60 billion in increased federal, state, and local government tax revenues.

• A reduction of a quarter trillion dollars in the U.S. trade deficit

By 2030, these annual benefits are projected to increase to (2005 dollars):

• Domestic alternative liquid fuel production plus transportation efficiency savings of 19 million barrels per day

• New investments of nearly $200 billion

• One-third of a trillion dollars in increased industry sales

• More than 1.4 million new jobs

• $14 billion in profits

• Nearly $100 billion in increased federal, state, and local government tax revenues.

• A reduction of over $600 billion in the U.S. trade deficit

The American Energy Security plan will revitalize major U.S. industries. Major industry beneficiaries will include technology providers; construction; petroleum and coal products; machinery; mining; professional, scientific, and technical services; primary metals; chemicals; oil and gas; motor vehicles; fabricated metal products; forestry; farming; and related industries.

American Energy Security initiatives will create an especially robust labor market and greatly enhanced employment opportunities in many industries and in professional and skilled occupations such as chemical, mechanical, electronics, petroleum, and industrial engineering; electricians; sheet metal workers; geoscientists; computer software specialists; skilled refinery personnel; tool and die makers; computer controlled machine tool operators; industrial machinery mechanics; electricians; oil and gas field professionals and technicians; machinists; engineering managers, electronics technicians; carpenters; welders; plumbers; and others. Pg. Xxv-xxvi

#### Our competiveness will continue to decline without the plan

Moore 12 [Mary Moore, “HBS survey: U.S. losing jobs to overseas as competitiveness slips,” Boston Business Journal, January 18, 2012, 6:00am EST, <http://www.bizjournals.com/boston/news/2012/01/17/hbs-survey-us-lags-in-competiveness.html>]

The United States faces a “deepening competitiveness problem” caused by “structural changes” that started long before the recession, according to a report released Wednesday by Harvard Business School.

Those changes “threaten to undermine the long-term competitiveness of the U.S.,” according to the report, which surveyed 10,000 HBS alumni. While the American economy is strong in some ways, “it is not keeping pace” with economies in other parts of the world, including those considered emerging economies.

About 1,700 survey respondents said they help decide whether to place business and jobs in the U.S. or abroad. In these situations, the U.S. did not fare well. Indeed, the report found, the U.S. lost two-thirds of the time.

Employers offering mass numbers of jobs, high-end work and multiple activities “moved out of the U.S. much faster than they moved in,” the report found.

What are America’s greatest weaknesses? Its “tax code, political system, K-12 education system, macroeconomic policies, legal framework, regulations, infrastructure and workforce skills,” the report read.

The report is the result of a Harvard Business School project spanning several years that explores the intricacies of international competition and its implications for the United States. In October 2011, nearly 10,000 Harvard Business School alumni completed an in-depth survey related to competitiveness, and their responses became the basis for the report released Wednesday, which summarizes the key findings. The full report is available for download here.

Seventy-one percent of survey respondents said they expect U.S. competitiveness to decline in the next three years. Four types of respondents who showed the most pessimism were those in their prime decision-making years, those in the manufacturing sector, those in the United States and those who firms face international competition.

#### A large relative growth differential is needed to sustain US hegemony.

Tellis 09 - Senior Associate @ Carnegie Endowment for International Peace, specializing in international security, defense and Asian strategic issues. [Ashley J. Tellis (Research Director of the Strategic Asia program @ National Bureau of Asian Research, “Preserving Hegemony: The Strategic Tasks Facing the United States,” Global Asia, Vol.4, No. 1, Spring 2009]

Precisely because the desire for dominance is likely to remain a permanent feature of US geopolitical ambitions — even though how it is exercised will certainly change in comparison to the Bush years — the central task facing the next administration will still pertain fundamentally to the issue of US power. This concern manifests itself through the triune challenges of: redefining the United States’ role in the world, **renewing the foundations of US strength**, and recovering the legitimacy of US actions. In other words, the next administration faces the central task of clarifying the character of US hegemony, **reinvigorating the material foundations of its power**, and securing international support for its policies.

The challenge of comprehensively strengthening US power at this juncture, when the United States is still in the early phase of its unipolar role in global politics, arises importantly from the fact that the hegemony it has enjoyed since 1991 represents a “prize” deriving from victory in intense geopolitical competition with another great power. The historical record suggests that international politics can be unkind to such victors over the long term. A careful scrutiny of the hegemonic cycles since 1494 confirms quite clearly that power transitions at the core of the global system often occur because successes in **systemic struggles** — of which the Cold War is but one example — **can irreparably weaken** otherwise victorious hegemonies. The annals of the past actually corroborate the surprising proposition that no rising challenger, however capable, has ever succeeded, at least thus far, in supplanting any prevailing hegemony through cold or hot war. Over the centuries, Spain, France, Germany, Japan and the Soviet Union all tried in different ways but failed.

This reassuring fact notwithstanding, hegemonic transitions still occurred regularly in international politics, a reality that points to two critical insights about succession struggles in the international system — which is a subject that ought to be of great significance to the United States and its allies as well as to its adversaries. First, struggles for hegemony in global politics are rarely limited to dyadic encounters between states. These struggles involve not only the existing hegemon and the rising challenger as the preeminent antagonists — roles that many expect will be played respectively by the United States and China over the long term — but also the entire cast of international characters, including non-state actors involved in economic processes, and the nature of their involvement in the competition become relevant to the succession process. Thus, the nature of the alliances orchestrated and managed by the United States (and possibly China as well) in the future, the relationship between state entities and the global economic system and the relative burdens borne by every actor involved in this contest become relevant to the outcome.

Second, and equally importantly, who wins in the ensuing struggle — whether that struggle is short or long, peaceful or violent — is as important as by how much. This is particularly relevant because the past record unerringly confirms that the strongest surviving state in the winning coalition usually turns out to be the new primate after the conclusion of every systemic struggle. Both Great Britain and the United States secured their respective ascendancies in this way. Great Britain rose through the wreckage of the wars with Louis XIV and with Napoleon. The United States did so through the carnage of the hot wars with Hitler and Hirohito, finally achieving true hegemony through the detritus of the Cold War with Stalin and his successors. If the United States is to sustain this hard-earned hegemony over the long term, while countering as necessary a future Chinese challenge should it emerge, Washington will need to amass the largest differential in power relative not only to its rivals but also to its friends and allies. Particularly in an era of globalization, this objective cannot be achieved without a conscious determination to follow sensible policies that sustain economic growth, minimize unproductive expenditures, [and] strengthen the national innovation system, maintain military capabilities second to none and enjoin political behaviors that evoke the approbation of allies and neutral states alike.

The successful pursuit of such policies will enable the United States to cope more effectively with near-term challenges as well, including the war on terrorism and managing **threatening regional powers**, and will ineluctably require — to return full circle — engaging the central tasks identified earlier as facing the new US administration. These tasks involve the need to satisfactorily define the character of desirable US hegemony, the need for sound policies that will renew the foundations of US strength, and the need to recover the legitimacy of US purposes and actions. What is clearly implied is that the principal burdens facing the next US president transcend Asia writ large. The success of these pursuits, however, will inevitably impact Asia in desirable ways, even as the resolution of several specifically Asian problems would invariably contribute to the conclusive attainment of these larger encompassing goals.

Policy Implications

US efforts in three areas will reaffirm its role as global leader: supporting a durable framework for international trade, maintaining unqualified military supremacy and ensuring the delivery of certain public goods, such as peace and security, freedom of navigation and a clean environment.

**The renewal of** traditional US **economic might requires policies that** **favor growth and innovation, increased** capital and **labor pools, and sustained** pursuit of total factor **productivity**. Legitimacy is an important facet of US power that has eroded over the last eight years. The US can secure legitimacy for future political acts by shaping world opinion through a combination of decisiveness, cultivation of key allied support and attentiveness to the views of others. Pg. 54-56

#### US great power capabilities will quickly erode. It will be a short ride to oblivion

**Ferguson 10** – Professor of Financial History @ NYU and Harvard University [Niall Ferguson, “Fiscal Crises and Imperial Collapses: Historical Perspective on Current Predicaments,” Ninth Annual Niarchos Lecture, Peterson Institute for International Economics, May 13, 2010, pg. <http://www.iie.com/publications/papers/niarchos-ferguson-2010.pdf>]

Lesson number three: What are the geopolitical consequences of crises of public finance? Well, first in fiscal stabilizations, **discretionary military expenditure is always the first casualty**. Secondly, in cases of default on external debt, there can be conflict with the creditors who get, to put it politely, screwed. Thirdly, in cases of radical currency depreciation your reserved currency status can be lost. Just look at what happened to the British pound in the post-1945 period. This chart, and it’s one of the last ones I’ll force you to look at, looks at defense expenditure and debt service (defense is red and debt service is blue) as percentages of federal revenues since the 1960s. Those lines are going to cross soon. Within, I would say, the next six years, interest payments on the federal debt will exceed the defense budget. I think one of the clearest lessons of history is that that is a major turning point for any power—from Spain in the 17th century, the Netherlands in the 18th century, through the Turks in the 19th century, and the British in the 20th century. **When you’re spending more on your debt than on your army** or your navy, **it’s all over as a great power.**

It’s no longer entirely possible to use the words Goldman Sachs without arousing a wry smile in an audience, but these figures I think are kosher. Jim O’Neill, as the chief economist [of Goldman Sachs], has been projecting gross domestic product forward for the major economies of the world, and for some years now he’s been arguing that by 2027, the gross domestic product of China will equal that of the United States, and by 2050 India will have caught up. Now history is not like this, the lines are never smooth, but I think the long term trajectory is plausible and this really seems to me to be the most profound implication of the story that I’m telling.

Ladies and gentlemen, let me revert to Thomas Cole’s great life Course of Empire. The point that I’m trying to make is very simple. It’s not a thousand years that separates imperial zenith from imperial oblivion. **It’s really a very, very short ride from the top to the bottom**. Pg. 13

#### Wars will be numerous and go nuclear

**Kagan** **07** – Senior associate @ Carnegie Endowment for International Peace [Robert Kagan (Senior transatlantic fellow at the German Marshall Fund), “End of Dreams, Return of History,” Policy Review, August & September 2007, pg. http://www.hoover.org/publications/policyreview/8552512.html]

The jostling for status and influence among these ambitious nations and would-be nations is a second defining feature of the new post-Cold War international system. Nationalism in all its forms is back, if it ever went away, and so is international competition for power, influence, honor, and status. American predominance prevents these rivalries from intensifying — its regional as well as its global predominance. Were the United States to **diminish its influence** in the regions where it is currently the strongest power, the other nations would settle disputes as great and lesser powers have done in the past: sometimes through diplomacy and accommodation but often through confrontation and wars of varying scope, intensity, and destructiveness. One novel aspect of such a multipolar world is that most of these powers would possess nuclear weapons. That could make wars between them less likely, or it could simply make them more catastrophic.

**It is** easy but also **dangerous to underestimate the role the U**nited **S**tates **plays in providing** a measure of **stability in the world** even as it also disrupts stability. For instance, the United States is the dominant naval power everywhere, such that other nations cannot compete with it even in their home waters. They either happily or grudgingly allow the United States Navy to be the guarantor of international waterways and trade routes, of international access to markets and raw materials such as oil. Even when the United States engages in a war, it is able to play its role as guardian of the waterways. In a more genuinely multipolar world, however, it would not. Nations would compete for naval dominance at least in their own regions and possibly beyond. Conflict between nations would involve struggles on the oceans as well as on land. **Armed embargos**, of the kind used in World War I **and** other **major conflicts**, would disrupt trade flows in a way that is now impossible.

Such order as exists in the world rests not merely on the goodwill of peoples but on a foundation provided by American power. Even the European Union, that great geopolitical miracle, owes its founding to American power, for without it the European nations after World War ii would never have felt secure enough to reintegrate Germany. Most Europeans recoil at the thought, but even today Europe ’s stability depends on the guarantee, however distant and one hopes unnecessary, that the United States could step in to check any dangerous development on the continent. In a genuinely multipolar world, that would not be possible without renewing the danger of world war.

People who believe greater equality among nations would be preferable to the present American predominance often succumb to a basic logical fallacy. They believe the order the world enjoys today exists independently of American power. They imagine that in a world where American power was diminished, the aspects of international order that they like would remain in place. But that ’s not the way it works. International order does not rest on ideas and institutions. It is shaped by configurations of power. The international order we know today reflects the distribution of power in the world since World War ii, and especially since the end of the Cold War. A different configuration of power, a multipolar world in which the poles were Russia, China, the United States, India, and Europe, would produce its own kind of order, with different rules and norms reflecting the interests of the powerful states that would have a hand in shaping it. Would that international order be an improvement? Perhaps for Beijing and Moscow it would. But it is doubtful that it would suit the tastes of enlightenment liberals in the United States and Europe.

The current order, of course, is not only far from perfect but also offers no guarantee against major conflict among the world ’s great powers. Even under the umbrella of unipolarity, regional conflicts involving the large powers may erupt. War could erupt between **China and Taiwan** and draw in both the United States and Japan. War could erupt between **Russia and Georgia**, forcing the United States and its European allies to decide whether to intervene or suffer the consequences of a Russian victory. Conflict between **India and Pakistan** remains possible, as does conflict between **Iran and Israel** or other Middle Eastern states. These, too, could draw in other great powers, including the United States.

Such conflicts may be unavoidable no matter what policies the United States pursues. But they are more likely to erupt if the United States weakens or withdraws from its positions of regional dominance. This is especially true in East Asia, where most nations agree that a reliable American power has a **stabilizing and pacific effect** on the region. That is certainly the view of most of China ’s neighbors. But even China, which seeks gradually to supplant the United States as the dominant power in the region, faces the dilemma that an American withdrawal could unleash an ambitious, independent, nationalist Japan.

In Europe, too, the departure of the United States from the scene — even if it remained the world’s most powerful nation — could be destabilizing. It could tempt Russia to an even more overbearing and potentially forceful approach to unruly nations on its periphery. Although some realist theorists seem to imagine that the disappearance of the Soviet Union put an end to the possibility of confrontation between Russia and the West, and therefore to the need for a permanent American role in Europe, history suggests that conflicts in Europe involving Russia are possible even without Soviet communism. If the United States withdrew from Europe — if it adopted what some call a strategy of “offshore balancing” — this could in time increase the likelihood of conflict involving Russia and its near neighbors, which could in turn draw the United States back in under unfavorable circumstances.

It is also optimistic to imagine that a retrenchment of the American position in the Middle East and the assumption of a more passive, “offshore” role would lead to security became threatened. That commitment, paired with the American commitment to protect strategic oil supplies for most of the world, practically ensures a heavy American military presence in the region, both on the seas and on the ground.

The subtraction of American power from any region would not end conflict but would simply change the equation. In the Middle East, competition for influence among powers both inside and outside the region has raged for at least two centuries. The rise of Islamic fundamentalism doesn ’t change this. It only adds a new and more threatening dimension to the competition, which neither a sudden end to the conflict between Israel and the Palestinians nor an immediate American withdrawal from Iraq would changegreater stability there. The vital interest the United States has in access to oil and the role it plays in keeping access open to other nations in Europe and Asia make it unlikely that American leaders could or would stand back and hope for the best while the powers in the region battle it out. Nor would a more “even-handed” policy toward Israel, which some see as the magic key to unlocking peace, stability, and comity in the Middle East, obviate the need to come to Israel ’s aid if its

. **The alternative to American predominance** in the region **is not balance and peace**. It is further competition. The region and the states within it remain relatively weak. A diminution of American influence would not be followed by a diminution of other external influences. One could expect deeper involvement by both China and Russia, if only to secure their interests. 18 And one could also expect the more powerful states of the region, particularly Iran, to expand and fill the vacuum. It is doubtful that any American administration would voluntarily take actions that could shift the balance of power in the Middle East further toward Russia, China, or Iran. The world hasn ’t changed that much. An American withdrawal from Iraq will not return things to “normal” or to a new kind of stability in the region. It will produce a new instability, one likely to draw the United States back in again.

The alternative to American regional predominance in the Middle East and elsewhere is not a new regional stability. In an era of burgeoning nationalism, the future is likely to be one of intensified competition among nations and nationalist movements. Difficult as it may be to extend American predominance into the future, no one should imagine that a reduction of American power or a retraction of American influence and global involvement will provide an easier path. // 1nc

### 1AC — Warming Advantage

#### Observation 1 — Warming

#### The transport sector is a key to contributor – Deployment of hydrogen infrastructure will significantly reduce global emissions

England 12– Master’s Degree in Planning @ University of Waterloo [Ashley England, “Analysis of a Potential Hydrogen Refuelling Network Using Geographic Information Systems: A Case Study of the Kitchener Census Metropolitan Area,” A thesis presented to the University of Waterloo in fulfillment of the thesis requirement for the degree of Master of Arts in Planning, 2012

The citizens of many cities, especially those in North America, are largely dependent on private automobiles for transportation. With the spread of suburbanization, cities and people are becoming ever more reliant on the car for transportation. Currently, the vast majority of vehicles on the road are fuelled by fossil fuels. This presents a multitude of problems. The transportation sector accounts for **33% of total carbon emissions** in the United States (Melaina, 2003). Within Canada, personal transportation is the second largest source of greenhouse gas (GHG) emissions, behind industry, with the vast majority produced by private vehicles (Poudenx and Merida, 2007). In addition, the transportation sector is one of the most rapidly growing sources of anthropogenic GHG emissions. As such, emission reductions in this sector have the potential to **significantly reduce** overall GHG emissions. This is of particular interest to national governments as there is increasing pressure to improve air quality and mitigate climate change. Air pollution is responsible for 5,900 deaths annually in Canada alone (Judek et al., 2004). Additionally, many Western countries are **dependent on foreign oil**. There is a need for energy security as 65% of the global petroleum supply is located within the politically unstable Middle East (Melaina, 2003). Among the solutions to the above problems is the adoption of alternative fuelled vehicles.

Imagine a world where personal transportation vehicles produce zero greenhouse gas emissions. This future may not be far away. As global concerns over air quality, climate change and energy security intensify, there is increasing pressure to develop alternative fuels for use in the transportation sector. The decline of the fossil fuel age is approaching: What type of fuel will replace the current fossil fuel economy? This question is critical to national governments as they attempt to maintain competitive advantages in the energy market while addressing climate and air quality concerns. Hydrogen fuel cell vehicles (HFCVs) are an attractive option because they have the potential to produce zero emissions except for water. While this technology is currently more expensive than conventional fossil fuel combustion engines and faces challenges to becoming commercially viable, further research and development will enhance its viability. Hydrogen fuel cell vehicles have the long term potential to reduce GHG emissions (Cuda et al., 2012; Li et al., 2012; Johnson, 2008). If hydrogen is produced from renewable sources such as wind, hydropower or solar energy, **true zero emission fuel use can be achieved**. Even if fossil fuels are used in the production phase, emission reductions can be achieved when compared to the burning of gasoline in the conventional combustion engine vehicle (Waegel et al., 2006). Canada is well-positioned to be a global supplier of hydrogen due to its wealth of natural resources.

One of the most important issues relating to the use of HFCVs that needs to be addressed is the deployment of hydrogen infrastructure. This is required in order for mass commercialization of HFCVs to occur. The deployment of hydrogen infrastructure is one of the strategic priorities of Canada’s Hydrogen Economy Initiative (Government of Canada, 2008). The term infrastructure encompasses the production, delivery, storage and use of hydrogen fuel. This infrastructure is related to the ‘**chicken-and-egg**’ problem whereby consumers are reluctant to purchase vehicles without supporting infrastructure, manufacturers will not produce vehicles without a market for them, and fuel providers will not deploy the required infrastructure without vehicles on the road. Research is needed on how the initial hydrogen infrastructure should be deployed to satisfy demand and help overcome this problem (Nicholas, Handy and Sperling, 2004). Analysis of potential hydrogen infrastructure deployment will help with this challenge and consequently help in meeting long term goals of improved air quality, mitigating climate change and improving energy security. Pg. 1-3

#### Scientific consensus is on our side – Earth is warming and humans are the cause

NRC 08- National Research Council provides independent and expert driven research for the United States National Academies [Committee on Assessment of Resource Needs for Fuel Cell and Hydrogen Technologies, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences, Transitions to Alternative Transportation Technologies--A Focus on Hydrogen, 2008

The second element of the energy “trilemma” concerns the environmental consequences of the buildup of CO2 and other greenhouse gases in the atmosphere. Light-duty vehicles generate one-third of global CO2 emissions and about a third of U.S. emissions. Capturing CO2 emissions from individual vehicles is effectively impossible, so reductions in the transportation sector can be effected only by improved fuel economy and/or replacement of current fuels with lower-carbon or zero-carbon fuels. Hydrogen contains no carbon at all, but the production processes currently available emit CO2—either from natural gas and other fossil fuels used to manufacture hydrogen or from fossil fuels that generate the electricity used to make hydrogen via electrolysis. Even including these production-derived carbon emissions, however, hydrogen fuel cell vehicles can reduce the well-to-wheels carbon given off by light-duty vehicles because of the greater efficiency of the fuel cell.

Nevertheless, achieving deep reductions in emissions from hydrogen production will require development and use of processes that can capture and sequester the CO2 generated in hydrogen manufacture, as well as greater use of low-carbon or zero-carbon energy sources for electricity generation. Biofuels, especially if produced renewably, also would reduce carbon emissions relative to conventional fuels. Although long-term in consequence, the threat of global warming is of **immediate concern**, because moderate actions taken now could preclude the need for drastic actions taken later. According to the **world’s clearinghouse for peer-reviewed climate science**, the Intergovernmental Panel on Climate Change (IPCC), “The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 parts per million (ppm) to 379 ppm in 2005. The atmospheric concentration of carbon dioxide [and methane] in 2005 exceeds by far the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice cores” (IPCC, 2007, p. 2).

In 2005, a National Research Council (NRC) report focused on these conclusions, stating that “in the judgment of **most climate scientists**, Earth’s warming in recent decades has been caused primarily by human activities that have increased the amount of greenhouse gases in the atmosphere” (NRC, 2005, p. 2). Although climatic the **debate over the science of historical changes has been largely resolved** and there is agreement about the potential influence of continued greenhouse gas emissions on climate, the 2005 NRC report notes that “there is still legitimate debate regarding how large, how fast, and where these effects will be” (p. 2). Most recently, in 2007, the IPCC wrote that “[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level” (IPCC, 2007, p. 5). The warming has been especially acute since 1995. According to the IPCC, “eleven of the last twelve years (1995-2006) rank among the 12 warmest years in the instrumental record of global surface temperature (since 1850)” (p. 5).

With regard to the consequences of the greenhouse gas buildup, the 2007 IPCC report noted that climate change risks are likely (greater than 66 percent) to include droughts, sea level rise, and increased tropical cyclone activity. Increased heat waves and heavy precipitation events, which can lead to flash floods and severe erosion, are very likely (greater than 90 percent).

The committee has not assessed climate change risks but concludes that if immediate action is required to reduce CO2 emissions, the transportation sector could provide a significant share of the reductions. The hydrogen technologies discussed in this report are particularly promising for large-scale reductions over the longer term. Pg. 23-24//1ac

#### It will get worse before it gets better - Expanded energy demands will force a shift to oil shale and tar sands. They will produce twice as much CO2 emissions

NRC 08- National Research Council provides independent and expert driven research for the United States National Academies [Committee on Assessment of Resource Needs for Fuel Cell and Hydrogen Technologies, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences, Transitions to Alternative Transportation Technologies--A Focus on Hydrogen, 2008

The current petroleum market lacks the excess production capacity that characterized past decades, and production and demand remain in close daily balance. This means that **any disruptive event**, whether from a natural disaster or terrorist activity, can cause severe and lasting price shocks, leading to **worldwide economic dislocation**. This situation is unlikely to improve in the near future.

Demand continues to increase at the same time that conventional petroleum production faces a leveling and/or peaking of world oil production. In a recent study, the U.S. Government Accountability Office noted that “the total amount of oil underground is finite, and, therefore, production will one day reach a peak and then begin to decline. Such a peak may be involuntary if supply is unable to keep up with growing demand” (GAO, 2007, p. 6). Similarly, the International Energy Agency (IEA) concluded, “Worldwide, the rate of [oil] reserve additions from discoveries has fallen sharply since the 1960s. In the last decade, discoveries have replaced only half the oil produced” (IEA, 2006, p. 132).

The literature offers a wide range of estimates concerning the timing of a maximum in world oil production because the data needed for more precise forecasting are not widely available. Much useful information is (1) proprietary to companies, (2) a state secret in the major oil exporting countries, and/or (3) biased to achieve political and economic objectives.

For example, a recent study by the National Petroleum Council stated that “there are accumulating risks to continuing expansion of oil and natural gas production from the conventional sources relied upon historically. These risks create significant challenges to meeting projected energy demand.” These risks are both geological and geopolitical. Further, “Forecast worldwide liquids production in 2030 ranges from less than 80 million to 120 million barrels per day, compared with current daily production of approximately 84 million barrels. The capacity of the oil resource base to sustain growing production rates is uncertain” (NPC, 2007, p. 91).

To be sure, enormous resources of unconventional oil—for example, **oil shale** or coal in the United States **and tar sands** in Canada—could be liquefied and substituted for oil. Exploiting these resources could greatly extend the availability of gasoline and diesel fuel, but would also raise environmental issues. Chiefly, they would nearly **double the** carbon dioxide (**CO2**) emitted per gallon of fuel consumed, unless the emissions from production can be captured and permanently sequestered, and their use would increase the demand for water.

In addition, a peaking or leveling in production would probably be attended by price increases, and these would induce a demand response—some combination of (1) greater efficiency in converting petroleum to services and (2) simply doing without. However, examining the potential contribution of either unconventional fuel resources or demand response falls outside the committee’s assigned tasks, and they are not considered further here. Pg. 23//1ac

#### Warming risks planetary extinction

Ahmed 10– Executive Director of the Institute for Policy Research & Development [NAFEEZ MOSADDEQ AHMED, PhD (Professor of international relations and globalization @ Brunel University and the University of Sussex), “Globalizing Insecurity: The Convergence of Interdependent Ecological, Energy, and Economic Crises,” Spotlight on Security, Volume 5, Issue 2 - Spring/Summer 2010, pg. <http://tinyurl.com/6v3q3mb>]

Perhaps the most notorious indicator is anthropogenic global warming. The landmark 2007 Fourth Assessment Report of the UN Intergovernmental Panel on Climate Change (IPCC) – which warned that at then-current rates of increase of fossil fuel emissions, the earth’s global average temperature would likely rise by 6°C by the end of the 21st century creating a largely **uninhabitable planet** – was a wake-up call to the international community.[v] Despite the pretensions of ‘climate sceptics,’ the **peer-reviewed scientific literature** has continued to produce evidence that the IPCC’s original scenarios were wrong – not because they were too alarmist, but on the contrary, because they were far too conservative.

According to a paper in the Proceedings of the National Academy of Sciences, current CO2 emissions are worse than all six scenarios contemplated by the IPCC. This implies that the IPCC’s worst-case six-degree scenario severely underestimates the most probable climate trajectory under current rates of emissions.[vi]

It is often presumed that a 2°C rise in global average temperatures under an atmospheric concentration of greenhouse gasses at 400 parts per million (ppm) constitutes a safe upper limit – beyond which further global warming could trigger rapid and abrupt climate changes that, in turn, could tip the whole earth climate system into a process of irreversible, runaway warming.[vii] Unfortunately, we are already well past this limit, with the level of greenhouse gasses as of mid-2005 constituting 445 ppm.[viii] Worse still, cutting-edge scientific data suggests that the safe upper limit is in fact far lower. James Hansen, director of the NASA Goddard Institute for Space Studies, argues that the absolute upper limit for CO2 emissions is 350 ppm: “If the present overshoot of this target CO2 is not brief, there is a possibility of seeding **irreversible** catastrophic effects.”[ix]

A wealth of scientific studies has attempted to explore the role of positive-feedback mechanisms between different climate sub-systems, the operation of which could intensify the warming process. Emissions beyond 350 ppm over decades are likely to lead to the total loss of Arctic sea-ice in the summer triggering magnified absorption of sun radiation, accelerating warming; the melting of Arctic permafrost triggering massive methane injections into the atmosphere, accelerating warming; the loss of half the Amazon rainforest triggering the momentous release of billions of tonnes of stored carbon, accelerating warming; and increased microbial activity in the earth’s soil leading to further huge releases of stored carbon, accelerating warming; to name just a few. Each of these feedback sub-systems alone is sufficient by itself to lead to irreversible, catastrophic effects that could **tip the whole earth climate system over the edge**.[x]

Recent studies now estimate that the continuation of business-as-usual would lead to global warming of three to four degrees Celsius before 2060 with multiple irreversible, catastrophic impacts; and six, even as high as eight, degrees by the end of the century – a situation **endangering the survival of all life on earth**.[xi]

### 1AC — Peak Oil Advantage

#### Adv \_\_\_\_: Peak Oil

#### Unconventional oil production is ponzi scheme that will inevitably collapse – The end result is a massive price spike and resource wars. Our only hope is to get investors to realize that the end of oil is near

Meijer 7/4/12 – Editor in chief of The Automatic Earth [Raul Ilargi Meijer, “Unconventional Oil is NOT a Game Changer,” Market Oracle, July 04, 2012 - 04:50 AM , pg. http://www.marketoracle.co.uk/Article35453.html]

At the same time, in the case of oil, we are seeing a sharp reversal of perception - from one of scarcity to one of glut - as pundits discuss how technological innovations, including horizontal drilling and hydraulic fracturing, will increase global supply dramatically. De-conventionalization of oil supply is touted as [the solution to peak oil for the foreseeable future](http://www.businessinsider.com/peak-oil-where-2012-6).

Euphoria particularly surrounds the projections for US production, with talk of the country becoming both energy independent and an exporting powerhouse - a [New Middle East](http://business.financialpost.com/2012/03/23/why-north-america-is-the-new-middle-east-citibank).

Leonardo Maugeri:

[Oil: The Next Revolution - the Unprecedented Upsurge of Oil Production Capacity and What it Means for the World](http://belfercenter.ksg.harvard.edu/files/Oil-%20The%20Next%20Revolution.pdf)

Thanks to the technological revolution brought about by the combined use of horizontal drilling and hydraulic fracturing, the U.S. is now exploiting its huge and virtually untouched shale and tight oil fields, whose production although still in its infancy is already skyrocketing in North Dakota and Texas.

The U.S. shale/tight oil could be a paradigm-shifter for the oil world, because it could alter its features by allowing not only for the development of the worlds still virgin shale/tight oil formations, but also for recovering more oil from conventional, established oilfields whose average recovery rate is currently no higher than 35 percent.

The natural endowment of the initial American shale play, Bakken/Three Forks (a tight oil formation) in North Dakota and Montana, could become a big Persian Gulf producing country within the United States. But the country has more than twenty big shale oil formations, especially the Eagle Ford Shale, where the recent boom is revealing a hydrocarbon endowment comparable to that of the Bakken Shale. Most of U.S. shale and tight oil are profitable at a price of oil (WTI) ranging from $50 to $65 per barrel, thus making them sufficiently resilient to a significant downturn of oil prices.

The difficulty is that an analogous scenario has unfolded before, in the natural gas industry. Out of sync with other commodities, the boom and bust in natural gas is giving us a glimpse of the future for unconventional oil. The extraction techniques are the same ones that have generated tremendous hype, while simultaneously setting up a ponzi scheme in flipping land leases, creating the perception of supply glut, crashing the price of natural gas in North America to far below break-even, amplifying financial risk for increasingly indebted producers, and threatening to put those same producers out of business.

This is the dynamic that is set to lead North America into a natural gas supply crunch over the next few years, as we discussed recently in Shale Gas Reality Begins to Dawn. Those involved in unconventional oil would do well to take note.

The drilling costs are high, as are the decline rates ("While some have been able to yield as much as 1,000 barrels a day, the rate then falls off to 65 percent the first year, 35 percent the second, and 15 percent the third"), and the EROEI is very low in comparison with conventional oil. As with unconventional gas, which suffers from the same obstacles, the industry is set on an accelerating drilling treadmill in an attempt to grow equity by expanding the reserve base with the cash flow generated.

Continued expansion is necessary to maintain the perception of company value. In other words, the industry is based on ponzi dynamics. So long as prices hold up, we can expect it to continue, but if we look at the broader economic context in conjunction with the lessons derived from unconventional gas, there is every reason to expect that the production boom is temporary, precisely because these circumstances will generate a price collapse.

Estimates of the price required for the new supplies to be economic vary. The consensus appears to be that there is a sufficient price cushion to withstand a fall, but producers are not anticipating a major one. Unfortunately for them, we can expect the perception of glut, combined with deepening economic depression, to force prices down to the cost of the lowest price producer, and quite possibly lower, at least temporarily. Companies on the unforgiving drilling treadmill will be facing increasing financial risk, and over the next few years, as over-extended and over-indebted companies go out of business, we can expect a supply crunch to develop.

The timescale is difficult to predict, as there are many factors with different timeframes to consider. Large scale deleveraging, which is set to unfold over the next few years, will have a tremendous impact on project capital availability, on demand, and on the affordability of operating and maintaining existing infrastructure. It will also be very difficult to build out new oil transport infrastructure to cope with changing energy supply patterns. The infrastructure mismatch will put continued downward price pressure on North American oil in comparison with international supplies, reducing the fungibility of oil.

Marin Katusa:

[Oil Price Differentials: Caught Between Sands And Pipelines](http://www.testosteronepit.com/home/2012/6/20/oil-price-differentials-caught-between-sands-and-pipelines.html)

North America has a long history of oil production and processing. Decades of producing oil and consuming lots of petroleum products have left the continent with a pretty good system of pipelines and refineries but pipelines are annoyingly stagnant things that tend to stay where you build them. And it turns out that the pipelines of yesterday are in the wrong places to serve the oil fields and refineries of today.

America's oil infrastructure was built around two inputs some domestic production and large volumes of imports. You see, while the Middle East may be the biggest producer of crude oil in the world, most of the refining occurs in the United States, Europe, and Asia. There are two reasons for this. The first is that it's easier to ship massive volumes of one product (crude oil) than smaller volumes of multiple products (gasoline, diesel, jet fuel, and so on). The second reason is that refineries are generally built within the regions they serve, so that each facility can be tailored to produce the right kinds and amounts of petroleum products for its customers...

...Remember how the US's oil pipelines were designed primarily to move refined products from the Gulf region and the coastal refineries to inland customers? Well, those pipelines of yesterday now run the wrong way.

The production boom in shale oil has momentum, and that is likely to carry on for some time, even in the face of sharply falling prices, as has been the case for natural gas. The rig count in shale oil production is skyrocketing, even as the rig count for natural gas falls, and production lags rig count..

The quantity of recoverable oil has been considerably hyped, and this resource is not going to represent a game-changer. In fact it would not even if we were not facing economic circumstances set to crash production.

Robert Rapier:

[Does the U.S. Really Have More Oil than Saudi Arabia?](http://www.theoildrum.com/node/9085)

The estimated amount of oil in place (the resource) varies widely, with some suggesting that there could be 400 billion barrels of oil in the Bakken. Because of advances in fracking technology, some of the resource has now been classified as reserves (the amount that can be technically and economically produced). However, the reserve is a very low fraction of the resource at 2 to 4 billion barrels (although some industry estimates put the recoverable amount as high as 20 billion barrels or so). For reference, the U.S. consumes a billion barrels of oil in about 52 days, and the world consumes a billion barrels in about 11 days.

In addition, the enormous number of expensive wells required would takes decades to drill with the rigs available, even if considerable efforts were made to increase their number, meaning that the oil that is there would be produced very slowly.

Beyond the shale oil of the Bakken in North Dakota or the Eagle Ford in Texas, there are other forms of unconventional oil that form part of the North American production boom hype.

Robert Rapier again:

When some people speak of hundreds of billions or trillions of barrels of U.S. oil, they are most likely talking about the oil shale in the Green River Formation in Colorado, Utah, and Wyoming. Since the shale in North Dakota and Texas is producing oil, some have assumed that the Green River Formation and its roughly 2 trillion barrels of oil resources will be developed next because they think it is a similar type of resource. But it is not.

The prospects for some of these are significantly worse than for shale oil, especially where the EROEI is even lower. Colorados oil shale in particular is unlikely ever to amount to much. While shale oil is a liquid hydrocarbon trapped in low permeability source rock, which can be liberated through fracking, oil shale is not a liquid at all, but solid kerogen that requires tremendous energy inputs to be separated from the source rock. Those required energy inputs mean a rock-bottom EROEI. Costs in monetary terms are sky-high as well.

Elliott Gue:

[The Difference Between Oil Shale and Shale Oil](http://www.theenergyreport.com/pub/na/7813)

To generate liquid oil synthetically from oil shale, the kerogen-rich rock is heated to as high as 950 degrees Fahrenheit (500 degrees Celsius) in the absence of oxygen, a process known as retorting.

There are several competing technologies for producing oil shale. Exxon Mobil has developed a process for creating underground fractures in oil shale, filling these cracks with a material that conducts electricity, and then passing currents through the shale to gradually convert the kerogen into producible oil. Royal Dutch Shell Plc buries electric heaters underground to heat the oil shale.

Although estimates of the cost to produce oil shale vary widely, the process is more expensive and energy-intensive than extracting crude from Canada's oil sands. Producers would require oil prices of roughly $100 a barrel before this capital-intensive process would be feasible on a commercial scale.

[Shale oil may have an EROEI of approximately 4, while tar sands would come in at 3](http://www.reformer.com/ci_20930567/is-peak-oil-dead) and oil shale would be 2 or less.

Humans are prone to grasp at straws and believe in fantasies rather than face unpleasant realities. Believing that unconventional fossil fuels can maintain business as usual is a fantasy. We cannot run our current complex society on low EROEI energy sources.

We are still facing peak oil, and, on the downslope of Hubberts Curve, we will be running faster and faster on our accelerating treadmill just to slow the decline in supply. Unconventional supplies with lower and lower EROEI are not going to change that picture, and the crash of prices that will happen thanks to economic depression will aggravate the situation considerably in the short term. We can expect prices to fall faster than the cost of production, and many corporate casualties to emerge as boom turns to bust, as it always does.

The next few years will be remembered for financial crisis, where it will be money in short supply rather than energy. As economic contraction proceeds, and purchasing power falls substantially due to the collapse of the money supply, demand for energy will - temporarily - fall a long way. Beyond that, as the deleverging comes to an end and the economy begins to stabilize somewhat (probably between five and ten years down the line), we are likely to see a supply crunch develop.

With that we are likely to see a major price spike, and the potential for resource wars will grow dramatically. Oil is liquid hegemonic power, and conflict can be expected to develop when it is perceived to be scarce. That’s not where we find ourselves today, but it is where the future is taking us.

#### Peak oil has been briefly placed on the backburner. However, if we do not use this time wisely we will face a supply crunch and social collapse

Foss 7/9/12 - Co-editor of The Automatic Earth [[Nicole Foss](http://www.businessinsider.com/author/nicole-foss), “The Guardian Is Ignoring The Critical Paradox Of Peak Oil,” [The Automatic Earth](http://theautomaticearth.blogspot.com) | Jul. 9, 2012, 1:56 PM pg: <http://theautomaticearth.org/Energy/peak-oil-a-dialogue-with-george-monbiot.html#ixzz20HZlJfhx>

I sent George a short response to his article, by way of opening a dialogue:

What we are facing is a demand and price collapse that will render unconventional supplies uneconomic. Natural gas is leading the way over the next few years. The high cost and low EROEI are fatal flaws.

And received this reply:

If there's a collapse in demand, peak oil is not an issue, right? If there's a resurgence of demand, unconventionals become economic again. As for EROEI being a constraint, try telling that to the tar sands producers in Alberta.

With best wishes,

George

The debate continues. Here is my next installment:

A demand collapse will certainly put peak oil on the backburner for a number of years. The next few years will be remembered for [financial](http://www.businessinsider.com/a-coming-demand-collapse-will-destroy-the-shale-energy-bull-case-2012-7) crisis as we move into what will be at least as bad as the Great Depression (and very likely worse, since the bubble was much larger this time). Peak oil will not have gone away, however.

We have used the cheap and accessible oil (and other fossil fuels) and what remains will be exceptionally, and increasingly, expensive in both financial and energy terms. Predictable consequences will follow from this, but in a complex interaction with many other factors, notably the context of the huge credit bubble bursting. This amounts to crashing the operating system. For a while, resource constraints will be relieved due to economic seizure (i.e. the collapse of both the money supply and the velocity of money).

During the period of financial crisis, deflation and deleveraging, weak demand will buy us some time, but at the cost of setting us up for a supply crunch later. The period of sharply falling prices will kill investment in the energy sector, because the cost of production will fall less quickly than prices, meaning margins will be squeezed. Both physical and financial risks will be much higher. A lack of economic visibility will be anathema to what are inherently long term projects.

In addition, trade collapses during periods of economic depression, as for instance letters of credit become impossible to obtain, and the lack of [funds](http://www.businessinsider.com/a-coming-demand-collapse-will-destroy-the-shale-energy-bull-case-2012-7) for maintenance compromises the integrity of distribution infrastructure. Infrastructure may also be deliberately targeted during the inevitable upheaval. All of these factors act to reduce supply, and would be difficult, or impossible, to reverse quickly if demand were to rise.

When supply and demand become tight, what transpires is not a simple price spike, but an exaggerated boom and bust dynamic. This has been underway since 2005/06. The first full cycle unfolded from 2005/06 to 2008. The second began in 2008/09 and will probably end with a price bottom relatively early in this depression with a resurgence of military demand, given that oil is liquid hegemonic power.

That should feed into the third cycle, which should send prices sharply higher in real terms, if not to a new high in nominal terms. This price volatility, against a backdrop of severe economic contraction, upheaval and fear is leading towards a profound societal change, most likely a significant period of involuntary loss of socioeconomic complexity.

You mention the tar sands, and they are indeed an interesting case - an arbitrage between cheap natural gas and expensive syncrude that can continue while the price disparity is maintained. They are able to make money, even though they are not producing much net energy. Unfortunately for the tar sands producers, the price disparity is set to reverse.

The hype surrounding shale gas has crashed the price to the point where it is on the verge of putting producers out of business. Natural gas in North America appears to have bottomed, while the perception of glut in unconventional oil, combined with weak demand and a lack of appropriate infrastructure for internal North American sources, is set to undermine oil prices considerably.

Tar sands projects will be under acute threat under those circumstances - not imminently, but over the next five years or so. Once one cannot make money from some combination of artificial input/output price disparity, public subsidy and the ability to socialize externalties, then EROEI becomes the defining factor, and the EROEI for tar sands is pathetic.

While I agree that oil men do not base decisions on EROEI, ultimately EROEI will determine their ability to make money, and that is their driving motivation. Finance can only temporarily allow people to ignore thermodynamics.

EROEI effectively determines what is and is not an energy source for a given society (ie to maintain a given level of socioeconomic complexity). Unconventional fossil fuels are caught in a paradox - that their EROEI is too low for them to sustain a society complex enough to produced them.

They can only be produced for the relatively short period of time that the complex society built on conventional sources continues to maintain its current capacities, but as the conventional sources disappear, and that society can no longer support itself, the ability to undertake all the activities required for unconventional production will be lost. The hype has no foundation.

We have been living in a major departure from reality in many ways, as always occurs during bubble times, but those times are coming to an end. Instead of overshoot, we are headed for undershoot, and we are not going to like it.

Note the critical paradox of unconventional supplies. That is where the cornucopian view of energy, where Monbiot now seems to have landed, breaks down.

The same argument applies to renewable power as it is currently practiced. Without affordable conventional fossil fuels, the increasingly complex alternatives cannot be developed and exploited.

We find ourselves in a world of receding horizons.

Unconventional supplies are always priced at conventional energy plus a premium, thanks to their crucial dependency on conventional supplies.

What high Energy Return On [Energy Investment](http://www.businessinsider.com/a-coming-demand-collapse-will-destroy-the-shale-energy-bull-case-2012-7) makes possible, low EROEI will eventually take away, following a brief boom that constitutes the last gasp of our modern energy bubble era.

#### Credit crunch makes all of their DA impacts inevitable

Tverberg 09 – Fellow of the Casualty Actuarial Society & Member of the American Academy of Actuaries [Gail E. Tverberg (MS in Mathematics from the University of Illinois), “Where Is Oil Production Headed?: An Adverse Scenario ,” The Oil Drum, 4mar2009, pg. http://www.mindfully.org/Energy/2009/Oil-Production-Scenario4mar09.htm

With all of the debt defaults, and the inability to settle all of the debts equitably, some sort of debt jubilee may be necessary. This may start with some small countries, like Iceland and perhaps the Ukraine defaulting on their debts. Gradually more and more countries will default, and their currencies will sink lower and lower.

After a certain point, it may become clear that virtually every economy in the world is in this mess together. There will be no way that more debt can be issued as "stimulus" to get the world out of this problem. The only thing that can be done is to start canceling debt, in some sort of debt jubilee, and to start over.

The problem with a debt jubilee is that there would be many too many claimants for many of the world's assets. If a wind turbine owner's debt is cancelled through a debt jubilee, who then "owns" the turbine—the original owner, or the lender whose debt was cancelled? If the debt of a factory making replacement parts for a wind turbine is cancelled, who runs the factory—the original owner of the factory, or the investor whose debt was cancelled?

The debts that are cancelled are likely to cross country borders, making for international disputes. Furthermore, countries may want to retaliate for a loss of one of their overseas investments by grabbing a business located in its own country that has overseas owners. In not very long, relationships among countries are likely to sink to deteriorate, and international trade will be at much lower levels than in the past. War may evenbreak out, or border disputes.

"Demand" will be at new low levels, because there is likely to be very little cross-border trade, except with a few trusted partners. Without this trade, it will not be possible to manufacture goods, other than those using only local products. In this kind of scenario, prices (to the extent the monetary system continues to function) would continue to be very low, because of the low demand. (A factory that is not operating doesn't need raw materials!)

The credit market would be close to non-existent, because creditors will expect that any debt that is issued could easily be cancelled. New investment would be limited to what can be financed by cash flow. With low prices, this cash flow would be very low, further limiting investment.

It is possible that in some parts of the world, the monetary system will cease to function all together, and barter would become necessary. Because barter is so cumbersome, this is likely to have a further limiting impact on trade.

In such a scenario, I would expect that oil production would be significantly lower than the physical resource available. If nothing else, it will be difficult for the whole chain from local production to pipeline to refinery to distribution pipeline to consumer to function properly. **Countries that previously exported oil** overseas will see that their chances of getting paid are less than 100%, and **may reduce their production** to match what they can sell through arrangements with trusted parties.

Production of many other goods may decline as well, **as the lack of an adequately functioning monetary system limits the ability of long supply lines to function** properly. Natural gas and coal production may decline, as well as oil production. Food through mechanized farming may decline, as Liebig's Law of the Minimum makes itself known.

On Figure 2, I show only a slight decline in production in 2009, but then large decreases in 2010, 2011, and 2012 to a level not much above 20 million barrels a day. If it reaches such a low level, due to a widespread failure of the financial system, I would expect electricity to be affected in many locations, and because of electricity, water and sewer systems. Some large cities may become uninhabitable.

Under such a scenario, I expect all of this would take a while to get sorted out. If there is a widespread failure of the monetary system, it is possible that many governments would be replaced. Some countries may fall to pieces, in the manner of the Soviet Union after its collapse in 1991. Governments may not have much faith in other governments—except perhaps with a few trusted trade /strategic partners. New monetary systems will likely be put in place, but many will not be any better than the previous ones, so bubbles and further collapses may occur.

In such an environment, international businesses will find it virtually impossible to survive. Businesses are likely become much smaller and more local. As I have shown on Figure 2, it may be many years before oil production begins to rise again. In fact, it may never rise again, if international trade stays at a low level.

I would expect that the renaissance, when it comes, would begin with basic human needs, in local communities and local agriculture. People will grow their own food, and trade with others in their community. There will be small shops that make shoes and clothing and cooking utensils. People may begin to raise animals for transportation.

People will still need energy for heating their homes and for cooking. The initial impulse will be to cut down trees for these purposes, but with the world's large population, this will tend to produce deforestation. Neo-environmentalists may urge people to use other products for this purpose—such as coal or oil, if these can be obtained. There may be some local electricity produced, particularly water generated, if transmission systems can be kept in good enough repair.

If this scenario happens, it is difficult for me to see much of a future for large complex systems that require specialized parts from around the world. Thus, I would expect large wind turbines to fall into disrepair in a few years, and solar PV panels to be very difficult to obtain, after such a crash scenario. Smaller windmills, similar to what a person sees on old farms, may come back into popular use, as may coal operated steam engines (at least in the US, where coal is still plentiful).

If you have been following the interconnected threads of what is occurring in our system, you are aware that the above scenario is at least a possibility. Due to the complexities involved, it is impossible to estimate a percentage likelihood of this particular trajectory, but the odds are increasing of something like it.

#### The end result is extinction

Manteau-Rao 08 - Master of Engineering from Ecole Centrale de Paris [Marguerite Manteau-Rao, (MBA from the University of Chicago) “David Holmgren’s Energy Future Scenarios,” La Marguerite, May 27, 2008, pg. http://lamarguerite.wordpress.com/2008/05/27/david-holmgrens-energy-future-scenarios/]

Collapse suggests a failure of the whole range of interlocked systems that maintain and support industrial society as high quality fossil fuels are depleted and/or climate change radically damages the ecological support systems. This collapse would be fast and more or less continuous without the restabilisations possible in Energy Descent. It would inevitably involve a major “die-off” of human population and a loss of the knowledge and infrastructure necessary for industrial civilization if not more severe scenarios including human extinction along with much of the planet’s biodiversity.

#### US support for hydrogen will rejuvenate the financial markets – We prevent a civilizational collapse

Rifkin 02 – Economist and president of the Foundation on Economic Trends [Jeremy Rifkin, “The dawn of the Hydrogen economy: when there is no more oil or gas … the next great commercial revolution,” RMA Journal, [Oct, 2002](http://findarticles.com/p/articles/mi_m0ITW/is_2_85/), pg. http://findarticles.com/p/articles/mi\_m0ITW/is\_2\_85/ai\_n14897180/pg\_5/?tag=content;col1

Experts had been saying that we had another 40 or so years of cheap available crude oil left. Now, however, some of the world's leading petroleum geologists are suggesting that global oil production could peak and begin a steep decline much sooner, as early as the end of this decade, sending oil prices through the roof. Non-OPEC oil-producing countries already are nearing their peak production, leaving most of the remaining reserves in the politically unstable Middle East. In desperation, the U.S. and other nations could turn to dirtier fossil fuels--coal, tar sand, and heavy oil--which will only worsen global warming and imperil the earth's already beleaguered ecosystems. Looming oil shortages make industrial life vulnerable to massive disruptions and possibly even collapse.

The Forever Fuel

As the fossil-fuel era is entering its sunset years, a new energy regime has the potential to remake civilization along radical new lines. Hydrogen is the most basic and ubiquitous element in the universe. It is the stuff of the stars and of our sun and, when properly harnessed, it is the "forever fuel." It never runs out and produces no harmful CO2 emissions when burned; the only by-products are heat and pure water. A new economy powered by hydrogen will fundamentally change the nature of our market, political, and social institutions, just as coal and steam power did at the beginning of the Industrial Age.

For the banking community, the hydrogen era offers a vast new opportunity for investment. Financing the infrastructure for a hydrogen economy and investing in the many new commercial ventures that will accompany the new energy regime will rejuvenate financial markets around the world and could lead to a qualitative leap forward for the whole of the world economy in the coming decades.

#### US pave the way for a global shift away from oil

CNA Military Advisory Board 09 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Defense:**Energy and the Risks to National Security*, May 2009]

A global consensus on the need for responses to climate change is leading governments to embrace policies designed to discourage the use of fossil fuels, increase efficiency, and **advance the development of alternatives**. This trend, already underway, will continue. Even with the current recession, the pace of this trend is likely to quicken.

In February 2009 testimony before Congress, Admiral Dennis Blair, the Director of National Intelligence, suggested that the U.S. will be expected to play a leading role in this regulatory advance [71].

“**Multilateral policymaking** on climate change is likely to be highly visible and a growing priority among traditional security affairs in the coming decades. We observe the United States is seen by the world as occupying a **potentially pivotal leadership role** between Europe, which is committed to long-term and dramatic reduction in carbon emissions, and a heterogeneous group of developing states wary of committing to greenhouse gas emissions reductions, which they believe would slow their economic growth. As effects of climate change begin to mount, the United States will come under increasing pressure to join the international community in setting meaningful long-term goals for emissions reductions, to reduce its own emissions, and to **help others mitigate and adapt to climate change through tech**nological **progress** and financial assistance.” Pg. 18 //1ac

#### We transform the debate about energy security. Tech – not war – will be seen as the solution

Sovacool 07 – Research Fellow for the Energy Governance Program @ National University of Singapore [Benjamin K. Sovacool (Professor of International Affairs @ Virginia Tech University), “Solving the oil independence problem: Is it possible?,” [Energy Policy](http://www.sciencedirect.com.proxy.library.emory.edu/science/journal/03014215) [Volume 35, Issue 11](http://www.sciencedirect.com.proxy.library.emory.edu/science?_ob=PublicationURL&_tockey=%23TOC%235713%232007%23999649988%23669309%23FLA%23&_cdi=5713&_pubType=J&view=c&_auth=y&_acct=C000034138&_version=1&_urlVersion=0&_userid=655046&md5=bb46814fec93576c271b4e8d17d993fb), November 2007, Pages 5505-5514//ScienceDirect]

The point, however, is that achieving **oil independence for the US *is* possible**, and foreign policy is not the only pathway. The US can accomplish oil independence through robust and coordinated domestic energy policy. To insulate the American economy from the vagaries of the world oil market, policymakers need not focus only on geopolitical power structures in oil producing states. Instead, attempts to change the behavior of the country's automobile drivers, industrial leaders, and homeowners could greatly minimize reliance on foreign supplies of oil. To battle the “oil problem” policymakers need not talk only about sending more troops to Iraq or Saudi Arabia nor drafting new contracts with Nigeria and Russia. They could also focus on curbing American demand for oil and **expanding domestic** conventional and **alternative supplies**.

The **debate** over whether oil independence can be achieved for the US continues only because those making the policy continue to *believe* it cannot be achieved. The key to implementing a strategy of oil independence is more a matter of **managing the *interdependence* of tech**nologies available to reduce oil demand and increase supply, rather than trying to establish the *independence* of the United States from foreign supplies of oil ([Grumet, 2006](http://www.sciencedirect.com.proxy.library.emory.edu/science?_ob=ArticleURL&_udi=B6V2W-4P83D8S-2&_user=655046&_coverDate=11%2F30%2F2007&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000034138&_version=1&_urlVersion=0&_userid=655046&md5=cec19a37447986a80122d016f0a2eec3" \l "bbib25) Grumet, J.S., 2006. Testimony Before the US Senate Committee on Foreign Relations. May 16, 2006, p. 1.[Grumet, 2006](http://www.sciencedirect.com.proxy.library.emory.edu/science?_ob=ArticleURL&_udi=B6V2W-4P83D8S-2&_user=655046&_coverDate=11%2F30%2F2007&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000034138&_version=1&_urlVersion=0&_userid=655046&md5=cec19a37447986a80122d016f0a2eec3#bib25)). Once such interdependence is recognized and synergistically pursued, the country can achieve oil independence. The only remaining questions are how and whether the benefits outweigh the costs.

### 1AC — Solvency

Observation 3 — Solvency

#### Hydrogen can be used in internal combustion engines – It’s key to transition to a sustainable transport sector

Balat 08– Professor of Biological Sciences @ University of Mahallesi [Mustafa Balat, “Potential importance of hydrogen as a future solution to environmental and transportation problems,” International Journal of Hydrogen Energy 33 (2008) pg. 4013–4029

The use of hydrogen as a fuel for transportation and stationary applications is receiving much favorable attention as a technical and policy issue [154]. **Hydrogen gas is being explored for** use in **IC engines** **and fuel cell** electric **vehicles**. Fuel cells are in the early stages of commercialization and offer a more efficient hydrogen use. Many of the world’s major car manufacturers have presented f

fuel cell vehicles as **demonstrations**, and are even beginning to lease small numbers of vehicles to the first selected customers. A hydrogen fuel cell vehicle offers advantages over hydrogen-fueled IC engines or fuel cells powered by other fuels [155]. Hydrogen can be used in fuel cells which can achieve a high electric efficiency. The total energy efficiency may even exceed 90% if the waste heat can be used [156]. Hydrogen and fuel cells are often considered as a key technology for future sustainable energy supply.

8. Conclusion - An important reason for interest in alternative transportation fuels is the concern for the greenhouse effect. Greenhouse gas emission reductions should be estimated on an annual basis. Where the levels from year to year vary significantly these should be specified on an annual basis. Hydrogen as a future energy carrier has a number of advantages. One of hydrogen’s primary advantages is that it can be produced from a variety of primary resources, one of which will most likely be readily accessible almost anywhere in the world. Another important advantage of hydrogen over other fuels is that its only major oxidation product is water vapor; its use **produces no CO2**. Hydrogen can help reduce carbon emissions, if produced from renewable energy sources and nuclear energy. The production of hydrogen from fossil fuels causes the coproduction of carbon dioxide, which is assumed to be mainly responsible for the so-called **‘‘greenhouse effect’’**. These processes use non-renewable energy sources to produce hydrogen and are **not sustainable**. Therefore, renewable energy sources and technologies for hydrogen production will be necessary during coming decades.

Hydrogen has good properties as a fuel for IC engines in automobiles. It can be used as a fuel directly in an IC engine not much different from the engines used with gasoline. The problem is that while hydrogen supplies three times the energy per pound of gasoline it has only one tenth the density when the hydrogen is in a liquid form and very much less when it is stored as a compressed gas. The blending of hydrogen and ethanol has been used as an alternative renewable fuel in a carbureted spark ignition engine. Pg. 4025 //1ac

#### Equipping current fueling stations solves – We build public trust and pave the way for 100% hydrogen fuel

Mazloomi & Gomes 12 – Professors of Electrical Engineering @ Universiti Putra Malaysia [Kaveh Mazloomi & Chandima Gomes “Hydrogen as an energy carrier: Prospects and challenges,” Renewable and Sustainable Energy Reviews 16 (2012) 3024– 3033

2.7.2. Production at sales outlets - Hydrogen can be produced in small scales at places such as refueling stations. Utilizing this method of fuel production eliminates some of the disadvantages of large scale hydrogen generation. As it was mentioned earlier, the cost of building large scale hydrogen tanks will become unreasonably high for huge storage capacities. Published statistical data by U.S. Census Bureau [83] and Research and Innovative Technology Administration, a branch of Bureau of Transportation Statistics [84] show a rate of roughly 200 cars attending to a normal fuel station in the United States daily. Assuming a requirement of 2.5 kg of hydrogen per vehicle, each station has to provide 500 kg hydrogen every day. In addition, US Department of Energy [85] expresses a period of 6 h of peak and 18 h of off-peak time during the weekdays. Hence, by assuming the mentioned amount of hydrogen to be generated during the whole 18 h period, a tank with the maximum capacity of 1/4 size of the daily supply will be sufficient for each station. In this case, **the investment cost** of building storage tanks will be minimal.

Moreover, none of the expressed transportation costs are applicable for this approach since each production site is provided with the required electricity supply, which can be used for gas generation. The latter will reduce up to 2 US$/kg hydrogen, depending on the means of fuel transportation.

Since most of the vehicles rely on gasoline based engines, the development of hydrogen vehicles can be started without multibillion dollar investments. **Current fuel stations can be equipped with hydrogen fuel dispensers to satisfy the needs of local markets.** Number of outlets and equipment per outlet can be increased gradually. Meanwhile, vehicle manufacturers will face new opportunities to enhance their designs and improve the number of their hydrogen based productions. In this approach, both **providers of vehicles and fuel will gain public trust** on a hydrogen based transportation economy. The concept of hydrogen production at the distribution points is illustrated in Fig. 4.

2.7.3. Household scale production - During the last few years, several major companies introduced home-level hydrogen stations. Their earlier models generated hydrogen from natural gases while the most recent systems use solar energy to produce this fuel by means of water electrolysis. The mentioned refueling systems are still under experiment, mainly in the United States [86]. The consumer price of this system is not officially stated, and it is not available for public to purchase. We believe equipping each hydrogen vehicle owner with one mini fuel station might be a short-term solution to overcome the unavailability of public facilities. However, this solution does not seem to be able to outperform the previous method, especially when macro-economics is the subject of debate.

Fig. 5 is a schematic showing the structure of small scale hydrogen production.

3. Conclusions - This study provides **solid info**rmation **on the feasibility** of developing the industry of producing hydrogen as a fuel or energy carrier, at several scales. Based on our analysis would like to make the following recommendations. The following advantages of hydrogen as a material over other competing fuels should be fully exploited

1. Possibility of mission free consumption.

a. Higher gravimetric energy content.

b. Possibility of feeding systems which are designed to utilize other fuels.

c. Requirement of less complex energy harvesting machinery and equipment.

d. Possibility of fuel production localization.

e. Possibility of production from renewable energy sources.

f. Unlimited resources.

2. The following drawbacks of hydrogen as a materials should be taken into account and addressed adequately when it is used as a fuel or energy carrier

a. Low volumetric energy content.

b. Requirement of developing country-scale infrastructures in order to be counted as a substitute for fossil-based fuels.

c. High transportation costs.

3. It is highly profitable to produce hydrogen by utilizing the surplus energy wasted in dummy loads (to maintain the system stability) in large scale grid systems (at generation end).

4. Power produced in distributed generators based on alternative energy sources can also be used for the generation of hydrogen, especially during off-peak hours.

5. In large grids, at consumer level it is profitable to produce hydrogen by electricity during off peak hours. This can be done at large consumer level (at gasoline stations) or retail consumer level (homes and small scale installations).

6. Storage of hydrogen is less costly when small to medium sized containers are used. As the capacity of the container exceeds medium scales, the cost of storage becomes excessively high.

7. Risk of handling hydrogen is equal or less than that of other competitive fuels. However it is emphasized to develop universal safety guidelines for mass handling of hydrogen as it becomes a day-to-day fuel.

8. Initially, it is proposed to use energy through hydrogen in gasoline-based engines themselves due to the practical constraints. As the usage increases 100% hydrogen fuel based automobiles and stationary engines can be constructed. Pg. 3031-3032 //1ac

#### Hydrogen fuel dramatically reduces CO2 emissions

Doll & Wietschel 08– Transportation Systems Analyst @ Fraunhofer Institute Systems and Innovation Research & Deputy Head of the Competence Center Energy Technology and Energy Systems. [Dr. Claus Doll (Ph.D in Business Engineering) & Dr. Martin Wietschel (Ph.D in Industrial Engineering), “Externalities of the transport sector and the role of hydrogen in a sustainable transport vision,” Energy Policy 36 (2008) pg. 4069–4078

A lot of research studies have been carried out to analyse the possible CO2 effects of hydrogen as a fuel in the transport sector. All in all the analysed studies show that the use of hydrogen in the transport sector can significantly reduce CO2 emission of the transport sector compared to other scenarios without hydrogen, even if taking into account tailpipe and upstream emissions as well as alternative technology developments (e.g. biomass as a transport fuel, efficiency improvements of the propulsion system) in the baseline scenario without hydrogen. This is an important result because CO2 emission reduction in the transport sector is a very challenging task and with respect to climate change it could be shown that the introduction of hydrogen would lead to a more sustainable transport system compared to an oil-based transport system. The reduction for CO2 goes up to 60% compared to a reference development for selected European countries. However the results are very sensitive on assumptions like feedstock for hydrogen and hydrogen vehicle penetration rates.

Local air emissions, responsible for particulate matter, ozone and acid rain, as well as noise could also be significantly reduced by the introduction of hydrogen fuel cell vehicles. Emissions of NOx, SO2, and particulate can be reduced by 70–80% compared to a reference case. Especially in highly densely populated areas this is one major benefit of hydrogen, which is often underestimated. The number of mega cities worldwide is increasing which demonstrates the increasing importance of this topic. A rough calculation shows that the CO2, local emissions, and noise benefits of a fuel cell vehicle lead up to reduction of average external cost by 1000–1500 Euro per vehicle compared to a conventional vehicle. Pg. 4077-78 //1ac

## Economy Extensions

### Economy Uniqueness

#### Unemployment going higher – OECD is on our side

Reuters 6/26/12 [[Lucia Mutikani](http://blogs.reuters.com/search/journalist.php?edition=us&n=lucia.mutikani&) “OECD raises red flag on U.S. long-term unemployment,” Tue Jun 26, 2012 1:11pm EDT, pg. http://www.reuters.com/article/2012/06/26/us-usa-economy-jobs-idUSBRE85K0S920120626

(Reuters) - The lengthy spells many Americans are spending without work risk leaving a lasting scar of higher unemployment on the U.S. economy and training programs are needed to avert the damage, the OECD said on Tuesday.

The warning from the Organization for Economic Cooperation and Development comes against the backdrop of stalled U.S. jobs growth and an uptick in the unemployment rate in May.

In a report on the U.S. economy, the Paris-based OECD estimated the unemployment rate which the economy could sustain without generating inflation at 6.1 percent, up from 5.7 percent in 2007. In May, the rate stood at 8.2 percent.

"However, structural unemployment may well already have risen more than this estimate would suggest, and there is a risk that it could increase still further, given the still high levels of long-term unemployment," the OECD said.

Before the 2007-2009 recession, many economists believed the so-called natural or structural rate of unemployment was around 5 percent.

However, millions of Americans have suffered unusually long bouts of unemployment, eroding both their skills and their attachment to the labor force - and potentially driving structural unemployment higher.

#### The structural damage will become permanent

Reuters 6/26/12 [[Lucia Mutikani](http://blogs.reuters.com/search/journalist.php?edition=us&n=lucia.mutikani&) “OECD raises red flag on U.S. long-term unemployment,” Tue Jun 26, 2012 1:11pm EDT, pg. http://www.reuters.com/article/2012/06/26/us-usa-economy-jobs-idUSBRE85K0S920120626

PERMANENT DAMAGE Though the median duration of unemployment has eased from the record 25 weeks touched in June 2010, it is still at an uncomfortably high 20.1 weeks. About 43 percent of the 12.7 million unemployed Americans have been out of work for more than six months. "The persistence of high unemployment duration is worrisome because the experience of other OECD countries has been that long-term unemployment can become structural or lead to permanent reductions in labor force participation," the OECD said. The U.S. labor force participation rate - the share of working-age Americans either employed or looking for work - is hovering near 30-year lows, driven down by retiring baby boomers and frustrated job seekers who have given up the hunt.

### Economy Links

#### Spending during a downturn is key – It is all about timing

CSM 08 [David R. Francis, “The economic stimulus package: How does spending help?,” Christian Science Monitor, February 4, 2008, pg. http://www.csmonitor.com/Business/2008/0204/p15s01-wmgn.html]

Yes, the tax stimulus raises federal debt. But with the economy already slowing, the nation must avoid hitting the economic brakes; rather keep it moving to slow rising unemployment and the weakening of businesses.

When the temporary tax cuts end, the economy should be moving forward again and federal revenues will rise to trim or end the federal budget deficit. That, explains Bluestone, is what happened in 1995-96 under [President Clinton](http://www.csmonitor.com/tags/topic/Bill%2BClinton). And if necessary, the government could dampen a new vigorous economic expansion to trim rising inflation.

"At least we tackle that problem when the economy is growing, not declining," says Bluestone. "It's a timing problem."

\*[Barry Bluestone](http://www.csmonitor.com/tags/topic/Barry%2BBluestone) - Dean and economist @ N[ortheastern University](http://www.csmonitor.com/tags/topic/Northeastern%2BUniversity)

## Warming Extensions

### Tar Sands Ext

#### Tar Sands makes it game over for the climate

[Hansen](http://www.giss.nasa.gov/staff/jhansen.html) 5/9/12 – Director of the NASA Goddard Institute for Space Studies [[James Hansen](http://www.giss.nasa.gov/staff/jhansen.html), “Game Over for the Climate, New York Times, “May 9, 2012, pg. http://www.nytimes.com/2012/05/10/opinion/game-over-for-the-climate.html

GLOBAL warming isn’t a prediction. It is happening. That is why I was so troubled to read a recent [interview with President Obama](http://news.sciencemag.org/scienceinsider/2012/04/i-have-the-utmost-respect-for.html) in Rolling Stone in which he said that [Canada](http://topics.nytimes.com/top/news/international/countriesandterritories/canada/index.html?inline=nyt-geo) would exploit the [oil](http://topics.nytimes.com/top/news/business/energy-environment/oil-petroleum-and-gasoline/index.html?inline=nyt-classifier) in its vast tar sands reserves “regardless of what we do.”

If Canada proceeds, and we do nothing, it will be game over for the climate.

Canada’s tar sands, deposits of sand saturated with bitumen, contain twice the amount of carbon dioxide emitted by global oil use in our entire history. If we were to fully exploit this new oil source, and continue to burn our conventional oil, gas and [coal](http://topics.nytimes.com/top/reference/timestopics/subjects/c/coal/index.html?inline=nyt-classifier) supplies, concentrations of carbon dioxide in the atmosphere eventually would reach levels higher than in the Pliocene era, more than 2.5 million years ago, when sea level was at least 50 feet higher than it is now. That level of heat-trapping gases would assure that the disintegration of the ice sheets would accelerate out of control. Sea levels would rise and destroy coastal cities. Global temperatures would become intolerable. Twenty to 50 percent of the planet’s species would be driven to extinction. Civilization would be at risk.

### AT: IPCC Bad

#### Consensus

Schneider 11 - Professor of Public Administration @ of North Carolina-Pembroke [Robert O. Schneider, “Climate change: an emergency management perspective,” Disaster Prevention and Management, 20. 1 (2011): 53-62

One often hears climate change critics assert that there is no scientific consensus on global warming. It is perhaps an understatement to say that the claims of these critics appear to be exaggerated ([10] LePage, 2007). The logical place to begin, of course, is with an understanding of exactly what the risks are in relation to climate change. While admitting that there may be some uncertainty associated with longer-range assessments, enough is actually known or is knowable to arrive at an accurate baseline for analysis.

It turns out that, contrary to the view of some critics, there is in fact a growing and overwhelming consensus in the scientific community about global warming and its causes ([21] Union of Concerned Scientists, 2009). Scientific societies (The American Meteorological Society, the American Geophysical Union, The American Association for the Advancement of Science, The Geological Society of America, The American Chemical Society, The US National Academy of Science, and International Academies) are in fundamental agreement that global warming is happening, humans are contributing to it, and that the scientific understanding of climate change is sufficiently clear to take steps to respond to its threats ([21] Union of Concerned Scientists, 2009).

#### Warming deniers are on the fringe of the scientific community

Schneider 11 - Professor of Public Administration @ of North Carolina-Pembroke [Robert O. Schneider, “Climate change: an emergency management perspective,” Disaster Prevention and Management, 20. 1 (2011): 53-62

Some people on the fringes of the scientific community and, many outside of it, debate the degree to which anthropogenic (human caused) climate change is impacting the weather or question how weather changes are related to increases in greenhouse gases emitted through fossil burning fuels and other human activities. This, in spite of the 2007 report issued by the Intergovernmental Panel on Climate Change in which 600 scientists from 40 countries cited the growing evidence that man-made global warming is a realty ([2] Broecker and Kunzig, 2008). This is just one more example that there is considerable agreement among experts worldwide about both the fact of climate change and the human role in it. However whatever the causes, there is no doubting that it is happening. There is also no doubt that without a decrease in our escalating vulnerability due to the development practices alluded to above the losses of life and property will accelerate with even modest increases in the intensity and frequency of extreme events.

### AT: China/India

#### We pave the way for a global hydrogen economy – US exports will prime the pump

Blanchette 08 – Chief Engineer for Army Programs @ Software Engineering Institute [Stephen Blanchette Jr., “A hydrogen economy and its impact on the world as we know it,” Energy Policy 36 (2008) pg. 522–530

Now, consider hydrogen and its possible affect on the LDCs. In the short term, hydrogen likely would be imported from developed nations. Since developed nations are targeting hydrogen prices to be competitive with the equivalent amount of gasoline (Milliken, 2004), hydrogen import costs are unlikely to be substantially worse than are those for oil imports. From that standpoint, developing nations would be no worse off. In fact, one can conceive of the possibility of short-term hydrogen price breaks for the LDCs, in the interest of hastening the arrival of the global hydrogen economy.

Further, in the long term, hydrogen promises to be producible anywhere. Therefore, assuming institutions like the World Bank continue funding global infrastructure projects, there is the hope that developing nations could eventually produce hydrogen domestically in quantities sufficient not just to maintain the status quo, but also to support growth. That is an exciting prospect. Pg. 527

## Peak Oil Extensions

### IL – Oil Supply shortage

#### Oil is the bottleneck – Supply shortage will trigger a massive credit crunch

Tverberg 12 – Fellow of the Casualty Actuarial Society & Member of the American Academy of Actuaries [Gail E. Tverberg (MS in Mathematics from the University of Illinois) , “Oil supply limits and the continuing financial crisis,” Energy, Volume 37, Issue 1, January 2012, pg. 27-34

Furthermore, we consider the possibility that if world oil supply fails to increase, the growth of the emerging economies will create a shortage of oil that will act as a bottleneck for Organization for Economic Co-operation and Development (OECD) economic growth in the next several years. This hypothesis seems reasonable since Smil shows that moving away from a fossil fuel civilization in less than 20 or 30 years is very unlikely, because of the very long time required for transition from one type of fuel infrastructure to another [1]. Biophysical constraints arising from the loss of fossil fuel energy could also be expected to negatively affect the economic process over the long-term [2]. Given our built infrastructure, oil is one input that is currently needed for economic growth. **While there are other requirements**, such as appropriate social institutions, technology, and ingenuity that are necessary for growth, **lack of oil would** seem to **act as a bottleneck, even if other necessary factors are present.**

While substantial work has been done outlining the connection of energy supply or oil supply with the economy, little work has been done laying out how, in practice, a reduction in oil supply might affect the credit system and the economic leverage it provides. It is the purpose of this paper to make a first step toward setting forth some of these connections. When this is done, there are striking similarities between the attributes of the 2008-2009 recession and the expected impacts of reduced oil supply on economies.

We show that increasing oil supply tends to give rise to **economic growth** and to conditions that foster the **expansion of credit**. Economic growth tends to be associated with many other favorable outcomes, including rising home prices, rising stock market prices, and adequate supply of capital. These outcomes play a crucial role in enhancing the positive effects that credit has on the functioning of modern economies. Decreasing oil supply tends to have an opposite effect, leading to economic stagnation or decline and credit restriction, and unfavorable follow-on outcomes, including falling home prices, declining stock market prices, and inadequate supply of capital.

Because declining oil supply tends to be associated with credit restrictions and economic stagnation or decline, the common belief that oil prices will rise to a very high level in the face of inadequate supply appears to be untrue. Instead, our research shows that the limiting factor with respect to oil supply is likely to be inadequate demand for high-priced oil. Oil prices are likely to rise to a point where they cause recession and credit contraction, and then decline. After at time, they may rise again with economic recovery, only to fall again when they reach the point when the high prices lead to recession. At times, there may appear to be a glut of oil on the market. Oil prices may never reach a high enough level to stimulate extraction from sources that require very expensive extraction techniques or to encourage widespread use of renewable sources of energy. Pg. 27-28

#### Credit contraction risks global collapse – Oil competition makes the decline self-reinforcing

Tverberg 12 – Fellow of the Casualty Actuarial Society & Member of the American Academy of Actuaries [Gail E. Tverberg (MS in Mathematics from the University of Illinois) , “Oil supply limits and the continuing financial crisis,” Energy, Volume 37, Issue 1, January 2012, pg. 27-34

Scenario 3. There is a possibility that world oil production will remain flat, or decline. In this scenario, indications are that the “All Other” countries will continue to outbid “OECD” for oil supplies, and OECD’s oil use will continue to decline. Recession and debt defaults are likely outcomes. Lower credit availability and lower demand can be expected to reduce demand for natural gas, coal, and alternative fuels, as it did during the 2008-2009 recession, making the impacts greater than the oil shortage by itself might suggest. This reduction in demand is expected to reflect a shortfall of demand for high priced energy products (analogous to the lack of demand for high priced oil). Unless low-priced energy substitutes can be found, it is not clear that there is a cure for this lack of demand.

8. Conclusion - While we cannot know what the future will bring, the evidence would seem to suggest that we are reaching limits on the amount of oil that the world can extract at a price OECD countries can afford to pay without causing serious recession. While there is a theoretical possibility that some way can be found around this roadblock, perhaps through innovation that brings down the price of oil extraction, or through the development of inexpensive alternative fuels, there appears to be a real possibility that OECD’s oil consumption will continue to fall, and OECD countries will continue to experience recession and debt contraction. One concern is that this could end very badly. Banks, insurance companies, and pension plans are all operated with the expectation that most debt will be repaid according to schedule, with appropriate interest added. They will encounter serious financial difficulties if they encounter a substantial number of defaults because their equity will be quickly eroded. The government can use bailouts and stimulus funds to temporarily remedy the situation, but eventually the widespread nature of the problem will become evident.

There are various types of insurance programs set up to handle bankruptcies of financial institutions, but they are not set up to handle a situation where problems are widespread. The assumption that is always made in funding these programs that bankruptcy is a very rare independent event.

At some point, there would appear to be a possibility that the financial system and the international trade system would be at risk of disruption, because these both depend on debtors being able to fulfill the terms of their loans.

Also, if economic decline starts, there seems to be evidence that it is self-reinforcing if OECD countries must compete with oil exporters and emerging economies for a virtually flat supply of oil, as in the recent past. Investment capital is likely to be in very short supply, because debt for investment will not be very available, and businesses may still need to pay back past loans in a declining economy. Lower energetic supplies will make it difficult to maintain all aspects of infrastructure.

Both Tainter [35] and Meadows [36] have described **adverse scenarios, where** all systems seemed to deteriorate at the same time**.** While there is no certainty that we are approaching such an outcome, it **would** seem to **be an outcome** that we should be considering. Some are hopeful that a steady state economy can be developed that can prevent collapse and allow world population to live at a lower, but acceptable, level [37, 38]. Research is needed as to the feasibility of this alternative. How many people can the world support with minimal use of fossil fuels? What type of lifestyle can be expected for these people? Without research in this area, there is a possibility that advocates of a steady state economy are proposing an alternative that does not differ materially from a collapse scenario. Pg. 33-34

### IL – Oil wars

#### Oil determines the geostrategic context that the US military operates within

CNA Military Advisory Board 10 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Economy: Energy Innovation at the Crossroads of National Security Challenges*, July 2010]

**•** *Geostrategic challenges*: Reliance on foreign oil presents geostrategic challenges to the nation. Oil funds some nations, notably Iran and Venezuela, whose objectives often run contrary to those of the United States. None of this is new: guaranteeing access to petroleum has been at the top of the American foreign policy agenda for decades. In 1980, for example, President Carter declared that American military forces would protect the Persian Gulf “from outside attempts to gain control” [5]. American actions abroad are, by necessity, conducted within this geostrategic context. Pg. 3

### IL – Price Volatility - Economy

#### Price volatility undermines the economy

CNA Military Advisory Board 09 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Defense:**Energy and the Risks to National Security*, May 2009]

The volatile fossil fuel markets have a major impact on our national economy, which in turn affects national security. Upward spikes in energy prices—tied to the wild swings now common in the world’s fossil fuel markets—constrict the economy in the short-term, and undermine strategic planning in the long-term. Volatility is not limited to the oil market: the nation’s economy is also wrenched by the increasingly sharp swings in price of natural gas and coal. This volatility wreaks havoc with government revenue projections, making the task of addressing strategic and systemic national security problems much more challenging. It also makes it more difficult for companies to commit to the long-term investments needed to develop and deploy new energy technologies and upgrade major infrastructure. Pg. 10-11

#### Oil price volatility undermines the economy

CNA Military Advisory Board 10 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Economy: Energy Innovation at the Crossroads of National Security Challenges*, July 2010]

*Economic impacts*: As of this writing, the full economic impacts of the Deepwater Horizon oil disaster to states along the Gulf Coast are not yet fully known, but they will no doubt be extraordinarily high and persist for many years. Further, oil imports are a huge drain on the nation’s economy. Despite the severe economic recession, the United States transferred an estimated $386 billion overseas to purchase oil in 2008 and over $350 billion in 2009. Finally, and perhaps most significant from an economic security perspective, the unpredictable volatility of oil prices sends ripple effects through American businesses and government agencies stretching from the federal to local level. Without stable and predictable energy prices, business leaders, farmers, and especially large industries cannot effectively plan, hire, and remain competitive in a global market. The economic costs of the nation’s energy choices affect jobs, American livelihoods, and the ability of the United States to compete in the global marketplace. America’s global leadership, militarily and diplomatically, is directly affected by its economic strength. Pg. 3

### IL – Oil infrastructure - Economy

#### Small attacks on the oil infrastructure can create surges in prices

CNA Military Advisory Board 09 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Defense:**Energy and the Risks to National Security*, May 2009]

The effects of these attacks have been regional, and none resulted in a catastrophic disruption in the flow of oil. However, these attacks have demonstrated the vulnerability of oil infrastructure to attack; a series of well-coordinated attacks on oil production and distribution facilities could have serious negative consequences on the global economy. Even these small-scale and mostly unsuccessful attacks have sent price surges through the world oil market. Pg. 6

### IL – Oil competition

#### Oil supply is constrained. Competition will intensify

CNA Military Advisory Board 09 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Defense:**Energy and the Risks to National Security*, May 2009]

The demand for oil is expected to increase even as the supply becomes constrained. A 2007 Government Accountability Office (GAO) report on peak oil, which considered a wide range of studies on the topic, concluded that the peak in production is likely to occur some time before 2040 [64]. While that 30-year timeframe may seem long to some, it is familiar to military planners, who routinely consider the 30- to 40-year life span of major weapon systems. According to the International Energy Agency (IEA), most countries outside of the Middle East have already reached, or will soon reach, the peak of their oil production [65]. This includes the U.S., where oil production peaked in 1970.

Just how constrained will oil supplies be? A November 2008 article by Fatih Birol, the IEA’s chief economist, outlined what it will take just to make up for the declining production in today’s oil fields, which Birol describes as “just standing still” [66]. Continuing to produce 85 million barrels of oil for the next 22 years will require 45 million barrels per day of new production. “That means four Saudi Arabias,” according to Birol. When an increase in demand is factored in, he says meeting demand will require finding the equivalent of an additional two more Saudi Arabias. This strain on production capacity suggests intense competition. Pg. 18

### IL – Military Readiness

#### Raising oil prices decreases military readiness

CNA Military Advisory Board 10 – Retired generals and admirals from all four services [Center for Naval Analyses: Analysis and Solutions (A not-for-profit company which provides indepth analysis and results-oriented solutions to help government leaders set policy and manage military operations), *Powering America’s Economy: Energy Innovation at the Crossroads of National Security Challenges*, July 2010]

**•** *Cost*: Like the rest of the country, heavy dependence on oil has significant economic repercussions in DOD. Given the size of DOD and its rate of energy consumption, the effects are especially significant. In 2008, approximately $20 billion of DOD’s budget was spent on energy, of which $3.8 billion purchased electricity for installations [7]. Over the past two decades, the Navy’s expenditure on energy has increased 500 percent [8]. When the price of fuel spikes (as it will continue to do), it sends a readiness shock wave through DOD’s budget. Every $10 increase in the price of a barrel of oil costs the Department $1.3 billion. That money comes at a direct and serious cost to other warfighting readiness priorities. Pg. 3

### Impact – Die-off

#### Collapse will trigger a 99.4% die-off

Weyler 12 – Founding member of Greenpeace [REX WEYLER, “Our Future Discussed,” Vancouver Peak Oil, Tues. May 29, 2012, pg. http://vancouverpeakoil.org/2012/05/29/rex-weyler-our-future-discussed/#more-2819

1. Collapse scenarios: **There will** indeed **be a die-off during humanity’s resource downslope**, but **a** die-off from 7-billion to 40 million (99.4% die-off) would not be a well-organized descent to utopia, it would be chaos, and the most desperate would lay waste to social infrastructure before they’d let your children and their friends convert cars to electric trains or any such thing. It might work on paper to have 40-million people living your present lifestyle, if you could blow the excess people out like candles, but in the real world, a social collapse of that magnitude would be sloppy, violent, and dis-integrating. It is more likely that the indigenous people in the Amazon and New Guinea would be the survivors, not the sustainability consultants and permaculturists in BC or Washington State. Your scenario is not realistic.

2. Who are the labour force?: And once humanity reached 40-million, all living at your pleasant level of goods and services, with trains running on time, who is keeping the hydroelectric projects running, and cleaning out the silted reservoirs? Who’s mining the copper and lithium and mineral ores. Recycling? Who is doing that? Where is the energy coming from and the energy infrastructure to recycle copper and rare earth metals out of old computers and cell phones? How are these materials getting shipped around to manufacturing centres? Who is doing the manufacturing? Who is growing the food for the miners and recyclers and manufacturers?

It could not and would not happen like that. If 40 million humans were left, one-half of 1-percent of present population, they would likely be living off the perennial output of whatever is left of nature’s bounty (not tearing up land each year to plant annual grains, for example).

You appear to me to be forgetting that all of the world’s affluent society living today as you describe (5-7 % of society) lives on the collective energy and materials flow provided by plundering nature and exploiting the masses to do all the dirty work.

The last time there were 40 million people on Earth, about 4,000 years ago, civilizations had irrigation and chariots, but achieved this with animal power and slaves**,** and by destroying forests to smelt copper. Many cities collapsed between 5,000 BC and 1000 AD.

The inequity and unsustainable lifestyles of the oligarchs brought these empires down. We possess no technological miracles that can change this reality. All of our techie toys exist on top of a giant pyramid of resource extraction, nature-destruction, and human exploitation.

### Solv – Tech solves

#### Political motivation for a shift to energy independence exists. US just needs the tech

Grunewald 09 - Argov Fellow @ IDC Herzliya [Adam Grunewald (Third year student, Lauder School of Government, Diplomacy and Strategy), “Dr. Gal Luft: Turning Oil into Salt,” IDC Herzliya, Nov 1, 2009, pg. <http://portal.idc.ac.il/He/Main/about_idc/news_events/DocLib2/71_gal_luft.pdf>]

Dr. Luft began his speech with a story about a similar strategic good that dictated the policies of nations for centuries; salt. Before the invention of canning and refrigeration, salt was the only means of preserving food. People were often paid in measures of salt, nations’ **military expeditions** were often dictated by salt, and in many countries people would live or die during the winter based on whether or not they had a large enough supply. Although salt is still widely used today for flavoring and other purposes, the **invention of modern tech**nologies has stripped the resource of its strategic importance. Dr. **Luft’s belief is that when we invest our resources into finding alternative fuel sources, oil will also lose its significance, and the oil rich Persian Gulf states will lose their leverage** over the rest of the world.

This geo-political exploitation is the primary danger associated with the continued world dependence on the members of OPEC (Organization for Petroleum Exporting Countries). Two of the most significant members of this cartel are Iran and Saudi Arabia, whose massive supply of petro-dollars allows them to sustain their efforts as the largest sponsors of radical Islam. Most of these OPEC countries are extremely underdeveloped in non-oil industries and are therefore unconcerned with the well-being of the world economy. Before the 1973 oil embargo, OPEC produced 30 million barrels of oil a day. Today, although the world economy has more than doubled in size and the demand for oil has skyrocketed over the past 36 years, OPEC produces only 29 million barrels of oil a day. This cynical strategy exemplifies the mindset of many of the cartel’s member states, which is to, “save it, and let the rest of the world run out so that they can further their oil-based exploitation.”

The United States government, is the largest importer of oil, and is fully aware of the situation of dependence that has developed between themselves and the Middle East. In fact, **energy independence has become one of the most politically bi-partisan and publicly supported issues in U**nited **S**tates history. Unfortunately, there is a widespread ignorance of how to achieve oil independence, even in the highest levels of government. During the U.S. presidential election Obama advocated the construction of large numbers of solar and wind based power plants, while McCain suggested that the nation build more nuclear reactors to get the country away from its need for oil. Dr. Luft was shocked to find out how little the two candidates knew about the issue. Nuclear, solar, and wind power plants are used to generate electricity, but today only 2% of the world’s electricity supply is powered by oil; “the people vying for the most powerful office in the world do not understand basic energy 101”.

Oil today exercises a complete monopoly over the transportation sector, which is the backbone of a functioning nation. While the magnitude of the world’s need for oil has become troubling, the most difficult reality is that there are currently no feasible alternatives. The popular slogan of the Republican Party to, “drill here, drill now” or the Democrat’s vision to “use less and conserve” are equally nonsensical in the eyes of Dr. Luft. Whether Americans are drilling domestically or consuming less oil, OPEC will simply drill less and wait until other countries run out. The problem is quite simply that when it comes to oil, the huge reserves of OPEC states means that they will inevitably control the game and its rules. So in the words of Dr. Luft, “If you want to beat Serena Williams, don’t play tennis against her; play cards, soccer, bowling or anything else, but don’t play tennis.”

* Gal Luft is executive director of the Institute for the Analysis of Global Security

#### Energy alternatives solve oil dependence and market uncertainty

Sovacool 07 **–** Research Fellow for the Energy Governance Program @ National University of Singapore **[Benjamin K. Sovacool (**Professor of International Affairs @ Virginia Tech University), “Oil Independence Possible for U.S. by 2030,” Scitizen, 26 Oct, 2007 11:49 am, pg. http://scitizen.com/future-energies/oil-independence-possible-for-u-s-by-2030\_a-14-1167.html]

**Oil independence is possible** for the U.S. if comprehensive and aggressive energy policies are implemented aimed at reducing demand for oil, increasing supply, and promoting alternative fuels.

The trick is to start by thinking about oil independence a little differently. Oil independence should not be viewed as eliminating all imports of oil or reducing imports from hostile or unstable oil producing states. Instead, it should entail creating a world where the costs of the country’s dependence on oil would be so small that they would have little to no effect on our economic, military, or foreign policy. It means creating a world where the estimated total economic costs of oil dependence would be less than one percent of U.S. gross domestic product by 2030.
Conceived in this way (and contrary to much political commentary these days), researchers at the Oak Ridge National Laboratory (ORNL) have calculated that if the country as a whole reduced their demand for oil by 7.22 million barrels per day (MBD) and increased supply by 3 MBD, oil independence would be achieved by 2030 with a 95 percent chance of success. By reducing demand for oil, increasing its price elasticity, and increasing the supply of conventional and unconventional petroleum products, ORNL researchers noted that the country would be virtually immune from oil price shocks and market uncertainty. If large oil producing states were to respond to the U.S. by cutting back production, their initial gains from higher prices would also reduce their market share, in turn further limiting their ability to influence the oil market in the future.

#### We make the oil problem small enough that we change their foreign policy decisions.

Sovacool 07 – Research Fellow for the Energy Governance Program @ National University of Singapore [Benjamin K. Sovacool (Professor of International Affairs @ Virginia Tech University), “Solving the oil independence problem: Is it possible?,” [Energy Policy](http://www.sciencedirect.com.proxy.library.emory.edu/science/journal/03014215) [Volume 35, Issue 11](http://www.sciencedirect.com.proxy.library.emory.edu/science?_ob=PublicationURL&_tockey=%23TOC%235713%232007%23999649988%23669309%23FLA%23&_cdi=5713&_pubType=J&view=c&_auth=y&_acct=C000034138&_version=1&_urlVersion=0&_userid=655046&md5=bb46814fec93576c271b4e8d17d993fb), November 2007, Pages 5505-5514//ScienceDirect]

Indeed, a situation may be imminent where oil independence—properly conceptualized—is now achievable for the US. If implemented quickly, a comprehensive policy aimed at developing alternatives to oil and rigorously promoting transportation energy efficiency could effectively insulate the US economy from oil price shocks. To accomplish this ambitious task, the country need not get off oil. Instead, policymakers must make the “oil problem” small enough that it no longer constrains the country's foreign policy decisions.

### AT: Resource cooperation

#### History is on our side – Resource depletion leads to unbridled competition

Heinberg 2/13/12 - Senior Fellow-in-Residence @ Post Carbon Institute [[Richard Heinberg](http://www.aljazeera.com/indepth/opinion/profile/richard-heinberg.html) , “Co-operation in a world of scarce resources,” Al Jazeera, Last Modified: 13 Feb 2012 14:04, pg. http://www.aljazeera.com/indepth/opinion/2012/02/20122410434136622.html]

The world's governments engage continually in both cooperative and competitive behaviour, though sometimes extremes of these tendencies come to the fore - with open conflict exemplifying unbridled competition. Geopolitics typically involves both cooperative and competitive strategies, with the long-term goal centred on furthering national interest (including increased control of territory and access to resources).

Recent decades have generally seen increasing international cooperation, revealed in the expansion of trade, the proliferation of treaties and conventions and the development of international laws and international institutions for justice and conflict resolution. The United Nations, World Trade Organisation, World Bank and the International Criminal Court - as well as regional economic (eg: the Shanghai Cooperation Organisation) and military (eg: NATO) cooperation groups exemplify this trend. While some of these efforts appear to be geopolitically motivated, others seem to be genuine attempts to reduce both international tensions and global environmental problems while advancing human rights.

This trend toward increasing international cooperation could see a reversal in coming years and decades. As noted above, history is replete with instances of resource scarcity fomenting conflict. In such cases, competitive advantage typically resides either with nations that have domestic resources and the ability to defend them, or with nations that develop a vigorous, flexible and motivated military force able to take advantage of other nations' weaknesses in order to seize control of their resources.
In addition to international conflict, a failure of human cooperation in the face of resource scarcity may also manifest as increasing conflict within nations. Since 1945, three-quarters of all wars have occurred within nations rather than between them, with most occurring in the world's poorest countries. About as many people may have died as a result of civil strife since 1980 as were killed in World War I. Civil conflicts devastate poor nations by destroying essential infrastructure, driving human and capital flight, diverting scarce financial resources toward military spending, undermining social trust, aggravating existing food shortages and spreading disease.
If the path towards increasing competition leads to both internal and external conflict, then the result - for winners and losers alike, in a "full" world seeing rapid resource depletion - will most probably be economic and ecological ruin accompanied by political chaos.

## Solvency Extensions

### Fuel Stations Solve

#### Only the plan can facilitate rapid installation and boost consumer confidence in hydrogen

Melaina 03 – Professor in the School of Natural Resources and Environment @ University of Michigan [Marc W. Melaina (Ph.D in Natural Resources and Environment from the University of Michigan), “Initiating hydrogen infrastructures: preliminary analysis of a sufficient number of initial hydrogen stations in the US,” International Journal of Hydrogen Energy, Volume 28, Issue 7, July 2003, Pages 743–755

The three scenarios examined in the present analysis represent only one technical approach to overcoming the chicken and egg problem. The results of the analysis are, however, insightful. From a business perspective the results suggest that this approach to initiating a hydrogen infrastructure would have to be a highly coordinated endeavor. It is highly unlikely that market forces alone could result in the rapid and coordinated installation of thousands of stations spread uniformly across interstates and metropolitan areas. High volume stations in metropolitan areas would see more rapid returns on investment than those located along interstates, but both types of stations would be needed to assure consumer confidence. Only coordinated and regulated investment patterns would ensure that both types of stations are put into place. The risks of stranded capital and required levels of coordination are too high to expect market forces alone to effectively guide capital investments through this process.

On the other hand, many technical strategies have been proposed to facilitate the initiation process and reduce upfront capital costs [24], [25], [26], [27] and [28]. Results from the present analysis emphasize three general technical strategies that will be important in reducing investment risks during the initiation process. The first strategy is to install many early stations as simple storage-based stations. Many early stations will not require large hydrogen delivery capacities for several years during the initiation process. Some of these stations, especially those clustered in large metropolitan areas, could be supported by one or more local production facilities. Storing hydrogen onsite as a gas would avoid the high costs of onsite production or liquid storage, which may be more expensive than delivery of gaseous hydrogen over short distances in low volumes [29]. More remote and underutilized stations could receive hydrogen via liquid tanker or some other mode of delivery [29]. As the frequency of delivery to these underutilized stations increases, the storage systems could be replaced by complete onsite production systems or even pipeline systems. This strategy could facilitate the rapid installation of large numbers of initial stations, maintain some of the cost advantages of high volume production facilities, and adapt to changing local demands for hydrogen. Early site preparation requirements, station footprints, and lead times could also be reduced with storage-based stations.

The second general strategy that could facilitate the initiation process is to develop smaller modular station components that could be added incrementally to adapt to growing local hydrogen demand [28]. Smaller and cheaper onsite hydrogen production facilities are obviously desirable for early stations. However, if these stations cannot be easily relocated and replaced, or combined in groups to expand capacity at a single site, excessive numbers of relocations and displacements would occur as demand for hydrogen increases at different rates in different regions. Rather than being designed for an ideal initial station size, modular components could be designed to allow for a range of station sizes.

Finally, a third general strategy apparent from this scenario analysis is to focus on minimizing the gap between station installations and FCV deployments. This gap is largely dependent upon a consumer's perceived rather than actual ability to refuel with hydrogen. Consumers may contemplate the purchase of a FCV for years, and assurance of local refueling could greatly influence this early contemplative period. Early investments in “virtual” hydrogen stations, established through public acknowledgement and planning of future hydrogen fueling sites, could prime both the infrastructure initiation process and early FCV deployment rates several years in advance of the intense period of capital investment required to actually install a sufficient number of initial hydrogen stations.

5. Summary

While it is not possible to predict with accuracy the number of hydrogen stations that will be required before FCVs can be mass-produced, estimates based upon some general criteria and simplified analyses can provide reasonable first-cut approximations. Three estimation approaches were explored, based upon: (1) existing populations of gasoline stations, (2) metropolitan land areas, and (3) lengths of principal arterial roads. The arterial roads approach appears to provide the most consistent analysis of both rural interstate and metropolitan area stations. Preliminary estimates from the three approaches suggest that around 4500 hydrogen stations would be required to satisfy many early adopters, and between 9200 and 17,700 hydrogen stations would be required before fuel cell vehicles could be mass-produced for the general public.

Innovative technical strategies, such as establishing local networks of storage-based stations, designing modular station components, or the installation of “virtual” hydrogen stations, will be important in reducing the capital costs of early hydrogen stations. In addition, scenario analysis suggests that initial cost burdens can be significantly reduced if a high degree of coordination is attained between all involved stakeholders, including fuel providers, vehicle manufacturers, vehicle purchasers and government. As has been the case for other alternative transportation fuels in the US, the chicken and egg problem will continue to resist incremental, market-driven advances in infrastructure development. A highly coordinated effort on a large scale will be essential to the success of initiating a hydrogen infrastructure for fuel cell vehicles. //1ac

#### 10-15% market penetration solves – Only coordination can circumvent the chicken or egg stasis

Agnolucci 07– Senior Research Fellow @ Policy Studies Institute [Paolo Agnolucci (Ph. D in economics @ Birkbeck University), “Hydrogen infrastructure for the transport sector,” International Journal of Hydrogen Energy 32 (2007) 3526 – 3544

In the transport sector a step-change approach has been advocated in the literature, as the incremental approach and related virtuous circle are considered unable to circumvent the chicken or egg stasis.18 In the transport sector, the chicken-and-egg conflict is likely to arise when (a) the new energy carrier is incompatible with the existing end-use technologies; (b) the new fuel has a higher price than the dominant fuel; (c) investments are characterised by long lead times; (d) there are strong scale economies in fuel production and distribution and in the manufacture of end-use technologies; (e) the end-use market is homogenous [50]. All these conditions seem to prevail in the case of hydrogen used in the transport sector. As argued in Wurster [37], a slow build-up of refuelling infrastructure is not attractive to industries focused on mass markets such as the automotive and fuel supply industries. The solution consists of fostering a high degree of co-ordination on large scale investments among all involved stakeholders, i.e. fuel providers, car manufacturers, government and consumers [2]. In fact, without a significant number of hydrogen-fuelled vehicles, producers will not be able to reap economies of scale and ultimately drive down the price. Analogously, without significant volumes of vehicle sales, the fuel industry might hesitate to add hydrogen to the fuels available at filling stations. It is also implausible that consumers will accept a fuel which is not widely accessible [39]. The availability of hydrogen stations is particularly important, as hydrogen vehicles are unlikely to be bi-fuelled [6].

There seems to be a remarkable consensus among the proponents of the step-change approach with regard to the time envisaged to put in place the required infrastructure needed “to ensure that a large fraction of potential FCV buyers have comfortable access to hydrogen fueling” [2, p. 744]. Jensen and Ross [57] and Melaina [2] fix this threshold at about 10–20,000 stations, i.e. 10–15% of the total number of stations in the US, installed over a timeframe of 4–5 years. According to Wurster [37], about 6 years would be needed to reach a similar percentage of German stations able to deliver hydrogen.Yang and Ogden [18] adopt 10% of existing fuel stations as a minimum for the number of refuelling points. Pg. 3533-4 //1ac

### AT: Engine Conversion

#### Hydrogen is easily converted to be used in the internal combustion engine

Balat 08– Professor of Biological Sciences @ University of Mahallesi [Mustafa Balat, “Potential importance of hydrogen as a future solution to environmental and transportation problems,” International Journal of Hydrogen Energy 33 (2008) pg. 4013–4029

Hydrogen can be used as a transportation fuel, whereas neither nuclear nor solar energy can be used directly. It has good properties as a fuel for internal combustion (IC) engines in automobiles. Hydrogen can be used as a fuel directly in an IC engine not much different from the engines used with gasoline [59]. The blending of hydrogen and ethanol has been used as an alternative renewable fuel in a carbureted spark ignition engine [60,61].

Hydrogen has very special properties as a transportation fuel, including a rapid burning speed, a high effective octane number, and no toxicity or ozone-forming potential. It has much wider limits of flammability in air (4–75% by volume) thanmethane (5.3–15% by volume) and gasoline (1–7.6% by volume). A stoichiometric hydrogen–air mixture has very lowminimum ignition energy of 0.02mJ (Table 4).A hydrogen engine is easy to start in cold winter because hydrogen remains in a gaseous state until it reaches a low temperature such as 20 K [62]. Such characteristics play a role to decrease engine cycle variation for the safety of combustion. However, it is frequently observed that the values of cycle variation for hydrogen-fueled engines with direct injection are higher than those of hydrogen fueled engines with manifold injection or those of gasoline engines, due to a decrease in the mixing period by direct injection in the process of compressing hydrogen [63].

Combustion product of hydrogen is clean, which consists of water and a little amount of nitrogen oxides (NOx). With proper measurements it is believed that this amount of NOx can be reduced, even attaining 1/200 as low as diesel engines [62]. Pg. 4017

#### Transportation infrastructure is key to the hydrogen economy

Balat 08– Professor of Biological Sciences @ University of Mahallesi [Mustafa Balat, “Potential importance of hydrogen as a future solution to environmental and transportation problems,” International Journal of Hydrogen Energy 33 (2008) pg. 4013–4029

One version of the vision for a sustainable energy system that has been able to unite economic growth and environmental concerns is the vision of the hydrogen economy [57]. There is no universally accepted definition of the ‘‘hydrogen economy’’, but it is generally viewed as the replacement of the vast majority of petroleum fuels used by transportation vehicles of all kinds (automobiles, trucks, trains, and aircraft) with hydrogen that is burned in IC engines, external-combustion (jet) engines, or preferably, used in fuel cells to more efficiently generate power for transportation [66]. A hydrogen economy, the long term goal of many nations, can potentially confer energy security, along with economic and environmental benefits [67]. Pg. 4018-4019

### AT: Black Hydrogen

#### SMR solves

England 12 – Master’s Degree in Planning @ University of Waterloo [Ashley England, “Analysis of a Potential Hydrogen Refuelling Network Using Geographic Information Systems: A Case Study of the Kitchener Census Metropolitan Area,” A thesis presented to the University of Waterloo in fulfillment of the thesis requirement for the degree of Master of Arts in Planning, 2012

Despite this, SMR is an attractive option because it is relatively inexpensive and the existing infrastructure for the extraction and distribution of natural gas is already in place (Waegel et al., 2006; Gielen and Simbolotti, 2005). Additionally, the existing infrastructure is likely sufficient to meet hydrogen demand during the early transitory stage to a hydrogen economy (Waegel et al., 2006). Referring to the Canadian context, the country’s wealth of resources allows for the possibility of many different hydrogen production pathways. Several refuelling stations in British Columbia currently use electrolysis to produce hydrogen on-site. This method uses electricity to split hydrogen and oxygen atoms in water. It is currently unclear whether the focus should be on maintaining diverse pathways or specializing in one type of production, such as electrolysis (Government of Canada, 2005). Regardless, the use of fossil fuel feedstocks is likely to continue in the near-term (Consonni and Vigano, 2005; National Academy of Science, 2004; Romm, 2004). Pg. 10

# Hydrogen Negative

## 1NC Frontlines

### Economy 1NC

#### Economy recovering now

MacAskill and Rushe 6-26 [“OECD says US economy is recovering but income inequality problematic,” <http://www.guardian.co.uk/business/2012/jun/26/oecd-us-economy-income-inequality?newsfeed=true>]

The [OECD](http://www.guardian.co.uk/business/oecd), which produces reports every two years, says that the US recovery is gaining momentum but remains fragile, with the country facing problems such as record long-term unemployment, income inequality and lack of investment in education and innovation.

The report is more bullish on the economy than Federal Reserve chairman Ben Bernanke, who recently downgraded his forecasts for the[US economy](http://www.guardian.co.uk/business/useconomy).

But it points out that poverty is worse in the US than in Europe. "Income inequality and relative poverty are among the highest in the OECD," the report says.

Only Chile, Mexico and Turkey among the 34 member OECD countries rank higher in terms of income inequality.

The [Obama administration](http://www.guardian.co.uk/world/obama-administration) welcomed the report, saying it was already implementing some of the proposals and backed others. It provides useful ammunition for the Obama administration in the run-up to the 2012 election which looks like being dominated by debate over the economy.

There is less in the report that would be welcomed by Republicans.

Karen Kornbluh, the US ambassador to the OECD, told a press conference in Washington to launch the report, that the organisation is recommending exactly what Barack Obama is doing in terms of investing in education to improve the skills of the workforce.

One OECD recommendation the Obama administration is not acting on and is likely to continue to shy away from in an election year is a proposal to increase gas prices to help reduce the use of fossil fuels.

Richard Boucher, deputy secretary-general of the OECD and a former US state department diplomat, who was also at the press conference, stood by the gas price recommendation. "I realise it is not always popular, particularly in an election year, but we call it as we see it."

Boucher expressed concern about the persistence of income inequality in the US. The chances of staying poor in the US are higher than in Europe, he said. "If your parents are poor, the chances are you are going to stay poor," he said.

The OECD argues that tackling inequality could help the wider economy, a point on which economists are divided. "We know that some of these steps to reduce inequality also help boost economic growth," Boucher said.

The OECD report said that growth in the US will remain moderate this year but concludes that America's economic recovery has "gained momentum".

Consumer and business spending have risen and unemployment, though still high at 8.2%, has fallen nearly two percentage points from its peak in 2009.

#### Europe debt crisis has global investors fleeing to the US – The economy will continue to grow

Heffernan 6/29/12 - Oversees the management of funds for institutions and high net worth individuals [Shayne Heffernan (Ph.D. in Economics) “Europe Will Not Survive, USA is in Good Shape,” June 29, 2012 -- Updated June 28, 2012 01:49 HKT, pg. http://www.livetradingnews.com/europe-will-not-survive-usa-is-in-good-shape-78243.htm#.T-0S28UdySo

Risks from Europe Mount, but U.S. Economic Recovery to Remain Resilient. The U.S. economy will grow by 2.1% in 2012 and 2013; unemployment rate of 8.1% by end of 2012, 7.7% by end of 2013.

The crisis in Europe is weighing on U.S. economic confidence, but healing in the U.S. housing market is a glimpse that better economic times lay ahead, according to a report released today by TD Economics (www.td.com/economics), an affiliate of TD Bank, America’s Most Convenient Bank.

“The escalation of the European sovereign debt crisis has injected new fears into financial markets and is contributing to the slowdown in hiring and investment,” says TD Chief Economist Craig Alexander. “However, while Europe gets the headlines, there’s been an undercurrent of good news in the U.S. with the housing market entering the early stages of recovery. This is a major reason for optimism over the future pace of U.S. growth.”

TD Economics forecasts U.S. economic growth to average 2.1% in 2012 and 2013. The unemployment rate is expected to edge down to 8.1% by the end of this year, improving gradually to 7.7% by the end of 2013.

European crisis heats up again

The European sovereign debt crisis has been a mainstay of TD Economics’ forecast for more than a year. In March, a short reprieve from the crisis was granted as Greece successfully negotiated a debt swap with private bondholders and the European Central Bank injected a new round of liquidity into the banking system. Unfortunately, the good news proved short-lived.

“As fears over Greece have been replaced by fears over Spain and Italy, the crisis has heated up again,” notes Alexander. “Its impact is visible in financial markets where riskier assets, such as stocks and high-yield corporate bonds, have been pummeled.”

Meanwhile, global investors have sought the safety of U.S. Treasury bonds, sending the dollar up and government bond yields to new historic lows.

#### Deficit spending collapses the economy

Roe 11 (Phil, member of the Education and Workforce Committee and Representative from Tennessee, “Cut, cap and balance: A fight toward fiscal responsibility,” 5-18, http://voices.washingtonpost.com/federal-eye/2010/05/navy\_plebes\_scale\_herndon\_monu.html)

On Monday, the United States reached the legal limit of its borrowing authority – further evidence that out-of-control spending is a matter of national security. Serious reforms and government spending cuts need to be made to avoid severe economic disruptions – both in the short and long-term. The national debt and deficits are rising at an unconscionable rate. The national debt now exceeds $14 trillion, and the government is still piling up debt at the rate of $200 million an hour, $30 billion a week, $120 billion a month and $1.6 trillion a year. It’s clear we don’t have a revenue problem – we have a spending problem. Raising the debt ceiling without these serious reforms will only burden our future generations with outrageous debt. Worse, the president and Senate Democrats are saying they want a “clean” debt ceiling increase, which means that they want to continue spending and borrowing more money with no strings attached. My view is we must not raise the debt ceiling by $1 without simultaneously making deep cuts in spending and taking real steps towards a balanced budget. It is imperative to the future of the country that we fight for an immediate shift toward fiscal responsibility. That is why I, along with my colleagues in the Republican Study Committee (RSC), wrote a letter to House Speaker John Boehner asking him to “Cut, Cap and Balance.” Specifically, we advocated for discretionary and mandatory spending reductions that would cut the deficit in half next year; enacting statutory, enforceable total-spending caps to reduce federal spending to 18 percent of Gross Domestic Product (GDP); and a Balanced Budget Constitutional Amendment (BBA) with strong protections against federal tax increases and including a Spending Limitation Amendment (SLA). This proposal will put us on a path to prosperity, and I will work to see provisions like this are included in any final agreement. I believe it is prudent to limit the extension of borrowing authority as much as possible, in order to demand accountability from Senate Democrats and the Obama Administration. Every day, we see more and more evidence of the need to confront the problem now. The International Monetary Fund (IMF) report released in April adds urgency to the need for meaningful actions — both short and long-term — to confront the nation's debt head-on. Additionally, Moody's Analytics released a report several weeks ago forecasting a downgrade in our country’s bond rating. It’s clear that if we fail to stop the spending spree, our nation will face economic collapse in the long-term.

#### Fiscal irresponsibility discourages businesses from investing

**Saphir 12** (Ann, Reuters Correspondent in Chicago, “Fed is sugar-coating Congress's task,” 4-30-12, <http://www.reuters.com/article/2012/04/30/usa-fed-fisher-idUSL1E8FUI6K20120430>)

(Reuters) - The U.S. Federal Reserve's super-easy monetary policy is doing little to spur job creation and is giving Congress license to avoid tackling looming fiscal problems and the towering national debt, a top Fed official said on Monday. "By providing monetary accommodation, we are saying, in essence, 'Congress, you better eat your vegetables, or we are going to serve you a big plate of monetary cookies,'" Richard Fisher, president of the Dallas Fed, told the Milken Institute Global Conference. The Fed's program of bond purchases is pushing down the price of debt, interfering with a pricing mechanism that would otherwise force Congress to come to terms with its "fiscal misfeasance," he said. "We have children in Congress," he said. "They need to be disciplined." Unless Congress acts to reduce uncertainties around fiscal policy, the Fed's low-interest-rate policy will remain powerless to boost jobs, he said, reprising a theme he revisits often in speeches around the country. The U.S. central bank last week kept its policy on hold, reiterating its expectation that it will need to keep rates near zero through late 2014 to support a weak recovery. Fisher, who is not a voter this year on the Fed's policy-setting panel, has been a staunch opponent of further Fed easing and identifies as an inflation hawk. While the Fed has been successful in keeping inflation in hand, he said, its easy money policy has not succeeded in bringing unemployment down to acceptable levels. Unemployment registered 8.2 percent in March, well above the 5.5 percent rate that is typically seen as representing full employment in the United States. Asked to explain why low rates have not pushed unemployment down faster, Fisher said, "My argument is because of fiscal policy." Uncertainty over taxes and regulation are keeping businesses from hiring, Fisher added.

#### Infrastructure is a poor stimulus

De Rugy and Mitchell 11 — Veronique de Rugy, Senior Research Fellow at the Mercatus Center at George Mason University, former resident fellow at the American Enterprise Institute, policy analyst at the Cato Institute, and research fellow at the Atlas Economic Research Foundation, holds an M.A. in Economics from the University of Paris IX-Dauphine and a Ph.D. in Economics from the University of Paris Pantheon-Sorbonne, and Matthew Mitchell, Senior Research Fellow at the Mercatus Center at George Mason University, holds an M.A. and Ph.D. in Economics from George Mason University, 2011 (“Would More Infrastructure Spending Stimulate the Economy?,” Mercatus Center Working Paper Number 11-36, September, Available Online at http://mercatus.org/sites/default/files/publication/infrastructure\_deRugy\_WP\_9-12-11.pdf, Accessed 06-12-2012, p. 1)

Four years into the deepest recession since World War II, the U.S. economy expanded at a rate of only 0.7 percent in the first half of 2011. This means that the economy is growing at a slower pace than the population and that capita output continues to fall.2

In response, the president has announced a plan for yet more deficit-financed stimulus spending.3 Like the two previous stimulus bills, this one focuses on infrastructure spending. The president‘s plan is rooted in the belief that stimulus spending and deeper deficits will give the economy the lift it needs to create more jobs. The hope is that, eventually, the economy will grow fast enough to allow the government to begin to pay down the national debt.

There are three problems with this approach. First, despite the claims of stimulus proponents, the evidence is not at all clear that more stimulus would be helpful right now. Second, even if one adheres to the idea that more government spending can jolt the economy, spending—particularly infrastructure spending—cannot be implemented in the way Keynesians say it ought to be. This greatly undermines its stimulative effect. Third, while no one disputes the value of good infrastructure, this type of spending typically suffers from massive cost overruns, waste, fraud, and abuse. This makes it a particularly bad vehicle for stimulus. In sum, further stimulus would be a risky short-term gamble with near-certain negative consequences in the long term.

#### Keynesian theory is wrong – spending doesn’t cause growth

Mitchell 9 — Daniel J. Mitchell, Senior Fellow at the Cato Institute, holds a B.A. and M.A. in Economics from the University of Georgia and a Ph.D. in Economics from George Mason University, 2009 (“Spending Is Not Stimulus: Bigger Government Did Not Work for Bush, and It Will Not Work for Obama,” *Tax & Budget Bulletin*, Number 5, February, Available Online at http://www.cato.org/pubs/tbb/tbb\_0209-53.pdf, Accessed 01-27-2010)

During the 1930s, Keynes and his disciples argued that the economy could be boosted if the government borrowed money and spent it. According to the theory, this new spending would put money in people’s pockets, and the recipients of the funds would then spend the money and “prime the pump” as the money began circulating through the economy. The Keynesians also said that some tax cuts—particularly lump-sum rebates—could have the same impact since the purpose is to have the government borrow and somehow put the money in the hands of people who will spend it.

Keynesian theory suffers from a rather glaring logical fallacy. It overlooks the fact that, in the real world, government can’t inject money into the economy without first taking money out of the economy. Any money that the government puts in the economy’s right pocket is money that is first removed from the economy’s left pocket. There is no increase in what Keynesians refer to as aggregate demand since every dollar that is spent on a stimulus package is a dollar that the government first must borrow from private credit markets. Keynesianism doesn’t boost national income, it merely redistributes it.

#### States don’t compete. Growth is not zero-sum

Krugman 94 - Professor of Economics @ Massachusetts Institute of Technology. [Paul Krugman, “Competitiveness: A dangerous obsession,” [Foreign Affairs](http://proquest.umi.com.proxy.library.emory.edu/pqdlink?RQT=318&pmid=6&TS=1284151698&clientId=1917&VInst=PROD&VName=PQD&VType=PQD)**.** New York: [Mar/Apr 1994](http://proquest.umi.com.proxy.library.emory.edu/pqdlink?RQT=572&VType=PQD&VName=PQD&VInst=PROD&pmid=6&pcid=34642&SrchMode=3&aid=1). Vol. 73, Iss. 2; pg. 28//ProQuest]

Moreover, countries do not compete with each other the way corporations do. Coke and Pepsi are almost purely rivals: only a negligible fraction of Coca-Cola's sales go to Pepsi workers, only a negligible fraction of the goods Coca-Cola workers buy are Pepsi products. So if Pepsi is successful, it tends to be at Coke's expense. But the major industrial countries, while they sell products that compete with each other, are also each other's main port markets and each other's main suppliers of useful imports. If the European economy does well, it need not be at U.S. expense; indeed, if anything a **successful European economy is likely to help the U.S. economy by providing it with larger markets and selling it goods of superior quality at lower prices**.

International trade, then, is not a zero-sum game. When productivity rises in Japan, the main result is a rise in Japanese real wages; American or European wages are in principle at least as likely to rise as to fall, and in practice seem to be virtually unaffected.

It would be possible to belabor the point, but the moral is clear:

while competitive problems could arise in principle, as a practical, empirical matter the major nations of the world are not to any significant degree in economic competition with each other. Of course there is always a rivalry for status and power--countries that grow faster will see their political rank rise. So it is always interesting to compare countries. But asserting that Japanese growth diminishes U.S. status is very different from saying that it reduces the U. S. standard of living--and it is the latter that the rhetoric of competitiveness asserts.

#### No relationship between US capabilities and peace

Fettweis 10 – Professor of national security affairs @ U.S. Naval War College. [Christopher J. Fettweis, “Threat and Anxiety in US Foreign Policy,” [Survival](http://www.informaworld.com.proxy.library.emory.edu/smpp/title~db%3Dall~content%3Dt713659919), Volume [52](http://www.informaworld.com.proxy.library.emory.edu/smpp/title~db%3Dall~content%3Dt713659919~tab%3Dissueslist~branches%3D52#v52), Issue [2](http://www.informaworld.com.proxy.library.emory.edu/smpp/title~db%3Dall~content%3Dg920313969) April 2010 , pages 59 – 82//informaworld]

One potential explanation for the growth of global peace can be dismissed fairly quickly: US actions do not seem to have contributed much. The limited evidence suggests that there is little reason to believe in the stabilising power of the US hegemon, and that there is no relation between the relative level of American activism and international stability. During the 1990s, the United States cut back on its defence spending fairly substantially. By 1998, the United States was spending $100 billion less on defence in real terms than it had in 1990, a 25% reduction.[29](http://www.informaworld.com.proxy.library.emory.edu/smpp/section?content=a920295991&fulltext=713240928#EN0029) To internationalists, defence hawks and other believers in hegemonic stability, this irresponsible 'peace dividend' endangered both national and global security. 'No serious analyst of American military capabilities', argued neo-conservatives William Kristol and Robert Kagan in 1996, 'doubts that the defense budget has been cut much too far to meet America's responsibilities to itself and to world peace'.[30](http://www.informaworld.com.proxy.library.emory.edu/smpp/section?content=a920295991&fulltext=713240928#EN0030) And yet the verdict from the 1990s is fairly plain: **the world grew more peaceful while the U**nited **S**tates **cut its forces**. No state seemed to believe that its security was endangered by a less-capable US military, or at least none took any action that would suggest such a belief. No militaries were enhanced to address power vacuums; **no security dilemmas** drove insecurity or arms races; **no regional balancing** occurred once the stabilis-ing presence of the US military was diminished. The rest of the world acted as if the threat of international war was not a pressing concern, despite the reduction in US military capabilities. Most of all, the United States was no less safe. The incidence and magnitude of global conflict declined while the UnitedStatescut its military spending under President Bill Clinton, and kept declining as the George W. Bush administration ramped the spending back up. Complex statistical analysis is unnecessary to reach the conclusion that world peace and US military expenditure are unrelated.

### Warming 1NC

#### They can’t solve for methane

Khan 12 [Amina Khan, “Dinosaurs' digestive gases linked to global warming,” May 07, 2012, Los Angeles Times, pg. <http://articles.latimes.com/2012/may/07/science/la-sci-dinosaur-methane-20120508>]

Dinosaurs' gassy guts may have contributed to global warming tens of millions of years ago, according to a new study that finds a group of plant-eating dinosaurs could have produced about as much methane as all of today's natural and man-made sources of the greenhouse gas.

British researchers reported in Tuesday's edition of the journal Current Biology that the methane emissions from sauropods far outstripped those of today's cattle, goats and other cud-chewing mammals.

Sauropods were a diverse bunch of plant-eating dinosaurs, known for their small heads and giant bodies with long necks and tails. An average-sized sauropod — such as Apatosaurus louisae, once popularly known as brontosaurus — could weigh 44,000 pounds, making it several times bigger than an elephant.

Like many modern herbivores, scientists think, sauropods probably hosted a diverse community of microbes in their guts to help break down and digest their food, producing methane in the process. In cattle and other ruminants, that gas is released in the form of burps and flatulence.

Such emissions from modern-day cattle are considered a major source of the greenhouse gas, adding up to roughly 55 million to 110 million tons per year. Though carbon dioxide is more abundant in the atmosphere, methane is more than 20 times as effective at trapping heat, according to the Environmental Protection Agency.

The problem of cattle emissions prompted ecologist David Wilkinson of Liverpool John Moores University in England to consider the climate-changing effects of sauropods.

#### No warming – IPCC is wrong

Ferrara 12 - Director of Entitlement and Budget Policy @ Heartland Institute [Peter Ferrara, “Sorry Global Warming Alarmists, The Earth Is Cooling, Forbes, 5/31/2012 @ 3:26PM, pg. <http://www.forbes.com/sites/peterferrara/2012/05/31/sorry-global-warming-alarmists-the-earth-is-cooling/2/>]

Climate change itself is already in the process of definitively rebutting climate alarmists who think human use of fossil fuels is causing ultimately catastrophic global warming. That is because natural climate cycles have already turned from warming to cooling, global temperatures have already been declining for more than 10 years, and global temperatures will continue to decline for another two decades or more.

That is one of the most interesting conclusions to come out of the seventh International Climate Change Conference sponsored by the Heartland Institute, held last week in Chicago. I attended, and served as one of the speakers, talking about The Economic Implications of High Cost Energy.

The conference featured serious natural science, contrary to the self-interested political science you hear from government financed global warming alarmists seeking to justify widely expanded regulatory and taxation powers for government bodies, or government body wannabees, such as the United Nations. See for yourself, as the conference speeches are online.

What you will see are calm, dispassionate presentations by serious, pedigreed scientists discussing and explaining reams of data. In sharp contrast to these climate realists, the climate alarmists have long admitted that they cannot defend their theory that humans are causing catastrophic global warming in public debate. With the conference presentations online, let’s see if the alarmists really do have any response.

The Heartland Institute has effectively become the international headquarters of the climate realists, an analog to the UN’s Intergovernmental Panel on Climate Change (IPCC). It has achieved that status through these international climate conferences, and the publication of its Climate Change Reconsidered volumes, produced in conjunction with the Nongovernmental International Panel on Climate Change (NIPCC).

Those Climate Change Reconsidered volumes are an equivalently thorough scientific rebuttal to the irregular Assessment Reports of the UN’s IPCC. You can ask any advocate of human caused catastrophic global warming what their response is to Climate Change Reconsidered. If they have none, they are not qualified to discuss the issue intelligently.

Check out the 20th century temperature record, and you will find that its up and down pattern does not follow the industrial revolution’s upward march of atmospheric carbon dioxide (CO2), which is the supposed central culprit for man caused global warming (and has been much, much higher in the past). It follows instead the up and down pattern of naturally caused climate cycles.

For example, temperatures dropped steadily from the late 1940s to the late 1970s. The popular press was even talking about a coming ice age. Ice ages have cyclically occurred roughly every 10,000 years, with a new one actually due around now.

In the late 1970s, the natural cycles turned warm and temperatures rose until the late 1990s, a trend that political and economic interests have tried to milk mercilessly to their advantage. The incorruptible satellite measured global atmospheric temperatures show less warming during this period than the heavily manipulated land surface temperatures.

Central to these natural cycles is the Pacific Decadal Oscillation (PDO). Every 25 to 30 years the oceans undergo a natural cycle where the colder water below churns to replace the warmer water at the surface, and that affects global temperatures by the fractions of a degree we have seen. The PDO was cold from the late 1940s to the late 1970s, and it was warm from the late 1970s to the late 1990s, similar to the Atlantic Multidecadal Oscillation (AMO).

In 2000, the UN’s IPCC predicted that global temperatures would rise by 1 degree Celsius by 2010. Was that based on climate science, or political science to scare the public into accepting costly anti-industrial regulations and taxes?

Don Easterbrook, Professor Emeritus of Geology at Western Washington University, knew the answer. He publicly predicted in 2000 that global temperatures would decline by 2010. He made that prediction because he knew the PDO had turned cold in 1999, something the political scientists at the UN’s IPCC did not know or did not think significant.

Well, the results are in, and the winner is….Don Easterbrook. Easterbrook also spoke at the Heartland conference, with a presentation entitled “Are Forecasts of a 20-Year Cooling Trend Credible?” Watch that online and you will see how scientists are supposed to talk: cool, rational, logical analysis of the data, and full explanation of it. All I ever see from the global warming alarmists, by contrast, is political public relations, personal attacks, ad hominem arguments, and name calling, combined with admissions that they can’t defend their views in public debate.

Easterbrook shows that by 2010 the 2000 prediction of the IPCC was wrong by well over a degree, and the gap was widening. That’s a big miss for a forecast just 10 years away, when the same folks expect us to take seriously their predictions for 100 years in the future. Howard Hayden, Professor of Physics Emeritus at the University of Connecticut showed in his presentation at the conference that based on the historical record a doubling of CO2 could be expected to produce a 2 degree C temperature increase. Such a doubling would take most of this century, and the temperature impact of increased concentrations of CO2 declines logarithmically. You can see Hayden’s presentation online as well.

Because PDO cycles last 25 to 30 years, Easterbrook expects the cooling trend to continue for another 2 decades or so. Easterbrook, in fact, documents 40 such alternating periods of warming and cooling over the past 500 years, with similar data going back 15,000 years. He further expects the flipping of the ADO to add to the current downward trend.

#### Aerosals prevent warming

Biello 11[David Biello, “Stratospheric Pollution Helps Slow Global Warming,” Scientific American, | July 22, 2011, pg. http://www.scientificamerican.com/article.cfm?id=stratospheric-pollution-helps-slow-global-warming

Despite significant pyrotechnics and air travel disruption last year, the Icelandic volcano Eyjafjallajokull simply didn't put that many aerosols into the stratosphere. In contrast, the eruption of Mount Pinatubo in 1991, put 10 cubic kilometers of ash, gas and other materials into the sky, and cooled the planet for a year. Now, research suggests that for the past decade, such stratospheric aerosols—injected into the atmosphere by either recent volcanic eruptions or human activities such as coal burning—are slowing down global warming.

"Aerosols acted to keep warming from being as big as it would have been," says atmospheric scientist John Daniel of the National Oceanic and Atmospheric Administration's (NOAA) Earth System Research Laboratory, who helped lead the research published online in Science on July 21. "It's still warming, it's just not warming as much as it would have been."

Essentially, sulfur dioxide gets emitted near the surface, either by a coal-fired power plant's smokestack or a volcano. If that SO2 makes it to the stratosphere—the middle layer of the atmosphere 10 kilometers up—it forms droplets of diluted sulfuric acid, known as aerosols. These aerosols reflect sunlight away from the planet, shading the surface and cooling temperatures. And some can persist for a few years, prolonging that cooling.

#### Adaptation prevents extinction

ScienceDaily 10 [“Animals Cope With Climate Change at the Dinner Table: Birds, Foxes and Small Mammals Adapt Their Diets to Global Warming,” (Feb. 9, 2010), pg. <http://www.sciencedaily.com/releases/2010/02/100209152235.htm>]

It's likely these are reactions to rapidly rising temperatures due to global climate change, speculates Prof. Yoram Yom-Tov of Tel Aviv University's Department of Zoology, who has been measuring the evolving body sizes of birds and animals in areas where climate change is most extreme.

Changes are happening primarily in higher latitudes, where Prof. Yom-Tov has identified a pattern of birds getting smaller and mammals getting bigger, according to most of the species he's examined. The change, he hypothesizes, is likely a strategy for survival. Prof. Yom-Tov, who has spent decades measuring and monitoring the body sizes of mammals and small birds, says that these changes have been happening more rapidly.

His most recent paper on the topic, focused on the declining body sizes of arctic foxes in Iceland, appeared in Global Change Biology.

Radical changes in body size

Animal populations in a wide variety of geographical areas -- birds in the UK, small mammals in the arctic, and most recently foxes, lynx and otters in cold Scandinavian regions -- are adapting to a shift in rising temperatures. Where temperature changes are most radical, such as those at higher latitudes, Prof. Yom-Tov has measured the most radical changes of these animals' body size over time.

"This change can be seen as an early indicator of climate change," says Prof. Yom-Tov. "There is a steady increase of temperatures at higher latitudes, and this effect -- whether it's man-made or natural -- is having an impact on the animals living in these zones."

In his most recent paper, Prof. Yom-Tov and his Tel Aviv University colleague Prof. Eli Geffen report that arctic foxes are being influenced by changing water currents in the oceans. These changes, likely a result of climate change, affects the foxes' food supplies. Hydrologists are confounded as to why the shifts in currents are happening, but the effect in foxes is evident: their bodies are changing along with the changing currents.

Scientists are finding changes in animals' bodies across the whole animal kingdom. "Climate change is affecting migration patterns and the behavior and growth of birds, mammals, insects, flowers -- you name it," says Prof. Yom-Tov. "The global warming phenomenon is a fact." What we do with this information may change our world.

Adapting to survive

Whether or not human beings are primarily responsible for climate change, Prof. Yom-Tov says, science shows that plants and animals are rapidly evolving in response to these changes. Smaller bodies allow mammals, for example, to cope with warmer temperatures, since a smaller body size gives the body a proportionally increased surface area for the dissipation of heat, he says.

"These animals need to adapt themselves to changing temperatures. In some regions the changes are as large as 3 or 4 degrees centigrade," says Prof. Yom-Tov. "If they don't adapt, their numbers may decline. If they do, their numbers remain stable or even increase."

#### 3/4th of future GHG emissions will occur in China, India and Mideast

Barbier 10– Professor of Economics & Finance @ University of Wyoming [Edward B. Barbier, “Global Governance: The G20 and a Global Green New Deal,” Economics E-Journal, Vol. 4, 2010-2 | January 13, 2010 | pg. http://www.economics-ejournal.org/economics/journalarticles/2010-2]

A world economic recovery that revives fossil fuel consumption will accelerate global climate change. With the resumption of energy demand growth, greenhouse gas (GHG) emissions will also increase by 45% to 41 gigatonnes (Gt) in 2030, with three-quarters of the rise generated by China, India and the Middle East (IEA 2008). Without a change in the carbon dependency of the global economy, the IEA (2008) warns that the atmospheric concentration of GHG could double by the end of this century, and lead to an eventual global average temperature increase of up to 6oC. Such a scenario is likely to cause a sea level rise between 0.26 and 0.59 meters, and severe disrupt freshwater availability, ecosystems, food production, coastal populations and human health (IPCC 2007). According to the Stern (2007), with 5-6°C warming, the world economy could sustain losses equivalent to 5-10% of global gross domestic product (GDP), with poor countries suffering costs in excess of 10% of GDP.4 Across all cities worldwide, about 40 million people are exposed to a 1 in 100 year extreme coastal flooding event, and by the 2070s the population exposed could rise to 150 million (Nicholls et al. 2007).5 pg. 10

### Peak Oil 1NC

#### They can’t solve in time – It will take decades for the hydrogen economy to develop. Their internal link ev is too good. It says that the bubble will burst much sooner than that

#### You should ignore all of their ev about Peak Oil – US oil shale and Canadian tar sands are creating a geopolitical and economic revolution

Mead 7/8/12 – Professor of Foreign Affairs and Humanities @ Bard College [Walter Russell Mead, “The Energy Revolution Part One: The Biggest Losers,” The American Interest, July 8, 2012, pg. http://blogs.the-american-interest.com/wrm/2012/07/08/the-energy-revolution-part-one-the-biggest-losers/]

Over the past year, we’ve been watching a geopolitical revolution get underway. It’s much bigger and more consequential than the Arab Spring, though the legacy media are giving it much less play. It will rearrange the global chessboard, improving the position of some powers, weakening others. It is a powerful boost to American power, reducing America’s strategic and economic liabilities while adding considerably to its assets. And it dramatically changes the long term outlook for, among other things, the US dollar. In line with Via Meadia‘s policy of trying to focus attention on the most consequential events of the time, we will be following this story as it unfolds, looking at the implications of the shifts now underway for world politics, the US economy, our domestic politics, and the green movement.

While the chattering classes yammered on about American decline and peak oil, a quite different future is taking shape. A world energy revolution is underway and it will be shaping the realities of the 21st century when the Crash of 2008 and the Great Stagnation that followed only interest historians.  A new age of abundance for fossil fuels is upon us.  And the center of gravity of the global energy picture is shifting from the Middle East to… North America.

The two biggest winners look to be Canada and the United States. Canada, with something like two trillion barrels worth of conventional oil in its tar sands, and the United States with about a trillion barrels of shale oil, are the planet’s new super giant energy powers. Throw in natural gas and coal, and the United States is better supplied with fossil fuels than any other country on earth. Canada and the United States are each richer in oil than Iraq, Iran and Saudi Arabia combined.

Further bolstering America’s new geopolitical edge, the rest of the western hemisphere is also rich in oil. Venezuela is now believed to have more oil that Saudi Arabia, and Brazil’s offshore discoveries make it a significant factor in world oil markets as well.

#### Peak oil is a fiction – North America is awash in hydrocarbons. It will solve their economy internal link

Green 7/10/12 - An environmental scientist and policy analyst @ American Enterprise Institute [[Kenneth P. Green](http://www.aei-ideas.org/author/ken-green/), “North America’s energy wealth,” American Enterprise Institute| [July 9, 2012, 11:53 am](http://www.aei-ideas.org/2012/07/north-americas-energy-wealth/), pg. http://www.aei-ideas.org/2012/07/north-americas-energy-wealth/

For decades now, the energy-narrative of North America, particularly the United States has been one of energy scarcity. We’ve been told, repeatedly, that the U.S. has surpassed “[peak oil](http://peakoil.com/),” and 6 years ago, people were so worried about natural gas supplies that [we were talking about importing liquified natural gas from abroad](http://www.nytimes.com/2005/06/15/business/15gas.html?pagewanted=all) (More on that [here](http://www.fas.org/spp/civil/crs/RL32205.pdf)).

But the narrative of energy scarcity in North America is a fiction: We are not only energy-wealthy, we are energy-wealthy beyond most people’s comprehension. Energy policy analyst Mark Mills spells out the energy potential of North America in a [new report published by the Manhattan Institute](http://assets.nationaljournal.com/pdf/ManhattenInstitute_EnergyExportsJuly12.pdf).

Some of the key findings of the report are:

•  The United States, Canada, and Mexico are awash in hydrocarbon resources: oil, natural gas, and coal. The total North American hydrocarbon resource base is more than four times greater than all the resources extant in the Middle East. And the United States alone is now the fastest-growing producer of oil and natural gas in the world.

•  An affirmative policy to expand extraction and export capabilities for all hydrocarbons over the next two decades could yield as much as $7 trillion of value to the North American economy, with $5 trillion of that accruing to the United States, including generating $1–$2 trillion in tax receipts to federal and local governments.

#### Other alt energies will solve – The solar, wind, and biomass industries are booming in China, Japan and the EU. They will facilitate a soft-landing. We can make a quick transition if needed

#### They can’t solve the global debt crisis – It makes their impact inevitable

Wolf 7/11/12 [Martin Wolf, A wave of sovereign and banking crises,” Financial Times, Published 9:37 AM, 11 Jul 2012 Last update 9:37 AM, 11 Jul 2012, pg. http://www.businessspectator.com.au/bs.nsf/Article/European-crisis-US-economy-fiscal-consolidation-au-pd20120711-W3UEP?opendocument&src=rss]

It is nearly five years since financial turmoil broke upon an unsuspecting world, in August 2007. So how are crisis-stricken high income countries doing? Badly, is the only answer.
Of the six largest high income economies (plus the eurozone), only those of the US and Germany are above previous peaks. Since the US was the epicentre of the early shocks, its recovery has been relatively good. Yet none of these countries can be happy with its performance. While US gross domestic product has been more buoyant than that of these other countries, its unemployment rate more than doubled, from 4.7 per cent in July 2007 to 10 per cent in October 2009. Since then its unemployment has fallen only a little. But the US has still had a better performance than the eurozone, whose economy is stagnant and whose latest rate of unemployment is 11.1 per cent, against 8.2 per cent in the US.
Economies stagnate, while policy is aggressive. The highest short-term interest rate offered by any of the central banks of the big high-income economies is the 0.75 per cent offered by the European Central Bank. Balance sheets of central banks have also doubled in the big high-income countries, relative to GDP, since 2007. Japan, the US and UK continue to run very large fiscal deficits for peacetime. Yet despite huge fiscal deficits, long-term interest rates on Japanese, US and UK government bonds are very low, at 0.8, 1.5 and 1.6 per cent, respectively.
David Levy, of the Jerome Levy Forecasting Center, labels this conjuncture of sluggish economies with huge policy stimuli a “contained depression”. The explanation is clear: a number of important economies are struggling with excessive leverage, particularly in their household and financial sectors. In the US, for example, total private sector debt rose from 112 per cent of GDP in 1976 to a peak of 296 per cent in 2008 (see chart). This ratio had fallen back to 250 per cent by the end of the first quarter of 2012, which is where it was in 2003. In 2007, US gross private borrowing was 29 per cent of GDP. In 2009, 2010 and 2011, however, it was negative.
Above all, private sectors are running large surpluses of income over spending. In the US, the financial balance of the private sector turned from a deficit of 2.4 per cent of GDP in the third quarter of 2007 to a surplus of 8.2 per cent in the second quarter of 2009. This massive shift would surely have caused a huge depression if the government had been unwilling to run offsetting fiscal deficits. That is how the depression was contained.
The US is the most important of the crisis-hit economies. But it is not the only one to have experienced large private sector retrenchment: so has the UK. In fact, the International Monetary Fund forecasts that the private sectors of all the large high-income countries will be in either balance or surplus this year (see chart). It follows that these countries must be running large current account surpluses or large fiscal deficits. Germany is doing the former. Others are running fiscal deficits. Since these big countries are unlikely to be able to run large current account surpluses together (with whom?), they have to run fiscal deficits once their private sectors run huge surpluses. These surpluses, in turn, are partly explained by the desire to de-leverage, partly by unwillingness to borrow and partly by the inability or unwillingness of the financial sector to lend. All this, then, is the painful hangover after the great credit binge.

#### No resource wars – The academic lit on this issue is strong and deep

Verhoeven 6/29/12 - Lecturer of Politics and International Relations @ Oxford University. [Harry Verhoeven, “Dambisa Moyo’s Resource War Argument is Flawed, Politics in Spire, Posted on [June 29, 2012](http://politicsinspires.org/2012/06/dambisa-moyos-resource-war-argument-is-flawed/) , pg. http://politicsinspires.org/2012/06/dambisa-moyos-resource-war-argument-is-flawed/

One of Moyo’s controversial arguments is that China’s ascendency doesn’t just put tremendous pressure on commodity markets, but is likely to represent such a big demand shock that supply of key resources simply can’t keep up. The consequence, for Moyo, is then that as countries — and the planet as a whole — run out of resources, this will trigger violent conflict (e.g. “Water Wars”) between different states and communities within states in an attempt to maintain their commodity entitlements. Moyo was thus uncriticically regurgitating the old Malthusian argument about “tragedies of the commons” occurring, mostly in developing countries, with population growth and environmental factors as the cause of growing poverty and civil strife.

Yet there is a [strong and deep academic literature](http://politicsinspires.org/2012/06/dambisa-moyos-resource-war-argument-is-flawed/%28http%3A//onlinelibrary.wiley.com/doi/10.1111/j.1467-7660.2011.01707.x/abstract%29), that draws on extensive interdisciplinary evidence from economics, political science, anthropology and history, which shows how simplistic and misguided such arguments about “resource wars” are, both when approached theoretically and through Asian or African case studies. Both historically and contemporarirly, growing resource scarcity does not tend to lead to conflict but to cooperation, even (or perhaps especially) in regions like the Middle East and the Horn of Africa. Moreover, the idea that wars are caused by exogenous environmental triggers — as opposed to endogenous political-economic drivers — has always been very convenient for powerful groups who try to depolicitise asymmetries in power and wealth and argue that scarcity is not man-made but really an Act of God that we can’t or shouldn’t contest.

### Solvency 1NC

#### Alternative fuels fail – The plan only address 1 of the 6 major issues

Romm 06 – Senior Fellow @ American Progress [Dr. Joseph Romm (Former assistant secretary at the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy), “The car and fuel of the future,” Energy Policy 34 (2006) pg. 2609–2614

Alternative fuel vehicles (AFVs) and their fuels face two central problems. First, they typically suffer from several marketplace disadvantages compared to conventional vehicles running on conventional fuels. Hence, they inevitably require government incentives or mandates to succeed. Second, they typically do not provide cost-effective solutions to major energy and environmental problems, which undermines the policy case for having the government intervene in the marketplace to support them.

On the second point, in September 2003, the US Department of Transportation Center for Climate Change and Environmental Forecasting released its analysis, Fuel Options for Reducing Greenhouse Gas Emissions from Motor Vehicles. The report assesses the potential for gasoline substitutes to reduce greenhouse gas emissions over the next 25 years. It concludes that ‘‘the reduction in GHG emissions from most gasoline substitutes would be modest’’ and that ‘‘promoting alternative fuels would be a costly strategy for reducing emissions’’ (DOT, 2003).

The US government and others (such as of California and Canada) have tried to promote AFVs for a long time. The 1992 Energy Policy Act established the goal of having alternative fuels replace at least 10% of petroleum fuels in 2000, and at least 30% in 2010. Currently, alternate fuels consumed in AFVs substitute for under 1% of total consumption of gasoline. A significant literature has emerged explaining this failure (GAO, 2000, Flynn, 2002). Besides the question of whether AFVs deliver cost-effective emissions reductions, there have historically been six major barriers to AFV success:

1. high first cost for vehicle 2. on-board fuel storage issues (i.e. limited range) 3. safety and liability concerns 4. high fueling cost (compared to gasoline) 5. limited fuel stations: chicken and egg problem 6. improvements in the competition (better, cleaner gasoline vehicles).

All AFVs that have so far been promoted with limited success—electric vehicles, natural gas vehicles, methanol vehicles, and ethanol vehicles—have each suffered from several of these barriers. Any one of these barriers can be a showstopper for an AFV or an alternative fuel, even where other clear benefits are delivered. MTBE, for instance, has had its biggest difficulty with the safety and liability issue, even though it has minimal problems in the other areas because it can be blended directly with gasoline. Electric vehicles deliver the clear benefit of zero tailpipe emissions, and can even have lower per mile costs than gasoline cars, but range, refueling, and firstcost issues have limited their success and caused most major auto companies to withdraw their electric vehicles from the marketplace. Pg. 2610

#### They will produce black hydrogen – No GHG emission reductions

England 12– Master’s Degree in Planning @ University of Waterloo [Ashley England, “Analysis of a Potential Hydrogen Refuelling Network Using Geographic Information Systems: A Case Study of the Kitchener Census Metropolitan Area,” A thesis presented to the University of Waterloo in fulfillment of the thesis requirement for the degree of Master of Arts in Planning, 2012

While hydrogen is the most common element on earth, it is rarely found as a gas and must be extracted from water, hydrocarbons or other substances containing hydrogen. A major infrastructural consideration is the type of feedstock used to produce hydrogen. Feedstock refers to the type of energy source used in the process of producing hydrogen fuel. Potential feedstocks include natural gas, coal, biomass, nuclear, wind, ethanol and water. Hydrogen fuel is often touted as a zero-carbon emitter when used in HFCVs. However, if the feedstock used in the production phase is a fossil fuel, greenhouse gas emissions are created. This is termed ‘black’ hydrogen as opposed to ‘green’ hydrogen. Presently, steam methane reforming (SMR) is the dominant path used for the production of hydrogen (Government of Canada, 2008; Waegel et al., 2006; Joffe et al., 2004; Ogden, 1999). As methane, also known as natural gas, is a fossil fuel, carbon capture and sequestration technologies must be used in order to achieve GHG reductions. Pg. 9 //neg

#### Several decades to solve – Not cost competitive until after 2020

NRC 08- National Research Council provides independent and expert driven research for the United States National Academies [Committee on Assessment of Resource Needs for Fuel Cell and Hydrogen Technologies, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences, Transitions to Alternative Transportation Technologies--A Focus on Hydrogen, 2008

The use of HFCVs can achieve large and sustained reductions in U.S. oil consumption and CO2 emissions, but several decades will be needed to realize these potential long-term benefits. Considerable progress is still required toward improving fuel cell costs and durability, as well as on-board hydrogen storage. The substantial financial commitments and technical progress made in recent years by the automotive industry, private entrepreneurs, and the U.S. Department of Energy (DOE) suggest that HFCVs and hydrogen production technologies could be ready for commercialization in the 2015-2020 time frame. Such vehicles are not likely to be cost-competitive until after 2020, but by 2050 HFCVs could account for more than 80 percent of new vehicles entering the fleet. Pg. 1

## Economy Extensions

### Uniqueness Ext

#### Economy improving – Prefer our ev. It is based on a key financial metric

Forbes 6/20/12 [[Mary Ellen Biery](http://blogs.forbes.com/sageworks/), Contributor, “Private companies' current business trends still positive,” http://www.forbes.com/sites/sageworks/2012/06/20/private-companies-indicator/]

President Obama’s statement earlier this month that the private sector “is doing fine” prompted a wave of criticism, and there are certainly signs that economic confidence among [consumers](http://www.gallup.com/poll/155228/Economic-Confidence-Ticks-Down-Third-Straight-Week.aspx?utm_source=tagrss&utm_medium=rss&utm_campaign=syndication) and [businesses](http://www.bloomberg.com/news/2012-06-19/fiscal-cliff-concerns-hurting-economy-as-companies-hold-back.html) has weakened recently. But a new real-time measure of key financial metrics for privately held companies in the U.S. shows sales and profitability trends remain solid, even if hiring continues to disappoint.

The Sageworks Private Company Indicator shows that privately held companies in June are generating average annual sales growth of 10 percent and an average annual net profit margin of 8 percent. Both rates are improved from a year earlier, when the average sales growth was 7.6 percent and the average profit margin was 6.3 percent, according to the indicator, launched recently by Sageworks Inc., a financial information company.

The indicator’s monthly data points are based on the trailing three-month average for all companies in Sageworks’ proprietary database. Sageworks aggregates about 1,000 financial statements a day in a cooperative model with financial institutions and accounting firms using Sageworks’ data and applications.  Net profit margin has been adjusted to exclude taxes and include owner compensation in excess of their market-rate salaries. These adjustments are commonly made to private company financials in order to provide a more accurate picture of the companies’ operational performance.

Sageworks analyst Greg Mulholland said the private-company financial trends don’t indicate the economy as a whole is back to pre-recession health, of course, but the growth in sales has returned to pre-recession levels or better, and sales and profitability trends are clearly improved from recessionary levels, he said.

“Long term, things are definitely looking better,” he said. “The fact is, we’re still seeing close to 10 percent sales growth, and that’s a pretty compelling number and very encouraging that the economy is doing better.”

### Competitiveness Ext

#### US can absorb tech faster. It will facilitate growth even if it is developed abroad

Galama & Hosek 08 - Management scientist Corporation & Director of the Forces and Resources Policy Center of the National Defense Research Institute Corporation[Titus Galama (Ph.D. in physics from the University of Amsterdam) *&* James Hosek (Ph.D. in economics from the University of Chicago.), *U.S. Competitiveness in Science and Technology*, 2008]

There is no reason to believe that the globalization of S&T and the rise of other nations affects the capability of the United States to absorb and apply new technology directly, as this capability is to a large extent determined by business incentives, consumers’ willingness to try new technologies, and the legal and regulatory framework. Some technology applications may not require much S&T capacity, or much knowledge of S&T within the user community or the general public. For example, solar collectors or filters for water purification can significantly enhance the productivity of workers in a developing country without the need for workers to understand their workings. But many technology applications do require S&T capacity (Silberglitt et al., 2006a, 2006b). Rural wireless communications requires little S&T capacity. Radio frequency identification (RFID) tagging, on the other hand, requires some basic knowledge and some industrial sophistication. And, ubiquitous information access, pervasive sensors, and wearable computers require substantial infrastructure and a high degree of sophistication. An advanced S&T capacity enables developed countries to implement a wide range of new technology, and, by the same token, the absence of such capacity helps to explain why developing nations may be slower to implement certain technology. Further, improvements in developing countries’ capacity to absorb technology will not undercut U.S. capacity to absorb technology. But some production may shift to these countries if they can produce more cheaply with their newly adopted technology than other countries, and the freed-up resources in the other countries will need to be reallocated to other uses. Pg. 47-48

#### External tech development expands the size of the pie. NO tradeoffs with the US economy

Galama & Hosek 08 - Management scientist Corporation & Director of the Forces and Resources Policy Center of the National Defense Research Institute Corporation[Titus Galama (Ph.D. in physics from the University of Amsterdam) *&* James Hosek (Ph.D. in economics from the University of Chicago.), *U.S. Competitiveness in Science and Technology*, 2008]

Thus, U.S. economic growth and standard of living are likely to continue to improve, with more foreign countries reaching higher levels of prosperity than they have at present, and the U.S. economy is likely to account for a smaller share of gross world product as developing nations grow faster than the United States. Although the United States will have a smaller share of world economic output, this will likely reflect the rise of other countries rather than the decline of the U.S. economy, standard of living, and S&T capability. As the size of the pie increases, the United States may benefit from increases in the amount of technology at hand resulting from inventions made abroad.pg. 48

### Keynes Wrong Ext

#### Keynesianism wrong – The academic studies are on our side

Rickards 6/25/12 [[James Rickards](http://www.usnews.com/topics/author/james_rickards), “Why Obama's Deficit Spending Is Making Things Worse,” US News and World Report, June 25, 2012, pg. http://www.usnews.com/opinion/blogs/economic-intelligence/2012/06/25/why-obamas-deficit-spending-is-making-things-worse

This neo-Keynesian formula has two parts. The first is deficit spending today ostensibly to create jobs and stimulate growth through the magic of the Keynesian multiplier—the idea that a dollar of deficit spending creates more than a dollar of gross domestic product. The second part is fiscal discipline in the so-called "out years" to reassure the bond vigilantes that U.S. spending is on a sustainable path. Both parts of this formula are flawed and the combination ruinous. However, the prominence of the proponents and political appeal of the timing—hamburgers today, payment tomorrow—give the idea a wide and receptive audience.

[[See a collection of political cartoons on the economy](http://www.usnews.com/cartoons/economy-cartoons).]

The first part of the formula is easy to shoot down. Empirical evidence has been accumulating for years that the Keynesian multiplier is mythical, an abstraction only an academic could embrace bearing no resemblance to real world economic dynamics. One need look no further than President Barack Obama's 2009 stimulus program of $787 billion in extra deficit spending. This was projected to create 7 million net new jobs and increase GDP by 3.7 percent by the end of 2010. In fact, no net jobs were created and the economy did not grow at all. Many academic studies have shown the Keynesian multiplier to be less than one, which means that new deficit spending actually reduces private sector output.

The second part of the formula—fiscal discipline down the road—is also flawed. Here the issue is broken trust. The latest promises from economists and opinion leaders about fiscal discipline in the future come on top of  50 years of lies, frauds, broken promises, and disrespect for citizens exhibited by elected officials in the United States. The highlight reel would include Vietnam, Watergate, Whitewater-Lewinsky, and Iraqi weapons of mass destruction. Broken promises specifically related to fiscal discipline are plentiful.

[[See a collection of political cartoons on the budget and deficit](http://www.usnews.com/cartoons/deficit-and-budget-cartoons).]

In 1986, President Ronald Reagan's Tax Reform Act sought to cut tax rates and pay for the cuts by eliminating loopholes and deductions. This is sound economics and a step in the direction of a flat tax with low rates and no deductions. The problem was that between 1990 and 1993, Presidents George H. W. Bush and Bill Clinton gradually raised tax rates but did not restore the deductions. The result was an eight-year game of bait-and-switch in which taxpayers ended up with higher rates and fewer deductions.

More recent examples of fiscal deception include President Obama's pledge in 2009 to "cut the deficit we inherited in half by the end of my first term in office." In fact, Obama has increased deficits by over $6 trillion and has come nowhere close to his promised target.

When you hear mainstream economists offer detailed reasons why the Bush-Clinton tax increases were needed and why the Obama deficits are the right medicine for the economy, bear in mind these are the same economists who did not see the 2007 housing collapse coming, did not see the 2008 financial panic coming, and are willfully ignoring gathering threats to the stability of the dollar today.

### Heg Not Solve

#### US restraint is risk free – Interdependence and institutions will keep the peace

Fettweis 10 – Professor of Political Science @ Tulane University [Christopher J. Fettweis, Dangerous Times?: The International Politics of Great Power Peace, 2010

If the only thing standing between the world and chaos is U.S. the military presence, then an adjustment in grand strategy would be exceptionally counter-productive. But it is worth recalling that none of the other explanations for the decline of war – nuclear weapons, complex economic interdependence, international and domestic institutions, evolutions in ideas and norms – necessitate an activist America to maintain their validity. Were America to become more restrained, nuclear weapons would still affect the calculations of the would-be aggressor; the process of globalization would continue, deepening the complexity of economic interdependence; the United Nations could still deploy peacekeepers where necessary; and democracy would not shrivel where it currently exists. Most importantly, the idea that war is a worthwhile way to resolve conflict would have no reason to return. As was argued in chapter 2, normative evolution is typically unidirectional. Strategic restraint in such a world would be virtually risk free. pg. 175-176

#### Restraint increases our leverage over alliances – Economic and diplomatic tools preserve our influence

Fettweis 10 – Professor of Political Science @ Tulane University [Christopher J. Fettweis, Dangerous Times?: The International Politics of Great Power Peace, 2010

Finally, formal alliances are hardly necessary to influence other countries. If there comes a time when the United States needs to restrain the actions of friendly states, it will always have substantial diplomatic and economic tools at its disposal. If those fail, then Washington can decide whether any potential conflict is actually worth a greater expenditure of U.S. treasure. The United States need not enter into formal security relationships in order to be able to affect the decision of other states. Ronald Steel argued some time ago that "unlike Rome, we have not exploited our empire. On the contrary, our empire has exploited us, making enormous drains on our resources and energies."10 The current alliance structure allows minor powers to manipulate U.S. decisions, making their problems ours. A restrained grand strategy would force minor powers to demonstrate the value of their relationship. Small states with whom the United States is unequally allied would not be able to rely on its unquestioned support; they would instead have to demonstrate their strategic value to Washington and earn its friendship. No longer should the United States cede control over its own foreign policy decisions to weak friends on the periphery. Pg. 186

### Spending Turns Heg

#### Republicans will oppose new spending – They will respond by letting the BCA devastate the military

Hanabusa 6/26/12 – Rep for Hawaii [Rep. Colleen Hanabusa (D-Hawaii) “Sequestration shows the danger of brinkmanship,” The Hill, 06/26/12 11:57 AM ET, pg. http://thehill.com/blogs/congress-blog/economy-a-budget/234781-sequestration-shows-the-danger-of-brinkmanship

Last year, as Congressional Republicans plotted to make President Obama the first president in history to be denied a straight up vote on raising the debt ceiling, they inserted the Budget Control Act in the equation. In exchange for raising the debt ceiling, the BCA created a 12-member joint congressional committee to develop a plan for an additional $1.5 trillion in deficit reduction. If this joint committee and ultimately the entire Congress failed to enact the additional savings, the bill provided up to $1.2 trillion in automatic spending cuts that would go into effect in January 2013, also known as sequestration. The Joint Select Committee on Deficit Reduction announced November 21, 2011 that it was unable to come to an agreement before the committee’s November 23 deadline.

Today, sequestration is the elephant in the room whenever we talk about the defense industry. Devastating cuts to our national defense base could take effect at the beginning of next year. Republicans are now using the threat of cuts as leverage for their old flawed strategy of gutting important programswhile refusing any logical revenue increases.

Under the BCA’s sequestration formula, defense programs would be cut by $54.7 billion each year from 2013 through 2021. (Non-defense programs would be cut by the same amount.) Cuts to the defense budget would slash programs equally across the board, reducing pay and benefits to military personnel and cancelling important procurement projects. This is an unacceptable risk to our national security, and we must act to prevent it.

#### More spending risks triggering automatic spending cuts on defense – That turns their heg impact

Goff 6/28/12 [[Emily Goff](http://blog.heritage.org/author/egoff/%22%20%5Co%20%22Posts%20by%20Emily%20Goff), Congress Must Address Both Defense Sequestration and Deficits,” The Foundary, June 28, 2012 at 6:54 am, pg. http://blog.heritage.org/2012/06/28/congress-must-address-both-defense-sequestration-and-deficits/]

The automatic spending cuts would gut national defense—a core function of the federal government—slashing the Pentagon’s budget by $492 billion, or 9 percent, over 10 years, as this [chart illustrates](http://www.heritage.org/federalbudget/budget-control-act). Meanwhile, entitlement programs, which are the main driver of current and future spending problems, would sustain just $171 billion in reductions—less than 1 percent.

Entitlements are on spending autopilot, full speed ahead. The Administration has offered no real solutions to tackle this challenge. However, the House budget resolution and Senator Mike Lee’s (R–UT) budget resolution, which is modeled after The Heritage Foundation’s [Saving the American Dream](http://savingthedream.org/), do address the problem of out-of-control entitlement spending with bold policy reforms.

The defense cuts could [threaten the readiness](http://www.heritage.org/research/reports/2011/07/slashing-defense-makes-america-less-safe) of already extended U.S. forces, which should be of deep concern to the commander in chief. Both the Pentagon and the myriad defense contractors with which it works are already feeling the threat of these spending cuts, which loom in the not-so-distant future. The cuts could easily lead to widespread layoffs, facilities closing, and infrastructure depletion. This phenomenon is akin to the uncertainty caused by [Taxmageddon](http://blog.heritage.org/2012/06/20/taxmageddon-is-slowing-the-economy-now/), an unprecedented tax increase set to strike Americans of all income levels in January 2013. Just like American families and businesses, the military and defense industry make plans well in advance. For example, projects crucial to force and weapons modernization, such as satellite and missile defense capabilities, have long lead times and require much more certainty than a year of funding—much less the threat of deep cuts.

There is nothing stopping Congress from acting now to prevent these reckless cuts. Delaying action until the end of the year, as some predict, will be a conscious—not to mention irresponsible—choice.

While Congress works to shift automatic spending cuts away from defense, it should also enact spending reduction measures that reduce short- and long-term deficits and debt. While the White House is right to encourage this, its idea of deficit reduction solutions can be boiled down to two flawed policies: tax hikes and stimulus spending. Americans—and the economy—cannot afford tax hikes, and more stimulus spending would be a prescription for continued deficits and further indebtedness. Excessive spending is what got us into this mess, and spending should be the target for getting out of it.

## Peak Oil Extensions

### Ext 2 – No Peak oil

#### They are just wrong - The facts have changed

Monbiot 7/2/12 [[George Monbiot](http://www.guardian.co.uk/profile/georgemonbiot), “We were wrong on peak oil. There's enough to fry us all

[guardian.com. uk](http://www.guardian.co.uk), Monday 2 July 2012 15.30 EDT , pg. http://www.guardian.co.uk/commentisfree/2012/jul/02/peak-oil-we-we-wrong

The facts have changed, now we must change too. For the past 10 years an unlikely coalition of geologists, oil drillers, bankers, military strategists and environmentalists has been warning that [peak oil](http://www.guardian.co.uk/environment/peak-oil) – the decline of global supplies – is just around the corner. We had some strong reasons for doing so: production had slowed, the price had risen sharply, depletion was widespread and appeared to be escalating. The first of the great resource crunches seemed about to strike.

Among environmentalists it was never clear, even to ourselves, whether or not we wanted it to happen. It had the potential both to shock the world into economic transformation, averting future catastrophes, and to generate catastrophes of its own, including a shift into even more damaging technologies, such as biofuels and petrol made from coal. Even so, peak oil was a powerful lever. Governments, businesses and voters who seemed impervious to the moral case for cutting the use of fossil fuels might, we hoped, respond to the economic case.

Some of us made vague predictions, others were more specific. In all cases we were wrong. In 1975 MK Hubbert, a geoscientist working for Shell who had correctly predicted the decline in US oil production, suggested that global supplies could peak in 1995. In 1997 the petroleum geologist Colin Campbell estimated that it would happen before 2010. In 2003 the geophysicist Kenneth Deffeyes said he was "99% confident" that peak oil would occur in 2004. In 2004, the Texas tycoon T Boone Pickens predicted that "never again will we pump more than 82m barrels" per day of liquid fuels. (Average daily supply in May 2012 was 91m.) In 2005 the investment banker Matthew Simmons maintained that ["Saudi Arabia … cannot materially grow its oil production"](http://www.nytimes.com/2005/08/21/magazine/21OIL.html?pagewanted=all). (Since then its output has risen from 9m barrels a day to 10m, and it has another 1.5m in spare capacity.)

Peak oil hasn't happened, and it's unlikely to happen for a very long time.

A [report by the oil executive Leonardo Maugeri](http://belfercenter.ksg.harvard.edu/files/Oil-%20The%20Next%20Revolution.pdf), published by Harvard University, provides compelling evidence that a new oil boom has begun. The constraints on oil supply over the past 10 years appear to have had more to do with money than geology. The low prices before 2003 had discouraged investors from developing difficult fields. The high prices of the past few years have changed that.

Maugeri's analysis of projects in 23 countries suggests that global oil supplies are likely to rise by a net 17m barrels per day (to 110m) by 2020. This, he says, is "the largest potential addition to the world's oil supply capacity since the 1980s". The investments required to make this boom happen depend on a long-term price of $70 a barrel – the current cost of Brent crude is $95. Money is now flooding into new oil: a trillion dollars has been spent in the past two years; a record $600bn is lined up for 2012.

The country in which production is likely to rise most is Iraq, into which multinational companies are now sinking their money, and their claws. But the bigger surprise is that the other great boom is likely to happen in the US. [Hubbert's peak](http://en.wikipedia.org/wiki/Hubbert_peak_theory), the famous bell-shaped graph depicting the rise and fall of American oil, is set to become Hubbert's Rollercoaster.

Investment there will concentrate on unconventional oil, especially [shale oil](http://www.guardian.co.uk/environment/2012/jan/18/shale-oil-gas-us-energy-self-sufficient) (which, confusingly, is not the same as oil shale). Shale oil is high-quality crude trapped in rocks through which it doesn't flow naturally.

There are, we now know, monstrous deposits in the United States: one estimate suggests that the [Bakken shales](http://www.guardian.co.uk/environment/2012/may/14/north-dakota-riding-oil-rush) in North Dakota contain almost as much oil as Saudi Arabia (though less of it is extractable). And this is one of 20 such formations in the US. Extracting shale oil requires horizontal drilling and [fracking](http://www.guardian.co.uk/environment/2012/apr/17/whats-the-truth-about-fracking): a combination of high prices and technological refinements has made them economically viable. Already production in North Dakota has risen from 100,000 barrels a day in 2005 to 550,000 in January.

So this is where we are. The automatic correction – resource depletion destroying the machine that was driving it – that many environmentalists foresaw is not going to happen. The problem we face is not that there is too little oil, but that there is too much.

### Ext 5 – $ Crisis inevitable

#### Europe will trigger a global banking crisis – European debt crisis will trigger their Tverberg impact

Tushe 7/2/12 — [Isida Tushe, Guest Scholar at Eurasia Review, “Who’s Keeping Europe Afloat? Is Eurozone Collapse Beginning Of Second Great Depression?,” Eurasia Review, <http://www.eurasiareview.com/02072012-whos-keeping-europe-afloat-is-eurozone-collapse-beginning-of-second-great-depression-analysis/>]

The recession of the 1930s caused failure in banks both in the U.S. and Europe to the point where the exchange rate adjustments made affected world trade and the international capital flow which turned into a global depression; loses in GDP and industrial production. Every day people witnessed mass unemployment to unprecedented scale similar to today’s Greece and Spain situation. Like the 1930s events, today’s event show a fall in resource utilization. The one difference is that it took years for these catastrophic events to happen in the 1930s. In just a few years, Europe has seen a degree of sudden financial stress, sharpness of the fall in the world trade, economic activity, and asset prices. The world monetary standard was gold, and today the European monetary standard is the euro. The EU has managed to establish a single market across its members, where now the Eurozone compromises of 17 member states. Synchronous to the 1930s, today’s collapse in trade, downturn in the economy, and fall in asset prices calls for a serious concern by the EU leaders.

## Solvency Extensions

### Black Hydrogen Ext

#### Current hydrogen production is fossil fuel dependent – It uses natural gas

Balat 08 – Professor of Biological Sciences @ University of Mahallesi [Mustafa Balat, “Potential importance of hydrogen as a future solution to environmental and transportation problems,” International Journal of Hydrogen Energy 33 (2008) pg. 4013–4029

Today, hydrogen is produced almost exclusively from fossil fuels, through steam reforming of methane (SMR) [40,41] or partial oxidation (POX) of hydrocarbon fuels [42]. SMR is currently the most popular process for producing hydrogen from natural gas. Almost 48% of the world’s hydrogen is produced from SMR, which is the most common and least expensive method of producing hydrogen, with an energy consumption rate of only about 1.23–1.35 GJ-NG/GJ-H2 [43]. The SMR process requires high process temperature and the most common practice for providing the needed heat for the process is via burning natural gas [38]. Steam reformation of natural gas (or methane from other sources) produces a hydrogen rich gas that is typically on the order of 70–75% on a dry basis, along with smaller amounts of CH4 (2–6%), CO (7–10%), and CO2 (6–14%) [15]. The SMR is a three-step process to produce hydrogen. Methane is first catalytically reformed at elevated temperature and pressure to produce a syngas mixture of H2 and CO. A catalytic shift reaction is then carried out to combine CO and H2O to produce the H2 product. The hydrogen product is then purified by adsorption. The reforming step is described by the following reaction [44]:

Reforming reaction : CH4 þ H2O$CO þ 3H2 pg. 4016

#### Fossil Fuel based hydrogen leads to massive CO2 emissions

Blanchette 08 – Chief Engineer for Army Programs @ Software Engineering Institute [Stephen Blanchette Jr., “A hydrogen economy and its impact on the world as we know it,” Energy Policy 36 (2008) pg. 522–530

Several things are needed for such a commercially viable energy system. Chief among these is a means of hydrogen production. Although hydrogen can be produced by a number of means, each of those production techniques has issues associated with it. For instance, making hydrogen from fossil fuels is relatively inexpensive but has the drawback of continuing to send mass quantities of carbon dioxide into the atmosphere—unless those emissions are captured and stored, a technology whose viability is still in question (Keith and Farrell, 2003). Pg. 525-526

### Long Timeframe Ext

#### They can’t even start to solve the oil advantage until 2025

NRC 08 - National Research Council provides independent and expert driven research for the United States National Academies [Committee on Assessment of Resource Needs for Fuel Cell and Hydrogen Technologies, Board on Energy and Environmental Systems, Division on Engineering and Physical Sciences, Transitions to Alternative Transportation Technologies--A Focus on Hydrogen, 2008

The main advantage of a transition to HFCVs is the potential for reducing the use of oil and emissions of CO2. Although hydrogen could not replace much gasoline before 2025, the 25 years after that would see a dramatic decline in the use of gasoline in the light-duty vehicle fleet to about one-third of current projections, if the assumptions of the maximum practical case are met. Emissions of CO2 will decline almost as much if hydrogen is produced with carbon capture and sequestration or from nonfossil sources. Pg. 2