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THE PENTAGON'S NEW MAP...TO OBLIVION:  
WHY THE UNITED STATES SHOULD DECLARE WAR ON OIL

by

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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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14. ABSTRACT  There is much discussion today about the problems of oil consumption and energy security. Since 1980, U.S. policy has been to ensure the free-flow of oil out of the Middle East region using force when necessary. This has resulted in heightened anti-American sentiment in the region, most notably among radical Islamist groups such as al Qaeda. There are additional problems with continuing to support an oil-based economy including diminishing supplies and detrimental climate implications. America's oil dependence cannot be myopically viewed as either an economic issue, a stability issue, a terrorism issue, or an environmental issue. These factors must be looked at cumulatively, and when they are a <i>National Security Crisis</i> emerges. America now has the choice of continuing to defend its access to the world's oil reserves, and face the consequences, or to move boldly toward an alternative. An aggressive public-private investment in the Hydrogen Economy offers just such an alternative.					
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*If you're thinking about this as an environmental issue first and foremost, you're missing the point. It is a national security emergency.*

Mr. Frank Gaffney, former Assistant Secretary of Defense. Founder, Center for Security Policy.<sup>1</sup>

## Introduction

Tom Barnett has briefed the “Pentagon’s New Map” to military leaders, government officials, and the national media literally hundreds of times since his ideas were first published in *Esquire* in March, 2003. His straightforward thesis suggests that rather than prepare for a phantom, post-cold war superpower threat, the United States military should pay more attention to where the problems actually are, i.e., the violent, poverty stricken, under-governed swath of despair he aptly refers to as the “non-integrating gap”. The current intervention in Iraq is not only necessary, he suggests, but just the first in a potentially long line of security exportations to “gap” countries that don’t play by the rules. Once these new “rule sets” are established, the gap can be safely connected, and the dream of globalization realized.<sup>2</sup>

But how many Iraq-like adventures will we require (there are over 100 countries in the Barnett gap)? How many will the American people *allow*? While asserting that 9/11 resulted from “feedback from a world in significant distress,”<sup>3</sup> Dr. Barnett dismisses—in *ad hominem* fashion—those that suggest America might combat terrorism by reducing dependence on foreign oil. He ridicules this realist position as a “knee-jerk” excuse for the “naive” to “not deal with *those* people.”<sup>4</sup> I will show that the history of U.S. intervention in the Middle East to ensure access to oil is precisely the reason we are in our current security predicament. That is not the only problem. While global demand continues to grow unabated, oil production is now near its peak. Furthermore, we are just



starting to see the effects of the coming environmental crisis derived from the at least doubling of atmospheric carbon dioxide. Can anything be done about America's dependence on fossil fuels? If so, at what cost?

Although his book provides a useful contrast, my intent here is not to critique Dr. Barnett's views.<sup>5</sup> I endorse his suggestion that we drop the "World War III" fantasy and instead concentrate on achieving a sustainable global community as the natural succession to cold war strategy. Still, talk of expanding global commerce and promoting "freedom" as a means of connecting the gap can only go so far. The harsh reality is that through a grand geologic accident, the "gap" has something the West desperately needs, and has shown its willingness to fight to the death over: *oil*.

Imagine how the global security environment would look if demand for oil was significantly reduced. America, with its insatiable thirst for petroleum-based energy, and tax-dollar supported military is, as Thomas Friedman puts it, "financing both sides of the war on terrorism."<sup>6</sup> Eliminating the Middle Eastern oil trust funds not only increases U.S. policy options in the region, but may allow the seeds of democracy to finally take root. A century of ever increasing dependence on oil has brought the United States—and the *world*—the triple threat of Islamic terrorism, dwindling supplies and environmental crisis. The vast international consensus behind the Kyoto Protocol (a consensus from which America is noticeably absent<sup>7</sup>) shows there is now a deep reservoir of support around the world to once and for all "kick the oil habit." The time has come for America to seriously consider a bold National Security Strategy that features an aggressive move toward global renewable energy.



## **Background: Oil Dependence and the Rise of Islamist Terrorism.**

### *Oil and Middle East intervention*

OPEC member states hold 80% of the world's proven oil reserves.<sup>8</sup> It is a matter of record that U.S. military intervention in the Middle East is a direct result of our intent to ensure the uninterrupted supply of oil. "If the chief natural resource of the Middle East were bananas," says Sheldon Richman of the Cato Institute, "the region would not have attracted the attention of U.S. policymakers as it has for decades."<sup>9</sup> In Jimmy Carter's 1980 State of the Union address he states: "An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States. It will be repelled by any means necessary, including military force."<sup>10</sup>

It did not take long for the U.S. to act on this threat. In 1987, when the Soviets offered to provide escort services for Kuwaiti tankers during the Iran-Iraq war, President Reagan immediately responded by reflagging 11 Kuwaiti oil tankers, and deploying warships to the Persian Gulf. What followed was a series of combat engagements, including the inadvertent Iraqi attack on the USS *Stark*, an Iranian Silkworm attack on a U.S. flagged tanker, U.S. attacks on Iranian offshore drilling platforms, and finally the downing of an Iranian commercial airliner by the cruiser USS *Vincennes*.<sup>11</sup>

The first Gulf War (1991) showed that the threat to control oil from within the region would not be tolerated either. Though President George H.W. Bush publicly downplayed the energy implications, and promoted the intervention as a "stand against aggression," it was the prospect of Saddam Hussein controlling 40% of the world's known oil reserves that drove Bush to embark on what Samuel Huntington refers to as "the first post-Cold War resource war."<sup>12</sup>

The fact that America was “all about oil” in the Persian Gulf/Middle East was not lost on Osama bin Laden. In a 1997 interview with the Islamabad newspaper *Pakistan*, he states that “The U.S. is increasing its presence in Arab countries to capture its oil reserves,” in an attempt to “consolidate hegemony over Arab oil resources.”<sup>13</sup> When we apply the *combat* (read: vital national interest) threshold to Dr. Barnett’s map of U.S. military intervention since 1990, the “gap” shrinks considerably.<sup>14</sup> Leaving aside the NATO-driven Bosnia and Kosovo interventions, in which whether U.S. vital interests were actually at stake can still be vigorously debated, combat operations are limited to three regions, and the U.S.’ associated vital interests: Iraq (oil security and counter-terrorism), Sudan, and Afghanistan (both counter-terrorism). So, despite all the flag-waving and good intentions throughout the gap, the U.S. has used force only to either strike back at terrorists, or protect access to the vital interest of the Carter Doctrine—*oil*.<sup>15</sup>

### *Middle East intervention and Islamist Terrorism*

While there is little disagreement regarding oil security being one of the few U.S. vital interests in the Middle East region capable of leading to combat intervention, there is considerable debate as to whether this intervention itself has anything to do with our other vital interest: Islamist terrorism. Yale naval history professor John Lewis Gaddis cites the Bush administration’s 2002 National Security Strategy as being in line with the idea that “resentments growing out of the absence of representative institutions in their own societies, so that the only outlet for political dissidence was religious fanaticism” are the motivating factors that led “a group of middle-class and reasonably well-educated



Middle Easterners to fly three airplanes into buildings and another into the ground.”<sup>16</sup>

While Gaddis’ offering of this “emerging consensus within the academic community” may prove to be the fundamental reason you have terrorism in the first place (arguably, there would be *no war at all* if everyone had fully “representative institutions in their own societies”), the fact is that terrorism—as a weapon of the weak—has always existed, and most likely will always exist. The pressing question is therefore not “how do we eradicate terrorism?” (a noble long term goal), but “how do we counter those that are using terrorism against us?”

Nearly a full decade before 9/11, Samuel Huntington warned us of an impending “clash of civilizations” leading to the eventual resistance of the “westernization” (today read: globalization) of society. “Most important,” says Huntington, “the efforts of the West to promote its values of democracy and liberalism as universal, to maintain its military predominance and to advance its economic interests engender countering responses from other civilizations.”<sup>17</sup> For a specific example of that “countering response,” we can turn to Osama bin Laden’s own words to the American people when referring to the 9/11 attacks: “What takes place in America today was caused by the flagrant interference on the part of successive American governments into others’ business.”<sup>18</sup> While there can be no reasonable discussion as to whether these attacks were justified, the fact remains: bin Laden’s statement is *true*.

I am not suggesting this is the whole story—but it is most of it. Almost as an afterthought, bin Laden demands that America “...put an end to its support of Israel”<sup>19</sup> as a condition for “calling off the dogs.” An argument can be made that the U.S.’ support of Israel is tied to oil security in the region, but there are certainly other factors at play—

most notably the settlement of the Israeli/Palestinian homeland situation. Still, if we return to bin Laden's 9/11 statement, and allow that the pattern of intervention required by the Carter Doctrine equates to "flagrant interference," logic dictates a sobering conclusion: *U.S. protection of Gulf oil interests has resulted in terrorist attacks on the United States.*

Alarming, the U.S. is preparing for an encore in Africa. African states are expected to produce 13% of the world's oil supply by 2025. Michael Clare and Daniel Volman report that "Bush administration officials tend to view America's growing dependence on African oil as a welcome alternative to reliance on the turbulent Persian Gulf. But Africa is no more free of violence and conflict than the Gulf is."<sup>20</sup> To get an idea of the ongoing tensions, and their impact on oil stability, one need look no further than the current headlines coming out of Nigeria.<sup>21</sup> In an eerie resemblance to the resentment that arose in response to the U.S. exerting its will in the Persian Gulf region, Clare and Volman suggest that "the more deeply the United States becomes involved in supporting these African petro-states, particularly those with large Muslim populations such as Nigeria, Chad and Sudan, the greater the likelihood that opposition forces will adopt an anti-American stance and ally with extremist groups like Al Qaeda."<sup>22</sup>

### **The Dark Side of Fossil Fuels: Dwindling Supplies and Global Warming.**

#### *Peak Oil: The beginning of the end?*

No matter what we think about how fossil fuel consumption may or may not relate to terrorism, global warming, sun spots or any other phenomenon, the fact of the matter is that society is running out of oil. Global oil demand is growing at its fastest rate



in 16 years—up 20% in the last year alone (with crude prices jumping a corresponding 30% over the same period<sup>23</sup>)—and now sits at approximately 82.5 million barrels per day.<sup>24</sup> So far, production has met demand—barely. Forbes reports that while “OPEC opted to raise output at its June 3 meeting in Beirut, most members are producing at full capacity already.” Additionally, says the Forbes report, “mature U.S. and North Sea oil fields are producing less and new finds have dropped to 6.8 billion barrels annually in 2001-2003 from 11.4 billion barrels per year in the previous five years.”<sup>25</sup>

There is currently an intra-industry debate going on as to when oil production will peak, that is when the “high tide” of global oil output will occur, after which we will be looking at ever-declining supplies as sources are depleted. While some argue that the peak can be delayed by employing high-tech exploration and drilling techniques, others, including Princeton University geologist Kenneth Deffeyes, say that production could peak as early as November, 2005.<sup>26</sup> Even as the current Bush administration pushes a politically charged plan to open the Arctic National Wildlife Refuge to drilling in an effort to expand the yield of the Alaskan North Slope oil reserves,<sup>27</sup> the U.S. Geological Survey reports that the economically recoverable oil from the reserve would account for only 0.3 percent of the global oil inventory.<sup>28</sup> Fortune Magazine notes that even if we manage to postpone the decline in production by utilizing, for example more of the Alaskan North Slope, or Canada’s tar sands, this much is clear—U.S. demand continues to soar (already the world’s largest oil consumer, the U.S. has increased its consumption by 20% over the last 10 years), prices are headed up<sup>29</sup> and sometime in the next 35 years—and possibly much sooner—we will see oil production start to decline once and for all.<sup>30</sup> But not before nature leaves us a nasty parting gift: *global warming*.

## *The Greenhouse Problem*

In 1957, a U.S. oceanographer named Roger Revelle warned that people are conducting a "large-scale geophysical experiment" on the planet by releasing greenhouse gases.<sup>31</sup> According to the U.S. Global Change Research Program's (USGCRP) latest report titled "Our Changing Planet," human induced Global Warming *is* happening: "North American temperature changes from 1950 to 1999 were unlikely to be due only to natural climate variations."<sup>32</sup> While the White House's 27 August 2004 acknowledgement that human activity has resulted in global climate change may have surprised some within the media and environmental lobby,<sup>33</sup> this was not news to the Bush administration. Rather, the connection between fossil fuel consumption and global warming (specifically CO<sub>2</sub> emissions) is well documented in the USGCRP's *U.S. Climate Action Report, 2002*. This report considers the potential impacts of climate change based on National Assessment projections of a 3-9 degree (F) rise in surface temperature and an 4-35" increase in mean sea level by 2100.<sup>34</sup> While taking these rather significant changes to the global climate system as "givens," the report cites wide ranges of uncertainty with regard to the specific impacts these changes will have. The Bush administration's response appears to key on these *impact* uncertainties as justification for avoiding strong action. When asked if the most recent reports changed the administration's position on global warming, White House spokesman Trent Duffy issued a statement saying "the president's policy is the same...we need to fill in the knowledge and the scientific gaps."<sup>35</sup> Climate change, it seems, is an acceptable risk.

Meanwhile, America continues to increase its rate of CO<sub>2</sub> addition to the atmosphere. Having backed out of the Kyoto Protocol, which sought to impose



restrictions on CO<sub>2</sub> emissions by industrial nations, due to the perception that it was “unfair and too expensive,”<sup>36</sup> the Bush administration’s 2002 National Security Strategy calls for largely volunteer efforts to yield an 18% decrease per economic unit, in greenhouse gas production over the next 10 years.<sup>37</sup> Even if this promising sounding goal is achieved, once we assume a nominal GDP annual growth rate of 4%, that translates to a roughly 22% *increase* in total U.S. CO<sub>2</sub> production over the projected period.

It should be noted that the previously cited National Assessment projections are based on a somewhat modest doubling of CO<sub>2</sub> by the end of the century. The National Oceanographic and Atmospheric Administration (NOAA) has shown that if CO<sub>2</sub> emissions grow faster than expected—or continue past the 100 year mark—a devastating quadrupling of atmospheric CO<sub>2</sub> could occur.<sup>38</sup> While the moderate projections cited by the Bush administration may result in mostly minor annoyances (such as more cases of heat exhaustion, the loss of coastal wetlands and reduced snow-pack for western skiers), “extended uncontrolled emissions” could lead to major problems, including releasing significant volumes of sea-level impacting continental ice from Greenland and Antarctica.<sup>39</sup> Though meaningful sea-level predictions are difficult due to complicated feedback mechanisms (e.g., a climate warming-induced change in the ocean’s thermohaline circulation could lead to ice sheet advances in some areas), it should be remembered that nearly every expected outcome of global warming has happened *faster* than anticipated. For example, NASA researchers monitoring glacial flow into Antarctica’s Weddell Sea recently observed that the climate change induced break-up of several small sea-ice sheets led to an unexpected eight-fold seaward acceleration of the

previously land-locked glaciers. "If anyone was waiting to find out whether Antarctica would respond quickly to climate warming," said Theodore Scambos, a University of Colorado glacier expert who worked on one study, "I think the answer is yes. We've seen 150 miles of coastline change drastically in just 15 years." Scambos described this small scale ice break-up as a "harbinger of what will happen when the large ice sheets begin to warm." The break-up of the barely-stable Ross Ice Shelf,<sup>40</sup> for instance, would lead to an increase in global mean sea level of 16 feet.<sup>41</sup>

Another potentially significant climate change response involves more frequent and stronger Atlantic hurricanes,<sup>42</sup> though some contend that natural cycles not directly associated with climate change may have a more direct impact on the frequency of tropical cyclones in the Atlantic. "We suggest that natural variability of storminess is the cause of Florida's recent hurricane disasters," wrote a group of ten scientists to Senator John McCain (R-AZ) in an effort to refute the link between climate change and the severe storms of 2004. Even so, a strong case can be made for the connection between climate change and hurricane intensity. According to Dan Cayan, a research meteorologist at the University of California in San Diego, "warmer water temperatures will promote more intense tropical storms...an increase of even a degree or so in the right environment would cause intensities to increase."<sup>43</sup>

### **Energy Transformation: *Imagining the Art of the Possible.***

One could reasonably argue that the global warming threat could be overblown, requiring only moderate adaptation efforts. Similarly, we could find abundant new oil reserves, or develop technology to extract sources that were previously deemed



economically unrecoverable. Peace *could* break out in the Middle East, thus ending the era of the Carter Doctrine and ensuring the eventual orderly transfer of approximately \$40 trillion<sup>44</sup> from the global economy to the OPEC coffers. It is even possible that we *could* have witnessed middle class Saudi Arabians flying airplanes into American buildings even if, in the words of Sheldon Richman, “the chief natural resource of the Middle East *were* bananas.” But it is at least equally reasonable to subscribe to the growing sentiment that America’s continued dependence on fossil fuels is *bad*, and *something should be done about it*. The Federal Government apparently shares this view, and has quietly invested over \$2 billion in an intriguing non-CO<sub>2</sub> producing option—Hydrogen and Clean Coal.

### *The Hydrogen Economy*

For all the criticism President Bush has taken from the left for a perceived lack of environmental concern or initiatives, it is precisely his 2003 vision for the future of energy that may hold the most promise—*hydrogen*: “A simple chemical reaction between hydrogen and oxygen generates energy, which can be used to power a car producing only water, not exhaust fumes. Join me in this important innovation to make our air significantly cleaner, and our country much less dependent on foreign sources of energy.”<sup>45</sup> The President has allocated an initial \$1.7 billion to help overcome anticipated difficulties with transitioning to hydrogen fuel such as cell capacity, and fuel storage and distribution.<sup>46</sup> More recently, U.S. Secretary of Energy Spencer Abraham announced the formation of “Centers of Excellence” to further enhance the integration of the Department of Energy’s (DoE) National Laboratories, industry and academia to “address

the key technical and economic hurdle of hydrogen storage that must be overcome to make the President's vision a reality.”<sup>47</sup>

Currently, fuel-grade hydrogen is most efficiently produced as a natural gas derivative, which though a vast improvement over oil regarding carbon emissions does little to address America's dependence on foreign sources (though natural gas fields are less concentrated in the volatile Gulf region). However, by tapping into America's estimated 250 year supply of coal we can produce our *own* hydrogen.<sup>48</sup> Make no mistake, burning coal is a major greenhouse gas problem, and is just plain dirty.<sup>49</sup> But there is hope here too—*clean* coal. In fact, promoting clean coal technology (a process by which CO<sub>2</sub> is sequestered and stored as solid rods rather than released to the atmosphere) is listed as a key to the President's emissions reduction goal as outlined in the 2002 NSS.<sup>50</sup> In February of 2003, George W. Bush announced that The Clean Coal Power Initiative would support this pillar to the tune of \$2B over the next ten years resulting in a “demonstration project to create the world's first coal-based, zero-emission electricity and hydrogen plant.”<sup>51</sup>

While it seems the stage is set to aggressively move toward the energy transformation envisioned by President Bush, DoE's current timeline does not fully realize the “Hydrogen Economy” (H<sub>2</sub>E) until 2045.<sup>52</sup> No wonder Barnett's “new rules” model has been getting so much play in Washington. Forty years is a long time to have to ensure access to increasingly scarce petroleum resources. So how is it that we can “send a man to the moon” but it will take us nearly a half-century to get out from under the thumb of OPEC? We can start by looking at DoE<sup>53</sup>—more specifically at what DoE is not. It is *not* an enterprise. It “promotes” and “advances.” It leaves the heavy lifting of



actually producing anything to private industry and the market economy.<sup>54</sup> In fact, DoE has programmed in a Commercialization Decision Point in the year 2015, at which time the whole program could be dropped if the transition is not deemed economically viable. With market forces in charge, one thing is clear: the H<sub>2</sub>E will be ready when it's *cheaper than the alternative*.

### *Analysis: The Next Apollo Project?*

We are now at an impasse. A market driven hydrogen economy is *probably* on the way, but likely will not be in time to seriously mitigate the impacts of climate change. Furthermore, it will come *nowhere near* soon enough to allow us to pursue any degree of military disengagement from the Middle East before the next “security exportation” will be required in the name of suppressing the by-product of intervention—terrorism. But consider an alternative—an alternative not unlike that which defined my own youth: *Apollo*. President Kennedy did not capture America’s imagination by describing how much money we would make by beating the Soviets to the moon. In fact, he convinced the nation to invest an enormous amount of the American treasure<sup>55</sup> with arguably no economic incentive at all. Without a greater purpose, private industry—and household budgets—keep track of only one thing: *money*. This lack of political will is why many noble conservation-related legislative proposals (e.g., gas taxes) have been deemed “dead on arrival” before they hit the Hill. “There are certain things you don’t break your lance on,” says former senator Tim Wirth (D-CO). “You don’t break it on gas taxes.”<sup>56</sup>

Admittedly, it will take investing in an Apollo-like dream to make energy transformation a reality any time soon. Should we go down this road, our government

will not be able to sit on the sideline and be a cheerleader; it will have to *play*. And yes, that dream may require—heaven forbid—a gas tax. That is just the beginning. We will need to take strong conservation efforts—we might even need to drive different cars.<sup>57</sup> We will need to invest a vast amount of public capital if we want the H<sub>2</sub>E to show up even one day sooner than it *has* to. Moreover, the U.S. will have to accept that there is a price to be paid for the oil habit. We are paying the price whether we accept it or not. It was paid by innocent civilians in New York City and Washington D.C. on 9/11, and is paid every day by American soldiers in Iraq. It will be paid with the loss of wetlands and coastline—and possibly much worse—around the globe. It will be paid the next time an American is executed by an Islamist terrorist seeking revenge.

Some might say that even if we commit substantial resources toward a government-led transition to the Hydrogen Economy, it just isn't feasible outside of the prescribed timeline. Maybe. But anyone who has ever ventured into a home improvement project knows that you can *do* anything. It depends on what it is worth to you. Kennedy didn't just "jumpstart" the over 20,000 private companies that contributed to the Apollo effort<sup>58</sup>, he *enlisted* them for a greater purpose. That opportunity exists again today on an even grander scale—with the stakes much higher. Consider all the nations that actually think the Kyoto Protocol is a *good* idea, and are actively doing their part to mitigate the coming climate change. Would *they* be interested in reversing global warming? What about our allies that have stood beside us through thick and thin to defend the access to Gulf oil for nearly 3 decades? Would *they* want to bring their troops home? Is there anybody *besides us* that would like to see the last innocent killed in the



name of *Jihad*? I say there is—and they would. And they have enterprise. And they have money.

I suppose that anything leading to a reduction in military forces deployed to the Middle East to protect oil access could lead to charges of “neo-isolationism” from liberal internationalists.<sup>59</sup> But far from a self-serving retreat, America should view this as a rare opportunity to invest in the greater good. The oil-rich middle-eastern states will adapt and survive, just as India survived the demise of the spice trade. Thomas Friedman points out that the lack of Middle Eastern oil revenues has been a major incentive for countries like Jordan and Bahrain to join the global economy. “People do not change when you tell them they should,” he says. “They change when they tell themselves they must.”<sup>60</sup> By removing America’s military intervention requirement, the H<sub>2</sub>E simply puts more engagement options on the table—and may even turn out to be the uniting enabler globalization has been waiting for.<sup>61</sup>

## **The War on Oil**

I have proposed that (1) America’s dependence on foreign oil—notably Persian Gulf oil—has led to a consistent pattern of U.S. military intervention in the Middle East including combat, (2) the push-back from this intervention has been the rise of anti-American Islamist terrorism, including the 9/11 attacks, (3) we will soon begin to see a decline in the world’s oil production, (4) we are already seeing the effects of CO<sub>2</sub> induced climate change, and the effects are likely to get much worse without strong containment measures, and (5) while the Bush administration’s hydrogen initiative is a promising start, the combination of a strategy that relies on market forces to drive the transition to

around the world waiting to be exploited.”<sup>64</sup> Similarly, regarding the development of a hydrogen fueled aircraft, Boeing cites hydrogen “production and infrastructure issues” (read: cost and availability) as the “over-riding concern.”<sup>65</sup> Indeed, lack of fueling infrastructure and the cost of hydrogen production using current technology are almost universally cited as the primary roadblocks to making energy transformation a reality. It would seem the Federal Government will have to be involved in some part of the process or we run the risk of bottom-line driven concerns hijacking the whole project.

Fortunately, companies like ChevronTexaco (who ironically already produce large volumes of hydrogen for petroleum refining) are only too eager to handle the production side of the H<sub>2</sub>E—*someday*. They assure us they have invested “millions,” in moving toward hydrogen, but that “it might take decades to transition to hydrogen-based energy and transport systems [read: infrastructure] that are economically sound on a large scale.” In the mean time we must patiently wait “for the industry to develop, test, and commercialize the best products and processes.”<sup>66</sup> While I do not mean to imply that oil (now *energy*) companies are deliberately slow-rolling the transition to hydrogen, I do submit that they have less incentive to “go fast” than a government with a security imperative.

This paper suggests that the H<sub>2</sub>E be adopted as an NSS pillar—not just a new growth industry for the energy companies. The obvious fact is that to make the H<sub>2</sub>E work we need *hydrogen*. We need it to be abundant, accessible, and cheap—*ridiculously* cheap if necessary.<sup>67</sup> And we need it soon. The technology is ready—but that is only half the battle.<sup>68</sup> DoE reminds us that “The [Bush] Administration believes it is not the role of the Federal Government to choose the energy sources for the country.”<sup>69</sup> If that is the



end of the story then the H<sub>2</sub>E is going nowhere fast.<sup>70</sup> Instead, the Federal Government needs to *choose* hydrogen—and invest in the infrastructure needed to bridge the gap between the hydrogen producers (energy companies) and users (e.g., fuel cell automobiles<sup>71</sup>).

Some have argued that we don't need anything on the scale of a "Marshall Plan" in order to achieve energy independence. *Newsweek* columnist Fareed Zakaria suggests that "the solution is already with us," referring to recent improvements in hybrid vehicles and the development of alternative fuels such as alcohol.<sup>72</sup> Similarly, *Fortune Magazine's* Amory Lovins notes that "if we build the right playing field [referring to government mandated incentives aimed at rewarding customers who choose, e.g., efficient vehicles]," then "America's shift from oil can be led profitably at a net savings to the economy of \$70 billion by 2025."<sup>73</sup> While these and other ideas are important interim measures (though Zakaria's claim that "hybrid technology is the answer to the petroleum problem," is somewhat overstated considering, for example, that the Ford Escape Hybrid is only 10-15% more fuel efficient than the gasoline version), this will not be enough to meaningfully address *all* the problems posed by America's oil dependence (both plans rely heavily on simply using different greenhouse gas producing fuels).

## Conclusion

The H<sub>2</sub>E is a "no regrets" strategy. As a fuel, hydrogen's nearly 3-fold efficiency advantage over gasoline and promise of zero emissions makes it the almost certain successor to petroleum.<sup>74</sup> Investing in the change now is likely to involve far less blood and treasure than waiting until the inevitable global supply crisis we will face on the

down side of peak oil. Similarly, from a National Security standpoint, an aggressive move away from an oil-based economy can only improve America's position in the Global War on Terror. Eliminating America's oil dependence offers an at least tangible means of increasing U.S. policy options in the Persian Gulf, such as the ability to assume a less aggressive military posture, and will likely have the attractive side effect of further marginalizing militant Islamism within the Arab World (*attacking the enemy strategy*, as Sun Tzu might suggest). If nothing else, a collapse of world oil markets will significantly impact funding lines for would be terrorists in places like Iraq, Iran, and Saudi Arabia. Finally, regarding climate change, the debate has already shifted from "if" to "how much." Any action the world's most prolific CO<sub>2</sub> producer can take to limit emissions can only serve to lessen the eventual impacts of human-induced climate warming.

### *Final thoughts*

Tom Barnett says the U.S. needs to "stand for the ability to choose."<sup>75</sup> I couldn't agree more. Imagine a world where we can *choose* to intervene for the sake of humanity, rather than the protection of purely selfish interests. Imagine Arab states that can *choose* the type of government they want, rather than the one that we require them to have. An accelerated transition to the Hydrogen Economy may just give us an option we haven't had before—the option to *succeed* in cultivating self-sustaining democracies. For the non-integrated populations of the world, the H<sub>2</sub>E helps us imagine the "art of the possible," in which widely available, cheap, renewable energy builds a true on-ramp to the global economy.<sup>76</sup>



Unfortunately, the Bush administration's policy of minimizing conservation efforts while allowing the road to the H<sub>2</sub>E to be constructed by bottom-line oriented private industry and paved by pure market forces means that the trip will be long, full of detours, and will probably end up somewhere else. The U.S. won the Space Race because, "unlike the Soviet Union, it committed vast resources to a well thought-out game plan right from the start. NASA also stuck to that plan despite occasional technical and political problems."<sup>77</sup> This is the approach we must adopt to achieve not just Energy Security—but *World* Security.

Tom Barnett ends his book by saying that "perhaps all this qualifies me as a dreamer."<sup>78</sup> I am inclined to agree. Anyone who seriously thinks the U.S. will be diving into another round of pre-emptive nation-building after the Iraq experience *is* in a dream world. If Barnett is ultimately right, and the U.S. engages in successive "gap" conflicts, it won't be because we're hunting terrorists, tracking down WMD, or trying to connect the Internet. It will be because *that's where the dwindling supply of oil is*. Still, in the "might be a dreamer" category, I'm right there with you, Dr. Barnett, in thinking we can mobilize the global community to rapidly move beyond oil. Who knows, maybe one of us is actually on to something. Let's hope so, and that the world turns out better for it.

<sup>1</sup> Mr. Gaffney is referring to curbing dependence on foreign oil. Quote taken from Danny Hakim, "Hybrid-Car Tinkerers Scoff at No-Plug-In Rule," *The New York Times*, April 2, 2005

<sup>2</sup> The basic thesis of Dr. Thomas P.M. Barnett, "The Pentagon's New Map," *Esquire*, March, 2003

<sup>3</sup> Dr. Thomas P.M. Barnett, *The Pentagon's New Map* (New York: G.P. Putnam's Sons Putnam Publishing, 2004), 34

<sup>4</sup> While these quotes are taken from the *Esquire* article, Dr. Barnett explains this position more fully in his book. On p. 216 of *The Pentagon's New Map* (PNM), he states: "The realist in me says oil is what brought us to the Middle East, but the optimist in me says 'that's fine' as long as we leverage that slim connectivity into a larger effort to integrate the region..." Barnett, *The Pentagon's New Map*, 216.

<sup>5</sup> For a countering perspective, see (e.g.) NPR's "On Point" in which Barnett debates NPR's Jack Beatty ([www.onpointradio.org/shows/2004/06/20040624\\_b\\_main.asp](http://www.onpointradio.org/shows/2004/06/20040624_b_main.asp)).

<sup>6</sup> Thomas L. Friedman, "No Mullah Left Behind," *The New York Times*, February 13, 2005

<sup>7</sup> Despite the President's refusal to sign the treaty, 132 U.S. mayors recently committed their cities to meeting the carbon emissions goals Kyoto would have mandated. From Eli Sanders, "Rebuffing Bush, 132 Mayors Embrace Kyoto Rules," *The New York Times*, May 14, 2005

<sup>8</sup> BPAmoco Statistical Review of World Energy 1999, "Oil and the Facts--Burning of fossil fuels," *The New Internationalist*, June 2001.

<sup>9</sup> Sheldon L. Richman, 'Ancient History: U.S. Conduct in the Middle East Since World War II and the Folly of Intervention,' *Cato Policy Analysis* No. 159, 1991

<sup>10</sup> Jimmy Carter State of the Union Address, 1980. From the Jimmy Carter Library & Museum, (<http://www.jimmycarterlibrary.org/>)

<sup>11</sup> Sheldon L. Richman, 'Ancient History: U.S. Conduct in the Middle East Since World War II and the Folly of Intervention,' 1991

<sup>12</sup> Samuel P. Huntington, *The Clash of Civilizations and the Remaking of World Order*, (New York, NY: Touchstone Publishing, 1996), 251-252.

<sup>13</sup> Bin Laden also cites America's financial motives regarding oil protection as "to ensure that Arab prices remained low so that Western economies would flourish while the Arab economies crumbled." From Anonymous, *Through Our Enemies' Eyes*, (Washington D.C.: Brassey's Inc, 2002), 51-52.

<sup>14</sup> The Barnett "gap," as defined by U.S. military involvement since 1990 shows that only the former Yugoslavia, Iraq, Afghanistan, and Sudan reflect actual "combat operations." Barnett, *The Pentagon's New Map*, inside front cover.

<sup>15</sup> And things are not getting better. *Forbes.com*, in describing the recent hike in oil prices reports that "recent violence in Saudi Arabia [the world's largest supplier of oil with over 250 billion barrels in reserve], including a deadly attack by Islamic militants in Khobar, and a fear that al Qaeda-linked forces are trying to provoke civil war in the kingdom have again raised fears about supply interruptions." From *Forbes.com*, "The Lowdown on High Oil Prices," 2004 ([http://www.forbes.com/business/energy/2004/06/07/cx\\_pm\\_0607oilintro.html](http://www.forbes.com/business/energy/2004/06/07/cx_pm_0607oilintro.html)).

<sup>16</sup> John Lewis Gaddis, "A Grand Strategy of Transformation," *Foreign Policy*, November/December 2002

<sup>17</sup> Samuel P. Huntington, "The Clash of Civilizations?" *Foreign Affairs*, Summer 1993.

<sup>18</sup> Email to "The American People" from Osama bin Laden, October 3, 2001. *The Atlantic Monthly*, September 2004.

<sup>19</sup> Email correspondence between Osama bin Laden and Mullah Omar, October 3, 2001. *The Atlantic Monthly*, September 2004.

<sup>20</sup> Michael T. Klare and Daniel Volman, "Africa's Oil and American National Security," *Current History*, May 2004

<sup>21</sup> As recently as 30 September, Reuters reported that "the militia group [Niger Delta People's Volunteer Force] threatened to target foreign oil firms and their international workers starting Friday, nudging crude oil prices to the historic peak of over \$50 per barrel in global markets." From Reuters, "Nigeria cease-fire appears to be holding," MSNBC, Sept. 30, 2004.

<sup>22</sup> M. T. Klare and D. Volman, "Africa's Oil and American National Security," *Current History*, May 2004

<sup>23</sup> From *forbes.com*, "The Lowdown on High Oil prices," 2004

<sup>24</sup> Reuters, "Oil prices jump, Nigeria supply still a concern," MSNBC, Sept. 30, 2004



- <sup>25</sup> From forbes.com, "The Lowdown on High Oil prices," 2004
- <sup>26</sup> John W. Schoen, 'Can technology help find oil fast enough?' MSNBC, Sept. 23, 2004
- <sup>27</sup> Reuters, 'First oil wells OK'd for Alaska reserve,' 31 August 2004
- <sup>28</sup> Energy Information Administration, "U.S. Crude Oil, Natural Gas and Natural Gas Liquid Resources, 1999 Annual Report," DOE/EIA-0216 (99) (December 2000).
- <sup>29</sup> "Fifty-dollar oil is just another stop on the road to much higher crude prices," according to said Peter Schiff, president of asset managers Euro Pacific Capital. From MSNBC, 'Oil closes at brand new high' Reuters; 24 September 2004
- <sup>30</sup> While natural gas is often touted as a preferable alternative to oil, due to its perceived high quantity and lower cost, the price has increased 3-fold over the last ten years, and the U.S. will require a 100% increase in net imports by 2020. Also, gas must be liquefied in order to be shipped long distances (up to \$220B for pipelines and terminals). According to *Fortune*, a "new OPEC" is developing around natural gas. Russia and Iran control 42.6% of the world's known gas reserves—61.3% when Qatar and Saudi Arabia are added in. "By 2020 they're going to be pretty much in control of the market," says Amy Jaffe, associate director of the James A. Baker III Public Policy Institute at Rice University. As *Fortune*'s Nicholas Varchaver puts it, "Not only did we not learn our lesson with oil, but we're now ready to repeat the experience with natural gas." From Nicholas Varchaver, 'How To Kick The Oil Habit,' *Fortune Magazine* (August 23, 2004), p. 100-114
- <sup>31</sup> Ross Gelbspan, 'Climate Change: Timeline', The Greenhouse Network ([www.greenhousenet.org](http://www.greenhousenet.org)), 2004
- <sup>32</sup> U.S. Global Change Research Program, 'Our Changing Planet,' Washington D.C., 2004
- <sup>33</sup> In Reuters, 'U.S. climate report heats up policy issue,' (27 August 2004), Philip Clapp, president of the National Environment Trust commented: "It will be interesting to see whether he (President Bush) plans to do something about global warming or just continue ignoring it for political reasons."
- <sup>34</sup> U.S. Global Change Research Program, 'Climate Action Report,' 2002.
- <sup>35</sup> Reuters, 'U.S. climate report heats up policy issue,' 27 August 2004 (from MSNBC, <http://www.msnbc.msn.com/id/5839243/>)
- <sup>36</sup> Ibid. This is a paraphrase. The full Reuters quote was "too costly to the U.S. economy while not requiring similar efforts from developing nations like China." Of further note, on Sept 30, 2004, the AP reports that Russia is preparing to adopt the Kyoto Protocol, leaving only the United States and China outside the accord among large industrial nations.
- <sup>37</sup> The White House, 'The National Security Strategy of the United States of America,' 2002
- <sup>38</sup> This would be considered a "worst case" scenario. The global prediction system used to simulate increased CO2 responses is called the Geophysical Fluid Dynamics Laboratory (GFDL) model. This model has shown exceptional skill in depicting global circulations including tropical cyclones, and is the primary prediction system of the National Hurricane Center and the military's Joint Typhoon Warning Center.
- <sup>39</sup> Total landlocked ice in Greenland and Antarctica could impact sea level by 23 and 240 feet respectively. National Oceanographic and Atmospheric Administration, 'Climate Impact of Quadrupling Atmospheric CO2,' 2004 ([http://www.gfdl.noaa.gov/~tk/climate\\_dynamics/climate\\_impact\\_webpage.html](http://www.gfdl.noaa.gov/~tk/climate_dynamics/climate_impact_webpage.html))
- <sup>40</sup> The National Snow and Ice Data Center reports that "the warmest part of the giant Ross Ice Shelf is in fact only a few degrees too cool in summer presently to undergo the same kind of retreat process[as the Larson B shelf]." From 'Larsen B Ice Shelf Collapses in Antarctica,' NSIDC, 21 March 2002. ([nsidc.org/iceshelves/larsenb2002/](http://nsidc.org/iceshelves/larsenb2002/))
- <sup>41</sup> Reuters, 'Antarctic glaciers melting faster,' September 22, 2004
- <sup>42</sup> "Over the past few years, we've seen an increasing trend toward greater activity in the Atlantic Basin and increased strength in storms," said Marshall Shepherd, a research meteorologist at NASA's Goddard Space Flight Center. "[That] has been leading us to believe that we are going to start seeing more intense hurricanes. That may be bearing itself out right now." From Michael Coren, "More Fierce Hurricanes May Loom on Horizon," CNN, September 6<sup>th</sup>, 2004. (<http://www.cnn.com/2004/TECH/science/09/03/hurricane.science.cnn.ap/index.html>)
- <sup>43</sup> Christopher Doering, "Will Climate Change Spark Fiercer Storms?" September 15<sup>th</sup>, 2004 (from MSNBC, <http://www.msnbc.msn.com/id/6014029/>)
- <sup>44</sup> Based on OPEC holding c. 764 billion barrels in reserve at \$53/barrell
- <sup>45</sup> President G.W. Bush, State of the Union Address, January 28, 2003
- <sup>46</sup> Nicholas Varchaver, 'How To Kick The Oil Habit,' *Fortune Magazine* (August 23, 2004), p. 100-114



- <sup>47</sup> These "Centers of Excellence" include the National Renewable Energy Laboratory, Los Alamos National Laboratory, and Sandia National Laboratories. From U.S. Department of Energy press release, "Secretary of Energy Abraham Announces NREL, Los Alamos and Sandia Hydrogen Storage "Centers of Excellence,"" April 27, 2004.
- <sup>48</sup> Current technologies require hydrogen to be isolated using electricity. Coal-fired plants could provide this electricity. From U.S. Department of Energy, "Taking Stock: Energy Challenges Facing the United States," *National Energy Policy* 2003.
- <sup>49</sup> EPA data from 1997 show that coal-fired power plants emitted 36 percent of the total carbon dioxide in the United States that year (two billion tons), 64 percent of the sulfur dioxide (thirteen million tons), 26 percent of the nitrogen oxides (six million tons), and 34 percent of mercury emissions from all known sources (fifty-two tons). From Dave Aftandilian, "Dirty, Coal-Fired Power Plants in Illinois," *Conscious Choice*, February 2001.
- <sup>50</sup> The White House, "The National Security Strategy of the United States of America," 2002
- <sup>51</sup> Mike Easton, "Opportunities and Challenges for New Clean Coal Technologies," National Energy Technology Laboratory, October 23, 2003.
- <sup>52</sup> United States Department of Energy, "Hydrogen Posture Plan," February 2004. ([www.eere.energy.gov/hydrogenandfuelcells/pdfs/hydrogen\\_posture\\_plan.pdf](http://www.eere.energy.gov/hydrogenandfuelcells/pdfs/hydrogen_posture_plan.pdf))
- <sup>53</sup> DOE's mission shows its commitment to the "public-encourage, private-do" venture model: "The Department of Energy's overarching mission is to advance the national, economic and energy security of the United States and to promote scientific and technological innovation in support of that mission." (DOE mission statement, [www.doe.gov](http://www.doe.gov), 2004)
- <sup>54</sup> A closer look at DOE's Hydrogen Posture Plan states this case more clearly: "In the long-term vision of the hydrogen economy (which will take several decades to achieve), hydrogen production and storage costs will be competitive; the basic components of a national hydrogen delivery and distribution network will be in place; and hydrogen-powered fuel cells, engines, and turbines will have become mature technologies in mass production for use in cars, homes, offices, and factories... Achieving this vision will require a combination of technological breakthroughs, market acceptance, and large investments in a national hydrogen energy infrastructure. Success will not happen overnight, but rather over decades; it will require an evolutionary process that phases hydrogen in as the technologies and their markets are ready."
- <sup>55</sup> An estimated \$100 billion in 1994 dollars. From Marcus Lindroos, "The Cost of the Moon Race: \$100 Billion to Land on the Moon," *THE ARTEMIS PROJECT*, 1997. (<http://www.asi.org/adb/m/02/07/apollo-cost.html>)
- <sup>56</sup> Nicholas Varchaver, "How To Kick The Oil Habit," *Fortune Magazine* (August 23, 2004), p. 100-114
- <sup>57</sup> One way to get more efficient cars on the road is an interesting government-sponsored "exchange program" suggested by Amory Loyins ("How American can free itself of oil—profitably," *Fortune*, October 4, 2004). In such a program, citizens would take advantage of government subsidized lease or purchasing incentives to "turn in" their "gas guzzler" in exchange for any variety of "transition" cars now available (e.g., gas-electric "hybrids," and advanced diesels).
- <sup>58</sup> Marcus Lindroos, "The Cost of the Moon Race: \$100 Billion to Land on the Moon," *THE ARTEMIS PROJECT*, 1997. (<http://www.asi.org/adb/m/02/07/apollo-cost.html>)
- <sup>59</sup> e.g., Georgetown University's Charles Kupchan, who suggests that an adherence to the "basic dictum of the [U.S.] Founding Fathers that America should stay out of the affairs of other countries so that they stay out of America's affairs," is a *bad* thing. Charles A. Kupchan "The Rise of Europe, America's Changing Internationalism, and the End of U.S. Primacy," *Political Science Quarterly*, Summer 2003
- <sup>60</sup> Thomas Friedman, "The Battle of the Pump," *The New York Times*, October 7, 2004.
- <sup>61</sup> Ted Galen Carpenter notes this discrepancy as he describes his concept of Strategic Independence: "...a refusal to police [the] Persian Gulf region does not imply that the U.S. must withdraw from the World Trade Organization." From Ted Galen Carpenter, "U.S. Security Strategy After 9-11," *Peace & Freedom: Foreign Policy for a Constitutional Republic*, 2002
- <sup>62</sup> Interestingly, all eleven OPEC countries are in Barnett's "gap".
- <sup>63</sup> MSNBC, "Sporty Mercedes Fuel Cell Car Unveiled," March 2, 2005
- <sup>64</sup> William Tucker, "It Fuels a Debate, Too," *The Wall Street Journal*, September 15, 2004
- <sup>65</sup> Dave Daggett, "Hydrogen Fueled Airplanes," Boeing presentation to Hydrogen Production and NW Transportation, Seattle, WA, June 16, 2003 ([www.pnl.gov/energy/hydrogen/presentations/daggett.pdf](http://www.pnl.gov/energy/hydrogen/presentations/daggett.pdf))



<sup>66</sup> During this period they (ChevronTexaco) “see hydrogen fuel being produced from widely available hydrocarbons, such as natural gas and liquid fuels (read: oil).” From “The Promise of Hydrogen,” ChevronTexaco Technology Ventures, [www.chevrontexaco.com](http://www.chevrontexaco.com)

<sup>67</sup> Given current technologies, hydrogen is roughly two-to-four times more expensive to produce than an equivalent volume of gasoline (White House Press Release, “Fact Sheet: Hydrogen Fuel: a Clean and Secure Energy Future,” February 6, 2003, <http://www.whitehouse.gov/news/releases/2003/02/20030206-2.html> and Oregon Department of Energy, “Alternative Fuel Descriptions,” 2004, <http://www.energy.state.or.us/trans/fueldes.htm>), but is 3 times more efficient. The “cost per mile” is roughly equivalent. Even a modest increase in, say the gasoline tax, would give hydrogen a strong market advantage.

<sup>68</sup> Terry Tamminen, head of California's Environmental Protection Agency recently announced California plans to operate 200 hydrogen fueling stations by 2010. “There are no showstoppers [referring to hydrogen fuel cell vehicles],” he told the audience. “It's ready to take us to the grocery store or on the family vacation.” From “Gentlemen, start your fuel cells,” by Miguel Llanos, MSNBC, Oct. 1, 2004

<sup>69</sup> Department of Energy, “Strategic Plan,” September 30, 2003, p. 17 ([www.doe.gov](http://www.doe.gov))

<sup>70</sup> Royal Dutch/Shell Group Chairman Ron Oxburgh—who is an unlikely advocate of governments pushing society towards a world less dependent on fossil fuel—recognizes this underpinning issue when he cautions that “none of these [carbon sequestration, and the use of hydrogen as a fuel] is going to happen if the market is left to itself.” Reuters, “Shell executive: Climate needs shift from oil,” January 26<sup>th</sup>, 2005.

<sup>71</sup> They are already. The San Jose Business Journal reports that a recent break-through in fuel cell technology will lead to earlier than expected marketing of fuel-cell vehicles. “We're just at the beginning of the development path,” says Jim Balcom, CEO and president of PolyFuel which recently announced a major improvement in fuel-cell membranes. “Our chemists know they can drive it towards the ideal characteristics required to compete head-to-head with the internal combustion engine [in 2-5 years].” From Janet Rae-Dupree, “Cheaper, more efficient fuel cells on the way,” *San Jose Business Journal*, 11 October, 2004

<sup>72</sup> Fareed Zakaria, “Imagine: 500 Miles Per Gallon,” *Newsweek*, Mar 7, 2005

<sup>73</sup> From Amory Lovins, “How American can free itself of oil—profitably,” *Fortune*, October 4, 2004

<sup>74</sup> U.S. DoE reports that “...they [hydrogen fuel cells] can reach efficiencies of up to 85 percent. Internal-combustion engines in today's automobiles convert less than 30 percent of the energy in gasoline into power that moves the vehicle.” U.S. Department of Energy, “The Hydrogen Future,” 2004 (<http://www.eere.energy.gov/hydrogenandfuelcells/future/benefits.html>). See also “Hydrogen Fuel Infrastructure,” in the March 1996 issue of *Science & Technology Review* that identifies hydrogen as having “long term advantages that no other fuel can match.”

<sup>75</sup> Dr. Barnett states that “many Muslims will...continue to prefer disconnectedness,” and that America should simply provide the “choice.” Barnett, *The Pentagon's New Map*, 214.

<sup>76</sup> Anyone that can make electricity (using, e.g., hydro-power, nuclear, any fossil fuel, etc.,) can make hydrogen. Dr. Barnett's skepticism toward the H2E is revealed on page 223 of “PNM,” where he argues that the H2E will “disconnect” the Middle East. Barnett, *The Pentagon's New Map*, 223

<sup>77</sup> Marcus Lindroos, “The Cost of the Moon Race: \$100 Billion to Land on the Moon,” *THE ARTEMIS PROJECT*, 1997.

<sup>78</sup> Barnett, *The Pentagon's New Map*, 383