America's oil boom and the collapse of its energy security paradigm

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The title of my lecture is an oxymoron. America is in the midst of an unprecedented energy boom. Due to the shale revolution, its oil and gas production are the highest in decades and the country is well on its way to becoming an energy exporter after years of energy vulnerability and deep dependency on imported energy. Only in 2007, Fed Chairman Alan Greenspan lamented in a Congressional hearing that America was in a midst of a natural gas crisis and fourteen gas import terminals were built along America's coasts to address the crisis. Seven years later and the U.S. is drowning in cheap gas and is well on its way to becoming a major natural gas exporter on par with Qatar. To illustrate the degree of the change that occurred consider the case of North Dakota. With a population equivalent to that of Frankfurt, the upper Midwestern state has been until recently a non-player in America's energy landscape. Today it is the second largest oil producing state after Texas, surpassing traditional energy giants like Alaska and California.

So with the backdrop of such an impressive boom how can I speak here today about a "collapse" of America's energy security paradigm?

Let's first understand the paradigm that governed America's energy policy discourse since the 1973 Arab Oil Embargo. Over that period, every American president from Richard Nixon to Barack Obama adopted the goal of reducing America's oil imports as the core of his energy policy. Time and again, Americans were promised that if we only found ways to reduce our consumption of oil through taxation or improved vehicle efficiency and/or to increase our domestic production by, say, drilling in Alaska and off our coast, we would remove the yoke of our dependency on the chronically unstable Middle East and we would pay less at the pump. This approach resonated with both Republicans and Democrats with the only difference being that Republicans chant "drill-baby-drill" while Democrats believe in "conserve-baby-conserve."

We have done both. Today cars sold in America are more fuel efficient than ever, and we drill more domestic oil than ever before. In fact, over the past few years America added to the world market more than three million barrels of crude per day – almost twice Norway's current production. Yet, none of this has had any noticeable impact on the price of crude or on the price of gasoline Americans buy at the pump. To the contrary, over the same decade in which the growth in U.S. production took place, the price of oil quadrupled itself, inflating more than most other commodities.

Simple economics suggest that in a competitive market if demand falls and supply rises, prices should fall. Against the expectations of many energy self-sufficiency advocates, the volume of America's imports and the cost of its imports moved in opposite directions. How can that be? What is wrong with our method?

The traditional definition of energy security is "availability of sufficient supply at affordable prices." In other words, energy should be not only freely *available* but also *affordable*. The balance sheet of the past decade shows that America has gained some points on the availability front but lost many more on the affordability side of the ledger. And in challenging economic times, it is the latter that matters more. The U.S. is the only major democracy in the world where gasoline prices can decide presidential elections. It is only understandable. Most Americans cannot even buy a loaf of bread without entering their car and driving somewhere. And when oil prices spike, disposable income of those Americans who aren't lucky enough to own an oilfield shrinks. This is perhaps why every major recession since World War II, including the most recent one, was preceded by a spike in oil prices. This means that for the U.S. the price of oil is more important for achieving energy security than the assurance of its availability.

This might explain why the energy boom and its resulting "energy independence" are *not* going to harbinger a U.S. withdrawal from the Middle East. Contrary to popular thinking, the U.S. has never been dependent on the Middle East for its crude supply. Today only nine percent of our oil originates from the region. The most it has ever been was 14 percent. Most of our foreign oil comes from Canada, Mexico and Venezuela.

What America imports from the Middle East is not the physical commodity but its price. Oil is a globally traded commodity with, more or less, global prices. When the price of oil spikes it spikes for everyone regardless of countries' level of dependency. So when instability takes place in the Persian Gulf or in Nigeria, American consumers feel the pain at the pump regardless of how much oil the U.S. imports from those regions. For example: when the 2011 Libyan upheaval caused a supply disruption, the U.S. imported no oil from Libya, but American motorists were as affected by the resulting $25 per barrel price hike caused by the war as the motorists of Libya's major oil purchasers.

The inability to keep the price of oil at bay, not the volume of imports, is the crux of America's energy vulnerability. But the price is what it is because virtually all the cars and trucks in the world are unable to run on anything but petroleum-based fuels. Oil faces no competition from other energy commodities in the sector from which its strategic importance stems, namely transportation. Since consumers are unable to choose between different commodities, suppliers do not need to compete for market share by increasing production capacity and supplying lower prices. And that, in turn, leads us to OPEC.

One can argue that OPEC isn't particularly adept at managing its response to fluctuations in the oil market month to month or week to week. But what is indisputable is that OPEC controls three quarters of the world's conventional oil reserves, while its members account for only one third of global production. If investor-owned oil companies such as Exxon, BP, Shell and Chevron were sitting on top of three quarters of the world's conventional oil reserves, they'd probably account for 68 percent, or 82 percent, or something in that range. And if not, they'd be slapped with an anti-trust lawsuit. Anti-trust lawsuits, however, don't work against sovereign regimes such as those that comprise OPEC. It shouldn't be surprising that OPEC's production capacity is so low since OPEC is a cartel, and a cartel aims to maximize profit by constricting supply. Thus, in the past four decades, global GDP grew tenfold, and the number of automobiles grew fourfold yet OPEC's crude production barely increased. In other words, OPEC keeps production capacity well below what its reserves allow, creating a supply level designed to keep prices at a certain level.

Perhaps the best way to understand this is through the metaphor of a homeostat. OPEC decides on an ideal price level and then adjusts supply accordingly. So when U.S. and Europe reduce their demand or increase their supply, OPEC responds by throttling down supply to drive prices back up to its ideal price level, what it calls a "fair" price, or just sitting on its hands while developing world demand picks up the slack. The thing is, this "fair" price keeps rising. In 2004, OPEC's "fair" price was $25 per barrel. Two years later it was $50. In 2010, it was $90, and by the end of 2011, the price was adjusted to $100.

OPEC's "fair" price is based ultimately on the budgetary needs of the cartel's members, whose appetite for petrodollars has increased significantly since the onset of the so-called Arab Spring. Hoping to avoid the fate of leaderships in Egypt, Libya and Tunisia, Persian Gulf regimes have showered their people with gifts and subsidies. Saudi Arabia alone almost doubled its budget, providing a 50 percent raise to all government employees. This expensive response to the protests will likely increase the break-even price the Saudis need in order to balance their budget. Other OPEC members, especially Iran, Iraq, Venezuela and Nigeria, will also seek higher oil prices. The same is true for Russia, which is not an OPEC member but needs $117 a barrel to meet its budgetary obligations.

Another reason for OPEC's rising break-even price is the cartel members' own oil consumption habits. Saudi Arabia is the world's largest oil producer, but due to its rapid population growth and heavy subsidization of fuels, the Kingdom is also the world's sixth largest oil consumer, consuming more oil than Germany, Canada or South Korea. Oil analysts counting on Saudi Arabia's production capacity reaching 12 million barrels per day tend to forget that half of Saudi Arabia's oil will be burned within the Kingdom instead of reaching the world market.

Bottom line: the reason our paradigm has collapsed is because oil enjoys a monopoly over the global transportation sector and at the same time its price is controlled to a large extent by a cartel. So it doesn't matter how well we follow the Republicans' "drill baby, drill" or the Democrats' conservation and efficiency; we'll still be on the same treadmill we've been on for decades regardless of how much we frack.

If we are to achieve true and lasting energy security we must break oil's monopoly over transportation fuels. The key to achieving this goal is *fuel competition*.

To chart our way out of the mire we should turn to history and study the story of salt. Oil today enjoys the status salt used to enjoy for many centuries. Because it was the sole means of food preservation, human beings depended on ample supplies of affordable salt for their survival. Those who had no salt – which was referred to as "white gold" – could not preserve enough meat, fish and vegetables during the summer to survive the harsh winter months. Wars were fought over salt; colonies were built around it, and salt producing centers like Tortuga, Boa Vista and Turk Island enjoyed the same strategic importance as today's Persian Gulf oil kingdoms. All this changed in the year 1800 by Napoleon. Malnutrition was a major problem for the 18th century French Army and a major operational problem for Napoleon who was planning to expand his empire. Napoleon offered a 12,000 franc cash prize to anyone who could devise a practical method for food preservation for armies on the march. A French chef named Nicolas Appert found a way to preserve food in glass containers thus creating the modern day process of canning foods. Around the same time an American inventor named Oliver Evans invented the first refrigeration machine. In the decades that followed, both canning and refrigeration technologies gradually improved to the point that by the middle of the 19th century food preservation no longer required salt. Today, we still use and import salt – in fact we import more salt today than in any other period in history – but I doubt many of you know who the world's big salt reserve holders are, and whether or how much salt your country imports.

In order to turn oil into salt, in other words turn it from a strategic commodity second to none into just another commodity, cars need to be open to run on competitive fuels. Competition over transportation fuel market share between petroleum based fuels and fuels made from other commodities would yield competition over price with downward pressure on oil prices. Drivers must be able to shift on the fly from one fuel to another, responding to the daily economics of the commodities from which the fuels are made.

At least two major countries are on their way to implementing this vision. In Brazil, where most of the cars have flexible fuel engines which can run on any combination of gasoline and ethanol, drivers can decide which blend of fuels they would like to use. Brazil has a developed sugar industry and in most fuel stations consumers can buy blends of gasoline and alcohol which vary based on the economics of crude oil versus sugar. When the price of oil rises people

use more alcohol. When sugar prices rise they shift back to gasoline. In 2008, when the price of oil reached nearly $150 Brazilians bought more ethanol than gasoline. Because gasoline and alcohol can blend with each other just like coffee blends with milk the ratios can be adjusted on a daily basis and no infrastructure change is needed.

Another country where fuel choice is increasingly happening is China, the fastest growing automobile market and the world's largest oil importer. Car ownership is the ultimate dream for the average Chinese, and by the end of the decade China is projected to have more cars on its roads than the United States. China's dependency on imported oil is its number one strategic vulnerability. The Chinese embraced another alcohol fuel called methanol which they make from coal. However it can also be made from natural gas, biomass and even recycled carbon dioxide. In Shanxi province, where roughly 36 million people live, one can enter any fuel station and buy methanol blends which are vastly cheaper than conventional gasoline. The economics of methanol are so favorable that in part of China illegal methanol blending has become rampant. While in Communist China consumers have choice between petroleum and alternatives, in the free market economies of the trans-Atlantic community, we are still living in a fuel dictatorship in which we are mandated to use only petroleum fuels. Think about it: we have choice in every aspect of our lives but not when it comes to transportation fuels.

Nothing like what happened in Brazil and China can happen in the United States and Europe as long as vehicles are warrantied to run exclusively on petroleum fuels. Over the past seven years, as U.S. import dependence dropped, nearly 100 million new petroleum-only vehicles rolled onto America's roads, each with an average lifespan of 15 years. This has effectively extended the stranglehold of oil and its possessors on our economy by two decades. This is a needless tragedy.

We should all remind ourselves the first law of holes: if you find yourself in a hole, stop digging. We are in a hole – a rather deep one. China and India's oil demand is growing by leaps and bounds. The Muslim world, home to most of the world's conventional crude reserves, is in the midst of a fierce and protracted internal war akin to the one the Christian world endured during its Wars of Reformation. Russia, the world's second largest crude producer is increasingly isolated and sanctioned and Nigeria may be sliding into a new civil war following its elections next year. Yet, we keep putting on our roads cars that can run on nothing but oil.

So what can we do? Perhaps the most important strategic move the U.S. can lead is opening the transportation fuel sector to natural gas, a resource it is well endowed with. And while gas is used widely in electric generation, today less than one percent of America's natural gas is used as automotive fuel. The figure for Europe is quite similar.

There are several ways to take advantage of the low cost of natural gas. One way to use natural gas in automobiles is by employing it to generate electricity for plug-in hybrids and electric vehicles. Such vehicles are gradually entering the market. They are clean, cheap to operate, and in many respects outperform gasoline-powered cars. However, due to the high cost of automotive batteries and the infrastructure requirements, mass-market penetration of battery-operated vehicles will take a long time.

Cars can also run on natural gas via compressed natural gas vehicles, which have a dedicated fuel line and a large gas canister in the trunk. But the most economical pathway for using natural gas in cars is methanol, the fuel used in China. In order for vehicles to run on methanol in addition to gasoline, they must be tweaked to manage its greater corrosiveness. Essentially, all that is needed are a fuel sensor and a corrosion-resistant fuel line. The cost? About $100 for a car or light truck. Indeed, a tweak of $100 – the cost of one barrel of oil – is what stands between the perpetuation of a restrictive, monopolistic and economically ruinous fuel system and a free and competitive fuel market which could provide us true and lasting energy security.

Free market economist Milton Friedman recognized the role of government in doing what the market cannot do itself, namely, to determine, arbitrate, and enforce the rules of the game. In his book Capitalism and Freedom he wrote: “The first and most urgent necessity in the area of government policy is the elimination of those measures which directly support monopoly.” The petroleum-only vehicle is one of those measures which support monopoly, and if we are to restore control over our future, governments should require that new vehicles should no longer be made to exclude non-petroleum fuels. An open fuel standard requiring new cars to be certified to run on alcohols in addition to gasoline will gradually give rise to a burgeoning industry of new fuels and the distribution system to serve them.

Of course, such a transformation will take some time. One cannot expect to roll back a century of oil dependency in a flick of a switch. But it is incumbent upon us to begin the process of breaking oil’s virtual monopoly today. As we commemorate the centennial of the First World War, one of the most catastrophic events in human history, it is important to remind ourselves how brittle the global system can be and how quickly the globalized world could shift from serenity to carnage. And when we ask ourselves what seminal events could trigger global instability – international terrorism, nuclear proliferation, war in the Middle East or in Asia-Pacific and a renewed Cold War with Russia – we would see that almost all of them have something to do with oil.

It goes without saying that governments that depend for their survival on high oil prices would oppose this effort. After all they want us to remain addicted to their product and keep us ill-informed about the alternatives. In this, a recent New York Times exposé about the corrupting influence of oil governments on Washington think tanks should raise a red flag. Leading

research institutions which are supposed to promote the best interests of the American people are recipients of tens of millions of dollars from oil governments like Qatar, UAE, and Saudi Arabia. And while those recipients claim that the money comes with no strings attached, we know too well that the donations have led to implicit agreements that the research groups would refrain from working against the interests of the donor governments. Which is why I cherish the opportunity to be here today and present to you a vision by which market forces can turn oil from the world's most strategic commodity into just another commodity – like salt.