Statement before the Senate Committee on Energy and Natural Resources

"CURRENT AND NEAR-TERM GASOLINE PRICES"

A Statement by

Frank A. Verrastro

Senior Vice President, & Director, Energy and National Security Program
Center for Strategic and International Studies (CSIS)

March 29, 2012

366 Dirksen Senate Office Building

Statement by Frank A. Verrastro
Senior Vice President and Program Director
Energy & National Security
Center for Strategic and International Studies

Current and Near Term Price Expectations and Trends In Oil Markets

Senate Energy and Natural Resources Committee Hearing
March 29, 2012

Chairman Bingaman, Senator Murkowski, Members of the Committee, thank you for the opportunity to appear before this Committee to discuss changes in the crude oil market and the outlook for gasoline and other refined petroleum products. The rapid rise in gas prices has become a staple on the evening news, is understandably painful for American consumers and adds another challenge to the economic recovery. So I commend the committee for holding today's hearing.

I currently serve as Senior Vice President and Director of the Energy & National Security Program at CSIS. The Center is a bipartisan/non-partisan think tank here in Washington that focuses on clarifying issues and developing solutions. I have been affiliated with the Center since 2003, but my energy roots go much deeper. In the 1970's I served briefly in the Oil and Gas Office of the U.S. Department of the Interior as well as in the Federal Energy Administration. In the Carter Administration, I was privileged to serve in the White House Office of Policy and Planning under Dr. James Schlesinger and later at the newly created U.S. Department of Energy, where I held a variety of policy positions, including serving as Deputy Assistant Secretary for International Energy Resources. The bulk of my career, however, was spent in the private sector, first with TOSCO Corporation as Director of Refinery Policy and Crude Oil Planning, and later for a 20 year run with Pennzoil Company as a Senior Vice President.

I also had the pleasure of working with my fellow panelist this morning, Dan Yergin, on the 2007 National Petroleum Council (NPC) "Hard Truths" report, where I chaired the Geopolitics and Policy Task Group. I would point out that the NPC effort, which, recognizing the expected growth in global energy demand, called for an "all of the above" approach to energy policy. I also served on the recently completed (2011) NPC report on the Prudent Development of North America's Oil and Gas Resources.

So I come at this issue from a decidedly industry perspective cognizant of the economic, environmental, and policy implications of what I would characterize as a changing energy landscape – even as we sit here today.

Given the expertise on this panel, instead of repeating what I expect many of my colleagues will describe in today's gasoline market, let me instead highlight a few major themes, and in the process dispel some myths. I have attached a series of charts to my testimony and will refer to them during this presentation to illustrate some key points.

Crude Oil Market Activity – Demand Growth, Supply Uncertainty, Iran Sanctions and Fukushima Support a Bullish View

With respect to the current oil market, it is instructive to roll back several months to get some perspective on the near term future (Figure 1).

After last year's Arab Spring (though the situation remains quite fluid from country to country) – the riots in Egypt, clashes in Bahrain, Syria and Iran, and the unrest and conflict in Libya, crude oil prices essentially settled into a narrow band for the last half of 2011 – largely as a consequence of counterbalancing signals of fears of weaker economic growth and the Euro crisis (impacting demand) on one hand and real and perceived stress on the supply side.

At the beginning of the year, however, this all began to change. On December 30, 2011 the price for Brent Crude was a few cents above $108/barrel; by the middle of February, it had risen to $118/barrel, topping out (at least for now) at $128.08 on March 9. Economic improvement in the U.S. and elsewhere as well as weather related events contributed to this bullish sentiment. But concerns about supply stability were also readily apparent, and Iranian threats to close the Strait of Hormuz added to that mix. Given the upside potential, commodity investments in oil also increased, not unlike what occurred in the price run up we saw in 2007-08 (Figure 2).

Bottom line is that, at least for the near term, the current "psychology" of the market is supportive of keeping oil prices elevated. Demand growth is still forecasted as we move through the year. And potential and real disruption threats abound with ongoing supply reductions in South Sudan, Yemen, Canada, China, Syria, the North Sea, and Nigeria (collectively removing almost 800,000 barrels per day from the market) and potential shortfalls in such places as Brazil and Iraq even as we see increased output from the U.S. and Saudi Arabia.

In addition, in the aftermath of Fukushima, Japan's inability to restart their nuclear reactors (53 of the country's 54 reactors are currently shut down) has resulted in increased demand for oil as well as for liquefied natural gas (LNG). And the projected removal of several hundred thousand barrels per day of Iranian output as a consequence of sanctions activity will put added stress on available global supplies. Iran is reported to have 5-6 VLCCs currently

being utilized as floating storage facilities. But at some point, a reduction in sales will effectively force a scale back in production as there will be simply no place to put the excess oil.

In such a market, even "good news," like Saudi Arabia's offer to increase output to ensure that the market is balanced, has been met with either skepticism concerning the country's ability to deliver those barrels or the recognition that additional Saudi production will effectively remove the bulk of the world's available spare capacity "cushion", leaving price, near term increases by Libya and use of strategic stocks as the only weapons available to dampen (even temporarily) further upward movements in the event of an additional, unanticipated disruptions. Not a comforting thought.

One glimmer of hope here is that if the Iranian confrontation can be peacefully diffused, we could find ourselves with (at least temporarily) an oversupply of oil in the market - possibly, enough to temper the current bullish sentiment before doing economic damage.

Gasoline and U.S. Refinery Closures – More an Issue of Delivery Logistics and Timing

Gasoline prices also began a similar but not identical ascent early in the year, rising from $3.25/gallon at the end of 2011 to $3.35/gallon by mid-January; then beginning a steeper climb, rising to $3.70 by the end of February and $3.87 as of Tuesday of this week.

As the raw material feedstock is the largest component of gasoline prices, the increase in crude prices is reflected in the run up, but concerns about availability given the refinery closures on the east coast and elsewhere were also factors.

Memorial Day is traditionally viewed as the onset of the "driving season" in the U.S. and in anticipation of increased demand, refineries begin gearing up for increased gasoline output in the spring as they come out of seasonal turnaround. The closure of Conoco's Trainer refinery and the Sunoco plant at Marcus Hook, PA means that come this summer, operational refining capacity in PADD I will have been reduced from 1.5 to roughly 1.1mmb/d (this is on top of the closure of Sunoco's 140,000b/d Eagle Point Refinery in New Jersey and Western Refining's 128,000b/d facility in Yorktown, Virginia last year). If/when Sunoco's Philadelphia refinery is closed, the capacity in PADD I will be reduced to around 700mb/d (half its former capacity). Add to that the surprise announcement to shutter the Hovensa refinery in St. Croix, and the availability of gasoline to parts of the east coast, from Florida to Ohio, will undoubtedly be impacted.

Given time, imports (product imports from Europe, the Middle East and Asia) or shipments from the U.S. Gulf coast will eventually close the gap, but prices (given transport costs) are likely to be higher until logistical alternatives (e.g., expansion of Colonial and regional pipeline systems) become available. Sunoco is likely to continue to keep its regional contract customers supplied with alternative volumes, but some spot purchasers may not have the same coverage. Shipments from the Gulf (PADD 3) are an option, but delivery will be influenced by the availability of Jones Act vessels (or waivers of the Jones Act), docking and storage facilities and regional/local pipeline capacity. Trucking deliveries from New York Harbor or other areas is

also a near term, albeit higher cost option, and may require waivers on driver hours. Logistical delivery shifts from crude to refined product shipments will require cleaning crude tanks and pipes in Philadelphia and elsewhere.

The "good news" is that, absent a massive global disruption or market tightening beyond what we foresee today, if history is any guide, U.S. gasoline prices also tend to decline after July (Figure 3).

So What Can be Done?

Unfortunately for consumers, little can be done in the near term. In a free market system, price is the final allocator of scarce resources.

There are, however, measures that can be taken to mitigate some of these impacts - several of which Members of this committee have already offered.

Accelerating the permitting and construction of storage and pipeline connectors or water borne infrastructure would be helpful as would looking at EPA and state waivers on fuel specifications to allow for greater substitutability of available gasoline in the system. To the extent that waivers of Jones Act requirements would facilitate more timely and larger volume movement of gasoline supplies between states and PADD districts, efforts should be made to eliminate such barriers. Department of Transportation (DOT) waivers on the hours driven by tank truck drivers could also be helpful to ensure the timely delivery of supplies to selected regional markets. The use of the Strategic Petroleum Reserve has also been suggested, but this too requires movement of refined product from PADD 3 refineries to east coast consumers.

In the long term, the President's goal of doubling fuel economy standards and increasing fuel choices makes eminent good sense. Doubling CAFÉ standards makes $4 gasoline feel like $2 gasoline to consumers. In addition, prudently developing America's vast energy resources (addressed in greater detail later in this statement) as well as the processing and delivery infrastructure needed to move it to market is also imperative.

The Commodity Futures Trading Commission (CFTC) and the Energy Information Administration (EIA) are currently evaluating the role of investors in market movements and an examination/explanation of the difference between gasoline costs (crude oil, refining, transport costs plus federal, state and local taxes) and retail pump prices (which reflect local competition, station lease costs and advertising, fill up days and discount policies, branded or unbranded supplies and profits, etc.) could also be instructive.

But, all that said, there is no immediate silver bullet here.

Oil Price Mythology

Claims by certain advocacy groups and political factions that merely announcing the intention to increase access or production of oil as a way of driving down prices are unproven at best, as they have never produced, on their own, any meaningful price impact. Claims that oil

prices plunged simply because President Bush on July 14, 2008 announced removing the moratorium on offshore development are, at best, half- truths without proper context. In point of fact, oil prices began their free fall well before the President's announcement (and continued long afterward) as a consequence of economic collapse and oversupply. 2008 oil prices peaked above at $145 on July 4th and continued their decline through the summer and fall, reaching $ 37.04/barrel on December 5, 2008.

In a similar vein, arguments that gas prices would be lower today if only the offshore moratorium had not been imposed after the Macondo accident, are also not persuasive. The addition of an incremental 250,000 or 300,000b/d, while helpful, is of little consequence in an 89 million barrel a day world. This is not to say that additional production volumes (from anywhere in the world) are not welcomed supplements as they add to global supply, but merely to suggest that volumes and context matter. Only last week, Saudi Minister Ali al-Naimi offered to increase the Kingdom's output by 2 million barrels per day over the next several months. Prices dropped by $2.48/barrel the next day, but then recovered before the week was out.

A recent statistical analysis conducted by the Associated Press covering 36 years found no statistical correlation between marginally higher U.S. domestic oil output and (monthly inflation adjusted) gasoline prices. The fact is that oil is a global commodity and U.S. production has only a limited impact on worldwide supply/demand balances.

"Excessive" regulation is often cited as a cause of reduced E&P activity, yet a recent report by PFC Energy points out that industry is coming back to America to invest. Partly due, no doubt, to the attractive resource prospects, but also as a result of America's legal and regulatory structure, improved economics, clean air and water, good schools, safe food, and quality of life. Moderation may be a useful concept here as both lax regulation and strangling overregulation have associated risks and costs.

For most Americans the focus of energy policy right now is all about gasoline prices. Critics of the administration are quick to point out that when President Obama took office in January of 2009, gas prices were around $1.90/gallon. They conveniently fail to mention that the U.S. economy was in a virtual depression. For purposes of comparison, when President Bush took office in January of 2001, gasoline sold for an average of $1.55/gallon. In the summer of 2008, his last year in office, prices exceeded $4.25. The reality is that presidents have very little to do with near term fluctuations in gasoline prices.

The Changing Landscape – Opportunities and Challenges; Using the Unconventionals to Build a New Energy Future

The energy landscape continues to change. As the world's population grows, so too will the demand for energy. Oil demand growth earlier this century (2002-2007) had effectively eroded existing spare capacity, creating persistently tighter markets in which any geopolitical or weather related supply disruptions often resulted in exaggerated spikes in commodity prices. This picture was further complicated by infrastructure and capability limitations, heightened geopolitical and investment risks, volatile costs and prices and a growing concern about the

environmental and security implications of the continued use of fossil fuels. At the same time, the emergence of new global players with increasingly larger energy and geopolitical footprints posed new threats to the ability of the U.S. to shape the global energy system of the future. In short, a new consensus was emerging that the time had come to fundamentally reform the system and develop new technologies, policies and strategies to simultaneously address the economic, environmental and foreign policy /security challenges related to the ways in which nations produce, transport and consume energy.

Most analyst agree that for a variety of reasons (e.g., growing global demand, concentration of resources, limited access and governance challenges, infrastructure needs, balance of payments outflows, changing geopolitical alliances, environmental and security considerations, etc.) the current energy system is simply unsustainable. A transformation is already underway. But make no mistake - it will take decades to complete.

For the last forty years, U.S. energy policy has been predicated on the dual notions of growing demand and resource scarcity, especially in relation to oil and natural gas – which are responsible for roughly two-thirds of U.S. energy consumption. As a consequence, we have looked to imports to balance our supply-demand needs, and in the process, have experienced periods of significant price volatility. But that trajectory is changing.

Fossil fuels (coal, oil and natural gas) account for more than 80 percent of global energy consumption. Renewables and nuclear make up the rest. And while the growth in solar and wind has been enormous, the base is small, and intermittency and infrastructure challenges remain a significant hurdle to widespread adoption. In the wake of the Macondo oil spill in 2010, the Fukushima nuclear incident in 2011, and the shale gas “revolution,” the energy landscape is being transformed. Higher prices and technology applications at scale are driving an unconventional resource revolution as there are enormous unconventional oil and gas resources both here and abroad.

This phenomenon has the potential for creating a new energy reality, one in which the United States once again becomes a global leader in oil and gas production. Coupled with efficiency improvements and alternative supplements, this revolution can substantially reduce U.S. oil imports, achieving a significant reduction in our balance of payments. It can also simultaneously create an engine for economic growth, a platform for technology and innovation, job creation, new tax and royalty revenues, and the revitalization of domestic industries. But the development must be managed prudently and responsibly, in line with balancing our environmental, economic, foreign policy and energy security goals..

If properly and prudently managed, the successful development of these resources will give us the “breathing space” to develop and dispatch the next generation of cleaner burning/lower carbon fuels that currently do not exist at scale.

The Shale Gas Experience

The growth of shale gas production in the U.S over the past decade has been truly remarkable. As a consequence of access (mostly on private lands), higher prices (2007-8) and the application of hydraulic fracturing (fracking) technology and extended reach lateral wells, the ability to economically unlock this vast "source rock" resource has elevated the United States to the position of the world's largest natural gas producer. This is an astounding accomplishment, as only a few years ago it was projected that the U.S would become increasingly dependent on pipeline gas from Canada and imports of LNG from around the world.

Less than a decade ago, shale gas comprised less than 2 % of domestic output. Today it accounts for almost a third. The enormous success in shale development has resulted in significantly lower prices, reduced consumers' electric bills and stimulated discussion about exports and the revival of a competitive domestic petrochemical industry (Figure 4: Map of Shale Gas Resources).

The 2011 report by the NPC projects a possible resource base of several thousand trillion cubic feet (TCF), suggesting more than a hundred years supply at current consumption rates. As we continue to learn more about the shale resource plays, more recent supply forecasts have become even more bullish.

That said, as with all energy sources, there continue to be operational risks and consequences. The practice of fracking is not without controversy. Environmental concerns about water contamination, water use at scale, recycling and proper disposal, land use, property values, noise, haze, methane and GHG emissions, seismicity concerns around wastewater disposal, congestion and other local issues will have to be responsibly addressed. However, technology, well integrity, operational "best practices" and community engagement, coupled with proper regulation and enforcement should make realization of the benefits of this resource achievable.

Tight Oil

The application of lateral wells and fracking technology has had a similar impact on tight oil and shale oil development. Development of the Bakken has catapulted North Dakota past California as the nation's third largest oil producing state, and similar development is also taking place in the Niobrara, the Monterey, the Utica, Eagle Ford and other basins around the country (Figure 5: Domestic Unconventional Oil Resources).

At the turn of the century, U.S. tight oil production was around 150,000 barrels per day (b/d). Last year it approached nearly 1 million b/d. Current projections estimate that it could approach 2.5-3 million b/d (or more) by 2020. When coupled with increased production from the offshore, including the ultradeep water and lower tertiary formations, oil sands (yes, the U.S. has oil sands), shale oil, oil shale, natural gas liquids, conventional onshore production and the Arctic – U.S. liquids production could exceed 12 million b/d, exceeding the current output of Russia and Saudi Arabia (Figure 6: North American Oil Supply Potential).

When alternative fuels and reduced demand due to efficiency improvements (CAFÉ standards) are factored in, U.S. imports (and our oil imports bill) can and will inevitably decline.

Not surprisingly, many of the concerns related to shale gas development are also associated with accessing unconventional oil. As is the case with unconventional gas, industry has committed to step up its game with respect to responsible management of both "above" and "below ground" issues, greater transparency, education and community engagement. Smarter, safer, cleaner is now an operational necessity.

At this writing, U.S oil production is at its highest level since 2003. Natural gas has eclipsed the previous output record set back in 1973. Oil imports comprise less than 49%of total consumption, and refined product exports are averaging almost 3 million barrels per day, giving the domestic refining sector an enormous "value add."

As development continues at scale, new issues will undoubtedly arise – including the build-out of new supporting infrastructure, the role of exports, the timing and sequencing of development initiatives (including in Alaska with respect to the TAPS pipeline), the right mix of federal and state regulation, etc. (Figures 7 & 8:, U.S. Refineries and Infrastructure Issues). However, the prospect of sizable new production opportunities in the U.S. and North America necessitates a re-assessment of our decades old tool kit and a serious policy "rethink" when it comes to mapping out the coming decades.

In formulating the final recommendations for the 2007 NPC "Hard Truths" report, we developed a policy model (Figure 9) that sought to balance and capture the trade offs often found between conflicting/competing foreign policy/security, economic and environmental objectives. The essence of the approach was that we needed to balance rather than subordinate competing interests in order to achieve sustainable growth – as all of these issues and considerations are likely to be with us for decades to come. With the ability to access these new unconventional resources, we may very well be on the verge of an American energy renaissance. And while the indicators are quite positive with respect to resource abundance, we are in the very early stages of the narrative and will collectively (industry and government alike) need to make prudent choices with respect to both policy/regulation and investment to enable this potential to become a reality.

I appreciate the opportunity to elaborate on these issues and look forward to answering any questions.