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Thank you, Chairman Bingaman, Ranking Member Murkowski, and distinguished members of this Committee for the privilege of contributing to your discussion this afternoon. My name is Kevin Book and I am a managing director and energy analyst at ClearView Energy Partners, LLC, a research and consulting firm headquartered here in Washington, D.C. that serves institutional investors and energy sector clients.

A STRATEGY FOR THE FUTURE

The nation's Strategic Petroleum Reserve for oil (SPR) is one of the most valuable insurance policies an industrialized nation can have. More than 700 million barrels of oil contained within the SPR have the potential to reach many of the nation's refineries within days of any disruption of our highly import-dependent oil supply. In light of recent hurricane-related disruptions to the operation of these refineries, it seems prudent to ask whether there might be a mitigation strategy that could ensure similar continuity in refined products supply. Last week, Energy Secretary Steven Chu addressed this very matter. In public comments the Secretary offered at a press conference, he hinted that a products reserve might be no simple task, observing that

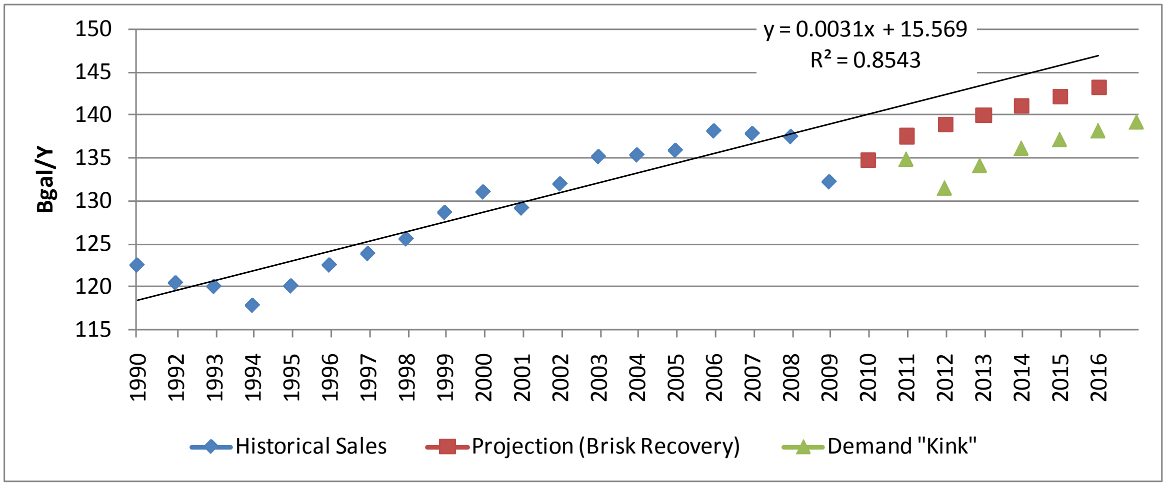
> For example, if a severe hurricane takes out a lot of the oil refining capacity in the United States, there might be a shortage, and I think that's the justification for [a products reserve]. The countervailing argument for that is that it's harder to store [refined products] underground.

I would like to examine several of the challenges to which Energy Secretary Chu alluded and highlight several other potential policy mechanisms that might increase transportation fuels supply security by impacting other links of the refined products value chain.

CHALLENGES

Let me begin by applauding this Committee's foresight in considering the energy challenges our nation may face in the future, even as economic crisis temporarily obscures many of the troubling indicia of scarcity that so recently captured public attention. Many financial investors generate value for their clients in a similar fashion by having the courage to buy when everyone else is selling, secure in the knowledge that business cycles tend to recover from one step back with two steps forward. Figure 1 presents a recent history of US annual demand for motor gasoline and projects two scenarios for the years ahead.

Figure 1 – Gasoline Demand Trends and Projections



Source: ClearView Energy Partners using EIA data

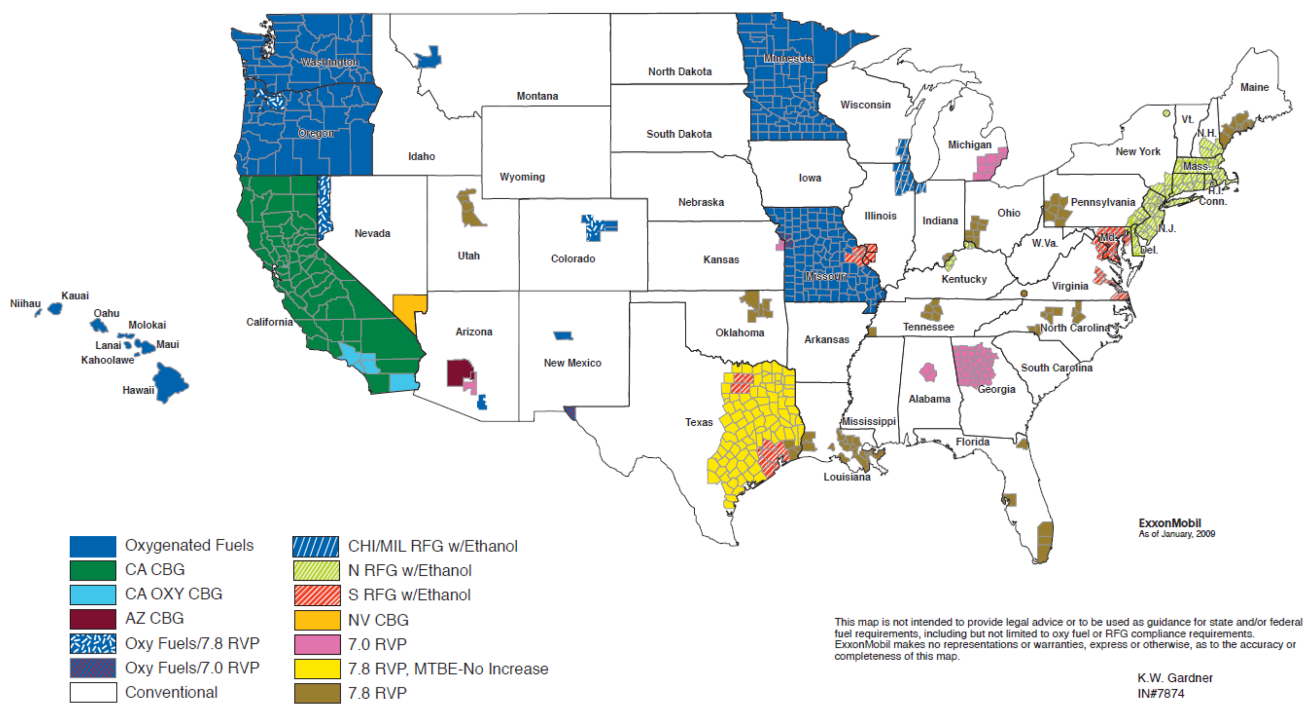
The blue diamonds in Figure 1 reveal last year's dramatic decline in gasoline demand. According to EIA data, sales fell from 137.46 billion gallons in 2007 to 132.22 billion gallons in 2008, probably more a result of consumers' adaptive responses to high prices than any structural change that might have occurred had drivers traded out of low-efficiency cars in favor of higher-fuel-economy vehicles. The red squares chart one possible course of gasoline demand in the unlikely event that a brisk recovery returns American drivers to their old ways. The green triangles present an alternative view of the future, informed by the history of the early 1980s, in which recovery might release pent-up new car demand and consumers' memories of recent price peaks might coincide with the arrival of a higher-efficiency vehicle fleet to dramatically destroy gasoline demand prior to its eventual recovery.

Whether the slope of future demand is shallow or steep, and irrespective of whether pent-up automobile purchases bring a "kink" in the demand curve, it seems a safe bet that broader economic recovery will depend on an uninterrupted supply of affordable transportation fuels. Even so, any policy improving the *status quo* will need to address chemical, practical, logistical and economic challenges.

Chemical challenges. Energy technologies may sometimes be best explained through familiar analogies, so let me offer an oversimplified comparison between crude oil and cereal grains. Most cereal grains, once dried and properly stored, are quite durable. The same is true of crude oil, whether it is stored in an underground salt cavern, in the hull of a tanker or in a commercial storage tank. When the miller grinds grain into flour, he removes many of its natural protective elements and transforms it into an intermediate good that is both more perishable and more useful than its granular precursor. The same is true, though it is a multi-stage process, when refiners manufacture specific fuels out of crude oil and ship them via pipeline, barge and truck to blending terminals. The most perishable link in the grain value chain is the bread the baker bakes, which tends to go stale fairly quickly once exposed to air and water. This, too, is true of finished gasoline, which can go stale over a period of as little as 60-90 days. Evaporation can strip gasoline of its octane-enhancing lighter "ends", oxidative degradation of refined petroleum can create gelatinous clumps that can gum up fuel lines and fuel alcohols can separate from fuel blends or attract water vapor from humid air. As a result, the procurement and storage processes associated with the current SPR may be unsuitable for a strategic refined products reserve. As with baked goods, preservatives added to gasoline could extend its "shelf life" at added cost but, for a variety of practical reasons, the continuous churning of inventory under existing distribution practices may be the cheapest way to keep gasoline fresh.

Practical challenges. The map in Figure 2, available on ExxonMobil's website, offers a perspective on the diversity of gasoline blends required around the nation during the course of a typical year. Even though a consumer buying gasoline at a service station might encounter only three grades of gasoline at the dispenser, many refiners and blenders transport and sell dozens of individual blends in order to conform to environmental regulations stipulating different specifications during winter and summer. Storing all of these blends would require active management of significant inventories, and no single blend might be available in sufficient quantities to meaningfully offset a supply disruption.

Figure 2 – U.S. Gasoline Requirements Reveal a Diversity of Blends and Requirements



Source: ExxonMobil, http://www.mobil.com/USA-English/GFM/Files/US_Gasoline_Map.pdf

This "boutique fuels" problem could be surmounted by establishing a single, "emergency spec" of gasoline, probably at the lowest common environmental denominator to yield the benefits of scale, and on the expectation that an emergency drawdown of strategic reserves would provide sufficient grounds for local or national air quality waivers. Even then, only a continued economic slowdown would be likely to leave refiners with adequate spare capacity to stock this strategic reserve, and increased refining runs in the absence of increasing demand would raise a larger practical consideration: about three-quarters of U.S. refiners' runs are "light" products, but gasoline comprises only about 55-60% of total volumes. In turn, this raises the question of whether the reserve should contain products other than gasoline and, if so, in what proportion? Alternatives to a multi-product reserve might include federal financial incentives to encourage willing refiners to undertake costly reconfigurations that increase gasoline fractions, or the use of federal funds to import refined products from overseas, even though more than 90% of refined products consumed in the U.S. are produced here today.

Logistical challenges. Geographic diversification of a refined products reserve away from the Gulf Coast, although a sensible long-term idea, might come at an impractically high price: the cost of new related and supporting infrastructure. The concentration of refineries on the nation's coasts that exposes our refining infrastructure to hurricane-related disruptions reflects the ship-borne conveyance of crude oil from foreign ports. Likewise, the pipeline infrastructure that transports gasoline and distillate fuels from refineries to intermediate destinations follows a similar geography. The Colonial, Centennial, Explorer and Plantation refined products pipelines, among others, are likely to be the primary transport routes for refined products drawn from a strategic reserve sited in the Gulf Coast, as well. Unfortunately, this does not circumvent a common vulnerability that pipeline pumping equipment shares with refineries themselves: both types of infrastructure require electricity to operate, so pipelines might prove inoperable in the event of a serious disruption, as in the immediate aftermath of hurricanes Katrina and Rita in 2005 and hurricanes Gustav and Ike in 2008, even if strategic reserves were available.

Economic challenges. In many ways, the U.S. refining sector is one of the purest forms of public-private partnership. Unlike the other two of the world's top three oil-producing nations, the U.S. has no national upstream oil company and no national downstream refining and marketing entity. Across the nation, approximately 169,000 gasoline stations and fueling depots operate profitably, locally and virtually continuously to support our way of life and our economy. This would be very difficult to replicate on a national, top-down basis, especially if one hoped to achieve the economical service delivery that results from tremendous competition among a large number individually-vested, private owners.

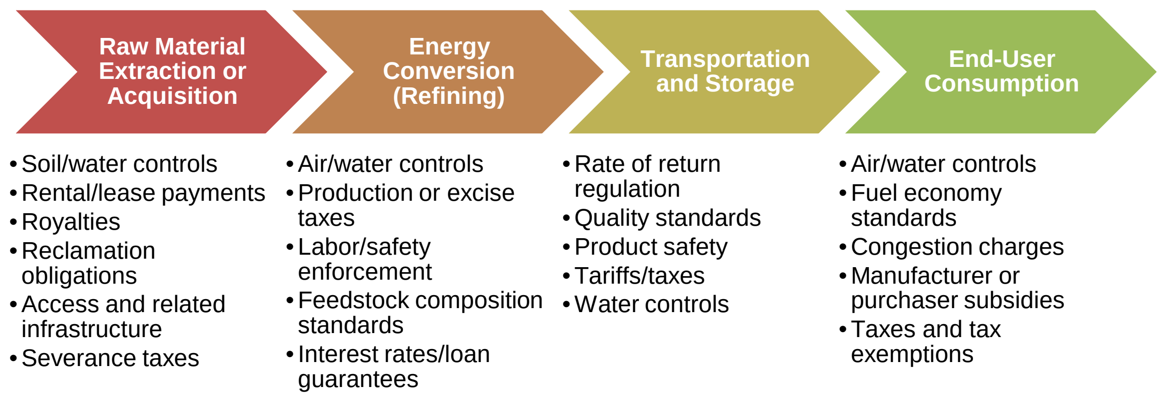
At the same time, buying an expensive commodity to sell a cheap one without any control over either price is not an easy business. As a legacy of decades of closely-regulated divestitures, retailers have little market power. The refiners who supply them must adhere to the above-mentioned framework of environmental standards. Retailers and refiners typically eke out normalized profits in the middle-to-high single-digit percentages and earn their money at the margins, a fraction of a cent at a time. Last but not least, refinery maintenance and expansion are time-consuming and expensive – complexity upgrades and capacity increases typically carry billion-dollar price tags and can require months to years of partial or total downtime – but government policies can change relatively quickly and, as recent experience reveals, demand patterns can shift virtually overnight. These factors add up to the ever-present risk of earning <u>negative</u> refining margins (refined products selling for lower per-barrel prices than the raw materials from which they are made).

Refiners' and retailers' primary consolations are: (a) relatively-inelastic, long-term refined products demand trends; and (b) the fact that, as difficult and expensive as it may be to operate an existing refinery, it is still more difficult and expensive to build and operate a new one. In this context, an autonomous supply of refined products could bring two unintended consequences. First, the unanticipated introduction of new supply into a tight market could undermine industry profitability and, potentially, drive smaller players out of business. Second, the assurance of a federal refined products safety net might lead cash-strapped industry players to consider reducing their working inventories below typical levels to free up capital, potentially negating the benefit of the reserve.

OPPORTUNITIES

Figure 3, below, offers an oversimplified model of the refined products sector as a value chain that has four links: (1) raw material extraction or acquisition; (2) energy conversion (refining); (3) transportation and storage; and (4) end-user consumption.

Figure 3 – Refined Products Value Chain and Potential Policy Tools



Source: ClearView Energy Partners, LLC

The downside of oversimplifying, of course, is that each of these little boxes represents far more than meets the eye. Crude oil extraction or acquisition is a topic as vast as the global economy. Energy conversion encapsulates 150 years of technologies for transforming crude oils into useful products. Transportation and storage refers to thousands of miles of pipeline and hundreds of thousands of dispensers, storage tanks and blending terminals of different sizes and descriptions. And the consumption "fleet" includes 240 million light-duty vehicles and 110 million households that can be influenced by policy actions and financial incentives.

The scale of the real world behind our four-stage model has an upside: each link of the value chain offers significant policy opportunities towards greater refined products supply security.

Raw material extraction/acquisition. Increased domestic crude oil production offers the most direct route to supply security (particularly as demand contraction may swiftly reverse when the global economy recovers), but other policy options include:

- **Biofuels.** The creation of the renewable fuels standard (RFS) by the Energy Policy Act of 2005 may well have prevented a catastrophic light products shortage when global crude oil demand peaked during the second quarter of last year.
- **"Souring up".** Another factor preventing a gasoline shock last summer may have been the ongoing modification of refineries to make use of heavy, sour, unconventional oils like those produced from oil sands in Alberta and Saskatchewan, a lower-cost source of expanded capacity.
- **Further feedstock diversification** efforts could include environmentally-responsible biomass and coal conversion into distillate fuels and gasoline through the Fischer-Tropsch process; electrification of passenger vehicles within urban areas for short distance travel and encouraging natural gas as a fuel for fleet vehicles.

Energy conversion (refining). Policies that stimulate the economic expansion of existing refinery capacity and increase (or maintain) the operating margins of existing facilities may offer a way to promote a "working reserve" instead of a fuel storage facility sited in one or several physical locations. Deterrents to new capacity include:

- **Administrative and construction-related delays,** which can rapidly erode project profitability for most types of energy infrastructure, and discourage projects on new sites;
- **Air quality restrictions** that limit the ability of existing refiners to profitably expand or upgrade their facilities; and
- **New surcharges** for carbon dioxide and other greenhouse gas emissions, which may further diminish economic incentives for expansion and new facility construction unless refiners receive emissions allowances in proportion to expected future costs.

Transportation and storage. The nation's blenders and refiners seek to operate at economically efficient inventory levels. On the other hand, building parallel transportation and storage infrastructure makes little more sense than building a parallel refining industry does, and for the same reason: its prohibitive cost. Tax policies may offer the potential to augment the productive capacity of existing infrastructure by encouraging larger working inventories of finished products at intermediate locations closer to end-users.

End-user consumption policies that discourage excessive demand, encourage the production and diffusion of greater energy efficiency technologies and transform energy use patterns by enabling better short-, medium- and long-term planning can also serve to buffer the impact of supply disruptions by reducing the economic reach of any shortfall. Inasmuch as this topic encompasses everything from public awareness strategies to industrial policy to urban planning, I will not attempt to treat it here, except to suggest that it might provide richer and more self-reinforcing mechanisms for improving supply security than a physical refined products reserve.

Mr. Chairman, this concludes my prepared testimony. I will look forward to any questions at the appropriate time.