Oil Above All
or
All of The Above?

A Super–Secure Energy Vehicle
To Address
Our Most Immediate And Enduring
Energy Threat

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WHY I WANTED TO GIVE THIS PRESENTATION AT HOCKING COLLEGE:

- Hocking College Energy Institute is here.
- Ohio has an "all of the above" energy mix.
- It’s the home state of the Speaker of the House of Representatives.
  It’s the swingin’est swing state of them all in the race for the presidency.
- Logan was on my "gas-way" to Oklahoma from Washington, D.C.
We’ve Had A “One Of The Above” Transportation Energy Policy for the Past Century

“Oil feeds my family and pays my taxes”

...precipitates wars, pollutes the air, land and water

...and comprises the largest % of the cost of gasoline
The “National Interest” Debate over the XL Pipeline has been a national distraction because our most immediate and enduring energy threat has not been defined.

- President Obama failed to do it in Cushing, Oklahoma.
- Candidate Romney failed to do it in Zanesville, Ohio.
- The oil industry has failed to do it in its advertising campaigns.
- Too many environmentalists are blind to it, and are “letting the perfect be the enemy of the good.”
“U.S. drivers slow to embrace all-electric vehicles”

“All-electric vehicles that you plug-in overnight are a tough sell with drivers afraid of becoming stranded with few charging stations in operation across the nation. Consumers want hybrids that combine gas with battery power, such as the Toyota Prius, or that plug in but have a backup gas tank, such as the Chevrolet Volt.” Detroit Free Press

“Toyota to cut back on electrics, double down on hybrids”

“Toyota, which two years ago confidently predicted it would be selling thousands of EVs, has reversed course, with a senior executive saying ‘the current capabilities of electric vehicles do not meet society’s needs, whether it may be the distance the cars can run, or the costs, or how long it takes to charge’” The Washington Examiner
Would achieving North American Oil Independence be in the greatest “National Interest”? 

- In 2011, almost 72% of the petroleum (crude oil and petroleum products) consumed in the United States came from North American sources, i.e., from the United States (55%), Canada (13%) and Mexico (3.6%), and that percentage will increase for 2012.

- Nonetheless, 2012 will set a yearly gasoline price average higher than ever before.

- North American Oil Independence relies on “unconventional” and “deep and high” oil, and high oil prices.
Net Imports and Domestic Petroleum as Shares of U.S. Demand, 2011

U.S. Petroleum 55%
Net Imports 45%

Note: U.S. Petroleum includes balancing item.
Source: U.S. Energy Information Administration, Monthly Energy Review, Table 3.3a (March 2012), preliminary data.

Top Sources of Net Crude Oil and Petroleum Product Imports:

Canada = 29%
Saudi Arabia = 14%
Venezuela = 11%
Nigeria = 10%
Mexico = 8%

U.S. = 55% of U.S. demand
Can.+Mex. = 17% of U.S. demand
N. America = 72% of U.S. demand
Positives of XL pipeline may outweigh negatives, but the negatives are huge, primarily environmental

• $50 per barrel: floor price needed for 2000 mile, $7 billion, 1500 p.s.i., 830 thousand b.p.d. pipeline.

• Neither the XL nor any other pipeline will insulate the United States from global oil price fluctuations.

• Best reasons to approve the XL, with strict environmental protections: The world’s best next door neighbor needs a pipeline easement through U.S. for its landlocked oil – oil we may need someday.
What is our most immediate and enduring energy threat?

Ninety-nine percent of the vehicles we drive are still 100% dependent on oil-based fuel, and they waste far more of that fuel than they utilize, and very, very few of us can drive around the block without it, no matter how scarce it becomes or how high its price climbs.

*Addressing that threat would truly be in the greatest National Interest.*
Motorist Elisabeth Chavarria fills her gas tank with only six dollars’ worth of gas Friday, Oct. 5, 2012, in Calabasas, California. It was just enough to get her home. (USA Today)

(AP Photo/Damian Dovarganes)
What types of Secure Energy ("SE") are available today?

**Type 1:** Electricity generated by regenerative braking: It recaptures the huge amount of energy (about 80%) the average vehicle gives up in the form of waste heat, much of it while braking. Only vehicles equipped with regenerative braking systems, i.e. hybrid, plug-in hybrid and pure electric drive vehicles can utilize this ultra-SE, turn it into electricity, store it in a battery and use it later for drive-train power. **This is the most secure form of SE available.**

**Type 2:** Electricity generated by solar systems and wind turbine generators. Plug-in hybrid and pure electric drive vehicles are the only vehicles on the road that can use this type of SE.

**Type 3:** Electricity generated by natural gas, coal-fired and nuclear power plants. Plug-in hybrid and pure electric drive vehicles are the only vehicles on the road that can use this type of SE.
What types of Secure Energy (“SE”) are available today? (cont.)

**Type 4:** On-board compressed methane gas (“CMG”). Conventional, hybrid or plug-in hybrid vehicles can be designed or converted to use this type of SE, either as a stand-alone fuel or as an additional fuel for “bi-fuel” vehicles that can use either CMG or gasoline.

**Not SE:** Gasohol. Conventional, hybrid and plug-in hybrid vehicles can all run on gasohol. However, each gallon is 85 to 90 percent gasoline, too much to qualify as SE.

**Not SE:** Gasoline (or diesel). Conventional, hybrid and plug-in hybrid vehicles can all run on gasoline. It is obviously not SE, but in the near term most SEVs and SSEVs will have to use it, in addition to the types of SE described above, for most uninterrupted long-distance trips — until either electric vehicle battery range and/or CMG availability greatly increases.

*Only SSEVs use all of the above.*
Secure Energy Vehicle ("SEV")

• Continually utilizes the cheapest and most secure form of SE available, i.e., Type 1

• Capable of using only SE (any type) for at least the length of the average uninterrupted vehicle trip (12.5 miles)

• Capable of making a non-stop trip of at least 50 miles.

• Examples: Nissan Leaf, Toyota Plug-In hybrid Prius, Chevrolet Volt, Ford Focus Electric, Ford C-Max Energi plug-in hybrid, Honda Fit EV, Tesla Model S, Honda Civic Natural Gas
Super-Secure Energy Vehicle ("SSEV")

- Continuously utilizes the cheapest and most secure form of vehicular energy available, i.e., Type 1

- Capable of using only secure energy ("SE") for at least ten times the length of the average uninterrupted vehicle trip (125 miles)

- Capable of making a non-stop trip of at least 300 miles.

- Capable of being refueled/recharged with secure energy in 10 minutes or less

- Affordable, i.e., under $30,000 (?)

- Example: SSEV-1 demonstrator
Basic Description of SSEV–1 Demonstrator

- Vehicle Platform: 2005 Toyota Prius Hybrid
- Plug-in conversion: 2kWh battery pack added
- CMG conversion: 2.5 GGE Type 3 tank added
- Bi-fuel (CMG or gasoline) capability included
- Total Cost: $20,000 -- $9,000 for used 2005 vehicle and $11,000 for conversions
Performance Characteristics of SSEV–1 Demonstrator

- 53 mpg, 50 mpGGE highway driving
- 10+ miles on battery power at speeds under 35 mph, or 75 mpg for 18 miles (blended)
- 120+ miles on CMG at normal speeds
- 500+ miles on gasoline at normal speeds
- 630+ miles non-stop with everything full
Advantages of SSEV–1 over contemporary SEVs

- Eliminates range anxiety
- Eliminates recharge–time concerns
- Greatly increases consumer choice
- Increases competition between gasoline, CMG and electricity suppliers
Advantages of SSEV–1 over other SEVs (cont.)

- Enables “all of the above” national energy strategy
- Keeps the door open for many types of renewables, including biofuels and biogas
- *Directly addresses our most immediate and enduring energy threat*
•“Energy security is almost entirely a function of the importance of oil consumption in the domestic economy and is not related to the original source of that oil.”

•“American consumers and businesses, and the economy are fully exposed to oil prices with practically no means to choose less costly alternatives in the short term.”

•“Self-sufficiency in supply will not shield U.S. consumers from price volatility.”

•“Rising oil production will not mitigate the foreign and military challenges of U.S. oil dependence.”

•“Vehicle fuel–economy standards are the most important energy security accomplishment in decades—they must be supported and continuously improved.”

•“Fuel efficiency is not enough on its own. The long-term goal of energy security policy must be to break petroleum’s stranglehold on the transportation sector.”

http://www.secureenergy.org/policy/new-american-oil-boom
The New American Oil Boom – SAFE, May, 2012
Neighborhood Youth Point To Transportation Energy Solutions