



Numbers and the State of the Union Energy segment

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The President's State of the Union message divided his energy initiative into two parts. The first deals with the stability of the supply of energy to the electric grid, and the second dealt with fuels for transportation. Both are fossil fuel dependent, but it is in transportation that the dependance on foreign oil is most critical. Let's unpack them under the fold.

The replacement of oil and gas power sources for electricity will be from an increased investment in "zero-emission coal-fired plants; revolutionary solar and wind technologies; and clean, safe nuclear energy". The funding here does not look for any major breakthroughs. The specific allocations for electric power are:

Coal. \$281 million to develop clean coal technologies "to generate electricity while meeting environmental regulations at low cost." And \$54 million for a "FutureGen" project with the private sector to seek "an emissions-free coal plant that captures the carbon dioxide it produces and stores it in deep geologic formations."

Solar power. \$148 million, more than double what was sought in 2006, "to accelerate the development of semiconductor materials that convert sunlight directly to electricity."

Wind power. \$44 million for wind energy research -- a \$5 million increase over Bush's 2006 request.

I will probably have more to say about coal this weekend (grin). In terms of automobile fuel, the change in power source is anticipated to come from "better batteries for hybrid and electric cars and in pollution-free cars that run on hydrogen. We will also fund additional research in cutting-edge methods of producing ethanol, not just from corn but from wood chips and stalks or switch grass. Our goal is to make this new kind of ethanol practical and competitive within six years." Specific funding allocations are:

Ethanol. \$150 million, a \$59 million increase over 2006, to find a more efficient way to make ethanol, the gasoline alternative now made primarily from corn in the United States. The focus is to use plant fiber from farms that is currently discarded as waste. "Research scientists say that accelerating research into "cellulosic ethanol" can make it cost-competitive by 2012, offering the potential to displace up to 30 percent of the nation's current fuel use," the White House said.

Plug-in hybrids. \$30 million, a \$7 million increase over 2006, to develop higher capacity batteries for hybrids as well as "plug-in" hybrids that would allow drivers to charge vehicles and run on electric power only. "These vehicles will enable drivers to meet most of their urban commuting needs with virtually no gasoline use," the White House said.

Hydrogen. \$289 million, a \$53 million increase over 2006, to develop fuel cell vehicles

that run on hydrogen "with no pollution or greenhouse gases." Bush in 2003 launched a \$1.2 billion hydrogen initiative and the White House said that "through the president's program, the cost of a hydrogen fuel cell has been cut by more than 50 percent in just four years."

In terms of original fuel source, neither improving battery life, nor building a hydrogen economy really provides an answer to a diminishing fuel supply. In that regard, only the ethanol initiative can be considered a step toward an answer. And in that regard there is already a small red flag waving in [Thailand](#). (thanks to [Energy Bulletin](#)). Basically because the rising price of oil was creating problems for the economy, the Thai government had encouraged the use of ethanol as an extender in gas to make gasahol. The Thai use sugar cane, molasses and cassava as the feed stock, and such has been demand, that domestic supplies cannot keep up, and there is competition between the food use and the fuel one. The shortage has led to the closure of 3 ethanol plants and the delay in construction of 18 more. Further the problem is not confined just to the ethanol source.

Meanwhile, the outlook for biodiesel, liquefied petroleum gas (LPG) and natural gas for vehicles (NGV) is similar. Chumnong said the problem with LPG was that demand was climbing rapidly due to government subsidies. More and more private vehicles and taxis are switching to this cheaper fuel, which should be used only as cooking gas. "I don't know how long the government can continue subsidising it for motorists. Last year we spent tens of billions of baht subsidising diesel prices," he said. Biodiesel-producers also lack sufficient raw materials, especially palm oil, to keep up with high consumption growth, and the price is also scarcely competitive. NGV is probably the best choice, but the cost of infrastructure and vehicle modification is very high, he said. "A biofuel alternative is a good idea, but it's hard to implement it efficiently. It needs sound planning and political will," he said.

For the United States the primary current source of ethanol is from corn, and, for example in Missouri, a corn-growing state, there is a move to [mandate](#) that all gasoline sold in the state should include 10% ethanol. Missouri has 3 plants in production (at about 0.5 million barrels per year each), a fourth in construction and a fifth in planning. (It takes 17 million bushels of corn to give slightly more than 1 million barrels of ethanol, but you can't do an energy balance on that since the process also generates 134,000 tons of distillers grain, which is a high protein animal feed.) Overall the plants will produce around 6 million barrels per year and require just about 25% of the Missouri corn crop to [supply that need](#).

This conflict between food and fuel, already highlighted in Thailand, and present at a low level with the use of corn in corn stoves, could, as the fuel supply changes, have a similar competitive effect in America. Thus, it is important to change the source of fuel from just the corn itself, to being able to also use the rest of the plant. Cellulosic ethanol requires microbes to break down the fibers of the plant, but since the corn has other uses, its cost can be considerably less than the original process. (The [Washington Monthly](#) has an article that describes the process.)

Taken all together the goal is to replace 75% of the oil that we get from the Middle East by 2025. The date resonates with the projections of the Hirsch report that it will take 20-years to allow a seamless transition, but that relies on a timely start before the shortfall begins to occur. Given that the US currently gets around 20% of its imports from the Middle East, and it imports [12.1 mbd](#) this equates to a target replacement of 1.8 mbd. When one looks at the anticipated shortfalls between supply and demand that have been projected on these pages, as elsewhere, then this is

It is also perhaps (in the Holmsian tradition) remarkable that he did not mention Natural Gas at all.



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