

CLEO Consulting Partners

A Constructive Critique of President Obama's Energy and Environmental Agenda

April 2, 2009

On March 31, 2009 the DOE publically released its final 2009 Energy Forecast. This permitted us to complete our company's analysis of President Obama's "New Energy for America Plan." Our report includes a summary of the DOE financial analysis of the economy-wide cap-and-trade program that is being debated this week by Congress. It also includes the summary of the stimulus plan economic analysis prepared by the World Resources Institute in February 2009.

Some highlights:

President Obama has proposed so many new spending and tax programs in such a short time frame that there has been little time to calculate and reflect on the long term consequences of these initiatives. More information has to be provided to Congress and our citizens if he is going to mobilize taxpayer support for his programs.

Over the past thirty years, five administrations have taken an unbalanced, piecemeal approach to energy policy. The green energy aspirations of President Obama are admirable but are as unbalanced, with respect to the overall policy, as those of previous administrations. Now as we restructure the US automobile industry and continue to run a huge balance of payments deficit, it is time for the US to finally develop an economically and environmentally sustainable energy policy for the next forty years.

As turnaround professionals, CLEO Consulting Partners offer suggestions on how to achieve the President's goals while spending less, taxing less, speeding up the transformation process, reducing costs and lessening our risk of default on our Chinese line of credit. We trust that you will find the attached report informative and that it stimulates additional suggestions on improving America's long term energy and environmental policy.

Executive Summary

We tested the reasonableness of achieving the Administration's benchmark goals against the Department of Energy's (DOE) 2009 Energy Forecast which forecasts energy supply, demand and prices through 2030. Our findings related to the Administration's principal goals are as follows:

- **Ending our addiction to foreign oil.** *In 10 years we will use 4% more oil than we do today. By 2030 41% of our oil will still be imported at \$130 per barrel. From 2015 on, annual oil imports will cost in excess of \$1 billion per day in 2007 dollars, the equivalent of 3 Iraq wars without end. The development of domestic oil and gas fields in previously prohibited areas is the only way we are going to begin to close this huge gap in the intermediate term. It can be done without any investment by the government and, at the same time, create tax revenues for local, state and federal governments. In the reference case, gasoline prices in 2030 are forecast to be \$5.63 per gallon in 2007 dollars. In the high cost case, the 2030 price is forecast to be \$7.89 per gallon when crude oil prices are \$200 per barrel. Neither of these gasoline prices takes into account the price increases that will result if the proposed cap-and-trade tax on energy is implemented.*
- **Producing 25% of our electrical energy from renewables by 2025.** *This is not economically feasible. The DOE estimates that renewables will produce only 13.1% of our electricity in 2025. The President speaks highly of the role solar energy is going to play. According to the DOE, by 2030 solar energy is expected to supply just 0.1% of our electric power due to its high cost, even when technology improvements are factored in. Onshore wind power is economically viable; however, the national grid must be expanded to move the*

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energy to market. The DOE currently is targeting 2% from wind in 2025. If this were to be doubled to 4%, then 15% of our energy would be produced from renewables in 2025, not 25%.

- **Implementing an economy-wide cap-and-trade program.** *We are highly skeptical that implementation of the program is consistent with job creation goals. The DOE estimates industrial shipments in 2030, excluding services, will be reduced by \$233 billion to \$589 billion (-2.9% to -7.4%). Also, this program focuses its attention on reducing emissions from the electric power industry and commercial sector, but the DOE concludes that this program does little to change the driving habits of the car driving public who produce 20% of our greenhouse gas emissions. A targeted carbon tax system is a much better alternative to cap-and-trade.*
- **Help create five million new high paying jobs by strategically investing \$150 billion over the next ten years to catalyze private efforts to build a clean energy future.** *We agree with the World Resources Institute analysis of the Stimulus Plan that at this level of investment we should be producing five million new jobs by the end of year ten. However, the Administration provides no estimate of how many jobs are going to be lost across the economy as we move to ever higher energy prices and taxes. The cap-and-trade program, as proposed, will tax industry and consumers approximately \$800 billion over 10 years. Also, if we are creating high paying jobs, then we fail to see why the U.S. venture capital markets will not supply substantially all of the capital required to fund commercially viable technologies.*
- **The Administration has no announced plan to streamline government and environmental review processes that delay private investment in energy.** *An example: If the ANWR project is ever approved, the DOE estimates it will take 10 to 12 years to bring ANWR oil to market. Of that time, 4 to 5 years is devoted to environmental impact statements, leasing and the approval process of a project that has been studied for over twenty years. The DOE has told Congress that three years will be required to get the first exploratory drilling rig on site. This is absurd. All of the oil and gas processing plants and equipment required for Prudhoe Bay were moved to the site in three years. The 1,552-mile ALCAN (Alaska-Canadian) Highway was built in 234 days in 1942. In 1977, the 800-mile Trans Alaskan Pipeline to Prudhoe Bay was completed in 26 months. This is the pipeline that will move ANWR oil to market. The last California offshore oil platform was delayed for twenty-five years by environmental litigation. A streamlined government process for fast-tracking major onshore and offshore energy projects is the change we need in Washington. Americans can accomplish great tasks once the bureaucrats get out of the way.*

We do believe that a more balanced approach to solving our energy and environmental problems will be far more effective than the New Energy Plan for America recommended by the President. Our report describes our suggestions for improving his plan. In a separate report, we have analyzed and commented on the Pickens Plan to produce more wind energy and to use natural gas to fuel our heavy vehicle fleet.

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By H. Andrew Thornburg, Principal and Founder, CLEO Consulting Partners



ENERGY AND THE ENVIRONMENT

The energy challenges our country faces are severe and have gone unaddressed for far too long. Our addiction to foreign oil doesn't just undermine our national security and wreak havoc on our environment -- it cripples our economy and strains the budgets of working families all across America. President Obama and Vice President Biden have a comprehensive plan to invest in alternative and renewable energy, end our addiction to foreign oil, address the global climate crisis and create millions of new jobs.

The Obama-Biden comprehensive New Energy for America plan will:

- Help create five million new jobs by strategically investing \$150 billion over the next ten years to catalyze private efforts to build a clean energy future.
- Within 10 years save more oil than we currently import from the Middle East and Venezuela combined.
- Put 1 million Plug-In Hybrid cars -- cars that can get up to 150 miles per gallon -- on the road by 2015, cars that we will work to make sure are built here in America.
- Ensure 10 percent of our electricity comes from renewable sources by 2012, and 25 percent by 2025.
- Implement an economy-wide cap-and-trade program to reduce greenhouse gas emissions 80 percent by 2050.

Executive Summary

We tested the reasonableness of achieving the Administration's benchmark goals set forth above against the Department of Energy's (DOE) 2009 Energy Forecast released on March 31, 2009. The DOE report forecasts energy supply, demand and prices through 2030. A summary of this data is included in this report. Our findings related to the Administration's principal goals are as follows:

- **Ending our addiction to foreign oil.** *By 2030 41% of our oil will still be imported. From 2015 on, annual oil imports will cost in excess of \$1 billion per day in 2007 dollars, the equivalent of 3 Iraq wars without end.*
- **Producing 25% of our electrical energy from renewables by 2025.** *This is not economically feasible.*
- **Implementing an economy-wide cap-and-trade program to fund investments in clean energy.** *We are highly skeptical that implementation is consistent with job creation goals. The DOE estimates Industrial shipments in 2030, excluding services, will be reduced by \$233 billion to \$589 billion (-2.9% to -7.4%).*

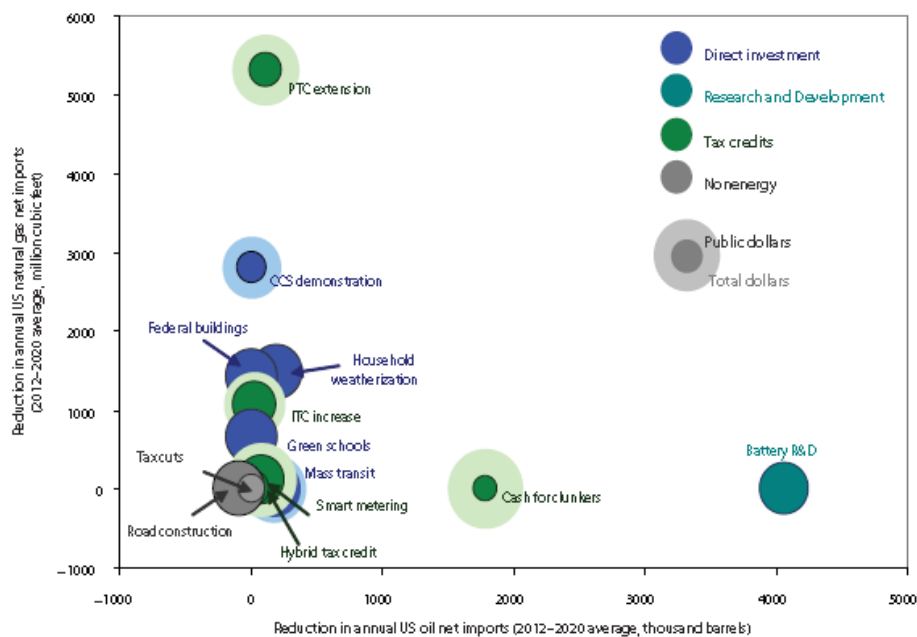
Discussion

President Obama claims that he has a comprehensive plan to end our addiction to foreign oil.

1. According to the DOE, in ten years (2018) we will be using 4% more liquid fuels than we do today, not less. Oil imports for 2009, 2018 and 2030 are forecast to be 10.3, 9.3 and 8.9 million bpd (barrels per day) respectively. Adjusted for price increases, our position will actually be worse in 2030, not better.
2. By 2015 the cost to the US for imports of foreign oil will increase by 85% to approximately \$1 billion per day, or the equivalent of the first TARP funding program every year to 2030 and beyond. This is \$1,200 cost per person per year that must be made up elsewhere. It is in addition to the \$1 trillion per year increase in the annual federal deficit the Congressional Office of the Budget is forecasting based on President Obama's current budget and stimulus package. In 2008 we paid \$321 billion for imported oil and had a \$266 billion trade deficit with China. China will own the US economy if we do not manage our affairs more prudently.
3. In 2018 gasoline is forecast to cost \$4.39 per gallon in 2007 dollars, right back at the crippling price levels of June 2008. In 2030, gasoline is forecast to cost \$5.65 per gallon in 2007 dollars. In the past, the DOE has underestimated energy price increases, therefore higher prices may arrive much sooner than forecast by the DOE. In which case, these high prices could stop our economic recovery and create the stagflation that plagued our economy in the late 1970's.
4. Building 1 million plug-in hybrid cars by 2015, even some that get 150 miles per gallon, is not going to have a significant impact on our imports of foreign oil for decades. This is a woefully inadequate target. We have 238 million light vehicles and 8 million heavy trucks and buses. If we build an average of 15 million cars per year over the seven years ending 2015, we will build 105 million new gasoline powered cars. To completely change to a new technology, such as all electric or hydrogen powered cars, will take at least 25 to 30 years after the first models prove commercially viable. We cannot wait that long. The average mileage of our light vehicle fleet in 2007 was 25.3 mpg down from its peak of 25.9 mpg in 1987, twenty years earlier. The DOE does not expect the US to achieve Europe's current fleet average of 35 mpg until 2020. Each 10 mpg improvement saves approximately 1.1 million barrels per day of imported oil. Europe is way ahead of us because, starting in the early 1990's, they focused on producing modern diesel powered cars which are 20% to 40% more fuel efficient than identical gasoline powered cars and produce 15% less green house gases. In several ECC countries, 70% of new cars are diesel powered. In 2007, only 1.7% of new US light vehicles were diesel powered and they are forecast to have only a 10% market share in 2030. If we want to significantly accelerate improvements in fleet mileage, we should adopt T. Boone Pickens suggestion to convert heavy trucks, which will use 2.76 million bpd oil equivalent in 2018, to run primarily on domestic LNG and, later, bio-gas. For cars we should focus on building hybrid diesel powered vehicles which can take advantage of existing truck diesel fuel refining capacity and distribution systems. These cars can also use bio-diesel fuels. (See the DOE January 2009 Report: Light-Duty Diesel Vehicles: Market Issues and Potential Energy and Emissions Impact).
5. Within 10 years, President Obama claims we will save the equivalent of all the oil we currently import from Venezuela and the Persian Gulf, which in 2007 totaled 3.5 million barrels per day. In fact, the DOE estimates we decrease imports by only 10%, 990,000 barrels per day. All of the "savings" will be due to the increase in domestic fuels production, 28% of which is to come from new corn based ethanol production. Today the ethanol industry is largely in bankruptcy, so 470,000 bpd of the forecast, or 48% of the decrease in imports is in question.

6. The economic stimulus plan, which is separate from the energy plan, will do little to assist the US in reducing oil imports. The World Resources Institute used the DOE 2009 Energy Forecast to benchmark various scenarios for energy savings and job creation expected to result from 12 different initiatives contained in the economic stimulus plan. The results are contained in the February 2009 report “A Green Global Recovery? Assessing US Economic Stimulus and the Prospects for International Coordination.” The only stimulus initiatives that reduce oil imports to any degree are cash for clunkers (48,900 barrels per day per \$10 billion investment) and battery R&D (112,000 barrels per day per \$10 billion investment). Their conclusion: “Even the most aggressive short-term spending will have only a modest impact on US greenhouse gas emissions and dependence on foreign sources of energy.” It also should be noted that the best prospect for reducing oil imports is battery R&D, which as noted earlier, will take more than a decade to have a significant impact on fuel mileage and employment.

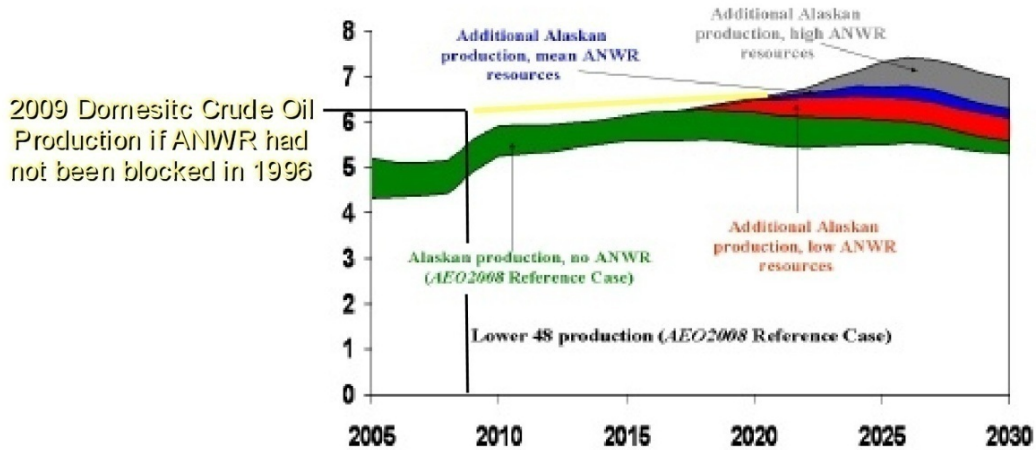
Figure 3 Economic and energy security impact of recovery policy options—reduction in annual oil imports (X-axis), natural gas imports (Y-axis), and job creation (circle size) for every \$1 billion spent



7. President Obama’s plan does not call for increasing production from oil and gas fields in restricted areas onshore or offshore. ANWR, offshore production and Arctic gas fields have the known potential to provide an intermediate term reduction in our balance of payments deficit. We view not tapping these resources as grossly irresponsible given the facts available to the Administration. Had the Clinton/Gore Administration not blocked the ANWR development in 1996, the first oil would have been flowing in 2006 and producing peak oil production would occur in 2015. Domestic production in 2015 would have been as high as 7.5 million bpd vs. 6 million bpd, an increase of 25% at a time when we will be paying \$1 billion per day for imported oil. Had we not blocked offshore exploration in 1982, an even more dramatic improvement in domestic production could be shown. It will be many decades before we can substantially reduce our need for liquid fuels, especially in transportation. Aircraft, trains, buses and heavy trucks, which represent 40% transportation fuel consumption, will probably use liquid fuels into the next century. Our remaining petroleum reserves are limited, thus we can only achieve long term independence from foreign oil by creating liquid fuels from our vast reserves of coal, shale and natural gas, albeit at a higher cost. Much more development is required to produce cellulose bio-mass fuels in

economically significant quantities. Our thirty-year quest to economically produce ethanol from corn has proven to be an economic and environmental failure to everyone but the Congressional representatives of 26 states receiving federal subsidies. Ethanol from corn is a Congressional pork barrel of the first order.

Figure 2. Domestic Crude Oil Production for the AEO2008 Reference Case and the Three ANWR Resource Cases, 2005-2030
(in million barrels per day)



Source: National Energy Modeling System runs - see 2008.d03.0208f, anw2008.d03.1008a, anw2008HEmf.d04.0308c and anw2008LEmf.d04.0308d

8. Those opposed to further development of domestic oil, gas and nuclear often cite that one of their objections is the long time required to complete these projects. They are correct. Environmental lawsuits delayed the installation of the last offshore California oil platform by twenty-five years. In the early 1970's, on the eve of the Arab Oil Embargo, the construction of the Prudhoe Bay field was delayed three years by the argument over caribou crossings and the project's anticipated adverse impact on the herd. In fact, the herd has increased from 3,000 in 1972 to over 30,000 by 2007, see the pictures below.



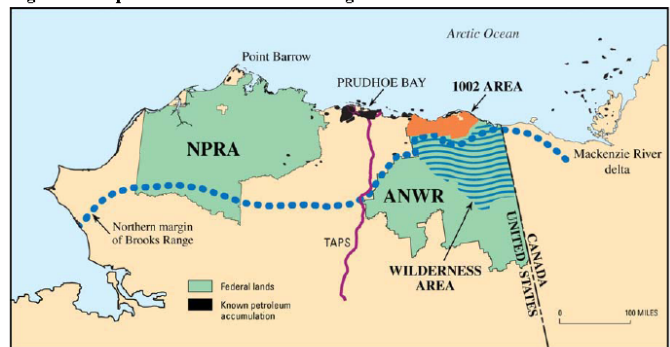
Attempts to build an Arctic gas line to move Prudhoe Bay natural gas to market has been blocked since 1972. All offshore oil and gas exploration, even that required only to determine the extent of our resources, has been blocked since 1982. As a consequence, in a national emergency, a tremendous amount of exploratory drilling would be required before development of any new fields could start. For example, to develop ANWR the DOE estimates that two to three of the ten years estimated development time is devoted to drilling the first exploratory well. We stopped the development of nuclear power plants that were taking 8 to 12 years to build. The French, in contrast, standardized their designs and knocked years off of the time required to bring a plant online. The DOE, in a May 2008 report on the development of ANWR, estimates that it will take 10 to 12 years after Congress authorizes development, provided there is not protracted litigation. Of that time, 4 to 5 years is devoted to

environmental impact statements, leasing and the approval process. This is the typical bureaucratic process for mineral development. We could have this ANWR oil online in 5-7 years if the government would work collaboratively with industry. This is change for the better that could be accomplished at the stroke of the President's pen and without any government investment.

9. We frequently hear the argument from conservationists opposed to new non-renewable development that the US has only 3% of the world's known reserves and thus we should not look to domestic production to solve our imported oil problem. They are correct about our relatively low reserves. They are also intentionally misleading the public and national media about what can be accomplished with the reserves we do have. According to the DOE 2009 Forecast, proven US reserves total 22.3 billion barrels and there are 131.9 billion barrels of unproved but technically recoverable reserves. What is not said is that the DOE is not allowed to report estimates of undiscovered oil and gas in any area where drilling is officially prohibited. Omitted from this total are 26.6 billion barrels of oil estimated by the U.S. Geological Survey in 2007 to be recoverable from the Arctic Offshore Outer Continental Shelf and Alaskan onshore reserves of 30.6 billion barrels, including the ANWR reserves, where drilling is prohibited. When these reserves are included the total unproven reserves are 189.1 billion barrels, or 43% more reserves than the DOE can use for public forecasts. To put the importance of the missing 57.2 billion barrels of Alaskan oil in perspective, the DOE base case estimate for ANWR reserves (1002 Area) are 4.1 billion barrels, 7% of the total. More importantly these areas also contain substantial amounts of unproven reserves of natural gas, which produces far less greenhouse gas emissions. For the diehard conservationists, these are very inconvenient truths.



Figure 1. Map of Northern Alaska Showing ANWR and the Coastal Plain 1002 Area



Source: United States Geological Survey.

If we are to have an informed debate about the options available to eliminate US dependence on foreign oil, all of the facts must be on the table. This includes doing exploratory drilling in heretofore prohibited areas to determine the true extent of our natural resources. Only then can we rationally determine how to supply the country with the energy it needs to assure the economic welfare of our citizens and continue to diminish our adverse impact on the environment.

President Obama wants to ensure 25% of our electricity comes from renewable resources by 2025.

1. Is 25% renewables by 2025 goal anything more than a leftover campaign slogan? Until President Obama issued his agenda, the DOE was planning to have 13.1% of all US electricity produced by renewables by 2025, an increase of 25%. This forecast includes a 350% increase in wind generated electricity over that generated in 2007 to 2% of all electricity generated. Solar is only expected to produce 0.1% of all electricity in 2025 because of its extremely high cost.
2. How realistic is a 25% goal? Electric energy generating capacity is projected to grow by 14% between 2010 and 2025. To achieve the Administration's goal, the only plants that could be built over this entire

period would have to be based on renewable energy. This alone should give the layman pause, given the diversity of climate, sunlight and lack of distribution capacity in the US. If these unidentified renewable plants were built, 5% of existing electric generating capacity would have to be retired. This is a forced retirement of generating capacity that is more economically efficient than the new renewable plants. Thus, the required additions to our electric generating capacity would be 19%, not including the standby power capacity required for solar and wind power which must grow from 1.9% to 14.3% of all installed capacity in just 15 years. Wind energy technology is ready to make an economically significant contribution to the country's energy supply. However, because of the uncertainty of weather conditions, the DOE limits the percent contribution of wind generated electricity in any region of the country to a maximum to 12%. Reducing the cost of solar energy is still a major issue in proving its commercial viability. In our view, attempting to expand these sources by 856% in 15 years is not technically possible, nor is it the only way to reduce the emission of greenhouse gases.

3. Even if the 25% goal could be achieved technically, the financial hurdles are enormous. Who is going to speculate on the massive investment in plant and equipment for this forced march? Who is going to pay for the 5% of capacity retired by investor owned utilities and the sunk costs of plants already in the planning stages or under construction? Who pays for the standby power plants needed for power when the sun does not shine and the wind stops blowing? Who pays for the creation of a national grid? What is the cost of electricity paid by the consumer? Can investor owned utilities make an acceptable return on their investment? Does the taxpayer at least cover the national debt service on his investment, or would some of this investment have a higher return in the President's education and healthcare initiatives? Will higher US electric rates force energy intensive US manufacturing businesses to move offshore?
4. The table below shows the relative cost advantages of competing electric generating technologies. If zero emissions is the national goal, onshore wind is the lowest cost alternative. However, in comparing wind and solar, the cost of distribution from appropriately sunny and windy locations to where it is needed involves significantly higher distribution costs and loss of power due to line resistance. In addition, these sources are dependent on nature; therefore the energy they produce cannot at present be stored for later use at a reasonable cost.

Comparative Cost Characteristics for Electric Generating Technologies vs. Nuclear

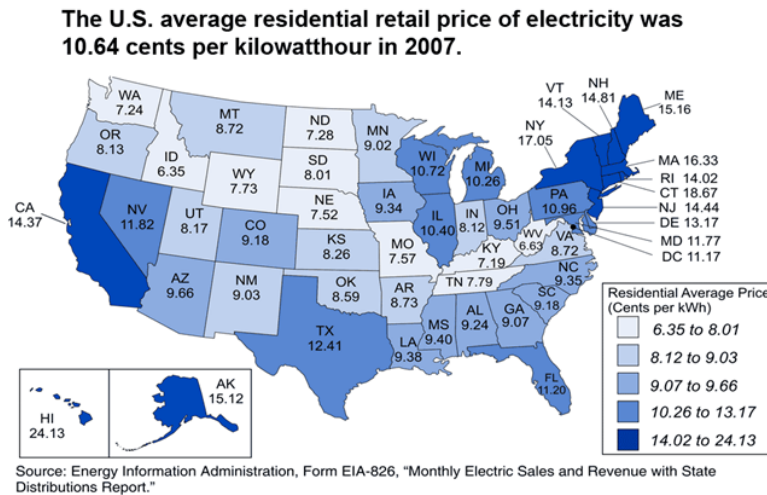
| Cost Difference vs. Nuclear <i>% cost per kw</i> | 2015 | | | 2030 | | |
|---|-----------|-------------|-----------|-----------|-------------|-----------|
| | Low Cost | Reference | High Cost | Low Cost | Reference | High Cost |
| Adv Gas Turbine | -71% | -71% | -71% | -69% | -70% | -71% |
| Adv Gas w/Carbon Capture | -44% | -43% | -43% | -43% | -44% | -46% |
| Wind | -41% | -41% | -41% | -31% | -32% | -35% |
| Adv Coal | -28% | -28% | -28% | -23% | -24% | -27% |
| Adv Nuclear | 0% | 0% | 0% | 0% | 0% | 0% |
| Adv Coal w/Carbon Capture | 5% | 5% | 5% | 8% | 7% | 2% |
| Wind Offshore | 15% | 15% | 15% | 22% | 21% | 15% |
| Solar Thermal | 43% | 43% | 43% | 32% | 30% | 24% |
| Solar Photovoltaic | 75% | 75% | 75% | 64% | 61% | 54% |

Source: DOE 2009 Energy Forecast Assumptions, Table 8.13, March 2009

President Obama, in his recent speeches, has expressed a strong preference for solar power, which even in 2030 will be 30% to 60% more expensive in curbing green house gases than nuclear power. By 2030 the DOE estimates that it will only be economic to produce 3 of 4665 billion kilowatts from solar energy. In smaller scale residential applications solar installations have an even larger cost handicap. This is no small consideration given that the President has also has expressed a strong interest in electric vehicles. Both electric and hydrogen powered vehicles require an increase in our electric generating capacity,

particularly in the evening. By 2050 the fourth generation of nuclear power plants, based on breeder reactors, is expected to be ready for commercial service after nearly 80 years of research and development. Such a development would almost qualify nuclear power as a “renewable” source of energy. It has the potential to be even more cost effective than the third generation advanced nuclear reactors that are being placed in service worldwide since 2000.

- Electric utility rates matter. Increases in electric utility rates, if they are not offset by corresponding increases in efficiency, are the equivalent to a tax on individuals and businesses. California has been a leader in the production of green energy. It also has a residential retail electric price 35% higher than the national average and 85% higher than Tennessee which produces much of its power from hydroelectricity. The production technology mix determines electric rates and the competitiveness of US products which require large amounts of electrical energy per unit of production.



- With President Obama’s February 2009 cancellation of the funding of the Yucca Mountain nuclear waste site, it is clear that the Administration sees at most a limited role for nuclear energy, a proven technology pioneered by the US. The US produces 19% of its electricity from nuclear power. It is the largest producer of commercial nuclear power in the world with 104 reactors, 85% more reactors than the 59 French reactors that provided 79% of their electricity in 2007. Our exports of services and equipment are significant contributors to our balance of payments and yet, we have not authorized a new US plant since 1973, because of safety and waste disposal concerns. No one has ever died from the failure of a US designed commercial or shipboard nuclear reactor. However, as an unintended consequence, greenhouse gas emissions from the coal fired plants that were built instead of nuclear plants have increased by more than 80%. In 2000, our calculations using mortality data prepared by the World Health Organization for that year, indicates that these additional US emissions are killing in excess of 4,000 people a year worldwide. This total does not include deaths associated with the mining and transportation of coal. In China approximately 6,000 coal miners die each year and they are soon slated to have twice as many coal fired power plants as the US. If the US goes green and China does not, we are going to lose even more manufacturing to them based on lower costs. Worldwide in 2007 a total of 436 reactors were operational and 44 were under construction, 11 of which are in China. Increasingly, nuclear power is being seen as the 21st Century answer to providing electricity 24/7 with no emissions of greenhouse gases. Internationally it is a growth industry, not a 20th Century dinosaur. In a global warming-conscious age, US politicians are ignoring a well proven, major electric generating technology which, according to the DOE, has a smaller life cycle carbon footprint than wind and solar technology. Dollar for dollar, no infrastructure project would do more to stimulate all levels of the economy than the construction of nuclear power plants. High technology manufacturing, engineering, service and

construction industries all benefit over the sixty-year life cycle of these plants. At the same time, we significantly reduce our production of green house gases. In contrast, building bridges and roads, while necessary, benefit a very small and low tech segment of the economy only during their construction. They also contribute to an increase in the production of green house gases.

Implement an economy-wide cap-and-trade program to reduce green house emissions 80 percent by 2050 and fund \$150 billion in clean energy investments over ten years by the government.

1. The Administration intends to fund its \$15 billion per year investment in clean energy from the sale of Green House Gas (GHG) emission credits. In FY 2012 industry is expected to pay \$79 billion to the government for these credits rising to \$83 billion by FY 2019. Who established that \$83 billion is an appropriate annual tax on business and that the proposed annual \$15 billion co-investment in private clean energy projects cannot be provided by the US venture capital market?
2. To put this annual tax in perspective, all US corporations paid \$354 billion in Federal income taxes in 2006. This new tax will be a significant hit to earnings that in turn will be reflected in reduced stock prices for companies. This is a tax that ultimately must be paid by the consumer of US goods, provided the US companies do not decide to move some production and jobs offshore.
3. American businesses are still in the midst of coping with our worst recession in forty years. Now is not the time to add an economy-wide business risk to a host of other concerns: future health care costs; the increase in taxes on small business owners; the increase in capital gains taxes; and threats to punitively tax windfall profits, executive compensation and offshore operations deemed to export US jobs. If we want to increase employment, we have to keep employers in business.
4. The energy market and economic impacts of S. 2191, Lieberman-Warner Climate Security Act of 2007 was analyzed by the DOE at the request of these senators. Report SR-OAIF/2008-1, released in April 2008 made the following observations on the various alternative emission cap programs.
 - S. 2191 significantly reduces green house gases (GHG). The reductions are 27% to 36% in 2020 and 45% to 56% lower in 2030.
 - The program is structured such that the impact on motor fuels is relatively small and, consequently, the change in driving habits is small. For example, the price of motor gasoline increases 22 to 49 cents per gallon in 2020 and 41 to 101 cents per gallon in 2030.
 - The electric power sector is projected to account for 82% to 87% of the reductions in GHG and many existing coal fired plants that do not capture carbon will be forced out of service.
 - If new nuclear, renewable and fossil plants are not constructed in time, more natural gas plants will be required. Various scenarios were studied and the DOE forecast natural gas used for power generation will increase between 8% to 82% in 2020 and between 21% and 142% in 2030. The impact of S. 2191 is that the price of natural gas quadruples in the worst case over the reference case.
 - The price of electricity for consumers is estimated to be 5% to 27% higher in 2020 and 11% to 64% higher in 2030.
 - The DOE states: "S. 2191 increases the cost of using energy, which reduces real economic output, reduces purchasing power, and lowers aggregate demand for goods and services." In 2030 the estimated loss in GDP ranges from \$27 billion to \$163 billion (-0.1% to -0.8%) while the

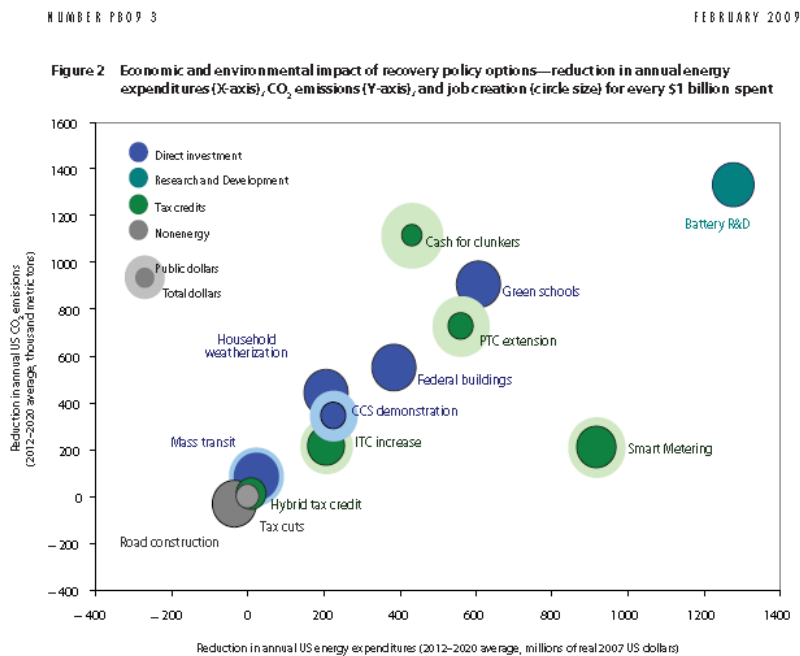
loss in consumption of goods and services ranges from \$58 billion to \$149 billion (-0.4% to -1.1%).

- S. 2191 impacts industrial activity, including manufacturing, to a greater extent than it affects the overall economy. Industrial shipments in 2030, excluding services, are reduced by \$233 billion to \$589 billion (-2.9% to -7.4%).

5. There are other approaches that should be debated. The third rail of energy politics are taxes on retail gasoline. However, it does work as evidenced by the European experience with fuel taxes that average approximately \$4.00 per gallon. Our highest fuel tax is Wisconsin’s \$0.51 per gallon. Because we have not adopted this approach, we are twenty years behind Europe in improving fuel mileage and forcing the Big 3 to stay competitive with foreign manufacturers. A ten-year, phased introduction of a consumer carbon tax would reduce both emissions and the wild percentage swings in retail fuel prices. It would condition buyers to put more constant emphasis on fuel efficiency when buying new cars. For that portion of the annual increases in fuel taxes that matched required increases in fuel efficiencies, fuel costs per mile for new cars would be neutral for the new car buyer and provide a stimulus to the other drivers to purchase new vehicles. As mentioned above, the carbon tax increase from under S. 2191 is expected to do little to change consumer driving habits. Clearly that is a sign that the tax is inadequate. Our fuel prices are production based and they have a direct effect on consumer priorities. We tax our fuels primarily to build more roads. These prices do not factor in the cost of our balance of payments deficit and the cost of oil embargos and oil wars. More stable and higher fuel costs would also improve the feasibility of producing fuels from alternative domestic sources such as coal and oil shale.

The Challenge of Addressing the Global Climate Crisis and Creating Millions of New, High Paying Jobs

The President’s believes his clean energy initiative will create five million new jobs. What is more important is the **net** number of jobs created by these programs. The World Resources Institute estimates there are scenarios that create 30,000 jobs for every billion dollars invested. If \$150 billion is invested in the appropriate job creation categories found in the stimulus plan, 4.5 million jobs would be created over a ten year period.



The World Resources Institute used the DOE 2009 Energy Forecast to benchmark various scenarios for job creation expected as result of President Obama's stimulus plan. The results are contained in the February 2009 report "A Green Global Recovery? Assessing US Economic Stimulus and the Prospects for International Coordination." They point out that international coordination is very important to the success of this program, otherwise, more US jobs will go overseas if our costs do not stay competitive. As noted previously, the model that calculated the number of new jobs created did not factor in any losses of jobs associated with the taxes created to fund the investment through the cap-and-trade program (S. 2191 legislation). If S. 2191 is enacted, the DOE estimates that GDP in the industrial sector will decline by 2.9% to 7.4%. It also does not factor in the additional reductions in employment caused by a crash program to generate 25% of our electricity from renewable resources by 2025.

Conclusions

The Administration has no announced plan which will end our dependence on foreign oil and stop the balance of payments hemorrhage. The renewable energy goals are not realistic and the cost/benefit of the cap-and-trade program is estimated by the DOE to adversely affect GDP growth, especially in manufacturing. Massive government spending may create 5 million new jobs. However, the Administration has not announced how many existing jobs and businesses will disappear as a consequence of their programs. Why government funding is needed to produce businesses that are capable of paying high wages has never been explained. The US venture capital industry is without peer in supplying capital to early stage companies.

There are no announced plans to streamline government approval and environmental review processes that delay private sector investments in energy. The 1,552-mile ALCAN (Alaska-Canadian) Highway was built in 234 days in 1942. In 1977 the 800-mile Trans Alaskan Pipeline to Prudhoe Bay was completed in 26 months. Americans can accomplish great tasks once the bureaucrats get out of the way. If Detroit continues to rely on improving the gasoline engines rather than making hybrid diesel engines the new development platform, it will fall further behind its international competitors. The same is true with respect to ignoring the cost and zero emission benefits of nuclear power. As a measure of how far we are behind consider: new cars in France are 70% diesel powered; they produce 79% of their electricity from nuclear power; their goal is to produce 90% of their electricity from nuclear power; and they reduce their nuclear waste by 90% because they recycle spent fuel and other nuclear waste. In contrast, less than 2% of our new vehicles are diesel powered; only 19% of our electrical energy is produced by nuclear power and no new plants have been authorized; we do not recycle nuclear wastes; and the President has just cancelled the nuclear waste burial site at Yucca Mountain that has been under development for more than 22 years. As a consequence, our greenhouse gas emissions, which represent 20% of the world's total, have increased by 21% between 1980 and 2007. All the nuclear waste ever produced by our nuclear power plants has not been reduced by recycling and is stored at each of our 104 nuclear reactors. This sad state of affairs is the result of five administrations taking an unbalanced, piecemeal approach to energy over thirty years. The green energy aspirations of President Obama are admirable but are as unbalanced as those of previous administrations. Now is the time, when we are restructuring the US automobile industry, for the US to finally develop an economically and environmentally sustainable energy policy for the next forty years.

Never has a US President proposed so much spending and tax increases in such a short time frame with so little public input and discussion of the consequences of his proposed actions. At the President's March 24, 2009 press conference not a single reporter challenged President Obama when he repeated his claim that he has a plan to end our dependence on foreign oil. More information has to be provided to Congress and our citizens if we are going to mobilize taxpayer support for President Obama's program. We trust that this report helps define the major issues that must be addressed.

Please share this analysis with individuals who can help make a difference in the direction of our energy policy.

About the Author



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For forty years, as an engineer, investment banker, CEO and early stage investor in new technology, I have been concerned about the lack of a coherent national energy and environmental policy. My energy advisory experience includes conventional oil and gas development, coalbed methane production, oil from shale, wind farms, solar energy, co-generation projects, refineries, mining and nuclear power. In 1970, as a graduate student at NYU, I participated in an eighteen month study of the US automobile industry and the emergence of OPEC as a potential threat to US economic interests. The group correctly predicted that there would be an energy crisis before 1975 and that Detroit was already well behind its competitors in designing fuel efficient cars to cope with the end of cheap energy. It was clear that we could learn from Europe. These mandated fuel efficiencies and well conceived taxes on non-renewable energy encouraged efficiency and provided the pricing support required to encourage the development of alternative energy sources including nuclear, solar and wind energy. For ten years following the Arab Oil Embargo, US policymakers paid attention to improving efficiency and developing domestic energy supplies, but as energy prices declined, so did our interest in having balanced energy policies. US vehicle fleet fuel efficiency was higher in 1987 than it was in 2007. As a consequence, forty years later, the US still does not have an effective energy policy that reconciles often competing forces: the need to maintain and improve the standard of living for a growing population, protecting the environment, keeping the country from becoming a debtor nation and reducing vulnerability to disruptions in energy supplies. Based on frequent trips to Asia, by 2000 I became convinced that rapidly increasing demand for energy in the developing countries was going to create serious future financial problems for the US. In 2006, I started warning my clients that our balance of payments deficit would balloon to an unsupportable level when energy prices exceeded \$100 per barrel and that the Big Three were going to be fighting for survival. In 2008, the nation had a wakeup call when oil topped \$147 per barrel and gasoline prices exceeded \$4.50 per gallon. Now is the time for the US to finally develop an economically and environmentally sustainable energy policy for the next forty years. It is both instructive and humbling to contrast our current energy situation with that of France where: 79% their electricity is produced from nuclear power with zero green house gas emissions; they reprocess their nuclear waste; 70% of all new cars are diesel powered; and they have the most extensive high-speed and urban mass transportation systems in the world. I hasten to add, that while I envy France's energy position vis-à-vis the US, the reverse is true with respect to their over regulation of business and labor practices. I was a director of a French subsidiary of a US company that shut down its French and German operations and moved them to a more business friendly England. California, my home for more than thirty years, is learning to its regret that businesses leave if the state does not provide quality public education, competitive personal and corporate tax rates and a favorable business climate.

My professional experience includes: Manager of International Finance at The Ralph M. Parsons Company responsible for project financing worldwide; Vice Chairman of Security Pacific Capital Market Group responsible for corporate and project finance; and as CEO/CFO managed the turnarounds of more than 30 companies in the US, Mexico and Asia. I received a BS in Mechanical Engineering with honors from the University of Wisconsin, MS in Industrial Engineering from UCLA, MBA in International Business and Quantitative Analysis from New York University. I am a graduate of Harvard Business School's Advanced Management Program. I also studied engineering on a Carnegie Scholarship at the Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico and was granted a Teaching Fellowship at UCLA College of Engineering.

SUPPORTING DOCUMENTATION

A Critique of President Obama's Energy and Environmental Agenda

***H. Andrew Thornburg
Principal and Founder***

***CLEO Consulting Partners
A Division of Thornburg & Co., Inc.
www.cleoconsultingpartners.com***

April 2, 2009

President Obama's energy independence claims are not supported by DOE data.

Department of Energy/Energy Information Agency 2009 Energy Forecast

Report #:DOE/EIA-0383(2009) Early Release

Release date, early release: December 2008

Release date full report: March 31, 2009

TABLE 1 - LIQUID FUELS SUPPLY AND DEMAND

| Liquid Fuels Supply and Demand | Million Barrels Per Day | 2009 | 2010 | 2015 | 2018 | Change 2009 to 2018 | | 2030 |
|---|-------------------------|-------------|----------------|----------------|----------------|---------------------|----------------|-----------------|
| | | | | | | % | mmbpd | |
| Liquid Fuels | | | | | | | | |
| Domestic Crude Production /1 | | 5.38 | 5.61 | 5.72 | 6.12 | 114% | 0.74 | 7.38 |
| Domestic Ethanol /2 | | 0.69 | 0.84 | 1.06 | 1.16 | 169% | 0.47 | 1.45 |
| Other Domestic Production ex. Ethanol | | 3.03 | 3.22 | 3.56 | 3.50 | 116% | 0.47 | 3.94 |
| Net Imports | | 10.32 | 10.12 | 9.91 | 9.33 | 90% | (0.99) | 8.88 |
| | % imports | 53% | 51% | 49% | 46% | 87% | | 41% |
| Consumption per day | | 19.42 | 19.79 | 20.25 | 20.11 | 104% | 0.69 | 21.65 |
| Venezuelan & Persian Gulf Imports 2007 | | 3.52 | | | | | | |
| Imported low sulfur crude | \$ | 60.89 | \$ 77.97 | \$ 109.96 | \$ 114.33 | 188% | \$ 53.45 | \$ 130.50 |
| Imported crude oil | \$ | 54.40 | \$ 71.97 | \$ 107.64 | \$ 110.64 | 203% | \$ 56.24 | \$ 123.81 |
| Net import DOE Price | \$ | 51.91 | \$ 66.77 | \$ 99.56 | \$ 104.41 | 201% | \$ 52.51 | \$ 114.60 |
| Imports \$mm/day | \$ | 536 | \$ 676 | \$ 987 | \$ 974 | 182% | | \$ 1,018 |
| Imports \$billions per year | \$ | 196 | \$ 247 | \$ 360 | \$ 355 | 182% | | \$ 371 |
| Gasoline Price per gallon (2007 dollars) | \$ | 2.38 | \$ 2.86 | \$ 4.01 | \$ 4.39 | 185% | \$ 2.01 | \$ 5.65 |
| | | 100% | 120% | 168% | 185% | | | 237% |

1/ domestic oil production expected to peak in 2018 in the EIA 2008 report. In the 2009 report, it is forecast that we will still be importing 8.88 million bpd of liquid fuels in 2030.

2/ half of the decrease in imports is dependent on increasing ethanol from corn by 69%.

In 2009, after 30 years of subsidies, the ethanol from corn industry is bankrupt, corn base ethanol energy conversion efficiency is marginal, there are serious crop rotation and Gulf of Mexico pollution issues and there is no estimate of the adverse impact on food prices and loss of export income from both corn and soy beans.

Table C5. Petroleum Product Prices
(2007 Cents per Gallon, Unless Otherwise Noted)

| Sector and Fuel | 2007 | Projections | | | | | | | | |
|---|-------|---------------|-----------|----------------|---------------|-----------|----------------|---------------|-----------|----------------|
| | | 2010 | | | 2020 | | | 2030 | | |
| | | Low Oil Price | Reference | High Oil Price | Low Oil Price | Reference | High Oil Price | Low Oil Price | Reference | High Oil Price |
| Crude Oil Prices (2007 dollars per barrel) | | | | | | | | | | |
| Imported Low Sulfur Light Crude Oil ¹ | 72.33 | 58.61 | 80.16 | 91.08 | 50.43 | 115.45 | 184.60 | 50.23 | 130.43 | 200.42 |
| Imported Crude Oil ¹ | 63.83 | 55.45 | 77.56 | 88.31 | 46.77 | 112.05 | 181.18 | 46.44 | 124.60 | 197.72 |
| Transportation | | | | | | | | | | |
| Liquefied Petroleum Gases | 213.8 | 194.4 | 231.2 | 249.9 | 224.9 | 360.3 | 522.0 | 250.5 | 431.0 | 621.7 |
| Ethanol (E85) ² | 253.0 | 194.4 | 254.5 | 276.8 | 199.7 | 369.1 | 442.1 | 227.8 | 414.0 | 532.5 |
| Ethanol Wholesale Price | 212.4 | 171.9 | 203.1 | 207.0 | 254.4 | 269.8 | 282.5 | 212.1 | 280.9 | 291.8 |
| Motor Gasoline ⁴ | 282.2 | 232.4 | 299.0 | 324.3 | 262.8 | 464.9 | 649.8 | 294.3 | 563.1 | 789.4 |
| Jet Fuel ⁵ | 217.3 | 178.6 | 228.0 | 257.7 | 193.7 | 386.4 | 591.2 | 215.2 | 482.0 | 719.5 |
| Diesel Fuel (distillate fuel oil) ⁶ | 287.0 | 239.2 | 289.6 | 318.2 | 278.8 | 460.9 | 670.1 | 315.2 | 567.9 | 804.2 |
| Residual Fuel Oil | 140.0 | 142.7 | 190.8 | 220.8 | 147.0 | 337.7 | 563.8 | 157.7 | 425.5 | 700.8 |

Thornburg & Co., Inc. comments on the advantage of converting to diesel engines for transportation

- 1 We have 238 million cars and 8 million heavy trucks and buses on the road. By 2015, when we build 1 million plug in cars, we will have built 75 million more gas guzzlers.
- 2 At a production rate of 15 million cars per year it will take the US 16 years to covert its automobile fleet to a new technology. Fully converting to electric cars will take at least 25 to 30 years. Diesel power seems to be a proven and more logical intermediate step. In several European countries diesel vehicles represent 70% of new car sales while less than 1.7% of our new cars are diesel powered.
- 3 According to the DOE, diesel engines are 20% to 40% more efficient than gasoline engines and produce 15% less green house gases. (See the DOE 1/2009 report, Light Duty Diesel Vehicles: Market Issues and Potential Energy and Emissions Impact prepared at the request of Senator Sessions.)
- 4 In the meantime, converting to abundant and clean burning LNG is especially attractive for heavy trucks and also feasible for automobiles. T. Boone Pickens has it right.

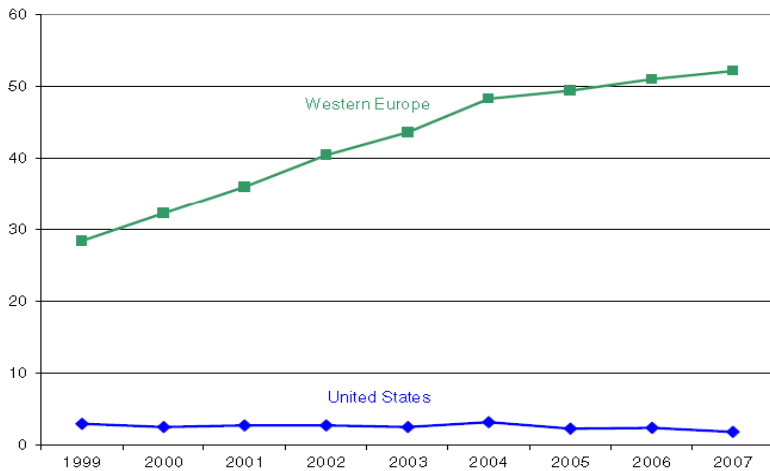
TABLE 3 - TRANSPORTATION FUEL USEAGE

| Transportation Fuel Usage Million Barrels Per Day Oil Equivalent | 2009 | 2010 | 2015 | 2018 | Change 2009 to 2018 | | 2030 |
|---|--------------|--------------|--------------|--------------|---------------------|-------------|--------------|
| | | | | | % | mmbpd | |
| Light-Duty Vehicles | 8.59 | 8.74 | 8.65 | 8.65 | 101% | 0.07 | 9.31 |
| Commercial Light Trucks | 0.30 | 0.31 | 0.33 | 0.33 | 109% | 0.03 | 0.36 |
| Bus Transportation | 0.13 | 0.13 | 0.13 | 0.13 | 102% | 0.00 | 0.14 |
| Freight Trucks | 2.25 | 2.31 | 2.66 | 2.76 | 123% | 0.51 | 3.31 |
| Rail, Passenger | 0.02 | 0.02 | 0.02 | 0.03 | 116% | 0.00 | 0.03 |
| Rail, Freight | 0.27 | 0.27 | 0.30 | 0.31 | 116% | 0.04 | 0.35 |
| Shipping, Domestic | 0.14 | 0.15 | 0.16 | 0.17 | 118% | 0.03 | 0.19 |
| Shipping, International | 0.31 | 0.35 | 0.39 | 0.39 | 125% | 0.08 | 0.40 |
| Recreational Boats | 0.13 | 0.14 | 0.14 | 0.14 | 106% | 0.01 | 0.15 |
| Air | 1.25 | 1.19 | 1.27 | 1.34 | 107% | 0.08 | 1.71 |
| Military Use | 0.36 | 0.36 | 0.35 | 0.35 | 97% | -0.01 | 0.37 |
| Lubricants | 0.07 | 0.07 | 0.07 | 0.07 | 104% | 0.00 | 0.07 |
| Pipeline Fuel | 0.33 | 0.32 | 0.33 | 0.33 | 100% | 0.00 | 0.36 |
| Total | 14.16 | 14.35 | 14.79 | 15.01 | 106% | 0.85 | 16.75 |

Source: Table 7, DOE/EIA Annual Energy Forecast 2009

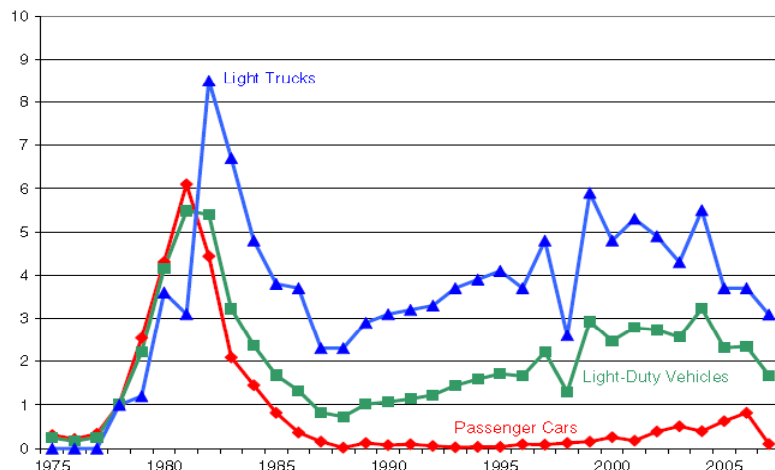
DIESEL VEHICLE SALES

Figure 3.2. Diesel Engine Vehicle Market Shares in Western Europe and the United States, 1999-2007 (Percent of Total New Light-Duty Vehicle Sales)



Sources: S.C. Davis, S.W. Diegel, and R.G. Boundy, *Transportation Energy Data Book: Edition 27*, ORNL-6981 (Oak Ridge, TN, 2008), Tables 4-5 and 4-6, web site <http://cta.ornl.gov/data/index.shtml>; and AID Ltd, *AID Newsletter*, Nos. 0102, 0302, 0501, 0602, 0702, and 0714 (2001-2007), web site www.eagleaid.com/index.htm (subscription site).

Figure 3.1. Market Shares of U.S. Light-Duty Diesel Vehicles, 1975-2007 (Percent of Total New Vehicle Sales)



Source: S.C. Davis, S.W. Diegel, and R.G. Boundy, *Transportation Energy Data Book: Edition 27*, ORNL-6981 (Oak Ridge, TN, 2008), web site <http://cta.ornl.gov/data/index.shtml>.

Due to poor vehicle performance, fuel quality problems, declining fuel prices, and severe reliability problems associated with the Oldsmobile diesels, however, consumers quickly lost interest in diesel cars, and by 1988 new diesel car sales had declined to only 0.2 percent of new car sales, and only Mercedes Benz and Volkswagen continued to offer diesel vehicles. Diesel car sales never recovered and have accounted for less than 1 percent of new car sales since 1988.³¹ Although new diesel light truck sales also declined rapidly between 1982 and 1988, the diesel engines offered in light trucks were reliable. They continue to be favored by a niche market and have accounted for, on average, about 4 percent of new light truck sales per year over the past 20 years.³²

In contrast to the United States, diesel engines are widely used in light-duty vehicles in Western Europe. Over the past decade, diesel sales in Western Europe have climbed from 28.4 percent of total light-duty vehicle sales to 52.2 percent (Figure 3.2). Belgium, France, and Spain have enacted policies that aggressively promote light-duty diesel vehicles. As a result, sales shares in those countries currently exceed 70 percent, whereas in the United States the diesel share of new light-duty vehicle sales has declined from 2.9 percent to just 1.8 percent, with a vast majority of the sales being light-duty trucks rather than passenger vehicles.

Source: DOE 1/2009 report, *Light Duty Diesel Vehicles: Market Issues and Potential Energy and Emissions Impact*

Thornburg & Co., Inc. comments on producing 25% of our electric power from renewables by 2025:

- 1 At present only 9.9% of our electricity is generated by non-renewables of which 71% is from hydro and geothermal sources. Solar and wind power represent 0.8% of total capacity. We do not have to wait to 2012 to produce 10% of our energy from renewable sources. We will be at 10.5% by 2010. It is getting to 25% by 2025 that is not economically feasible.
- 2 Electric energy generating capacity is projected to grow by 14% over the 10 year period 2010 to 2025. To achieve the Administration's goal, the only plants that would be built over this entire period would have to be based solely on renewables. If these plants were built, 5% of our existing electrical plant generating capacity would have to be retired and projects in construction and in the planning stages cancelled. Thus the required new additions to our electrical capacity will be greater than 19%, not including the the construction of the standby capacity required for solar and wind power.
- 3 Assuming the DOE's estimates of growth in renewable capacities are reasonable, that additional capacity must come from wind and solar, we will have to increase their share of capacity from 1.9% to 14.3% in just 15 years. This means constructing additional wind and solar capacity at the compound rate of 14.4% per year. Keep in mind that electrical demand is growing at just over 1% per year. Who is going to speculate on such a massive investment in plant and equipment for this forced march? Who is going to pay for the 5% of capacity retired by investor owned utilities? Who pays for the stand by capacity required? And the most important question: What is the cost of electricity to the consumer? Thornburg & Co., Inc. has prepared utility rate case applications so we are well aware of the complexity involved in this process.
- 4 Clearly, the Administration sees no future role for nuclear power in our energy future. It has stopped funding Yucca Mountain. With 102 nuclear reactors the US is the leading producer of energy from the atom and we have twice as many reactors as France even though the last US reactor was started in 1973. There are 434 nuclear reactors in the world. The supply of engineering services and equipment is a major source of export earnings. The reprocessing of nuclear fuels is a major business for France. We have the technology to do the same safely but there has not been political leadership in this area for over forty years.

TABLE 4 - ELECTRIC POWER GENERATION

| Electric Power Generation | | | | | Change 2010 to 2025 | | 2030 |
|-----------------------------------|-------|-------------|-------|--------------|---------------------|-------------|-------|
| (billions kilowatt hours) | 2009 | 2010 | 2018 | 2025 | % | bil. Kwh | |
| DOE Forecast | | | | | | | |
| Total Electric Generation | 3842 | 3904 | 4160 | 4436 | 114% | 533 | 4665 |
| Nonrenewable sources | 3462 | 3494 | 3643 | 3855 | 110% | 362 | 4057 |
| Nuclear Power | 806 | 807 | 809 | 831 | 103% | 25 | 905 |
| % nuclear power | 21.0% | 20.7% | 19.5% | 18.7% | | | 19.4% |
| Renewable Sources /1 | 379 | 410 | 518 | 581 | 142% | 171 | 607 |
| % renewable | 9.9% | 10.5% | 12.4% | 13.1% | | | 13.0% |
| Wind subtotal | 73 | 74 | 83 | 89 | 120% | 15 | 121 |
| % total capacity | 1.9% | 1.9% | 2.0% | 2.0% | | | 2.6% |
| Solar subtotal | 0.5 | 1 | 2 | 2 | | | 3 |
| % total capacity | 0.0% | 0.0% | 0.1% | 0.1% | | | 0.1% |
| Obama Administration goals | | | | | | | |
| | | 2010 | | 2025 | | | |
| Total Electric Generation | | 3904 | | 4436 | 114% | 533 | |
| Nonrenewable sources /2 | | 3494 | | 3327 | 95% | -166 | |
| Renewable Sources | | 410 | | 1109 | 270% | 699 | |
| % renewable | | 10.5% | | 25.0% | | | |
| Wind and Solar subtotal /3 | | 75 | | 617 | 821% | 541 | |
| % total capacity | | 1.9% | | 13.9% | | | |

/ 1 President Obama's 10% of energy from renewable sources is in the DOE forecast. The DOE forecasts do not contain data on the feasibility and cost of creating 25% of our electric power from renewable resources by 2025.

/ 2 The consequence of the Administration's goal is that 5% of existing power generating capacity is retired and 19% new plant capacity must be built in 15 years instead of 14%. This does not include standby capacity required for wind and solar energy facilities.

/ 3 If the additional demand is to be met by wind and solar power it will require increasing capacity by 14.4% every year for 15 years.

Source: Table 8 and Table 14, DOE/EIA Annual Energy Forecast 2009