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Lessons Not Learned, Energy 101 – Part III

by B. Alan Whitson, RPA

Partisan politics, special interest groups and pork barrel spending have driven America's energy policy for 35 years. As a result, we are endangering our national security, threatening our economic future, and wasting our natural resources. It's time for this nonsense to stop. There's lots of information to get a handle on. Here's a stab at it.

Nonsense

Making ethanol from corn wastes taxpayer's money, drives up food prices and damages the environment. The stated intent is to reduce oil imports. Instead:

>Producing and shipping ethanol uses almost as much fossil fuel as it saves.

>It takes 1.3-gallons of ethanol to replace 1-gallon of gasoline.

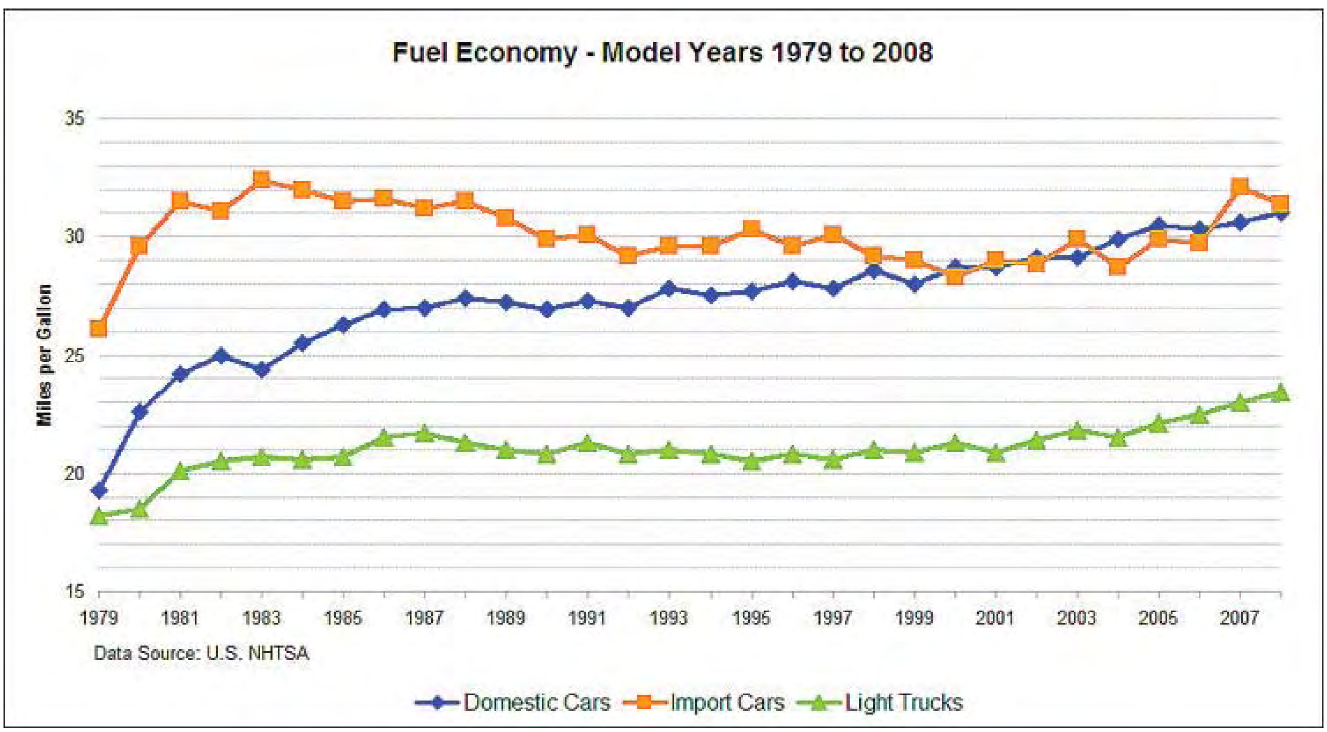
>Ethanol costs twice as much as gasoline

Can this really be the fuel of the future? Nearly 30 years ago, **Stephen Chapman** challenged the viability of ethanol from corn in the *New Republic*. In 2008, a *Time* cover story called ethanol a "scam." Yet, President Clinton created a plan to make ethanol an anti-smog fuel additive. President Bush went even further with a 9-billion-gallon-a-year ethanol mandate. So what is keeping ethanol alive? Politics. For one thing, getting the farm vote is believed to be an essential step in winning the race to the White House and the race begins in Iowa.

More Nonsense

Ethanol is an easy target. The next is something that most of the country is calling for and is ready to throw rotten tomatoes at politicians who don't support it: **Corporate Average Fuel Economy** (CAFE). This law fines an automaker if its customers buy vehicles that have a fuel economy lower than a specific standard. Currently, the CAFE standard is 27.5 miles per gallon for automobiles and 22.2 miles per gallon for light trucks. In 2011, new standards will start to phase in. By 2020, automakers must achieve average fuel efficiency across their fleets of 35 miles per gallon.

Higher fuel efficiency, of course, is a good goal and 87% of American voters support it. But many think CAFE is a poor way to get it and there is significant evidence they are right. According to **Bob Lutz**, General Motor's Vice Chairman and the person behind the new **Chevrolet Volt**, the new CAFE standard will push car prices up by $4,000 to $10,000 per vehicle, or an average $6,000 per vehicle," although the increase will not come all at once."



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To understand what is wrong with CAFE you need to understand how it operates. The best place to start is with an analogy. Let us say Congress wants to address America's obesity problem, so it passes a law that penalizes retailers if their customers buy clothes in any size other than small. Who thinks this is going to work?

Furthermore, American automakers build cars worldwide. Some of the smaller fuel-efficient cars are manufactured overseas and then imported into the America. Yet American automakers cannot include the cars they import into America with the cars they build domestically in calculating their CAFE numbers.

When Congress created CAFE it failed to consider how consumers make buying decisions. Fuel economy is a major consideration for many consumers. Dollars and cents, however, not miles-per-gallon drive behavior. Oil was well above $30 a barrel in 1980 then it began a slide to under $10 in late 1998, interrupted only by a price spike after Iraq invaded Kuwait in 1990. This price decline more than offset the lower fuel economy of trucks, and many consumers put the issue of fuel efficiency on the back burner.

Since 1979, trucks went from 10% of all new vehicles sold to the dominant share of the market. A major factor in this shift was that trucks are much cheaper than cars. CAFE contributed to this shift: as cars got smaller and more expensive to meet increasing fuel economy standards, trucks and SUVs offered consumers more space and better-perceived value. Because of this shift, overall fuel economy rose to a peak of 26.2 miles per gallon in 1987 then dipped to 24.5 miles per gallon in 2001. Currently, it stands at 26.8 miles per gallon.

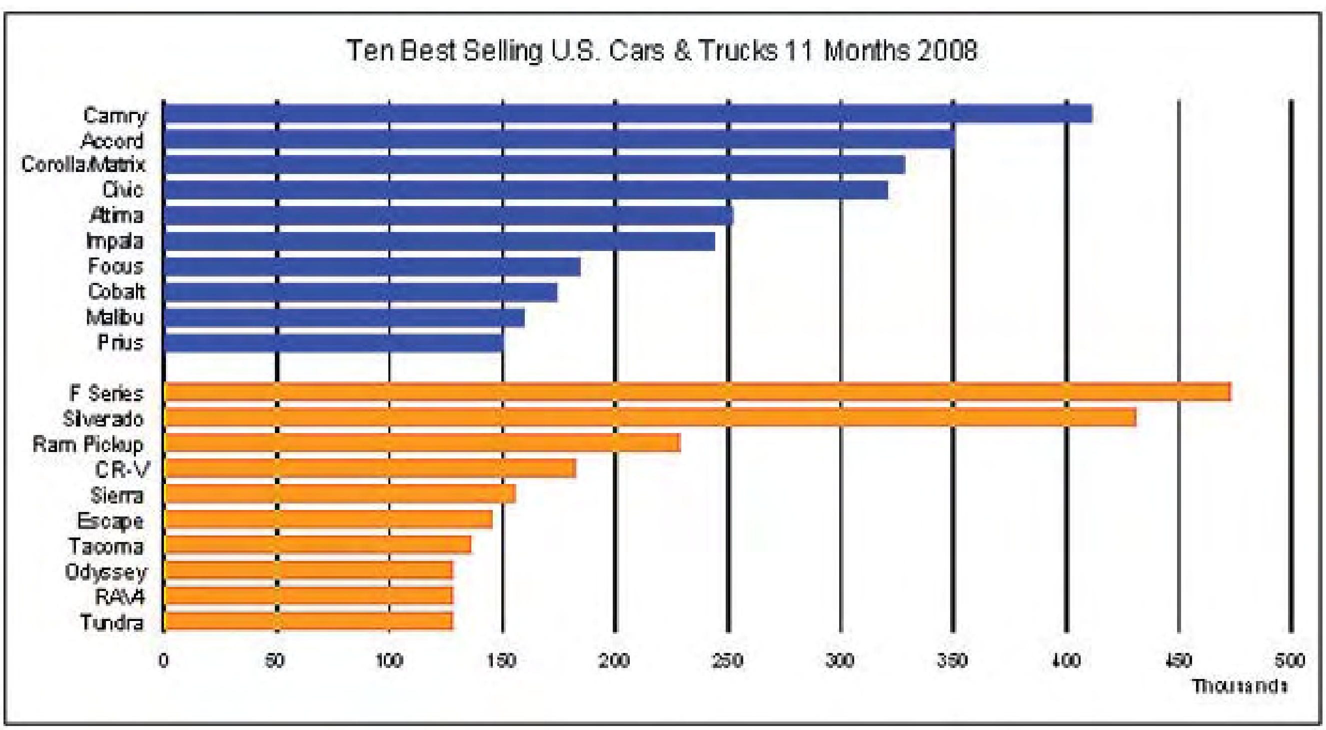
(The fuel economy rules apply to foreign brands too. Aston Martin, BMW, Daimler, Ferrari, Maserati, Porsche, and Volkswagen elect to pay the CAFE fines rather than build cars at a loss to please Washington. Recently, Daimler paid one of the largest CAFE fines in history, $30 million or $118 per car.)

Automakers, of course, eagerly embraced the public's new love affair with trucks, since the profit margin for trucks was much larger than it was for small cars. Quickly, metallic paint, plush carpet, six-way seats, leather interior, and sound systems became the norm for trucks, no longer stripped-down work vehicles.

Although new vehicle sales in December 2008 were off 37%, the home construction industry was in the dumps and $4 gasoline still fresh in consumer's minds, the top two sellers were the Ford F-Series and the Chevrolet Silverado (The Dodge Ram took number eight.) Overall sales for 2008 were down 18%, and two of the top four selling vehicles were Ford F-Series, Chevrolet Silverado.

Fuel Taxes: Unappealing good sense

From a standpoint of effective energy policy, it makes more sense to influence the behaviors of all drivers, than dictating the design of new cars and trucks. The best way to do this is a fuel tax. In Europe, a policy of high fuel taxes was a key driver in getting con-



sumers to buy fuel-efficient vehicles. In Holland, gasoline sells for more than $10 a gallon, with $5.57 of that going to taxes. In Britain, even with its sizeable North Sea oil production, gasoline sells for $8.71 a gallon. While European consumers undoubtedly don't like higher fuel taxes any more than American consumers, they have adapted and their economies survive.

In 1990, President George H. W. Bush's administration considered a sizeable gas tax increase. It was pared down to 5 cents a gallon after a number of Republican members of Congress broke with the president. William K. Reilly, who ran the Environmental Protection Agency at the time said, "This was a stark lesson and people decided the gas tax was the third rail of public policy."

In mid-2008 when gasoline prices were closing in on $5 per gallon, consumer behavior changed overnight. Carpooling, use of public transportation, and sales of fuel-efficient vehicles skyrocketed. In June 2008, Ford Motor reported that sales of its full-size F-series pickup (15 MPG Combined) – the country's best-selling vehicle for 26 consecutive years – dropped 40%. (On July 11, 2008, crude oil peaked at $147.27 a barrel. On December 30, crude oil closed at $39.14 a barrel – a price not seen since 2005. The U.S. average price for regular gasoline has fallen to $1.62 per gallon – one year ago, it was $3.04.)

These events provide us with evidence of what works. Just imagine how much better off America would be today if any of our Presidents and Congress had shown some courage and foresight and replaced CAFE with a gas tax.

America Deserves a Common Sense Approach to Energy

The First Oil Embargo was 35-years ago, and we now import twice the amount of foreign oil as we did in 1973. Every administration since Richard Nixon has promised action. Instead of results, we've gotten vile partisan politics, special interest groups fighting each other, and billions in pork barrel spending. Making matters worse is that the issue of CO_2 emissions has sidetracked us from the very real problems America needs to deal with: the addiction to foreign oil and the reinvention of our energy infrastructure.

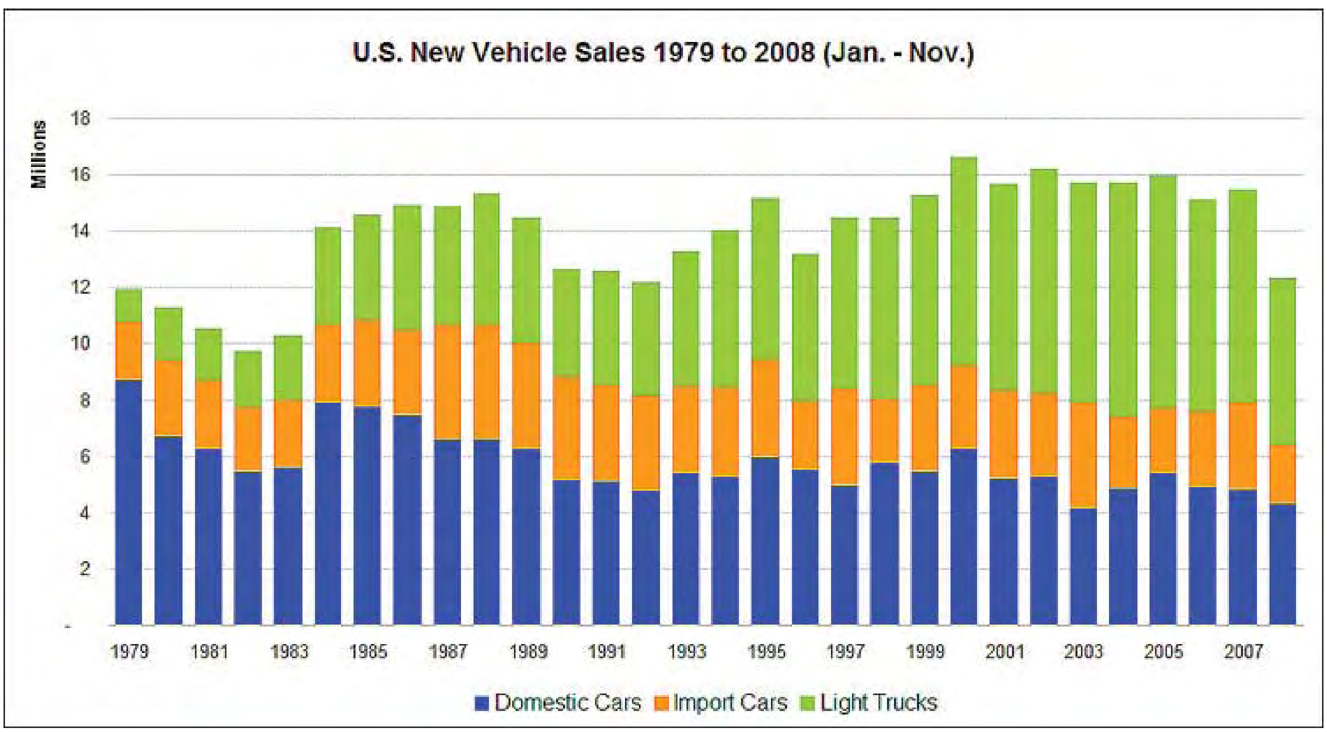
America is beyond the point of needing a comprehensive, coherent and effective energy policy. We need to take action and start getting results now. There are four factors that will influence our ability to get it done: Our Goals, Global Context, Strategic Issues, and Tactical Issues.

Our Goals

The goals are simple, straightforward and complementary:

>**Ensure our national security** - By overcoming America's addiction to foreign oil through energy independence.

>**Revitalize our economy** - The move to energy independence and more sustainable energy sources can employ thousands of Americans and propel our economy to new heights.



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>**Protect our environment** - We cannot expect other nations to change their environmental behavior unless we provide a positive example, make available new technology and innovation, and show them how to profit by changing their ways.

Global Context

Energy is a global issue, and America must address its energy use within a global context. The recently released International Energy Agency's ***World Energy Outlook 2008*** indicates that world demand for energy will increase 45% from 2006-2030. As a group, non-OECD countries are expected to account for 87% of the increase in world demand; their energy consumption surpassed that of the 30 OECD countries in 2005. **[Footnote at the end: List OECD nations]** China and India are expected to be responsible for over half of the increase, with Middle East countries accounting for 11% of the increase.

Global oil demand is projected to rise from 85 million barrels per day in 2007 to 106 million barrels per day in 2030 with the increase coming from non-OECD countries. Global demand for coal is increasing twice as fast as that for oil. Coal's share of energy demand is expected to rise from 26% in 2006 to 29% in 2030. Electricity generation in China and India will account for 85% of the global increase in coal consumption. While nuclear power output is expected to climb, it is estimated that its share of global electricity generation will go from 6% in 2006 to 5% in 2030. Hydroelectric output is also expected to increase, even as its share is estimated to drop from 16% to 14%. Non-hydro renewables are expected to increase from 1% in 2006 to 4% in 2030.

In light of these estimated increases in energy demand, it is sobering to realize that over half of projected investment in global energy from 2007 to 2030 will be needed to maintain the current level of supply capacity. Among other things, much of the world's existing infrastructure for supplying oil, gas, coal and electricity needs to be replaced by 2030.

We need to face reality. Even if America were 100% energy independent, the rest of the world would have energy problems. Energy is a political weapon. Petro-dictators have used energy to intimidate other countries into foreign policies of apathy, accommodation, and appeasement rather than doing what is morally right. Iran, Russia, Saudi Arabia and Venezuela use their oil and natural gas supplies as a big stick to get what they want. Many of America's foreign policy failures can find their roots in our addiction to foreign oil.

The population explosion in India and China is steadily pushing those countries to the edge. Japan, the world's third largest economy, is only 16% energy self-sufficient (and lest we forget, Japan's energy needs were one of the factors leading to the bombing of Pearl Harbor and the entry of the U.S. into World War II). The rest of Asia is a political and religious powder keg with a short fuse. Africa is a nightmare of epic proportions. Other than Brazil, Latin America is a basket case. Europe gets much of its oil and natural gas from the Middle East and Russia. Both of these sources are unstable and hostile. Iran is about two years away from its stated objective of launching a nuclear attack against Israel. Russia is growing bolder and more aggressive in pushing around former Eastern Bloc nations. The ripple effect could be horrific.

Strategic Issues

Many hope that the eco-politician who says renewable energy sources can meet all of America's energy needs in 10-years is right. Yet deep down we know that's not going to happen. Hope is what you do when you have no control. A strategy consists of the actions and tactics that convert visions into results. Wisdom is knowing the difference between positive attitudes and positive actions and the flaw of relying on one without the other. Energy is a complex issue, but the following elements create a framework for making the necessary strategic decisions:

>*Action Now* – Politicians have failed us too many times over the last thirty-five years. Without visible signs of action or some sense of progress, Americans will lose confidence in our nation's ability to overcome our energy challenges.

>*Long-Term Commitment* – Overcoming America's addiction to foreign oil isn't going to happen overnight. Developing and installing a sustainable energy infrastructure will take more than 10-years. If we don't start, we will never finish.

>*Maximize Efficiency* – Dollar for dollar, energy efficiency is the most effective tool in our toolkit. Encouraging energy efficiency reduces the demand on existing resources and it lessens the size, cost, and time needed to develop and implement sustainable solutions.

>*Regulatory Rigor* – We must maintain a strong and effective enforcement of our regulations for health, safety and environmental protection.

>*Short-Term Trade-Offs* – The all-or-nothing mindset of many on all sides of energy issues has stymied America's efforts in the past. Some steps in the transformation process are less than optimal, but we need them to buy time until technological or implementation issues are resolved. We need sensible solutions now.

>*Economic Insurance* – During this transition, we should use America's vast energy resources to ensure our national security and protect our economy from price shocks and interruptions in the global energy markets.

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Royalties, fees and taxes can provide funding for new sustainable energy sources. Ask yourself, "Which is the more responsible course of action? Use America's energy resources, or, take trillions of dollars out of our economy and putting them into the coffers of foreign countries, many of which are hostile to America."

>*Invest in Our Future* – We need to invest in research & development at all levels in our society. R&D tax credits, government funding, private foundations, investors and back yard inventors need to be encouraged. Once new technologies are developed and implemented in America, they can be exported to the rest of the world. Congress should avoid trying to pick the winners and losers; incentives should be based on objective performance metrics rather than the skill of lobbyists. Experience shows that our free market system works better than any alternative when we assure a fair and level playing field.

>Realism – The intense frenzy about global warming has caused us to lose sight of our problems. We need to balance human needs, environmental concerns, and economic realities. Our ultimate goal isn't to reduce CO_2 emissions as such, but to ensure our national security, improve the quality of life and protect the environment. Drastic climate policies- may or may not work, but we can help more people, at a lower cost, with greater success by pursuing a down to earth approach focusing on immediate problems such as hunger, poverty, malaria, AIDS, safe drinking water and clean air.

Tactical Issues

America is the world's largest energy producer, consumer, and net importer. We rank first worldwide in known reserves of coal, sixth in natural gas, and eleventh in oil. Success in reaching our goals will depend upon initiative, innovation, and our wisdom to use effectively and efficiently the fuel sources and technologies we have at our disposal.

Energy Demand – On a per capita basis, America's energy use is declining. Even so, our overall energy demand is increasing due to a growing population. America's demand for liquid fuels is expected to increase 30% from 2006 to 2030, with electricity demand growing 41% in this period. Energy demand from commercial buildings is projected to grow faster than the square-footage added.

Oil & Natural Gas – Oil and gas is the lifeblood of our economy and currently there is no substitute. Our transportation system accounts for 69% of all oil used, and natural gas provides 22% of our electricity. Proponents say, "Drill, Baby, Drill." Opponents say, "We can't drill our way out of this problem." Both are wrong. This is the glass is half-full or is it half-empty argument. What we need to do is to find something else to put into the glass. Just as whale oil was replaced by kerosene, which was later replaced by electricity, oil and gas will be replaced by new sustainable energy sources. In the meantime, we should use our vast oil and natural gas resources as a way to fund development of new technologies, and protect our national security and economy.

Boone Pickens makes a sound case: use America's natural gas to replace foreign oil. Natural gas currently powers trucks, buses and fleet vehicles all across America, so adoption is straightforward. Other energy sources such as wind and nuclear could be used to make electricity. These two elements, when combined, would greatly reduce America's need for foreign oil.

Bio Fuels - *Forget corn.* Our future fuels need to come from more practical feedstocks. In addition, we shouldn't waste time and money with fuels that have lower energy yields than gasoline. This leaves four fuels that equal or exceed the energy yield of gasoline.

>*Algal biodiesel* uses genetically modified strains of algae grown in enclose bioreactors and fed waste CO_2 from coal-fired power plants, cement kilns or breweries. While algae can produce more oil per acre than soy or palm, growing and processing algae at this scale presents challenges, but a number of U.S. facilities are slated to come online in 2012. This fuel yields 103% of the energy of gasoline.

>*Green gasoline* uses the simple sugars converted from cellulose or sugarcane. The simple sugars are reacted over solid catalysts to remove oxygen and form high-energy hydrocarbons. From here, the process is much like traditional oil refineries. **Virent**, backed by Shell and Honda, hopes to have its gas available in 2012. This fuel yields 100% of the energy of gasoline.

>*Designer* hydrocarbons are another source: scientists essentially trick microorganisms such as E. coli and yeast into converting simple sugars into diesel, gasoline or jet fuel instead of fats or alcohols by swapping out natural genes with synthetic genes. The microbes ferment the sugars in slurry, similar to traditional ethanol production. Since the finished fuel doesn't mix with water, the hydrocarbons are separated by centrifuge without expensive distillation. The first commercial plant is in Brazil and diesel production should start in 2010. This fuel yields 106% of the energy of gasoline.

>*Fourth generation fuel* uses genetically engineered algae that turns CO_2 into oil and continuously excretes this oil directly into the surrounding water. This simplifies the harvesting process since the previous generation of algae stores the oil within its cell walls; this new process eliminates the drying and extraction process. The oil is then processed into biodiesel. If this can be done at a large scale, it provides a new paradigm. **Synthetic Genomics** seeks to have commercial quantities of biodiesel on the market within five years,

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although no plants have been built. This fuel yields 103% of the energy of gasoline.

Coal – It's cheap, plentiful, and energy rich. It's also dirty and releases minerals such as mercury, arsenic, silicon, calcium, chlorine, and sodium, as well as metals such as aluminum, iron, lead, magnesium, titanium, boron, chromium. Coal is used to create 49% of America's electricity. In 2006, there were 616 coal-fired facilities with 306.6 GW of generating capacity. By 2030, capacity is expected to increase by 13% to 346.2 GW. On the down side, advancements in implementing clean coal technologies have stalled for a host of reasons – most of them political. Moreover, even if America didn't use coal, emissions from burning coal in China and India quickly find their way into America.

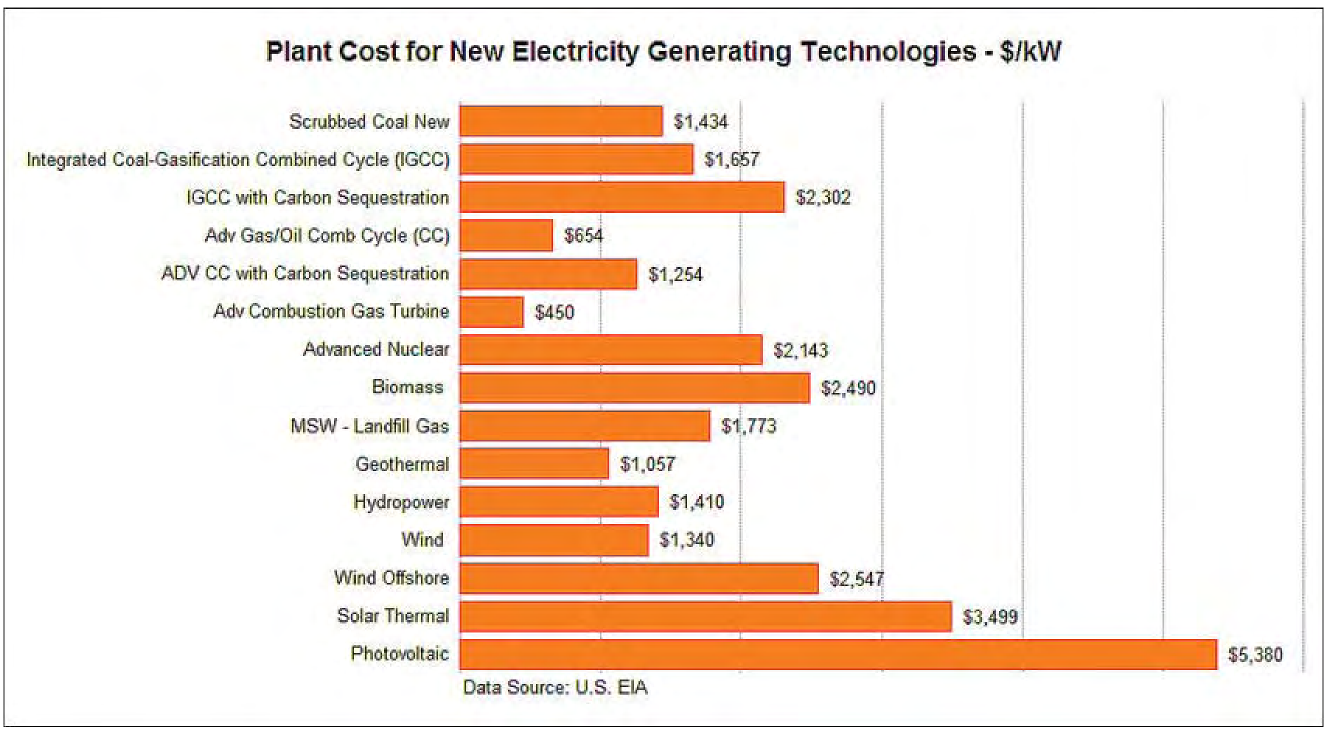
Nuclear – Once again, fear and politics is getting in the way of real solutions. The Chernobyl nuclear plant disaster in the former Soviet Union turned the public away from nuclear energy. What most people don't realize is that disabled safety systems, unauthorized reactor experiments, irresponsible management, and inferior equipment – hallmarks of the Soviet Union – were responsible for this tragedy. Worldwide there are 443 operating nuclear power plants. The top four countries using nuclear power are U.S., France, Japan and Germany. Many Americans may be surprised to learn that France gets 80% of its electricity from nuclear reactors.

Currently, 104 operating nuclear reactors in 65 facilities located 31 states provide about 20% of America's electricity. Applications for 17 nuclear plants in the U.S. are pending. The EIA reports that nuclear power provides 110.6 GW of generating capacity, and it will reach 112.2 GW by 2030.

Dealing with nuclear waste is an issue that demands more research and development. Reprocessing spent fuel rods can recover up to 95% of the uranium and plutonium for use in new fuel rods. This reduces the long-term radioactivity in the remaining waste and reduces its volume by 90%. Britain, France, Russia, Japan, China and perhaps India reprocess spent fuel from nuclear reactors. Contrary to popular belief, burning coal releases more radioactive waste into the environment than nuclear power. The effective dose equivalent of radiation from coal-fired plants is 100 times that of nuclear power plants.

Hydro – FDR put thousand to work during the Depression to build dams. Currently waterpower is America's fourth largest source of electricity, providing about 6% of our electric power. The expansion potential at existing hydroelectric facilities, at dams without powerhouses, at new small- and low-power developments, and from ocean wave energy and hydrokinetic technologies is estimated to be 23.0 GW. This could increase to 85.0 to 95.0 GW if economic incentives and regulatory processing were improved.

Wind – In 2007, America held the number two spot in the world with 16.8 GW (17.9%) of total installed wind capacity, and the number one spot in new capacity added with 5.2



GW, double the 2006 number. In 2008, 5 to 6 GW of new capacity came online. New wind projects account for 30% of America's new power-producing capacity.

The Department of Energy (DOE) recently estimated that wind could provide 20% of the nation's electricity by 2030. Under this 20% wind scenario, new wind power installations would increase to more than 16 GW per year by 2018 and continue at that rate through 2030. Currently, wind power generates about 0.8% of America's electricity.

Biomass – Bioenergy or biopower is one of the products of resulting from processing biomass, the waste material from farms, forests and urban centers, and converting it to energy, as opposed to putting the waste into landfills. The current output is roughly 10 GW of power and growing. About 6 GW is powered with clean wood and wood waste, and most of this energy is generated and consumed "behind the meter," primarily by the forest products industry. The energy intensive pulp and paper industry is currently more than 50% energy self-sufficient because of its use of waste from the papermaking process.

Biopower also includes landfill gas and anaerobic digester gas (ADG). These applications turn waste methane from a liability onto power. With more than 1.2 GW in production, landfill gas-to-power exceeds the total output of the nation's photovoltaic capacity. The ADG opportunity, based on animal waste, biogas from sewage treatment plants, and food waste is largely untapped. German ADG facilities not only produce energy, but also a high value, odorless fertilizer used on nearby farms in the form of post-fermentation residue.

Municipal waste to energy plants are another source of bioenergy, since 75% of municipal waste is biomass. Currently 90 waste-to-energy facilities generate nearly 3 GW of electricity. Wood and waste provide 0.93% and 0.04% respectively of America's electricity.

Geothermal – America continues to lead the world in geothermal power installations, with an installed base of 2.9 GW as of May 2007. California is the home of most of these installations at 2.5 GW. If all the geothermal projects under construction come online, capacity will increase 13%, and if all the projects under development come to fruition, capacity would increase 76%. Geothermal offers utilities the advantage of steady non-intermittent power making it ideal for base-load operations. Currently, geothermal power provides 0.36% of America's electricity.

Solar – For centuries, people have captured the sun to heat water for bathing, cleaning clothes, and heating homes. Today's solar thermal systems use the sun to produce hot water for homes and commercial applications reducing the need for gas or electricity to heat water.

We can also use the sun to create electricity. Invented by Bell Laboratories in 1953, **photovoltaic** (PV) systems convert solar energy directly into DC electricity. Many PV industry pundits proclaim PV will be the future's primary energy source. This reality is challenged by intermittent daytime-only electricity output and very high cost. Despite efforts to make PV cheaper, today's market price to produce a PV module is between $4.50 and 5.50 per watt. Rather than getting cheaper, prices for PV have been rising at 5% to 9% a year since 2001. For PV to become competitive without massive government grants and subsidies, this price must drop to below $2 per watt. Contrary to the hype, PV will remain a nano-niche solution unless a major technological breakthrough occurs that dramatically lowers manufacturing costs or increases output. Currently, PV provides 0.01% of America's electricity.

A third solar alternative is **Concentrating Solar Power** (CSP), which concentrates sunlight with mirrors to create heat, then uses this heat to create stream to drive turbines and electric generators. There are four major CSP technologies: Parabolic Trough, Fresnel Mirror, Power Towers, and Dish/Stirling and Concentrating PV (CPV).

Parabolic trough is a proven technology and experts indicate the electricity costs to be $0.10/kWh or less. However, power towers, with their higher efficiencies and capacity factor of 65%, may be able to achieve electricity costs of $0.07 to $0.08/kWh.

Wind proponents say that CSP isn't cost-competitive with wind power. Utilities say reliability, not cost, is the critical issue. Wind output is intermittent and usually blows at night, while CSP produces power during periods of high demand.

CSP fits well into America's electric system. First, it's dispatchable. When combined with thermal storage, CSP can provide electricity when the sun isn't available, and hybridization with natural gas can provide a stopgap heat source when there isn't enough sun. Second, utilities are familiar with solar steam generation, and CSP uses the same power block as fossil fuel based technologies. Third, it's suitable for utility scale applications of 100 MW or more. Fourth, stable and known costs with zero emissions offer a hedge against natural gas's price volatility and future carbon caps.

The best news about CSP is the quantities of electricity it can produce. According to a report from the American Solar Energy Society, "… analysts evaluated the solar resource in the Southwest and … found that CSP could provide nearly 7,000 GW of capacity, or seven times the current total US electric capacity." California, Arizona, Nevada, New Mexico, Colorado, parts of Utah, and Texas could be tapped for CSP facilities.

CSP is a global opportunity; the Trans-Mediterranean Renewable Energy Cooperation (TREC) has calculated that, almost all of electricity the world now uses could be generated in less than 1% of the Sahara desert (about 25,000 square miles or the size of West Virginia) if it were covered with CSP facilities. An area, one-fifth that size could provide the European Union all the electricity it's now using. Another benefit of CSP is that the waste heat from steam turbines could be use for desalination of seawater. The mirrors in the solar field could provide shaded areas suitable for growing food crops and other produce on land that is now unproductive.

Transmission Grid - Over the last three decades, the investment in America's high-voltage transmission grid has been slim. Yet, the demand for electricity doubled in this period. Deregulation exacerbates the problem as power producers send electricity hundreds of miles to the highest bidders over a patchwork system of wires and switch gear never designed for this type of use. The load can overwhelm the system, as when a power line near Cleveland failed on August 14, 2003. This single failure created a cascading series of overloads that plunged 40 million people in eight states and 10 million people in the province of Ontario into a blackout lasting up to seven-days.

The demand for renewable energy is creating another reason to enhance our transmission grid. These new sources of electricity aren't where the old generating plants are; they may be 500 to 1,000 miles away. It will take 22,000 miles of 765,000-volt transmission lines to create a national grid. This grid will be able to move about 25% of our current electricity consumption over great distances. Line losses are modest, as very high voltage lines are more efficient than lower voltage systems. Building the grid will cost $75 billion, adding a transmission cost of 0.3 cents per kilowatt-hour to the retail price of electricity, which currently averages about 9 cents.

With an enhanced grid and by pooling the nation's supply and demand, cheap electricity can follow demand across the country and around the clock. This can lower the capital cost of electricity by utilizing billion-dollar power plants over more hours of the day. Some industry analysts estimate that this can reduce the average cost of electricity between 30% and 50%. Moreover, by providing cheap access to cheaper power, the grid can accelerate the adoption of other technologies such as plug-in hybrid cars that recharge at night.

Bottom Line

The key obstacle to the rapid implementation of these strategies, tactics and technologies is a lack of awareness and understanding by the media, investors, decision makers, politicians and the public. The consequences: our politicians continue to make inappropriate decisions and fail to provide appropriate incentives, effective regulation and enforcement. Of course, that's how we got into this mess in the first place.

Even so, we should be optimistic about America's future. We have in place or within our grasp sustainable energy technologies that can ensure our national security, revitalize our economy and protect our environment. The implementation issues are clear-cut since energy companies are comfortable with many of these technologies. Clearly, there is room for price reductions as these technologies improve, mature, and the economics of scale begin to take hold.

While the investments will be large, so will the return on those investments. Some will say America cannot afford it, especially in these tough economy times. Yet, the cost of not doing this is too high. Our choice is simple: restore America to its prime or let it devolve into a subprime nation.

Now is the time to reinvent America's energy infrastructure. Success requires that we fully engage in the process of change at the local, state and federal level. We must move beyond the partisan politics, scientific groupthink, special interest groups, and pork barrel spending that has shaped America's energy practices in the past. As professionals in the design, construction and real estate industry, we have an important role in revitalizing America's energy infrastructure. If we fail, we will have no one to blame other than ourselves. ■

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***OECD Countries**: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. The World Bank describes 27 as high-income countries. Members, Poland, Mexico and Turkey, are upper middle-income