ENERGY, SECURITY, CLIMATE: CONVERGING SOLUTIONS

Ned Farquhar*

So often our challenges seem daunting. So often we fail to address them until it’s too late; this can be said of everything from terrorism to Social Security. It is true of energy policy as well. Since the first oil embargo in the early 1970s, the nation seems to have sleepwalked through three decades of indecision and irresolution with respect to energy. When prices rise, perhaps we see a flurry of interest in alternative energy options. But almost inevitably the prices fall again, and, despite the damage and the remaining vulnerability, the interest in alternatives flags.

Today, with oil prices nudging at the $100 level, it would be a good time to recognize that a sustained, focused interest in energy policy is needed. Even more, we need a change in attitude, recognizing that the challenges posed by energy policy—from national security to economic prosperity to preservation of the global atmosphere and climate—are profitable and rewarding to solve. Meeting the energy policy challenge isn’t something that needs to be painful, or even to require large changes in our lifestyles or communities.

In contrast, the converging solutions to our energy, security and climate problems will be relatively easy and affordable to solve. Their magnitude is intimidating, but the fact is that these problems are indeed solvable. We should quit running away from them and address them head-on, with a set of complementary policies that reduce costs to consumers and taxpayers, that reduce our carbon emissions, that create a more resilient and productive economy, and that strengthen our nation and reduce its exposure to hostile organizations and regimes around the world. Sounds like a tall order, but it really isn’t for a nation with our resources, financial depth, technical and scientific strength, and world presence.

Before stepping into the background and solutions, however, I should point out, to this Utah audience, that the solutions are not all that’s converging these days. So are the politics. Utah’s Governor Jon Huntsman has been a strong leader on energy efficiency—he’s the likely next chairman of the Western Governors’ Association and a voice for regional action on climate change like Democratic governors (including New Mexico’s Bill Richardson and Arizona’s Janet Napolitano) who have preceded him. Similarly along nonpartisan lines, the presidential race has narrowed to candidates who recognize the energy and climate challenge and are proposing bold solutions. This isn’t a partisan issue by nature. It

* © 2009 Ned Farquhar, Senior Energy and Climate Advocate with the Natural Resources Defense Council and former Senior Advisor to New Mexico Governor Bill Richardson. Some of the recommendations and solutions in this paper are similar to those he has worked on with both Gov. Richardson and NRDC, although Mr. Farquhar purports to represent neither in this presentation. This article is informally adapted from his introduction to energy and climate issues at the Stegner Symposium in March 2008.
can be addressed by cooperation and collaboration among those who wish to achieve the many benefits of converging energy, security, and climate solutions.

The following ten solutions will put America on the path not only to energy sustainability and independence, but also to an economically vibrant future and a restored place in the world.

I. BACKGROUND

I enjoyed the September 2006 Field & Stream readers’ poll more than I usually do. It asked whether readers believed that climate change was affecting fish and wildlife, or whether, instead, global warming was a hoax put up by tree-dwelling vegans. Only 29% denied that global warming was a threat.¹ When tree-dwelling vegans get 71% in Field & Stream, they are on a roll.

By April 2008, oil prices were on the vegans’ side, having risen to the almost unimaginable level of $100 per barrel. So the price of traditional fossil energy became an economic ally to those who, like tree-dwelling vegans, believe that traditional energy is a dead end for the global climate. Of course later in 2008, prices rose to almost $150 per barrel. As Governor Bill Richardson predicted in his 2007 book, Leading By Example, this rise in the price of basic energy appears to have contributed to a world-wide recession.² Rising energy prices, which have to be paid at the pump by commuters and on delivery by other consumers, forced tremendous pressure on family budgets in the United States, particularly households that “drove till they qualified” for lower-priced, far-suburban homes that were more economically accessible with gasoline at $1.25 per gallon than they became at $4 per gallon. Household budgets began backing up against mortgage commitments. It’s easier to let ninety days pass without paying the mortgage than it is to get to work without paying for gasoline several times a week. The direct connection between the mortgage crisis and spiking energy prices is one that will be explored and laid bare by future academics and scholars. For now it is simply an obvious fact.

While oil prices rose, so did the fortunes of the OPEC nations, the military, and nationalistic ambitions of many oil-rich nations. Russia began throttling sovereign nations whose policies weren’t Russia-friendly; European countries, dependent on Russian gas, held back their criticism. As oil prices were at their peak, Russia marched on Georgia, taking and holding territory previously controlled by the independent nation of Georgia. Iran, floating on petrodollars even though the United States doesn’t import its oil directly, felt perfectly safe making threats in the Gulf (remember the capture of a British patrol boat and fifteen British sailors?) and asserting itself both on the ground and in the politics of Iraq. Venezuela funded guerillas and challenged the United States both in the Western Hemisphere and at the United Nations. Sudan knows it is invulnerable to serious United Nations

oversight, despite the horrors of Darfur, because China is increasingly its biggest oil consumer and China’s economy can’t afford the cost of cutting back on the needed Sudanese supply. The international examples of oil-funded hubris and contention are many.

Meanwhile, the entities that had funded Al Qaeda over the decades were rolling in dough. The McKinsey Global Institute issued a paper in early 2008, before prices reached even half their peak, predicting the “coming oil windfall in the (Persian) Gulf.” Thus the United States, spending about $500 billion per year on foreign oil at inflated prices, and perhaps another $100 billion in defending oil shipping routes and oilfields, and another $150 billion per year (or more) on the Iraq war, was gushing oil dollars while others ran around collecting them. The Saudis, who have benefited tremendously from U.S. protection of the Gulf over the course of decades, and who trembled when Saddam Hussein’s forces invaded and held Kuwait in the early ’90s, criticized the U.S, for its gluttonous oil consumption habits (exceeded world-wide by only a few nations, including, of course, the Saudis). How long can our economy stand this kind of profligacy, these kinds of costs, these investments in fair-weather friends, and direct or indirect investment in our enemies?

Iran, Qatar, and Russia moved forward on the creation of a world-wide natural gas cartel. With the world’s seemingly bottomless appetite for oil and gas, why not? Why should OPEC have such an influence on world oil markets but nations controlling natural gas not have a similar influence? World gas markets are beginning to merge, with the construction of continental gaslines and the growth of liquefied natural gas in the world market. No longer is natural gas a local or regional commodity. In coming decades, it could be as subject to world price fluctuations and world demand fluctuations as oil has been.

The petroleum problem is that we are addicted to oil, not that we are addicted to foreign oil. With 2–3% of the world’s resources, and using 25% of its output, we can’t drill our way to energy independence. Our peak production passed in the 1970s. Every new barrel of domestic oil is going to cost more and more, as tertiary recovery becomes the norm, as new fields are farther and farther offshore and underground. We keep saying we plan to kick the habit, but we never do. In fact, while we talked about energy independence, we grew twice as dependent on foreign oil, which now constitutes more than 60% of our supply. Opening the Arctic Refuge would reduce this by about 5% ten years from now. Opening up and drilling the Outer Continental Shelf, everywhere we can, will produce an almost meaningless amount of oil compared to our projected consumption.

The fact is that we need to get off oil, quickly. We need to implement efficiencies (many of them objected to by the auto companies now begging for tens of billions of bailout dollars, and opposed by the oil companies that profit from our overdependence on their commodity), and we need to implement them fast. We need to develop alternatives, and we need to get them into the marketplace right away. This nation tried everything from nonchalance to domestic supply enhancement, and it didn’t work. Now it’s time to put real policies in place that
will create consumer choice and market competition, that will reduce our oil demand quickly, and will bring energy dollars home to the United States economy.

American households can’t afford the price spikes that suddenly gobble up large percentages of already committed budgets. Wall Street, starting with the price rise in the spring of 2008, can’t afford it either. January 3, 2008 Wall Street Journal headline: “Oil’s Surge Reshapes the World.” Investors see the threat of oil dependence and the absence of alternatives. Presto magico: a recession, slower tax receipts and climbing deficits, bear markets, investors going underground.

The “oil shockwave” isn’t necessarily about suddenly restricted supply, as it was in the 1970s oil embargoes. It’s about excessive demand and rising prices that throw the world economy into turmoil, stated by now Defense Secretary Robert Gates and the oil shockwave team three years ago. Their prescient analysis indicated things we should have seen coming and taken seriously. Instead, even with a completely pro-industry Congress and president, the nation spent the first five years of the twenty-first century digging itself deeper into the petroleum hole. Congress and the president offered nonsolution after nonsolution—drilling in the Arctic and offshore, minimal increases in fuel economy standards (that will be eaten up by increased vehicle miles traveled), off-and-on tax credits for wind and solar energy investment and production that send flashing red light signals to the important alternative energy industry. They propose coal-to-liquids options—petro-methadone that does anything but get the user off drugs and onto clean, long-term alternatives, and ethanol and biodiesel subsidies that likewise maintain our dependence on liquid fuels—now 97% of what we use to power transportation, about equivalent to what we import daily. Where large shifts are needed, we tend to stay inside the lines and increase our addiction.

There was that great headline in the New York Times last year: “Auto Chiefs Make Headway Against a Mileage Increase.” Another, “Move Over G.M., Toyota is No. 1.” Also, “Oil Industry Says Biofuel Push May Keep Gas Prices High.” They can’t keep up with fast-moving global markets and trends with their heads stuck in the sand.

II. SOLUTIONS 1–3: TRANSPORTATION

Transportation is where we use most of our oil—more than 60%. That is also how much we import. We need a transportation policy that considers energy supplies and creates incentives for alternatives. It is the important starting point for an entirely new approach to energy and climate.

---

5 Micheline Maynard, Rivals in the Rearview Mirror May Be Smaller Than They Appear, N.Y. TIMES, Apr. 25, 2007, at C1.
**A. Solution 1 – Efficiency**

Our cars should be much more efficient. Recent changes by Congress will boost miles per gallon to 35 by 2020. Europe and Japan are shooting for 50. Efficiency saves consumers money. It may cost an additional several hundred dollars to make a car more efficient, but the driver recoups that investment by purchasing less gasoline in the subsequent eighteen months, and then starts making a profit.

The California carbon emissions standards for automobiles and light trucks that Assemblywoman Fran Pavley got through to the Governor’s desk for signature several years ago will result in far lower carbon emissions—and much better gas mileage, probably 45 mpg in the same timeframe as the weak new federal standards. Yet the Administration has opposed them, denying California (and more than a dozen other states together representing more than half of U.S. drivers) a waiver from federal air standards for the first time since the passage of the Clean Air Act. The same day that the president signed the miserably low 35 mpg standard into law, the Environmental Protection Agency by some coincidence denied the waiver. What one hand giveth is quickly and much more meaningfully taken away by the other, doubtless with the complete foreknowledge of both the White House and the EPA.

Cars should be lighter, built with materials that increase safety and reduce weight. Tires should stay inflated. Engines can be designed to use significantly less fuel. We need more hybrid engines and soon, plugin hybrid engines. We should set industry standards so that auto makers around the world understand we want greater and greater efficiency—at least 75 mpg by 2030. If the automakers around today won’t build these more efficient cars, someone else will. But public policy tools need to be used now to achieve efficiencies needed for our national and economic security. We will “produce” far more oil with these efficiencies than we would with an all-now, nothing-later, oil-only domestic drilling policy. By adopting efficiency now, we allow future generations to make some mistakes of their own regarding oil and natural gas instead of using up all the affordable stuff before our children are even old enough to vote.

**B. Solution 2 – Fuel-switching**

The electric engine is four or five times as efficient as the internal combustion engine in turning raw energy into vehicle-miles traveled. Its time has come.

Electric engines are easier to maintain and easier to fuel (by plugging in at home overnight rather than stopping at the service station a couple times weekly). The battery technologies need work, and a national system of managing batteries so they don’t end up in landfills leaking toxics. We don’t want to open a new Pandora’s Box. Yet electrification should be our direction over coming decades.

Electric engines demand energy that is easy to regulate for carbon impact. Instead of attempting to reduce emissions from millions of gasoline engines emitting carbon, we can create more sustainable electricity supplies with increased
amounts of domestic, renewable fuel, and we can institute a cap and trade system that will move electricity providers such as coops and utilities away from carbon-heavy sources to produce electricity.

For now, electric engines don’t have adequate range for some users, as battery capacity is limited to about 40 miles of driving for most electric cars. Commuters can find them useful, and 75% of our driving is in the range below 40 miles. For now we must rely on booster engines to charge batteries much beyond this kind of daily range. Thus consumers will be buying two fuel systems when they buy a plugin electric hybrid, and they will need incentives, such as an instant rebate, to buy them in many cases. But it’s a change we need to subsidize, after decades of subsidizing the oil and auto industries.

Low-carbon fuel standards will help introduce carbon-efficient biofuels into liquid fuels markets. Today’s biofuel incentives, though improved by Senator Jeff Bingaman’s inclusion of some life-cycle carbon accounting in the production of some biofuels mandated in the 2007 Energy Policy Act, still tend to encourage biofuel production that creates a carbon impact almost equal to gasoline’s. Across-the-board, low-carbon fuels standards will encourage biofuel production from switchgrass and cellulosic fiber instead of from corn and other food sources, partly because these cellulosic alternatives require fewer inputs in the way of fertilizers, water, tilling and weed management. They are more compatible with many of our habitat management objectives as well.

These liquid fuel alternatives are particularly important in non-auto travel. Airplanes are unlikely ever to carry the weight of electric battery plugin systems, or to charge fast enough between flights. They will need liquid fuels—biofuels—for a long time. Similarly, providing biodiesel for long rail, ship, and truck travel will probably be more cost-effective than converting these distance-haulers to electric systems.

C. Solution 3 – Reduce Vehicle Miles Traveled

All this energy from renewable, domestic sources! Doesn’t it open up endless horizons?

Well, no. First, it will take decades for these measures to replace all the inefficient, carbon-emitting automobiles now on the roads. Second, producing biofuels and electricity is not zero-impact even if it is zero-carbon. The systems to produce and transport energy create impacts on water, wildlife, and land that should be reduced as much as possible. Overall, trying to create more livable, bikeable, walkable communities is essential. The mayors of more than 400 cities around the continent agree: they have committed to smart growth and transportation policies that enhance options for commuters, encourage developers to combine jobs and housing, limit sprawl, and develop community open spaces so that households have access to trails and parks instead of maintaining individual lawns and yards.

These smart growth options save consumers time and money. In the nation’s most drastic examples, such as Houston and Detroit, households spend more on
transportation than they do on home equity—and of course, equity in a car tends to diminish quickly while home equity is usually the core of a family’s long-term investment. Creating comfortable, safe communities allows children to walk to school, reduces time in traffic and commuting, and makes a metro area (from Portland, Oregon to New York City) more attractive to investment by knowledge-dependent industry in high tech and finance. In Amsterdam, despite rain and wind through many months of the year, more than 40% of residents commute by bike, maintaining their health and reducing their costs; of course, this is an old-world European model that many Americans aren’t excited about. But younger Americans seem more and more inspired by the bike and scooter lifestyle. Instead of planning to be what we have already been, the United States should create programs and incentives to grow—and reduce vehicle miles traveled—as we want to be in the future.

III. SOLUTIONS 4–5: INTERNATIONAL ENERGY POLICIES

As energy gamblers over recent decades, we have lost more than a few hands, and our pile of chips is looking meager. But we do have an ace in the hole: about 20% of our oil supply (or about a third of imports) comes from neighboring Canada and Mexico. These are nations that are generally friendly and whose oil transport routes don’t require much in the way of aircraft carrier fleet defense. In fact, you can’t get an aircraft carrier fleet up the Rio Grande or down the St. Lawrence Seaway, so we can’t even dream of spending as much on defending our neighbors’ oilfields and oil transportation routes as we do today around the world. (International climate solutions are addressed separately, under Solution 8.)

A. Solution 4 – The North American Energy Council

To date, we have allowed our relations with Mexico and Canada to go up and down. We have somewhat ignored these nations’ importance to us, and too often we are regarded as an overbearing, self-centered older brother.

Our interests in energy cooperation with Canada and Mexico are far broader than our interest in their oil and gas. We need to cooperate and access their hydrocarbon resources, for sure. But the potential for cooperation goes much further.

Mexico uses its oil and gas inefficiently and has trouble keeping up with oilfield management practices. These would be good places to start. We can help Mexico implement energy efficiencies and oilfield improvements that could sharply reduce oil demand and make Mexico’s economy accessible and efficient, benefiting people throughout the country. We could help develop international renewable energy markets and transmission systems, resulting in upgrades and improvements to Mexico’s electrical grid while providing resources back and forth across the border.

Canada is increasingly using its tar sands to provide oil to the United States. The technology to produce oil from tar sands is brutal, requiring large amounts of
energy to move and heat tar sands so that usable oil separates out. We need to work with the Canadians to reduce the carbon impact of this oil production method, and we need to include the life-cycle carbon impacts of tar sands in the consideration of fuels under a low-carbon fuel standard.

Further, we should cooperate in the development of a continental natural gas pipeline system that brings Canadian and Mexican gas to market alongside U.S. resources. The Alaska natural gas line that may wind through northwest Canada is an example that could benefit both the U.S. and Canada. Biofuel production, under accepted standards, could also be an important industry for Canada and Mexico.

The cooperation of Mexico, Canada, and the United States will increase technological exchange, opportunities for safe long-term investment, and economic opportunity throughout the continent, perhaps inspiring participation by allies in Latin America. Brazil has just announced the discovery of a supergiant field. Venezuela and other nations have significant oil and gas resources as well. Rather than range world-wide in search of needed traditional energy resources, the United States would do well to enhance its relations with its hemispheric partners toward an integrated continental energy economy.

B. Solution 5 – Gradual Multilateralization of Oil Defenses

Estimates of the U.S. taxpayers’ investment in defending major oil transport routes and oilfields, largely supertankers coming in and out of sensitive areas such as the Persian Gulf and the Straits of Malacca, and military presence and activity in oil-rich regions such as the mideast, range from $100–150 billion per year. This doesn’t include the $150-billion-plus per year investment that the United States made in deposing Saddam Hussein, who for decades ruled the world’s third-richest oil nation, and maintaining its presence in Iraq.

It is crucial for oil-rich nations such as Iran and Saudi Arabia to resolve their differences at least with respect to transport of the oil so crucial to their economic well-being. Instead, surrogates from the United States and Europe are patrolling the Gulf, sending carrier fleets in and out, separating hostile forces, and showing force when necessary. As it reduces its own dependence on foreign oil, with the measures recommended in these ten converging solutions, the United States should turn to the United Nations, the oil-consuming nations, and the oil-producing nations to develop and gradually implement a program that will shift most of the burden of defending and maintaining oil transport routes to the nations that benefit, and away from the U.S. taxpayer and military.

It is vital for all nations to share in the vision of stable, affordable energy world-wide. The United States should have a diminishing role as the world’s oil and gas policeman, instead of the increasing presence we have had in recent decades. We can’t afford to do it all, we can’t be effective doing it all, and we raise tensions and hostilities in some areas by attempting to do it all. The oil companies and the oil transport companies might not be very happy about it, but our subsidies of their activities are a hidden surcharge on every single barrel of oil we bring into the United States. This surcharge is not one paid at the pump, but will be absorbed
by future generations of taxpayers who will have to pay off our $10-trillion-plus
debt.

IV. SOLUTIONS 6–7: ELECTRICITY AND NATURAL GAS

It is an old and beloved axiom of policy analysis that solutions always cause
new problems. Truly valuable policy analysis, and truly effective legislation, will
try to anticipate some of the problems that the solutions may cause. In no place is
this axiom more obvious than in the recommendation to switch much of our
transportation energy demand from oil to electricity. We now obtain about half of
our electricity from coal. Yet coal produces about twice as much carbon load as
does natural gas. So by increasing our use of electricity, would we also increase
our already world-leading contribution to global warming?

A. Solution 6 – Gas and Electric Efficiency

California has proved it over the past twenty-five years: achieving high rates of
electrical efficiency (versus new generation) is both possible and profitable. Since
1985, California’s electricity use per capita has remained flat, at around 7500
kilowatt hours per year. This happened in the land of hot tubs, plasma televisions,
McMansions, all-night computers at home and at work, and world-leading water
transport and irrigation. Meanwhile the U.S. average increased about 60%, to more
than 12,000 kwh/yr. The California Energy Commission estimates that even
though electric rates have risen, these efficiencies save California consumers more
than a billion dollars per year because demand is much lower than it would have
been. As often stated by Ralph Cavanagh, my colleague at the Natural Resources
Defense Council, customers pay bills, not rates. If the rate is higher, but the
consumption is lower, there’s often a net savings to the customer, and certainly a
significant savings throughout the system.

The McKinsey Global Institute study, Reducing U.S. Greenhouse Gas
Emissions: How Much at What Cost?, issued in 2007, indicates that almost all the
efficiency activities we could implement—from demand-side management to
appliance standards—are cost-effective. These measures forestall expensive
construction of new generating facilities, and they reduce the spiraling costs of fuel
and energy demand. Construction and renovation of buildings so that they are more
efficient in their lighting, heating and cooling, and deflection of ambient wind,
heat, and cold could alone reduce gas and electric consumption by about 50%,
according to experts affiliated with the American Association of Architects.

These kinds of efficiencies make a lot of sense. They reduce electric and gas
demand at a significant net savings to consumers. They should be required because
markets tend to move slowly in implementing them, and because some utilities,

report.pdf.
whose efficiency programs have not yet been “decoupled” from energy sales, make
more money selling energy than conserving it.

We could also see significant new efficiencies in electricity transmission, by
producing energy closer to demand centers and by using new technologies on the
electric grid. This could include high-efficiency cable to grid management that
anticipates and coordinates electricity supply and demand much more accurately.
Transmission efficiency also provides the side benefit of reducing the impacts of
transmission lines on America’s lands, wildlife, and waterways.

B. Solution 7 – Renewable Energy

Windmills, solar collectors, geothermal systems are the wave of the future.
With them, investors eliminate the risk of fuel price changes as well as the
potential costs of reducing their carbon emissions. The nation’s supply of these
renewable energy resources is almost infinite, although today they constitute less
than 2% of our energy supply.

We are already starting to bring more renewable energy into our electricity
supply, as states institute “renewable portfolio standards” requiring utilities to
provide some percentage of their electricity from renewable sources. In New
Mexico, this is largely wind; in Arizona, it will likely be heavily solar; in Nevada,
it will be geothermal and solar. California is considering an increase in its
requirement that will result in 33% renewables by 2020. Along with renewable
energy investment and production tax credits, these requirements have jump-
started the wind industry and brought solar and geothermal back to life after a
couple of decades of little investment.

Renewable energy has some limits. Right now, solar collectors are more
expensive than most conventional energy options. Additionally, wind and solar are
variable according to immediate and seasonal conditions, unlike coal or nuclear
power. The resources are also sometimes distant from the demand. Thus it is
important to consider a broad variety of complementary policies, such as
transmission to energy storage than can even out wind and solar so they are
available 24/7. (Variability of wind and solar are generally manageable until they
grow to 15, 20, or 25% of electric supply, depending on grid-specific issues such
as size and reliability protections already present. We have time to research and
address the possible challenge of energy storage. The problem is that we seldom
use our time wisely in the energy policy field.)

Making our electric supply sustainable—instead of being so dependent on
conventional coal combustion or massive new nuclear investments that bring
concerns about cost, safety and waste management—is not going to happen
without huge new investments in wind, solar, and geothermal energy. Geothermal,
in particular, holds promise to become the baseload resource of our electric future.
A 2006 report on geothermal energy by the Massachusetts Institute of Technology
indicated that a minimal investment of about $1 billion per year for fifteen years
would make millions of megawatts of the earth’s dry heat available at acceptable
Paired with variable wind and solar, geothermal could become the backbone of a new, sustainable energy supply in the United States and around the world. However, coal and nuclear companies might not think it is such a great idea.

V. SOLUTIONS 8–10: CONTROLLING CARBON, PROTECTING CLIMATE

The world’s climate is changing. And it’s 90% likely that the cause is mostly human combustion of fossil fuels (and a few other practices that release carbon, such as soil management), according to a conservative group of international atmospheric scientists who have conducted decades of research. The changes, according to climate scientists in the western United States and a new report from the Natural Resources Defense Council called Hotter and Drier, are already underway in the West, with much greater drought, higher temperatures, and lower soil moisture that contributes to sharply increased wildfire occurrence and damage. The West is not now, and will not be, the place we have known.

Further, to prevent what they predict as “catastrophic” climate change that will accelerate sea level rise, storms, floods, disease, and a variety of other impacts, international climate scientists say we must reduce carbon emissions 80% over the next forty years or so. That’s a challenge. And we have to start now, or the changes become even more expensive and more difficult to achieve.

A. Solution 8 – Addressing Climate Change At Home and Abroad

The U.S. Interior Department says it can’t estimate the impacts of its actions—energy development, land management—on the climate. The issue is just too big to be considered in individual land management plans and environmental impact analyses. This is a symptom of a system that is pushing itself over a cliff, inch by inch, by maintaining its inertia and momentum. If we don’t change it, it goes over the cliff. That we know.

Similarly, in international forums and among the agencies that populate Washington, D.C., the United States has been saying we can’t rely on mandates and standards to reduce emissions. The President often talks about voluntary, incentive-based measures. Yet these have had little effect in his eight years in office, as U.S. emissions have kept rising and international emissions have skyrocketed.

The United States must, in the words of New Mexico Governor Bill Richardson’s recent book Leading By Example, lead by example. It must enact practical, effective steps to reduce its emissions and implement new energy

---

10 See Richardson, supra note 2.
policies. At the same time, it must rejoin the community of nations and urge mandatory reductions in carbon emissions. Other nations, particularly those that are growing fast (such as India and China), often point out that the atmosphere would not be in such a precarious situation and threatening the world’s basic ecological health without centuries of past coal- and oil-burning by the United States and other western economies. In other words, while the rest of the world continued to burn wood (producing emissions whose carbon comes from and returns to the atmosphere), advanced economies became experts at digging up energy in the form of coal and petroleum whose fossil carbon is added to the atmosphere.

The U.S. can recognize and accept this because our technological and investment capabilities are so great. If we commit to large reductions, we will incentivize the development of a carbon-reduction industry that can spread across the globe. It will be a second industrial revolution, centered on our science and our exports. But it can’t happen without an international agreement—one that again may not be very appealing to the coal and oil companies now so present and influential around the world. They would need to apply their great knowledge and expertise to marketing new types of energy instead of staying with their old business model. Few have sincerely adopted a long-term interest in developing energy alternatives.

Sir Nicholas Stern’s thorough economic analysis of the economic impact of climate change mitigation, commissioned by the British government, found in 2006 that it will cost far less to address climate change—perhaps the low single digits of international economic growth—than it will cost to allow climate change to unfold unabated. The costs of changing sea levels alone, as coastal infrastructure supporting more than half the world’s population is sunk or damaged at ports and cities around the world, will be gigantic. Add other impacts to sea level rise and climate change becomes an almost unimaginably expensive influence on the world economy.

Developing nations may need financial assistance if they are to meet new standards. The United States and other developed economies need to figure out how to make these new technologies accessible and affordable around the world. Cutting emissions will be difficult and complicated. Consider some more headlines from recent papers: “China, U.S. Spar at Climate Talks,” “Inside the Messy Reality Of Cutting CO2 Output,” “Greenhouse Gas Plan Throws Europe Off Guard.” What we are talking about is one of the biggest international efforts in human history. It will test our diplomatic structures and depth, and it will require a realistic, cold-blooded recognition of what the costs and benefits are to America and to the rest of the world. Yet failure to act ensures economic and environmental disaster.

B. Solution 9 – Freeze Conventional Coal

China is building as many as 1000 MW of new conventional coal generating capacity every week. India is shopping for coal mines throughout the world. The
U.S. was home to as many as 150 new coal plant proposals as recently as a year ago. We can’t go on like this.

Both nationally and internationally, we must stop building conventional coal combustion plants. Gasification of coal, with capture and sequestration of the carbon in coal (leaving hydrogen to power electric turbines), may be a climate-friendly option, but it is expensive and relatively untested. This means we should proceed with testing and deployment of these new technologies in places where coal is going to remain a core energy source, and we must enact the policies to adopt large amounts of efficiency and renewables (as stated above) in areas where coal is not necessarily the backbone of an energy economy.

In fact, meeting the emissions reductions targets we know we must meet to avoid “catastrophic” climate change, we should also begin retiring older conventional coal plants whose emissions are very difficult and very expensive to reduce. Pulling carbon out of the exhaust gas (flue gas) of a conventional coal plant will require new technologies and energy penalties that probably make the concept very impractical. Rather than invest in retrofitting a large number of these older coal plants, we should move to production of new energy sources to displace that coal energy. This is the kind of change that can’t, and shouldn’t, happen quickly. But as these plants reach their natural retirement in coming decades, they should be replaced with low- and zero-carbon alternatives.

This may seem, in the course of the day-to-day economic analyses that have gotten us where we are today, to be an unjustifiable approach: why close these plants producing large amounts of low-cost, baseload power? But today’s economic analyses need to be about more than the dollars and cents of buying and burning coal to produce electrons. They need to include the environmental and climate costs of the carbon we can’t afford to keep injecting into the atmosphere, as well as all the hidden subsidies for our current energy system, from national security to petrodollar exports.

C. Solution 10 – Creating Carbon Markets

The most efficient way to encourage efficiency, to reduce carbon emissions, and to incent the adoption of renewable energy is to move the markets. We do it daily through the Federal Reserve’s policies. We do it by investing public dollars in certain types of infrastructure (highways) and not others (rail). We do it by setting standards regarding how many and which pollutants a facility can emit, or how many miles per gallon a fleet of cars must achieve. We do it by setting tobacco taxes and requiring display of the Surgeon General’s warning on packages containing cigarettes. We should have done it with respect to management of housing finance in the past decade, and our failure to regulate these markets (as with carbon emissions) created a vast economic problem.

Thus the concept of creating a market-based, maximally efficient approach to controlling carbon emissions is hardly outside the mainstream of economic thought or regulatory practice in the United States.
The concept of a carbon market is similar to the “cap and trade” approach enacted in the Clean Air Amendments of 1990 to control acid rain emissions in the northeast and Midwest United States. Lakes and waterways in New England (particularly) were dying. The cause was acid deposition, largely sulfur, produced to the west and transported and deposited in the northeastern states. The solution was the reduction of the emissions containing acid rain pollutants.

The Clean Air Act amendments set up a cap and trade system to gradually reduce the overall allowable amount of pollution, and then allow potential emitters to vie for the permits. After the initial round of allocations, they could buy and trade permits depending on their need. Companies that reduced their emissions would reduce their need for permits. Companies that didn’t reduce their demand faced the prospect of buying permits from others as the pollution permit ceiling dropped lower.

As a result, utilities switched, quickly, to low-sulfur coal, they bought and installed bags and filters and scrubbers to remove sulfur (and other pollutants contributing to acid rain), and they beat the schedule for reducing acid rain emissions. They moved so quickly that the cost of an emissions permit ended up being about one-quarter what economists and utilities had predicted. The market, in other words, responded to the regulatory conditions and costs that utilities and other emitters could feel in the marketplace, and to the certainty that over all, acid rain emissions were going to become more and more expensive.

Cap and trade worked more efficiently than a pollution tax or site-by-site command and control regulation would have. A carbon tax does not include the hard ceiling on emissions critical to reducing pollution—without the hard cap, emissions would rise, unpredictably and perhaps in excess of scientifically acceptable levels—when economic conditions are such that emitters decide it is worth paying the pollution tax to make a return on the activity generating the pollution. In other words, a future economic boom could create a collateral pollution boom. Command-and-control regulation, in concert with a pollution tax, could limit the amount of emissions overall, but it would require individual regulation of individual facilities, and would create openings for political decision-making that prefers one potential emitter over another. Thus, in my view, a cap and trade system is preferable for pollutants that don’t have toxic or local impacts, such as carbon. (It clearly doesn’t work for mercury and other toxics that could create public health hot spots.)

The same approach as that applied to the acid rain problem will reduce carbon emissions in the most efficient, effective fashion. Carbon emitters, seeing that overall carbon emissions limits will drop perhaps 2% per year, will move to more efficient and lower-carbon systems. If the carbon market is designed and rolled out sensibly (without too many offsets or free allocations), they will want to avoid uncertain costs, and will move ahead with reductions quickly, in anticipation of the standards and costs.

The nation needs such a system but Congress has been high-centered by climate change deniers for more than a decade. Now the deniers are turning into detailers who will probably never be satisfied with the content of any carbon
legislation. Thus, in the absence of federal and international action, the proposed Western Climate Initiative, or WCI, becomes the regional template for carbon emissions reductions in a regional context.

Environmental justice advocates raise the valid concern that creation of a carbon market could result in concentration of certain emissions sources such as power plants, or allow some egregious polluters to continue polluting near low-income settlements. It isn’t easy for low-income people to attract regulators’ attention to plants that belch toxics. Sometimes, in fact, state-level regulators are politically prevented from taking steps they know they should be taking to enforce basic environmental laws in defense of human health. Any decision to create a carbon market should be paired with aggressive, comprehensive enforcement of environmental laws protecting human health, especially in areas where carbon emissions appear to concentrate as emissions limits are reduced.

The WCI, comprising seven states with a mix of Canadian provinces and states with both Republican and Democratic leadership (Arizona, California, Montana, New Mexico, Oregon, Utah and Washington), will establish a regional cap and trade program to set a hard ceiling on carbon emissions and subsequently allow buying and trading of carbon pollution permits by potential emitters.

Critics say the WCI can’t solve global warming by itself. If they recognize the threat of climate change, they think the problem is international and the solution must be international.

That’s where the energy, security, climate convergence comes home.

The solutions to our energy and security challenges are largely the same as, or overlap substantially with, the solutions to our global climate challenge.

The solutions to our energy, security, and climate challenges create economic returns and benefits in the same ways: bringing energy dollars back into the domestic economy; creating efficiencies, market competition, and consumer choice that enhance markets and increase productivity and reliance.

The solutions to the energy, security, and climate challenges facing the nation call upon our world-leading technological, scientific, and financial expertise, and promise large new domestic and international profit centers in an otherwise vulnerable economy.

The solutions to our energy, security, and climate challenges also reposition the United States internationally. Instead of being an energy-insecure nation, fearful about the future of the oil supply that it largely imports and profligately inefficient both in our use of that energy and the dollars we spend to defend oil around the world, we can become a nation beholden to no Middle East or South American or African or Asian oil producers. We can leave the competition for oil and energy to those nations that fail to develop alternatives and to reshape their energy markets.

Creating carbon markets thus emerges as not the last and least of the ten converging solutions, but the one that ties them all together into a coherent batch of concerted strategies. Creating carbon markets, internal to the United States and internationally, sets the other nine solutions in motion, and provides a foundation and a context for them. Because both major presidential candidates have embraced
carbon cap and trade, we can all hope that Congress will move quickly, after the Bush Administration moves on, to enact carbon cap and trade. Until that happens, we must institute regional cap and trade wherever possible, coast to coast.

VI. CONCLUSION

The nation’s energy problems have magnified and echoed throughout the United States and across the globe for decades: overdependence on oil has affected almost everything we do economically and internationally. The globe’s growing climate problem has shifted more attention to the failure of our energy policies. The attack on our nation on September 11, 2001, by terrorists whose funding came from oil nations and a Saudi oil fortune, is an indirect consequence of the growth of oil markets and the oil economy over the last century. Furthermore, the U.S. interest (and expenditure in lives and taxpayer funding) in Iraq is hardly divisible from our interest in oil; there have been many other horrible dictators whom we have not painted as a threat to the United States and whom we have ignored for decades.

All these issues and challenges have converged in recent years. And as a consequence, the solutions have also converged.

With a comprehensive, complementary set of new policies related to energy security, and climate, the United States is positioned to lead the world to a better economic and environmental future less fraught with conflict related to energy supply and demand.

Denmark is doing it. Little Denmark. Conservative, progressive, confusing Denmark is doing it with pig fat, wind, taxes, bicycles and electric cars. These are the decisions that must be made. Denmark has decided it needs to insulate itself from the volatility of world energy supply and demand. It doesn’t have the military strength or the world market presence to affect the world, so it needs to protect itself. It doesn’t have the income to throw away petrodollars but it has the income to invest in its own energy future. Slightly more expensive now, but it is a vastly efficient investment for the future.

Ten easy steps—ten converging solutions—will create a similar sustainability and independence here in the United States. Our resources and our strengths are much larger than Denmark’s. Admittedly, Denmark doesn’t have Congress and isn’t home (figuratively or literally) to the world’s largest coal company. But it is definitely to our benefit that we have these strengths and resources here in the United States. We can do more, faster and at lower unit cost, than Denmark can do. We should embrace the challenge before we find it is too late. We will create a brighter future and diminish the energy, security, and climate threats that overshadow us today.

THANKS AND ACKNOWLEDGMENTS

I appreciate being invited to address the Stegner Symposium on this topic. Mr. Stegner was a great writer and thinker, someone I and so many others admired for
his forthrightness and vision. At this year’s symposium, I learned a lot listening to the other speakers and to members of the audience who spoke up. Thanks to Governor Huntsman for being a bold Utah Governor who brings business acumen, international experience, and republican values to the energy, security and climate agenda. Thanks to the Stegner Center staff who prepared an excellent event and helped people like me get there on time and in the right place. Thanks also to Megan Anderson and her colleagues who helped organize the publication of the Stegner Symposium proceedings. And thanks to the Wall Street Journal, the New York Times, the Economist, the McKinsey Global Institute, the Natural Resources Defense Council, Field and Stream, and Governor Bill Richardson’s Leading By Example for providing the material and underpinnings of much of my presentation.