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Energy Security is National Security

By Keith W. Cooley for:

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Keith W. Cooley, engineer, strategist and corporate executive for more than 40 years is a business leader focusing his talents on developing policy, creating strategies and working collaboratively to stimulate innovative activism for energy, power and workforce programs that assure environmental sustainability. His diverse background in corporate, university, not for profit and government settings combines a formal training in scientific method and facts based analysis with years of real world know-how building and leading teams, empowering others and fostering innovative risk taking. This blend of skill-set with experience has produced proven results in advocacy, dispute resolution and coalition building especially between groups with differing agendas who must find common ground to create unique solutions to especially thorny problems.

Cooley, currently CEO of advisory firm, Principia, LLC, was most recently President and Chief Executive Officer of NextEnergy, an accelerator for alternative energy businesses and technologies. There at the request of Michigan's Governor Granholm, he led the creation of a sorely needed and robust sustainability plan; helped the organization reconnect to vital funding from the foundation community; and hosted Vice President Biden's announcement of a \$1.3 billion award to Michigan business for vehicle electrification before expanding his interests to form Principia.

Prior to joining NextEnergy, Cooley was the Director of the Department of Labor & Economic Growth (DLEG) and a cabinet member to the Governor. In this capacity, he directed the activities of more than 4,000 employees in 35 agencies and managed a \$1.4 billion budget. His principal objective was to "up-skill" Michigan's workforce to compete in a global arena and provide opportunities for economic recovery. Mr. Cooley's background includes work as an experimental physicist, engineering program manager, strategic planner, and CEO of Focus: HOPE; where he championed the celebrated civil and human rights organization's work in manufacturing technology and workforce development serving underrepresented urban youth.

His professional activities and affiliations include membership in the Engineering Society of Detroit and service with The University of Michigan Engineering Advisory Council; and the Michigan Environmental Council. He has been recognized in Who's Who in the World, named a Tau Beta Pi Eminent Engineer, and received the General Motors President's Council Honors.

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An Introduction to Energy Security as National Security

Defining national security can be a difficult undertaking because it can mean different things to different people. George Kennan has offered, in my mind, perhaps the least complicated but reasonable definition: "...the continued ability of a country to pursue its internal life without serious interference...."¹

Over the years the world has shrunk because of the many technological advances that now seem commonplace (e.g. the internet, global positioning satellites, electronic convergence) and with that shrinking the context in which the term "national security" is defined has morphed. Forty years ago no one would think it possible to be able to track someone's whereabouts using only a telephone (at that time a phone represented a location... not a person, per se); the same holds true for the idea of stealing government secrets in the middle of the night... while sitting thousands of miles away in the comfort of one's own home; and certainly few people would have believed that the survival of the species could be threatened by the thoughtless acquisition and use of carbon laden fuels. Yet each of these concepts is now an everyday reality and in their own way they contribute to our national feeling of insecurity personally and nationally.

Energy security can be described in many ways, but for the purposes of this briefing, to paraphrase the International Energy Association, let's simply call it "...the assurance of the uninterrupted supply of energy at an affordable price, while respecting environmental concerns...."²

Of late we have seen energy insecurity growing at an alarming rate. From the ability of hackers to disrupt the flow of power on an international Internet-reliant grid; to the seemingly innocuous decision to make critical parts for energy distribution systems offshore... that backfires the moment our supply base decides they are our competitors; to the growing threat to health and safety from oil spills and the environmental contamination it breeds, it is clear that ready access to cheap energy is becoming evermore problematic. When you factor in the uneven distribution of energy availability in countries across the globe and the manipulation of fuel pricing that threatens geopolitical stability, the problem becomes even more complex.



This paper will address the notion of energy security as national security from four points of view that are in my opinion strategic priorities:

Priority 4) Wide spread increased dependence on domestic energy efficiency;

Priority 3) Migrating to alternative (sometimes called "clean") energy sources;

Priority 2) Developing and sustaining a US alternative energy capability;

Priority 1) Creating strong civic, business and political leadership to quickly implement needed changes that assure energy and national security for this country

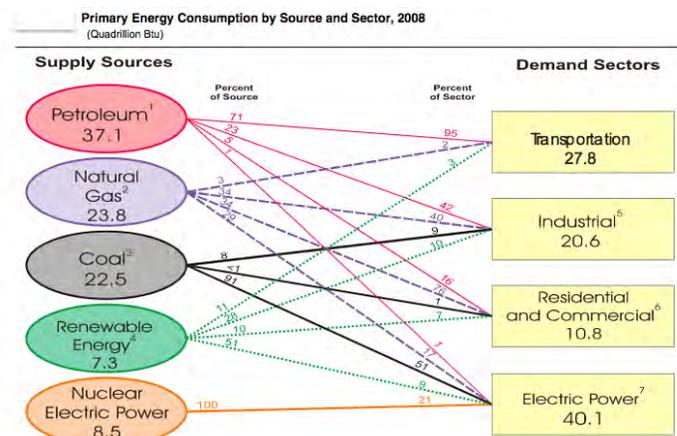
The Facts:

Energy supply and demand plays an increasingly vital role in our national security and the economic output of our nation. It is not surprising that we spend more than \$500 billion annually on energy.

The United States, on both domestic and military fronts, is a tremendous user of the world's proven supplies of energy. It is the world's 2nd largest consumer in total usage at roughly 100 quadrillion BTUs³ annually of a 451 quadrillion BTU flow. Put

differently, that means that 4.5% of the world's population uses 21% of the world's energy. For those of us who have traveled abroad, it is clear that energy is not only accessible, but also comparatively cheap.

As one might suspect the majority of our fuels are petroleum/oil based at 38% followed by coal at 23% and 24% from natural gas. Nuclear power provides 8% and renewables weigh in at 7%.⁴



Moreover our appetite for power and energy is continually growing. Facts pulled from a brutal but honest assessment by Financier Michael Milken⁵ suggests an unsustainable (translate as “addictive”) appetite for oil over the last 35 years:

Year	Foreign Oil Dependence	Quote from the then sitting President
1974	36.1%	President Richard Nixon said, “At the end of this decade, in the year 1980, the United States will not be dependent on any other country for the energy we need.”
1979	40.5%	President Jimmy Carter said, “Beginning this moment, this nation will never use more foreign oil than we did in 1977 – never.”
1981	43.6%	President Ronald Reagan said, “While conservation is worthy in itself, the best answer is to try to make us independent of outside sources to the greatest extent possible for our energy.”
1995	49.8%	President Bill Clinton said, “The nation’s growing reliance on imports of oil...threatens the nation’s security...[we] will continue efforts to...enhance domestic energy production.”
2006	65.5%	President George W. Bush said, “Breakthroughs...will help us reach another great goal: to replace more than 75 percent of our oil imports from the Middle East by 2025.”
2009	66.2%	President Barack Obama said, “It will be the policy of my administration to reverse our dependence on foreign oil while building a new energy economy that will create millions of jobs.”

It is also clear that we are not the only substantial user of the world's energy supplies. China, just this year, has overtaken the US as the world's largest energy consumer.⁶

Without going into more detail the facts are unambiguous. The US economy:

- Uses more of the world's energy resources than anyone else (except China)
- Is using these resources at an ever-increasing rate
- Is importing more of its energy supplies each year
- Is in competition with our global neighbors for available proven reserves
- Needs a cheap, readily accessible supply of energy to continue to thrive

Clearly strategies that lessen our dependence on "traditional fuels from traditional sources" are, without doubt, needed if we are to preserve our place in the global "pecking order".

So let us take a look at four strategic priorities that can greatly assist our efforts to have the energy we need when we need it AND continue our role as a global leader.

Strategic Priority #4: Widespread increased reliance on energy efficiency

Energy efficiency simply means using *less* energy to produce the *same level* of energy service. For example insulating a building allows the use of less heating and/or cooling energy to achieve and hold a comfortable temperature for its occupants. The use of florescent lighting and natural lighting (e.g. skylights) can in many circumstances provide as much or more light energy as a conventional incandescent light bulb. If there is any path that can quickly and easily move us towards greater energy security it is energy efficiency.

A McKinsey & Company report entitled "Unlocking Energy Efficiency in the U.S. Economy" states, in part, that:

"... Energy efficiency offers a vast, low cost energy resource for the U.S. economy – but only if the nation can craft a comprehensive and innovative approach to unlock it.... If executed at scale, a holistic approach would yield gross energy savings of up to \$1.2 trillion...."

This \$1.2 trillion savings on energy, which does not include the transportation sector, nor factor in the cost of green house gas emissions, could cut the country's energy usage by as much as 23% (~ 9.1 quadrillion BTU's) in the year 2020... that would be more than enough to offset the expected growth in U.S. energy use if we continue at a "business as usual" pace.

Note that this savings comes from a \$520 billion investment in energy efficiency improvements like insulating basements, replacing old inefficient appliances with newer ones and sealing leaky building ducts.

With these energy savings comes the opportunity for consumers (whether commercial or residential) to take those same dollars previously used for energy generation and

allow them to flow into other portions of our U.S. economy... for example to offset costs of critical services like education and health care... as opposed to an economic model that sends many of those dollars overseas.

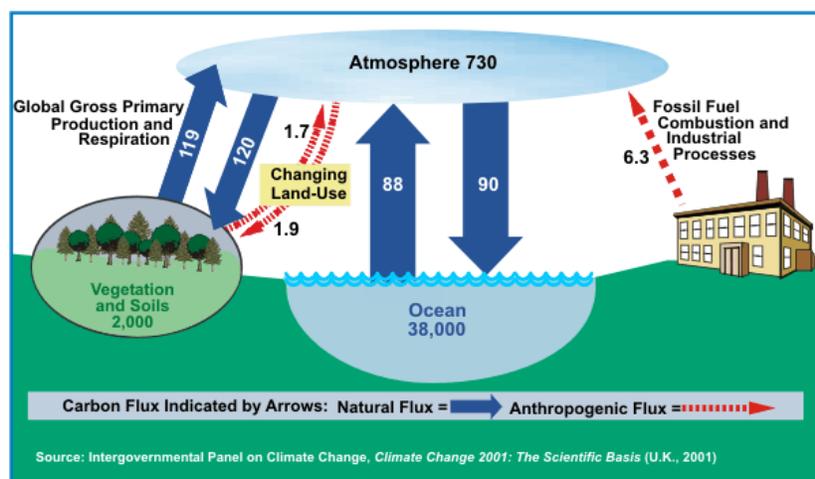
For the military, a comprehensive energy efficiency plan focusing on the war fighter would suggest, again, the ability to access the same level of energy services at a much lower energy cost. Lower energy costs “in country” may very well translate into lower fuel consumption. As I’ve heard it stated, “... the less we have to use... the less we have to carry....”

Just as important is the notion that as the U.S. begins a serious effort to downsize its energy use; especially usage that depletes precious fossil fuel reserves; more nations of the world will begin to see us as serious partners in the hunt for comprehensive solutions to global warming as well as to health hazards that arise from using oil, gasoline, diesel, etc. As that happens, we will find ourselves in better standing with countries that, in my opinion, now see us as addicted to energy at any cost. Their sense of us will change because of our significant efforts to commit to a more sustainable world through a change in perspective and behavior.

Strategic Priority #3: Migration to alternative energy sources leading to less dependence on carbon intensive fossil fuels

There are at least two significant reasons the U.S. must migrate from fossil fuels to alternative (sometimes called “clean”) sources (e.g. solar, wind, geothermal, bio mass) in the near future:

Foremost is the fact that power generation by such means expels significant amounts of carbon into the atmosphere (~6.3 billion metric tons globally on an annual basis, see graphic below⁸). This contributes to an ever-increasing global warming trend for which the U.S. is responsible for fully 25%.



Global Carbon Cycle (Billion Metric Tons Carbon)

Experts believe the effects of this warming will be adverse, especially for the U.S.: “Likely future changes for the United States and surrounding coastal waters include

more intense hurricanes with related increases in wind, rain, and storm surges ... as well as drier conditions in the Southwest and Caribbean. These changes will affect human health, water supply, agriculture, coastal areas, and many other aspects of society and the natural environment.”⁹

Moving to alternative fuel sources will greatly slow the rate at which we add to the problem because we will be reducing the amount of pollutants we put in the air. That will be a huge step forward toward slowing, stopping and eventually reversing global warming.

Secondly, as competition for these fuels increases, the cost to the U.S. in dollars and materiel (military equipment, apparatus, supplies, etc.) must increase along with a significant loss in global goodwill. China and India lead a contingent of emerging nations that will need more oil to sustain their rise in economic and military clout... and they will seek those resources from the same places we do... the Middle East (e.g. Iraq, Saudi Arabia, etc.), Africa (e.g. Nigeria) and South America (e.g. Venezuela). The U.S., no doubt, will fight to keep its energy supply intact.

On that subject, the following opinion was voiced: “Some countries such as the US (sic) have enormous military expenditure in part to protect global oil areas for their interests. A number of other large countries are getting more involved or active in the international arena due to energy related concerns, including China and Russia prompting a fear of a geopolitical cold war centered around energy security.”¹⁰

Moving to alternative fuels that significantly decrease our dependence on foreign owned supplies will significantly reduce the level of competition in which we must engage to assure uninterrupted access to power and energy.

Of course, other reasons for making the transition are abundant. Included are:

- A “green economy” based on alternative energy will require a workforce skilled in “green jobs”, an economy that will be associated with fewer health problems than that of our present energy/power generation industry and an economy built on “knowledge work”. This suggests better paying high tech jobs that will boost the U.S economy and stabilize/raise the standard of living for millions of Americans.
- The sooner we make the change over, the sooner we put the hurdles to such a change behind us... whether they are technological, process difficulties, consumer acceptance, cost benefits of economies of scale, etc.
- And of course we cannot leave out the smaller number of significant oil spills/leakages that will occur (a la the BP/Deepwater Horizon mishap in the Gulf this summer) around the globe as these fuels become less and less important to satisfying our energy needs. Fewer spills create fewer environmental concerns.

Clearly then, moving to carbon based fossil fuel alternatives for power and energy generation is an imperative if we are to overcome a series of key challenges to our present way of life.

Strategic Priority #2: Assuring that alternative energy creation, refinement and manufacturing prowess starts and stays in the U.S.

Over the past one hundred years the American scientific, research, design and manufacturing base has given the world thousands of technological advances from motorcars to spacecraft to cancer fighting breakthroughs. Not only have many of these advances provided a better standard of living for much of the rest of the world... it has given the U.S. a competitive global position second to none. As you might suspect that number one standing comes with a significant investment price tag.

A quick look at the numbers reveals that the Federal Government's investment has not been there. "...the federal government spends less than 1 percent of its R&D budget on energy—a level less than one-fifth of expenditures in the 1970s and 1980s—clearly insufficient in light of coming challenges...."¹¹ This is true not only in energy but in most areas of scientific, technological and manufacturing endeavor we would consider critical to our goal of self-sufficiency.

With that in mind it should come as no surprise that the U.S. scientific/industrial base has been eroding over the past five decades and our ability to continue to supply an ever accelerating series of "game changing" technical breakthroughs is heavily dependent on our commitment to such an effort... a investment in dollars as well as in the American creative spirit.

We must now focus our efforts on clean energy advances that improve existing technology while developing the "disruptive" proofs of concept that will lead us to the next level of energy/power generation and storage capability. We need this to happen in a number of areas if a comprehensive "green" future is to be realized. That includes investments in power generation, energy storage, sustainable transportation and "smart grid" technology to name just a few.

At the same time we will need to shore up our crumbling manufacturing base; one that not long ago lead the world in providing a host of products on a national and international basis. By that I mean the gears, bearings, advanced materials and electronics that were the bedrock of manufacturing in the "old economy"... and will become the critical elements we need in years to come for wind turbines, solar cells, biomass gasification generators, etc. to slow the pace of global warming. This will benefit not only us, but also citizens of the entire world community.

On the other hand, failure to embrace this course of action will lead to a loss of our global innovation leadership. That in turn will lead to a loss of status for us in the global "pecking order" with negative impact to our economy and a substantial downgrading of the American way of life *as we have known it*. Implicit in this loss is the notion that we will have to buy "green" products, for both domestic and military purposes, from others. National security interests alone "scream" at us that this is an unsafe place to be. The cost to the U.S. can certainly not be any less ... and may be so very much more than the cost of investing in technological, scientific and manufacturing leadership now.

Strategic Priority #1: Creating strong civic, business and political leadership to quickly implement needed changes that assure U.S. energy and national security

I have made this priority #1 because to me it is the most important. The best plans in the world are little more than paper and ink unless they are acted upon! Unfortunately we find ourselves in just such a circumstance. We have known for years how precarious our position has been. We know what we should do about it... and we know, at least in the short term, how to go about implementing the plans.

If we do, we can reduce and eventually stop global warming and the problems it could bring; we can lessen tensions between our global neighbors and ourselves that would otherwise grow because of the increased competition for a diminishing, but precious natural resource (foreign oil); and we can revitalize a U.S. economy (built on alternative energy solutions), create needed “green” jobs and rebuild a standard of living that was once foremost in the world. This work can start with priorities 2-4 discussed above.

Creating this “collective will” to make the changes we have talked about will be a major undertaking requiring the attention and commitment of our nation’s principal leaders in government, business and community. It will not be an easy task, but one that has been accomplished in many other parts of the world and, on a smaller scale, in the U.S. It happens when opinion leaders in the community see the need for change and convince those in power, sometimes one person at a time, to commit to and lead initiatives that change the thinking and behavior of the community at large. Pulling from examples across the globe; China and Europe (Wind and Solar) to Brazil (Sugar cane ethanol) and from projects here in the U.S.; Seattle, WA, Portland, OR and Minneapolis/St Paul, MN (“Green” jobs in weatherization/energy efficiency) America can take lessons from best practices in these locales and create a roadmap for national implementation.

This same collective will has been a part of U.S. history throughout the country’s existence. Most notably in the 1940’s when we saw President Franklin Roosevelt’s “Arsenal of Democracy” quickly transform Detroit auto production to the building of bombers, tanks and guns for World War II; in the 1950’s when the creation of a national interstate highway championed by President Dwight D. Eisenhower connected the nation in a way not previously possible; and when the U.S./Soviet “space race” of the late 50’s and 60’s was all but won by the realization of President John Kennedy’s 1962 vision of having a man on the moon by the end of the decade. We also will take lessons from these examples to realize the clean, environmentally sustainable, prosperous and socially equitable future we all desire.

Conclusion/Summary:

U.S. energy insecurity is growing as more countries of the world compete for a fixed (some would say diminishing) quantity of oil to satisfy growing energy appetites. This insecurity is worsened by the harmful effect that the burning of fossil fuels has on our atmosphere, exacerbating an already dangerous greenhouse gas problem that will negatively impact the health of the nation and its rich, diverse environment.

Overcoming these challenges starts with actions in four specific areas outlined above (viz. Increased energy efficiency, increased “clean” energy use, assuring a U.S. clean energy technical/manufacturing capability and possessing the will to act). Of all of these strategies the most important and the one for which we have done little to implement is *moving to real action*.

We know what we need to do to increase U.S. energy efficiency. Energy audits to gauge the need, installation of improved lighting systems and upgraded insulation as well as the use of energy efficient appliances are “off the shelf” strategies we can implement immediately. When paired with thoughtful growth planning, especially in urban areas and state of the art Leadership in Energy & Environmental Design (LEED) sustainable building design we can move the country to an increasingly smaller carbon footprint over the next few decades.

Mandating a national energy policy that calls for increased use of low or carbon free renewable energy sources can be done *now*... and the manufacturing of clean energy products in the U.S. for installation and use all over the country is feasible *now*.

The creation of a series of new U.S. energy research laboratories where innovative, disruptive concepts can be discovered, explored and proven is within our means at this very moment in time. The ability to safeguard the intellectual property from these discoveries as well as the means to produce such products here in the U.S. is ours if we want it.

The creation of millions of new higher paying jobs driven by the demand for clean energy technology from entry level/green collar jobs to engineers and scientists can begin *now*. Those jobs can be shared now by every segment in our society regardless of economic standing or “accident of birth”.

The question we must collectively answer, as a nation is this: If we really want to remain the master/mistress of our own destiny; and if the means to do it are clearly at our disposal... then why have we not done so?

I suspect the answer to that question is not an easy one, or if it is, it is not an easy one to hear. I suspect the answer to that question has to do with intestinal fortitude and the willingness to sacrifice short-term comfort for longer term/longer lasting gain. I also believe the answer to that question tells us a lot about our ability to act in unity for the good of the entire nation as opposed to the good of narrow-minded and somewhat insular interests. Whatever the case, those of us who understand the critical role energy security and environmental sustainability play in assuring national security have no other option but to endorse and encourage in the strongest ways the implementation of these priorities.

The comments Lou Glazier¹², head of *Michigan Futures* made, when outlining the path forward for the State of Michigan’s economic revitalization are just as applicable for our nation.

“It’s inconceivable to us that the big changes we are recommending can happen without strong civic and business (and ultimately political) leadership. If this project is going to avoid just sitting on

the shelf, *there needs to be some group with clout that takes ownership of this agenda.* It is an essential ingredient in our future economic success.” (Italics mine)

This paper is written to urge action on energy security issues at the highest levels of government, industry, and civic engagement. We have many examples to draw lessons from both here and abroad that can inform our actions. But we must act; we must engage... it is the only path to our survival available.

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