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#### Financial incentives must be targeted at energy generation

O’Brien, Minister of State, Department for Energy and Climate Change, UK Parliament, 11/18/’8

(Mike, “Clause 20 — Terms and conditions,” <http://www.theyworkforyou.com/debate/?id=2008-11-18b.159.3>)

I have quite a lot still to say, so I shall try to give as full a reply, and as brief, as possible. Amendment (b) to Lords amendment No. 42 suggests we replace the term "financial incentives" in proposed new subsection (2)(a) with "payment". The use of the term "financial incentives" clarifies that the general purpose of the scheme is to incentivise low-carbon electricity generation through financial incentives, as opposed to other means such as a regulatory obligation or barrier-busting support, such as help with the planning system. We believe that such clarity is helpful in setting out beyond any doubt the primary purpose of the scheme. However, to give additional reassurances about our intentions, I would point to the powers under proposed new subsection (3) that specifies the term "payment" in all the key provisions that will establish the scheme. In others words, it is explicit that we are dealing with payments to small-scale generators. What is proposed will be a real feed-in tariff scheme.

#### R&D isn’t tied to energy production—plan is an indirect incentive

EIA, Energy Information Administration, Office of Energy Markets and End Use, U.S. DOE, ‘92

(“Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets,” <ftp://tonto.eia.doe.gov/service/emeu9202.pdf>)

Research and development. The budgetary cost of Government-funded research and development (R&D) is easy to measure. Determining the extent to which Government energy R&D is a subsidy is more problematic: often it takes the form of a direct payment to producers or consumers, but the payment is not tied to the production or consumption of energy in the present. If successful, Federal-applied R&D will affect future energy prices and costs, and so could be considered an indirect subsidy.

#### Vote Neg—tons of bidirectional mechanisms impact energy tech in ways that could increase production—only direct financial disbursements for increased production create a predictable and manageable topic

EIA, Energy Information Administration, Office of Energy Markets and End Use, U.S. DOE, ‘92

(“Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets,” <ftp://tonto.eia.doe.gov/service/emeu9202.pdf>)

In some sense, most Federal policies have the potential to affect energy markets. Policies supporting economic stability or economic growth have energy market consequences; so also do Government policies supporting highway development or affordable housing. The interaction between any of these policies and energy market outcomes may be worthy of study. However, energy impacts of such policies would be incidental to their primary purpose and are not examined here. Instead, this report focuses on Government actions whose prima facie purpose is to affect energy market outcomes, whether through financial incentives, regulation, public enterprise, or research and development.

# death

#### The aff’s invocation of death impacts is necrophilia, a blind obsession with body counts that ends in extinction. Vote neg to reject death impacts—this is a gateway issue—if they win death impacts are good, the rest of the 1NC applies—we won’t cross-apply to prove links

Erich **Fromm 64**, PhD in sociology from Heidelberg in 1922, psychology prof at MSU in the 60’s, “Creators and Destroyers”, The Saturday Review, New York (04. January 1964), pp. 22-25

People are aware of the possibility of nuclear war; they are aware of the destruction such a war could bring with it--and yet they seemingly make no effort to avoid it. Most of us are puzzled by this behavior because we start out from the premise that people love life and fear death. Perhaps we should be less puzzled if we questioned this premise. Maybe there are many people who are indifferent to life and many others who do not love life but who do love death. There is an orientation which we may call love of life (biophilia); it is the normal orientation among healthy persons. But there is also to be found in others a deep attraction to death which, following Unamuno's classic speech made at the University of Salamanca (1938), I call necrophilia. It is the attitude which a Franco general, Millán Astray, expressed in the slogan "Long live death, thus provoking Unamuno’s protest against this "necrophilous and senseless cry." Who is a necrophilous person? He is one who is attracted to and fascinated by all that is not alive, to all that is dead; to corpses, to decay, to feces, to dirt. Necrophiles are those people who love to talk about sickness, burials, death. They come to life precisely when they can talk about death. A clear example of the pure necrophilous type was Hitler. He was fascinated by destruction, and the smell of death was sweet to him. While in the years of success it may have appeared that he wanted only to destroy those whom he considered his enemies, the days of the Götterdämmerung at the end showed that his deepest satisfaction lay in witnessing total and absolute destruction: that of the German people, of those around him, and of himself. The necrophilous dwell in the past, never in the future. Their feelings are essentially sentimental; that is, they nurse the memory of feelings which they had yesterday--or believe that they had. They are cold, distant, devotees of "law and order." Their values are precisely the reverse of the values we connect with normal life; not life, but death excites and satisfies them. If one wants to understand the influence of men like Hitler and Stalin, it lies precisely in their unlimited capacity and willingness to kill. For this they' were loved by the necrophiles. Of the rest, many were afraid of them and so preferred to admire, rather than to be aware of, their fear. Many others did not sense the necrophilous quality of these leaders and saw in them the builders, saviors, good fathers. If the necrophilous leaders had not pretended that they were builders and protectors, the number of people attracted to them would hardly have been sufficient to help them seize power, and the number of those repelled by them would probably soon have led to their downfall. While life is characterized by growth in a structured, functional manner, the necrophilous principle is all that which does not grow, that which is mechanical. The necrophilous person is driven by the desire to transform the organic into the inorganic, to approach life mechanically, as if all living persons were things. All living processes, feelings, and thoughts are transformed into things. Memory, rather than experience--having, rather than being--are what counts. The necrophilous person can relate to an object--a flower or a person--only if he possesses it; hence, a threat to his possession is a threat to himself; if he loses possession he loses contact with the world. That is why we find the paradoxical reaction that he would rather lose life than possession, even though, by losing life, he who possesses has ceased to exist. He loves control, and in the act of controlling he kills life. He is deeply afraid of life, because it is disorderly and uncontrollable by its very nature. The woman who wrongly claims to be the mother of the child in the story of Solomon's judgment is typical of this tendency; she would rather have a properly divided dead child than lose a living one. To the necrophilous person justice means correct division, and they are willing to kill or die for the sake of what they call, justice. "Law and order" for them are idols, and everything that threatens law and order is felt as a satanic attack against their supreme values. The necrophilous person is attracted to darkness and night. In mythology and poetry (as well as in dreams) he is attracted to caves, or to the depth of the ocean, or depicted as being blind. (The trolls in Ibsen's Peer Gynt are a good example.) All that is away from or directed against life attracts him. He wants to return to the darkness {23} of the womb, to the past of inorganic or subhuman existence. He is essentially oriented to the past, not to the future, which he hates and fears. Related to this is his craving for certainty. But life is never certain, never predictable, never controllable; in order to make life controllable, it must be transformed into death; death, indeed, is the only thing about life that is certain to him. The necrophilous person can often be recognized by his looks and his gestures. He is cold, his skin looks dead, and often he has an expression on his face as though he were smelling a bad odor. (This expression could be clearly seen in Hitler's face.) He is orderly and obsessive. This aspect of the necrophilous person has been demonstrated to the world in the figure of Eichmann. Eichmann was fascinated by order and death. His supreme values were obedience and the proper functioning of the organization. He transported Jews as he would have transported coal. That they were human beings was hardly within the field of his vision; hence, even the problem of his having hated or not hated his victims is irrelevant. He was the perfect bureaucrat who had transformed all life into the administration of things. But examples of the necrophilous character are by no means to be found only among the inquisitors, the Hitlers and the Eichmanns. There are any number of individuals who do not have the opportunity and the power to kill, vet whose necrophilia expresses itself in other and (superficially seen) more harmless ways. An example is the mother who will always be interested in her child's sickness, in his failures, in dark prognoses for the future; at the same time she will not be impressed by a favorable change nor respond to her child's joy, nor will she notice anything new that is growing within him. We might find that her dreams deal with sickness, death, corpses, blood. She does not harm the child in any obvious way, yet she may slowly strangle the child's joy of life, his faith--in growth, and eventually infect him with her own necrophilous orientation. My description may have given the impression that all the features mentioned here are necessarily found in the necrophilous person. It is true that such divergent features as the wish to kill, the worship of force, the attraction to death and dirt, sadism, the wish to transform the organic into the inorganic through "order" are all part of the same basic orientation. Yet so far as individuals are concerned, there are considerable differences with respect to the strength of these respective trends. Any one of the features mentioned here may be more pronounced in one person than in another. Furthermore, the degree to which a person is necrophilous in comparison with his biophilous aspects and the degree to which a person is aware of necrophilous tendencies and rationalizes them vary considerably from person to person. Yet the concept of the necrophilous type is by no means an abstraction or summary of various disparate behavior trends. Necrophilia constitutes a fundamental orientation; it is the one answer to life that is in complete opposition to life; it is the most morbid and the most dangerous among the orientations to life of which man is capable. It is true perversion; while living, not life but death is loved--not growth, but destruction. The necrophilous person, if he dares to be aware of what he feels, expresses the motto of his life when he says: "Long live death!" The opposite of the necrophilous orientation is the biophilous one; its essence is love of life in contrast to love of death. Like necrophilia, biophilia is not constituted by a single trait but represents a total orientation, an entire way of being. It is manifested in a person's bodily processes, in his emotions, in his thoughts, in his gestures; the biophilous orientation expresses itself in the whole man. The person who fully loves life is attracted by the process of life in all spheres. He prefers to construct, rather than to retain. He is capable of wondering, and he prefers to see something new to the security of finding the old confirmed. He loves the adventure of living more than he does certainty. His approach to life is functional rather than mechanical. He sees the whole rather than only the parts, structures rather than summations. He wants to mold and to influence by love, by reason, by his example--not by force, by cutting things apart, by the bureaucratic manner of administering people as if they were things. He enjoys life and all its manifestations, rather than mere excitement. Biophilic ethics has its own principle of good and evil. Good is all that serves life; evil is all that serves death. Good is reverence for life (this is the main thesis of Albert Schweitzer, one of the great representatives of the love of life--both in his writings and in his person), and all that enhances life. Evil is all that stifles life, narrows it down, {24} cuts it into pieces. Thus it is from the standpoint of life-ethics that the Bible mentions as the central sin of the Hebrews: "Because thou didst not serve thy Lord with joy and gladness of heart in the abundance of all things." The conscience of the biophilous person is not one of forcing oneself to refrain from evil and to do good. It is not the superego described by .Freud, a strict taskmaster employing sadism against oneself for the sake of virtue. The biophilous conscience is motivated by its attraction to life and joy; the moral effort consists in strengthening the life loving side in oneself. For this reasons the biophile does not dwell in remorse and guilt, which are, after all, only aspects of self-loathing and sadness. He turns quickly to life and attempts to do good. Spinoza's Ethics is a striking example of biophilic morality. "Pleasure," he says, "in itself is not bad but good; contrariwise, pain in itself is bad." And in the same spirit: "A free man thinks of death least of all things; and his wisdom is a meditation not of death but of life." Love of life underlies the various versions of humanistic philosophy. In various conceptual forms these philosophies are in the same vein as Spinoza's; they express the principle that the same man loves life; that man's aim in life is to be attracted by all that is alive and to separate himself from all that is dead and mechanical. The dichotomy of biophilia-necrophilia is the same as Freud's life-and-death instinct. I believe, as Freud did, that this is the most fundamental polarity that exists. However, there is one important difference. Freud assumes that the striving toward death and toward life are two biologically given tendencies inherent in all living substance that their respective strengths are relatively constant, and that there is only one alternative within the operation of the death instinct--namely, that it can be directed against the outside world or against oneself. In contrast to these assumptions I believe that necrophilia is not a normal biological tendency, but a pathological phenomenon--in fact, the most malignant pathology that exists in mail. What are we, the people of the United States today, with respect to necrophilia and biophilia? Undoubtedly our spiritual tradition is one of love of life. And not only this. Was there ever a culture with more love of "fun" and excitement, or with greater opportunities for the majority to enjoy fun and excitement? But even if this is so, fun and excitement is not the same as joy and love of life; perhaps underneath there is indifference to life, or attraction to death? To answer this question we must consider the nature of our bureaucratized, industrial, mass civilization. Our approach to life becomes increasingly mechanical. The aim of social efforts is to produce things, and. in the process of idolatry of things we transform ourselves into commodities. The question here is not whether they are treated nicely and are well fed (things, too, can be treated nicely); the question is whether people are things or living beings. People love mechanical gadgets more than living beings. The approach to man is intellectualabstract. One is interested in people as objects, in their common properties, in the statistical rules of mass behavior, not in living individuals. All this goes together with the increasing role of bureaucratic methods. In giant centers of production, giant cities, giant countries, men are administered as if they were things; men and their administrators are transformed into things, and they obey the law of things. In a bureaucratically organized and centralized industrialism, men's tastes are manipulated so that they consume maximally and in predictable and profitable directions. Their intelligence and character become standardized by the ever-increasing use of tests, which select the mediocre and unadventurous over the original and daring. Indeed, the bureaucratic-industrial civilization that has been victorious in Europe and North America has created a new type of man. He has been described as the "organization man" and as homo consumens. He is in addition the homo mechanicus. By this I mean a "gadget man," deeply attracted to all that is mechanical and inclined against all that is alive. It is, of course, true that man's biological and physiological equipment provides him with such strong sexual impulses that even the homo mechanicus still has sexual desires and looks for women. But there is no doubt that the gadget man's interest in women is diminishing. A New Yorker cartoon pointed to this very amusingly: a sales girl trying to sell a certain brand of perfume to a young female customer recommends it by remarking, "It smells like a new sports car." Indeed, any observer of men's behavior today will confirm that this cartoon is more than a clever joke. There are apparently a great number of men who are more interested in sports-cars, television and radio sets, space travel, and any number of gadgets than they are in women, love, nature, food; who are more stimulated by the manipulation of non-organic, mechanical things than by life. Their attitude toward a woman is like that toward a car: you push the button and watch it race. It is not even too farfetched to assume that homo mechanicus has more pride in and is more fascinated by, devices that can kill millions of people across a distance of several thousands of miles within minutes than he is frightened and depressed by the possibility of such mass destruction. Homo mechanicus still likes sex {25} and drink. But all these pleasures are sought for in the frame of reference of the mechanical and the unalive. He expects that there must be a button which, if pushed, brings happiness, love, pleasure. (Many go to a psychoanalyst under the illusion that he can teach them to find the button.) The homo mechanicus becomes more and more interested in the manipulation of machines, rather than in the participation in and response to life. Hence he becomes indifferent to life, fascinated by the mechanical, and eventually attracted by death and total destruction. This affinity between the love of destruction and the love of the mechanical may well have been expressed for the first time in Marinetti's Futurist Manifesto (1909). "A roaring motor-car, which looks as though running on a shrapnel is more beautiful than the Victory of Samothrace. … We wish to glorify war--the only health-giver of the world-militarism, patriotism, the destructive arm of the Anarchist, the beautiful Ideas that kill the contempt for woman." Briefly then, intellectualization, quantification, abstractification, bureaucratization, and reification--the very characteristics of modern industrial society--when applied to people rather than to things are not the principles of life but those of mechanics. People living in such a system must necessarily become indifferent to life, even attracted to death. They are not aware of this. They take the thrills of excitement for the joys of life and live under the illusion that they are very much alive when they only have many things to own and to use. The lack of protest against nuclear war and the discussion of our "atomologists" of the balance sheet of total or half-total destruction show how far we have already gone into the "valley of the shadow of death."1 To speak of the necrophilous quality of our industrial civilization does not imply that industrial production as such is necessarily contrary to the principles of life. The question is whether the principles of social organization and of life are subordinated to those of mechanization, or whether the principles of life are the dominant ones. Obviously, the industrialized world has not found thus far an answer, to the question posed here: How is it possible to create a humanist industrialism as against the bureaucratic mass industrialism that rules our lives today? The danger of nuclear war is so grave that man may arrive at a new barbarism before he has even a chance to find the road to a humanist industrialism. Yet not all hope is lost; hence we might ask ourselves whether the hypothesis developed here could in any way contribute to finding peaceful solutions. I believe it might be useful in several ways. First of all, an awareness of our pathological situation, while not yet a cure, is nevertheless a first step. If more people became aware of the difference between love of life and love of death, if they became aware that they themselves are already far gone in the direction of indifference or of necrophilia, this shock alone could produce new and healthy reactions. Furthermore, the sensitivity toward those who recommend death might be increased. Many might see through the pious rationalizations of the death lovers and change their admiration for them to disgust. Beyond this, our hypothesis would suggest one thing to those concerned with peace and survival: that every effort must be made to weaken the attraction of death and to strengthen the attraction of life. Why not declare that there is only one truly dangerous subversion, the subversion of life? Why do not those who represent the traditions of religion and humanism speak up and say that there is no deadlier sin than love for death and contempt for life? Why not encourage our best brains--scientists, artists, educators--to make suggestions on how to arouse and stimulate love for life as opposed to love for gadgets? I know love for gadgets brings profits to the corporations, while love for life requires fewer things and hence is less profitable. Maybe it is too late. Maybe the neutron bomb, which leaves entire cities intact, but without life, is to be the symbol of our civilization. But again, those of us who love life will not cease the struggle against necrophilia.

# elections

Obama will win by a narrow margin

Enten, 9-20

Harry Enten, political science writer for the Guardian,” 9-20-2012, “Post-convention polling gives definitive view: Obama has consolidated his lead,” <http://www.guardian.co.uk/commentisfree/2012/sep/20/post-convention-polling-obama-consolidates-lead>

Any individual national poll is confusing, but the aggregate is a fairly clear Obama edge. Nine pollsters have conducted a survey with a median field date at least a week after the Democratic National Convention. President Obama has led in all of their surveys except for Rasmussen's.

National polls, 2012

The median result is Obama ahead by 4 percentage points. You might note that the Gallup and YouGov results are among registered voters. Even when we shave 2.5 points off of Obama's margin for a "likely voter" adjustment, the median result is still Obama, by 3 percentage points.

For those who don't like doing the math, a 3-point lead is actually larger than the 1.5-point lead Obama had going into the conventions. The fact that I'm looking only at data one week (or later, for the RNC) after the conventions suggests to me that Obama didn't receive merely a momentary bump but may have gotten the campaign equivalent of a shot of cortisone that will last the rest of the campaign.

The factors underlying this campaign have also not shifted in Romney's direction, but rather in Obama's. In May, I wrote that "the 2012 race comes down to Obama's approvals v Romney's favorables". Take a look at this chart of Romney's favorability ratings since 1 June.

Favorables 2012

What you see is steadiness or even a slight dip in favorables since the conventions. The absolute numbers are skewed because of different sample populations (likely voters v registered voters v adults), yet the trend is undeniable. Mitt Romney's main electoral failing has been a lack of favorability, and the conventions did nothing to change this factor.

Meanwhile, President Obama's achilles heel had been his low job approval rating. A chart of his approvals since the conventions shows a positive trend.

Approvals 2012

For the first time in almost a year and a half, Obama's approval is reater than his disapproval in the HuffPollster approval chart. Remember that Obama managed to lead this race when his approval still trailed his disapproval in the HuffPollster chart. As you might expect, his lead has increased, given the rise in his approvals.

The state level data is less clear, but we still ca make some keen observations. The baseline electoral college estimate looks like this:

Electoral map 2012

There isn't an analyst in the world who thinks that Barack Obama isn't leading in Ohio right now. It is also fairly clear that Obama's Ohio lead is wider than his national margin. The weighted HuffPollster aggregate, which accounts for house effects and weights state level to regional and national estimates, has Obama running 1.3 points ahead of his national percentage in Ohio. Romney's own political director admits that it's not an "easy state".

If Obama wins Ohio, he's at 255 electoral votes. A win in Florida puts him in the White House for a second term. Let's, for argument's sake, give Romney Florida, even though he trails there. We'll also afford him North Carolina, where he does hold a small advantage. Romney then must take Colorado and Iowa. Both are states where he seems to be running at least equal to his national numbers, if not somewhat ahead. Still, he is probably losing to Obama in both.

Even after giving Romney all these states where he isn't ahead, he is still only at 250 electoral votes. His deficit in Virginia is almost certainly greater than his nationwide hole. A loss in Virginia means he's got to take New Hampshire, Nevada, and Wisconsin. The issue here is that there hasn't been a poll with Romney ahead in Nevada in the last year and a half. Likewise, Wisconsin also seems to be slipping from Romney's grip, with two polls out Wednesday pegging him down by at least 6 points. Only New Hampshire may be trending towards Romney.

The bottom line is that the state level isn't any better than the national picture for Romney. In fact, you can argue that it is considerably worse.

Some Romney supporters might argue that this election is still about the economy and the economy stinks – bad for the incumbent. The truth is that while the economy may not be booming, it is almost certainly good enough to get an incumbent re-elected. Econometric models projecting the election have a 50:50 split. That should give Romney hope for a comeback, but it definitely doesn't guarantee one. John Sides makes a powerful argument that the economy, in fact, favors Obama. That's probably why you've seen Obama catching up to Romney on the question of who can best manage the economy.

But what about a game-changing event? Gaffes like Romney's 47% remarks have shown no ability to move the polls. Debates, as John Sides points out, have historically almost never made a difference. A foreign policy fiasco would almost certainly result in a rally around the leader effect, a la Carter in 1980, before the incumbent gets blamed. There isn't enough time for the "blame" part of the equation to occur before the election.

That's why polls a few weeks after the conventions are usually quite accurate in predicting the result. The economy is usually factored in by voters at this time, and there isn't a campaign event that can alter the playing field fast enough.

Simply put,there hasn't been a single candidate to come back after trailing by 3 points this late in the campaign in the past 60 years.

When I look the current polling data and put it into this historical context, I just don't see a Romney victory. It's not that it can't happen; it's just that 3 points is a good lead in a race that has hasn't shifted easily. Indeed, I wouldn't be surprised if Obama's 3-point lead eventually shrank back to the pre-convention numbers that were so stable for so long. That would fit a historical pattern of tightening before an election. But this race is no toss-up: it now leans pretty hard in Obama's direction.

The plan upsets Obama’s balancing act on energy, reduces environmentalist turnout critical to reelection

Schnur, 4-9

Dan Schnur, director of the Jesse M. Unruh Institute of Politics at the University of Southern California; he served as the national communications director of Senator John McCain’s presidential campaign in 2000, “The President, Gas Prices and the Pipeline,” http://campaignstops.blogs.nytimes.com/2012/04/09/the-president-gas-prices-and-the-keystone-pipeline/

Like every president seeking re-election, Barack Obama walks the fine line every day between the discordant goals of motivating his party’s strongest loyalists and reaching out to swing voters for their support. A few weeks ago, that pathway took him to a tiny town in Oklahoma, where, caught between the anti-drilling demands of the environmental community and the thirst for more affordable gasoline from unions, business owners and drivers, the president announced his support for building half of an oil pipeline.

The economic impact of rising energy prices in itself is considerable, but the psychological toll on voters is just as significant, as tens of millions of motorists are reminded by large signs on almost every street corner of the financial pain of filling their gas tanks. Obama and his political lieutenants are acutely aware that this growing frustration has the potential to complicate an election year that otherwise seems to be shifting in the incumbent’s favor.

As a result, Obama has been hitting the energy issue hard in recent weeks, at least as hard as a candidate can hit when forced to navigate between two almost mutually exclusive political priorities. The result is a president who talks forcefully of the benefits of wind and solar power while also boasting about the amount of oil the nation produces under his leadership.

There are times when this gets slightly uncomfortable. Obama recently called for increased exploration along the Atlantic Coast but stopped short of calling for expanded drilling in that region. This is the energy policy equivalent of admitting to an experiment with marijuana but not inhaling.

Where the issue becomes more tangible and therefore trickier for Obama is when the multiple choices become binary. The debate over the proposed XL Keystone Pipeline that would transport Canadian oil through the nation’s heartland to the Gulf of Mexico crystallizes the choices involved and forces a shades-of-gray conversation into starker hues of black and white.

Obama recognizes that the devoted environmentalists who represent a critical portion of the Democratic party base need some motivation to turn out for him in the fall. But he also understands that centrist voters who support him on a range of other domestic and foreign policy matters could be lured away by a Republican opponent who either promises relief at the gas pump or who can lay blame at the White House doorstep for those higher prices. Even more complicated is the role of organized labor, which has poured immense amounts of support into Obama’s re-election but also prioritizes the job-creation potential of the pipeline.

The result of these competing political and policy pressures brought Obama to Ripley, Okla., where he tried to satisfy the needs of these various audiences without alienating any of them. First, the president endorsed the southern portion of the Keystone project in order to relieve the glut of domestically drilled oil that is now unable to make it to refineries near the Gulf of Mexico in a timely manner. This had the effect of irritating his environmental allies but failed to mollify the project’s advocates, who pointed out that the review process that the president called for was already underway.

He then reiterated the administration’s antipathy toward the northern section of the pipeline, which would allow Canadian-drilled oil to be transported into this country. This provided some comfort to drilling opponents, but infuriated both the pro-oil forces and the Canadian government. The most likely outcome is that Canada will still build a pipeline, but rather one that goes westward to the Pacific Ocean north of the United States border and then ships Canadian oil to China instead of into this country.

#### Romney win causes China-bashing – causes a trade war

Gerstein 11

(Josh, writer @ Politico, “The GOP's China syndrome”, 11/22/12, http://www.politico.com/news/stories/1111/68952.html)

Mitt Romney says America is at war with China — a “trade war” over its undervalued currency. “They’re stealing our jobs. And we’re gonna stand up to China,” the former Massachusetts governor declared in a recent Republican presidential debate, arguing that the United States should threaten to impose tariffs on Chinese imports. When Romney steps on stage tonight for another debate, this one devoted to foreign policy, that kind of China-bashing is likely to be a favorite theme. With a moribund economy and relatively little traction for other international issues, the threat posed by cheap Chinese imports and Chinese purchases of U.S. debt is an irresistible target. The problem, China experts are quick to point out, is that those attacks often fly in the face of the business interests Republicans have traditionally represented, not to mention the record many of the candidates have either supporting trade with China — or actively soliciting it. Just last year, for example, Romney slammed President Barack Obama for growth-killing protectionism after he put a 35 percent tariff on Chinese tires because of a surge of cheap imports. And, Romney wrote in his book, “No Apology: The Case for American Greatness,” “Protectionism stifles productivity.” And though Texas Gov. Rick Perry predicted at a debate this month that “the Chinese government will end up on the ash heap of history if they do not change their virtues,” a picture posted on the Internet shows a smiling Perry on a trade mission to Shanghai and Beijing posing with Chinese Foreign Minister Yang Jiechi after presenting him with a pair of cowboy boots. Nor has Perry been shy about encouraging Chinese investments in Texas: In October 2010, he appeared at the announcement of a new U.S. headquarters for Huawei Technologies to be located in Plano, Texas, despite lingering concerns among U.S. security officials that Huawei-made telecommunications equipment is designed to allow unauthorized access by the Chinese government. “There’s a certain pandering going on,” said Nicholas Lardy of the Peterson Institute for International Economics, who adds that the GOP rhetoric is squarely at odds with the views of the U.S. establishment, which believes a showdown with China over the trade issue “will make things worse, not better.” Not all of the 2012 GOP presidential hopefuls have taken to publicly pummeling Beijing. The only bona fide China expert in the group, former Ambassador to China Jon Huntsman, has criticized Romney for being cavalier and simplistic in his talk of tariffs. “You can give applause lines, and you can kind of pander here and there. You start a trade war if you start slapping tariffs randomly on Chinese products based on currency manipulation,” Huntsman said at a recent debate. “That doesn’t work.” Former Sen. Rick Santorum also rejected the idea of slapping tariffs on Beijing if it won’t buckle on the currency issue. “That just taxes you. I don’t want to tax you,” Santorum said. Newt Gingrich says he wants to bring a world of hurt down on Beijing for alleged Chinese cyberattacks on the U.S. and theft of intellectual property, though he’s vague about how. “We’re going to have to find ways to dramatically raise the pain level for the Chinese cheating,” the former house speaker declares. And Herman Cain talks of a threat from China, but says the answer is to promote growth in the U.S. “China’s economic dominance would represent a national security threat to the USA, and possibly to the rest of the world,” Cain wrote in May in the Daily Caller. “We can outgrow China because the USA is not a loser nation. We just need a winner in the White House.” Romney’s rhetoric has been **particularly harsh**. “It’s predatory pricing, it’s killing jobs in America,” he declared at the CNBC debate earlier this month, promising to make a formal complaint to the World Trade Organization about China’s currency manipulation. “I would apply, if necessary, tariffs to make sure that they understand we are willing to play at a level playing field.” The Romney campaign insists those tariffs are entirely distinguishable from the tire duties Obama imposed in 2009. “The distinction between Obama’s tire action and what Gov. Romney is proposing is simple,” said a Romney aide who did not want to be named. “President Obama is not getting tough with China or pushing them unilaterally, he is handing out political favors to union allies. [Romney’s] policy focuses on fostering competition by keeping markets open and the playing field level.” Romney, who helped set up investment bank Bain Capital, has long been a favorite of Wall Street, so his stridency on the China trade issue has taken some traditional conservatives — for whom free trade is a fundamental tenet — by surprise. National Review said Romney’s move “risk[ed] a trade war with China” **and was “a remarkably bad idea.”** In fact, many business leaders give Obama good marks for his China policy. “What the Obama administration has done in not labeling China as a ‘currency manipulator’ is correct,” said one U.S. business lobbyist who closely follows U.S.-China trade issues and asked not to be named. “We’re very leery of a tit-for-tat situation,” he added, while acknowledging that the anti-China rhetoric is “good politics.”

#### That goes nuclear

Taaffe 5

(Peter Taaffe, general secretary of the Socialist Party of England and Wales, “China, A New Superpower?,” Socialist Alternative.org, Nov 1, 2005, pg. <http://www.socialistalternative.org/news/article11.php?id=30>)

While this conflict is unresolved, the shadow of a trade war looms. Some commentators, like Henry C.K. Liu in the Asia Times, go further and warn that "trade wars can lead to shooting wars." China is not the Japan of the 21st century. Japan in the 1980s relied on the U.S. military and particularly its nuclear umbrella against China, and was therefore subject to the pressure and blackmail of the U.S. ruling class. The fear of the U.S., and the capitalists of the "first world" as a whole, is that China may in time "out-compete" the advanced nations for hi-tech jobs while holding on to the stranglehold it now seems to have in labor-intensive industries. As the OECD commented recently: "In the five-year period to 2003, the number of students joining higher education courses has risen by three and a half times, with a strong emphasis on technical subjects." The number of patents and engineers produced by China has also significantly grown. At the same time, an increasingly capitalist China - most wealth is now produced in the private sector but the majority of the urban labor force is still in state industries - and the urgency for greater energy resources in particular to maintain its spectacular growth rate has brought it into collision on a world scale with other imperialist powers, particularly the U.S. In a new worldwide version of the "Great Game" - the clash for control of central Asia's resources in the nineteenth century - the U.S. and China have increasingly come up against and buffeted one another. Up to now, the U.S. has held sway worldwide due to its economic dominance buttressed by a colossal war machine accounting for 47% of total world arms spending. But Iraq has dramatically shown the limits of this: "A country that cannot control Iraq can hardly remake the globe on its own." (Financial Times) But no privileged group disappears from the scene of history without a struggle. Donald Rumsfeld, U.S. defense secretary, has stated: "Since no nation threatens China, one must wonder: why this growing [arms] investment? Why these continuing large and expanding arms purchases?" China could ask the same question of the U.S. In order to maintain its position, the U.S. keeps six nuclear battle fleets permanently at sea, supported by an unparalleled network of bases. As Will Hutton in The Observer has commented, this is not because of "irrational chauvinism or the needs of the military-industrial complex, but because of the pressure they place on upstart countries like China." In turn, the Chinese elite has responded in kind. For instance, in the continuing clash over Taiwan, a major-general in the People's Liberation Army baldly stated that if China was attacked "by Washington during a confrontation over Taiwan... I think we would have to respond with nuclear weapons." He added: "We Chinese will prepare ourselves for the destruction of all of the cities east of Xian. Of course, the Americans would have to be prepared that hundreds... of cities would be destroyed by the Chinese." This bellicose nuclear arms rattling shows the contempt of the so-called great powers for the ordinary working-class and peasant peoples of China and the people of the U.S. when their interests are at stake.

# Defense Budget Disad 1NC

#### DoD budget aligned with DoD strategic guidance now—additional tradeoffs collapse the entire package

Harrison 12

Todd Harrison, Center for Strategic and Budgetary Priorities, 8/24/2012, ANALYSIS OF THE FY 2013 DEFENSE BUDGET AND SEQUESTRATION, http://www.csbaonline.org/publications/2012/08/analysis-of-the-fy2013-defense-budget-and-sequestration/

The Fiscal Year (FY) 2013 defense budget currently being debated in Congress is a departure from previous budgets in several respects. It is the first budget submitted following the release of the Pentagon’s new strategic guidance, marking the beginning of a “pivot” from the wars of the past decade to the Asia-Pacific region. It is also the first budget request in more than a decade to propose a real decline in defense spending from the level currently enacted. Moreover, the prospect of sequestration hangs over the budget, threatening to cut some 10 percent of funding if Congress does not act to prevent it. Secretary of Defense Leon Panetta has argued that **the budget request is a “complete package**,” that “**there is little room here for** significant **modification**,” and that **any further funding reductions**, such as those called for by sequestration, **would require the Department to fundamentally rethink its new strategy**.1 Nevertheless, the FY 2013 request is unlikely to survive unscathed and the Department will likely be forced to revise its strategic guidance.

#### Nuclear is uniquely cost-prohibitive—massive cost overruns

USA Today 9

USA Today, 8/1/2009, Cost overruns for reactors in the offing., www.thefreelibrary.com/Cost+overruns+for+reactors+in+the+offing.-a0206055211

The likely cost of electricity for a new generation of nuclear reactors would be 12 to 20 cents per kilowatt hour, **considerably more expensive** than the average cost of increased use of energy efficiency and renewable energies at six cents per kWh, according to a study by Mark Cooper, a senior fellow for economic analysis at the Institute of Energy and the Environment at Vermont Law School, South Royalton. The report finds that it would cost 1.9 trillion to 4.1 **trillion dollars** more over the life of 100 new nuclear reactors than it would to generate the same elecfricity from a combination of more energy efficiency and renewables.

Coopers analysis of more than three dozen cost estimates for proposed **new nuclear reactors** shows that the projected **price tags** for the plants **have quadrupled** since the start of the industry's so-called "Nuclear Renaissance" at the beginning of this decade, a striking parallel to the eventually sevenfold increase in reactor cost estimates that doomed the "Great Bandwagon Market" of the 1960s and 1970s, when half of the planned reactors had to be abandoned or canceled due to **massive cost overruns**.

The study notes that the required massive subsidies from taxpayers and ratepayers would not change the real cost of nuclear reactors; they simply would shift the risks to the public. Even with huge subsidies, nuclear reactors would remain more costly than the alternatives, such as efficiency, biomass, wind, and cogeneration.

"We are literally seeing nuclear reactor history repeat itself," proclaims Cooper. "The Great Bandwagon Market that ended so badly for consumers was driven by **advocates** who **confused** hope and **hype with reality**. It is telling that, in the few short years since the so-called Nuclear Renaissance began, there has been a fourfold increase in projected costs. In both time periods, the original lowball estimates were promotional, not practical,"

Adds former U.S. Nuclear Regulatory Commission member Peter Bradford: "Having government set a quota of 100 new nuclear reactors by a certain date presumes--against decades of evidence to the contrary--that politicians can pick technological winners. Such a policy combines distraction, deception, debt, and disappointment in a mixture reminiscent of other failed Federal policies in recent years."

#### Plan causes massive tradeoffs undermining the military budget

Spencer 11, research fellow in nuclear energy – Heritage, 6/22/’11

(Jack, “Capability, Not Politics, Should Drive DOD Energy Research,” http://www.heritage.org/research/reports/2011/06/capability-not-politics-should-drive-dod-energy-research)

With multiple wars ongoing, traditional threats looming, and new ones emerging, the U.S. Armed Forces are already under tremendous stress. So introducing a new assignment that needlessly bleeds scarce resources away from core missions to advance a political agenda is untenable. Yet this is exactly what the Obama Administration is doing by ordering the military to lead a green revolution.

The White House is pushing the idea that the alternative energy industry would get the kick start it needs if the military will just commit to using them. But the assumptions behind this argument are flawed, and the strategy would **increase demands on the military budget** while **harming national security.** Congress should put a stop to it right away.

Not a Legitimate Military Mission

Catalyzing a commercially viable alternative energy industry is not within the military's purview. Even it if were, the federal government has a horrible track record of developing products for commercial use. In most cases, governments fund things that have no market value—hence the need for government support.

#### Resourced strategic guidance key to overall hegemony, and Asia and Middle East stability

Barno and Bensahel 12

David Barno, Lieutenant General, Center for a New American Security Senior Advisor and Senior Fellow, Nora Bensahel, Ph.D., CNAS Deputy Director of Studies and Senior Fellow, 1/6/12, You Can't Have It All, www.cnas.org/node/7641

On Thursday, President Barack Obama and his top defense advisers unveiled new strategic guidance to direct the U.S. military as it transitions from a decade of grueling ground wars to an era of new challenges, including a rising China and looming budget cuts. The administration has adopted what is best characterized as a "pivot but hedge" strategy: The United States will pivot to the Asia-Pacific but hedge against unexpected threats elsewhere, particularly in the greater Middle East. This new guidance makes good sense in today's world, but it assumes that the Pentagon will absorb only $487 billion in budget cuts over the next decade. **If** far **deeper cuts occur**, as required by sequestration, **the D**epartment **o**f **D**efense **will not have the resources to execute the guidance**. "**Pivot but hedge" will die in its crib**.

The pivot to the Asia-Pacific is essential because the region stands poised to become the centerpiece of the 21st-century global economy. By 2015, East Asian countries are expected to surpass North America and the eurozone to become the world's largest trading bloc. Market opportunities will only increase as the region swells by an additional 175 million people by 2030. As America's economic interests in the Asia-Pacific grow, its diplomatic and military presence should grow to defend against potential threats to those interests.

From the perspective of the United States and its Asian allies, China and North Korea represent the most serious military threats to regional security. China's military modernization continues to progress, and its foreign policy toward its neighbors has become increasingly aggressive over the past two years. Meanwhile, the death of Kim Jong Il means that nuclear-armed North Korea has begun a leadership transition that could lead to greater military aggressiveness as his son Kim Jong Un seeks to consolidate his power and demonstrate control. In light of these potential dangers, several Asian nations have asked the United States to strengthen its diplomatic and military presence in the region so it can remain the ultimate guarantor of peace and security. A bolstered U.S. presence will reassure allies who worry about American decline by clearly conveying an unwavering commitment to Asian security.

But while the Asia-Pacific is becoming more important, instability across the greater Middle East -- from Tunisia to Pakistan -- still makes it the most volatile region in the world. The Arab Spring unleashed a torrent of political change that has reshaped the region in previously unfathomable ways. Iran continues to pursue nuclear weapons, and it has threatened recently to close the Strait of Hormuz. Trapped in the middle of the upheaval is Israel, a permanent ally and key pillar of America's regional security strategy. Meanwhile, U.S.-Pakistan relations continue to plunge toward a nadir, lessening American influence over a nuclear-armed and terrorist-infested state that is arguably the most dangerous country in the world.

Amid these dangers, U.S. interests in the greater Middle East remain largely unchanged: ensuring the free flow of petroleum from a region containing 51 percent of proven global oil reserves, halting nuclear proliferation, and guarding against the diminished but still real threat of Islamist-inspired terror attacks. Protecting these interests will unquestionably require the active involvement of the U.S. military over the next 10 years and beyond, though this certainly does not mean U.S. troops will necessarily repeat the intensive counterinsurgency campaigns of the last decade.

The administration's new guidance tries to balance America's rightful new focus on the Asia-Pacific with the continuing reality of deep instability in other areas of the world where U.S. interests are at stake. Yet implementing this "pivot but hedge" strategy successfully depends largely on how much Congress cuts from the Pentagon's budget, something that still remains undecided at the start of a divisive presidential election year.

The 2011 Budget Control Act, signed as part of last summer's negotiations over raising the U.S. debt ceiling, contains spending caps that will reduce the Department of Defense's base budget (excluding ongoing war costs in Afghanistan) by at least $487 billion over 10 years, according to Pentagon estimates. This represents a decline of about 8 percent compared to current spending levels. Administration officials have repeatedly described these cuts as painful but manageable. Indeed, Defense Secretary Leon Panetta stated Thursday that these cuts require difficult choices but ultimately involve "acceptable risk."

Yet deeper cuts are an entirely different story. Administration officials are extremely concerned about the Budget Control Act's automatic spending reduction process known as sequestration, which was triggered in November by the failure of the deficit reduction "super committee." According to the Congressional Budget Office, this process would roughly double the cuts to the Pentagon's base budget, resulting in nearly $900 billion in total reductions. Current law requires these cuts to take effect in January 2013 unless Congress enacts new legislation that supersedes it.

The new guidance says little about what cuts the Department of Defense will make when it releases its fiscal year 2013 budget request next month. But the Pentagon has made clear that its new guidance and budget request assume it will absorb only $487 billion in cuts over the next 10 years. Defense officials have acknowledged that the new guidance cannot be executed if sequestration takes place. When announcing the new strategy, for instance, Panetta warned that sequestration "would force us to shed missions, commitments, and capabilities necessary to protect core U.S. national security interests."

Sequestration would likely require the United States to abandon its longstanding global engagement strategy and to incur far greater risk in future military operations. If sequestration occurs, the Pentagon will likely repeat past mistakes by reducing capabilities such as ground forces that provide a hedge against unexpected threats. A pivot to the Asia-Pacific might remain an executable option under these conditions, but the U.S. ability to hedge against threats elsewhere -- particularly in the volatile Middle East -- would be diminished. This is a recipe for high risk in an uncertain and dangerous world.

The Pentagon's new strategic guidance presents a realistic way to maintain America's status as a global superpower in the context of shrinking defense dollars. But **further cuts**, especially at the level required by sequestration, **would make this "pivot but hedge" strategy impossible to implement** **and** would **raise serious questions about whether the U**nited **S**tates **can continue to play the central role on the global stage**.

#### Asia conflict likely and goes nuclear war

Landy, National Security Expert @ Knight Ridder, 3/10/’2K

(Jonathan, Knight Ridder, lexis)

Few if any experts think China and Taiwan, North Korea and South Korea, or India and Pakistan are spoiling to fight. But even a minor miscalculation by any of them could destabilize Asia, jolt the global economy and even start a nuclear war. India, Pakistan and China all have nuclear weapons, and North Korea may have a few, too. Asia lacks the kinds of organizations, negotiations and diplomatic relationships that helped keep an uneasy peace for five decades in Cold War Europe. “Nowhere else on Earth are the stakes as high and relationships so fragile,” said Bates Gill, director of northeast Asian policy studies at the Brookings Institution, a Washington think tank. “We see the convergence of great power interest overlaid with lingering confrontations with no institutionalized security mechanism in place. There are elements for potential disaster.” In an effort to cool the region’s tempers, President Clinton, Defense Secretary William S. Cohen and National Security Adviser Samuel R. Berger all will hopscotch Asia’s capitals this month. For America, the stakes could hardly be higher. There are 100,000 U.S. troops in Asia committed to defending Taiwan, Japan and South Korea, and the United States would instantly become embroiled if Beijing moved against Taiwan or North Korea attacked South Korea. While Washington has no defense commitments to either India or Pakistan, a conflict between the two could end the global taboo against using nuclear weapons and demolish the already shaky international nonproliferation regime. In addition, globalization has made a stable Asia \_ with its massive markets, cheap labor, exports and resources \_ indispensable to the U.S. economy. Numerous U.S. firms and millions of American jobs depend on trade with Asia that totaled $600 billion last year, according to the Commerce Department.

# cp

#### The Advanced Research Projects Agency for Energy should research and develop Small Modular Reactors technology for the Department of Defense.

#### The Department of Defense should only procure energy that is cost competitive.

#### ARPA-E can spur energy tech innovation for military application—leads to DoD adoption

Hayward et al 10

Steven Hayward, AEI Resident Scholar, Mark Muro, Brookings Institute Metropolitan Policy Program, Ted Nordhaus and Michael Shellenberger, Breakthrough institute cofounders, October 2010, Post-Partisan Power, thebreakthrough.org/blog/Post-Partisan Power.pdf

In addition to fostering stronger linkages between government-funded research centers and private sector investors, entrepreneurs, and customers, the **DOD can work to** more **closely connect research efforts and** the growing **energy innovation** **needs of the U.S. military**.

This close relationship between research efforts and DOD procurement and technology needs was central to the successful history of the Defense Advanced Research Projects Agency (DARPA), famous for inventing the Internet, GPS, and countless other technologies that have both improved the fighting capabilities of the U.S. military and launched many spin-off technologies American consumers and businesses now take for granted. DARPA program managers had a keen awareness of the technologies and innovations that could improve military capabilities and funded breakthrough innovations aligned with those needs. Once innovations matured into potentially useful technologies, the DOD was there as an early customer for these products, allowing entrepreneurial firms to secure market demand, scale-up production, and continue to improve their products.

Congress made the right move in creating and funding an Advanced Research Projects Agency for Energy (ARPA-E) program modeled after the historic success of DARPA. ARPA-E resides within the DOE, however, which is not set up to be a major user of energy technologies. By contrast, DOD has both the opportunity and the urgent need to use many of these technologies.64 The DOD can and should play a greater role in administering ARPA-E and making sure that breakthrough energy discoveries become real- world technologies that can strengthen American energy security, enhance the capabilities of the U.S. military, and spin off to broader commercial use.

Fiscal year 2011 funding requests for the ARPA-E program are currently a modest $300 million, just one- tenth the annual budget for DARPA research.65 Truly bringing the DARPA model to the energy sector would imply scaling ARPA-E up to match DARPA. Given the multi-trillion dollar scale of the energy industry, only funding levels on this order of magnitude will have a significant impact on the pace of energy innovation and entrepreneurship.

We recommend scaling up funding for ARPA-E over the next five years to $1.5 billion annually, with a significant portion of this funding dedicated to dual-use energy technology innovations with the potential to enhance energy security and strengthen the U.S. military. **DOD and DOE should** extend and expand their current Memorandum of Understanding, established in July 2010,66 and **launch an active partnership between ARPA-E and DOD to** determine and **select nascent** dual-use **breakthrough energy innovations for funding through the ARPA-E program and** potential **adoption** and procurement **by the DOD**.

# solvency

SMRs empirically fail at commercialization

Magwood, commissioner – NRC, 7/14/’11

(William, “ECONOMICS AND SAFETY OF MODULAR REACTORS; COMMITTEE: SENATE APPROPRIATIONS; SUBCOMMITTEE: ENERGY AND WATER DEVELOPMENT,” CQ Congressional Testimony)

That is not to say that SMRs are a new idea. The conceptual benefits of small reactors have been the subject of discussion and analysis for decades, and all the potential benefits I've mentioned have been considered in the past. The potential advantages of smaller reactors prompted the government to provide considerable financial support for the development of the mid- size, passive-safety reactors in the 1990s and to encourage the pursuit of the pebble-bed modular reactor in the early years of this century.

Both efforts proved unable to overcome the economic realities of building and operating nuclear power plants realities that tend to penalize small reactors and reward larger designs. Thus, instead of the AP-600 and 500 megawatt Simplified Boiling Water Reactor of the early 1990s, the market pushed vendors to increase the size of their designs; today, vendors offer Generation III+ technologies based on those smaller systems the 1100 megawatt AP- 1000 and the 1600 megawatt Economic Simplified Boiling Water Reactor.2

Around the turn of the century, both DOE and industry became interested in the Pebble Bed Modular Reactor, or PBMR. This was a small, high-temperature gas-cooled reactor with a generating capacity of about 165 megawatts. This technology captured considerable media attention after U.S. companies became involved in an effort to build a commercial pilot in South Africa. However, as the high costs of the project became apparent, commercial participants began to peel away and eventually the South African project was abandoned.

All small reactor technologies of the past failed to find a way to overcome the fact that the infrastructure required to safely operate a nuclear power reactor of any size is considerable. Tons of steel and concrete are needed to construct containment buildings. Control rod drives, steam generators, and other key systems are **hugely expensive** to design and build. A larger plant with greater electric generating capacity simply has an inherently superior opportunity to recover these large up-front costs over a reasonable period.

So why is today different from yesterday? The greatest difference is the fact that the technology has evolved significantly over the years. Having learned lessons from the development of Generation III+ technologies and from the failure of previous small reactors, today's SMR vendors clearly believe they have solved the riddle of small reactor economics. They are presenting novel design approaches that could lead to significant improvements in nuclear safety. For example, design concepts that I have seen thus far further advance the use of passive safety systems, applying gravity, natural circulation, and very large inventories of cooling water to reduce reliance on human intervention during an emergency. SMR designs also apply novel technologies such as integral pressure vessels that contain all major system components and use fewer and smaller pipes and pumps, thereby reducing the potential for a serious loss-of- coolant accident.

Very importantly, these new SMRs are much smaller than the systems designed in the 1990s; this choice was made to assure that they could be factory-built and shipped largely intact by rail for deployment. The ability to "manufacture" a reactor rather than "constructing" it on-site could prove to be a major advantage in terms of cost, schedule reliability, and even quality control.

But will innovations like these allow this new breed of SMRs to be successful? Maybe.

Many years of work remain for SMR vendors to refine their designs and allow for the development of realistic and reliable cost estimates. **This is much the same state of affairs that existed in** the **2002** time frame when DOE launched the Nuclear Power 2010 program to spur the development and certification of Generation III+ designs such as the AP-1000. At that time, the level of design completeness was insufficient to enable vendors to provide utilities with reliable cost and schedule estimates.

Low gas prices kill SMRs

McMahon, energy contributor – Forbes, 5/23/’12

(Jeff, <http://www.forbes.com/sites/jeffmcmahon/2012/05/23/small-modular-reactors-by-2022-but-no-market-for-them/>)

Small Modular Nuclear Reactors By 2022 -- But No Market For Them

The Department of Energy will spend $452 million—with a match from industry—over the next five years to guide two small modular reactor designs through the nuclear regulatory process by 2022. But cheap natural gas could freeze even small nuclear plants out of the energy market well beyond that date.

DOE accepted bids through Monday for companies to participate in the Small Modular Reactor program. A number of reactor manufacturers submitted bids, including NuScale Power and a collaboration that includes Westinghouse and General Dynamic.

“This would allow SMR technology to overcome the hurdle of NRC certification – the ‘gold standard’ of the international nuclear industry, and would help in the proper development of the NRC’s regulatory framework to deal with SMRs,” according to Paul Genoa, Senior Director of Policy Development at the Nuclear Energy Institute.

Genoa’s comments are recorded in a summary released today of a briefing given to Senate staff earlier this month on prospects for small modular reactors, which have been championed by the Obama Administration.

DOE defines reactors as SMRs if they generate less than 300 megawatts of power, sometimes as little as 25 MW, compared to conventional reactors which may produce more than 1,000 MW. Small modular reactors can be constructed in factories and installed underground, which improves containment and security but may hinder emergency access.

The same summary records doubt that SMRs can compete in a market increasingly dominated by cheap natural gas. Nuclear Consultant Philip Moor told Senate staff that SMRs can compete if natural gas costs $7 to $8 per million BTU—gas currently costs only $2 per MBTU—or if carbon taxes are implemented, a scenario political experts deem unlikely.

“Like Mr. Moor, Mr. Genoa also sees the economic feasibility of SMRs as the final challenge. With inexpensive natural gas prices and no carbon tax, **the economics don’t work** in the favor of SMRs,” according to the summary.

Multiple barriers prevent nuclear investment

Fahring, JD – U Texas School of Law, ‘11

(T.L., 41 Tex. Envtl. L.J. 279)

V. Potential Problems with the Combined Government Measures to Promote New Nuclear Construction In 2007, a developer filed with the NRC the first application for a new reactor in nearly thirty years. n263 To date, the NRC has received eighteen COL applications for twenty-eight reactors. n264 The NRC has granted four ESPs and four Standard Design Certifications. n265 Applicants have filed seventeen applications for a Standard Design Certification. n266 The DOE has another seven Standard Design Certifications under review. n267 This recent spate of licensing activity after so long a dry-spell arguably owes much to the measures the United States has taken as of late to promote new nuclear [\*303] development. To the extent that these applications have been filed, these measures have been a success. But this initial success does not necessarily ensure that new nuclear construction will take place: In announcing the new reactor license applications ... utilities have made clear that they are not committed to actually building the reactors, even if the licenses are approved. Large uncertainties about nuclear plant construction costs still remain ... All those problems helped cause the long cessation of U.S. reactor orders and will need to be addressed before financing for new multibillion-dollar nuclear power plants is likely to be obtained. n268 A number of obstacles, thus, still might stand in the way of new nuclear construction in the United States. A. Developers Have Not Followed the Ideal Sequence in the NRC's Streamlined Licensing Process First, developers have failed to follow the ideal steps of the NRC's streamlined licensing process. n269 NRC Commissioner Gregory Jaczko explains: The idea was that utilities could get a plant design completed and certified and a site reviewed first ... They could then submit an application that simply references an already certified design and an approved early site permit. But almost no one is following that ideal process. Instead, we are once again doing everything in parallel ... n270 Developers also are delaying review of their applications. n271 They have put four of the seventeen COL applications filed with the NRC on hold. n272 They also have yet to complete the seventeen applications for designs filed with the NRC and are continuing to revise the four designs under review. n273 A possible explanation for the problems with the streamlined licensing process is that much of 2005 EPACT provides incentives only for the first few developers to proceed with new nuclear construction. In particular, the production tax credits, as construed by the IRS, were available only for the first 6,000 megawatts of additional nameplate capacity filed through COL applications with the NRC. n274 All COL applications that the NRC has received were filed after IRS Notice 2006-40, which provided this guidance. n275 "The deadline for automatic eligibility for the tax credit appears to [have provided] a strong incentive for nuclear plant applicants to file with the NRC by [\*304] the end of 2008 ..." n276 Given this incentive, developers might have filed quickly and with incomplete information, in the process failing to follow the NRC's ideal streamlined licensing sequence. n277 These problems with the licensing process could be detrimental to continued nuclear development. Defects in the licensing process led to cost overruns in the 1970s and 1980s, which dissuaded developers from undertaking any new nuclear construction for nearly thirty years. n278 Continued problems would constitute an input cost uncertainty to developers who have not yet filed applications, which might cause them to further delay new construction. B. The Reduction in Reactor Licensing Hearing Formality Might Cause a Public Backlash Second, insofar as the NRC's reduction in nuclear licensing hearing formality limits public participation in the licensing process, it could lead to a public backlash. "Public involvement has two basic functions: it permits the raising of issues that will improve the safety of nuclear power plants, and it enhances the transparency and level of confidence and trust that the public can have in nuclear regulation and decision-making." n279 Measures that limit public participation in the nuclear licensing process undermine both of these functions. n280 As noted in the overview of the history of U.S. nuclear construction above, nuclear construction has always been extremely sensitive to changes in public opinion. In 2009, a majority of the American public favored nuclear power. n281 However, only a minority of the public favored new nuclear construction in the area in which they live. n282 After the nuclear crisis at the Fukushima Daiichi plant in Japan, U.S. public support for nuclear power fell sharply, with polls showing that many feared a major nuclear accident in this country. n283 Limiting public participation in the licensing process could decrease public support by undermining any trust that the public has in the regulatory system. This defect could lead to more litigation and a repeat of U.S. nuclear construction's nightmarish cost overruns of the 1970s and 1980s, thus increasing input cost uncertainty to developers. n284 [\*305] C. Costs for Nuclear Construction Still Might Rise Over Time Third, much of 2005 EPACT is animated by the belief that costs will be highest for the first few reactors to be built: as developers build subsequent units, costs will go down. n285 The history of U.S. nuclear development shows this assumption not necessarily to be the case. n286 Historically, costs of nuclear construction rose over time. Nothing indicates that the costs of nuclear construction will do otherwise now. n287 D. The Production Tax Credit Might Not Be Sufficient to Reduce Costs of Construction in a Reactor Series Fourth, even if conditions are such that costs will decrease over time, the production tax credits in 2005 EPACT might not be sufficient to reduce costs in a reactor series. n288 The credits go to those first reactors up to 6,000 megawatts in nameplate capacity filed with the NRC. n289 However, at the time of this note, the NRC has approved four standard design certifications. n290 Because each COL has a reactor with a nameplate capacity between 1,200-1,500 megawatts, at most only four to five reactors would be covered. n291 Therefore, only one or two reactors from each design certification would be built that would qualify for the credit. n292 Thus, this tax credit might not be enough to reduce costs through series production so that subsequent units would be economically viable without a tax credit. n293 Moreover, the production tax credit does not have any adjustment for inflation, which could decrease its benefits to the first new plant to come online. n294 Because the benefit of the production tax credit is uncertain, developers have less incentive to go through with new construction.

Waste destroys long term industry growth and causes public backlash

GAO, Government Accountability Office, April ‘11

("Commercial Nuclear Waste, Effects of a Termination of the Yucca Mountain Repository Program and Lessons Learned," GAO-11-229)

The proposed termination of Yucca Mountain, which had been planned to be opened in 2020, will likely prolong storage at reactor sites, which would increase on-site storage costs. Because of delays in opening the Yucca Mountain repository, on-site storage at commercial nuclear facilities has been the de facto near-term strategy for managing spent nuclear fuel. Most spent nuclear fuel is stored at reactor sites, immersed in pools of water designed to cool it and isolate it from the environment. With the extension of on-site storage because of the delays in opening Yucca Mountain, some reactors are running out of space in their pools and have turned to dry-cask storage systems. In 2009, we reported that such systems for reactor operators cost from about $30 million to $60 million per reactor, with costs increasing as more spent nuclear fuel is added to dry storage.34 We also reported that the spent nuclear fuel would likely have to be repackaged about every 100 years, although experts said this is uncertain and research is under way to better understand the longevity of dry-cask systems. This repackaging could add from about $180 million to nearly $500 million, assuming initial repackaging operations, with costs dependent on the number of casks to be repackaged and whether a site has a transfer facility, such as a storage pool. Prolonging on-site storage would add to the taxpayer burden by increasing the substantial liabilities that DOE has already incurred due to on-site storage at commercial nuclear reactors. Were DOE to open Yucca Mountain in 2020, as it had planned, and begun taking custody of spent nuclear fuel, it would still have taken decades to take custody of the entire inventory of spent nuclear fuel. Assuming a 2020 opening of Yucca Mountain, DOE estimated that the total taxpayer liabilities for the backlog as of 2020 would be about $15.4 billion and would increase by $500 million for each year of delay thereafter.35 It is important to recognize that these liabilities are outside of the nearly $15 billion already spent on developing a repository and the estimated $41 to $67 billion still to be spent if the Yucca Mountain repository were to be constructed and become operational, most of the cost of which is borne by the Nuclear Waste Fund. Instead, these liabilities are borne by taxpayers because of the government’s failure to meet its commitment to take custody of the waste has resulted in lawsuits brought by industry.36 Furthermore, not all of the lawsuits have been resolved and industry has claimed that the lawsuits still pending could result in liabilities of at least $50 billion. Some former DOE officials and industry and community representatives stated that the termination of the Yucca Mountain program could result in an additional delay in the opening of a repository by at least 20 years, which would lead to additional DOE liabilities in the billions of dollars. Until a final disposition pathway is determined, there will continue to be uncertainties regarding the federal government’s total liabilities. At decommissioned reactor sites, prolonged on-site storage could further increase costs or limit opportunities for industry and local communities, according to industry and community representatives.37 As long as the spent nuclear fuel remains, the sites would not be available for other purposes, and the former operators may have to stay in business for the sole purpose of monitoring, storing, and providing costly security for the fuel. Local communities could lose the potential use of the site for alternative purposes, potentially impacting economic growth and tax revenue. For example, according to an industry representative, a local government in Illinois would like to encourage development of property fronting Lake Michigan near a shutdown nuclear reactor planned for decommissioning. A local government official stated in an interview with the media, however, that it may be difficult to develop and sell the property because prospective buyers may feel uneasy about living next to a site storing spent nuclear fuel. Similarly, a local government official from Minnesota expressed concern about having to provide security and emergency response for the Prairie Island reactor site and its spent nuclear fuel because tax revenues from the facility will decrease substantially after it is decommissioned. However, these issues may not affect all reactor sites. For example, officials in Oregon told us they did not feel dry-cask storage at Trojan, a decommissioned reactor, adversely affected economic growth or tax revenue. This site is about 42 miles north of Portland, Oregon, and is not in a major metropolitan area. Prolonging on-site storage could also increase opposition to expansion of the nuclear industry, according to state and industry officials. Without progress on a centralized storage facility or repository, some experts have stated that some state and local opposition to reactor storage site recertification will likely increase and so will challenges to nuclear power companies’ applications for reactor license extensions and for new reactor licenses.38 For example, Minnesota officials noted that negative public reaction to a proposal to increase dry-cask storage at a nuclear plant led the state legislature to impose a moratorium on new nuclear plants. At least 12 other states have similar prohibitions on new construction, 9 of which can be lifted when a means of disposing of spent nuclear fuel can be demonstrated. Representatives from some tribal and environmental organizations said they were concerned with the long-term on-site storage of spent nuclear fuel. They said nuclear plants should take additional measures to ensure the safety and security of dry-cask storage sites, and they have raised these concerns in objecting to the relicensing of commercial reactors in Minnesota and New Jersey. For instance, tribal officials from the Prairie Island Indian Community in Minnesota told us they opposed relicensing the Prairie Island Nuclear Generating Plant because of environmental and safety concerns they have about living just 600 hundred yards from spent nuclear fuel.

# dod

DOD won’t lose oil access—any alternative is less efficient

Sarewitz 12, Co-Director – Consortium for Science, Policy & Outcomes, and Thernstrom, senior climate policy advisor – Clean Air Task Force, ‘12

(Daniel and Samuel, “Introduction,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

Even so, given adequate forward planning, DoD has little¶ reason to fear constraints on supply of petroleum-based fuels¶ for several decades, perhaps many. A tightening international¶ oil market, resulting in continuing price increases, would pose¶ greater difficulties for other segments of the U.S. economy and¶ society, **and for other countries.** DoD’s expenditures on fuel **may¶ seem large**, but should be viewed in the context of other routine¶ expenditures. Even for the Air Force, the principal consumer with¶ its fleet of nearly 6,000 planes, fuel accounts for only around¶ one-fifth of operations and maintenance costs.12 In Afghanistan¶ and Iraq, fuel and water have made up 70 percent (by weight) of¶ the supplies delivered to forward areas.13 Transport convoys have¶ drawn frequent and deadly attacks, but the only way to reduce¶ risks, casualties, and delivery costs is to cut consumption (of¶ water as well as fuel)—**not something that alternative fuels can¶ promise.** Alternative fuels might have somewhat lower energy¶ densities than petroleum (less energy content per gallon or per¶ pound), meaning somewhat more fuel would have to be burned¶ for the same power output, but not higher (by any significant¶ amount). Indeed, alternative fuels cannot promise performance¶ advantages of any sort.

No disruptions—multiple trends

Alic 12, former tech and science consultant – Office of Technology Assessment, adjunt professor – Johns Hopkins SAIS, ‘12

(John, “Defense Department Energy Innovation: Three Cases,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

Over 80 percent of the petroleum purchased and consumed¶ by the U.S. military consists of jet fuel designated JP-5 or JP-8;¶ diesel fuel makes up nearly all the rest.46 By volume, recent¶ purchases peaked in fiscal 2003 with the invasion of Iraq, then¶ declined even as rising oil prices pushed expenditures upward:¶ fuel doubled as a share of DoD outlays, from 1.5 percent to 3¶ percent, between fiscal years 2004 and 2008. Consumption did¶ not change much, but purchases rose from $7 billion (2004) to¶ $18 billion (2008). Prices then fell back somewhat, but in 2011¶ DoD paid more for jet fuel just as motorists did for gasoline.¶ Even so, the Energy Information Administration (EIA, part of the¶ Energy Department) predicts relatively flat oil prices over the next¶ quarter century, with inflation-adjusted prices in the range of¶ $120 per barrel.47¶ Oil prices respond almost instantaneously to international¶ political events (e.g., the threat of supply constrictions) and to¶ economic fluctuations affecting demand. A small number of big¶ suppliers—state-owned or state-controlled enterprises inside¶ and outside the Organization of Petroleum Exporting Countries¶ (OPEC), plus a handful of private multinationals—dominate¶ production. In recent years, most have appeared to pump¶ oil at or near capacity most of the time. By most indications,¶ Saudi Arabia alone retains the ability to affect prices by raising¶ or lowering output. Otherwise suppliers must act together to¶ set prices, and in recent years that has come to seem mostly a¶ theoretical possibility. Periodic fears of disruption linked with¶ political unrest or war have had greater effects, and sharp swings¶ in prices have been common, affected also by asynchronous¶ demand variations in major markets. **Price increases have been¶ moderated by declining energy intensity** (energy consumption¶ relative to economic output) **in most parts of the world.** This is¶ the principal reason EIA does not expect the long-term trend to¶ be sharply upward.¶ Acknowledging the more dramatic scenarios some analysts¶ put forward, **there seems little** in what is actually known about¶ world oil reserves and the workings of the international market **to¶ suggest that the U.S. military faces** either intolerably **burdensome¶ fuel costs or supply risks** in the foreseeable future. DoD buys¶ fuel alongside other purchasers. It is a big customer, but not¶ big enough to affect prices. Long-distance transport of crude¶ oil and refined products is **routine and inexpensive.** So long¶ as the world market remains effectively integrated, it would¶ take a massive injection of substitutable alternatives to affect¶ prices. Private investors, absent proven capability to produce¶ alternatives in substantial quantities at competitive costs—or a¶ package of subsidies such as those for domestic ethanol, perhaps¶ including binding price guarantees—will find little reason to¶ increase production capacity rapidly. Fuel is fuel, and as output¶ of substitutable alternatives builds it will simply flow into the¶ international market at prices little different from those for other¶ refined petroleum products.¶ Given U.S. dependence on imported oil, it is reliability of¶ supply, rather than pricing, that might seem the larger issue.¶ But again, the market is international; indeed, DoD buys much¶ of its fuel abroad—in recent years, something like half (box¶ 2.3). Innovations—perhaps sustainable biofuels—would, once¶ proven, migrate to the lowest-cost-production locations, many of¶ them presumably overseas. (The United States has no monopoly¶ on sunshine and arable land.) DoD and the government might¶ support innovation and subsidize production, but it would be¶ difficult to wall off domestic output without some compelling¶ national security rationale. Wartime supply interruptions¶ might be accepted as justifying government ownership and¶ reservation of output for the military, but not indefinite fears of¶ future interruptions. Private ownership coupled with domestic¶ production and export restrictions would more than likely be¶ seen as contravening bedrock principles of U.S. foreign economic¶ policy, which since World War II has been based on borders¶ nominally open to trade.

Grid is resilient and sustainable

Clark 12, MA candidate – Intelligence Studies @ American Military University, senior analyst – Chenega Federal Systems, 4/28/’12

(Paul, “The Risk of Disruption or Destruction of Critical U.S. Infrastructure by an Offensive Cyber Attack,” American Military University)

In 2003, a simple physical breakdown occurred – trees shorted a power line and caused a

fault – that had a cascading effect and caused a power blackout across the Northeast (Lewis

2010). This singular occurrence has been used as evidence that the electrical grid is fragile and

subject to severe disruption through cyber-attack, a disruption that could cost billions of dollars,

brings business to a halt, and could even endanger lives – if compounded by other catastrophic

events (Brennan 2012). A power disruption the size of the 2003 blackout, the worst in American¶ history at that time (Minkel 2008), is a worst case scenario and used as an example of the¶ fragility of the U.S. energy grid. This perceived fragility is not real when viewed in the context¶ of the robustness of the electrical grid.¶ When asked about cyber-attacks against the electrical grid in April of 2012, the¶ intelligence chief of U.S. Cyber Command Rear Admiral Samuel Cox stated that an attack was¶ unlikely to succeed because of the “huge amounts of resiliency built into the [electrical] system¶ that makes that kind of catastrophic thing very difficult” (Capaccio 2012). This optimistic view¶ is supported by an electrical grid that has **proven to be robust in the face of large natural¶ catastrophes.** Complex systems like the electrical grid in the U.S. are prone to failures and the¶ U.S. grid fails frequently. Despite efforts to reduce the risk out power outages, the risk is always¶ present. Power outages that affect more than 50,000 people have occurred steadily over the last¶ 20 years at a rate of 12% annually and the frequency of large catastrophes remains relatively¶ high and outages the size of the 2003 blackout are predicted to occur every 25 years (Minkel¶ 2008). In a complex system that is always at risk of disruption, the effect is mitigated by policies¶ and procedures that are meant to restore services as quickly as possible. The most visible of these policies is the interstate Emergency Management Assistance Compact, a legally binding¶ agreement allowing combined resources to be quickly deployed in response to a catastrophic¶ disaster such as power outages following a severe hurricane (Kapucu, Augustin and Garayev¶ 2009).¶ The electrical grid suffers service interruptions regularly, it is a large and complex system¶ supporting the largest economy in the world, and yet commerce does not collapse (Lewis 2010).¶ **Despite blizzards, earthquakes, fires, and hurricanes** that cause blackouts, the economy is¶ affected but does not collapse and even after massive damage like that caused by Hurricane¶ Katrina, national security is not affected because U.S. military capability is not degraded (Lewis¶ 2010).¶ Cyber-security is an ever-increasing concern in an increasingly electronic and¶ interconnected world. Cyber-security is a high priority “economic and national security¶ challenge” (National Security Council n.d.) because cyber-attacks are expected to become the¶ top national security threat (Robert S. Mueller 2012). In response to the threat Congress is¶ crafting legislation to enhance cyber-security (Brito and Watkins 2012) and the Department of¶ Homeland Security budget for cyber-security has been significantly increased (U.S. Senate¶ Committee on Homeland Security and Governmental Affairs 2012).

Microgrids solve DOD vulnerability

Pike Research 11, market research and consulting firm that provides in-depth analysis of global clean technology markets, 9/16/’11

(<http://www.pikeresearch.com/newsroom/military-microgrid-capacity-to-experience-more-than-700-growth-by-2017>)

Military Microgrid Capacity to Experience More than 700% Growth by 2017

September 16, 2011

The United States Department of Defense (DOD) is the single largest consumer of petroleum in the world. U.S. military operations are also the largest consumer of all forms of energy globally. Microgrids, which enable distributed energy generation at a localized scale including the ability to “island” themselves from larger utility grids, can shrink the amount of fossil fuels consumed to create electricity by networking generators as a system to maximize efficiency. Microgrids enable military bases – both stationary and tactical – to sustain operations no matter what is happening on the larger utility grid or in the theater of war.

According to a new report from Pike Research, the capacity of military microgrids will grow at a rate of 739% between 2011 and 2017, increasing from 38 megawatts (MW) to 316 MW during that period, under a baseline forecast scenario. The cleantech market intelligence firm expects that, under a more aggressive adoption scenario, stationary and mobile military microgrid capacity could reach as high as 817 MW during the same timeframe.

“The military’s **primary concern** is disruption of service from utility transmission and distribution lines,” says senior analyst Peter Asmus. “The lack of control and ownership of these lines – and the uneven quality of power service regionally throughout the United States – has **prompted the DOD to reexamine the existing electricity service delivery model.** This analysis has led the DOD to the inevitable conclusion that the **best way** to bolster its ability to secure power may well be through microgrid technology it can own and control.”

Asmus adds that, as awareness about the electrical grid’s vulnerability to terrorist attacks has increased in recent times, the U.S. military has become one of the strongest proponents of microgrids, which offer the ultimate secure power supply for fixed base mobile operations. Many army, navy, air force, and other related bases and offices already have vintage microgrids in place. What is new, says Asmus, is that these facilities are looking to **envelop entire bases** with microgrids and integrate distributed energy generation on-site. These resources, when capable of safe islanding from the surrounding grid, offer the ultimate security since fuel never runs out with renewable energy resources such as solar or wind. The opportunity to help develop these microgrids has attracted a number of powerful technology companies including Lockheed Martin, GE, Honeywell, Boeing, and Eaton.

#### Data disproves hegemony impacts

Fettweis, 11

Christopher J. Fettweis, Department of Political Science, Tulane University, 9/26/11, Free Riding or Restraint? Examining European Grand Strategy, Comparative Strategy, 30:316–332, EBSCO

It is perhaps worth noting that there is no evidence to support a direct relationship between the relative level of U.S. activism and international stability. In fact, the limited data we do have suggest the opposite may be true. During the 1990s, the United States cut back on its defense spending fairly substantially. By 1998, the United States was spending $100 billion less on defense in real terms than it had in 1990.51 To internationalists, defense hawks and believers in hegemonic stability, this irresponsible “peace dividend” endangered both national and global security. “No serious analyst of American military capabilities,” argued Kristol and Kagan, “doubts that the defense budget has been cut much too far to meet America’s responsibilities to itself and to world peace.”52 On the other hand, if the pacific trends were not based upon U.S. hegemony but a strengthening norm against interstate war, one would not have expected an increase in global instability and violence.

The verdict from the past two decades is fairly plain: The world grew more peaceful while the United States cut its forces. No state seemed to believe that its security was endangered by a less-capable United States military, or at least none took any action that would suggest such a belief. No militaries were enhanced to address power vacuums, no security dilemmas drove insecurity or arms races, and no regional balancing occurred once the stabilizing presence of the U.S. military was diminished. The rest of the world acted as if the threat of international war was not a pressing concern, despite the reduction in U.S. capabilities. Most of all, the United States and its allies were no less safe. The incidence and magnitude of global conflict declined while the United States cut its military spending under President Clinton, and kept declining as the Bush Administration ramped the spending back up. No complex statistical analysis should be necessary to reach the conclusion that the two are unrelated.

Military spending figures by themselves are insufficient to disprove a connection between overall U.S. actions and international stability. Once again, one could presumably argue that spending is not the only or even the best indication of hegemony, and that it is instead U.S. foreign political and security commitments that maintain stability. Since neither was significantly altered during this period, instability should not have been expected. Alternately, advocates of hegemonic stability could believe that relative rather than absolute spending is decisive in bringing peace. Although the United States cut back on its spending during the 1990s, its relative advantage never wavered.

However, even if it is true that either U.S. commitments or relative spending account for global pacific trends, then at the very least stability can evidently be maintained at drastically lower levels of both. In other words, even if one can be allowed to argue in the alternative for a moment and suppose that there is in fact a level of engagement below which the United States cannot drop without increasing international disorder, a rational grand strategist would still recommend cutting back on engagement and spending until that level is determined. Grand strategic decisions are never final; continual adjustments can and must be made as time goes on. Basic logic suggests that the United States ought to spend the minimum amount of its blood and treasure while seeking the maximum return on its investment. And if the current era of stability is as stable as many believe it to be, no increase in conflict would ever occur irrespective of U.S. spending, which would save untold trillions for an increasingly debt-ridden nation.

It is also perhaps worth noting that if opposite trends had unfolded, if other states had reacted to news of cuts in U.S. defense spending with more aggressive or insecure behavior, then internationalists would surely argue that their expectations had been fulfilled. If increases in conflict would have been interpreted as proof of the wisdom of internationalist strategies, then logical consistency demands that the lack thereof should at least pose a problem. As it stands, the only evidence we have regarding the likely systemic reaction to a more restrained United States suggests that the current peaceful trends are unrelated to U.S. military spending. Evidently the rest of the world can operate quite effectively without the presence of a global policeman. Those who think otherwise base their view on faith alone.

# warming

DOD domestic purchases don’t spill over

Marqusee, executive director – Strategic Environmental Research and Development Program @ DOD, ‘12

(Jeffrey, “Military Installations and Energy Technology Innovations,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

Decisions on implementing these technologies will be made in a distributed sense and involve tens of thousands of individual decision makers if they are ever to reach large-scale deployment. These are the energy technologies that DoD installations will be buying, either directly through appropriated funds or in partnership with third-party financing through mechanisms such as Energy Saving Performance Contracts (ESPCs) or Power Purchase Agreements (PPAs). In the DOE taxonomy shown above, these distributed installation energy technologies cover the demand space on building and industrial efficiency, portions of the supply space for clean electricity when restricted to distributed generation scale, and a critical portion in the middle where microgrids and their relationship to energy storage and electric vehicles reside. There is an extensive literature on the impediments to commercialization of these emerging energy technologies for the building infrastructure market.82 A key impediment (and one found not just in the building market) is that energy is a cost of doing business, and thus rarely the prime mission of the enterprise or a priority for decision makers. In contrast to sectors such as information technology and biotechnology, where advanced technologies often provide the end customer with a new capability or the ability to create a new business, improvements in energy technology typically just lower the cost of an already relatively low-cost commodity (electricity). As a result, **the market for new technology is highly price sensitive**, and life-cycle costs are sensitive to the operational efficiency of the technology, to issues of maintenance, and to the estimated lifetime of the component. Thus, a first user of a new energy technology bears significantly more risk while getting the same return as subsequent users. A second impediment is the slow pace of technological change in the U.S. building sector: **it takes** years, if not **decades**, **for new products to achieve widespread use.** One reason for this is that many firms in the industry are small; they lack the manpower to do research on new products, and they have limited ability to absorb the financial risks that innovation entails. A third impediment to the widespread deployment of new technologies arises from the **fragmented or distributed nature of the market**; decisions are usually made at the individual building level, based on the perceived return on investment for a specific project. The structural nature of decision making and ownership can be a significant obstacle to technological innovation in the commercial market: n The entity that bears the up-front capital costs is often not the same as the one that reaps the operation and management savings (this is known as the “split incentives” or “principal agent” problem). n Key decision makers (e.g., architecture and engineering firms) face the liabilities associated with operational failure but do not share in the potential savings, **creating an incentive to prefer reliability over innovation.** n Financing mechanisms for both energy efficiency (by energy service companies using an ESPC) and distributed and renewable energy generation (through PPA and the associated financing entities) require high confidence in the long-term (decade-plus) performance of the technology, and thus investors are unwilling to put capital at risk on new technologies. Other significant barriers to innovation include a lack of information, which results in high transactional costs, and an inability to properly project future savings. As the National Academy of Sciences has pointed out, the lack of “evidence based” data inhibits making an appropriate business case for deployment.83 The return on the capital investment is often in terms of avoided future costs. Given the limited visibility of those costs when design decisions are being made, it is often hard to properly account for them or see the return. This is further exacerbated by real and perceived discount rates that can lead to suboptimal investment decisions. Finally, the lack of significant operational testing until products are deployed severely limits the rapid and complete development of new energy technologies. The impact of real-world conditions such as building operations, variable loads, human interactions, and so forth makes it **very difficult to optimize technologies**, and specifically inhibits any radical departure from standard practice. These barriers are particularly problematic for new energy efficiency technologies in the building retrofit market, which is where DoD has the greatest interest. In addition to these barriers, which are common across DoD and the commercial market, DoD has some unique operational requirements (security and information assurance issues) that create other barriers.

Lack of a national energy policy means no spillover

Vilhauer 11, Energy and National Security Program @ CSIS, 7/15/’11

(Laura, “Event Summary: Operational Energy Strategy,” <http://csis.org/files/attachments/110720_Energy_SummaryL.pdf>)

An overarching theme from the panel was the **uphill battle** faced by DoD in the implementation of its strategy due **to the dearth of a national energy policy.** Admiral Nathman noted that one of the largest hurdles faced by DoD is its inability to influence the direction of the market. DoD’s fuel demand is less than 1% of the nation’s total. Thus, according to Admiral Nathman, this means that the formation of an overarching energy policy that creates incentives will be a vital determinant of DoD’s ability to pursue the goals laid out in its strategy. Admiral Nathman applauded efforts by DoD to establish a strategy, however, he emphasized that without guidance, **it is operating in a vacuum.**

Warming won’t cause extinction

Barrett, professor of natural resource economics – Columbia University, ‘7

(Scott, Why Cooperate? The Incentive to Supply Global Public Goods, introduction)

First, climate change does not threaten the survival of the human species.5 If unchecked, it will cause other species to become extinction (though biodiversity is being depleted now due to other reasons). It will alter critical ecosystems (though this is also happening now, and for reasons unrelated to climate change). It will reduce land area as the seas rise, and in the process displace human populations. “Catastrophic” climate change is possible, but not certain. Moreover, and unlike an asteroid collision, large changes (such as sea level rise of, say, ten meters) will likely take centuries to unfold, giving societies time to adjust. “Abrupt” climate change is also possible, and will occur more rapidly, perhaps over a decade or two. However, abrupt climate change (such as a weakening in the North Atlantic circulation), though potentially very serious, is unlikely to be ruinous. Human-induced climate change is an experiment of planetary proportions, and we cannot be sur of its consequences. Even in a worse case scenario, however, global climate change is not the equivalent of the Earth being hit by mega-asteroid. Indeed, if it were as damaging as this, and if we were sure that it would be this harmful, then our incentive to address this threat would be overwhelming. The challenge would still be more difficult than asteroid defense, but we would have done much more about it by now.

CO2 isn’t key

Watts, 25-year climate reporter, works with weather technology, weather stations, and weather data processing systems in the private sector, 7/25/’12

(Anthony, <http://wattsupwiththat.com/2012/07/25/lindzen-at-sandia-national-labs-climate-models-are-flawed/>)

ALBUQUERQUE, N.M. — Massachusetts Institute of Technology professor Richard Lindzen, a global warming skeptic, told about 70 Sandia researchers in June that too much is being made of climate change by researchers seeking government funding. He said their data and their methods did not support their claims.

“Despite concerns over the last decades with the greenhouse process, they oversimplify the effect,” he said. “Simply cranking up CO2 [carbon dioxide] (as the culprit) is not the answer” to what causes climate change.

Lindzen, the ninth speaker in Sandia’s Climate Change and National Security Speaker Series, is Alfred P. Sloan professor of meteorology in MIT’s department of earth, atmospheric and planetary sciences. He has published more than 200 scientific papers and is the lead author of Chapter 7 (“Physical Climate Processes and Feedbacks”) of the International Panel on Climate Change’s (IPCC) Third Assessment Report. He is a member of the National Academy of Sciences and a fellow of the American Geophysical Union and the American Meteorological Society.

For 30 years, climate scientists have been “locked into a simple-minded identification of climate with greenhouse-gas level. … That climate should be the function of a single parameter (like CO2) has always seemed implausible. Yet an obsessive focus on such an obvious oversimplification has likely set back progress by decades,” Lindzen said.

For major climates of the past, other factors were more important than carbon dioxide. Orbital variations have been shown to quantitatively account for the cycles of glaciations of the past 700,000 years, he said, and the elimination of the arctic inversion, when the polar caps were ice-free, “is likely to have been more important than CO2 for the warm episode during the Eocene 50 million years ago.”

There is little evidence that changes in climate are producing extreme weather events, he said. “Even the IPCC says there is little if any evidence of this. In fact, there are important physical reasons for doubting such anticipations.”

Lindzen’s views run counter to those of almost all major professional societies. For example, the American Physical Society statement of Nov. 18, 2007, read, “The evidence is incontrovertible: Global warming is occurring.” But he doesn’t feel they are necessarily right. “Why did the American Physical Society take a position?” he asked his audience. “Why did they find it compelling? They never answered.”

Speaking methodically with flashes of humor — “I always feel that when the conversation turns to weather, people are bored.” — he said a basic problem with current computer climate models that show disastrous increases in temperature is that relatively small increases in atmospheric gases lead to large changes in temperatures in the models.

But, he said, “predictions based on high (climate) sensitivity ran well ahead of observations.”

Real-world observations do not support IPCC models, he said: “We’ve already seen almost the equivalent of a doubling of CO2 (in radiative forcing) and that has produced very little warming.”

He disparaged proving the worth of models by applying their criteria to the prediction of past climatic events, saying, “The models are no more valuable than answering a test when you have the questions in advance.”

Modelers, he said, merely have used aerosols as a kind of fudge factor to make their models come out right. (Aerosols are tiny particles that reflect sunlight. They are put in the air by industrial or volcanic processes and are considered a possible cause of temperature change at Earth’s surface.)

Then there is the practical question of what can be done about temperature increases even if they are occurring, he said. “China, India, Korea are not going to go along with IPCC recommendations, so … the only countries punished will be those who go along with the recommendations.”

He discounted mainstream opinion that climate change could hurt national security, saying that “historically there is little evidence of natural disasters leading to war, but economic conditions have proven much more serious. Almost all proposed mitigation policies lead to reduced energy availability and higher energy costs. All studies of human benefit and national security perspectives show that increased energy is important.”

He showed a graph that demonstrated that more energy consumption leads to higher literacy rate, lower infant mortality and a lower number of children per woman.

Given that proposed policies are unlikely to significantly influence climate and that lower energy availability could be considered a significant threat to national security, to continue with a mitigation policy that reduces available energy “would, at the least, appear to be irresponsible,” he argued.

Responding to audience questions about rising temperatures, he said a 0.8 of a degree C change in temperature in 150 years is a small change. Questioned about five-, seven-, and 17-year averages that seem to show that Earth’s surface temperature is rising, he said temperatures are always fluctuating by tenths of a degree.

CO2 boosts plant performance and prevents mass starvation—avoids extinction

Singer, PhD physics – Princeton University and professor of environmental science – UVA, consultant – NASA, GAO, DOE, NASA, Carter, PhD paleontology – University of Cambridge, adjunct research professor – Marine Geophysical Laboratory @ James Cook University, and Idso, PhD Geography – ASU, ‘11

(S. Fred, Robert M. and Craig, “Climate Change Reconsidered,” 2011 Interim Report of the Nongovernmental Panel on Climate Change)

Regarding the first of these requirements, Tilman et al. note that in many parts of the world the historical rate of increase in crop yields is declining, as the genetic ceiling for maximal yield potential is being approached. This observation, in their words, ―highlights the need for efforts to steadily increase the yield potential ceiling.‖ With respect to the second requirement, they indicate, ―without the use of synthetic fertilizers, world food production could not have increased at the rate it did [in the past] and more natural ecosystems would have been converted to agriculture.‖ Hence, they state the solution ―will require significant increases in nutrient use efficiency, that is, in cereal production per unit of added nitrogen, phosphorus,‖ and so forth. Finally, as to the third requirement, Tilman et al. remind us ―water is regionally scarce,‖ and ―many countries in a band from China through India and Pakistan, and the Middle East to North Africa either currently or will soon fail to have adequate water to maintain per capita food production from irrigated land.‖ Increasing crop water use efficiency, therefore, is also a must. Although the impending biological crisis and several important elements of its potential solution are thus well defined, Tilman et al. (2001) noted ―even the best available technologies, fully deployed, cannot prevent many of the forecasted problems.‖ This was also the conclusion of Idso and Idso (2000), who stated that although ―expected advances in agricultural technology and expertise will significantly increase the food production potential of many countries and regions,‖ these advances ―will not increase production fast enough to meet the demands of the even faster-growing human population of the planet.‖ Fortunately, we have a powerful ally in the ongoing rise in the air‘s CO2 content that can provide what we can‘t. Since atmospheric CO2 is the basic ―food of essentially all plants, the more of it there is in the air, the bigger and better they grow. For a nominal doubling of the air‘s CO2 concentration, for example, the productivity of Earth‘s herbaceous plants rises by 30 to 50 percent (Kimball, 1983; Idso and Idso, 1994), and the productivity of its woody plants rises by 50 to 80 percent or more (Saxe et al. 1998; Idso and Kimball, 2001). Hence, as the air‘s CO2 content continues to rise, the land use efficiency of the planet will rise right along with it. In addition, atmospheric CO2 enrichment typically increases plant nutrient use efficiency and plant water use efficiency. Thus, with respect to all three of the major needs identified by Tilman et al. (2002), increases in the air‘s CO2 content pay huge dividends, helping to increase agricultural output without the taking of new land and water from nature. Many other researchers have broached this subject. In a paper recently published in the Annual Review of Plant Biology, three scientists associated with the Institute of Genomic Biology at the University of Illinois at Urbana-Champaign (USA) write that meeting the global increase in agricultural demand during this century ―is predicted to require a doubling of global production,‖ but ―the world has limited capacity to sustainably expand cropland,‖ and this capacity is actually ―shrinking in many developed countries.‖ Thus, Zhu et al. (2010) state, ―meeting future increases in demand will have to come from a near doubling of productivity on a land area basis,‖ and they conclude ―a large contribution will have to come from improved photosynthetic conversion efficiency,‖ estimating ―at least a 50% improvement will be required to double global production.‖ The researchers‘ reason for focusing on photosynthetic conversion efficiency derives from the experimentally observed facts that increases in the atmosphere‘s CO2 concentration increase the photosynthetic rates of nearly all plants, and those rate increases generally lead to equivalent—or only slightly smaller—increases in plant productivity on a land area basis. That provides a solid foundation for their enthusiasm in this regard. In their review of the matter, however, they examine the prospects for boosting photosynthetic conversion efficiency in an entirely different way: genetically, without increasing the air‘s CO2 content. ―Improving photosynthetic conversion efficiency will require,‖ the three scientists state, ―a full suite of tools including breeding, gene transfer, and synthetic biology in bringing about the designed alteration to photosynthesis.‖ For some of these ―near-term‖ endeavors, they indicate ―implementation is limited by technical issues that can be overcome by sufficient investment,‖ meaning they can ―be bought.‖ But several ―mid-term‖ goals could take 20 years or more to achieve; and they state ―even when these improvements are achieved, it may take an additional 10–20 years to bring such innovations to farms in commercial cultivars at adequate scale.‖ And if that is not bad enough, they say of still longer-term goals that ―too little of the science has been undertaken to identify what needs to be altered to effect an increase in yield,‖ while in some cases they acknowledge that what they envision may not even be possible, as in developing a form of RuBisCO that exhibits a significant decrease in oxygenation activity, or in designing C3 crops to utilize the C4 form of photosynthetic metabolism. Clearly, we do not have the time to gamble on our ability to accomplish what needs to be done in order to forestall massive human starvation of global dimensions within the current century. Therefore—in addition to trying what Zhu et al. suggest—we must rely on the ―tested and true: the CO2-induced stimulation of plant photosynthesis and crop yield production. And all we need to do in this regard is to refrain from interfering with the natural evolution of the Industrial Revolution, which is destined to be carried for some time yet on the backs of fossil-fuel-driven enterprises that can provide the atmosphere with the extra carbon dioxide that will be needed to provide the extra increase in crop growth that may mean the difference between global food sufficiency and human starvation on a massive scale a mere few decades from now. Another take on the matter has been provided by Hanjra and Qureshi (2010). They begin their treatment of the subject by quoting Benjamin Franklin‘s well-known homily, ―When the well is dry, we know the worth of water,‖ and they write we ―must not lose sight of surging water scarcity.‖ Noting ―population and income growth will increase the demand for food and water,‖ they contend ―irrigation will be the first sector to lose water, as water competition by non-agricultural uses increases and water scarcity intensifies.‖ As ―increasing water scarcity will have implications for food security, hunger, poverty, and ecosystem health and services,‖ they report ―feeding the 2050 population will require some 12,400 km3 of water, up from 6800 km3 used today.‖ This huge increase, they continue, ―will leave a water gap of about 3300 km3 even after improving efficiency in irrigated agriculture, improving water management, and upgrading of rainfed agriculture,‖ as per the findings of de Fraiture et al. (2007), Molden (2007), and Molden et al. (2010). This water deficiency, according to Hanjra and Qureshi, ―will lead to a food gap unless concerted actions are taken today.‖ Some of the measures they propose are to conserve water and energy resources, develop and adopt climate-resilient crop varieties, modernize irrigation, shore up domestic food supplies, reengage in agriculture for further development, and reform the global food and trade markets. To achieve these goals, they write, ―unprecedented global cooperation is required,‖ which by the looks of today‘s world is an exceedingly remote possibility. What, then, can we do to defuse the ticking time-bomb of this looming food and water crisis? One option is to do nothing: don‘t mess with the normal, unforced evolution of civilization‘s means of acquiring energy. This is because on top of everything else we may try to do to conserve both land and freshwater resources, we will still fall short of what is needed to be achieved unless the air‘s CO2 content rises significantly and thereby boosts the water use efficiency of Earth‘s crop plants and that of the plants that provide food and habitat for what could be called ―wild nature,‖ enabling both sets of plants to produce more biomass per unit of water used. To ensure this happens, we will need all of the CO2 that will be produced by the burning of fossil fuels, until other forms of energy truly become more cost-efficient than coal, gas, and oil. In fact, these other energy sources will have to become much more cost-efficient before fossil fuels are phased out, because the positive externality of the CO2-induced increase in plant water use efficiency provided by the steady rise in the atmosphere‘s CO2 concentration due to the burning of fossil fuels will be providing a most important service in helping us feed and sustain our own species without totally decimating what yet remains of wild nature. In yet another paper to address this important issue—this one published in the Journal of Proteome Research—Sarkar et al. (2010) write, ―increasing population and unsustainable exploitation of nature and natural resources have made ‗food security‘ a burning issue in the 21st century,‖ echoing the sentiments expressed by Farrell (2009), who noted ―the alarming increase in biofuel production, the projected demand for livestock products, and the estimated food to feed the additional 700 million people who will arrive here by 2016, will have unprecedented consequences,‖ among which are likely to be that ―arable land, the environment, water supply and sustainability of the agricultural system will all be affected,‖ and not in a positive way. Furthermore, when the human population of the globe reaches 8.7–11.3 billion by the year 2050 (Bengtsson et al., 2006), the situation will become truly intolerable, unless something is done, far in advance of that date, to mitigate the situation dramatically. Thus, as Sarkar et al. suggest, ―a normal approach for any nation/region is to strengthen its agricultural production for meeting future demands and provide food security.‖ But a major difficulty, which could spoil mankind‘s ability to do so, is the ongoing rise in the atmosphere‘s ozone concentration. This is the subject of Sarkar et al.‘s new paper. In a study designed to elucidate the many ways in which ozone (O3) is harmful to plants, the eight researchers grew two high-yielding cultivars (Sonalika and HUW 510) of wheat (Triticum aestivum L.) outdoors at the Agriculture Research Farm of India‘s Banaras Hindu University. This was done within open-top chambers maintained at the ambient O3 concentration and at elevated O3 concentrations of 25 percent and 50 percent above ambient during the peak O3 period of the day (10:00 to 15:00 hours local time) for a total of 50 days, during which time they measured numerous responses of the plants to the two levels of ozone enrichment. Sarkar et al. determined, among several other things, that the moderate increases in the air‘s O3 concentration resulted in higher foliar injury, a reduction in photosynthetic efficiency, induced inhibition in photochemical efficacy of photosystem II, lowered concentrations of photosynthetic pigments and proteins, and what they describe as ―drastic reductions‖ in RuBisCO large and small subunits, while noting major leaf photosynthetic proteins and important energy metabolism proteins were also ―drastically reduced.‖ Discussing the results, the scientists from India, Japan, and Nepal remark that anthropogenic activities have made ozone a ―major environmental pollutant of our time,‖ while noting some are predicting it to be an even ―greater problem for the future.‖ Adding this dilemma to the problem of feeding the world over the next few decades and beyond makes humanity‘s future look incredibly bleak. Thus, Sarkar et al. suggest we focus on ―engineering crops for future high O3,‖ concentrating on maintaining ―effective stomatal conductance of plants which can avoid O3 entry but not hamper their productivity.‖ We agree. But not knowing to what extent we will be successful in this endeavor, we also need to do something we know will work: allowing the air‘s CO2 content to rise, unimpeded by the misguided efforts of those who would curtail anthropogenic CO2 emissions in the guise of fighting what they claim is anthropogenic-induced global warming. This contention is largely theoretical and wholly unproven, but we know, as a result of literally hundreds, if not thousands, of real-world experiments, that atmospheric CO2 enrichment increases both the productivity and water-use efficiency of nearly all plants, and that it often more than compensates for the negative effects of O3 pollution. Introducing another review of food security studies pertinent to the challenge of feeding 9 billion people just four decades from now, Godfray et al. (2010) note ―more than one in seven people today still do not have access to sufficient protein and energy from their diet and even more suffer some form of micronutrient malnourishment,‖ citing the FAO (2009). Although ―increases in production will have an important part to play‖ in correcting this problem and keeping it from worsening in the future, mankind ―will be constrained by the finite resources provided by the earth‘s lands, oceans and atmosphere,‖ This set of difficulties they describe at the end of their review as constituting a ―perfect storm.‖ In considering ways to mitigate these problems, the first question they ask is: ―How can more food be produced sustainably?‖ They state the primary solution to food shortages of the past was ―to bring more land into agriculture and to exploit new fish stocks,‖ but they note there is precious little remaining of either of these pristine resources. Thus, they conclude ―the most likely scenario is that more food will need to be produced from the same or less land.‖ As they suggest, ―we must avoid the temptation to sacrifice further the earth‘s already hugely depleted biodiversity for easy gains in food production, not only because biodiversity provides many of the public goods upon which mankind relies, but also because we do not have the right to deprive future generations of its economic and cultural benefits.‖ And, we might add, because we should be enlightened enough to realize we have a moral responsibility to drive no more species to extinction than we already have sent to that sorry state. So how can these diverse requirements all be met simultaneously? A clue comes from Godfray et al.‘s statement that ―greater water and nutrient use efficiency, as well as tolerance of abiotic stress, are likely to become of increasing importance.‖ And what is there that can bring about these changes in mankind‘s crops? You guessed it: carbon dioxide. Rising concentrations of atmospheric CO2 increase the photosynthetic prowess of essentially all of the Earth‘s plants, while generally reducing the rate at which they transfer water from the soil to the air. In addition, more CO2 in the air tends to enhance the efficiency with which plants utilize nutrients in constructing their tissues and producing the edible portions that we and all of Earth‘s animals depend upon for our very existence. Focusing on the water scarcity aspect of the food shortage problem, Kummu et al. (2010) write, ―due to the rapidly increasing population and water use per capita in many areas of the world, around one third of the world‘s population currently lives under physical water scarcity (e.g. Vorosmarty et al., 2000; Alcamo et al., 2003; Oki and Kanae, 2006).‖ But despite the large number of water scarcity studies conducted over the years, ―no global assessment is available of how this trend has evolved over the past several centuries to millennia.‖ Thus they conducted a study covering AD 0 to 2005. This analysis was carried out for ten different time slices, defined as those times at which the human population of the globe was approximately double the population of the previous time slice. Global population data for these analyses were derived from the 5‘ latitude x 5‘ longitude-resolution global HYDE dataset of Klein Goldewijk (2005) and Klein Goldewijk et al. (2010), while evaluation of water resources availability over the same period was based on monthly temperature and precipitation output from the climate model ECBilt-CLIO-VECODE, as calculated by Renssen et al. (2005). After completing these assessments, the four researchers found ―moderate water shortage first appeared around 1800, but it commenced in earnest from about 1900, when 9% of the world population experienced water shortage, of which 2% was under chronic water shortage (<1000 m3/capita/year).‖ Thereafter, from 1960 onwards, they write, ―water shortage increased extremely rapidly, with the proportion of global population living under chronic water shortage increasing from 9% (280 million people) in 1960 to 35% (2300 million) in 2005.‖ And currently, they continue, ―the most widespread water shortage is in South Asia, where 91% of the population experiences some form of water shortage,‖ while ―the most severe shortage is in North Africa and the Middle East, where 77% and 52% of the total population lives under extreme water shortage (<500 m3/capita/year), respectively.‖ To alleviate these freshwater shortages, Kummu et al. state measures generally have been taken to increase water availability, such as building dams and extracting groundwater. But they note ―there are already several regions in which such measures are no longer sufficient, as there is simply not enough water available in some regions.‖ In addition, they observe, ―this problem is expected to increase in the future due to increasing population pressure (e.g. United Nations, 2009), higher welfare (e.g. Grubler et al., 2007) [and] production of water intensive biofuels (e.g. Varis, 2007, Berndes, 2008).‖ Hence, they conclude there will be an increasing need for many nonstructural measures, the first and foremost of which they indicate to be ―increasing the efficiency of water use.‖ This characteristic of nearly all of Earth‘s plants is almost universally promoted by atmospheric CO2 enrichment.

Causes food wars and extinction

Brown, 9 – founder of the Worldwatch Institute and the Earth Policy Institute

(Lester R, “Can Food Shortages Bring Down Civilization?” Scientific American, May)

The biggest threat to global stability is the potential for food crises in poor countries to cause government collapse. Those crises are brought on by ever worsening environmental degradation

One of the toughest things for people to do is to anticipate sudden change. Typically we project the future by extrapolating from trends in the past. Much of the time this approach works well. But sometimes it fails spectacularly, and people are simply blindsided by events such as today's economic crisis.

For most of us, the idea that civilization itself could disintegrate probably seems preposterous. Who would not find it hard to think seriously about such a complete departure from what we expect of ordinary life? What evidence could make us heed a warning so dire--and how would we go about responding to it? We are so inured to a long list of highly unlikely catastrophes that we are virtually programmed to dismiss them all with a wave of the hand: Sure, our civilization might devolve into chaos--and Earth might collide with an asteroid, too! For many years I have studied global agricultural, population, environmental and economic trends and their interactions. The combined effects of those trends and the political tensions they generate point to the breakdown of governments and societies. Yet I, too, have resisted the idea that food shortages could bring down not only individual governments but also our global civilization.

I can no longer ignore that risk. Our continuing failure to deal with the environmental declines that are undermining the world food economy--most important, falling water tables, eroding soils and rising temperatures--forces me to conclude that such a collapse is possible. The Problem of Failed States   Even a cursory look at the vital signs of our current world order lends unwelcome support to my conclusion. And those of us in the environmental field are well into our third decade of charting trends of environmental decline without seeing any significant effort to reverse a single one. In six of the past nine years world grain production has fallen short of consumption, forcing a steady drawdown in stocks. When the 2008 harvest began, world carryover stocks of grain (the amount in the bin when the new harvest begins) were at 62 days of consumption, a near record low. In response, world grain prices in the spring and summer of last year climbed to the highest level ever.As demand for food rises faster than supplies are growing, the resulting food-price inflation puts severe stress on the governments of countries already teetering on the edge of chaos. Unable to buy grain or grow their own, hungry people take to the streets. Indeed, even before the steep climb in grain prices in 2008, the number of failing states was expanding [see sidebar at left]. Many of their problem's stem from a failure to slow the growth of their populations. But if the food situation continues to deteriorate, entire nations will break down at an ever increasing rate. We have entered a new era in geopolitics. In the 20th century the main threat to international security was superpower conflict; today it is failing states. It is not the concentration of power but its absence that puts us at risk.States fail when national governments can no longer provide personal security, food security and basic social services such as education and health care. They often lose control of part or all of their territory. When governments lose their monopoly on power, law and order begin to disintegrate. After a point, countries can become so dangerous that food relief workers are no longer safe and their programs are halted; in Somalia and Afghanistan, deteriorating conditions have already put such programs in jeopardy.Failing states are of international concern because they are a source of terrorists, drugs, weapons and refugees, threatening political stability everywhere. Somalia, number one on the 2008 list of failing states, has become a base for piracy. Iraq, number five, is a hotbed for terrorist training. Afghanistan, number seven, is the world's leading supplier of heroin. Following the massive genocide of 1994 in Rwanda, refugees from that troubled state, thousands of armed soldiers among them, helped to destabilize neighboring Democratic Republic of the Congo (number six).Our global civilization depends on a functioning network of politically healthy nation-states to control the spread of infectious disease, to manage the international monetary system, to control international terrorism and to reach scores of other common goals. If the system for controlling infectious diseases--such as polio, SARS or avian flu--breaks down, humanity will be in trouble. Once states fail, no one assumes responsibility for their debt to outside lenders. If enough states disintegrate, their fall will threaten the stability of global civilization itself.

Water and land constraints will cause Chinese food insecurity and domestic instability—long-term yield boosts are key

Romann, business and politics reporter – China Daily, Asia-Pacific, 7/13/’12

(Alfred, “Hinging on water,“ http://www.chinadailyapac.com/article/hinging-water)

Once chronically short of food, China now produces 95 percent of the staples (including rice) it needs. The government has upped the ante in the 12th Five-Year Plan (2011-15) and targets 100 percent self-sufficiency.

Core to this shift, from dependent to donor, has been a fair amount of success developing high-yield hybrid rice strains and agricultural technology, including more widespread irrigation, fertilizers and pesticides. By 2007, China was producing 381 kg of grain per capita and “self-sufficiency was basically achieved”, wrote researchers Dr Xiao Yunlai and Dr Nie Fengying in A Report on the Status of China’s Food Security. Last year, hybrid rice pioneer Yuan Longping developed a new breed that set an output record of 13 tons in one hectare.

But the advances that have secured food today may create problems tomorrow.

Agricultural production in China is either water intensive or very polluting. Also, yield increases from hybrid seeds are leveling off.

With a population likely to hit 1.48 billion in 2025, China cannot afford to see these increases stop. It will need to produce 580 million tons of grain by 2020, compared to 546 million in 2010 to meet the 95 percent target, says Robert Ash, professor of economics at the School of Oriental and African Studies in London. Meeting the 100 percent goal will require even higher outputs.

China has 22 percent of the world’s population but only 10 percent of the arable land. And this small portion of land is jeopardized by urban sprawl (the growth of cities) and urbanization (the migration from the rural countryside to the cities). How it manages those scant resources will play a big role in the future of the country’s food security.

There are a couple of critical factors that affect the availability of arable land and crop production.

The first is the urbanization process that has led to a steady demand for land to build factories or housing or city facilities at the expense of land used in crop production. Since the mid-1990s, some 8.3 million hectares of arable land — about 6.5 percent of the country’s total — has been lost to this urban sprawl, noted the UN’s Food and Agriculture Organization (FAO) last year.

A second, perhaps more significant, factor is water. China is trying to feed close to a quarter of the population of the world with a tenth of arable land and only 7 percent of fresh water. Water is key to opening up uncultivated or under-utilized land as well as preserving land affected by floods or drought.

“Water is one of the main issues for food security, not immediately, but in five to 10 or 15 years,” says Alex Bulcourt, co-founder and director of OEE consulting, who specializes in the field. “It will be critical in northeast China, where wheat is grown.”

“China invested a lot in highly inefficient (crop growing) techniques that waste a lot of water, even though they are highly productive,” says Bulcourt. “The high yields require a lot of water, along with pesticides and fertilizers.”

Not just China, but the Asia Pacific as a whole has limited water resources, according to Hiroyuki Konuma, assistant director-general and Asia-Pacific representative at FAO.

Maintaining the food security it has achieved will, in future, likely depend on how China manages its water. Although the country now produces enough food for its own needs and has surplus to donate, production is not water efficient. One solution would be developing more drip irrigation, which cuts water consumption by about half.

How China manages its arable land and food production affects the world. According to the UN, the world as a whole will have to produce 60 percent more food than it does today by 2060, when the global population is expected to top 9 billion.

China’s food needs impact global markets because what food the country does not produce domestically, it secures in international markets.

The concern is not so much that China could go hungry but that whatever action it takes has global implications. Whenever China goes on a food-buying spree, global prices and supplies are affected.

In October 2011, China bought 900,000 metric tons of corn from the US, despite a bumper harvest at home. Global corn prices shot up as a result.

In 2004, a drop in domestic wheat stocks turned China into the largest importer of wheat in the world. Net exports of 1.8 million tons in 2003 became net imports of 6.5 million tons.

China did not start buying soybeans abroad until 1996. By 2010, it was buying almost 55 million tons — including about half of Argentina’s entire production.

China has made remarkable progress in alleviating hunger and ensuring it has enough food to feed its citizens but just having the food is not enough.

“There are three elements to food security: Is there enough, can people afford it and nutrition,” says Rierson. Most observers focus on the first but increasingly, affordability and nutrition are even greater challenges, he points out.

In China there are pockets of people who are still vulnerable to food shortages. China being the size it is, those pockets account for tens of millions. FAO says 130 million people in China faced undernourishment between 2005 and 2007.

China has the land resources and even the water resources to produce enough food for itself even if technology does not advance significantly, according to the Vienna-based International Institute for Applied Systems Analysis, a non-profit research institute. But it does have to solve some problems, including improving water efficiency, diverting water to agricultural production in the north and removing bottlenecks in distribution. It also has to promote larger farms and step up research.

Despite the success to date, food security remains a key issue in China, Han Jun, deputy director of the State Council’s Development Research Center, told China Daily earlier this year.

“Food security remains the weakest link in China’s national economic security,” he said.

Nuclear war

**Yee**, Associate Professor of Government @ Hong Kong Baptist University, and Storey, Asian-Pacific Center for Security Studies, **‘2**

(Herbert and Ian, China Threat: Perception, Myths, and Reality, p. 5)

The fourth factor contributing to the perception of a china threat is the fear of political and economic collapse in the PRC, resulting in territorial fragmentation, civil war and waves of refugees pouring into neighbouring countries. Naturally, any or all of these scenarios would have a profoundly negative impact on regional stability. Today the Chinese leadership faces a raft of internal problems, including the increasing political demands of its citizens, a growing population, a shortage of natural resources and a deterioration in the natural environment caused by rapid industrialisation and pollution. These problems are putting a strain on the central government’s ability to govern effectively. Political disintegration or a Chinese civil war might result in millions of Chinese refugees seeking asylum in neighbounng countries. Such an unprecedented exodus of refugees from a collapsed PRC would no doubt put a severe strain on the limited resources of China’s neighbours. A fragmented china could also result in another nightmare scenario — nuclear weapons falling into the hands of irresponsible local provincial leaders or warlords.12 From this perspective, a disintegrating China would also pose a threat to its neighbours and the world.

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## Overview

#### Topical affs

DSIRE, Database of State Incentives for Renewables & Efficiency, ‘11

(http://www.dsireusa.org/incentives/index.cfm?state=us&printable=1)

Federal

Incentives/Policies for Renewables & Efficiency

Financial Incentives

Corporate Deduction

Energy-Efficient Commercial Buildings Tax Deduction

Corporate Depreciation

Modified Accelerated Cost-Recovery System (MACRS) + Bonus Depreciation (2008-2012)

Corporate Exemption

Residential Energy Conservation Subsidy Exclusion (Corporate)

Corporate Tax Credit

Business Energy Investment Tax Credit (ITC)

Energy-Efficient New Homes Tax Credit for Home Builders

Renewable Electricity Production Tax Credit (PTC)

Federal Grant Program

Tribal Energy Program Grant

U.S. Department of Treasury - Renewable Energy Grants

USDA - High Energy Cost Grant Program

USDA - Rural Energy for America Program (REAP) Grants

Federal Loan Program

Clean Renewable Energy Bonds (CREBs)

Energy-Efficient Mortgages

Qualified Energy Conservation Bonds (QECBs)

U.S. Department of Energy - Loan Guarantee Program

USDA - Rural Energy for America Program (REAP) Loan Guarantees

Industry Recruitment/Support

Energy-Efficient Appliance Manufacturing Tax Credit

Personal Exemption

Residential Energy Conservation Subsidy Exclusion (Personal)

Personal Tax Credit

Residential Energy Efficiency Tax Credit

Residential Renewable Energy Tax Credit

Rules, Regulations & Policies

Appliance/Equipment Efficiency Standards

Federal Appliance Standards

Energy Standards for Public Buildings

Energy Goals and Standards for Federal Government

Green Power Purchasing

U.S. Federal Government - Green Power Purchasing Goal

Interconnection

Interconnection Standards for Small Generators

#### Incentives for energy production distinct from incentives on energy tech development

ICTSD 11

ICTSD Global Platform on Climate Change, Trade and Sustainable Energy, Nov. 2011, Fostering Low Carbon Growth: The Case for a Sustainable Energy Trade Agreement, http://ictsd.org/i/publications/117557/?view=details

In assessing the implications of policies and incentives for sustainable energy, **it is useful to distinguish between incentives provided for** sustainable **power generation versus incentives provided for equipment manufacture**. While nearly every country in the world – depending to a large extent on geographical factors and resource endowment – would benefit from the deployment of sustainable energy, perhaps the same urgency or priority does not hold true for the deployment of manufacturing activity in sustainable energy equipment. Certain countries may be more suited to manufacturing sustainable energy equipment or parts for various reasons, including skills, low labour costs, or infrastructure. Yet most countries desire to attract manufacturing activity, in addition to sustainable power generation. This is due to obvious benefits related to employ- ment generation, economic activity, technology flow and diffusion, along with the need to simply try and establish early leadership in an area that many believe will witness rapid growth in the coming years.

#### R&D only has potential incentive effects—plan just attempts to create tech for energy production—distinct from subsidies for energy production

Painuly, UNEP Collaborating Centre on Energy and Environment @ Risø National Laboratory, ‘1

(J.P., “Barriers to renewable energy penetration; a framework for analysis,” Renewable Energy Vol. 24, Issue 1, p. 73–89)

5. Measures to overcome barriers

It may not be possible to achieve technical potential but research and development can reduce the gap between techno-economic potential and technical potential. In most of the cases, the aim is to achieve or move closer to techno-economic potential.

Imperfections and distortions in the market coupled with unfavourable financial, institutional and regulatory environments imply that governmental intervention is not only desirable but also a must to promote RETs. The role of governments in technology transfer has been outlined in the IPCC special report on technology transfer [15], which is relevant for renewables too. The role includes generic actions to remove barriers, building human and institutional capacity, setting up research and development infrastructure, creating an enabling environment for investment, and providing information and mechanisms to promote RETs.

Policy approaches to achieve the techno-economic potential can either remove the barriers or create conditions where the market is forced to act, ignoring the barriers. The former normally works at the micro level addressing the barriers directly, and the latter mostly at macro level addressing the barriers indirectly. For example, setting up information centres, establishing codes and standards etc. address the barriers directly, whereas increasing energy prices through pollution taxation addresses the barriers indirectly.

The measures required to promote RETs thus follow from (a) identification of barriers through administration of questionnaires/interview of the stakeholders, and (b) feedback from stakeholders on the measures to overcome the barriers, obtained by extending the questionnaire/interview to include questions related to the possible measures. Finally, policy actions need to be designed and implemented to operationalise the measures identified to overcome the barriers. Some of the policy actions taken by various governments and implicit barrier removal measures in these are discussed below. Measures taken by IEA countries have been discussed in IEA [16] and [17]. Several possibilities may exist and the one that best suits a country should be chosen. Several of these measures have been explored by the Global Environment Facility (GEF) through support to RET projects in different countries (see [2] for details).

5.1. Energy sector liberalisation

This is a broad term encompassing several policy measures such as restructuring of the energy sector, opening up to introduce competition and removing other controls. Some examples of the specific policies are; creating separate entities for generation and distribution in the electricity sector, allowing private sector entry and diluting or removing controls on energy pricing, fuel use, fuel import, and capacity expansion etc. Institutional measures such as setting up independent regulatory bodies may be needed for success of these policy actions. The basic purpose of liberalisation is to increase efficiency of the energy sector through facilitating market competition. The initial impact of such measures may be unfavourable to RETs due to increased competitiveness. However, in the long term a liberalised energy market may provide a better environment for the healthy growth of RETs.

5.2. Guaranteed markets

Since renewable energy is not able to compete in the energy market with existing barriers, energy suppliers may be required by law to include a part of the energy from renewables in their supply mix. Examples of such measures are the Non-Fossil Fuel Obligation (NFFO) law in the UK, Electricity Feed Law (EFL) in Germany, and Renewable Portfolio Standard (RPS) in the US. The NFFO guarantees pre-determined electricity prices for competitively selected renewable energy projects. It promotes reduced cost of RETs due to competitive process for project selection. Any extra cost to the electricity companies is reimbursed by a small charge to all electricity consumers. Five NFFO orders have been issued since the law was passed in 1989. The costs of generating electricity under NFFO contracts have been halved; NFFO-5 contracts were at an average of 2.71 p/kWh compared with the average pool selling price of 2.60 p/kWh in 1998 [18]. NFFO has now been succeeded by the New & Renewable Energy Policy. EFL required electricity network operators to buy all the electricity from renewables at premium prices. In April 1998, the EFL was changed slightly and now utilities are not required to accept more than 5% of their total electricity from renewable sources. In February 2000, the EFL was replaced by the Renewable Energy Law, which provides a guaranteed price for electricity from renewables [19]. RPS requires each retail supplier of electricity to provide a specified percentage of renewable energy in its electricity supply portfolio. The obligations have been made tradable through renewable energy credits (RECs) with a view to introducing flexibility and reducing costs. A variation of these mechanisms is two-way metering, which is under consideration in some EU countries. In this, distributed electricity generation (generally at household level) can be used to meet own demand and surplus electricity can be fed back to the grid, allowing the household meter to run backwards. The buyback rate is thus 100% of the utility price [16]. Although these measures may improve economic efficiency of RETs, the impact in the short run is an increased cost of electricity.

5.3. Economic/financial incentives

Several governments provide capital subsidies for installation of renewable energy systems. However the capital subsidies need to have a defined phase out time frame to ensure efficiency improvements in RETs. For example, capital subsidies for wind energy in Denmark were phased out in 10 years time. Tax exemption, credit facilities and third party financing mechanisms are other measures in some IEA countries [16]. Incentive-based renewable energy programmes are in operation in several developing countries. The World Bank's renewable energy programmes in Indonesia (solar home system project), Sri Lanka, Laos etc. are incentive-based programmes. The ESMAP programme in Africa, sponsored by UNDP, World Bank and other donors is another example of use of financial incentives to promote renewable energy. Several developing countries such as India, China etc. have their own incentive-based renewable energy programmes. Developing countries such as Uganda, Zimbabwe etc. have also provided micro-credits to consumers through revolving funds.

5.4. Government investments

In countries where governments are major players in the energy sector, they have made national plans and strategies for promotion of RETs. Governments have also made investments through specialised agencies created for RET development.

5.5. Information and awareness campaigns

Several countries have initiated informative programmes to promote renewable energy. The stakeholders can be educated and supplied with the necessary tools to evaluate the RETs and design implementation. The campaigns are both general in nature as well as targetting specific RET product promotion.

5.6. Standards and regulations

Deregulation of the electricity industry to allow renewable energy producers access to the grid has been carried out in several countries. Regulatory measures to provide a guaranteed market for renewable energy have been taken, and standards formulated to boost confidence in RET products.

5.7. Institutional measures

Specialised agencies to plan and promote RETs have been created in several countries. Regulatory agencies have also been set up in response to the need for liberalisation of the energy sector. Other measures include promotion of energy service companies (ESCOs) that address several barriers such as lack of up-front financing, credit facilities, and technical knowledge.

5.8. Research and development

Since high cost is a major barrier to RET penetration, R&D programmes have been set up to make it more competitive. Long-term RET technology costs can be reduced through research.

5.9. Facilitating measures

Several facilitating measures have been taken by governments. These include financing for feasibility studies, planning and fixing targets for renewable energy contribution, resource assessment for RETs at national and regional levels, siting of renewable energy systems, technology demonstrations etc. Skill development through training in various aspects of RETs (such as technical, regulatory, managerial, financial skills etc.) has been arranged by some governments and also facilitated through GEF projects.

## Offense

#### Incentives must be directly tied to energy production—their interpretation unlimits—allows incentives for any economic activity tangentially related to energy production

Tacoa-Vielma, counsellor – Trade in Services Division @ WTO, ‘3

(Jasmin, “ENERGY AND ENVIRONMENTAL SERVICES: Negotiating Objectives and Development Priorities,” unctad.org/en/docs/ditctncd20033\_en.pdf)

Another perceived deficiency relates to the fact that a variety of other services that intervene in the energy value-added chain (from production to sale to final consumers) are found in the whole range of services sectors on the list, e.g. research and development, engineering, construction, management consultancy, environmental, financial and distribution services. These services could be termed "energy-related services" because of their relevance, but not exclusivity, to the energy industry. It has been argued that such dispersion of “energy-related services” makes it difficult to determine existing commitments and to negotiate the totality of the services necessary for the energy industry; that would make sense from an economic viewpoint. However, this situation is not unique to the energy industry, as most economic activities or industries require a variety of services inputs that in many cases are designed or adapted for different end-uses. For example, there are engineering, financial or construction services especially tailored for the energy industry as well as for the telecom industry.4 Having an all-encompassing definition of the energy services sector would certainly facilitate considering the totality of services involved in the industry; however, that should not be equated to a guarantee of complete coverage by GATS commitments.

#### That includes any federal spending that has subsidy-like effects on energy markets—that creates an unlimited and unpredictable topic

EIA, Energy Information Administration, Office of Energy Markets and End Use, U.S. DOE, ‘92

(“Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets,” <ftp://tonto.eia.doe.gov/service/emeu9202.pdf>)

The issue of subsidy in energy policy analysis extends beyond consideration of actions involving some form of financial commitment by the Federal Government. Subsidy-like effects flow from the imposition of a range of regulations imposed by Government on energy markets. Regulations may directly subsidize a fuel by mandating a specified level of consumption, thereby creating a market which might not otherwise exist. The imposition of oxygenate requirements for gasoline in the winter of 1992, which stimulates demand for alcohol-based additives, is a recent example.

Regulations more often explicitly penalize rather than subsidize the targeted fuel. To the extent that regulations on coal emissions raise costs of coal use, the competitive opportunities for alternatives, including renewables, natural gas, and conservation, are enhanced. The additional costs that influence the consumption of coal versus other fuels do not require any exchange of money between the Government and buyers and sellers of energy. However, this in no way diminishes the policy’s potential impact on resource allocation and relative prices of energy products.

Much current debate on energy policy focuses on externalities associated with energy use. Many believe there is a large implicit subsidy to energy production and consumption insofar as pollution results in environmental costs not fully charged to those responsible. Failure to internalize “recognized” externalities in the context of current fuel use may result in conventional energy being underpriced compare to other energy sources. Advocates of increased use of renewable energy claim this form of “subsidy” to be central to the continued dominance of fossil fuels as a component of energy supply. In fact, the effort to deal with environmental concerns has become a central feature of Federal energy policy. Substantial costs which were formerly outside the market mechanism have, through the implementation of a series of taxes and regulations, been internalized to energy markets. This report examines these developments as components of the current energy debate regarding the significance of direct and indirect energy subsidies. In that context, a variety of environmental trust funds and components of the Clean Air Act are examined. The report does not address the question of how much and what kind of externalities remain to be addressed through further revision of policy. Such considerations are far beyond the scope of this effort.

There could be legitimate debate over whether some of the programs described in this report are primarily directed towards energy or towards some broader objective, or alternatively whether programs excluded from this report ought to have been included. Programs that provide incentives for broad classes of economic activity, such as investment in fixed capital or investment in basic **research**, **have been excluded**, because they affect neither the choice between energy and nonenergy investment, nor the choice among particular forms of energy. Some may consider the Strategic Petroleum Reserve (SPR) to be a subsidy to energy consumers, while others may consider it to be a program to protect the vital national interests of the United States. The SPR is not included in this report. Some of the more expansive definitions of energy subsidies have included defense expenditures related to contingencies in the Persian Gulf. U.S. defense expenditures are designed to provide security, and the level of oil prices is not functionally related to the level of defense activity. Therefore defense expenditures are not considered here. Some may consider Federal transportation programs to be forms of energy subsidy, while others may think the energy impact of transportation programs is incidental to their intended purpose. Transportation programs are not included. State and local programs (which are significant in a number of cases) have been excluded by definition, since this report is about Federal subsidies.

#### Allows small affs unrelated to the core of the topic

Selivanova, PhD international law – University of Berne, trade expert – Energy Charter Secretariat, Brussels, ‘7

(Yulia, “The WTO and Energy,” <http://ictsd.org/i/publications/129716/>)

There are several problems that are associated with definition of energy services. Firstly, some energy products can be considered either a good or a service (e.g. electricity).70 Furthermore, many services that form part of the energy production chain are in fact not core energy services. Examples of such services are construction, engineering, consulting, etc. There were discussions of merits to distinguish between core and non-core services.71 An activity would be considered as “core” if the service was an essential part of the chain of supply of the sector, i.e. without that service the sector would not be able to function (Tacoa-Vielma, 2003). Non-core services simply support the chain and are closely connected to the process. The problem with this distinction is where to draw the line between the two categories. What makes service an “essential” part of the energy production chain?

# at: reasonability

#### Reasonability is impossible – it’s arbitrary and undermines research and preparation

Resnick, assistant professor of political science – Yeshiva University, ‘1

(Evan, “Defining Engagement,” Journal of International Affairs, Vol. 54, Iss. 2)

In matters of national security, establishing a clear definition of terms is a precondition for effective policymaking. Decisionmakers who invoke critical terms in an erratic, ad hoc fashion risk alienating their constituencies. They also risk exacerbating misperceptions and hostility among those the policies target. Scholars who commit the same error undercut their ability to conduct valuable empirical research. Hence, if scholars and policymakers fail rigorously to define "engagement," they undermine the ability to build an effective foreign policy.

## Offense—AT: Nit-Picky

#### Precision—technical definitions are the gold standard in energy debates

Brown, judge – Court of Appeals for the Fifth Circuit, ‘59

(John R., “CONTINENTAL OIL COMPANY, Petitioner, v. FEDERAL POWER COMMISSION,” Dissenting Opinion, 266 F.2d 208; 1959 U.S. App. LEXIS 5196; 10 Oil & Gas Rep. 601)

Indeed, I do not think that my cautious Brothers would have undertaken this excursion had they not first have found (or assumed) a basis for considering production in its ordinary, common usage. For clearly, what the Court says does not follow if the term is used in the sense of the oil and gas field. For example, the Court states, 'In the ordinary language of purchase and sale of a product where it is in deliverable form the stream of gas is, in a sense, 'produced' at the latest after it has passed through the first master valve. \* \* \*.' Again, it states, 'but this does not change the fact that in the ordinary sense of the terms production of the gas has been completed at or just above the surface of the ground where it is physically deliverable but then is shut in until delivery commences.'To support this approach, the Court frankly states that 'our duty here is not to determine what is generally understood in the industry, in the resolution of other relationships, is meant by 'production." It is, rather, the Court goes on to say 'to determine what Congress meant by the term.' Reading § 1(b) as though it contained only the first part of the sentence and disregarding [\*\*35] altogether the exclusionary phrases at its end, the Court then proceeds to find that the sole Congressional purpose was 'to regulate these interstate sales.' This causes the Court then to reject the industry context and adopt a construction of 'production' which 'is in line with ordinary non-technical usage' so that it will 'effectuate and not \* \* \* frustrate the purpose of the law.'.' The abundant legislative history canvassed by the many Supreme Court cases But Congress was not legislating in an atmosphere of 'ordinary non-technical usage reveals an articulate awareness of the complexities of this whole business. The object of § 1(b) was clearly to define the purpose to regulate [\*220] transportation and sale and companies engaged in such transportation or sale. This was done against the background fully known to Congress that at one end of the process was the production of the natural gas, that at the other end was the consumer, and in between were those who transported and distributed it. As pointed out in Part I above, the Court has been emphatic in ascribing an intention to Congress to exclude those matters which relate to the local production activities [\*\*36] traditionally reserved to states for their exclusive control.We are told that § 1(b) exclusion is a provision '\* \* \* that \* \* \* precludes the Commission from and control over the activity of producing or gathering natural gas. \* \* \*.' Colorado Interstate Gas Co. v. FPC, 1945, 324 U.S. 581, 603, 65 S.Ct. 829, 839, 89 L.Ed. 1206. Two years later this was reiterated in Interstate Natural Gas Company v. FPC, 1947, 331 U.S. 682, 690, 67 S.Ct. 1482, 1487, 91 L.Ed. 1742. 'Clearly, among the powers thus reserved to the States is the power to regulate the physical production and gathering of natural gas in the interests of conservation or of any other consideration of legitimate local concern. It was the intention of Congress to give the States full freedom in these matters.'Within another two years this was reemphasized in FPC v. Panhandle Eastern Pipe Line Co., 1949, 337 U.S. 498, 509-13, 69 S.Ct. 1251, 1258, 93 L.Ed. 1499. 'To accept these arguments springing from power to allow interstate service, fix rates and control abandonment would establish wide control by the Federal Power Commission over the production and gathering [\*\*37] of gas. It would invite expansion of power into other phases of the forbidden area. It would be an assumption of powers specifically denied the Commission by the words of the Act as explained in the report and on the floor of both Houses of Congress. The legislative history of this Act is replete with evidence of the care taken by Congress to keep the power over the production and gathering of gas within the states.'How Congress expected to preserve the absolute freedom of the States in matters concerning production unless that term was used in the context of that industry is nowhere made clear by my Brothers. If Congress were to adhere to its purpose, carefully to regulate some but not all of the natural gas moving of dedicated to move in interstate commerce, it was required to prescribe the boundary limits of each in terms of the business and industry to be regulated. That is the usual, not the extraordinary, principle of statutory construction long ago set forth in Unwin v. Hanson, (1891) 2 Q.B. 115, 119, approved in O'Hara v. Luckenback Steamship Co., 1926, 269 U.S. 364, 370-371, 46 S.Ct. 157, 160, 70 L.Ed. 313:'If the act is one [\*\*38] passed with reference to a particular trade, business, or transaction, and words are used which everybody conversant with that trade, business, or transaction, knows and understands to have a particular meaning in it, then the words are to be construed as having that particular meaning, though it may differ from the common or ordinary meaning of the words.'And see 50 Am.Jur., Statutes § 277 (1944).What is 'production of natural gas' is to be determined in the light of the actual substantive conditions and engineering-business requirements of that great field of scientific mechanical activity. Such activity is not to be assayed by Judges who, learned in the law, have naught but the limited technical experience and cumulative knowledge of the ordinary person.Judged by the standards of the industry, not only by what was said and uncontradicted, but by what was done on a large scale in this very field, the Commission could only find that all of Continental's facilities were essential to and a part of the production of gas. [\*221] IV.The Court's action and opinion is portentous. It is so precisely because it is based on an erroneous assumption and an equally [\*\*39] erroneous construction. It assumes that we are fact finders to supplant or supplement the expert agency. It finds the capacity to cope with this problem by relieving it of all technical complexities and casting it in the mold of the ordinary meaning of production.The Court finds 'that in the ordinary sense of the term production of the gas has been completed at or just above the surface of the ground where it is physically deliverable \* \* \*.' (emphasis in the original) Tying this in to the point of delivery (at the very extreme end of Continental's 4-inch master value and at the very beginning of El Paso's swage), the Court has necessarily adopted the approach of the Commission that facilities for the sale of natural gas subject to the jurisdiction of the Commission are those 'serving to contain the gas at the point of delivery.' That it means to champion this construction is likewise established by the Court's unqualified approval, both here and in Sun Oil Company v. FPC, 5 Cir., 1959, 266 F.2d 222, of J. M. Huber Corp. v. FPC, 3 Cir., 1956, 236 F.2d 550, 556 and Saturn Oil & Gas Co. v. FPC, 10 Cir., 1957, 250 F.2d 61, 69, [\*\*40] the latter of which states: 'To us it is clear that facilities necessary to effect a sale of gas in interstate commerce are facilities used in interstate commerce and are within the jurisdiction of the Commission. This would seem to be the plain intent of section 7(c). The Third Circuit has so held in J. M. Huber Corp. v. Federal Power Commission, 3 Cir., 236 F.2d 550, 556.'The vice of this rationale is compounded by the Court's interpretation of 'production' or 'production facilities' in terms of ordinary non-industry connotation. But even without this, if the test is to be stated in terms of that piece of equipment which is needed to effectuate the sale or contain the gas at the point of sale delivery, then there is in fact no physical limitation. In those terms the master valve (whether upper or lower, or both) does not alone contain the gas. The master valves are ineffective without the continuation of the leakproof surface casing, the production casing or many other parts of the well, all of which operate simultaneously and indispensably to bring and hold the gas under effective control.That is critical since § 7(c) requires certification [\*\*41] of facilities which are to be constructed or extended. And once a little intrusion is made into the forbidden 1(b) area of production, it is only logical to expect (and justify) application of the full reach of this concept. It stops in a given well where, but only where, the particular piece of equipment may be said to directly assist in the containment of the gas at delivery point. Worse, it means that by the force of § 7(c), the drilling and equipping of a new well could only be done by express approval of the Commission.We and all others have now firmly held that on the commencement of the first jurisdictional sale, the Commission's power attaches at least to the sale. The Court by our present opinion holds that simultaneously power attaches to some piece of gas well equipment. If the jurisdictional sale setting all of this Federal control in motion is in the common form of a long-term dedication-of-reserves- contract by which the mineral owner undertakes to develop a field and deliver all production to the long line pipe line purchaser, the result will be that the drilling of additional wells may not be done except on Commission terms and approval. In such [\*\*42] a situation the 'new' well would, of course, be the means by which to effectuate the sale of the gas. Since this would constitute 'the construction or extension of any facilities' for the sale of natural gas subject to the jurisdiction of the Commission, and would result in the acquisition and operation of 'such facilities or extensions thereof,' it would, as § 7(c) demands, positively require that the Commission issue a certificate of public [\*222] convenience and necessity 'authorizing such acts or operation.'Combining this opinion and Sun Oil, this day decided, this Court binds a gas well owner to produce gas for as long as the Commission prescribes. Neither the length of the contract nor the production-nature of the facility by which the 'service' (sale) is performed are an effective limitation. Until nature shuts off the gas the Commission is the perpetual regulator from whose power the Commission's own brief says, '\* \* \* there is no \* \* \* hiding place.'Congress did not mean to invest its creature with these scriptural powers (Psalms 139:7, 8). Section 1(b) draws the line at production.

# DOD

## 2nc no disruptions

Switching energy sources doesn’t reduce the risk of supply cut-offs—it’s also vulnerable to the same price swings

Shachtman, contributing editor – Wired, editor – Danger Room, nonresident fellow – Brookings, 4/27/’12

(Noah, “Is the Pentagon Going Green, or Eco-Pretending?” <http://www.wired.com/dangerroom/2010/04/is-the-pentagon-going-green-or-eco-pretending/?utm_source=Contextly&utm_medium=RelatedLinks&utm_campaign=Previous>)

Navy Secretary Ray Mabus says he’s ready to turn an entire carrier strike group an environmentally friendly armada — from biofueled fighter jets to hybrid ships — by 2016. The idea: demonstrate that some of the military’s biggest gas guzzlers don’t have to stay that way. But even Mabus’ own energy specialists aren’t sure what “deploying” this so-called “Great Green Fleet” will really mean. “**It’ll depend on the supply chain.** If they go over the horizon and 30 days later they have to go back to regular fuel because there’s not enough biofuel, then so be it,” says Chris Tindal, deputy director for renewable energy in the Navy’s Energy Office.¶ The story is already generating some discussion in the Defense Department. “How will replacing one fuel with another (a la the Green Fleet) change any military advantage or vulnerability” asks one Pentagon official in a thought-provoking e-mail. The note in full, after the jump.¶ Here are some thoughts to consider. How will replacing one fuel with another (a la the Green Fleet) change any military advantage or vulnerability? From a military perspective, a requirement for maple syrup (instead of JP-8 [the standard, petroleum-based fuel]) would still mean that we’re vulnerable to supplies of maple syrup. You’re right to bring up the nuclear navy example, but the benefits of nuclear power were more clear from a military perspective. Primarily, they cut the need for oilers to refuel the carrier. Unless we’re brewing up the fuel at sea (which I haven’t heard about), the Green Fleet does no such thing. It’s also useful to remember that a criticism of the carrier’s nuclear power is that the air wing and battle group still needed to be refueled (esp after demise of nuclear power CGs [cruisers]) and retained the need for the long logistics tails. Makes me think of the scenario of the CVN [aircraft carrier] speeding to the Arabian Sea, only to leave behind the battle group when they needed to refuel.¶ Supplier diversity is important, but equally – maybe more important – is reducing our energy needed for a given level of mission output. Developing non-petroleum supplies of fuel does not, by itself, affect any form of military vulnerability. The quote by Chris Tindal is telling. It may be a net social or public policy good to pursue the Green Fleet, but it’s not clear how this increases our military advantage or decreases our vulnerability. Strategically, we’ll always be able to get petroleum – it may cost a lot, but we can get it. DoD consumption is a pittance compared to global supply (or even US supply), and **the bigger problem is getting it to the user.** Operational energy risk is about being vulnerable to those logistics **being disrupted**. Reducing demand, not substituting one fuel for the other, will reduce that vulnerability.**¶** Something to consider. I’m all for energy alternatives, but we should place them in the related but often distinct contexts of national policy objectives on the one hand, and more narrow military risks and opportunities on the other.¶ Hope all is well. Look forward to talking more, if you like.¶ Cheers,¶ XXXXXXXX¶ PS: One final comment. Someone once said that the best solution to global warming is a gallon of fuel not used. Never mind the new exotic alternative fuels, better efficiency might do the trick better. Not sexy, but efficiency pays.

Framing issue—we would never let oil prices cripple the army—we’d take oil from everywhere else before it impacts heg

Alic, former tech and science consultant – Office of Technology Assessment, adjunt professor – Johns Hopkins SAIS, ‘12

(John, “Defense Department Energy Innovation: Three Cases,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

In any event, should serious bottlenecks in fuel supplies¶ appear, **the U**nited **S**tates **will be less vulnerable than** many¶ **other countries,** including major allies. The U.S. government¶ can expect to outbid competing customers, beginning with¶ poor countries totally dependent on imported oil and including¶ wealthy economies such as Japan that benefit from the U.S.¶ security umbrella. So long as there is fuel to buy (or commandeer,¶ in war), DoD will be better able to afford it than almost any other¶ customer. The armed forces have first claim on the Strategic¶ Petroleum Reserve. Household consumers and airlines have more¶ to fear from supply constrictions and price rises than DoD.

No scenario for a cut-off and the SPR solves

Green, resident scholar – AEI, 7/2/’12

(Kenneth P., “End the DoD's green energy fuelishness,” AEI)

Virtually **none of these arguments pass a laugh test.** Yes, when conventional fuels rise in price, military operating costs go up. But in a global fuel market, the market value of any liquid fuel will track with the world price of oil on an energy-content basis. Simply switching to biofuels offers no price protection in a world of fuel-fungibility. Analysts at Rand put it quite succinctly in a recent report. "Alternative liquid fuels do not offer DoD a way to appreciably reduce fuel costs."

As to the risk of a supply interruption, we don't face one: Rand further observes, while the U.S. military uses a lot of fuel, when looked at in context, it uses a tiny percentage of world, or even North American production. Its consumption is less than one-half of 1 percent of global petroleum demand. The U.S. also produces over 8 million barrels a day. "we can find no credible scenario in which the military would be unable to access the 340,000 bpd of fuel it needs to defend the nation," says Rand. And, of course, there's that whole Strategic Petroleum Reserve, which can hold 727 million barrels of oil. Let's see, 727 million divided by 340,000 ... the SPR could power the military by itself for almost 6 years.

No chance of price spikes and won’t impact the military

Alic, former tech and science consultant – Office of Technology Assessment, adjunt professor – Johns Hopkins SAIS, ‘12

(John, “Defense Department Energy Innovation: Three Cases,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

The Energy Information Administration expects the 12 members of OPEC, which account for some 70 percent¶ of estimated world reserves, to pump slightly more than 40 percent of world oil production over the next several¶ decades.c U.S. oil imports will remain high. At the same time, supplies have become more diversified since the¶ 1970s, and the OPEC cartel weaker. Canada now ships more oil to the United States than does any other nation¶ (followed by Mexico, and only then Saudi Arabia). **Domestic output has crept upward** in recent years. All these¶ factors tend to argue against a repetition of unexpectedly sudden supply constrictions. So does the dependence of¶ many exporting states on oil revenues as a prop to internal security, by buying off political opponents or buying¶ weapons to suppress them.¶ To some observers, common sense nevertheless seems to imply that dependence on imported oil weakens the¶ U.S. economy, and by extension national security, given that military power depends, if indirectly, on the size¶ and composition of a nation’s economy. These extrapolations from dependence on imported oil to some sort of¶ larger national vulnerability have little foundation in empirically grounded understanding of either economic¶ affairs or military security. Within the analytical framework of economics, weakness and strength are problematic¶ notions, lacking an accepted basis in quantitative measures; governments collect statistics on output, income,¶ and productivity, not “strength.” Trade deficits, furthermore, are usually taken to be derivative of savings and¶ investment, viewed as the fundamental forces driving a nation’s balance of payments. The implication of this more¶ or less standard view is that a reduction in U.S. imports of oil (e.g., from greater domestic output), would simply¶ lead to a rise in imports of other goods and services. Third, **the relationships between economic performance and¶ military strength are loose.** The Soviet Union, after all, managed to remain a superpower for decades by steering a¶ large share of economic output to its military.¶ The implications of oil imports for U.S. security interests, then, seem oblique. The administration’s most recent

Military will never have to stop using oil – domestic reserves and new discoveries

Spencer, research fellow in nuclear energy – Heritage, 6/22/’11

(Jack, “Capability, Not Politics, Should Drive DOD Energy Research,” <http://www.heritage.org/research/reports/2011/06/capability-not-politics-should-drive-dod-energy-research>)

Price fluctuations, supply chain vulnerability, and dependence on foreign oil are often used to justify taxpayer support for energy research within the Pentagon. None of these arguments holds water.¶ Price Fluctuations. Multiple complex variables contribute to fuel prices, and the government is the wrong institution to sort them out. Oil reserves may eventually decline to the point where accessing it is no longer affordable, which would create the opportunity for entrepreneurs to develop alternatives. Or someone may develop a less expensive alternative that pushes oil out of the market. As likely, however, is that technological improvements and oil reserve discoveries could lead to oil price decreases.¶ Supply Chain Vulnerability. A major justification for the Pentagon investing in oil alternatives is the dangers of transporting liquid fuels over long distances and through war zones. This is a legitimate concern, and the U.S. armed forces should develop capabilities that decrease that threat. However, pursuing biofuels for environmental reasons under the pretext of safer transportation is disingenuous. Like oil, biofuels need to be transported. And in some cases, these fuel alternatives may be more dangerous, as some oil alternatives are less energy dense, which means that more fuel is required to produce the same amount of energy.¶ Dependence on Foreign Oil. Oil replacement advocates often decry America’s dependence on foreign sources of oil. This is then coupled with solutions to subsidize or mandate some alternative. This argument is flawed. American consumers can enjoy access to inexpensive foreign oil (or other energy sources) without being dependent on any particular supplier by opening access to foreign and domestic supplies. This undermines any leverage a foreign supplier might have over the U.S. If a supplier cut off supplies, the U.S. could simply meet its demand from another supplier. So the best way to ensure that the U.S. military has the fuel supplies that it needs is to maximize supply diversity, which means expanding drilling domestically and opening markets abroad.¶ The mission-based vehicles in the military consume about 340,000 barrels of petroleum products per day. Cutting this even by half would save less petroleum than is produced from Thunderhorse, a **single production platform in the Gulf of Mexico.** The U.S. Energy Information Administration projects the cost of producing additional oil offshore at $40–$50 per barrel. Forcing the military to instead buy biofuels that cost hundreds of dollars per barrel provides no added security.

No impact to military – others curb consumption

Bartis, PhD chemical physics – MIT, senior policy researcher – RAND, and van Bibber, researcher – RAND, ‘11

(James T. and Lawrence, “Alternative Fuels for Military Applications,” RAND Corporation)

Defense Department goals for alternative fuels in tactical weapon systems should¶ be based on potential national benefits, since the use of alternative, rather than¶ petroleum-derived, fuels offers no direct military benefits. While Fischer-Tropsch¶ fuels and hydrotreated renewable fuels are no less able than conventional fuels to meet¶ the Defense Department’s needs, they offer no particular military benefit over their¶ petroleum-derived counterparts. For example, even if alternative fuels can be produced¶ at costs below the prevailing costs for conventional fuels, they will be priced at market¶ rates. Also, we are unable to find any credible evidence that sources to produce jet¶ or naval distillate fuel will run out in the foreseeable future. If conflict or a natural¶ disaster were to abruptly disrupt global oil supplies, the U.S. military would not suffer¶ a physical shortage. Rather, the resulting sharp increase in world prices would cause¶ consumers around the world to curb use of petroleum products. Less usage would¶ ensure that supplies remained available. As long as the military is willing to pay higher¶ prices, it is unlikely to have a problem getting the fuel it requires. If problems do arise,¶ the Defense Production Act of 1950 (P.L. 81-774) contains provisions for performance¶ on a priority basis of contracts for the production, refining, and delivery of petroleum¶ products to the Defense Department and its contractors.

## at: SMRs on forward bases

SMRs won’t be deployed to forward bases unless they’re thorium—and that won’t happen

Ackerman, editor – Danger Room @ Wired, 2/18/’11

(Spencer, “Latest Pentagon Brainstorm: Nuke-Powered War Bases,” Danger Room)

Buried within Darpa’s 2012 budget request under the innocuous name of “Small Rugged Reactor Technologies” is a $10 million proposal to fuel wartime Forward Operating Bases with nuclear power. It springs from an admirable impulse: to reduce the need for troops or contractors to truck down roads littered with bombs to get power onto the base. It’s time, Darpa figures, for a “self-sufficient” FOB.

Only one problem. “The only known technology that has potential to address the power needs of the envisioned self-sufficient FOB,” the pitch reads, “is a nuclear-fuel reactor.” Now, bases could mitigate their energy consumption, like the solar-powered Marine company in Helmand Province, but that’s not enough of a game-changer for Darpa. Being self-sufficient is the goal; and that requires going nuclear; and that requires … other things.

To fit on a FOB, which can be anywhere from Bagram Air Field’s eight square miles to dusty collections of wooden shacks and concertina wire, the reactor would have to be “well below the scale of the smallest reactors that are being developed for domestic energy production,” Darpa acknowledges.

That’s not impossible, says Christine Parthemore, an energy expert at the Center for a New American Security. The Japanese and the South Africans have been working on miniature nuclear power plants for the better part of a decade; Bill Gates has partnered with Toshiba to build mini-nuke sites. (Although it’s not the most auspicious sign that one prominent startup for modular reactors suspended its operations after growing cash-light last month.) Those small sites typically use uranium enriched to about 2 percent. “It would be really, really difficult to divert the fuel” for a bomb “unless you really knew what you were doing,” Parthemore says.

But Darpa doesn’t want to take that chance. Only “non-proliferable fuels (i.e., fuels other than enriched uranium or plutonium) and reactor designs that are fundamentally safe will be required of reactors that may be deployed to regions where hostile acts may compromise operations.”

Sensible, sure. But it limits your options: outside of uranium or plutonium, thorium is the only remaining source for generating nuclear fuel. The Indians and now the Chinese have experimented with thorium for their nuclear programs, but, alas, “no one has ever successfully found a way” to build a functioning thorium reactor, Parthemore says, “in a safe and economical manner.”

For now, Darpa proposes to spend $10 million of your money studying the feasibility of the project. But it’s just one part of the researchers’ new push to green the military. Another $10 million goes to a project called Energy Distribution, which explores bringing down energy consumption on the FOBs. An additional $5 million will look at ways to keep fuel storage from degrading in extreme temperatures. For $50 million, Darpa proposes to build a turbine engine that uses 20 percent less energy.

But all of that is mere isotopes compared to the Nuclear FOB. Darpa appears to have thought about it a lot. It says it plans to work with the Department of Energy “to ensure that existing advanced reactor development activities are being exploited and/or accelerated as appropriate, based on the military’s needs.”

Still, if it can’t find the right non-proliferable fuel, it suggests that it might look to the “development of novel fuels.” Says a stunned Parthemore, “I have no idea why you’d want to bring that upon the world.”

Thorium SMRs are impossible

McMahon, energy contributor – Forbes, 5/23/’12

(Jeff, <http://www.forbes.com/sites/jeffmcmahon/2012/05/23/small-modular-reactors-by-2022-but-no-market-for-them/>)

“Like Mr. Moor, Mr. Genoa also sees the economic feasibility of SMRs as the final challenge. With inexpensive natural gas prices and no carbon tax, **the economics don’t work** in the favor of SMRs,” according to the summary.

The SMRs most likely to succeed are designs that use the same fuels and water cooling systems as the large reactors in operation in the U.S. today, according to Gail Marcus, an independent consultant in nuclear technology and policy and a former deputy director of the Department of Energy Office of Nuclear Energy, simply because the NRC is accustomed to regulating those reactors.

“Those SMR designs that use light water cooling have a **major advantage** in licensing and development [and] those new designs based on existing larger reactor designs, like Westinghouse’s scaled‐down 200 MW version of the AP‐1000 reactor, would have particular advantage.”

This is bad news for some innovative reactor designs such as thorium reactors that rely on different, some say safer, fuels and cooling systems.

## at: transportation

Can’t replace transport batteries—past innovation proves

Alic, former tech and science consultant – Office of Technology Assessment, adjunt professor – Johns Hopkins SAIS, ‘12

(John, “Defense Department Energy Innovation: Three Cases,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

As the illustrations above suggest, **even the best batteries**,¶ despite the advances of the past several decades, continue to¶ seem costly, clumsy, and heavy. Because of performance ceilings¶ imposed by electrochemical principles, they promise “limited¶ specific energy with little room for improvement.”74 Since the¶ determinants of battery weight are well understood and most¶ of the obviously attractive chemistries have been the subject¶ of at least some research, big jumps in energy density may not¶ be achievable. Cost declines through development of cell types¶ based on inexpensive starting materials hold greater promise.¶ Beyond Batteries¶ A few years ago the Air Force Scientific Advisory Board (SAB),¶ stating that “combat controllers, pararescuemen, and combat¶ weathermen often carry packs weighing several hundred¶ pounds” and that “thirty percent of the weight is batteries,” called¶ for the elimination of batteries. According to the SAB, this would¶ “change the game.”75 Their report does not say how batteries¶ might be dispensed with, but the SAB most likely had fuel cells in¶ mind (box 2.6).¶ Practical small fuel cells would provide a basis for lightweight¶ power packs for soldiers. Larger units could replace towed¶ diesel generators and serve as auxiliary power units to minimize¶ inefficient low-load operation of the main engines in ground¶ vehicles and naval vessels. Unlike solar and wind power, **however**,¶ and **despite massive investments in R&D** over the past two¶ decades motivated chiefly by prospective applications to electric¶ vehicles, fuel cells have not been commercialized to any great¶ extent. Costs remain prohibitive, for reasons alluded to in box¶ 2.6, such as short-lived and expensive catalysts. For DoD, the¶ attractions—quiet stationary power in remote areas, lighter loads¶ for dismounted soldiers—justify much higher costs than civilian¶ markets will accept. The Army has conducted a considerable¶ number of fuel cell demonstrations in recent years, and in 2009¶ began shipping small numbers to Afghanistan.76 Even if costs¶ never decline sufficiently for high-volume commercial sales,¶ advances in fuel cells for military applications will continue and¶ applications spread.

Fuel cells fail

Alic, former tech and science consultant – Office of Technology Assessment, adjunt professor – Johns Hopkins SAIS, ‘12

(John, “Defense Department Energy Innovation: Three Cases,” in Energy Innovation at the Department of Defense: Assessing the Opportunities, March)

In practice, as so often, costs and engineering realities pose obstacles. Hydrogen fuel cells offer simplicity and¶ efficiency, but for reasonable volumetric energy density the hydrogen must be stored as either a very lowtemperature¶ liquid or a very high-pressure gas, as mentioned in the preceding section. This requires either a heavily¶ insulated or a heavily strengthened storage vessel. Liquid fuels consumed directly in the cell or converted first to¶ hydrogen via standard chemical processes known as reformation tend to foul or poison the catalysts on which fuel cells and reformers depend; good catalysts are expensive, and JP-8, which otherwise would be ideal for military¶ applications, is one of the worst starting points because of relatively high sulfur content (sulfur is lethal to catalysts,¶ and the sulfur content of jet fuel, unlike that of diesel fuel for road vehicles, remains essentially unregulated).¶ Comparisons¶ Fuel cells and batteries offer relatively high efficiency (the fraction of energy theoretically available that can be¶ converted into useful work) compared to most other energy converters. The best diesel engines, for example,¶ approach 40 percent efficiency under optimal conditions (i.e., the load-speed combination that gives the highest¶ efficiency). While this is better than gasoline engines or gas turbines can achieve, some batteries approach 90 percent efficiency. For any fuel-burning engine, moreover, efficiency falls off at loads and speeds well away from the¶ maximum point, so that average efficiencies do not approach the maximum under load-varying conditions, as for¶ passenger vehicles. Cars and light trucks in typical urban driving, for example, may average 15 percent efficiency¶ or less. For batteries and fuel cells, by contrast, efficiency does not change much with load (i.e., rate of discharge).¶ On the other hand, fuel-burning engines exhibit greater energy density and power density than batteries and have¶ sometimes, for that reason, been considered for soldier-portable power. The technology for combustion engines is¶ highly developed, manufacturing costs are modest, and small engines can be designed to operate much more quietly¶ than leaf blowers or model airplanes. Miniature diesel engines could burn jet fuel. On the other hand, combustion¶ engines would have to be integrated with a generator to produce electrical power, and all such engines scale down¶ poorly, since heat and mechanical losses rise as a proportion of output. In most evaluations, the disadvantages¶ have seemed to outweigh the advantages.

Military can’t integrate renewable fuels

Kuntz, Colonel – Army National Guard of the United States, and Fittipaldi, project advisor – ODASA (ESOH), ‘7

(Gordon and John, “Use of Renewable Energy in Contingency Operations,” AEPI and USAWC Research Paper, March)

Although there are many advantages in using renewable energy systems, there are likewise some disadvantages. Initial investment and system costs for renewable energy systems can be somewhat higher than conventional systems. Renewable energy systems are weather dependent37 to some extent and can have a decrease in performance with inclement weather, including low wind speed for turbine systems, low or limited sunlight with photovoltaic energy systems, and excessive moisture with biomass generators or waste to energy conversion systems38. By themselves, renewable energy systems may not exclusively meet energy demands of military operations. With today’s technology, it is highly unlikely that renewable energy systems will totally replace use of conventional fossil fuel powered generator systems.

Commensurate with the limited use of renewable energy systems in CONOPS, there is limited field testing of renewable energy systems and underlying questions about their durability. Manufacturers may have a **limited ability to produce** renewable energy systems for the military, since meeting military specifications and system specific maintenance needs can ultimately mean increasing delivery time for ordered renewable energy systems. **Little if any formal education or training exists** for Commanders to increase their knowledge and confidence about renewable energy systems. Feedback from interviews and references indicates Commanders lack clear understanding of and confidence in the effectiveness and benefits of using renewable energy systems, which in turn limits expanding their use. Significant effort will be required to incorporate institutional, doctrinal, and operational changes necessary to fully integrate renewable energy systems into current and future Warfighting mentality.

Those implementation barriers are necessary conditions for solvency

Kuntz, Colonel – Army National Guard of the United States, and Fittipaldi, project advisor – ODASA (ESOH), ‘7

(Gordon and John, “Use of Renewable Energy in Contingency Operations,” AEPI and USAWC Research Paper, March)

Given all the above advantages of renewable energy systems it is difficult to understand why these systems are not used more often. The United States Army fields equipment (some of which was developed decades ago and includes energy systems) that often **dictate current energy requirements, technology, and supply sources** through fuel demands and system efficiencies or inefficiencies. In reality, impediments to Commanders’ use of renewable energy systems are vast and varied. This writer believes there are six key impediments to the Army’s increased use of renewable energy systems. They include:

1. Leadership Issues

2. Doctrine/Policy Issues

3. Institutional Perceptions

4. Acquisition Process

5. Renewable Energy Expertise

6. Financial Considerations

Leadership issues exist at various levels of the Army regarding use of renewable energy systems, from lower enlisted soldiers to Senior Leaders. Due to the Army’s failure to educate Commanders about renewable energy systems, many Commanders lack the confidence, vision, and insight as to how to effectively employ renewable energy systems and how renewable energy systems can impact the force structure. In addition, most junior soldiers are unaware of the various renewable energy systems currently available that could be employed to both maintain and improve operational effectiveness while decreasing the need for fossil based fuel. There is a definite lack of reported need for renewable energy systems by Senior Leaders, major Combatant Commanders, senior noncommissioned officers, or leaders in line units. **An extensive literature review** resulted in **only one** Combatant Commander, MG Zilmer, identifying a need for renewable energy systems. Currently, there appears to be little interest or command emphasis toward implementation of renewable energy systems, and no single person is clearly identified as a “Champion” that could propagate the need for and importance of using renewable energy systems.

There is limited reference in Army doctrine and policy to employ renewable energy systems during CONOPS and what is referred to appear outdated. There is limited information found in Army regulations, policies and procedures, technical manuals, supply and re-supply procedures, operations, or Mission Essential Task List (METL) requirements to use renewable energy systems. This continued use of old or outdated doctrinal belief by Army Leadership regarding traditional energy sources without serious consideration to the benefits of renewable energy systems can significantly limit options for efficient means of generating, converting, and utilizing energy.

Military service schools at all levels lack incorporating or making reference to use of renewable energy systems in their various curriculums. Addressing use of renewable energy systems is absent from the general instruction at Basic Combat Training, Advanced Individual Training, NCO Development Schools, Basic Officer Leaders Course, Captains Career Course, as well as at Officer and NCO advanced education schools. Institutional beliefs and stereotypes can only be changed with infusion of current information on renewable energy systems and their ability to enhance the mission. The current preconceived mindsets, established biases, and cultural issues about the Army’s “energy institution” must be overcome. There is not an unlimited source of fossil fuel available for energy wherever and whenever needed. This energy comes at a price; the cost in dollars to purchase fuel, equipment to haul it, and vulnerability of soldiers assigned to convoys bringing fuel to run generators.

Military renewables fail—too volatile, too hard to implement, and forces budget trade-offs that make the aff unsustainable

Kalloz, et al., energy and environment analyst – LMI, MPP environmental policy – George Washington U, ‘11

(Julia, “OPPORTUNITIES FOR DOD USE OF ALTERNATIVE AND RENEWABLE FUELS,” FY10 NDAA SECTION 33 4 CONGRESSIONAL STUDY, July)

Section 334 asks whether the national interest in renewable fuel use by DoD is¶ compelling enough to justify the implied changes in doctrine, training, logistics¶ networks, and DLA Energy operating procedures. The creation of a new fuel¶ commodity class, separate from petroleum, would focus DoD leadership’s attention¶ on this commodity and make it more visible throughout the defense community.¶ However, creating a DoD renewable fuel commodity class separate from the¶ Class III POL supply chain involves issues that raise doubt as to the wisdom of¶ such an action.¶ For one, the military Services are striving to make such fuels interchangeable with¶ petroleum. This thrust is consistent with DoD’s one-fuel-on-the-battlefield doctrine,¶ which aims to facilitate the simplified logistics of supplying fuels for expeditionary¶ operations. Because drop-in renewable fuels, such as HRJ-8, can be¶ processed to approximate the properties of conventional petroleum JP-8, the Services’¶ desire to integrate them into the existing supply chain appears achievable.¶ Creation of **a separate renewable** fuel **commodity** class would be inconsistent with¶ this approach and **could** even **create additional** infrastructure and management¶ costs while deterring user acceptance.¶ Second, renewable fuels only offer some limited military utility. Although some¶ of these fuels have desirable properties (discussed in Chapter 8), our review of¶ drop-in renewable fuels indicates that their advantages over conventional military¶ specification fuels are limited to cleaner combustion, potential for reduced engine¶ start and maintenance issues, and usefulness in some specialty applications (lower¶ freeze point, etc.). DoD’s existing commodity classes appear to identify distinct¶ categories of items essential to military operations. Although renewable fuels may¶ be useful in some respects, they do not appear sufficiently distinct or superior¶ from a military utility perspective to merit creation of a separate commodity class.¶ Third, **many of these fuels are expensive to produce**, and how rapidly their costs¶ will drop over time is unclear. As a result, DoD could suffer adverse budget consequences¶ from large purchases, at least over the next decade, perhaps causing a¶ reevaluation of the commitment in the future. By implication, compelling the creation¶ of a separate DoD commodity class appears premature.

#### Status quo solves—Obama has moved to multilateralism on Libya and beyond. The UN is back, and other nations are following the US lead!

**World Outline**, postgraduate student in international affairs at King’s College, **1/24**/2012

[“How valuable is multilateral diplomacy in a post-9/11 world?,” http://worldoutline.wordpress.com/2012/01/24/how-valuable-is-multilateral-diplomacy-in-a-post-911-world/]

At the turn of the last century, 189 world leaders convened at the Millennium Summit and approved the Millennium Declaration which outlined eight specific goals that the United Nations was to achieve by 2015.[4] Yet, just a year later the 9/11 terrorist attacks tilted the world upon its head. The Security Council was rallied into action after the attacks and unanimously backed the United States against the threat which had caused so much devastation.[5] However, a wounded United States became increasingly relentless and unilateral in their ‘War on Terror’; when the Security Council refused to authorise a US attack upon an allegedly nuclear-armed Iraq, the United States, led by George. W. Bush, launched the assault anyway without UN approval.[6] This has been referred to as the ‘crisis of multilateralism’, as the United States undermined the very institution of which it is the biggest financial contributor and the most influential player.[7] If the founding member of the UN was refusing to follow the guidelines of the institution then why should other states follow the rules? This act set a worrying precedent for the rest of the world and, as Kofi Annan asserted, ‘undermined confidence in the possibility of collective responses to our common problems’.[8] Other instances of American unilateralism are Bush’s abstention from the Human Rights Council, his refusal to sign the Kyoto Protocol and the US departure from the Comprehensive Test Ban Treaty. The United States was losing sight of the benefits that multilateral diplomacy has to offer. However, the arrival of Barack Obama at the Oval Office has **revived multilateral values within US foreign policy**. The Obama administration has realised that it must now engage with the UN and this has marked a ‘**transitional moment in the history of multilateralism**’.[9] In his 2010 National Security Strategy, Obama acknowledged the fact that the US had been successful after the Second World War by pursuing their interests within multilateral forums such as the United Nations and not outside of them.[10] The global financial crisis of 2008 and the European Union’s sovereign debt crisis have demonstrated just how interdependent the economies of the western world are and these crises have created an age of austerity in which multilateralism is needed more than ever before.[11] The US has overstretched its resources and is now currently winding down two wars in Afghanistan and Iraq; they have realised that they simply do not have the means to conduct their foreign affairs exclusively anymore. **Clear indications of Washington’s improved multilateral engagement with the UN** since Obama’s inauguration, **and the changing attitude in US foreign policy**, are the economic sanctions negotiated over Iran, Obama’s decision for the US to join the Human Rights Council and, more specifically, its participation in the recent Libya mission. In Libya, the US provided support for the mission, yet played a subdued role in the campaign, allowing its European counterparts to take the lead. In contrast to his predecessor, Obama is displaying pragmatism rather than sentimentalism in his search for partners, making alliances in order to adapt to the emerging multipolar world; this is typified by Obama’s recent visit to the Asia-Pacific and his tour of South America (Brazil, Chile and El Salvador) in 2010. For the time being, US unipolarity looks to be a thing of the past; its **foreign policy is changing from Bush’s unilateralism at the start of the century to a more multilateral approach at the beginning of a new decade** under Obama.[12] This is the **correct precedent** that the most powerful nation in the world should be setting for other states to follow. The fact that the US is now engaging with the UN to counter global problems has restored the credibility that the UN had lost after the Iraq debacle and, by setting this example, **other nations will follow suit** and the international community as a whole can only benefit. From this change in US foreign policy, it is clear that multilateral diplomacy is of more value today than it was a decade ago.

# 1nr

# impact ov

#### Most probable

**Campbell et al 8** (Kurt M, Assistant Secretary of State for East Asian and Pacific Affairs, Dr. Campbell served in several capacities in government, including as Deputy Assistant Secretary of Defense for Asia and the Pacific, Director on theNational Security Council Staff, previously the Chief Executive Officer and co-founder of the Center for a New American Security (CNAS), served as Director of the Aspen Strategy Group and the Chairman of the Editorial Board of the Washington Quarterly, and was the founder and Principal of StratAsia, a strategic advisory company focused on Asia, rior to co-founding CNAS, he served as Senior Vice President, Director of the International Security Program, and the Henry A. Kissinger Chair in National Security Policy at the Center for Strategic and International Studies, doctorate in International Relation Theory from Oxford, former associate professor of public policy and international relations at the John F. Kennedy School of Government and Assistant Director of the Center for Science and International Affairs at Harvard University, member of Council on Foreign Relations and  International Institute for Strategic Studies, “The Power of Balance: America in iAsia” June 2008, <http://www.cnas.org/files/documents/publications/CampbellPatelSingh_iAsia_June08.pdf>)

Asian *investment* is also at record levels. Asian countries lead the world with unprecedented infra­structure projects. With over $3 trillion in foreign currency reserves, Asian nations and businesses are starting to shape global economic activity. Indian firms are purchasing industrial giants such as Arcelor Steel, as well as iconic brands of its once-colonial ruler, such as Jaguar and Range Rover. China’s Lenovo bought IBM’s personal computer

We call the transformations across the Asia-Pacific the emergence of “iAsia” to reflect the adoption by countries across Asia of fundamentally new stra­tegic approaches to their neighbors and the world. Asian nations are pursuing their interests with real power in a period of both tremendous potential and great uncertainty. iAsia is: *Integrating:* iAsia includes increasing economic interdependence and a flowering of multinational forums to deal with trade, cultural exchange, and, to some degree, security. *Innovating:* iAsia boasts the world’s most successful manufacturing and technology sectors and could start taking the lead in everything from finance to nanotech to green tech. *Investing:* Asian nations are developing infrastruc­ture and human capital at unprecedented rates. But the continent remains plagued by: Insecurity: Great-power rivalry is alive in Asia. Massive military investments along with historic suspicions and contemporary territorial and other conflicts make war in Asia plausible. Instability: From environmental degradation to violent extremism to trafficking in drugs, people, and weapons, Asian nations have much to worry about. *Inequality:* Within nations and between them, inequality in Asia is more stark than anywhere else in the world. Impoverished minorities in countries like India and China, and the gap in governance and capacity within countries, whether as back­ward as Burma or as advanced as Singapore, present unique challenges. A traditional approach to Asia will not suffice if the United States is to both protect American interests and help iAsia realize its potential and avoid pitfalls. business and the Chinese government, along with other Asian financial players, injected billions in capital to help steady U.S. investment banks such as Merrill Lynch as the American subprime mortgage collapse unfolded. Chinese investment funds regional industrialization, which in turn creates new markets for global products. Asia now accounts for over 40 percent of global consumption of steel 4 and China is consuming almost half of world’s available concrete. 5 Natural resources from soy to copper to oil are being used by China and India at astonishing rates, driving up commodity prices and setting off alarm bells in Washington and other Western capitals. Yet Asia is not a theater at peace. On average, between 15 and 50 people die every day from causes tied to conflict, and suspicions rooted in rivalry and nationalism run deep. The continent harbors every traditional and non-traditional challenge of our age: it is a cauldron of religious and ethnic tension; a source of terror and extrem­ism; an accelerating driver of the insatiable global appetite for energy; the place where the most people will suffer the adverse effects of global climate change; the primary source of nuclear proliferation; and the most likely theater on Earth for a major conventional confrontation and even a nuclear conflict. Coexisting with the optimism of iAsia are the ingredients for internal strife, non-traditional threats like terrorism, and traditional interstate conflict, which are all magnified by the risk of miscalculation or poor decision-making.

#### Triggers a massive arms race

Kemp 10

Geoffrey Kemp, Director of Regional Strategic Programs at The Nixon Center, served in the White House under Ronald Reagan, special assistant to the president for national security affairs and senior director for Near East and South Asian affairs on the National Security Council Staff, Former Director, Middle East Arms Control Project at the Carnegie Endowment for International Peace 2010, The East Moves West: India, China, and Asia’s Growing Presence in the Middle East, p. 233-5

A third scenario, Asian Balance of Power, assumes that while economic growth on a global level resumes and India, China, and Japan continue to show economic strength, the overall prosperity of the Western world—particularly of the United States—weakens. That leads to increasing domestic pressures for the United States and Europe to pay less attention to security problems in the Middle East and Asia, given the high price that they already paid for intervention in the 1990s and the first decade of the twenty-first century. While the Western World still has an interest in stable energy markets, there is less inclination to intervene and play the role of policeman. In the United States, there is an equivalent of the East of Suez debate that took place in Britain in the 1960s, when Britain decided to draw down its military presence in both the Indian Ocean and the Gulf. With the unilateral decision by the United States to draw down its presence, the **major Asian powers**—**given** that **they** continue to **have** **unresolved problems among themselves—expand their own military forces, particularly** their **nuclear and maritime capabilities**, ultimately **leading to a triangular Asian arms race among India, China, and Japan**. Under those circumstances, **Japan is likely to obtain nuclear weapons**, especially if the crisis on the Korean peninsula remains unresolved, and the security of the region ultimately will be in the hands of the Asian powers themselves. The sorts of alliances and arrangements that they make with the Gulf states and other Middle East countries would be uncertain. In all probability, India would play a key role, particularly in the Gulf. Indeed, India would be most assertive if it felt that China was encroaching on a region in which India believes that it should have hegemonic control.

A fourth scenario, International Cooperation, assumes that while the world economic situation may not be as rosy as outlined in the first scenario, there nevertheless remains a strong interest on the part of all the major industrial powers in ensuring secure energy supplies; as a result, the price of energy is kept at a reasonable level. The United States does not go through an East of Suez moment and continues to play a responsible and significant role in the maritime peacekeeping operations in the region. However, there is more pressure on the regional powers to share more of the burden and to participate in joint security operations ranging from sea control missions to cooperative ventures to curb terrorism, proliferation, and radicalism. Under these circumstances, **the presence of the U**nited **S**tates **is seen as beneficial and reduces the tendency of the Asian powers to compete among themselves**. While the U.S. commitment is not open ended, it serves long—term U.S. interests, in much the same way that the U.S. presence in Europe today continues to serve U.S. national interests. **In this cooperative environment, local conflicts are easier to manage** since it is in the interests of the all major powers to resist the forces of radicalism and proliferation—**particularly nuclear terrorism**.

#### Goes nuclear

**Cirincione 2k** (Joseph, director of the Non-Proliferation Project at the Carnegie Endowment for International Peace, Foreign Policy, “The Asian Nuclear Reaction Chain,” 3/22/00, lexis)

The blocks would fall quickest and hardest in Asia, where proliferation pressures are already building more quickly than anywhere else in the world. If a nuclear breakout takes place in Asia, then the international arms control agreements that have been painstakingly negotiated over the past 40 years will crumble. Moreover, the United States could find itself embroiled in its fourth war on the Asian continent in six decades--a costly rebuke to those who seek the safety of Fortress America by hiding behind national missile defenses. Consider what is already happening: North Korea continues to play guessing games with its nuclear and missile programs; South Korea wants its own missiles to match Pyongyang's; India and Pakistan shoot across borders while running a slow-motion nuclear arms race; China modernizes its nuclear arsenal amid tensions with Taiwan and the United States; Japan's vice defense minister is forced to resign after extolling the benefits of nuclear weapons; and Russia--whose Far East nuclear deployments alone make it the largest Asian nuclear power--struggles to maintain territorial coherence. Five of these states have nuclear weapons; the others are capable of constructing them. Like neutrons firing from a split atom, one nation's actions can trigger reactions throughout the region, which in turn, stimulate additional actions. These nations form an interlocking Asian nuclear reaction chain that vibrates dangerously with each new development. If the frequency and intensity of this reaction cycle increase, critical decisions taken by any one of these governments could cascade into the second great wave of nuclear-weapon proliferation, bringing regional and global economic and political instability and, perhaps, the first combat use of a nuclear weapon since 1945.

#### Key to power projection

Cohen, 11

Craig Cohen, vice president for Research and Programs at CSIS and editor of this volume, serves as principal adviser to CSIS president, June 2011, “Capacity and Resolve: Foreign Assessments of U.S. Power,” http://csis.org/files/publication/110613\_Cohen\_CapacityResolve\_Web.pdf

This study finds that citizens of countries of the Middle East are more apt to expect a weakened United States over the next decade. But there is also still a sense that the United States is the only actor with the ability to play the role of external guarantor of security for the region. It is the Israelis who question America’s will most sharply, as they believe that U.S. power plays an existential rather than merely a utilitarian role in their country’s future. Until the current uprisings, Middle Eastern views of U.S. power were still largely tied to Iraq and Iran: how the United States struggled to shape Iraq’s future over the past decade, and whether the United States would be willing to deter Iran’s regional ambitions over the next. While Iran will likely remain the single greatest test of U.S. power in the region, it will be important to see whether the way Washington manages the “Arab spring,” the Middle East peace process, and NATO’s military engagement in Libya will eventually weigh more heavily than memories of Iraq or fears of Iran. Iran sees U.S. influence in the region in decline and continues to look for opportunities to exploit this. It is too early to know the extent to which the uprisings may provide opportunity for Iran to exert influence as well as the extent to which the protests are potentially destabilizing to Tehran’s clerical regime. Although Arab governments’ concerns about Iran remain quite high, public perceptions of the Iranian threat are low by comparison. **To the extent the uprisings produce more democratic governments, this development might** eventually **alter regional threat perceptions** in ways that could favor the United States or, in some circumstances, engender greater suspicion of American power. **Elites in the Middle East believe that demonstrations of U.S. commitment remain the critical factor**. When President Obama explained the March bombing of Libya from the Oval Office by stating, “So for those who doubted our capacity to carry out this operation, I want to be clear: the United States of America has done what we said we would do,” he was speaking directly to those in the region who have diminished expectations of U.S. power and are distrustful of Washington’s willingness to use its power for objectives the region prioritizes. **Middle Easterners believe that a powerful U**nited **S**tates **that deemphasizes the region could cause profound realignment**. In contrast, **a diminished U**nited **S**tates **committed to the region could** still **shape order for decades to come**.

# Link—Power Purchasing

#### Power purchase agreements inflate cost of energy—cause tradeoffs with key capabilities undermining the military

Spencer 11

Jack Spencer, Research Fellow in Nuclear Energy, Institute for Economic Policy Studies at The Heritage Foundation, 6/22/11, Capability, Not Politics, Should Drive DOD Energy Research, www.heritage.org/research/reports/2011/06/capability-not-politics-should-drive-dod-energy-research

Do not establish long-term contracts based on price floors. Many purveyors of expensive energy want the Pentagon to engage in long-term contracts with energy suppliers that set price floors. **This has** two **negative impacts**. First, **it would cost the military more to fuel its operations**. Setting price floors signals to the market that certain fuel producers do not have to compete. Second, prices would never fall below the floor even if production costs allow for lower pricing or superior alternatives exist at lower prices. The Pentagon is a massive fuel consumer that can help fuel suppliers make substantial profits. **But fuel suppliers should have to compete for the Pentagon’s business**. Long-term contracts should be used to guarantee that the Pentagon has the supplies it needs, not to provide a guaranteed market for expensive fuel producers.

Establish a capabilities-based determination on the best way to ensure secure domestic base energy supplies. An over-reliance on the U.S. electricity grid is emerging as a concern for some military planners. An attack on the civilian grid could leave domestic military bases without power. While this fear may be legitimate, by itself it does not justify alternative energy investments.

End renewable energy mandates. According to Section 2911(e) of Title 10 of the United States Code, the DOD is obligated to generate 25 percent of its electricity using renewable sources by 2025. This mandate should be ended immediately. Such mandates will cause the Pentagon to expend an increasing amount of its resources on renewable energy rather than on increasing capability. Plus, mandates undermine the incentive for renewable energy producers to provide competitively priced products, thus actually impeding the ultimate availability of oil alternatives.

Do not mandate more expensive alternatives to oil. Oil products may be expensive, but they are the least expensive option currently available. Forcing the military to purchase more expensive alternatives would leave **fewer resources for training, modernization, and recapitalization, resulting is a less capable military**.

#### New reactors cause severe price increases—passed along through rates—swamps any potential benefits

Cooper 9

Mark Cooper, Ph.D, Senior Fellow for Economic Analysis Institute for Energy and the Environment, Vermont Law School, November 2009, ALL RISK, NO REWARD FOR TAXPAYERS AND RATEPAYERS: THE ECONOMICS OF SUBSIDIZING THE ‘NUCLEAR RENAISSANCE’ WITH LOAN GUARANTEES AND CONSTRUCTION WORK IN PROGRESS, http://www.vermontlaw.edu/Documents/11\_03\_09\_Cooper%20All%20Risk%20Full%20Report.pdf

It is a fundamental principle of investment analysis and regulation of utility decision-making that decisions are constantly evaluated and re-evaluated to ensure that they are prudent and projects are economically viable. The fact that some costs have been sunk in these projects should not matter in the determination of whether to proceed. The project must stand or fall on the merits of going forward costs.18 It does not make sense to throw good money after bad. Indeed, to date the costs incurred for new reactors are quite small compared to the ultimate costs that will be incurred if construction proceeds.

The Economics of Nuclear Reactors showed that there is no reason to believe the hype about the low-cost, “quick-to-market” claims of nuclear advocates in the early 2000s. As shown in Table II-2, at the height of the “nuclear renaissance” in 2005-2007, when almost two dozen projects seemed to be gaining a head of steam, it took a series of heroic, and entirely unrealistic, assumptions to reach the conclusion that nuclear reactors made economic sense. Most of these assumptions were incorrect when they were made and those that were not incorrect four or five years ago have been undermined by recent developments. Thus, this is the exactly right moment when utilities should cancel or suspend these projects.

Subsidies Will Impose Severe Financial Harm on Taxpayers and Ratepayers

Advocates of loan guarantees and construction work in progress claim that these subsidies lower the financing costs of nuclear reactors and are good for consumers, but in fact, what **they** do is **shift the risk from shareholders to taxpayers and ratepayers**. The risk is not lowered or eliminated. **Any benefits** from lowering of financing costs are **swamped by the costs imposed by shifting risk**, as discussed below.

Wall Street responds to risk by raising interest charges or simply refusing to float loans, but when taxpayer and ratepayer money is used by policymakers to subsidize these projects; they are not given this option. The simplistic claim that ratepayers will be better off, if they fund these projects ignores the real-world risks of these projects. Consumers will not be better off if any of a variety of conditions holds.

First, if the subsidy induces the utility to choose an option that is not the least-cost option available, ratepayers will bear the burden. If nuclear reactors are not the least-cost choice to begin with, the accounting treatment can only lower the net losses that choosing the wrong option imposes on consumers. In other words, the correct comparison is not between nuclear reactors with and without subsidies; it is between the least-cost option with subsidies and the nuclear reactor with subsidies (or both options without subsidies). Dozens of studies make it clear that nuclear reactors are far from the least-cost option, even with subsidies, so the bottom line for taxpayers and ratepayers is negative.

Second, if the taxpayer/ratepayer subsidy induces the utility to undertake risky behaviors that they would not have engaged in, but for the subsidy, and those undertakings go bad, the costs of the failures will be born by taxpayers and ratepayers in the form of expenditures that do not produce a flow of goods and services. Beating the odds on high-risk behavior is unlikely and it is taxpayers and ratepayers who bear the burden if projects subsidized with public money fail.19 Historical experience of failed nuclear projects was very bad and current projects seem to be repeating that pattern with many running into substantial troubles.

Third, if **the** subsidy **approval process reduces scrutiny of cost escalation and overruns**, ratepayers will end up paying a higher price than anticipated. These highly complex projects are prone to delay, but their high price tag induces utilities to low ball the initial estimates and claim that they did the best they could to manage the project. Knowing this, utilities are adamantly opposed to price caps or incentive mechanisms that control costs.

Fourth, the analysis must make some heroic and unlikely financial assumptions regarding utilities and consumers for the accounting treatment to result in net gains for consumers. Projects with the subsidies must not have an adverse impact on the utility’s financial rating. If the subsidy induces utilities to undertake projects they would not otherwise have attempted and the utility suffers a rating downgrade by Wall Street as a result of pursuing high-risk ventures, the total cost of electricity will increase by much more than the accounting savings that resulted from the subsidy. Moody's analysis of the nuclear construction boom of the 1970s and 1980s shows that five-sixths of the utilities it rated suffered financial downgrades.20 The downgrading of utilities proposing new reactors has already begun, long before concrete has even begun to be poured, which is where the execution risk becomes most severe.

Fifth, the financial analysis must assume that taxpayers and ratepayers have nothing better to do with their money than make interest-free loans to utilities to construct reactors. If taxpayers and ratepayers have a higher discount rate than the utility rate of return, they would be better off having the present use of their money. For cash strapped consumers, taking after-tax dollars out of their pockets is a severe burden. Estimates of the discount rate on efficiency investment, for example, run two to three times as high as the utility cost of capital.21 This is a misallocation of capital that makes consumers worse off.

Because the nuclear projects cannot meet very stringent underlying economic and financial conditions, the claim of consumer benefit is incorrect, as suggested by Table II-3.

A careful analysis of the risks and challenges facing nuclear reactors makes it abundantly clear why utilities simply cannot fund these projects through capital markets. Without loan guarantees and guaranteed recovery of construction work in progress, these reactors simply will not be built. However, the six inherent risks of new reactors cannot be solved through loan guarantees or construction work in progress; these would only shift the risks from investors to taxpayers and ratepayers. **If taxpayer and ratepayer funds are commandeered by policymakers to subsidize new nuclear reactors, it is a** virtual **certainty that they will suffer severe economic harm**.

#### Power purchasing doesn’t solve the link—costs are passed along in utility rates

Cooper 9

Mark Cooper, Ph.D, Senior Fellow for Economic Analysis Institute for Energy and the Environment, Vermont Law School, June 2009, THE ECONOMICS OF NUCLEAR REACTORS, http://www.vermontlaw.edu/documents/cooper%20report%20on%20nuclear%20economics%20final%5B1%5D.pdf

Risk plays an important role in the nuclear analysis because of the history, long lead-times, and economic and technological uncertainties involved in reactor construction and operation. The decision to commit to a reactor that requires a long lead-time and produces a large quantity of power creates sunk costs and results in rigidities that are vulnerable to changing economic, regulatory, or financial conditions. Over the long construction and operation period, things can change, rendering the initial decision uneconomic.

Regulators should not assume that ratepayers should bear the real risks of building nuclear reactors. A decision to authorize a reactor that has the risks identified above **can** **impose severe costs on ratepayers**, the utility, and the local economy. In addition to imposing excessive costs on consumers, a reactor may become uneconomic during its long construction cycle due to the development of alternative technologies, thus weakening the economy of the service area and the financial status of the utility.45

In the regulatory context, **there is a tendency to** try to **shift the risk to ratepayers** before and after the construction decision is made. Before the decision is made, utilities try to shift risks to ratepayers by **seeking recovery of costs** before the plant is in service. After a decision is made, if something goes wrong, the utilities will argue that they made the best decision they could at the time and therefore should not be held accountable when things change. In a competitive marketplace, however, they would bear the risk of their decisions, but also reap the rewards if the costs they incurred were lower than other alternatives available.

Beyond the risk of cost overruns, marketplace and technological risk should be taken into account in the resource planning process. Extensive assessment of the cost and availability of alternatives should be made to ascertain whether the proposed plant is likely to be the least costly alternative. At a minimum, the public utility commission should consider the likely technological developments during the construction and early operation phase of the nuclear reactor, identifying alternative technologies that could meet the need for electricity in that time frame.

A variety of mechanisms are available for incorporating risk into the decision-making process and allocating the risk to various stakeholders. For example, commissions can put a cap on costs, **forcing utilities to bear the burden of cost overruns**. The important point is to recognize the risk and make its allocation explicit and transparent.

Figure VI-1 presents three characteristics of generation alternatives from the Lazard study that, as we have noted, underestimates nuclear costs significantly. Nevertheless, it shows that nuclear reactors are not the preferred option by a long shot. It shows the consumer cost, capital cost, and the construction period. These are three key determinants of risk, as discussed above. Capital costs are sunk costs, which render the option inflexible; long lead-times not only allow consumer costs to escalate, but also give alternatives more time to develop, thus improving their competitiveness. Finally, high consumer costs may reduce demand. The smaller the circle and the closer to the origin, the lower the cost and the less risk.

The Lazard study used a construction period of 69 months for nuclear, but others have used much longer time periods. Even with the underestimation of capital costs and the relatively short construction period, nuclear has a unique set of characteristics that are unattractive from the risk point of view – **combining high costs, large capital outlays, and a long construction period**. The coal based alternatives present about the same risk profile as nuclear reactors. There are half a dozen options that are clearly superior to nuclear reactors on all three risk dimensions, and the lowest risk alternative. Efficiency is not shown because Lazard estimated only the cost, which, as we have seen, is quite low. Efficiency would certainly have a short lead time and a low capital cost. If it were included it would be the most attractive on all three risk dimensions.

# Link—Full Funding Magnifier

#### Full funding requirements magnify the link—the entire procurement costs are included in the FY13 defense budget

O’Rourke 5

Ronald O’Rourke, Congressional Research Service Specialist in National Defense Foreign Affairs, Defense, and Trade Division, and Stephen Daggett, CRS Specialist in National Defense Foreign Affairs, Defense, and Trade Division, 2005, Defense Procurement: Full Funding Policy — Background, Issues, and Options for Congress, www.fas.org/sgp/crs/natsec/RL31404.pdf

For DOD procurement programs, the full funding policy requires the entire procurement cost of a weapon or piece of equipment to be funded in the year in which the item is procured. The rule applies to all weapons and equipment that DOD procures through the procurement title of the annual DOD appropriations act. In general, the policy means that DOD cannot contract for the construction of a new weapon or piece of equipment until the entire cost of that item has been approved by Congress. Sufficient funding must be available for a complete, usable end item before a contract can be let for the construction of that item.

A principal effect of the full funding policy is to prevent the use of incremental funding in the procurement of DOD weapons and equipment. Under incremental funding, a weapon’s cost is divided into two or more annual portions, or increments, that reflect the need to make annual progress payments to the contractor as the weapon is built. Congress then approves each year’s increment as part of its action on that year’s budget. Under incremental funding, DOD can contract for the construction of a weapon after Congress approves only the initial increment of its cost, and completion of the weapon is dependent on the approval of the remaining increments in future years by that Congress or future Congresses.

#### Makes tradeoffs likely

O’Rourke 5

Ronald O’Rourke, Congressional Research Service Specialist in National Defense Foreign Affairs, Defense, and Trade Division, and Stephen Daggett, CRS Specialist in National Defense Foreign Affairs, Defense, and Trade Division, 2005, Defense Procurement: Full Funding Policy — Background, Issues, and Options for Congress, www.fas.org/sgp/crs/natsec/RL31404.pdf

Alternative of Incremental Funding. Prior to the imposition of the full funding policy, DOD weapon procurement was accomplished through incremental funding. Incremental funding fell out of favor because opponents believed it did (or could do) one or more of the following:

make the total procurement costs of weapons and equipment more difficult for Congress to understand and track; create a potential for DOD to start procurement of an item without necessarily understanding its total cost, stating that total cost to Congress, or providing fully for that total cost in future DOD budgets — the so-called “camel’s-nose-under-the-tent” issue; permit one Congress to “tie the hands” of one or more future Congresses by providing initial procurement funding for a weapon whose cost would have to be largely funded by one or more future Congresses; increase weapon procurement costs by exposing weapons under construction to potential uneconomic start-up and stop costs that can occur when budget reductions or other unexpected developments cause one or more of the planned increments to be reduced or deferred.

Although incremental funding fell out of favor due to the above considerations, supporters of incremental funding could argue that its use in DOD (or federal) procurement can be advantageous because it can do one or more of the following:

permit very expensive items, such as large Navy ships, to be procured in a given year without **displacing other programs from that year’s budget**, which can increase the costs of the displaced programs due to uneconomic program-disruption start-up and start costs; avoid a potential bias against the procurement of very expensive items that might result from use of full funding due to the item’s large up-front procurement cost (which appears in the budget) overshadowing the item’s long-term benefits (which do not appear in the budget) or its lower life cycle operation and support (O&S) costs compared to alternatives with lower up-front procurement costs; permit construction to start on a larger number of items in a given year within that year’s amount of funding, so as to achieve better production economies of that item than would have been possible under full funding; recognize that certain DOD procurement programs, particularly those incorporating significant amounts of advanced technology, bear some resemblance to research and development activities, even though they are intended to produce usable end items; reduce the amount of unobligated balances associated with DOD procurement programs; implicitly recognize potential limits on DOD’s ability to accurately predict the total procurement cost of items, such as ships, that take several years to build; and preserve flexibility for future Congresses to stop “throwing good money after bad” by halting funding for the procurement of an item under construction that has become unnecessary or inappropriate due to unanticipated shifts in U.S. strategy or the international security environment.

# cp

#### ARPA-E tech development will be collaborative with DoD—results in initial adoption and use by DoD

Bonvillian and Van Atta 12

William B. Bonvillian, Director of the Massachusetts Institute of Technology Washington DC Office, and Richard Van Atta, Senior Research Analyst at the Institute for Defense Analyses, former Department of Defense Special Assistant for Dual Use Technology Policy and Assistant Deputy Under Secretary for Dual Use and Commercial Programs, March 2012, Energy Innovation at the Department of Defense: Assessing the Opportunities, http://bipartisanpolicy.org/library/report/energy-innovation-department-defense-assessing-opportunities

“In-reach” within DOE. ARPA-E is working on building ties, as suggested above, with applied programs in DOE so these agencies can be ready to pick up ARPA-E projects and move them into the applied, later-stage implementation programs they run. ARPA-E’s PMs have found that key to this DOE “in-reach” is building relationships between PMs and applied line scientists and technologists in the applied entities, particularly EERE, the Fossil Energy Office, and the Electricity Office. This is a bottom- up connection process. Meanwhile, in a top-down process, the ARPA-E director has worked in parallel at building ties between his office and the leadership of the applied agencies at DOE. But the PMs believe bottom-up connections are the key to “in-reach” success—without support deep in the applied bureaucracies, transfers simply won’t happen, whatever the leadership levels agree to.

While DOE in-reach is part of the answer, another logical step for ARPA-E is to connect with DoD agencies potentially interested in ARPA-E technologies for DoD needs, given the latter’s depth in test bed capabilities and first-market opportunities, which remain gaps in DOE’s innovation system.

ARPA-E is in fact working on building ties to DoD for test beds and initial markets. DOE has executed a memorandum of understanding with DoD, but implementation is still largely at the discussion stage, and results are still “in progress.” DoD and ARPA-E have recently partnered on two projects, however. DoD’s own efforts on energy technology are just now coming into effect, but it is pursuing energy technology advances to meet its tactical and strategic needs, as well as to cut energy costs at its more than 500 installations and 300,000 buildings. As an indication of its serious intent, **ARPA-E has on staff a technologist with significant defense contractor experience** (he is on the Commercialization Team; see discussion below) **working full time on collaboration with DoD**. **The** potential **role of DoD to test** and **validate and** to **offer an initial market for new energy technologies is well understood at ARPA-E**, offsetting the fact that its home organization, DOE, generally does not engage in the innovation process beyond late-stage development and prototyping support.

Commercialization team. ARPA-E has assembled on staff a separate team **working full time to promote implementation and commercial advances for ARPA-E technologies**. These team members work with particular PMs on the most promising technologies emerging from their portfolios. The tactics this team develops in implementing technologies can include follow-on approaches for ARPA-E-funded technologies through in-reach with DOE applied programs, **connections to DoD test beds and procurement**, and connections to VC firms and interested company collaborators, or combinations of these. The team’s work includes identifying first markets and market niches for ARPA-E technologies.

“halo effect.” ARPA-E is consciously taking advantage of the “halo effect” whereby VC firms and commercial firms pick up and move toward commercialization of the technologies that are selected by ARPA-E as promising. In other words, the private sector views the ARPA-E selection process as rigorous and sound enough that it is prepared to fund projects emerging from that process. ARPA-E recently announced, for example, that six of its early projects, which it funded at $23 million, subsequently received over $100 million in private sector financing. This effect has been seen at DARPA and at the Department of Commerce’s Advanced Technology Program (renamed the Technology Investment Program). The VC or financing firm will perform its due diligence regardless, but ARPA-E’s selection helps in identifying and, in effect, validating, a candidate pool.

Connecting to the industry “stage gate” process. The stage gate process is used by most major companies in some form in the management of their R&D and technology development. In this approach, candidate technology projects are reevaluated at each stage of development, weeded out, and only what appear to be the most promising from a commercial success perspective move to the next stage. This is not a process ARPA-E employs; like DARPA (as discussed above), it places technology visioning up front in its process and adopts a high risk/high rewards approach to meet the technology vision. Although ARPA-E’s is a more fluid and less rigid, vision-based approach, it has recently started to work with its researchers to get their technologies into a format and condition to survive in the industry stage gate process. For academic researchers in particular, this is not a familiar process.

Consortia encouragement. Aside from stage gate connections to industry, in a different kind of outreach effort, ARPA-E is building an additional industry connection step between the firms and academics that it works with and the industries they must land in—consortia promotion. ARPA-E tries to pave the way for acceptance of its new technologies at firms by working to encourage companies that work in similar areas to talk to each other on common problems, including on technology solutions that APRA-E’s current or prospective projects could present.

Role as first adopter/initial-market creator. DARPA has frequently undertaken a technology insertion role; in coordination with other parts of DoD it has been able to create initial markets for its new technologies, allowing the Department to serve as first technology adopter. DOE offers no comparable first market for ARPA-**E** technologies. **Given DoD’s interest in energy technology advances, it could serve as an initial market.** ARPA-E will need to develop further strategies to find first adopters and initial markets, because the lack of track records of costs and efficiencies constitutes a serious barrier to commercializing and scaling new energy technologies.

#### Requiring cost-competitive energy sources means DoD adopts plan tech on a large-scale after ARPA-E nails it—solves the aff while avoiding the disad

Bartis, PhD chemical physics – MIT, senior policy researcher – RAND, and van Bibber, researcher – RAND, ‘11

(James T. and Lawrence, “Alternative Fuels for Military Applications,” RAND Corporation)

If a national effort to reduce greenhouse gas emissions is implemented, major emphasis is likely to be placed on emissions associated with electric power generation, particularly coal-fired power generation. This effort will require very large investments to ensure that electric power demand for traditional uses continues to be met. For this reason, we are skeptical that additional hundreds of billions of dollars can be available for investments in power generation that would be dedicated to alternative fuel production.

Another important consideration is cost. As discussed in Appendix B (Table B.1), the external power requirement for hydrogen addition in FT and other gasification- based fuel production is roughly 1,300 kilowatt-hours per barrel of product. New nuclear generation systems are unlikely to yield power at wholesale costs significantly less than $0.08 per kilowatt-hour (Deutch, 2009). At those rates, power costs alone would be about $100 per barrel of alternative fuel. This suggests that hydrogen addition is not economically viable unless the prices (including fees, if any, for releasing greenhouse gases into the atmosphere) of conventional fuels are above $150 per barrel. For light-duty civilian vehicles, electric drive technology has already achieved public acceptance, as evidenced by growing demand for hybrid vehicles. Further technical advances may open the civilian marketplace to plug-in hybrids as well as allelectric vehicles. Our analyses indicate that if such electric vehicles were available, it would be about twice as efficient, in terms of lifecycle energy use, and thereby less costly, to use nuclear or renewable electric power in those vehicles as opposed to using that power to produce hydrogen for the purpose of manufacturing alternative liquid fuels for use in gasoline- or diesel-powered vehicles. This efficiency argument, however, is not valid for certain civilian applications, such as commercial aviation, marine transport, and long-haul trucking, for which electricity is not an option. Likewise, electricity is not appropriate—from technical, logistical, and operational viewpoints—for powering military aircraft, tactical vehicles, and most naval vessels.

Over the longer term, it is possible that advances in electric power generation will result in lower costs for nuclear and renewable electricity. Further, the combined development of advanced nuclear generating systems that operate at high temperatures and high-temperature hydrogen production systems could allow more efficient and economic production of hydrogen. Over the next two decades, however, these advanced technologies will likely see very limited commercial applications (Patterson and Park, 2008).

Using greenhouse-gas-free power for alternative fuel production does offer benefits that may be important over the longer term. For example, this approach provides an alternative path for greatly reducing plant-site greenhouse gas emissions in the event that carbon dioxide sequestration proves to be not as broadly applicable as currently anticipated. Also, this approach greatly increases product yield per unit of feedstock. This attribute could prove important if increasing demands on agriculture for both food and fuel drive up the costs of biomass feedstocks. Finally, this approach provides a productive use of nuclear and renewable power during periods of low demand, thereby allowing a greater fraction of overall power demand to be supplied by a combination of nuclear and renewable technologies.

These considerations suggest that alternative fuel production with greenhousegas- free power may **eventually** be a viable economic choice for the production of military fuels as well as certain civilian fuels (e.g., for long-haul trucks and commercial jets). However, this is not a promising option over at least the next two decades, especially considering the very large investments required over the coming decades for meeting traditional electricity demand while reducing greenhouse gas emissions from power generation.

## mars

#### Mars internal link is about generic nuclear power – and it assumes commercialization so either they don’t solve it or we do

#### All previous human spaceflight is insignificant – long term colonization is still infeasible.

Launius 10 – (2010, Roger, PhD, Curator, Planetary Exploration Programs, National Air and Space Museum, expert on Aerospace history, fellow and board member of the American Astronautical Society, “Can we colonize the solar system? Human biology and survival in the extreme space environment,” Endeavour Volume 34, Issue 3, September 2010, Pages 122-129, science direct, )

Although microbial life might survive the extreme conditions of space, for Homo sapien sapiens the space environment remains remarkably dangerous to life. One space life scientist, Vadim Rygalov, remarked that ensuring human life during spaceflight was largely about providing the basics of human physiological needs. From the most critical – meaning that its absence would cause immediate death, to the least critical – these include such constants available here on Earth of atmospheric pressure, breathable oxygen, temperature, drinking water, food, gravitational pull on physical systems, radiation mitigation, and others of a less immediate nature. As technologies, and knowledge about them, stand at this time, humans are able to venture into space for short periods of less than a year only by supplying all of these needs either by taking everything with them (oxygen, food, air, etc.) or creating them artificially (pressurized vehicles, centrifugal force to substitute for gravity, etc.).10 Spaceflight would be much easier if humans could go into hibernation during the extremes of spaceflight, as did the Streptococcus mitis bacteria. Resolving these issues has proven difficult but not insurmountable for such basic spaceflight activities as those undertaken during the heroic age of space exploration when the United States and the Soviet Union raced to the Moon. Overcoming the technological hurdles encountered during the Mercury, Gemini, and Apollo programs were child's play in comparison to the threat to human life posed by long duration, deep space missions to such places as Mars. Even the most sophisticated of those, the lunar landings of Project Apollo, were relatively short camping trips on an exceptionally close body in the solar system, and like many camping trips undertaken by Americans the astronauts took with them everything they would need to use while there. This approach will continue to work well until the destination is so far away that resupply from Earth becomes highly problematic if not impossible if the length of time to be gone is so great that resupply proves infeasible. There is no question that the U.S. could return to the Moon in a more dynamic and robust version of Apollo; it could also build a research station there and resupply it from Earth while rotating crews and resupplying from Earth on a regular basis. In this instance, the lunar research station might look something like a more sophisticated and difficult to support version of the Antarctic research stations. A difficult challenge, yes; but certainly it is something that could be accomplished with presently envisioned technologies.11 The real difficulty is that at the point a lunar research station becomes a colony profound changes to the manner in which humans interact with the environment beyond Earth must take place. Countermeasures for core challenges – gravity, radiation, particulates, and ancillary effects – provide serious challenges for humans engaged in space colonization (Figure 4).

Colonization Impossible – Multiple Barriers

Brandt 7

(David Brandt, The Hard SF, articles focusing on delineating science from science fiction, 5-10-7, “Can Space Colonization Guarantee Human Survival?”, <http://www.hardsf.org/IssuSpac.htm>)

Can Space Colonization Guarantee Human Survival? Many people have argued that as long as humans live only on Earth, we have "all our eggs in one basket". They suggest we need space colonies to insure the future of the species. There are many current and potential threats to the human race. However, considering the human source of many of the threats and the timescales involved, I'm not sure that space colonization should be the top priority in preempting those threats. Timescales To consider how well space colonization is likely to solve our problems we need to ask what the timescales of sustainable, independent space colonies are. If, after disaster strikes Earth, Earth is still able to supplement the needs of space colonies, then those space colonies aren't necessarily essential to continuing the human race. We have to ask when spaces colonies would be functioning without need of any assistance from Earth. Truly independent space colonies must not simply provide bare nutrition, air, heat, and habitat repair for 100 years. They should have a non-traumatizing environment with enough people to protect against dangerous levels of inbreeding – able to last and progress indefinitely. There will also be a minimum number of people required for any space colony in order to provide needed manpower in various occupations (one person with multiple occupations doesn’t help if you need two of those occupations in different places at the same time). How does that compare to the timescales of threats from climate change, environmental crisis, nuclear / bio weapons and accidents, possible nanotech weapons or accidents, overpopulation, etc.? We also have to consider threats to the global economy, since an economic collapse would presumably at least interrupt efforts towards establishing space colonies. Economic crises also increase risks of war, which could have apocalyptic consequences. Even assuming the ultimate solution of human survival is space colonization, we may need to find a way to extend the lifespan of human civilization and economy on Earth in order to have time to accomplish sustainable space colonization. Consider the possible habitats. Space stations in orbit around Earth or at L5 have little natural resources at their location other than solar energy. The Moon has no atmosphere, a limited amount of water at best, which part of the Moon has access to solar energy varies during the month, and it's not considered one of the solar system's better sources of minerals. Venus is extremely hot, the atmosphere is dangerous and with the cloud cover I'm not sure how practical solar energy would be at the surface. Mars has too little atmosphere and accessible water is questionable, etc. Some of the outer planet's moons may have enough ice and raw materials, but are very cold, lack usable atmospheres and get limited solar energy. And so on. We may be able to establish bases at some of these places in a realistically short amount of time, but not independent ones. Any colony that wants to get resources from post-apocalyptic Earth will need to have spaceships that can land on Earth and later achieve escape velocity from Earth while carrying cargo without help from Earth. Otherwise, the needed resources may not be available from a single astronomical body. That could require longer distance travel between bodies - whether that's between asteroids, between moons, between planets or some other combination. Significant space travel ability may be essential. A colony would need an industrial base capable of extracting and refining raw materials, and making useful things from them. Interstellar colonies and terraforming of planets in our solar system are longer range goals. Colonies in any place other than an Earth-like planet will require a substantial infrastructure to allow humans to exist in an otherwise deadly environment. The colony needs to be able to maintain and repair that infrastructure... There is a significant difference between an enormous disaster on Earth and one at any space colony we can expect for at least a century. Even something on the scale of a "dinosaur killer" asteroid impact won't necessarily kill all humans on Earth. (However, if the world economy / technology is setback too much it may not be possible to re-achieve a hi-tech civilization. We've extracted most minerals / fossil fuels that can be gotten without hi-tech, a post-disaster society may be left unable to get these.) It will be a long time before an independent space colony could grow to the point some of its people could survive after a major disaster. Meanwhile, we have not yet solved the physical and psychological problems that develop during months of low gravity. Most of the physical issues may not be significant for those who never intend to return to Earth-type gravities. Psychological issues remain. Some physical issues may arise when dealing with years and decades in low gravity. Even in shorter spans of time, weakening bones may have serious consequences in low gravity situations. Weakened hip bones may be a problem for women giving birth in low gravity. Other stressful activities may also be problematic. We need to find out how low gravity will effect a fetus during pregnancy and child growth afterwards. Identifying and resolving all the issues is likely to take many years. Currently, our society is not inclined to invest that much in either stopping global warming (and other threats) or space habitats. It strikes me as improbable that we will see a heavy investment in both of them at the same time in the next period of time. My impression is the best chance for human survival is focusing as much as possible on one or the other of the two paths, and that space colonization will not solve the problem within the limited time-frame. Of course, if governments refuse to fund solutions to the environmental crisis, but budget money for space habitats we should use that money. Hopefully, governments will respond to the crisis before it’s too late and the problems will be brought under control and within safe limits. Then there will be no reason not to expand out into the universe. Postscript For those who still believe space colonization should be the priority, I would like to suggest one piece of advice. The known threats to human survival in the next century or so are not vast earthquakes and volcanoes, asteroid impacts, supernovas or other natural disasters. Most of them are at least partly man-made. If the same problems are not to threaten survival of humans on space colonies, we either have to make humans on Earth act more responsibly to ensure survival before we colonize, or we need to know how to insure that those people who colonize are not so prone to make the same mistakes their Earthly brothers do. If space colonization ends up amounting to running away from our problems, we will not have changed the odds of human survival by much. Space colonies would need to be planned in a way to avoid this fate.