## \*\*\* 1NC

### 1NC T

#### Topical Financial Incentives must be FOR energy production.

#### FOR is exclusive—

Clegg 95—J.D., 1981 Yale Law School; the author is vice president and general counsel of the National Legal Center for the Public Interest. (Roger, “Reclaiming The Text of The Takings Clause,” 46 S.C. L. Rev. 531, Summer, lexis)

Even if it made no sense to limit the clause to takings "for public use"--and, as discussed below, it might make very good sense--that is the way the clause reads. It is not at all ambiguous. The prepositional phrase simply cannot be read as broadening rather than narrowing the clause's scope. Indeed, a prepositional phrase beginning with "for" appears twice more in the Fifth Amendment, and in both cases there is no doubt that the phrase is narrowing the scope of the Amendment. n20

#### Energy Production is contextual for each source.

EIA 12—U.S. Energy Information Administration [Online Glossary updated regularly, http://www.eia.gov/tools/glossary/index.cfm?id=A]

Energy production: See production terms associated with specific energy types.

#### VIOLATION—the aff’s incentive isn’t exclusively FOR more electricity produced via fission in a reactor

EIA 12—U.S. Energy Information Administration [Online Glossary updated regularly, http://www.eia.gov/tools/glossary/index.cfm?id=A]

Nuclear electric power (nuclear power): Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

#### VOTE NEG—

#### 1. PREDICTABLE LIMITS—allowing the aff to incentivize parts of the production process, the use of coal, or anything that is a related by-product explodes the topic.

#### 2. AFF GROUND—getting to incentivize end use and type of production unfairly gives the aff built in uniqueness and links for advantages that we can’t predict or have answers to based on solvency.

### 1NC K

#### Death and misfortune are inevitable – the joy of life comes in accepting things as they are – plans to save the world only bring more suffering

Slabbert 1 [Jos, Taoist teacher and philosopher, “Tao te Ching: How to Deal with Suffering” http://www.taoism.net/theway/suffer.htm]

Dealing with loss Express yourself completely, then keep quiet. Be like the forces of nature: when it blows, there is only wind; when it rains, there is only rain; when the clouds pass, the sun shines through. If you open yourself to the Tao, you are at one with the Tao and you can embody it completely. If you open yourself to insight, you are at one with insight and you can use it completely. If you open yourself to loss, you are at one with loss and you can accept it completely. Open yourself to the Tao, then trust your natural responses; and everything will fall into place. (Chapter 23) The word "open" is repeated often in this poem. Most people think the only way to handle suffering is to withdraw and to close yourself. The poet is clearly saying in this poem that the opposite is true: If you open yourself to loss, you are at one with loss and you can accept it completely. This openness, a willingness and courage to face reality, is the only way to deal with suffering, particularly inescapable suffering. But the openness the poet is describing is more than just facing reality. It is facing reality in total harmony with the Tao: If you open yourself to the Tao, you are at one with the Tao and you can embody it completely. It is only when you "embody" the Tao that you can face suffering with true equanimity. You will then have the openness that insight into your own nature and the natural way of Tao brings you. The right approach to suffering is only possible when you have reduced your ego to a minimum. The less ego you have, the less you suffer. Facing death with unresolved agendas is a terrible form of suffering. You will have to let go of selfish interests and futile aims to concentrate on dealing with the moment. **It is the acceptance of the inevitable that makes suffering bearable**. On his death bed, his family mourning, he is serene, for he knows Death, like Life, is an illusion: there is no beginning and no end. There is only the endless flow of Tao. The man of Tao has no fear, for he walks with Tao. (The Tao is Tao, 154) Agendas A good traveler has no fixed plans and is not intent upon arriving. (Chapter 27) Plans, aims, objectives and agendas have become the routes of suffering for so many people, and not only the ambitious. Agendas often take spontaneity and joy out of life. In the process, many people have become bad travelers, concentrating only on their objectives, and arriving at their destinations only to find that even their destinations are not really worth the trouble. Having no fixed plans? This does not sound like survival in a modern technological environment, does it? I mean, who but the extremely fortunate have the luxury of not having agendas running their lives? In most cases, one could justifiably point out, agendas are forced on you by your professional and familial obligations. You do not really have a choice, do you? How could one then become a good traveler through life in this modern world? I think the key lies in the second line of the quotation. One should not be "intent upon arriving". You should adopt an attitude of detachment. The moment your aims become egocentric, your suffering increases. The less your own ego is involved, the less seriously you will take life, and the more you will enjoy the journey. It is easier said than done, though, particularly when the job you are doing seems to be devoid of meaning, and the activities on your agenda tedious. They might even go against what you truly believe. It is clear. To become a good traveler in the modern world often entails more than just a change of attitude. It could also mean changing your life style, even your profession. It could mean taking risks in the process. But liberation has always been a risky undertaking, hasn’t it? People are willing to take risks for the most mundane things like profit and possession. Why not take a few risks when your spiritual progress is at stake? Truly good travelers often leave the beaten track and become masters of their own far more adventurous journeys. Tampering with the world Do you want to improve the world? I don't think it can be done. The world is sacred. It can't be improved. If you tamper with it, you'll ruin it. If you treat it like an object, you'll lose it. (Chapter 29) If anything, the Twentieth Century will be called the century of social engineering. Simplistic ideologies, like fascism, were used to try to change the world, with terrible consequences inducing suffering on a scale never seen before in the history of the human being. A savage economic system based on greed - capitalism - has ravaged the world. Yet, the human being has not learnt from this. Still, politicians show their ignorance by tampering with the sacred. It is the age of management, that euphemistic word for manipulating society. It is still happening. What else are many political programs but tampering with the sacred and ruining it in the process? It is the source of endless suffering. Forcing issues Whoever relies on the Tao in governing men doesn't try to force issues or defeat enemies by force of arms. For every force there is a counterforce. Violence, even well intentioned, always rebounds upon oneself. The Master does his job and then stops. He understands that the universe is forever out of control, and that trying to dominate events goes against the current of the Tao. (Chapter 30) Understanding that the universe is out of control is the key to wisdom and patience. No amount of tampering with the universe will change this. In fact, the more we tamper with it, the more damage we will do.

#### No one knows what is good and bad. Reject the aff’s judgments, even if we lose all life on earth

Kirkland 98 [Russell Kirkland, Associate Professor of Religion (and Asian Studies), “"Responsible Non-Action" In a Natural World: Perspectives from the Nei-Yeh, Chuang-Tzu, and Tao-Te Ching,” 1998, University of Georgia, http://kirkland.myweb.uga.edu/rk/pdf/pubs/ECO.pdf]

Why It Is Wrong to Resent Unexpected Changes In Chuang-tzu 18, we find two famous stories in which a man experiences a sudden and deeply personal transformation, a transformation that strikes others around him as deeply troubling.5 In one, the philosopher Hui-tzu goes to offer his sympathies to Chuang-tzu upon the event of the death of Chuang's wife. In the next story, a willow suddenly sprouts from the elbow of a fictional character. In each story, a sympathetic friend is shocked and dismayed to find that the first character in each story is not shocked and dismayed by the unexpected turn of events. In each story, the first character patiently and rationally explains the nature of life, and counsels his companion to accept the course of events that life brings to us, without imposing judgment as to the value of those events. In each case, the reader learns that it is foolish and inappropriate to feel emotional distress at such events, for a proper understanding of the real nature of life leads us to accept all events with the same equanimity, even those events that might have once sticken us as deeply distressing. In the Taoist classic Huai-nan-tzu, one finds a famous story of a man who suddenly finds himself the unexpected owner of a new horse. His neighbors congratulate him on his good fortune, until his son falls from the horse and breaks his leg. The man's neighbors then act to console him on his bad fortune, until army conscriptors arrive and carry off all the able-bodied young men, leaving the injured young man behind as worthless. The lesson of the story is that when an event occurs, we are quick to judge it as fortunate or unfortunate, but our judgments are often mistaken, as later events often prove.6 And one of the most heavily stressed lessons of the Chuang-tzu is that humans quickly judge events on the basis of what we accept on the basis of simplistic assumptions — e.g., that life is inherently better than death — and that the wise person learns to question and discard such assumptions, and forego such judgments regarding events. When Chuang-tzu's wife died, Chuang-tzu does not argue that the world is a better place for her absence, or that his life is improved by his sudden new freedom. In fact, there is no issue in the passage of whether the world is better off with Chuang-tzu's wife alive or dead. The only issue in the passage is that people are born and that people later die, and to ignore that basic fact would display culpable stupidity. The very same lesson is impressed upon the reader of the previous passage, regarding the sudden transformation of a character's elbow. What we are taught in that passage is that life is a process of ineluctable change and transformation, and that humans would be profoundly wrong and clearly silly to object to such change. Another element of the lesson is that the nature of human life is not separate from, or other than, the nature of nonhuman life. When one says that "life is ineluctable change, and we must accept such change with serenity," one is speaking about "life" in such a way that it clearly involves the lives of individual humans just as fully as it involves the events that occur in the broader world, and vice versa. Imagine the story of the death of Chuang-tzu's wife involving, instead, the death of the species we call whooping cranes: Chuang-tzu would, in that case, patiently point out to his deeply caring but deeply shallow friend that he had indeed felt grief to see such beautiful birds come to their end, but had gone on to engage in appropriate rational reflection upon the nature of life, and had come to accept the transitory nature of all such creatures, just as in the present story Chuang-tzu had come to accept the transitory nature of his own spouse. If one must learn to accept with serenity the death of someone we love, someone without whose life our own life would have never been what it is, wouldn't the author urge us to accept that the death of some birds, birds that have never played a role in our lives the way that one's deceased spouse had done, is an event that we should accept with equanimity? If change catches up with us, even to the extent that the planet that we live on should become permanently devoid of all forms of life, the response of the author of these passages would logically be that **such is the nature of things**, and that crying over such a sudden turn of events would be very silly indeed, like a child crying over a spilt glass of milk, or the death of some easily replaceable goldfish. The only reason that a child cries over the death of a goldfish is that he or she has become irrationally attached to that creature as it exists in its present form, and has formed an immature sentimental bond to it. As adults, we appreciate the color and motion of fish in our aquaria, but seldom cry over the death of one of its inmates: we know very well that to cry over the death of such a fish would be silly and a sign of juvenile behavior. As our children grow, we teach them, likewise, never to follow their raw emotional responses, but rather to govern their emotions, and to learn to behave in a responsible manner, according to principles that are morally correct, whether or not they are emotionally satisfying. If, for instance, one were to see a driver accidentally run over one's child or beloved, one's first instinct might be to attack the driver with a righteous fury, falsely equating emotional intensity and violent action with the responsible exercise of moral judgment. In general, we work to teach ourselves and each other not to respond in that way, to take a course of self-restraint, curbing emotion, lest it propel us into actions that will later, upon calm reflection, be revealed to have been emotionally satisfying but morally wrong. If I saw my child run down by a car, it might give me great emotional satisfaction to drag the driver from her car and beat her to death. But it might well turn out that she had in fact done nothing wrong, and had been driving legally and quite responsibly when a careless child suddenly ran into her path, giving her no time to stop or to evade the child. Because we have all learned that the truth of events is often not apparent to the parties that are experiencing them, we generally work to learn some degree of self-control, so that our immediate emotional reaction to events does not mislead us into a foolish course of action. Now if we take these facts and transfer them into our consideration of Chuang-tzu and Mencius on the riverbank, that episode should, logically, be read as follows. If Mencius feels an emotional urge to jump into the river to save the baby, his emotional response to the baby's presence there must be seen as immature and irresponsible. After all, one might muse, one never knows, any more than the man with the horse, when an event that seems fortunate is actually unfortunate, or vice versa. What if the baby in the water had been the ancient Chinese equivalent of Adolf Hitler, and the saving of young Adolf — though occasioned by the deepest feelings of compassion, and a deep-felt veneration for "life" — led to the systematic extermination of millions of innocent men, women, and children? If one knew, in retrospect, that Hitler's atrocities could have been totally prevented by the simple moral act of refraining from leaping to save an endangered child, would one not conclude, by sound moral reasoning, that letting that particular baby drown would have represented a supremely moral act? How, Chuang-tzu constantly challenges us, **how can we possibly know what course of action is truly justified?** What if, just for the sake of argument, a dreadful plague soon wipes out millions of innocent people, and the pathogen involved is soon traced back to an organism that had once dwelt harmlessly in the system of a certain species of bird, such as, for instance, the whooping crane? In retrospect, one can imagine, the afflicted people of the next century — bereft of their wives or husbands, parents or children — might curse the day when simple-minded do-gooders of the twentieth-century had brazenly intervened with the natural course of events and preserved the cursed specied of crane, thereby damning millions of innocents to suffering and death. We assume that such could never happen, that all living things are somehow inherently good to have on the planet, that saving the earthly existence of any life-form is somehow inherently a virtuous action. But our motivations in such cases are clearly, from a Taoist point of view, so shallow and foolish as to warrant no respect. If Mencius, or a sentimental modern lover of "life," were to leap into the river and save a floating baby, he or she would doubtless exult in his or her selfless act of moral heroism, deriving a sense of satisfaction from having done a good deed, and having prevented a terrible tragedy. But who can really know when a given event is truly a tragedy, or perhaps, like the horse that breaks a boy's leg, really a blessing in disguise. Since human wisdom, Chuang-tzu suggests, is inherently incapable of successfully comprehending the true meaning of events as they are happening, when can we ever truly know that our emotional urge to save babies, pretty birds, and entertaining sea-mammals is really an urge that is morally sound. The Taoist answer seems to be that we can never be sure, and **even if the extinction** of Chuangtzu's wife or of the whooping crane really **brought no actual blessing to the world, such events are natural and proper in the way of life itself, and to bemoan such events is to show that one is no more insightful about life than a child who sentimentally cries over the loss of a toy**, a glass of milk, a beloved pet, or even her mommy, run over by a drunken driver. The Taoist lesson seems, in this regard, to be the same in each case: things happen, and some things cause us distress because we attach ourselves sentimentally to certain people, objects, and patterns of life; when those people, objects, or patterns of life take a sudden or drastic turn into a very different direction, a mature and responsible person calms his or her irrational emotions, and takes the morally responsible course of simply **accepting the new state of things**.

### 1NC DA

#### Obama will win—key states, electoral votes, Nate Silver, and Intrade.

Lobe 9/8/12—Washington Bureau Chief of the International News Agency Inter Press Service (IPS), JD Berkeley [Jim Lobe, U.S.: Advantage Obama As Election Begins in Earnest, <http://www.ipsnews.net/2012/09/u-s-advantage-obama-as-election-begins-in-earnest/>]

Despite persistent high levels of unemployment and some 60 percent of the electorate telling pollsters that the country is headed “in the wrong direction”, most political analysts believe that Obama enters the final 60 days of the race with a leg up over his challenger.

The latest Gallup poll, released just hours after Obama’s acceptance speech Thursday night at the Democratic convention in Charlotte, North Carolina—another key swing state—showed Obama with a 48-45 percent lead over Romney and with a 52-percent overall job approval rating, his highest since June 2011, when he was still basking in the afterglow of the successful U.S. commando raid that killed Al-Qaeda’s chief, Osama bin Laden—an event to which many speakers referred repeatedly during the proceedings.

Gallup suggested in its analysis that Obama appeared likely to benefit from a bigger post-convention “bounce” in the polls than Romney received after the Republican convention in Tampa, Florida, the week before. Indeed, Romney’s “bounce” coming off the convention was virtually non-existent, according to the polls.

Because the president is not elected by the popular vote, however, both political experts and the two campaigns are focused much more on the swing states—those that are considered neither solidly Republican (red) nor Democratic (blue)—that will decide outcome.

Instead of a direct popular vote, the president and vice president are actually elected by an “electoral college” in which each state is allocated a certain number of votes based on their representation in the U.S. Congress.

Almost all states use a “winner-take-all” formula in which whatever candidate wins a majority of the state’s vote receives all of that state’s electoral votes. To win, a candidate must receive a total of at least 271 electoral votes in the electoral college.

Thus, the country’s most populous state, California, has 55 electoral votes all of which will, as appears virtually certain given California’s strongly Democratic electorate, be cast in Obama’s favour. The second-most populous state, Texas, has 38 electoral votes all of which, given the state’s strongly Republican cast, will almost certainly go to Romney.

According to most political analysts, including Republicans, Obama enjoys a significant advantage in the electoral contest.

Current polling shows Romney and his running-mate, Wisconsin Rep. Joe Ryan, with a decisive lead in more states, especially in the Midwest and the Southeast, than Obama and Vice President Joe Biden. But the combined electoral votes of those solidly Republican states come to less than those—including California, New York, New Jersey, Illinois, and Washington State—where the Democratic ticket is considered sure to win.

Different analysts disagree on precisely what constitutes a decisive lead. CNN, for example, currently estimates 237 electoral votes are either solidly in or leaning strongly toward Obama’s column, compared to 191 in Romney’s. Estimates by the Congressional Quarterly a week ago yielded a closer result—201-191.

Analysts likewise disagree on how many toss-up, or swing, states remain. Going into this week’s Democratic convention, CNN named seven states—Florida, Virginia, New Hampshire, Ohio, Iowa, Colorado, and Nevada as true toss-ups. It found four other states—North Carolina, Indiana, Missouri, and Arizona—“leaning” to the Republican ticket, and four more—New Mexico, Wisconsin (despite Ryan’s candidacy), Michigan, and Pennsylvania—“leaning” toward Obama.

If the leaning states fell into their respective columns, Obama would lead Romney by a 247-206 margin and put him within relatively easy striking distance of the magic 271 electoral votes needed to win.

The fact that Obama swept all seven of the remaining toss-up states in 2008 is seen here as making Romney’s task considerably more difficult, particularly given the growing voting strength of Latinos—whose appeals for immigration reform were soundly rebuffed at the Republican convention—in Nevada and Colorado—and concerns among the substantial numbers of retired and elderly voters in Florida about what the Republicans intend to do about the Social Security and Medicare programmes.

In addition, the commitment of former President Bill Clinton—the only living national politician with a 70-percent approval rating whose rousing nomination speech for Obama Thursday fired up the convention in Charlotte and drew rave reviews from all but the most right-wing commentators—to play an active role in the campaign, especially in the industrial swing states, could help shore up support for Obama among white male—especially blue-collar — voters who, of all demographic groups, are seen as most susceptible to Romney’s appeals.

Indeed, those who are actually betting money on the race give Obama much better odder than the polls would suggest. As of Friday, Intrade, the main U.S. on-line betting site, is giving Obama a 59-percent chance of winning, up from a mid-June low of around 54 percent.

The New York Times’ polling guru, Nate Silver, who pays closest attention to state polling, rates Obama’s chances of winning even higher. While Obama will win 51.3 percent of the popular vote Nov 6, Silver estimated Friday, the electoral margin is likely be 313-225 margin. Based on his statistical methods, Silver, the accuracy of whose predictions in the 2008 election persuaded the Times to hire him, is currently estimating Obama’s chances of winning at 77.3 percent.

Of course, all of these predictions could still be upset by a number of intervening factors, such as a sharp rise in unemployment, which is still running at more than eight percent, or a major international crisis, although Obama appears far more eager to inject foreign-policy issues into the campaign than Romney whose failure to praise the U.S. military in his nomination acceptance speech in Tampa was widely criticised, even by fellow-Republicans.

**Plan drives a wedge into Obama’s base—they’re key to re-election**

**Mick 6/19**/10 [Jason Daily Tech, Obama Fights For Nuclear, Environmentalists Label Him a Shill http://www.dailytech.com/Obama+Fights+For+Nuclear+Environmentalists+Label+Him+a+Shill/article18781.htm]

Despite these small victories, President Obama's nuclear vision faces many impending obstacles.  Despite the fact that you could tear down one of the nation's old reactors, replace it with a dozen modern clean reactor designs and still have less net waste, some environmentalist groups remain adamantly opposed to new plant construction.  They have vowed to bury the bid for clean nuclear power under a flood of lawsuits.  If the suits succeed, they will raise the cost of nuclear so high, that it can't even compete with the most expensive forms of nuclear energy, like solar power.

And perhaps the biggest obstacle to Obama's nuclear vision will come in 2012.  That is the year when he will face reelection.  That may prove challenging given that one of his former key constituent groups—the environmental lobby—has become one of his staunchest critics.  Regardless, the U.S. is making its first true nuclear progress in 30 years, and that is among the many factors that will already make President Obama's presidency noteworthy.

**Obama’s margin for error is small—plan deflates democrat enthusiasm**

**TNF 12** [1-3, The New Fuelist, Obama’s tall environmental task in 2012 http://www.newfuelist.com/blog/obama-coal-regulations-keystone-pipeline]

In case you can’t see it, that’s a treacherous tightrope Barack Obama is walking on these days whenever he steps into the circus-like national energy and environmental policy debate. And his margin for political error on environmental issues will shrink even more during this election year. To avoid alienating environmentalists who supported him in 2008, he must not forget to occasionally—and substantially—lean to the left. But if he wants to hold on to coveted independent voters who are more worried about the slumping economy than they are about pollution, he must also periodically shift back to the middle and right.

The proposed Keystone XL pipeline embodies the President’s conundrum. From the right, calls for increased “energy security” and for the creation of (a disputed number) of pipeline-related jobs make it hard for him to say no. On the left, a large and organized anti-pipeline contingent has taken pains to turn the decision on the pipeline—which will carry crude made from Canadian oil sands, the extraction and production of which makes the fuel much more greenhouse gas-intense than conventional oil—into a political make-or-break for Obama on climate change.

The administration spent 2011 establishing what it must view as a politically necessary middle ground on the environment. It engineered a drastic ratcheting up of fuel efficiency standards for automakers, and sold it as a way to both reduce greenhouse gas emissions and the burden on the consumer. It also introduced landmark regulations on air pollution from power plants, while placating utilities—and outraging many supporters—by delaying the EPA’s proposed tightening of the nation’s standards for smog. And it earned at least temporary relief from pressure to decide on the Keystone XL by punting the issue past the election, to 2013.

But it’s going to be tougher to maintain balance on the tightrope this year. Congressional Republicans, by demanding a much-earlier Obama decision on the Keystone XL in exchange for their support of the recent payroll tax extension, have hinted at their party’s desire to force the President’s hand on environmental issues. The GOP’s presidential nominee will undoubtedly attempt to paint Obama as an over-regulator and irrational environmentalist—an attack line which will warrant a defense. And therein lies Obama’s tall task: to defend his administration’s substantial forays into environmental regulation in terms that resonate with independents whose main concern is the economy—all while simultaneously ensuring that his frustrated environmentalist supporters don’t completely lose their patience.

**Romney causes massive foreign backlash and nuclear wars around the globe**

**BANDOW 12 senior fellow at the Cato Institute and former special assistant to President Ronald Reagan** [Doug Bandow, 5-15-12, “Mitt Romney: The Foreign Policy of Know-Nothingism” http://www.cato.org/publications/commentary/mitt-romney-foreign-policy-knownothingism]

Romney’s overall theme is American exceptionalism and greatness, slogans that win public applause but offer no guidance for a bankrupt superpower that has squandered its international credibility. “This century must be an American century,” Romney proclaimed. “In an American century, America leads the free world and the free world leads the entire world.” He has chosen a mix of advisers, including the usual neocons and uber-hawks — Robert Kagan, Eliot Cohen, Jim Talent, Walid Phares, Kim Holmes, and Daniel Senor, for instance — that gives little reason for comfort. Their involvement suggests Romney’s general commitment to an imperial foreign policy and force structure. Romney is no fool, but he has never demonstrated much interest in international affairs. He brings to mind George W. Bush, who appeared to be largely ignorant of the nations he was invading. Romney may be temperamentally less likely to combine recklessness with hubris, but he would have just as strong an incentive to use foreign aggression to win conservative acquiescence to domestic compromise. This tactic worked well for Bush, whose spendthrift policies received surprisingly little criticism on the right from activists busy defending his war-happy foreign policy. The former Massachusetts governor has criticized President Obama for “a naked political calculation or simply sheer ineptitude” in following George W. Bush’s withdrawal timetable in Iraq and for not overriding the decision of a government whose independence Washington claims to respect. But why would any American policymaker want to keep troops in a nation that is becoming ever more authoritarian, corrupt, and sectarian? It is precisely the sort of place U.S. forces should not be tied down. In contrast, Romney has effectively taken no position on Afghanistan. At times he appears to support the Obama timetable for reducing troop levels, but he has also proclaimed that “Withdrawal of U.S. forces from Afghanistan under a Romney administration will be based on conditions on the ground as assessed by our military commanders.” Indeed, he insisted: “To defeat the insurgency in Afghanistan, the United States will need the cooperation of both the Afghan and Pakistani governments — we will only persuade Afghanistan and Pakistan to be resolute if they are convinced that the United States will itself be resolute,” and added, “We should not negotiate with the Taliban. We should defeat the Taliban.” Yet it’s the job of the president, not the military, to decide the basic policy question: why is the U.S. spending blood and treasure trying to create a Western-style nation state in Central Asia a decade after 9/11? And how long is he prepared to stay — forever? On my two trips to Afghanistan I found little support among Afghans for their own government, which is characterized by gross incompetence and corruption. Even if the Western allies succeed in creating a large local security force, will it fight for the thieves in Kabul? Pakistan is already resolute — in opposing U.S. policy on the ground. Afghans forthrightly view Islamabad as an enemy. Unfortunately, continuing the war probably is the most effective way to **destabilize nuclear-armed Pakistan**. What will Romney do if the U.S. military tells him that American combat forces must remain in Afghanistan for another decade or two in order to “win”? The ongoing AfPak conflict is not enough; Romney appears to desire **war with Iran** as well. No one wants a nuclear Iran, but Persian nuclear ambitiions began under America’s ally the Shah, and there is no reason to believe that the U.S. (and Israel) cannot deter Tehran. True, Richard Grenell, who briefly served as Romney’s foreign-policy spokesman, once made the astonishing claim that the Iranians “will surely use” nuclear weapons. Alas, he never shared his apparently secret intelligence about the leadership in Tehran’s suicidal tendencies. The Iranian government’s behavior has been rational even if brutal, and officials busy maneuvering for power and wealth do not seem eager to enter the great beyond. Washington uneasily but effectively deterred Joseph Stalin and Mao Zedong, the two most prolific mass murderers in history. Iran is no substitute for them. Romney has engaged in almost infantile ridicule of the Obama administration’s attempt to engage Tehran. Yet the U.S. had diplomatic relations with Hitler’s Germany and Stalin’s Russia. Washington came to regret not having similar contact with Mao’s China. Even the Bush administration eventually decided that ignoring Kim Jong-Il’s North Korea only encouraged it to build more nuclear weapons faster. Regarding Iran, Romney asserted, “a military option to deal with their nuclear program remains on the table.” Building up U.S. military forces “will send an unequivocal signal to Iran that the United States, acting in concert with allies, will never permit Iran to obtain nuclear weapons... Only when the ayatollahs no longer have doubts about America’s resolve will they abandon their nuclear ambitions.” Indeed, “if all else fails... then of course you take military action,” even though, American and Iranian military analysts warn, such strikes might only delay development of nuclear weapons. “Elect me as the next president,” he declared, and Iran “will not have a nuclear weapon.” Actually, if Tehran becomes convinced that an attack and attempted regime change are likely, it will have **no choice** but to develop nuclear weapons. How else to defend itself? The misguided war in Libya, which Romney supported, sent a clear signal to both North Korea and Iran never to trust the West. Iran’s fears likely are exacerbated by Romney’s promise to subcontract Middle East policy to Israel. The ties between the U.S. and Israel are many, but their interests often diverge. The current Israeli government wants Washington to attack Iran irrespective of the cost to America. Moreover, successive Israeli governments have decided to effectively colonize the West Bank, turning injustice into state policy and making a separate Palestinian state practically **impossible.** Perceived American support for this creates **enormous hostility** toward the U.S. across the Arab and Muslim worlds. Yet Romney promises that his first foreign trip would be to Israel “to show the world that we care about that country and that region” — as if anyone anywhere, least of all Israel’s neighbors, doesn’t realize that. He asserted that “you don’t allow an inch of space to exist between you and your friends and allies,” notably Israel. The U.S. should “let the entire world know that we will stay with them and that we will support them and defend them.” Indeed, Romney has known Israeli Prime Minister Benjamin Netanyahu for nearly four decades and has said that he would request Netanyahu’s approval for U.S. policies: “I’d get on the phone to my friend Bibi Netanyahu and say, ‘Would it help if I say this? What would you like me to do?’” Americans would be better served by a president committed to making policy in the interests of the U.S. instead. Romney’s myopic vision is just as evident when he looks elsewhere. For instance, he offered the singular judgment that Russia is “our number one geopolitical foe.” Romney complained that “across the board, it has been a thorn in our side on questions vital to America’s national security.” The Cold War ended more than two decades ago. Apparently Romney is locked in a time warp. Moscow manifestly does not threaten vital U.S. interests. Romney claimed that Vladimir “Putin dreams of ‘rebuilding the Russian empire’.” Even if Putin has such dreams, they don’t animate Russian foreign policy. No longer an ideologically aggressive power active around the world, Moscow has retreated to the status of a pre-1914 great power, concerned about border security and international respect. Russia has no interest in conflict with America and is not even much involved in most regions where the U.S. is active: Asia, the Middle East, and Latin America. Moscow has been helpful in Afghanistan, refused to provide advanced air defense weapons to Iran, supported some sanctions against Tehran, used its limited influence in North Korea to encourage nuclear disarmament, and opposes jihadist terrorism. This is curious behavior for America’s “number one geopolitical foe.” Romney’s website explains that he will “implement a strategy that will seek to discourage aggressive or expansionist behavior on the part of Russia,” but other than Georgia where is it so acting? And even if Georgia fell into a Russian trap, Tbilisi started the shooting in 2008. In any event, absent an American security guarantee, which would be madness, the U.S. cannot stop Moscow from acting to protect what it sees as vital interests in a region of historic influence. Where else is Russia threatening America? Moscow does oppose NATO expansion, which actually is foolish from a U.S. standpoint as well, adding strategic liabilities rather than military strengths. Russia strongly opposes missile defense bases in Central and Eastern Europe, but why should Washington subsidize the security of others? Moscow opposes an attack on Iran, and so should Americans. Russia backs the Assad regime in Syria, but the U.S. government once declared the same government to be “reformist.” Violent misadventures in Kosovo, Afghanistan, Iraq, and Libya demonstrate that America has little to gain and much to lose from another attempt at social engineering through war. If anything, the Putin government has done Washington a favor keeping the U.S. out of Syria. This doesn’t mean America should not confront Moscow when important differences arise. But **treating Russia as an adversary risks encouraging it to act like one**. Doing so especially will make Moscow more suspicious of America’s relationships with former members of the Warsaw Pact and republics of the Soviet Union. Naturally, Romney wants to “encourage democratic political and economic reform” in Russia — a fine idea in theory, but meddling in another country’s politics rarely works in practice. Just look at the Arab Spring. Not content with attempting to start a mini-Cold War, Mitt Romney dropped his nominal free-market stance to demonize Chinese currency practices. He complained about currency manipulation and forced technology transfers: “China seeks advantage through systematic exploitation of other economies.” On day one as president he promises to designate “China as the currency manipulator it is.” Moreover, he added, he would “take a holistic approach to addressing all of China’s abuses. That includes unilateral actions such as increased enforcement of U.S. trade laws, punitive measures targeting products and industries that rely on misappropriations of our intellectual property, reciprocity in government procurement, and countervailing duties against currency manipulation. It also includes multilateral actions to block technology transfers into China and to create a trading bloc open only for nations genuinely committed to free trade.” Romney’s apparent belief that Washington is “genuinely committed to free trade” is charming nonsense. The U.S. has practiced a weak dollar policy to increase exports. Washington long has subsidized American exports: the Export-Import Bank is known as “Boeing’s Bank” and U.S. agricultural export subsidies helped torpedo the Doha round of trade liberalization through the World Trade Organization. Of course, Beijing still does much to offend Washington. However, the U.S. must accommodate the rising power across the Pacific. Trying to keep China out of a new Asia-Pacific trade pact isn’t likely to work. America’s Asian allies want us to protect them — no surprise! — but are not interested in offending their nearby neighbor with a long memory. The best hope for moderating Chinese behavior is to tie it into a web of international institutions that provide substantial economic, political, and security benefits. Beijing already has good reason to be paranoid of the superpower which patrols bordering waters, engages in a policy that looks like containment, and talks of the possibility of war. Trying to isolate China economically would be taken as **a direct challenge**. Romney would prove Henry Kissinger’s dictum that **even paranoids have enemies**. Naturally, Romney also wants to “maintain appropriate military capabilities to discourage any aggressive or coercive behavior by China against its neighbors.” However, 67 years after the end of World War II, it is time for Beijing’s neighbors to arm themselves and cooperate with each other. Japan long had the second largest economy on earth. India is another rising power with reason to constrain China. South Korea has become a major power. Australia has initiated a significant military build-up. Many Southeast Asian nations are constructing submarines to help deter Chinese adventurism. Even Russia has much to fear from China, given the paucity of population in its vast eastern territory. But America’s foreign-defense dole discourages independence and self-help. The U.S. should step back as an off-shore balancer, encouraging its friends to do more and work together. It is not America’s job to risk Los Angeles for Tokyo, Seoul, or Taipei. Romney similarly insists on keeping the U.S. on the front lines against North Korea, even though all of its neighbors have far more at stake in a peaceful peninsula and are able to contain that impoverished wreck of a country. The Romney campaign proclaims: “Mitt Romney will commit to eliminating North Korea’s nuclear weapons and its nuclear-weapons infrastructure.” Alas, everything he proposes has been tried before, from tougher sanctions to tighter interdiction and pressure on China to isolate the North. What does he plan on doing when Pyongyang continues to develop nuclear weapons as it has done for the last 20 years? The American military should come home from Korea. Romney complained that the North’s nuclear capability “poses a direct threat to U.S. forces on the Korean Peninsula and elsewhere in East Asia.” Then withdraw them. Manpower-rich South Korea doesn’t need U.S. conventional support, and ground units do nothing to contain North Korea’s nuclear ambitions. Pull out American troops and eliminate North Korea’s primary threat to the U.S. Then support continuing non-proliferation efforts led by those nations with the most to fear from the North. That strategy, more than lobbying by Washington, is likely to bring China around. Romney confuses dreams with reality when criticizing President Obama over the administration’s response to the Arab Spring. “We’re facing an Arab Spring which is out of control in some respects,” he said, “because the president was not as strong as he needed to be in encouraging our friends to move toward representative forms of government.” Romney asked: “How can we try and improve the odds so what happens in Libya and what happens in Egypt and what happens in other places where the Arab Spring is in full bloom so that the developments are toward democracy, modernity and more representative forms of government? This we simply don’t know.” True, the president doesn’t know. But neither does Mitt Romney. The latter suffers from the delusion that bright Washington policymakers can remake the world. Invade another country, turn it into a Western-style democracy allied with America, and everyone will live happily every after. But George W. Bush, a member of Mitt Romney’s own party, failed miserably trying to do that in both Afghanistan and Iraq. The Arab Spring did not happen because of Washington policy but in spite of Washington policy. And Arabs demanding political freedom — which, unfortunately, is not the same as a liberal society — have not the slightest interest in what Barack Obama or Mitt Romney thinks. Yet the latter wants “convene a summit that brings together world leaders, donor organizations, and young leaders of groups that espouse” all the wonderful things that Americans do. Alas, does he really believe that such a gathering will stop, say, jihadist radicals from slaughtering Coptic Christians? Iraq’s large Christian community was destroyed even as the U.S. military occupied that country. His summit isn’t likely to be any more effective. Not everything in the world is about Washington. Which is why Romney’s demand to do something in Syria is so foolish. Until recently he wanted to work with the UN, call on the Syrian military to be nice, impose more sanctions, and “increase the possibility that the ruling minority Alawites will be able to reconcile with the majority Sunni population in a post-Assad Syria.” Snapping his fingers would be no less effective. Most recently he advocated arming the rebels. But he should be more cautious before advocating American intervention in another conflict in another land. Such efforts rarely have desirable results. Iraq was a catastrophe. Afghanistan looks to be a disaster once American troops come home. After more than a decade Bosnia and Kosovo are failures, still under allied supervision. Libya is looking bad. Even without U.S. “help,” a full-blown civil war already threatens in Syria. We only look through the glass darkly, observed the Apostle Paul. It might be best for Washington not to intervene in another Muslim land with so many others aflame. Despite his support for restoring America’s economic health, Romney wants to increase dramatically Washington’s already outsize military spending. Rather than make a case on what the U.S. needs, he has taken the typical liberal approach of setting an arbitrary number: 4 percent of GDP. It’s a dumb idea, since America already accounts for roughly half the globe’s military spending — far more if you include Washington’s wealthy allies — and spends more in real terms than at any time during the Cold War, Korean War, or Vietnam War, and real outlays have nearly doubled since 2000. By any normal measure, the U.S. possesses far more military resources than it needs to confront genuine threats. What Romney clearly wants is a military to fight multiple wars and garrison endless occupations, irrespective of cost. My Cato colleague Chris Preble figured that Romney's 4 percent gimmick would result in taxpayers spending more than twice as much on the Pentagon as in 2000 (111 percent higher, to be precise) and 45 percent more than in 1985, the height of the Reagan buildup. Over the next ten years, Romney's annual spending (in constant dollars) for the Pentagon would average 64 percent higher than annual post-Cold War budgets (1990-2012), and 42 percent more than the average during the Reagan era (1981-1989). If Mitt Romney really believes that the world today is so much more dangerous than during the Cold War, he should spell out the threat. He calls Islamic fundamentalism, the Arab Spring, the impact of failed states, the anti-American regimes of Cuba, Iran, North Korea, and Venezuela, rising China, and resurgent Russia “powerful forces.” It’s actually a pitiful list — Islamic terrorists have been weakened and don’t pose an existential threat, the Arab Spring threatens instability with little impact on America, it is easier to strike terrorists in failed states than in nominal allies like Pakistan and Saudi Arabia, one nuclear-armed submarine could vaporize all four hostile states, and Russia’s modest “resurgence” may threaten Georgia but not Europe or America. Only China deserves to be called “powerful,” but it remains a developing country surrounded by potential enemies with a military far behind that of the U.S. In fact, the **greatest danger** to America is the **blowback** that results from promiscuous intervention in conflicts not our own. Romney imagines a massive bootstrap operation: he wants a big military to engage in social engineering abroad which would require an even larger military to handle the violence and chaos that would result from his failed attempts at social engineering. Better not to start this vicious cycle. America faces international challenges but nevertheless enjoys unparalleled dominance. U.S. power is buttressed by the fact that Washington is allied with every industrialized nation except China and Russia. America shares significant interests with India, the second major emerging power; is seen as a counterweight by a gaggle of Asian states worried about Chinese expansion; remains the dominant player in Latin America; and is closely linked to most of the Middle East’s most important countries, such as Israel, Saudi Arabia, Egypt, Jordan, and Iraq. If Mitt Romney really believes that America is at greater risk today than during the Cold War, he is not qualified to be president. In this world the U.S. need not confront every threat, subsidize every ally, rebuild every failed state, and resolve every problem. Being a superpower means having many interests but few vital ones warranting war. Being a bankrupt superpower means exhibiting judgment and exercising discretion. President Barack Obama has been a disappointment, amounting in foreign policy to George W. Bush-lite. But Mitt Romney **sounds even worse.** His rhetoric suggests a return to the worst of the Bush administration. The 2012 election likely will be decided on economics, but foreign policy will prove to be equally important in the long-term. America can ill afford another know-nothing president.

### 1NC Cp1

**The United States federal government should incentivize the expansion of small modular nuclear reactors in the United States by reducing restrictions in the United States.**

**The plan solves the only major roadblock to the creation of a robust domestic SMR industry.**

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Abstract: More and more companies—in the U.S. and abroad—are investing in new commercial nuclear enterprises, chief among them, small modular reactors (SMRs). The SMR industry is growing, with many promising developments in the works—which is precisely why the government should not interfere, as subsidies and government programs have already resulted in an inefficient system for large reactors. Heritage Foundation nuclear policy experts explain how the future for small reactors can remain bright.

Small modular reactors (SMRs) have garnered significant attention in recent years, with companies of all sizes investing in these smaller, safer, and **more cost-efficient** nuclear reactors. Utilities are even forming partnerships with reactor designers to prepare for potential future construction. Perhaps most impressive is that most of this development is occurring without government involvement. Private investors and entrepreneurs are **dedicating resources** to these technologies based on their future prospects, not on government set-asides, mandates, or subsidies, and despite the current regulatory bias in favor of large light water reactors (LWRs).

The result is a young, robust, innovative, and growing SMR industry. Multiple technologies are being proposed that each have their own set of characteristics based on price, fuel, waste characteristics, size, and any number of other variables. To continue this growth, policymakers should reject the temptation to offer the same sort of subsidies and government programs that have proven ineffective for large LWRs. While Department of Energy cost-sharing programs and capital subsidies seem attractive, they have yet to net any new reactor construction. Instead, policymakers should focus on the systemic issues that have continued to thwart the expansion of nuclear power in recent years. Specifically, the federal government needs to develop an efficient and **predictable regulatory pathway** to new reactor certification and to develop a sustainable nuclear waste management strategy.

Why SMRs?

Small modular reactors share many of the attractive qualities of large reactors, such as providing abundant emissions-free power, while adding new features that could make them more appropriate for certain applications, such as providing power to rural communities or for dedicated industrial use. SMRs are not yet positioned to take the place of traditional large LWRs, but they represent an important growth area for the commercial nuclear industry.

Indeed, should the promise of small modular reactors be realized, the technology could transform the nuclear industry. That is because these attributes would potentially mitigate some of the financial and regulatory problems that nuclear energy has recently faced. SMRs potentially cost less (at least in up-front capital), are more mobile and multifunctional, provide competition, and can largely be produced by existing domestic infrastructure.

Lower Costs Up Front. Large reactors are very expensive to license and construct and require massive up-front capital investments to begin a project. Small reactors, while providing far less power than large reactors, can be built in modules and thus be paid for over time. For example, estimates for larger reactors range from $6 billion to $10 billion and must be financed all at once. The Babcock & Wilcox Company’s modular mPower reactors, alternatively, can be purchased in increments of 125 megawatts (MW), which would allow costs to be spread out over time. Though cost estimates are not yet available for the mPower reactor, its designers have stated that they will be competitive. This should not be used as a reason to refrain from building larger, 1,000-plus MW reactors. Each utility will have its own set of variables that it must consider in choosing a reactor technology, but given that one of the primary justifications for government subsidies is that the high costs of large reactors puts unacceptable strain on utility balance sheets, an option that spreads capital outlays over time should be attractive.

Safe Installation in Diverse Locations. Some designs are small enough to produce power for as few as 20,000 homes. One such reactor, Hyperion Power’s HPM (Hyperion Power Module) offers 25 MW of electricity for an advertised cost of $50 million per unit. This makes the HPM a potential power solution for isolated communities or small cities.[1] The Alaskan town of Galena, for example, is planning to power its community with a small reactor designed by Toshiba, while Fairbanks is looking into a small plant constructed by Hyperion.[2] In addition, Western Troy Capital Resources has stated that it will form a private corporation to provide electric power from small reactors for remote locations in Canada.[3] Public utility officials in Grays Harbor, Washington, have spoken with the NuScale Power company about powering the community with eight small nuclear plants;[4] and Hyperion Power has reported a high level of interest in small nuclear reactor designs from islands around the world.[5]

Using a small nuclear reactor could cut electricity costs in isolated areas since there would be no need for expensive transmission lines to carry power to remote locations.[6] SMRs could also potentially be integrated into existing energy infrastructure. SMRs could be built into old coal plants, for instance. The reactors would replace the coal boilers and be hooked into the existing turbines and distribution lines. According to the Nuclear Regulatory Commission, these modifications could be completed safely since small reactors will likely be easier to control during times of malfunction.[7]

Multi-functionality. SMRs can be used in a variety of applications that have substantial power and heat requirements. The chemical and plastics industries and oil refineries all use massive amounts of natural gas to fuel their operations. Similarly, small reactors could produce the heat needed to extract oil from tar sands, which currently requires large amounts of natural gas. While affordable today, natural gas prices vary significantly over time, so the long-term predictable pricing that nuclear provides could be very attractive. SMRs may also provide a practical solution for desalination plants (which require large amounts of electricity) that can bring fresh water to parts of the world where such supplies are depleting.[8] Perhaps most important, is that SMRs have the potential to bring power and electricity to the 1.6 billion people in the world today that have no access to electricity, and to the 2.4 billion that rely on biomass, such as wood, agricultural residue, and dung for cooking and heating.[9]

Competition. While competition among large nuclear-reactor technologies currently exists, small reactors will add a new dimension to nuclear-reactor competition. Multiple small technology designs are set to emerge on the market. Not only will competition among small reactors create a robust market, it will also provide an additional incentive for large reactors to improve. If smaller reactors begin to capture a share of the nuclear market and the energy market at large, it will drive innovation and ultimately lower prices for both new and existing technologies.

Domestic Production. Although the nuclear industry necessarily shrank to coincide with decreased demand, much of the domestic infrastructure remains in place today and could support the expansion of small-reactor technologies. Although the industrial and intellectual base has declined over the past three decades, forging production, heavy manufacturing, specialized piping, mining, fuel services, and skilled labor could all be found in the United States. Lehigh Heavy Forge Corporation in Bethlehem, Pennsylvania, could build the forges while Babcock & Wilcox could provide the heavy nuclear components, for instance. AREVA/Northrop Grumman Shipbuilding broke ground on a heavy components manufacturing facility last June.[10] Further, a number of companies are expanding manufacturing, engineering, and uranium enrichment capabilities—all in the United States.

If SMRs are so great, where is the construction?

While some designs are closer to market introduction than others, the fact is that America’s **regulatory** and policy environment is not sufficient to support a robust expansion of existing nuclear technologies, much less new ones. New reactor designs are difficult to license efficiently, and the lack of a sustainable nuclear waste management policy causes significant risk to private investment.

Many politicians are attempting to mitigate these market challenges by offering subsidies, such as loan guarantees. While this approach still enjoys broad support in Congress and industry, the reality is that it has not worked. Despite a lavish suite of subsidies offered in the Energy Policy Act of 2005, including loan guarantees, insurance against government delays, and production tax credits, no new reactors have been permitted, much less constructed. These subsidies are in addition to existing technology development cost-sharing programs that have been in place for years and defer significant research and development costs from industry to the taxpayer.

The problem with this approach is that it ignores the larger systemic problems that create the unstable marketplace to begin with. These systemic problems generally fall into three categories:

Licensing. The Nuclear Regulatory Commission (NRC) is ill prepared to build the regulatory framework for new reactor technologies, and no reactor can be offered commercially without an NRC license. In a September 2009 interview, former NRC chairman Dale E. Klein said that small nuclear reactors pose a dilemma for the NRC because the commission is uneasy with new and unproven technologies and feels more comfortable with large light water reactors, which have been in operation for years and has a long safety record.[11] The result is that enthusiasm for building non-light-water SMRs is generally squashed at the NRC as potential customers realize that there is little chance that the NRC will permit the project within a timeframe that would promote near-term investment. So, regardless of which attributes an SMR might bring to the market, the **regulatory risk** is such that real progress on commercialization is difficult to attain. This then leaves large light water reactors, and to a lesser extent, small ones, as the least risky option, which pushes potential customers toward that technology, which then undermines long-term progress, competition, and innovation.

Nuclear Waste Management. The lack of a sustainable nuclear waste management solution is perhaps the greatest obstacle to a broad expansion of U.S. nuclear power. The federal government has failed to meet its obligations under the 1982 Nuclear Waste Policy Act, as amended, to begin collecting nuclear waste for disposal in Yucca Mountain. The Obama Administration’s attempts to shutter the existing program to put waste in Yucca Mountain without having a backup plan has worsened the situation. This outcome was predictable because the current program is based on the flawed premise that the federal government is the appropriate entity to manage nuclear waste. Under the current system, waste producers are able to largely ignore waste management because the federal government is responsible. The key to a sustainable waste management policy is to directly connect financial responsibility for waste management to waste production. This will increase demand for more waste-efficient reactor technologies and drive innovation on waste-management technologies, such as reprocessing. Because SMRs consume fuel and produce waste differently than LWRs, they could contribute greatly to an economically efficient and sustainable **nuclear waste management strategy**.

Government Intervention. Too many policymakers believe that Washington is equipped to guide the nuclear industry to success. So, instead of creating a stable regulatory environment where the market value of different nuclear technologies can determine their success and evolution, they choose to create programs to help industry succeed. Two recent Senate bills from the 111th Congress, the Nuclear Energy Research Initiative Improvement Act (S. 2052) and the Nuclear Power 2021 Act (S. 2812), are cases in point. Government intervention distorts the normal market processes that, if allowed to work, would yield the most efficient, cost-effective, and appropriate nuclear technologies. Instead, the federal government picks winners and losers through programs where bureaucrats and well-connected lobbyists decide which technologies are permitted, and provides capital subsidies that allow investors to ignore the systemic problems that drive risk and costs artificially high. This approach is especially detrimental to SMRs because subsidies to LWRs distort the relative benefit of other reactor designs by artificially lowering the cost and risk of a more mature technology that already dominates the marketplace.

How to Fix a Broken System

At the Global Nuclear Renaissance Summit on July 24, 2008, then-NRC chairman Dale Klein said that a nuclear renaissance with regard to small reactors will take “decades to unfold.”[12] If Members of Congress and government agencies do not reform their current approach to nuclear energy, this will most certainly be the case. However, a new, market-based approach could lead to a different outcome. Instead of relying on the policies of the past, Congress, the Department of Energy, and the NRC should pursue a new, 21st-century model for small and alternative reactor technologies by doing the following:

Reject additional loan guarantees. Loan guarantee proponents argue that high up-front costs of new large reactors make them unaffordable without loan guarantees. Presumably, then, a smaller, less expensive modular option would be very attractive to private investors even without government intervention. But loan guarantees undermine this advantage by subsidizing the capital costs and risk associated with large reactors. A small reactor industry without loan guarantees would also provide competition and downward price pressure on large light water reactors. At a minimum, Congress should limit guarantees to no more than two plants of any reactor design and limit to two-thirds the amount of any expanded loan guarantee program that can support a single technology. Such eligibility limits will prevent support from going only to a single basic technology, such as large light water reactors.[13]

Avoid subsidies. Subsidies do not work if the objective is a diverse and economically sustainable nuclear industry. Despite continued attempts to subsidize the nuclear industry into success, the evidence demonstrates that such efforts invariably fail. The nuclear industry’s success stories are rooted in the free market. Two examples include the efficiency and low costs of today’s existing plants, and the emergence of a private uranium enrichment industry. Government intervention is the problem, as illustrated by the government’s inability to meet its nuclear waste disposal obligations.

Build expertise at the Nuclear Regulatory Commission. The NRC is built to regulate large light water reactors. It simply does not have the regulatory capability and resources to efficiently regulate other technologies, and building that expertise takes time. Helping the NRC to develop that expertise now would help bring new technologies into the marketplace more smoothly. Congress should direct and resource the NRC to develop additional broad expertise for liquid metal-cooled, fast reactors and high-temperature, gas-cooled reactors. With its existing expertise in light water technology, this additional expertise would position the NRC to effectively regulate an emerging SMR industry.

Establish a new licensing pathway. The current licensing pathway relies on reactor customers to drive the regulatory process. But absent an efficient and predictable regulatory pathway, few customers will pursue these reactor technologies. The problem is that the legal, regulatory, and policy apparatus is built to support large light water reactors, effectively discriminating against other technologies. Establishing an alternative **licensing pathway** that takes the unique attributes of small reactors into consideration could help build the necessary regulatory support on which commercialization ultimately depends.[14]

Resolve staffing, security, construction criteria, and fee-structure issues by December 31, 2011. The similarity of U.S. reactors has meant that the NRC could establish a common fee structure and many general regulatory guidelines for areas, such as staffing levels, security requirements, and construction criteria. But these regulations are inappropriate for many SMR designs that often have smaller staff requirements, unique control room specifications, diverse security requirements, and that employ off-site construction techniques. Subjecting SMRs to regulations built for large light water reactors would add cost and result in less effective regulation. The NRC has acknowledged the need for this to be resolved and has committed to doing so, including developing the budget requirements to achieve it. It has not committed to a specific timeline.[15] Congress should demand that these issues be resolved by the end of 2011.

### 1NC CP 2

#### Text: The United States federal government should establish a nitrogen fertilizer tax of 16 cents per pound of nitrogen, and use the revenue from that tax to provide loan guarantees for farmers to procure biocharcoal technology.

#### A fertilizer tax plus subsidy would incentivize farmers to shift to biochar.

Tom Konrad, 12/14/2009. PhD Mathematics @ Purdue, CFA, financial analyst, freelance writer, and policy wonk specializing in renewable energy and energy efficiency. “The Nitrogen-Biochar Link,” Clean Energy Wonk, http://cleanenergywonk.com/2009/12/14/the-nitrogen-biochar-link/.

[Biochar, used as a soil amendment, improves water and nutrient uptake by plants](http://www.altenergystocks.com/archives/2009/07/biochar_investing.html). It has its greatest effects in poor soils, helping the plants access the nutrients that are available, and this effect can last for centuries after the soil has been amended with biochar. Biochar-ameneded soil should reduce the risks to farmers of using too little fertilizer, and hence reduce the incentive to over-apply, benefiting both the farmers and everyone else in the watershed. Studies suggest that [fertilizer taxes are the most economically efficient way to reduce Nitrogen runoff](http://www.altenergystocks.com/archives/2009/07/biochar_investing.html). **If such taxes were in place, farmers would have a stronger incentive to use biochar in order to make the most of the suddenly more expensive fertilizer**. For environmentalists interested in reducing carbon emissions, this would have the added benefit of [reducing nitrous oxide (N2O) emissions](http://en.wikipedia.org/wiki/Biochar#Enhancing_soil) from heavily fertilized soils, for an additional reduction of greenhouse emissions. Hence, [Biochar advocates](http://www.biochar-international.org/) should team up with groups concerned about the [fisheries](http://news.nationalgeographic.com/news/2005/05/0525_050525_deadzone.html) and health effects of runoff to advocate for higher taxes on nitrogen fertilizer. When farmers complain, perhaps we can buy them off by using the revenue for a biochar subsidy?

#### Studies show such a fertilizer tax could effectively reduce usage.

Pierre M ́erel, September 2011. Agricultural and Resource Economics @ UC Davis. “Inferring the Effects of Nitrogen Management Policies Using a Fully Calibrated Programming Model of California Agriculture,” asi.ucdavis.edu/research/nitrogen/nitrogen-faculty-workgroup-materials/Merel%20Final%20Report.pdf.

Our work addresses ex ante policy evaluation as it relates to nitrogen management in agriculture, in particular the reduction of nitrogen losses from field crops. We build a bio-economic model of crop production at the regional scale to predict the effects of nitrogen-related policies on agriculture and the environment. The model is calibrated against economic data on observed crop acreages and yields, as well as predetermined supply responses. In addition, crop-specific production functions are calibrated to exogenous agronomic information on yield responses to nitrogen and irrigation. Environmental outcomes are tracked using the biophysical model DAYCENT.¶ The model is applied to the study of a nitrogen tax in Yolo County, California, intended to mitigate non-point source nitrogen pollution from field crops. At low tax levels, the behavioral and environmental responses to the nitrogen tax appear to be largely due to the reduction in fertilizer use and irrigation on each crop. However, as the tax level increases, reductions in input intensities start to level out due to unfavorable yield effects, and acreage reallocation among crops begins to play a sizable part in the total response.¶ From a methodological standpoint, our study illustrates the need to accurately model input intensity adjustments in regional models of crop supply intended for agri-environmental policy analysis. From a policy standpoint, our study shows that sizable reductions in nitrogen application, and attendant reductions in nitrogen losses, can be achieved at the regional scale at a moderate social cost. Overall, the induced reduction in nitrate leaching appears larger than the reduction in nitrous oxide emissions.¶ Specific results: The study develops an economic model of nitrogen use at the regional scale, for use in ex ante agri-environmental policy evaluation. The model is based on the principles of positive mathematical programming (PMP), as outlined in Howitt (1995) and, more recently, M ́erel et al. (2011). As such, the model exactly replicates an observed acreage¶ 1allocation among activities, as well as an exogenous set of crop supply elasticities. The nov- elty of our approach lies in the fact that the model is also calibrated so as to replicate crop yield responses to irrigation and nitrogen application consistent with agronomic information obtained from the biophysical soil process model DAYCENT (Del Grosso et al., 2008). Con- sequently, our fully calibrated model is particularly fit for the analysis of policies that are likely to affect both acreage allocation and input intensity in multi-crop agricultural systems.¶ This paper is not the first one to recognize the need to better represent farmers’ input adjustment opportunities in programming models of agricultural supply, but it is the first one to propose a solution to the yield response calibration problem in the context of positive mathematical programming. Before us, Godard et al. (2008) have used local yield response curves derived from the biophysical model STICS (Brisson et al., 2003) to represent farmers’ nitrogen fertilizer application choice as a first stage to a linear programming representation of crop choice. Graveline and Rinaudo (2007) have exploited a yield response curve for corn to specify a discrete set of corn production activities in a pure linear programming framework. Our approach is different from these, as we focus on exact replication of observed economic behavior through non-linear PMP calibration, as opposed to constrained linear optimization. We also calibrate crop yield responses not only to nitrogen, but also irrigation, an important margin for the assessment of certain environmental outcomes such as nitrate leaching. Finally, we use the biophysical model to derive regional-level—as opposed to farm- level—yield response curves.¶ Our model is applied to field crop agriculture in Yolo County, California, to evaluate the economic and environmental effects of an exogenous increase in the price of nitrogen. A nitrogen tax represents a possible market-based instrument to help mitigate non-point source nitrogen pollution from agriculture. The effects of the tax on nitrate leaching and nitrous oxide (N2O) fluxes are tracked. The linkages between the agronomic model DAYCENT and the economic optimization model are depicted in figure 1.¶ To comprehend the effect of a nitrogen tax on behavioral and environmental outcomes, it is useful to decompose the total effect into its two elementary economic responses: an extensive margin effect, that is, the reallocation of acreage among crops, and an intensive margin effect, that is, the change in input intensity per acre, for a given crop. Both effects are operating simultaneously, and in our application the intensive margin effect, which has been overlooked in existing PMP studies (Helming, 1998), is likely to be large. Hence, to anticipate the full effect of a nitrogen tax policy, it is necessary to accurately model the intensive margin response, in addition to the extensive margin response.¶ Indeed, we find that at low to moderate tax levels, most of the environmental benefits of the policy arise from reductions in nitrogen and water application on each crop, with acreage reallocation playing a minor role. However, as tax levels rise, input intensity adjustments start to level out due to adverse yield effects, and acreage reallocation among crops starts to play a more significant role in the behavioral and environmental responses.¶ Table 1 reports the contributions of the input intensity and acreage reallocation effects to the total behavioral response, that is, the reduction in nitrogen application at the regional level. At the tax level of ¢4/lb N, the total reduction in nitrogen applied in Yolo is predicted to be 3.9%, and 3.3% is due to the input intensity effect. At the higher tax level of ¢16/lb N, the total effect is a reduction of N application by 12.8%, the contribution of the input intensity effect being 8.3%. As such, the relative importance of the acreage reallocation effect to the total effect is increasing with the tax level.1

#### Solves through sequestration without reducing coal emissions.

Technology Review, 4/26/2007. “The Case for Burying Charcoal,” published by MIT, http://www.technologyreview.com/news/407754/the-case-for-burying-charcoal/.

Several states in this country and a number of Scandinavian countries are trying to supplant some coal-burning by burning biomass such as wood pellets and agricultural residue. Unlike coal, biomass is carbon-neutral, releasing only the carbon dioxide that the plants had absorbed in the first place. But a new research [paper](http://dx.doi.org/10.1016/j.biombioe.2007.01.012) published online in the journal Biomass and Bioenergy argues that the battle against global warming may be better served by instead heating the biomass in an oxygen-starved process called pyrolysis, extracting methane, hydrogen, and other byproducts for combustion, and burying the resulting carbon-rich char. **Even if this approach would mean burning more coal**--which emits more carbon dioxide than other fossil-fuel sources--**it would yield a net reduction in carbon emissions**, according to the analysis by [Malcolm Fowles](http://technology.open.ac.uk/tm/mf.htm), a professor of technology management at the Open University, in the United Kingdom. Burning one ton of wood pellets emits 357 kilograms less carbon than burning coal with the same energy content. But turning those wood pellets into char would save 372 kilograms of carbon emissions. That is because 300 kilograms of carbon could be buried as char, and the burning of byproducts would produce 72 kilograms less carbon emissions than burning an equivalent amount of coal. ¶ Such an approach could carry an extra benefit. Burying char--known as black-carbon sequestration--enhances soils, helping future crops and trees grow even faster, thus absorbing more carbon dioxide in the future. Researchers believe that the char, an inert and highly porous material, plays a key role in helping soil retain water and nutrients, and in sustaining microorganisms that maintain soil fertility. ¶ [Johannes Lehmann](http://www.css.cornell.edu/faculty/lehmann.html), an associate professor of crops and soil sciences at Cornell University and an expert on char sequestration, agrees in principle with Fowles's analysis but believes that much more research in this relatively new area of study is needed. "It heads in the right direction," he says.¶ Interest in the approach is gathering momentum. On April 29, more than 100 corporate and academic researchers will gather in New South Wales, Australia, to attend the first international conference on black-carbon sequestration and the role pyrolysis can play to offset greenhouse-gas emissions. ¶ **Lehmann estimates that as much as 9.5 billion tons of carbon--more than currently emitted globally through the burning of fossil fuels--could be sequestered annually by the end of this century through the sequestration of char**. "Bioenergy through pyrolysis in combination with biochar sequestration is a technology to obtain energy and improve the environment in multiple ways at the same time," writes Lehmann in a research paper to be published soon in [Frontiers in Ecology and the Environment](http://www.frontiersinecology.org/). Fowles says that there would be an incentive for farmers, logging communities, and small towns to convert their own dedicated crops, agricultural and forest residues, and municipal biowaste into char if a high enough price emerged for the sale of carbon offsets. "Every community at any scale could pyrolyse its biowaste ... motivated by doing their bit against global warming," he says. Fowles believes that storing black carbon in soil carries less risk, would be quicker to implement, and could be done at much lower cost than burying carbon dioxide in old oil fields or aquifers. And he says the secondary benefits to agriculture could be substantial: "Biochar reduces the soil's requirement for irrigation and fertilizer, both of which emit carbon." Fowles adds that it has also been shown to reduce emissions of greenhouse gases from decay processes in soil. This would include nitrous oxide, a potent greenhouse gas. "Biochar has been observed to reduce nitrous-oxide emissions from cultivated soil by 40 percent."

### 1NC—adv 1

#### Great power wars are unthinkable—unipolarity just results in minor power wars.

Jervis 11—Professor of International Politics @ Columbia University [Robert Jervis (On the board of nine scholarly journals & Former president of the American Political Science Association), “Force in Our Times,” Saltzman Working Paper No. 15, July 2011, pg. <http://www.siwps.com/news.attachment/saltzmanworkingpaper15-842/SaltzmanWorkingPaper15.PDF>]

FORCE TODAY - Two dramatic and seemingly-contradictory trends are central. On the one hand, since the end of the Cold War if not before, the amount of inter-state and even civil war has drastically declined. Of course much depends on the time periods selected and the counting rules employed, but **by any measure international wars are** scarce if not **vanishing**, and civil wars, after blossoming in the 1990s, have greatly diminished.32 Significant instances of civil strife remain and are made salient by the horrific examples that appear in the newspapers every day, but in fact all inventories that I know of conclude that they are fewer than they used to be. Ironically, although realism stresses the conflict–inducing power of international anarchy, the barriers and inhibitions against international war now seem significantly more robust than those limiting civil wars. But even the latter are stronger than they were in the past. Although a central question is whether these trends will be reversed, they truly are startling, of great importance, and were largely unpredicted. They also remain insufficiently appreciated; one rarely reads statements about how fortunate we are to live in such a peaceful era. Perhaps the reasons are that optimism is generally derided in the cynical academic community, peace is not the sort of dramatic event that seizes public (and media) attention, and in the absence of major wars, we all find other things to worry about.

But Plato was not entirely wrong to say that “only the dead have seen the end of war.”33 Force, even when deeply recessed, can come to the surface again. Discussions in the US and Europe about relations with Iran often debate whether force should be “taken off the table.” But, regardless of whether it would be desirable to do so, would this be possible? As long as important disputes with Iran remain, with even the best will in the world there are limits to how far thoughts of the use of force could be pushed out of the minds of all the participants, especially those in Tehran. It is interesting that Tony Blair told the Chilcot commission that with respect to Iraq “even prior to September 11, 2001…. You know, the fact is [that] force was always an option.”34

Don’t try to tell Bashar al-Assad or Muammar Qaddafi that force is no longer important. As Osgood and Tucker noted in their important study over 40 years ago, “if force has lost its utility, its condemnation on moral grounds is superfluous.”35 Libya, in fact, represents the other trend. **Since the end of the Cold War, the US**, and to a lesser but significant extent Britain and France, **have used force more often** than they did before. **Panama, the Gulf War, Haiti, Bosnia, Kosovo, Afghanistan, Iraq, and now Libya are unmatched in the Cold War era.** The US is now fighting three wars, although by the time this article appears in print its military role in Libya and Iraq may be over. Of course these military adventures are all small by comparison with most wars, and certainly by the standards of Korea and Vietnam, let alone the wars between Iran and Iraq and Ethiopia and Eritrea. Nevertheless, they cannot be dismissed.

It is beyond my scope to explore all the possible explanations for either of these trends, but it does seem clear that the rise in American military activity was caused at least in part by the end of the Cold War and the related fact that the US is now the sole superpower. The new configuration means that the US is no longer deterred from entering local conflicts by the fear of a confrontation with the Soviet Union, makes others rely even more on the US to be a policeman (if often a misguided one), and elevates the salience of both threats and values that were previously trumped by the superpower rivalry. Opportunities loom larger for the US and the UK than they did during the Cold War, and new threats calling for military intervention have increased in visibility if not in actual occurrence. To start with the latter, although terrorism was a concern during the Cold War, it played nothing like the role that it does now. Of course the US never suffered an attack like 9/11 before, but while I will briefly discuss the extent of the danger of terrorism later, here I want to argue that the common placement of terrorism at the top of the list of threats is a product not only of the attacks over the past decade, but also of the paucity of other threats. The felt need to use force against terrorists, states that support them and even countries that might work with them in the future in part stems from a security environment that is remarkably benign.

THE SECURITY COMMUNITY - Alongside and in part responsible for the two contrasting trends in the use of force is the existence of a security community among the world’s leading powers. Although I can be brief because I have discussed this elsewhere,40 the point is of fundamental importance. **For the first time in history, the leading states of the world** (the US, most of Europe, and Japan) not only are at peace with each other, butfind the idea of war within this group literally unthinkable (which is the definition of a security community).41 Although Russia and China remain outside the community (which is not to say that war with or between them is highly likely, but only that it is within the realm of possibility), the change in world politics is enormous. War among the leading powers of the world and, at least as much, fear of war, preparation for war, and the desire to avoid such wars if possible--and prevail in them if not--has been the driving motor of international politics for centuries. At the risk of hyperbole, I think we can say that turning off this motor is the greatest change in international politics that we have ever seen. Its implications remain hard to grasp, and indeed how citizens and leaders come to understand this new world will strongly shape how they behave. But even now it is clear that the existence of the security community is crucial to world politics, international relations theory, and our lives.

Obvious questions are what caused the community to form, what could lead it to be replicated elsewhere, and what if anything could lead it to unravel. I have discussed the first question in my earlier writings and so will discuss only the latter two topics here. Of course speculations about what could bring the community to an end are not unrelated to analysis of its causes despite the fact that path-dependence could be at work and the possibility that the community could survive an end to the factors that brought it into being. Nevertheless, just as the community was formed by changes in domestic regimes, ruling values and ideas, and the costs and benefits of war and peace, so factors in these categories might bring us back to earlier and less fortunate relations. On top of all the normal unknowns in dealing with possible futures, our speculations are limited by the fact that the security community is particularly psychological in that it is defined by the unthinkability of war among the members. If we know little about how events move from being seen as possible to actually coming about, we know even less about what forces and processes move them from being unthinkable to being seen as possible.42

Here it is worth stressing that the fact that war among the members is unthinkable has real consequences beyond the fact that peace is maintained. When I ask my undergraduates whether they think they will live to see a war with another leading power, they look at me as though I have lost my mind because such an idea has never crossed theirs. What—among other things—they fail to realize is that their state of mind is without precedent and that the ability to go about their lives without the slightest concern that they or their country might—just might—have to fight another leading power shapes a good deal of their lives and our society. This is not to say that their lives are now free from worry, but only that their freedom from worrying about what used to be considered the greatest scourge of the human race gives them freedom to worry about other things.

On a larger scale, societies and governments within the community can go about their business without thinking about how this might affect the prospects for peace or the outcome of war with other members. Like my students’ lack of concern, we take this for granted, but in fact it represents a sharp break from the past. Rivalries, concern for relative position, and the desire for bargaining advantages still remain, but the intensity and consequences are quite different when war is out of the question. The whole tenor of inter-state relations and fundamental attitudes toward conflict and cooperation are different from the time a century ago when a British observer could return from a trip to Germany saying “Every one of those new factory chimneys is a gun pointed at England.”43

I see no reason to expect the community to come to an end. Indeed, the fact that it is defined by the participants’ beliefs that war cannot occur means that if they thought it would end, then in fact it would be dissolved (although war might not actually occur). More broadly, **just as** I noted earlier that **expectations of war can be** self-fulfilling**, so can expectations of peace**. But since academic musings have little impact, it is safe to pursue our scholarly duty of asking about what developments, currently unforeseen, might destroy the community.

Just as one pillar of the community was the transformation of the old idea that war was honorable and glorious by the almost universal repugnance of it44 (and this is one reason why any war now has to be carefully sold to the public), the community would be at least weakened if this attitude changed. Is it conceivable that war could come back into fashion? It is literally unimaginable that slavery or monarchical rule could return to favor. The current replacements for these ideas are deeply woven into the fabric of the social order, and the current conception of war as a terrible enterprise similarly does not stand alone and presumably could not change without wide-ranging alteration of our societies. **One dreadful** but I think unlikely **possibility would be that the** success of a series of **military interventions** of the type **we have seen recently could lead to a general reevaluation of not only the utility of this kind of force, but of its fundamental role in human endeavors**. Even without this, might values change in a cyclical fashion? Might boredom lead to a resurrection of the idea that force is noble? Could males, finding themselves losing power and status in their societies, seek a return to a world in which the arena of violence in which they have a comparative advantage is seen more positively? If it impossible to say that this cannot occur, it seems at least as difficult to foresee a chain of events that would bring this about. (But it is worth noting that before September 11, 2001 few of us believed that torture might come back into the inventory of state behavior.) Even if war is still seen as evil, the security community could be dissolved if severe conflicts of interest were to arise. Could the more peaceful world generate new interests that would bring the members of the community into sharp disputes?45 A zero-sum sense of status would be one example, perhaps linked to a steep rise in nationalism. More likely would be a worsening of the current economic difficulties, which could itself produce greater nationalism, undermine democracy, and bring back old-fashioned beggar-thy-neighbor economic policies. While these dangers are real, it is hard to believe that the conflicts could be great enough to lead the members of the community to contemplate fighting each other. It is not so much that economic interdependence has proceeded to the point where it could not be reversed—states that were more internally interdependent than anything seen internationally have fought bloody civil wars. Rather it is that even if the more extreme versions of free trade and economic liberalism become discredited, it is hard to see how without building on a pre-existing high level of political conflict leaders and mass opinion would come to believe that their countries could prosper by impoverishing or even attacking others. Is it possible that problems will not only become severe, but that people will entertain the thought that they have to be solved by war? While a pessimist could note that this argument does not appear as outlandish as it did before the financial crisis, an optimist could reply (correctly, in my view) that the very fact that we have seen such a sharp economic down-turn without anyone suggesting that force of arms is the solution shows that even if bad times bring about greater economic conflict, it will not make war thinkable.

In the past, the conflict of interest that has sparked war has involved territory more often than economic issues, although of course the two are often linked.46 Thus the rise of the security community has been accompanied by a decline in territorial conflicts, and reciprocal causation is surely at work here. Could territorial conflicts resume a salient place in relations among the leading power? Territory in the guise of self-determination continues, as the likely coming of a referendum on Scottish independence indicates. But a reduced attachment to territory is indicated by the fact that the rest of the UK is not willing to fight to prevent this, just as it would be willing to part with Northern Ireland if the majority of the inhabitants desired to join the Irish Republic. Indeed, the existence of a security community and the related decline in traditional security threats makes it easier for sub-national units to split off.

Concern for territory has not entirely disappeared, of course, and the recent Danish claim on large portions of the Arctic reminds us that changes in climate and technology can endow areas with new value.47 But the virulent disputes we see around the world stem from the break-up of states or the partition of areas of the globe previously ruled by others, and within the community it is hard to see either likely candidate territorial disputes or general trends that would return to traditional values. Could anything occur that would lead Germany to feel that it was vital to reclaim Alsace and Lorraine? If this were to happen, we would be in a different world. But to turn this around, we would have to be in a very different world for this to occur.

The security community is underpinned not only by the benefits it is believed to bring, but also by the perceived high costs of war. If large-scale conventional war would be very destructive, the presence of nuclear weapons pushes the costs off the scale (and it is worth remembering that although Germany and Japan do not have nuclear weapons, they could develop them very quickly). One does not have to accept all the precepts of standard deterrence theory to believe that it would take extraordinary incentives for the states to contemplate war with so many nuclear weapons scattered around. The other side of the coin is that the security community might be weakened if the costs of war were to become much less. The good news—from this perspective—is that there are few prospects of this. Even President Obama, who has stressed the need to abolish nuclear weapons, admits that this cannot be done in his lifetime. Missile defenses, endorsed by all American presidents since Reagan, remain out of reach, and no technologies or tactics are in sight that could render conventional war quick and relatively bloodless.

A more likely change would be an erosion of American hegemony. Among the leading powers, all are not equally leading. The strength, interests, and military presence of the US remain sufficient to see that others in the community do not challenge either it or each other. A decline in American power and a partial withdrawal of its influence are certainly possible, and at minimum, American troops might be withdrawn from Europe in the coming years. But would this matter? **Even if American dominance played a large role in forming the community, it may not be necessary for the community’s** maintenance. Path dependence **may operate strongly here**, and although firm evidence is hard to come by, I would argue that in the absence of other changes of the kind I have discussed, **it is** very unlikely **that pulling off the American security blanket would lead to thoughts of war**. (On the level of policy prescription, however, I am cautious enough not to want to run the experiment.)Pg. 13-20

\*Expectations for peace are self-fulfilling

\*Path dependence prevents heg from disrupting the trend

\*Their ev is media/academic hype

\*Bringing other countries (Russia/China) into the group will make war unthinkable for them

\*Unipolar small wars make great power wars thinkable

#### Warming is slowing because of sulfur aerosols.

[Louise Gray](http://www.telegraph.co.uk/journalists/louise-gray/), 11/26/2010. Environment Correspondent for the Telegraph. “Global warming has slowed because of pollution,” The Telegraph, http://www.telegraph.co.uk/earth/environment/climatechange/8159991/Global-warming-has-slowed-because-of-pollution.html.

The latest figures from more than 20 scientific institutions around the world show that global temperatures are higher than ever. ¶ However the gradual rise in temperatures over the last 30 years is slowing slightly. Global warming since the 1970s has been 0.16C (0.3F) but the rise in the last decade was just 0.05C (0.09F), according to the Met Office. ¶ Sceptics claim this as evidence man made global warming is a myth. ¶ But in a new report the Met Office said the reduced rate of warming can be easily explained by a number of factors. And indeed the true rate of warming caused by man made greenhouse gases could be greater than ever. ¶ One of the major factors is pollution over Asia, where the huge growth in coal-fired power stations mean aerosols like sulphur are being pumped into the air. This reflects sunlight, cooling the land surface temperature. ¶ Dr Vicky Pope, Head of Climate Change Advice, said pollution may be causing a cooling effect. ¶ “A possible increase in aerosol emissions from Asia in the last decade may have contributed to substantially to the recent slowdown,” she said. “Aerosols cool the climate by reflecting the sunlight.”

#### Reducing coal emissions would trigger rapid warming due to reduced aerosol cooling.

N. Chalmers et al, 1,2 E. J. Highwood,1 E. Hawkins,1,2 R. Sutton,1,2 L. J. Wilcox1, 8/21/2012. 1Department of Meteorology, University of Reading, Reading, U.K.; 2NCAS-Climate, University of Reading, Reading, U.K. “Aerosol contribution to the rapid warming of 2 near-term climate under RCP 2.6,” Manuscript, accepted for publication in Geophysical Research Letters, www.met.reading.ac.uk/~ed/home/chalmers\_etal\_2012\_accepted.pdf.

\*\*\*RCP="Representative Concentration Pathways." These are IPCC scenarios designed for use in climate models, that essentially project different scenarios for changes (or lack thereof) in global emissions. RCP2.6 is a scenario of significant emissions reductions. RCP4.5 is the baseline "business as usual" scenario.

\*\*\*CDNC=cloud droplet number concentration

The period during which global mean surface temperature in RCP2.6 is higher than in 130 RCP4.5, discussed in the previous section, is directly related to a rapid increase in global 131 mean surface temperature in RCP2.6, between around 2010 and around 2025 (Figure 1a). 132 In this section we investigate the causes of this rapid warming, and relate this event to 133 the comparison with RCP4.5. Figure 3 shows maps of the differences between the 10 year 134 means before and after the rapid warming. In this case a positive value indicates a larger 135 value after the sudden warming identified in Figure 1.¶ 136 As expected, there is a large reduction in sulphate load, and corresponding decrease 137 in CDNC over most of the northern hemisphere, consistent with a change in the indirect 138 aerosol effect. An increase in the effective radius is also seen (not shown). This reduces 139 the optical depth of the clouds when they are present, meaning more downward shortwave 140 flux is transmitted to the surface. There is also a prominent decrease in cloud fraction over 141 the subtropical northeastern Pacific Ocean which could be a consequence of the impact 142 of reduced sulphate aerosol on cloud lifetime. Lu et al. [2009] show that drizzle rate from 143 clouds in this region is indeed inversely related to aerosol concentration. Kloster et al. 144 [2010] also suggested that a change in cloud water path in their simulations with aggres-¶ 145 sive aerosol reductions resulted from enhanced drizzle formation. We hypothesise that 146 the localised nature of this feature by comparison with the sulphate and CDNC change 147 is due to the cloud in this region being particularly sensitive to a change in aerosol. Cli- 148 matologically, this region is a transition zone between open and closed mesoscale cellular 149 convection [Rosenfeld et al., 2011], aerosol concentrations being lower in the open celled 150 regions [Woods et al., 2011]. Although the details of these processes are unlikely to be 151 represented explicitly in global models, the localised strong decrease in cloud fraction in 152 the northeastern Pacific ocean would be consistent with a change in cloud regime driven 153 by decreased aerosol. Other regions show increases in cloud fraction, which cannot readily 154 be explained as a direct response to the decrease in sulphate load. It is likely that instead 155 these reflect non-local adjustments of the coupled ocean-atmosphere system in response 156 to the change in forcing.¶ 157 Figure 3 also shows the difference in surface shortwave flux (panel d), surface air tem- 158 perature (panel e), and global energy balance (panel f). The predicted increase in surface 159 downward shortwave radiation is seen in the global mean and particularly in the regions 160 of decreased cloud fraction and sulphate load. A negative anomaly in surface SW is co- 161 located with the positive cloud fraction changes. The pattern of surface air temperature 162 change shows large warming over the northern continents and the Arctic, and also a local 163 maximum over the subtropical northeastern Pacific coincident with the region of reduced 164 cloud fraction. The same localised pattern appears in all the simulations of Kloster et al. 165 [2010] that include aerosol reductions, but is absent from their simulations considering 166 only future changes in greenhouse gases.¶ 167 The surface energy budget shows the expected increases in downward shortwave radia- 168 tion. In addition there is an increase in downward longwave radiation in response to the 169 increase in GHG concentrations between the two periods, and also reflecting changes in 170 clouds. The warming due to increases in net surface downward radiation is balanced by 171 increases in latent and (over land) sensible heat fluxes.¶ 4. Discussion and Conclusions¶ 172 In this study we have compared projections of near term climate in the HadGEM2-ES 173 model under RCP4.5 and RCP2.6. GHG forcing under these scenarios is almost identical 174 until 2020, and then declines in RCP2.6 relative to RCP4.5. However, between 2018 and 175 2037 global annual mean surface air temperature is warmer under RCP2.6. The start of 176 this period **is characterised by a period of particularly rapid warming**.¶ 177 Our results provide compelling evidence that the warming in RCP2.6 is a result of a 178 rapid decrease in sulphate aerosol load. This decrease is caused by a decrease in sulphur 179 emissions in RCP2.6, **as a result of the rapid decrease in coal use** needed to reduce GHG 180 emissions. Thus our results highlight the difficulty of reducing the rate of global warming 181 in the near term in this model, even under extreme scenarios for reducing GHG emissions, 182 and is consistent with previous simulations by Wigley [1991] and Johns et al. [2011].

#### That would double warming and quickly take us above the “2-degree threshold.”

Dr Andrew Glikson, 6/6/2011. Earth and paleoclimate science, Australian National University. “Global warming above 2° so far mitigated by accidental geo-engineering,” Crikey, http://www.crikey.com.au/2011/06/06/global-warming-above-2%C2%B0-so-far-mitigated-by-accidental-geo-engineering/.

According to NASA’s Goddard Institute of Space Science climate reports, global warming is already committed to a rise above two degrees. The magical two degrees ceiling determined by governments **is only holding thanks to effective, if unintended, geo-engineering by sulphur dioxide** emitted from industry, holding global warming to about half of what it would be otherwise. Recent publications by Hansen and his [research](http://www.columbia.edu/%7Ejeh1/mailings/2011/20110415_EnergyImbalancePaper.pdf) [group](http://arxiv.org/ftp/arxiv/papers/1105/1105.0968.pdf) indicate the rise of atmospheric energy (heat) level due to greenhouse gases and land clearing are committed to +2.3 degrees (+3.1 Watt/m2), currently mitigated by the transient effect of sulphur aerosols and the cooling effect of the oceans. Sulphur dioxide is emanated from coal, oil and the processing of minerals (breakdown of sulphides to produce copper, zinc, lead and so on), and from other chemical industries. It combines with water in the atmosphere to produce sulphuric acid, which (being heavier than air) condenses and settles to the ground within a few years. Aerosols stay in the atmosphere and stratosphere on time scales ranging from hours to days and to years, depending on their grain size, chemistry and height in the atmosphere and on the physical state and temperature of the atmosphere at different altitudes and latitudes. The aerosols are short-lived, i.e. on time scales of up to a few years, but since they are continuously emitted from industry the overall level is increasing as burning of fossil fuels is rising. The continuing emission of sulphur aerosols in effect constitute a global geo-engineering process without which the atmosphere would warm by another 1.2 degrees (1.6 Watt/m2) above the present level, **resulting in near-doubling of global warming** ([Figure 1](http://www.columbia.edu/%7Ejeh1/mailings/2011/20110415_EnergyImbalancePaper.pdf)).

#### 1. Slowing now due to natural forcings—no risk of runaway warming

Klimenko 11 [VV, Research Assistant at the [Department of Theoretical Astrophysics](http://www.ioffe.ru/astro/) of the [Ioffe Physico-Technical Institute](http://www.ioffe.ru/), “Why Is Global Warming Slowing Down?,” 5-20, Doklady Earth Sciences, 2011, Vol. 440, Part 2, pp. 1419–1422]

The first decade of the present century has ended with a remarkable climatic event: for the first time over the past 65 years, the five year average global temperature over 2006–2010 turned out to be lower than the value for the previous five year interval (2001–2005). In addition, the absolute maximum temperature, which was attained as long ago as in 1998, has not been surpassed for thirteen years. Both these facts seem ingly support the arguments of the opponents of global warming theory, at least those who regard the anthro pogenic origin of warming questionable or even farfetched. Indeed, the anthropogenic emission of carbon dioxide, which is the major greenhouse atmospheric component, has risen by 60% from 5.2 giga tons to 8.5 gigatons of carbon, and its concentration has increased from 339 to 390 ppmv (parts per million by volume). How then do we explain the apparent slowdown in the rate of global warming?

Evidently, the observed global rise in temperature (Fig. 1) is a response of the climatic system to the combined action of both anthropogenic and natural impacts. Some of the latter are precisely the factors responsible for the current climatic paradox. Further, we will attempt to identify these factors and, based on their analysis, forecast the global climatic trends for the next decades.

Figure 2 presents the wavelet spectra yielded by continuously analyzing the time series of global tem perature over 1850–2011 [1]. Here, we analyze only one of three existing global temperature datasets which are continuously updated, namely the HadCRUT3 temperature series provided by the Uni versity of East Anglia (accessible at http://www.cru. uea.ac.uk/cru/data/temperature/), because this is, as of now, the only dataset covering more than a 150-year interval, which is crucial for our study. We note that it only recently became possible to analyze such long time series and, thus, identification of multidecade rhythms became a solvable task. The temperature data were preliminarily rid of the longterm anthropogenic trend associated with the accumulation of greenhouse gases and aerosols in the atmosphere; this trend was calculated from the energybalance climate model developed at the Moscow Power Engineering Institute (MPEI) [2]. The resulting temperature series, free of anthropogenic trends, will contain important infor mation on the influence of natural factors. Figure 2 shows that, throughout the entire interval of instrumental observations since the mid nineteenth century, the data contain rather stable 70 year and 20 year cyclic components. A less significant 9year cycle was present in most observations (during 1870– 1900 and 1940–2000), and a 6year cycle persisted over a considerable part of the entire time span. Closely consistent results were also obtained when analyzing the temperature series by the maximum entropy method (MEM) (Fig. 3). As the order of the auroregression (AR) method is known to significantly affect the result, in our case this parameter was chosen to be onethird the length of the studied data series: according to the long experience in application of MEM in climate research, this value is suitable for providing useful information. All the harmonic com ponents identified above are statistically significant with a confidence level of 90%.

Supposedly, the source of the dominant 70year cycle is the North Atlantic, where this harmonic is reliably identified not only in the ocean [3–5] but also on the continental margins: in Greenland [6], England [7], Finland [8], at the Novaya Zemlya Archipelago, and on the Yamal Peninsula [9]. Moreover, this periodical component is not only recognized in the instrumental data but it is also revealed in the time series of paleotemperature and pressure which date back to over hundreds and even thousands of years ago. We believe that this rhythm is associated with the quasiperiodical changes in the atmospheric and oceanic circulation known as the North Atlantic Oscillation (NAO) and with the related pulsations in the advection of warm waters to the basins of the Nor wegian and Barents seas. Indeed, the time series of the NAO index contain an approximately 60to 70year component [10] and show a strong positive correlation with the time series of temperature in the Northern hemisphere [11]. The positive phases of NAO indices are character ized by a more intense westerly air mass transport and a noticeable warming of the major part of the nontrop ical zone in the northern hemisphere, which is most prominent in the winter–spring season. Incidentally, the most rapid phase of the presentday warming (1975–2005) just featured such seasonal asymmetry, which is more evidence in favor of the hemispherical and global temperatures being related to NAO. Finally, it turns out that the 70year periodicity is present in the globally averaged temperature and in the temperature averaged over the northern hemisphere, whereas in the spectrum for the southern hemisphere, this harmonic component is rather weak (Fig. 3). This is an important additional argument in favor of the North Atlantic origin of the 70year cycle.

The existence of the quasibidecadal oscillations is often attributed to the influence of the Sun. However, the situation is not so simple: in our case, this cycle is almost not recognizable in the northern hemisphere, although clearly pronounced in the southern hemisphere (Fig. 3). This fact motivates one not to con strain the probable origin of this periodicity to the behavior of the Sun, but also to search for its possible correlations to the variability in the Southern Oscillation (SO) whose index has a peak at a period of 22 years [12, 13]. The latter hypothesis is supported by the fact that the temperature series over the equatorial and southern portions of the Pacific as well as those over the entire water area of the Indian Ocean contain a distinctly expressed quasibidecadal oscillation [3]. In turn, the SO, which largely controls the tempera ture regime of the southern hemisphere, is undoubt edly affected by the variations in the rate of the Earth’s rotation, which also have a significant periodical com ponent at 22 years [14].

As of now, the nature of the 9year oscillations is least clear. We suppose it to be a result of superimposi tion of oscillations associated with the lunar–solar tides that have characteristic times of 8.85 (the perigee period of the Moon) and 9.86 years (the period of barycenter of the Sun–Jupiter system), which are cer tainly able to cause significant changes to the atmo spheric circulation and, therefore, temperature. The comparison of the instrumental data series since 1850 with the results of calculations using the energy balance model with superimposed main cyclic components is presented in Fig. 1. The calculated curve in the interval 1850–2011 accounts for more than 75% of the observed variability in the data and clearly demonstrates that the natural factors may considerably enhance or, quite the opposite, reduce the ongoing warming up to its complete disappearing or even shortterm cooling, as has occurred during the last 6–8 years. We suppose warming will resume shortly in the years to come (Fig. 1). However, up to the end of the century, its rate will likely be lower than the value attained in 1975–2005 when the extremely intense positive phases of NAO and SO concurrent with the highest solar irradiation over the last 600 years [15] resulted in a rate of warming as high as in excess of 0.2°C per decade. In the next few decades, the natural forcings will restrain the process of global warming. This will be primarily associated with the decline in solar activity and the transition to the negative phase in NAO, which features a weaker westerly air mass transport. Recent measurements show that both these processes are gaining strength. Indeed, the NAO index has consistently decreased since early 1990 and is now at a 40year low (http://www.cgd. ucar.edu/cas/jhurrell/indices.html). At the same time, the minimal solar constant over the entire 33year history of satellite observations has been recorded in the current, solar cycle 24, which started in the fall of 2008 (http://www.pmodwrc.ch/pmod.php?topic=tsi/ composite/SolarConstant/).

#### 2. Negative feedbacks solve

Singer et al. 11 [S Fred, PhD, a distinguished atmospheric physicist and first director of the U.S. Weather Satellite Service, Craig Idso, editor of the online magazine CO2 Science and author of several books and scholarly articles on the effects of carbon dioxide on plant and animal life, Robert M Carter, marine geologist and research professor at James Cook University in Queensland, Australia Climate Change Reconsidered: 2011 Interim Report]

In the 2009 NIPCC report, Idso and Singer (2009) discussed the plausibility of a multistage negative feedback process whereby warming-induced increases in the emission of dimethyl sulfide (DMS) from the world‘s oceans tend to counteract any initial impetus for warming. The basic tenet of this hypothesis is that the global radiation balance is significantly influenced by the albedo of marine stratus clouds (the greater the cloud albedo, the less the input of solar radiation to the Earth‘s surface). The albedo of these clouds, in turn, is known to be a function of cloud droplet concentration (the more and smaller the cloud droplets, the greater the cloud albedo and the reflection of solar radiation), which is dependent upon the availability of cloud condensation nuclei on which the droplets form (the more cloud condensation nuclei, the more and smaller the cloud droplets). And in completing the negative feedback loop, the cloud condensation nuclei concentration often depends upon the flux of biologically produced DMS from the world‘s oceans (the higher the sea surface temperature, the greater the sea-to-air flux of DMS).

Since the publication of the 2009 NIPCC report, additional empirical evidence has been found to support the several tenets of the DMS feedback process. Qu and Gabric (2010), for example, introduce their contribution to the subject by stating, ―dimethylsulfide (DMS) is the main volatile sulfur [species] released during the formation and decay of microbial ocean biota and ―aerosols formed from the atmospheric conversion of DMS to sulfate and methanesulfonic acid can exert a climate cooling effect directly by scattering and absorbing solar radiation and indirectly by promoting the formation of cloud condensation nuclei and increasing the albedo of clouds, thus reflecting more solar radiation back into space.

Working with climate and DMS production data from the region of the Barents Sea (70–80°N, 30– 35°E) obtained over the period 1998 to 2002, Qu and Gabric employed a genetic algorithm to calibrate chlorophyll-a measurements (obtained from SeaWiFS satellite data) for use in a regional DMS production model. Then, using GCM temperature outputs for the periods 1960–1970 (pre-industry CO2 level) and 2078–2086 (triple the pre-industry CO2 level), they calculated the warming-induced enhancement of the DMS flux from the Barents Sea region. The two researchers report, ―significantly decreasing ice coverage, increasing sea surface temperature and decreasing mixed-layer depth could lead to annual DMS flux increases of more than 100% by the time of equivalent CO2 tripling (the year 2080). In commenting on their findings, they state, ―such a large change would have a great impact on the Arctic energy budget and may offset the effects of anthropogenic warming that are amplified at polar latitudes. What is more, they write, ―many of these physical changes will also promote similar perturbations for other biogenic species (Leck et al., 2004), some of which are now thought to be equally influential to the aerosol climate of the Arctic Ocean. Thus it can be appreciated that DMS production in a warming world—especially when augmented by analogous biogenic phenomena—may provide a large moderating influence on the primary impetus for warming that is produced by mankind‘s emissions of CO2 and other greenhouse gases.

Kim et al. (2010) write that DMS ―represents 95% of the natural marine flux of sulfur gases to the atmosphere (Bates et al., 1992; Liss et al., 1997), and they say it ―may be oxidized to form non sea-salt sulfate aerosols, which are known to act as cloud condensation nuclei and thereby exert a cooling effect by absorbing or scattering solar radiation. They cite Charlson et al. (1987), who first described the intriguing and important chain of events. They also note ―DMS is generated by intracellular or extracellular enzymatic cleavage of DMSP [dimethylsulfoniopropionate] by DMSP-lyase, which is synthesized by algae and bacteria, following DMSP secretion from producer cells or release following autolysis or viral attack, while noting that ―grazing activity can also result in DMSP conversion to DMS if DMSP and DMSP-lyase are physically mixed following grazing, citing Stefels et al., 2007, and Wolfe and Steinke, 1996.

Working in the coastal waters of Korea from 21 November to 11 December 2008, the 14 Korean scientists utilized 2,400-liter mesocosm enclosures to simulate, in triplicate, three sets of environmental conditions—an ambient control (~400 ppm CO2 and ambient temperature), an acidification treatment (~900 ppm CO2 and ambient temperature), and a greenhouse treatment (~900 ppm CO2 and ~3°C warmer-than-ambient temperature)—and within these mesocosms they initiated phytoplankton blooms by adding equal quantities of nutrients to each mesocosm on day 0. For 20 days thereafter they measured numerous pertinent parameters within each mesocosm. This work revealed, as they describe it, that ―total accumulated DMS concentrations (integrated over the experimental period) in the acidification and greenhouse mesocosms were approximately 80% and 60% higher than the values measured in the control mesocosms, respectively, which they attribute to the fact that, in their experiment, ―autotrophic nanoflagellates (which are known to be significant DMSP producers) showed increased growth in response to elevated CO2 and ―grazing rates [of microzooplankton] were significantly higher in the treatment mesocosms than in the control mesocosms. In the concluding paragraph of their paper, they write, ―the key implication of our results is that DMS production resulting from CO2-induced grazing activity may increase under future high CO2 conditions, concluding that ―DMS production in the ocean may act to counter the effects of global warming in the future.

#### 3. No risk of extinction.

Lomborg 8—Director of the Copenhagen Consensus Center and adjunct professor at the Copenhagen Business School [Bjorn, “Warming warnings get overheated,” The Guardian, August 15, 2008, http://www.guardian.co.uk/commentisfree/2008/aug/15/carbonemissions.climatechange]

These alarmist predictions are becoming quite bizarre, and could be dismissed as sociological oddities, if it weren't for the fact that they get such big play in the media. Oliver Tickell, for instance, writes that a global warming causing a 4C temperature increase by the end of the century would be a "catastrophe" and the beginning of the "extinction" of the human race. This is simply silly. His evidence? That 4C would mean that all the ice on the planet would melt, bringing the long-term sea level rise to 70-80m, flooding everything we hold dear, seeing billions of people die. Clearly, Tickell has maxed out the campaigners' scare potential (because there is no more ice to melt, this is the scariest he could ever conjure). But he is wrong. Let us just remember that the UN climate panel, the IPCC, expects a temperature rise by the end of the century between 1.8 and 6.0C. Within this range, the IPCC predicts that, by the end of the century, sea levels will rise 18-59 centimetres – Tickell is simply exaggerating by a factor of up to 400. Tickell will undoubtedly claim that he was talking about what could happen many, many millennia from now. But this is disingenuous. First, the 4C temperature rise is predicted on a century scale – this is what we talk about and can plan for. Second, although sea-level rise will continue for many centuries to come, the models unanimously show that Greenland's ice shelf will be reduced, but Antarctic ice will increase even more (because of increased precipitation in Antarctica) for the next three centuries. What will happen beyond that clearly depends much more on emissions in future centuries. Given that CO2 stays in the atmosphere about a century, what happens with the temperature, say, six centuries from now mainly depends on emissions five centuries from now (where it seems unlikely non-carbon emitting technology such as solar panels will not have become economically competitive). Third, Tickell tells us how the 80m sea-level rise would wipe out all the world's coastal infrastructure and much of the world's farmland – "undoubtedly" causing billions to die. But to cause billions to die, it would require the surge to occur within a single human lifespan. This sort of scare tactic is insidiously wrong and misleading, mimicking a firebrand preacher who claims the earth is coming to an end and we need to repent. While it is probably true that the sun will burn up the earth in 4-5bn years' time, it does give a slightly different perspective on the need for immediate repenting. Tickell's claim that 4C will be the beginning of our extinction is again many times beyond wrong and misleading, and, of course, made with no data to back it up. Let us just take a look at the realistic impact of such a 4C temperature rise. For the Copenhagen Consensus, one of the lead economists of the IPCC, Professor Gary Yohe, did a survey of all the problems and all the benefits accruing from a temperature rise over this century of about approximately 4C. And yes, there will, of course, also be benefits: as temperatures rise, more people will die from heat, but fewer from cold; agricultural yields will decline in the tropics, but increase in the temperate zones, etc. The model evaluates the impacts on agriculture, forestry, energy, water, unmanaged ecosystems, coastal zones, heat and cold deaths and disease. The bottom line is that benefits from global warming right now outweigh the costs (the benefit is about 0.25% of global GDP). Global warming will continue to be a net benefit until about 2070, when the damages will begin to outweigh the benefits, reaching a total damage cost equivalent to about 3.5% of GDP by 2300. This is simply not the end of humanity. If anything, global warming is a net benefit now; and even in three centuries, it will not be a challenge to our civilisation. Further, the IPCC expects the average person on earth to be 1,700% richer by the end of this century.

### AT: adv 2

#### Prolif dramatically decreases the risk of full-scale war. Robust empirical evidence proves.

Asal and Beardsley 7 (Victor, Assistant Prof. Pol. Sci.—SUNY Albany, and Kyle, Assistant Prof. Pol. Sci.—Emory U., Journal of Peace Research, “Proliferation and International Crisis Behavior,” 44:2, Sage)

As Model 1 in Table IV illustrates, all of our variables are statistically significant except for the protracted conflict variable. Our primary independent variable, the number of nuclear actors involved in the crisis, has a negative relationship with the severity of violence and is significant. This lends preliminary support to the argument that **nuclear weapons have a restraining affect on crisis behavior**, as stated in H1. It should be noted that, of the crises that involved four nuclear actors—Suez Nationalization War (1956), Berlin Wall (1961), October Yom Kippur War (1973), and Iraq No-Fly Zone (1992)—and five nuclear actors—Gulf War (1990)—only two are not full-scale wars. While this demonstrates that the pacifying effect of more nuclear actors is not strong enough to prevent war in all situations, it does not necessarily weaken the argument that there is actually a pacifying effect. The positive and statistically significant coefficient on the variable that counts the number of crisis actors has a magnitude greater than that on the variable that counts the number of nuclear actors. Since increases in the number of overall actors in a crisis are strongly associated with higher levels of violence, it should be no surprise that many of the conflicts with many nuclear actors—by extension, many general actors as well—experienced war. Therefore, the results can only suggest that, keeping the number of crisis actors fixed, increasing the proportion of nuclear actors has a pacifying effect. They do not suggest that adding nuclear actors to a crisis will decrease the risk of high levels violence; but rather, adding more actors of any type to a crisis can have a destabilizing effect. Also in Table IV, Model 2 demonstrates that the effect of a nuclear dyad is only approaching statistical significance, but does have a sign that indicates higher levels of violence are less likely in crises with opponents that have nuclear weapons than other crises. This lukewarm result suggests that it might not be necessary for nuclear actors to face each other in order to get the effect of decreased propensity for violence. **All actors should tend to be more cautious in escalation when there is a nuclear opponent, regardless of their own capabilities**. While this might weaken support for focusing on specifically a ‘balance of terror’ as a source of stability (see Gaddis, 1986; Waltz, 1990; Sagan & Waltz, 2003; Mearsheimer, 1990), **it supports the logic in this article that nuclear weapons can serve as a deterrent of aggression from both nuclear and non-nuclear opponents**.6 Model 3 transforms the violence variable to a binary indicator of war and demonstrates that the principal relationship between the number of nuclear actors and violence holds for the most crucial outcome of full-scale war. Model 4 demonstrates that accounting for the presence of new nuclear actors does not greatly change the results. The coefficient on the new nuclear actor variable is statistically insignificant, which lends credence to the optimists’ view that new nuclear-weapon states should not be presupposed to behave less responsibly than the USA, USSR, UK, France, and China did during the Cold War. Finally, Model 5 similarly illustrates that crises involving superpowers are not more or less prone to violence than others. Superpower activity appears to not be driving the observed relationships between the number of nuclear-crisis actors and restraint toward violence. It is important to establish more specifically what the change in the probability of full-scale war is when nuclear actors are involved. Table V presents the probability of different levels of violence as the number of nuclear actors increases in the Clarify simulations. The control variables are held at their modes or means, with the exception of the variable that counts the number of crisis actors. Because it would be impossible to have, say, five nuclear-crisis actors and only two crisis actors, the number of crisis actors is held constant at five. As we can see, the impact of an increase in the number of nuclear actors is substantial. Starting from a crisis situation without any nuclear actors, including one nuclear actor (out of five) reduces the likelihood of fullscale war by nine percentage points. As we continue to add nuclear actors, the likelihood of full-scale war declines sharply, so that the probability of a war with the maximum number of nuclear actors is about three times less than the probability with no nuclear actors. In addition, the probabilities of no violence and only minor clashes increase substantially as the number of nuclear actors increases. The probability of serious clashes is relatively constant. **Overall, the analysis lends significant support to the more optimistic proliferation argument related to the expectation of violent conflict when nuclear actors are involved**. While the presence of nuclear powers does not prevent war, it significantly reduces the probability of full-scale war, with more reduction as the number of nuclear powers involved in the conflict increases. As mentioned, concerns about selection effects in deterrence models, as raised by Fearon (2002), should be taken seriously. While we control for the strategic selection of serious threats within crises, we are unable to control for the non-random initial initiation of a crisis in which the actors may choose to enter a crisis based on some ex ante assessment of the outcomes. To account for possible selection bias caused by the use of a truncated sample that does not include any non-crisis cases, one would need to use another dataset in which the crisis cases are a subset and then run Heckman type selection models (see Lemke & Reed, 2001). It would, however, be difficult to think of a different unit of analysis that might be employed, such that the set of crises is a subset of a larger category of interaction. While dyadyear datasets have often been employed to similar ends, the key independent variable here, which is specific to crises as the unit of analysis, does not lend itself to a dyadic setup. Moreover, selection bias concerns are likely not valid in disputing the claims of this analysis. If selection bias were present, it would tend to bias the effect of nuclear weapons downward, because the set of observed crises with nuclear actors likely has a disproportionate share of resolved actors that have chosen to take their chances against a nuclear opponent. Despite this potential mitigating bias, the results are statistically significant, which strengthens the case for the explanations provided in this study.

#### Deterrence failure is very unlikely. Proliferation saves far more lives than it costs.

Preston 7 (Thomas, Associate Prof. IR—Washington State U. and Faculty Research Associate—Moynihan Institute of Global Affairs, “From Lambs to Lions: Future Security relationships in a World of Biological and Nuclear Weapons”, p. 31-32)

1.) The Cost of Deterrence Failure Is Too Great Advocates of deterrence seldom take the position that it will always work or that it cannot fail. Rather, they take the position that if one can achieve the requisite elements required to achieve a stable deterrent relationship between parties, **it vastly decreases the chances of miscalculation and resorting to war—even in contexts where it might otherwise be expected to occur** (George and Smoke 1974; Harvey 1997a; Powell 1990, 2003; Goldstein 2000). Unfortunately, critics of deterrence take the understandable, if unrealistic, position that if deterrence cannot be 100 percent effective under all circumstances, then it is an unsound strategic approach for states to rely upon, especially considering the immense destructiveness of nuclear weapons. Feaver (1993, 162), for example, criticizes reliance on nuclear deterrence because it can fail and that rational deterrence theory can only predict that peace should occur most of the time (e.g., Lebow and Stein 1989). Yet, were we to apply this standard of perfection to most other policy approaches concerning security matters — whether it be arms control or proliferation regime efforts, military procurement policies, alliance formation strategies, diplomacy, or sanctions —none could be argued with any more certainty to completely remove the threat of equally devastating wars either. Indeed, one could easily make the argument that **these alternative means have shown themselves historically to be far less effective than nuclear arms in preventing wars**. Certainly, the twentieth century was replete with examples of devastating conventional conflicts which were not deterred through nonnuclear measures. Although the potential costs of a nuclear exchange between small states would indeed cause a frightful loss of life, it would be no more costly (and likely far less so) than large-scale conventional conflicts have been for combatants. Moreover, if nuclear deterrence raises the potential costs of war high enough for policy makers to want to avoid (rather than risk) conflict, it is just as legitimate (if not more so) for optimists to argue in **favor of nuclear deterrence in terms of the lives saved through the avoidance of far more likely recourses to conventional wars**, as it is for pessimists to warn of the potential costs of deterrence failure. And, while some accounts describing the "immense weaknesses" of deterrence theory (Lebow and Stein 1989, 1990) would lead one to believe deterrence was almost impossible to either obtain or maintain, since 1945 there has not been one single historical instance of nuclear deterrence failure (especially when this notion is limited to threats to key central state interests like survival, and not to minor probing of peripheral interests). Moreover, the actual costs of twentieth-century conventional conflicts have been staggeringly immense, especially when compared to the actual costs of nuclear conflicts (for example, 210,000 fatalities in the combined 1945 Hiroshima and Nagasaki atomic bombings compared to 62 million killed overall during World War II, over three million dead in both the Korean and Vietnam conflicts, etc.) (McKinzie et al. 2001, 28).3 Further, as Gray (1999, 158-59) observes, "it is improbable that policymakers anywhere need to be educated as to the extraordinary qualities and quantities of nuclear armaments." Indeed, the high costs and uncontestable, immense levels of destruction that would be caused by nuclear weapons have been shown historically to be facts that have not only been readily apparent and salient to a wide range of policy makers, but ones that **have clearly been demonstrated to moderate extreme policy or risk-taking behavior** (Blight 1992; Preston 2001) Could it go wrong? Of course. There is always that potential with human beings in the loop. Nevertheless, it has also been shown to be effective at moderating policy maker behavior and introducing an element of constraint into situations that otherwise would likely have resulted in war (Hagerty 1998).

#### Uncertainty makes costs of war too high—nuclear weapons deter all military aggression

Karl 96 (David, PhD in International Relations from USC, *International Security*, “Proliferation Pessimism and Emerging Nuclear Powers,” Vol. 21, No. 3, Winter, p. 95-96)

Optimists have relaxed views of the preventive-war dangers entailed in situations in which a nuclear power confronts a nuclearizing rival. The practical difficulties of ensuring a disarming strike to preclude any possibility of nuclear retaliation make preventive actions a military gamble that states are very unlikely to take. As Waltz explains, "prevention and pre-emption are difficult games because the costs are so high if the games are not perfectly played. . . . Ultimately, the inhibitions [against such attacks] lie in the impossibility of knowing for sure that a disarming strike will totally destroy an opposing force and in the immense destruction even a few warheads can wreak." 25 To optimists, states will have to learn to live with a rival's emerging nuclear armory. Because strategic uncertainty is seen as having a powerful dissuasive effect, optimists usually view the very increase in the numbers of nuclear-armed states as an additional element of stability. Dagobert Brito and Michael Intriligator, for instance, argue that uncertainty over the reaction of other nuclear powers will make all hesitant to strike individually. 26 As an example, they point to the restraint the superpowers exercised on each other in the 1960s, when first the United States and then the Soviet Union contemplated military action against China's nascent nuclear weapon sites. The net effect of the uncertain reaction of others is that "the probability of deliberate nuclear attack falls to near zero with three, four, or more nuclear nations." 27 Similarly, Waltz reasons that even in cases of asymmetric proliferation within conflict dyads, nuclear weapons will prove "poor instruments for blackmail" because a "country that takes the nuclear offensive has to fear an appropriately punishing strike by someone. Far from lowering the expected cost of aggression, a nuclear offense even against a non-nuclear state raises the possible costs of aggression to incalculable heights because the aggressor cannot be sure of the reaction of other nuclear powers."28

#### New proliferators will build small arsenals which are uniquely stable.

Seng 98 (Jordan, PhD Candidate in Pol. Sci.—U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES,” p. 203-206)

However, this "state of affairs" is not as dangerous as it might seem. The nuclear arsenals of limited nuclear proliferators will be small and, consequently, the command and control organizations that manage chose arsenals will be small as well. The small arsenals of limited nuclear proliferators will mitigate against many of the dangers of the highly delegative, 'non-centralized' launch procedures Third World states are likely to use. This will happen in two main ways. First, only a small number of people need be involved in Third World command and control. The superpowers had tens of thousands of nuclear warheads and thousands of nuclear weapons personnel in a variety of deployments organized around numerous nuclear delivery platforms. A state that has, say, fifty nuclear weapons needs at most fifty launch operators and only a handful of group commanders. This has both quantitative and qualitative repercussions. Quantitatively, the very small number of people 'in the loop' greatly diminishes the statistical probability that accidents or human error will result in inappropriate nuclear launches. All else being equal, the chances of finding some guard asleep at some post increases with the number of guards and posts one has to cover. Qualitatively, small numbers makes it possible to centrally train operators, to screen and choose them with exceeding care, 7 and to keep each of them in direct contact with central authorities in times of crises. With very small control communities, there is no need for intermediary commanders. Important information and instructions can get out quickly and directly. Quality control of launch operators and operations is easier. In some part, at least, Third World states can compensate for their lack of sophisticated use-control technology with a more controlled selection of, and more extensive communication with, human operators. Secondly, and relatedly, Third World proliferators will not need to rely on cumbersome standard operating procedures to manage and launch their nuclear weapons. This is because the number of weapons will be so small, and also because the arsenals will be very simple in composition. Third World stares simply will not have that many weapons to keep track of. Third World states will not have the great variety of delivery platforms that the superpowers had (various ballistic missiles, cruise missiles, long range bombers, fighter bombers, missile submarines, nuclear armed ships, nuclear mortars, etc., etc.), or the great number and variety of basing options, and they will not employ the complicated strategies of international basing that the superpowers used. The small and simple arsenals of Third World proliferators will not require highly complex systems to coordinate nuclear activities. This creates two specific organizational advantages. One, small organizations, even if they do rely to some extent of standard operating procedures, can be flexible in times of crisis. As we have discussed, the essential problem of standard operating procedures in nuclear launch processes is that the full range if possible strategic developments cannot be predicted and specified before the fact, and thus responses to them cannot be standardized fully. An unexpected event can lead to 'mismatched' and inappropriate organizational reactions. In complex and extensive command and control organizations, standard operating procedures coordinate great numbers of people at numerous levels of command structure in a great multiplicity of places. If an unexpected event triggers operating procedures leading to what would be an inappropriate nuclear launch, it would be very difficult for central commanders to “get the word out' to everyone involved. The coordination needed to stop launch activity would be at least as complicated as the coordination needed to initiate it, and, depending on the speed of launch processes, there may be less time to accomplish it. However, the small numbers of people involved in nuclear launches and the simplicity of arsenals will make it far easier for Third World leaders to 'get the word out' and reverse launch procedures if necessary. Again, so few will be the numbers of weapons that all launch operators could be contacted directly by central leaders. The programmed triggers of standard operating procedures can be passed over in favor of unscripted, flexible responses based on a limited number of human-to-human communications and confirmations. Two, the smallness and simplicity of Third World command and control organizations will make it easier for leaders to keep track of everything that is going on at any given moment. One of the great dangers of complex organizational procedures is that once one organizational event is triggered—once an alarm is sounded and a programmed response is made—other branches of the organization are likely to be affected as well. This is what Charles Perrow refers to as interactive complexity, 8 and it has been a mainstay in organizational critiques of nuclear command and control s ystems.9 The more complex the organization is, the more likely these secondary effects are, and the less likely they are to be foreseen, noticed, and well-managed. So, for instance, an American commander that gives the order to scramble nuclear bombers over the U.S. as a defensive measure may find that he has unwittingly given the order to scramble bombers in Europe as well. A recall order to the American bombers may overlook the European theater, and nuclear misuse could result. However, when numbers of nuclear weapons can be measured in the dozens rather than the hundreds or thousands, and when deployment of those weapons does not involve multiple theaters and forward based delivery vehicles of numerous types, tight coupling is unlikely to cause unforeseen and unnoticeable organizational events. Other things being equal, it is just a lot easier to know all of what is going on. In short, while Third World states may nor have the electronic use-control devices that help ensure that peripheral commanders do nor 'get out of control,' they have other advantages that make the challenge of centralized control easier than it was for the superpowers. The small numbers of personnel and organizational simplicity of launch bureaucracies means that even if a few more people have their fingers on the button than in the case of the superpowers, there will be less of a chance that weapons will be launched without a definite, informed and unambiguous decision to press that button.

### 1NC Solvency

#### 1. Nuclear will remain uncompetitive for decades—our evidence cites industry leaders.

Hiltzik 11—Michael Hiltzik is a Pulitzer Prize-winning journalist and author who has covered business, technology, and public policy for the Los Angeles Times for twenty years, master of science degree in journalism from the Graduate School of Journalism at Columbia University [March 23, 2011, “A nuclear renaissance in U.S. was unlikely even before Japan disaster,” *LA Times*, http://articles.latimes.com/2011/mar/23/business/la-fi-hiltzik-20110323]

To all those who may be concerned that the catastrophic events at Japan's Fukushima Daiichi nuclear plant will derail the heralded renaissance of nuclear power in the U.S., you can relax.

The reason is simple: There is no renaissance.

Not even Exelon Corp., the nation's biggest nuclear generation company, has been holding its breath for a surge in orders or appreciable increase in new generating capacity.

The reason has little to do with an unreasoning public's fear of nuclear meltdowns and radiation poisoning, and almost everything to do with pure economics. As John Rowe, Exelon's chairman and chief executive, told an audience at a Washington think tank two weeks ago, you can build a new natural gas plant for 40% less than a new nuclear plant, and the price of its fuel is at rock bottom.

"Natural gas is queen," he says. (To be fair, Exelon also makes a lot of money from gas.)

In recent years, nuclear energy has been promoted as a "green," or at least greenish, alternative to coal power and other fossil-fueled generation. That's been a potent selling point as concern has mounted over the latter's effect on climate change by the production of greenhouse gases. Nuclear power is burdened by its own environmental issues, including the dangers of radioactive release into the atmosphere, but the production of carbon dioxide isn't among them.

Yet the technology's potential as a weapon against global warming has been as oversold, just as its virtues as safe, clean and "too cheap to meter" were during its infancy in the 1950s. To realistically make a dent in climate change, nuclear plant construction would have to take off at such a rate that it would "pose serious concerns" for the availability of construction materials, properly trained builders and operating technicians, and safety and security oversight, as a report by the Council on Foreign Relations observed in 2007.

"For at least a couple of decades to come, nuclear will be very uncompetitive," the report's author, Charles D. Ferguson, told me this week. Ferguson is president of the Federation of American Scientists.

The ongoing disaster in Japan will exacerbate social concerns about nuclear waste disposal — the on-site storage of spent fuel, which is common at U.S. plants, has complicated the situation at Fukushima — as well as concerns about the safety and security of existing plants. But those concerns have existed for years, so the spectacle of the Japanese grappling with the consequences, graphic as it is, may not in itself affect public attitudes.

Talk of nuclear renaissance in the U.S. had been spurred by two developments. One was the dramatic improvement in the operating record of U.S. plants. In recent years the domestic nuclear industry had been operating at close to 90% of capacity, compared with the lousy 65% record it turned in during the 1970s. The change was the product partially of the industry's consolidation into a small number of specialty operators with nuclear expertise, and it tended to reduce the apparent cost of nuclear power to levels competitive with other sources.

But that also means that "people who advocate nuclear power have rose-colored glasses about its economics," says John E. Parsons of the Massachusetts Institute of Technology, the co-author of a 2009 update to a 2003 MIT report on the future of nuclear power.

Further encouragement came from the streamlining of U.S. licensing rules. The new procedure consolidates what formerly were separate construction and operating permits into one, removing the uncertainty that a utility might build an entire facility only to be denied permission to run it.

But no new plant has yet been approved under the new system, so plenty of uncertainty still exists. "An investor has to ask, 'Am I looking at a technology that works only when all the cards fall my way?'" Parsons says.

Despite expressions of support for nuclear power coming from political leaders, including President Obama, who is offering loan guarantees for new reactors, nuclear energy can't develop in a policy vacuum. One of the dismal ironies of the American energy program is that many of the same politicians standing foursquare behind nuclear power are also sworn opponents of policies such as a carbon tax, which would make nukes more competitive by raising the price of fossil-based alternatives.

For example, here's Mitt Romney. In "No Apology," the book he published last year presumably as a manifesto for his 2012 presidential campaign, Romney says he doesn't understand why nuclear power is such a "boogeyman," because America's existing plants are "trouble-free." Romney contends that nuclear plants are economically unfeasible in the U.S. only because of our "interminable permitting, regulatory and legal delays."

Romney should listen more to fellow businessmen like Exelon's Rowe, who would tell him that the real reason is that gas generation is cheaper, thanks to pricing that ignores such external costs of gas as pollution and climate change. Yet in his book Romney condemns policies such as the carbon tax because it would "fatten government, harm employers and employees, and hurt consumers." You can't have it both ways, Mitt.

Romney defends the economics of nuclear power by observing that countries with major nuclear construction programs, such as China, seem to have solved the economic conundrum without much trouble. Yet even pro-nuclear experts here acknowledge that nuclear economics don't easily cross national borders. China, which has 13 operating nuclear plants and 30 under construction, has endowed its state-owned nuclear industry with heavy subsidies.

According to a report by the Federation of American Scientists, China's burgeoning demand for electrical power can't effectively be satisfied from its current main source, coal, which will face a depletion crisis around the end of this decade. That makes ramping up nuclear an urgent issue for China. But in the U.S., says Andrew Kadak, the former CEO of Yankee Atomic Power Co., a New England nuclear plant operator, "we don't have that urgency because natural gas is too cheap an alternative."

With the construction of plants still hampered by economics, nuclear utilities are devoting more attention to improving efficiencies and increasing the output of their existing plants, a process known as "uprating." But that amounts to treading water until the social and economic difficulties of nuclear power can be addressed. And they'll have to be addressed: "It's going to be very hard to reduce carbon dioxide if nuclear is out of the picture," MIT's Parsons says. But the first step is injecting realism into the discussion. Nuclear power may be necessary to our energy future, but it won't be our savior.

#### SMRs have greater economic barriers than conventional reactors.

Lyman 11—Edwin Lyman is Senior Global Security Scientist with the Union of Concerned Scientists (UCS). He specialises in nuclear proliferation, nuclear terrorism, and nuclear power safety. He has published many articles in journals and magazines and written many reports. Lyman was president of the Nuclear Control Institute. He has a Ph.D. in physics from Cornell University. [July 14, 2011, Testimony of Dr. Edwin Lyman Senior Scientist, Global Security Program Union of Concerned Scientists “An Examination of the Safety and Economics of Light Water Small Modular Reactors” Before the Energy and Water Development Subcommittee Committee on Appropriations, U.S. Senate, http://www.ucsusa.org/assets/documents/nuclear\_power/lyman-appropriations-subcom-7-14-11.pdf]

Some SMR vendors emphasize that their designs are “passively safe.” However, no credible reactor design is completely passive and can shut itself down and cool itself in every circumstance without need for intervention. Some reactor designs, large or small, have certain passive safety features that allow the reactor to depend less on operator action for a limited period of time following design-basis accidents. Small reactors may have an advantage because the lower the power of a reactor, the easier it is to cool through passive means such as natural convection cooling with water or even with air. However, accidents affecting multiple small units may cause complications that could outweigh the advantages of having lower heat removal requirements per unit. Moreover, passively safe reactors generally require some equipment, such as valves, that are designed to operate automatically but are not one hundred percent reliable.

Operators will always be needed to monitor systems to ensure they are functioning as designed, and to intervene if they fail to do so. Both passive systems and operator actions would require functioning instrumentation and control systems, which were unreliable during the severe accidents at Three Mile Island and Fukushima. Passive systems may not work as intended in the event of beyond-design-basis accidents, and as result passive designs should also be equipped with highly reliable active backup systems and associated instrumentation and control systems.

But more backup systems generally mean higher costs. This poses a particular problem for SMRs, which begin with a large economic disadvantage compared to large reactors.

According to the standard formula for economies of scale, the overnight capital cost per kilowatt of a 125 megawatt reactor would be roughly 2.5 times greater than that of a 1250 megawatt unit, all other factors being equal. Advocates argue that SMRs offer advantages that can offset this economic penalty, such as a better match of supply and demand, reduced up-front financing costs, reduced construction times, and an accelerated benefit from learning from the construction of multiple units. However, a 2007 paper by Westinghouse scientists and their collaborators that quantified the cost savings associated with some of these factors found that they could not overcome the size penalty: the paper found that at best, the capital cost of four 335 megawatt reactors was slightly greater than that of one 1340 megawatt reactor.1

## \*\*\* 2NC

### 1st Line—African Conflicts

#### 1. Their impact is terminally non-unique—the armed conflict in the Ivory Coast is spilling across borders and is escalating uncontrollably into all-out war

Elizabeth Dickinson is projects editor at Foreign Policy. She traveled to Liberia as part of a grant from the United Nations Foundation. 3/11/11 (“West Africa Lurches Toward War,” for *Foreign Policy* on March 11, 2011, Available Online at http://www.foreignpolicy.com/articles/2011/03/11/west\_africa\_lurches\_toward\_war?page=full)

Armed conflict from the Ivory Coast is spilling over its fluid western border with Liberia. And the result is the worst humanitarian crisis that West Africa has faced since 2003, when the wars ravishing Liberia, Sierra Leone, Guinea, and the Ivory Coast finally wound down.

What's unfolding now in West Africa are the warning signs of another all-out war. Off and on for almost two decades, from 1989 to 2004, rebels roamed the region, pillaging and attacking villages and displacing millions. In Sierra Leone, rebel armies routinely hacked off limbs and hands to deprive villagers of their economic potential -- their physical ability to farm. In Liberia, child soldiers, drugged and armed with old Kalashnikovs, terrorized the countryside. Tens of thousands of U.N. peacekeepers have worked for years to stitch the region back together.

The scene today, however, is darkly familiar. Elements of the old wars are surfacing again: Armed fighters are suddenly trying to cross the border from Ivory Coast into Liberia, Liberian ex-combatants are being lured to fight in the Ivory Coast, and almost half a million have been uprooted from their homes in both Liberia and the Ivory Coast, plunging the region into humanitarian crisis. Tension throughout the region is reaching a boiling point at a time when Liberia was already warily preparing for a national election. War is in the air.

The trigger came in November, when Ivory Coast's incumbent president, Laurent Gbagbo, refused to step down after losing an internationally certified election. Although international pressure has isolated Gbagbo diplomatically, he retains strong local support -- about 50 percent of the vote and the country's territory. He and his opponent, Alassane Ouattara, are each backed by loyal armed forces, which were supposed to have integrated after the war. But instead, Gbagbo's army has maintained control over the south while Ouattara's rebels, the Forces Nouvelles, have guarded the north. In early January, they started fighting one another again in Abobo, a suburb of the capital Abidjan, and in recent days all along the border with Liberia.

The result has been growing chaos on the Liberian side of the border, where the flow of refugees increased by 90 percent in February. In just the last two weeks, the number of people who have entered Liberia from the Ivory Coast has jumped from 30,000 to 100,000. In the Ivory Coast, at least 200,000 have fled their homes in Abidjan, bringing the total number of displaced in the country to around 370,000. In the country's interior, the United Nations has very limited access to them. Meanwhile, U.N. agencies in the Liberian capital of Monrovia say they have contingency plans for housing as many as 250,000 refugees.

But civilians aren't the only ones crossing the border. The U.N.'s top envoy in Liberia, Ellen Margaret Loj, confirmed that armed Ivorian fighters from both sides of the emerging conflict have recently attempted to enter the country. "Some [were] trying apparently to use Liberia as a transit to re-enter into Cote d'Ivoire, others to come in and see if there were any defected fighters among the refugees," she told me on March 9.

The U.N. mission in Liberia, UNMIL, has so far turned those combatants away -- at least at formal border crossings. But along an unmanned, largely forested border that stretches across four Liberian counties, neither the United Nations nor the local military and police can be everywhere. Many fear that Liberia's hard-earned disarmament over the past several years may be put into jeopardy, Loj said. "The worry both on my side but certainly even more so on the government side is that people will come in with weapons from Cote d'Ivoire."

In recent days, the number of men and boys among the refugee flows, which were originally dominated by women and children, has skyrocketed in what U.N. officials say is a sign of how intense the fighting has become. Sulaiman Momodu, the local spokesman for UNHCR, the U.N. relief agency, told me on March 9 that many of these young men left for fear of being conscripted into pro- or anti-Gbagbo forces. Others, Momodu said, had seen fighting directly or heard gunfire. For now, Ouattara's troops are controlling the Ivorian side of the border with Liberia, but refugees from both political affiliations are literally running for their lives.

Meanwhile, some Liberians are said to be going in the other direction. According to local radio reports and secondhand accounts, former combatants and other jobless young men are heading across the border to fight, lured by the promise of cold, hard cash. UNMIL can't confirm those rumors, Loj told me, "but I'm sure there's some truth to them." Certainly, money could lure plenty of recruits here in Liberia, where the vast majority are not formally employed, particularly in rural areas. During its disarmament program, the U.N. partnered with NGOs and the government to offer ex-combatants vocational training, but many are still without work. Former soldiers are jobless, too, ever since the army -- tainted by the atrocities it committed during the decade and a half of fighting -- was disbanded after the war.

The newly recruited and trained security forces that replaced them are still struggling to maintain order. There are about 4,000 Liberian police, for example, but they don't yet operate independently, and their UNMIL trainers readily admit that outside Monrovia, police operations are even more remedial. In response to the violence and the refugee situation, UNMIL has redeployed some forces to the border, and four units of armed policemen (most police in Liberia are not armed) have been moved there as well.

Relief workers seem overwhelmed by the burgeoning crisis. The U.N. refugee agency originally requested funds for the operation based on a maximum refugee population of 50,000 -- only half of the number present in Liberia's border region now. Of the nearly $19 million that the U.N. says it needs for the operation to function, only 10 percent of that -- $1.9 million -- is in hand. "We are losing the battle on the CNN effect. [In Libya,] geopolitical interests are more acute," says Isabel Crowley, UNICEF country director in Liberia, who expressed frustration that the situation in the Ivory Coast has failed to capture headlines. "If we don't get funds, people are going to start to die."

Supplies of food and water are running desperately low. At the moment, the U.N. World Food program has enough provisions to feed some 72,000 people for 15 days at the rate of one meal per person per day; new supplies won't arrive until April 1. As for water, U.N. agencies and humanitarian organizations say they can meet the emergency needs of about 30,000 people and long-term needs of just 8,000. Worse yet, the rainy season will begin in a matter of months, making roads inaccessible and raising transportation costs.

UNHCR has constructed one refugee camp, but only about 650 refugees have relocated there. Most of the refugees in Liberia are still close to the border, many camping outside or finding temporary shelter in schools or churches, says Crowley. Others are being taken into the homes of local Liberians, many of whom are the same ethnicity.

The welcome wears out fast, however. "We already have reports of tension between the refugee community and the host community," Loj reports. "You can be generous, but only so long when you have nothing to share, and then you start bickering and arguing, and we are watching that very carefully because it has the potential of threatening the security situation." Local radio stations are a mouthpiece for those fears, as talk shows feature local residents discussing their anxieties that incoming refugees will take scarce resources or jobs.

In Liberia, all this is taking place against the backdrop of an upcoming presidential election in October. The incumbent, Ellen Johnson Sirleaf, Africa's first elected female leader and a darling of international donors, has significant support, but her victory is far from a done deal. "If you analyze this, the situation in Cote d'Ivoire is a result of elections, disputed elections," Momodu of UNHCR said. "So as Liberia heads toward elections, there is a genuine fear in the population that what has happened in Cote d'Ivoire could also happen here."

Things in the Ivory Coast are likely to get worse before they get better. On March 10, Gbagbo rejected an African Union deal that would have created a unity government including both him and Ouattara, but with Ouattara as the official president. Other pressure on Gbagbo to resign has come to naught. Threats from the regional West African economic community, ECOWAS, to use force if necessary to remove Gbagbo have dimmed as regional giant Nigeria prepares for its own tricky elections in April. The one hope of the international community has been that economic sanctions could cripple Gbagbo's ability to pay his loyal military and civil service, come hell or high water. But he still seems to have cash.

Perhaps more importantly, for every moment he stays in power, Gbagbo gains more leverage. What began as threats of military action faded into vague discussions of an African Union working group, occasional mediation from regional presidents and dignitaries, and discussions of a power-sharing government. The more proposals he rejects from the international community, the more -- and larger -- concessions he wins in subsequent rounds of negotiation.

While those discussions continue, the fighting and the humanitarian crisis triggered by it continue apace. Analysts here fear that the situation will soon devolve into all-out war as the number of displaced rises and clashes escalate.

The gravity of the situation was clear on March 8, as Johnson Sirleaf began her International Women's Day speech with a moment of silence "for our brothers and sisters in Cote d'Ivoire," as she told a stadium full of otherwise jubilant Liberian women. "May god give them the courage not to follow our path, because we know what that means."

#### 3. African conflict is inevitable—can’t solve all the root causes

Juma, 02 – Former Associate at the Africa Program of the International Peace Academy (Monica, September 2002, The Infrastructure of Peace in Africa, accessed via cioanet.org, p. 1.)

Since the end of the Cold War, Africa has been embroiled in a plethora of intra- and interstate conflicts. Most of these conflicts have a transnational character and generate consequences that have implications for regions beyond those in which they occur. Among the major causes of these conflicts are: the weak democratization process; deep-seated environmental problems; competition for resources; breakdown in the rule of law; and proliferation of private armies, militias, and the attendant problem of illicit trade in, and use of, illegal arms. In addition, the nature and dynamics of conflicts are shaped by the interplay of features peculiar to each sub-region.

### 2NC AT: N/U—Reintervene

#### The only comprehensive study proves no transition impact.

MacDonald & Parent 11—Professor of Political Science at Williams College & Professor of Political Science at University of Miami [Paul K. MacDonald & Joseph M. Parent, “Graceful Decline? The Surprising Success of Great Power Retrenchment,” International Security, Vol. 35, No. 4 (Spring 2011), pp. 7–44]

In this article, we question the logic and evidence of the retrenchment pessimists. To date there has been neither a comprehensive study of great power retrenchment nor a study that lays out the case for retrenchment as a practical or probable policy. This article fills these gaps by systematically examining the relationship between acute relative decline and the responses of great powers. We examine eighteen cases of acute relative decline since 1870 and advance three main arguments.

First, we challenge the retrenchment pessimists’ claim that domestic or international constraints inhibit the ability of declining great powers to retrench. In fact, when states fall in the hierarchy of great powers, peaceful retrenchment is the most common response, even over short time spans. Based on the empirical record, we find that great powers retrenched in no less than eleven and no more than fifteen of the eighteen cases, a range of 61–83 percent. When international conditions demand it, states renounce risky ties, increase reliance on allies or adversaries, draw down their military obligations, and impose adjustments on domestic populations.

Second, we find that the magnitude of relative decline helps explain the extent of great power retrenchment. Following the dictates of neorealist theory, great powers retrench for the same reason they expand: the rigors of great power politics compel them to do so.12 Retrenchment is by no means easy, but necessity is the mother of invention, and declining great powers face powerful incentives to contract their interests in a prompt and proportionate manner. Knowing only a state’s rate of relative economic decline explains its corresponding degree of retrenchment in as much as 61 percent of the cases we examined.

Third, we argue that the rate of decline helps explain what forms great power retrenchment will take. How fast great powers fall contributes to whether these retrenching states will internally reform, seek new allies or rely more heavily on old ones, and make diplomatic overtures to enemies. Further, our analysis suggests that great powers facing acute decline are less likely to initiate or escalate militarized interstate disputes. Faced with diminishing resources, great powers moderate their foreign policy ambitions and offer concessions in areas of lesser strategic value. Contrary to the pessimistic conclusions of critics, retrenchment neither requires aggression nor invites predation. Great powers are able to rebalance their commitments through compromise, rather than conflict. In these ways, states respond to penury the same way they do to plenty: they seek to adopt policies that maximize security given available means. Far from being a hazardous policy, retrenchment can be successful. States that retrench often regain their position in the hierarchy of great powers. Of the fifteen great powers that adopted retrenchment in response to acute relative decline, 40 percent managed to recover their ordinal rank. In contrast, none of the declining powers that failed to retrench recovered their relative position. Pg. 9-10

### 2NC—AT: Runaway

#### It overwhelms all positive feedbacks

Idso and Idso 7 [Sherwood, Research Physicist @ US Water Conservation laboratory, and Craig, President of Center for the Study of Carbon Dioxide and Global change and PhD in Geography, “Carbon Dioxide and Global Change: Separating Scientific Fact from Personal Opinion”, 6-6, <http://www.co2science.org/education/reports/hansen/HansenTestimonyCritique.pdf>]

(6) Hansen says “doubling the amount of carbon dioxide in the atmosphere causes a global climate forcing similar in magnitude to that for a 2% increase of solar irradiance.” All else being equal, this statement may not be far off the mark. However, it does not consider all of the negative biological feedbacks that the warming produced by the initial forcing might kick into motion, which could cause the long-term effective magnitude of the primary forcing to be significantly less than its initial value. Neither does it consider the cooling effects produced by increases in various biological processes that may be induced solely by the growth-enhancing effects of the increase in the air’s CO2 content, which do not even require an impetus for warming in order to be put into play. An example of the first of these ameliorative phenomena involves dimethylsulfide or DMS, which is derived from its algal precursor dimethylsulphoniopropionate. Very briefly, and rather simplistically, in response to an initial increase in temperature (caused by an increase in the air's CO2 content, for example), the climate-stabilizing mechanism begins with a warming-induced increase in the productivity of certain marine microalgae or phytoplankton, which leads to a greater production of oceanic DMS and its release to the atmosphere, which boosts the number of gas-to-particle conversions occurring there, increasing the atmosphere's population of cloud condensation nuclei and, ultimately, the albedos of marine stratus and altostratus clouds, via a narrowing of the cloud droplet spectrum and a decrease in the mean radius of the cloud droplets, both of which phenomena tend to counter the initial impetus for warming and thereby decrease the “all-else-being-equal” effect of the increase in the air’s CO2 concentration, as originally suggested by Charlson et al. (1987). Literally hundreds of peer-reviewed scientific papers have been published on this important subject over the past two decades, and recent work continues to demonstrate the great significance of this major negative feedback phenomenon. In one such study, Meskhidze and Nenes (2006) investigated the effects of ocean biological productivity on the microphysical and radiative properties of marine clouds over a large and seasonally-recurring phytoplankton bloom in the Southern Ocean in the vicinity of South Georgia Island, where the upwelling of nutrient-rich waters, as they describe it, “can support massive phytoplankton blooms, with chlorophyll-a concentrations more than an order of magnitude higher than the background.” In this ambitious endeavor, Meskhidze and Nenes used the Sea-viewing Wide Field-of-view Sensor to obtain the needed chlorophyll data and the Moderate Resolution Imaging Spectroradiometer to determine the effective radii of cloud condensation nuclei. These efforts revealed, in their words, that the “cloud droplet number concentration over the bloom was twice what it was away from the bloom, and cloud effective radius was reduced by 30%.” In addition, they report that “the resulting change in the short-wave radiative flux at the top of the atmosphere was [a negative] 15 watts per square meter, comparable to the aerosol indirect effect over highly polluted regions,” and, we might add, much greater locally than the opposite (positive) radiative forcing typically attributed to the combined increases in the concentrations of all greenhouse gases emitted to the atmosphere since the inception of the Industrial Revolution.

### 2NC—No Extinction

#### Adaptation means no catastrophic impact to warming

Kenny 12 [April 9, 2012, Charles, senior fellow at the Center for Global Development, a Schwartz fellow at the New America Foundation, and author, most recently, of Getting Better: Why Global Development Is Succeeding and How We Can Improve the World Even More., “Not Too Hot to Handle,” http://www.foreignpolicy.com/articles/2012/04/09/not\_too\_hot\_to\_handle?print=yes&hidecomments=yes&page=full]

But for all international diplomats appear desperate to affirm the self-worth of pessimists and doomsayers worldwide, it is important to put climate change in a broader context. It is a vital global issue -- one that threatens to slow the worldwide march toward improved quality of life. Climate change is already responsible for more extreme weather and an accelerating rate of species extinction -- and may ultimately kill off as many as 40 percent of all living species. But it is also a problem that we know how to tackle, and one to which we have some time to respond before it is likely to completely derail progress. And that's good news, because the fact that it's manageable is the best reason to try to tackle it rather than abandon all hope like a steerage class passenger in the bowels of the Titanic.

Start with the economy. The Stern Review, led by the distinguished British economist Nicholas Stern, is the most comprehensive look to date at the economics of climate change. It suggests that, in terms of income, greenhouse gasses are a threat to global growth, but hardly an immediate or catastrophic one. Take the impact of climate change on the developing world. The most depressing forecast in terms of developing country growth in Stern's paper is the "A2 scenario" -- one of a series of economic and greenhouse gas emissions forecasts created for the U.N.'s Intergovernmental Panel on Climate Change (IPCC). It's a model that predicts slow global growth and income convergence (poor countries catching up to rich countries). But even under this model, Afghanistan's GDP per capita climbs sixfold over the next 90 years, India and China ninefold, and Ethiopia's income increases by a factor of 10. Knock off a third for the most pessimistic simulation of the economic impact of climate change suggested by the Stern report, and people in those countries are still markedly better off -- four times as rich for Afghanistan, a little more than six times as rich for Ethiopia.

It's worth emphasizing that the Stern report suggests that the costs of dramatically reducing greenhouse-gas emissions is closer to 1 (or maybe 2) percent of world GDP -- in the region of $600 billion to $1.2 trillion today. The economic case for responding to climate change by pricing carbon and investing in alternate energy sources is a slam dunk. But for all the likelihood that the world will be a poorer, denuded place than it would be if we responded rapidly to reduce greenhouse gases, the global economy is probably not going to collapse over the next century even if we are idiotic enough to delay our response to climate change by a few years. For all the flooding, the drought, and the skyrocketing bills for air conditioning, the economy would keep on expanding, according to the data that Stern uses.

And what about the impact on global health? Suggestions that malaria has already spread as a result of climate change and that malaria deaths will expand dramatically as a result of warming in the future don't fit the evidence of declining deaths and reduced malarial spread over the last century. The authors of a recent study published in the journal Nature conclude that the forecasted future effects of rising temperatures on malaria "are at least one order of magnitude smaller than the changes observed since about 1900 and about two orders of magnitude smaller than those that can be achieved by the effective scale-up of key control measures." In other words, climate change is and will likely remain a small factor in the toll of malaria deaths into the foreseeable future.

What about other diseases? Christian Zimmermann at the University of Connecticut and Douglas Gollin at Williams evaluate the likely impact of a 3-degree rise in temperatures on tropical diseases like dengue fever, which causes half a million cases of hemorrhagic fever and 22,000 deaths each year. Most of the vectors for such diseases -- mosquitoes, biting flies, and so on -- do poorly in frost. So if the weather stays warmer, these diseases are likely to spread. At the same time, there are existing tools to prevent or treat most tropical diseases, and Zimmerman and Gollin suggest "rather modest improvements in protection efficacy could compensate for the consequences of climate change." We can deal with this one.

It's the same with agriculture. Global warming will have many negative (and a few positive) impacts on food supply, but it is likely that other impacts -- both positive, including technological change, and negative, like the exhaustion of aquifers-- will have far bigger effects. The 2001 IPCC report suggested that climate change over the long term could reduce agricultural yields by as much as 30 percent. Compare that with the 90 percent increase in rice yields in Indonesia between 1970 and 2006, for example.

Again, while climate change will make extreme weather events and natural disasters like flooding and hurricanes more common, the negative effect on global quality of life will be reduced if economies continue to grow. That's because, as Matthew Kahn from Tufts University has shown, the safest place to suffer a natural disaster is in a rich country. The more money that people and governments have, the more they can both afford and enforce building codes, land use regulations, and public infrastructure like flood defenses that lower death tolls.

Let's also not forget how human psychology works. Too many environmentalists suggest that dealing with climate change will take immediate and radical retooling of the global economy. It won't. It is affordable, practical, and wouldn't take a revolution. Giving out the message that the only path to sustainability will require medieval standards of living only puts everyone else off. And once you've convinced yourself the world is on an inevitable course to disaster if some corner of the U.S. Midwest is fracked once more or India builds another three coal-fueled power plants, the only logical thing to do when the fracking or the building occurs is to sit back, put your Toms shoes on the couch, and drink micro-brewed herbal tea until civilization collapses. Climate change isn't like that -- or at the very least, isn't like that yet.

So, if you're really just looking for a reason to strap on the "end of the world is nigh" placards and go for a walk, you can find better excuses -- like, say, the threat of global thermonuclear war or a rogue asteroid. The fight to curb greenhouse gas emissions is one for the hard-nosed optimist.

#### Empirics prove our argument

INPCC 10—Nongovernmental International Panel on Climate Change [Past Warm Episodes did not Cause Extinction, 15 July 2010, http://www.nipccreport.org/articles/2010/jul/15jul2010a7.html]

Many claims have been made about catastrophic negative effects of increasing air temperature on biodiversity; but nearly all of these claims are based on either speculation or simple correlative models. In the study of Willis *et al*. (2010), on the other hand, past historical periods were identified in which climate was either similar to that projected by global climate models for the next century or so, or in which the rate of temperature change was unusually rapid; and these real-world periods were examined to see if any real-world climate-related extinctions had occurred. The first period they examined was the Eocene Climatic Optimum (53-51 million years ago), during which time the atmosphere's CO2 concentration exceeded 1200 ppm and tropical temperatures were 5-10°C warmer than modern values. Yet far from causing extinctions of the tropical flora (where the data are best), the four researchers report that "all the evidence from low-latitude records indicates that, at least in the plant fossil record, this was one of the most biodiverse intervals of time in the Neotropics." They also note that "ancestors of many of our modern tropical and temperate plants evolved ...when global temperatures and CO2 were much higher than present...indicating that they have much wider ecological tolerances than are predicted based on present-day climates alone." The second period they examined consisted of two rapid-change climatic events in the Holocene -- one at 14,700 years ago and one at 11,600 years ago -- during which times temperatures increased in the mid- to high-latitudes of the Northern Hemisphere by up to 10°C over periods of less than 60 years. During these events, there is evidence from many sites for rapid plant responses to rapid warming. And the authors note that "at no site yet studied, anywhere in the world, is there evidence in the fossil record for large-scale climate-driven extinction during these intervals of rapid warming." On the other hand, they report that extinctions did occur due to the cold temperatures of the glacial epoch, when subtropical species in southern Europe were driven out of their comfort zone. The study of Willis et al. also makes use of recent historical data, as in the case of the 3°C rise in temperature at Yosemite Park over the past 100 years. In comparing surveys of mammal fauna conducted near the beginning and end of this period, they detected some changes, but no local extinctions. Thus, they determined that for all of the periods they studied, with either very warm temperatures or very rapid warming, there were no detectable extinctions.

### 2NC Terrorism

#### Terrorist weapons theft is unlikely—small arsenals make tight control feasible, risky states have greater incentives and opaque proliferation makes weapons hard to find

Seng 98 (Jordan, PhD Candidate in Pol. Sci.—U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES,” p. 227-229)

If a band of terrorists manage to steal some nuclear weapons, it will be bad if the weapons are not equipped with use-control or tamper-control devices to prevent them from being used. However, if we are speaking of the likelihood that a state's nuclear weapons can be used by terrorists, we will want to consider the probability that they can be stolen in the first place. It may be true that Third World proliferators will not have the advanced technologies to prevent stolen weapons from being used by terrorists, but they will have excellent chances of preventing weapons from being stolen. First, limited nuclear proliferators will have very small nuclear arsenals. This in itself will greatly aid in the security of nuclear weapons. There will only be a handful of weapons to guard. It is unlikely that any state's organizational or financial resources will be stretched too thin by the security requirements of a few dozen nuclear weapons. Personnel for guarding such a small number of weapons can be hand-picked, and screened for loyalty and competence (just as all personnel for controlling nuclear weapons in states with small arsenals can be hand-picked and highly trained). Also, deployment of those few weapons in Third World states is not likely to be far-flung or complicated. Third World proliferators do not have to worry about safeguarding weapons in foreign countries like the U.S. did. Neither do Third World states have to worry about weapons on submarines, aircraft carriers or destroyers. In addition, Waltz has suggested that because Third World states will need long lead times to develop large arsenals, leaders will have lots of time to learn proper control and security on small arsenals that will not place much demand on their limited organizational and financial resources. His argument is sound enough as far as it goes. However, as I made clear in chapter two, it is highly unlikely that Third World states will ever buildup arsenals beyond very small numbers of weapons. Limited nuclear proliferators in the Third World will enjoy the advantages of having to secure only small numbers of weapons; they wilt- probably get better at it over time, and the growth of their arsenals—if there is growth—will not outstrip their resources. Second, if a state suffers from an unstable domestic scene, one would expect it to be more worried about weapons security, not less worried. It is unlikely that Third World nuclear states will compromise their weapons security out of negligence. If a government suffers from separatist agitation, for instance, given limited nuclear proliferators' ability to hand-pick control and security personnel, one would expect central governments to exclude operators of questionable loyalty from the 'loop.' Such exclusive patterns are seen in militaries in many unstable or potentially-unstable states. Saddam Hussein reserves his best equipment and most sensitive tasks for his elite Red Guard troops. Most of the most sensitive resources of the Yugoslavian army were kept in the hand of Serbians by the Serbdominated central government before the national break-up. Finally, the opacity of weapons development in the Third World will aid in preventing nuclear weapons theft. Opaque weapons are hidden weapons. By keeping weapons hidden from the international community proliferators will also be keeping them hidden from terrorists who might hope to steal them. Also, states that follow an opaque pattern of proliferation are sure to concern themselves with the security of weapons from the very beginning of development. Even if leaders are not worried about weapons theft, per se, they will be worried about their secret getting our, and thus weapons will have to be carefully guarded. In all, it seems highly unlikely that Third World proliferators will give anything less then their full attention and best efforts to keeping nuclear weapons secure from theft. Because arsenals will be small and patterns of deployment will be simple, their best efforts will be quite adequate despite resources that are limited in comparison to those of advanced states. Similarly, one need not worry greatly about the chances that a nuclear coup d'etat could compromise nuclear control and result in spill-over nuclear wars. Nuclear weapons are of little use, either symbolically or strategically, to combatants in domestic disputes, and therefore they are unlikely to be seized by rebels. If nuclear weapons are seized by rebels, nuclear control technically will be compromised; however, the scenarios in which they might be used are specific and rare. If they are used, it is difficult to see how the nuclear use could spill-over into international nuclear conflagrations.

### 2NC Conventional War

#### Conventional war is really deadly.

Arbatov et al 89 (Alexei, Head, Nikolae Kishilov, Head of Section, and Oleg Amirov, Senior Researcher, Department on Problems of Disarmament—Institute of world Economic and International Relations, in “Conventional arms Control and East-West Security”, Ed. Robert Blackwill and F. Stephen Larrabee, p. 76-78)

A large-scale conventional war, even if it would not quickly boil over into a nuclear war, would have numerous unpredictable features that would make it quite dissimilar to World War II, the experience of which continues to be used even now as the point of departure for the strategic and operational planning of combat operations for NATO and WTO ground forces, air forces and naval forces. The fact that during the past 40 years incomparably greater changes have taken place in technology than those that took place in the earlier interwar periods of 1870-1914 and 1918-1939 supports such a conclusion. Therefore, war in the modern era is even less similar to World War II than that war was to War World I, and the latter in turn to the Franco-Prussian war. It is exceptionally difficult, if it is possible at all, to predict its course. But there is every justification to say that the numerous contradictions and paradoxes of a hypothetical new war would in practice have the most unexpected consequences, consequences most likely incompatible with the concept of "protracted" conventional combat on the European continent or on a global scale. This concerns, for example, the fact that the sharply increased interdependence of different types of armed forces and troops, individual formations and units and various weapons systems is a distinguishing feature of the functioning of enormous and highly complex organizations, which is what modern armed forces are. A great spacial scope of operations (on the scale of entire TVDs), the rapidity and intensity of combat actions, and the multinational structure of opposing coalitions of states will characterize their actions. All of this poses unprecedently high demands for coordinating the actions of all elements of military potentials and for carefully planning operations, their priority, sequence of interaction and so on. At the same time, the character of modern warfare makes inevitable the constant and rapid change of the combat situation on the fronts, deep breakthroughs and envelopments, and the intermixing of one's own and others' formations, units and subunits. In view of the high maneuverability of troops even the traditional FEBA may no longer exist. In place of it zones of combat contact of a depth of dozens of kilometers will arise and rapidly change and shift. The unpredictability, mutability and intensity of probable combat actions would so overload the capabilities of a centralized command and control in the theater of war and the separate TVDs that they would most likely rapidly lead to total chaos. The intensity of the anticipated combat also renders inevitable exceptionally great losses in arms and equipment. At the same time, because of the rapid increase in the cost of weapons systems, the quantitative levels of armed forces and arms on the whole have a tendency to decrease. Fewer but much improved and more powerful arms have a much lesser chance than in World War II of being used repeatedly in several battles. Their longevity will entirely depend on how successfully they may outstrip the opponent and destroy his forces and capabilities earlier than they will be destroyed by him. Therefore, combat actions will in any event most likely have a short-term character, if not for both, then at least for one of the sides. And this is not to mention the enormous losses among the civilian population and the damage to the economic infrastructure in the region of combat, which may now envelop the greatest and most densely populated portion of the European continent. Neither the population, economy nor ecology of Europe can withstand a large-scale conventional war for any amount of time—even in the improbable event that nuclear power stations, chemical enterprises and nuclear and chemical weapons depots are not destroyed. The limited capabilities of the "human factor" in conditions of modern battle are clearly demonstrated by the experience of the local wars of the 197os and the 198os. Thus, for maintaining the combat capability of troops at a "sufficiently high level" during the Falklands conflict (1982), the British command was forced to replace forward units every two days. Furthermore, the high sortie rate of Great Britain's air force and naval aviation in this period was guaranteed largely thanks to the use of special medicinal preparations. Naturally, it is impossible to compare and carry over the experience of individual local conflicts to potential large-scale combat operations on the European continent, where their character would be quite different both in terms of intensity and scope. This concerns the anticipated transient "fire contacts" with the rapid change of the tactical and operational situation, the threat of using nuclear weapons at any moment, the swift advance of enemy troops, the simultaneous envelopment of large territories with combat actions, the premeditated violation of lines of communication and C3I, and the conduct of combat operations at any time of the day (including at night) and under any weather conditions—all of which maximally increase the physical and psychological stress on a person, and cannot be compared with what took place in the years of World War II, in the Middle East in 1973 or in the Falkland Islands in 1982. It is also necessary to observe that the replacement of the leading units by their withdrawal to the rear for rest and replenishment, as was done in the past, becomes practically impossible in the conditions of large-scale combat operations. Where to withdraw the units for rest, and at what time, if just 3o-5o kilometers from the front there would be a zone of combat operations just as intense as at the forward line? Any assessments of the losses of the sides participating in the conflict can only be highly abstract. Only one thing is clear—the human and material losses in the event of a "general conventional war" will be characterized, undoubtedly, by a scale many hundreds of times greater than that in analogous conflicts of the past, and, what is especially important, by a significantly higher "attrition rate" of people and equipment, of the share of irreplaceable losses.

#### Benefits outweigh the costs 40 to 1.

de Mesquita and Riker 82 (Bruce Bueno and William, Dept. Pol. Sci.—Rochester, Journal of Conflict Resolution, “An Assessment of the Merits of Selective Nuclear Proliferation”, Vol. 26, No. 2, p. 302-303)

One might object further. Conceding that the likelihood of miscalculation does diminish as proliferation occurs, one might still contend that the costs of such a miscalculation are so large that they cannot conceivably justify even the diminished risk of war. If the expected costs from nuclear wars arising out of miscalculation or irrational acts exceed the expected costs from wars that could be prevented by proliferation, then, indeed, proliferation is a very dangerous thing. There is, of course, no precise way to measure these expected costs, but we do have some basis for estimating them. Using expected utility calculations similar to the one suggested here, one of us (Bueno de Mesquita 1981b) found that 65 of approximately 70,000 opportunities to initiate war rationally were seized in the period 1816 to 1974, with hundreds of other opportunities being used to threaten war. In that same study it was also found that only 11 of nearly 500,000 opportunities to initiate war were seized in violation of the expectations arising from the expected utility framework. In other words, the ratio of seemingly rational and correct calculations to either irrational calculations or miscalculations that have led to war is over 40 to 1. This implies that through symmetry-producing nuclear proliferation, we may expect to prevent approximately 40 conventional or one-sided nuclear wars for every one miscalculated or irrational bilateral nuclear exchange. Using the 40 most recent wars as a crude indicator, this analysis implies that a single miscalculated or irrational nuclear exchange in the third world would have to kill several tens of millions of people before some proliferation would be unjustified by yielding a higher expected loss of life. It seems to us unlikely that one such miscalculated or irrational act among third world countries, each with a very few warheads, could produce this level of loss. Still, we do not rule it out, but rather note that it is exactly such estimates that must be made in calculating the trade-offs between gains and losses from nuclear proliferation. One might expect, for instance, that selection of candidates for proliferation might be based partially on the calculation of the marginal effect on expected costs in life and property from not standing in the way of the candidate in question. Thus, proliferation would be resisted where the expected marginal effect would be an increase in loss of life and property over nonproliferation, but would be encouraged where the marginal effect was otherwise.

### 2NC Conventional War Extension Wall

#### The newest and best research coupled with all history proves prolif is stabilizing. It prevents bloody conventional wars.

Tepperman 9 (Jonathon, former Deputy Managing Ed. Foreig Affairs and Assistant Managing Ed. Newsweek, Newsweek, “Why Obama should Learn to Love the Bomb”, 44:154, 9-7, L/N)

A growing and compelling body of research suggests that nuclear weapons may not, in fact, make the world more dangerous, as Obama and most people assume. The bomb **may actually make us safer**. In this era of rogue states and transnational terrorists, that idea sounds so obviously wrongheaded that few politicians or policymakers are willing to entertain it. But that's a mistake. Knowing the truth about nukes would have a profound impact on government policy. Obama's idealistic campaign, so out of character for a pragmatic administration, may be unlikely to get far (past presidents have tried and failed). But it's not even clear he should make the effort. There are more important measures the U.S. government can and should take to make the real world safer, and these mustn't be ignored in the name of a dreamy ideal (a nuke-free planet) that's both unrealistic and possibly undesirable.

The argument that nuclear weapons can be agents of peace as well as destruction rests on two deceptively simple observations. First, nuclear weapons **have not been used** since 1945. Second, there's **never** been a nuclear, or even a nonnuclear, war between two states that possess them. Just stop for a second and think about that: it's hard to overstate how remarkable it is, especially given the singular viciousness of the 20th century. As Kenneth Waltz, the leading "nuclear optimist" and a professor emeritus of political science at UC Berkeley puts it, "We now have 64 years of experience since Hiroshima. It's striking and against all historical precedent that for that substantial period, there has not been any war among nuclear states."

To understand why—and why the next 64 years are likely to play out the same way—you need to start by recognizing that all states are **rational on some basic level**. Their leaders may be stupid, petty, venal, even evil, but they tend to do things only when they're pretty sure they can get away with them. Take war: a country will start a fight only when it's almost certain it can get what it wants at an acceptable price. **Not even Hitler or Saddam waged wars they didn't think they could win**. The problem historically has been that leaders often make the wrong gamble and underestimate the other side—and millions of innocents pay the price.

Nuclear weapons change all that by making the costs of war obvious, inevitable, and unacceptable. Suddenly, when both sides have the ability to turn the other to ashes with the push of a button—and everybody knows it—**the basic math shifts**. Even the craziest tin-pot dictator is **forced to accept that war with a nuclear state is unwinnable** and thus **not worth the effort**. As Waltz puts it, "Why fight if you can't win and might lose everything?"

Why indeed? The **iron logic of deterrence and mutually assured destruction** is **so compelling**, it's led to what's known as **the nuclear peace**: the virtually unprecedented stretch since the end of World War II in which **all the world's major powers have avoided coming to blows**. They did fight proxy wars, ranging from Korea to Vietnam to Angola to Latin America. But these never matched the furious destruction of full-on, great-power war (World War II alone was responsible for some 50 million to 70 million deaths). And since the end of the Cold War, such bloodshed has declined precipitously. Meanwhile, the nuclear powers have scrupulously avoided direct combat, and there's very good reason to think they always will. There have been some near misses, but a close look at these cases is **fundamentally reassuring**—because in each instance, **very different leaders all came to the same safe conclusion**.

Take the mother of all nuclear standoffs: the Cuban missile crisis. For 13 days in October 1962, the United States and the Soviet Union each threatened the other with destruction. But both countries soon stepped back from the brink when they recognized that a war would have meant curtains for everyone. As important as the fact that they did is the reason why: Soviet leader Nikita Khrushchev's aide Fyodor Burlatsky said later on, "It is impossible to win a nuclear war, and both sides realized that, maybe for the first time."

The record since then shows the same pattern repeating: nuclear-armed enemies **slide toward war**, then **pull back**, always for the same reasons. The best recent example is India and Pakistan, which fought three bloody wars after independence before acquiring their own nukes in 1998. Getting their hands on weapons of mass destruction didn't do anything to lessen their animosity. But it did dramatically mellow their behavior. Since acquiring atomic weapons, the two sides have never fought another war, despite severe provocations (like Pakistani-based terrorist attacks on India in 2001 and 2008). They have skirmished once. But during that flare-up, in Kashmir in 1999, both countries were careful to keep the fighting limited and to avoid threatening the other's vital interests. Sumit Ganguly, an Indiana University professor and coauthor of the forthcoming India, Pakistan, and the Bomb, has found that on both sides, officials' thinking was strikingly similar to that of the Russians and Americans in 1962. The prospect of war brought Delhi and Islamabad face to face with a nuclear holocaust, and leaders in each country did what they had to do to avoid it.

Nuclear pessimists—and there are many—insist that even if this pattern has held in the past, it's crazy to rely on it in the future, for several reasons. The first is that today's nuclear wannabes are so completely unhinged, you'd be mad to trust them with a bomb. Take the sybaritic Kim Jong Il, who's never missed a chance to demonstrate his battiness, or Mahmoud Ahmadinejad, who has denied the Holocaust and promised the destruction of Israel, and who, according to some respected Middle East scholars, runs a messianic martyrdom cult that would welcome nuclear obliteration. These regimes are the ultimate rogues, the thinking goes—and there's no deterring rogues.

But are Kim and Ahmadinejad really scarier and crazier than were Stalin and Mao? It might look that way from Seoul or Tel Aviv, but history says otherwise. Khrushchev, remember, threatened to "bury" the United States, and in 1957, Mao blithely declared that a nuclear war with America wouldn't be so bad because even "if half of mankind died … the whole world would become socialist." Pyongyang and Tehran support terrorism—but so did Moscow and Beijing. And as for seeming suicidal, Michael Desch of the University of Notre Dame points out that Stalin and Mao are the real record holders here: both were responsible for the deaths of some 20 million of their own citizens.

Yet when push came to shove, their regimes **balked at nuclear suicide**, and **so would today's international bogeymen**. For all of Ahmadinejad's antics, his power is limited, and the clerical regime has always proved rational and pragmatic when its life is on the line. Revolutionary Iran has never started a war, has done deals with both Washington and Jerusalem, and sued for peace in its war with Iraq (which Saddam started) once it realized it couldn't win. North Korea, meanwhile, is a tiny, impoverished, family-run country with a history of being invaded; its overwhelming preoccupation is survival, and every time it becomes more belligerent it reverses itself a few months later (witness last week, when Pyongyang told Seoul and Washington it was ready to return to the bargaining table). These countries may be brutally oppressive, but **nothing in their behavior suggests they have a death wish**.

### AT: Miscalculation

#### Proliferation stops miscalculation—risks of nuclear war are too clear.

Roth 7 (Ariel Ilan, Associate Dir. National Security Studies—Johns Hopkins U. and Visiting Assistant Prof. IR—Goucher College, International Studies Review, “Reflection, Evaluation, Integration Nuclear Weapons in Neo-Realist Theory”, 9, p. 369-384)

**No such potential for miscalculation exists in a nuclear conflict**. In several papers and articles, as well as a co-authored book, Waltz makes explicit his belief that nuclear weapons eliminate (or at least severely reduce) the likelihood of miscalculation of the degree to which a war will be costly. Because, according to Waltz, one of the main engines for war is uncertainty regarding outcomes and because the immense destruction that can come as the result of a nuclear exchange can be fully anticipated, **it is never rational to engage in a war where the possibility of a nuclear exchange exists.** Consequently, as Waltz (1990:740) forcefully argues, ‘**‘the probability of major war among states having nuclear weapons approaches zero.’’**

### 2NC Arms Racing

#### No impact to arms racing.

Seng 98 (Jordan, PhD Candidate in Pol. Sci.—U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES,” p. 247)

In all, arms buildups in the Third World are not likely result in a reduction of security for any state involved. Even at minimal levels of weapons development, Third World proliferators will achieve ample damage capability. Third World proliferators will find it easy to make their forces invulnerable to counterforce strikes from one another. Because Third World states could never hope to compromise the second strike capability of advanced nuclear states, arms races between Third World proliferators and advanced nuclear powers will not change security equations in any destabilizing way. Strategically speaking, arms races are simply unlikely to matter.

### 2NC Conflict Escalation

#### Prolif decreases conflict intensity. Diminishes crisis escalation and increases stability.

Sechser 9 (Todd, Assistant Prof. Politics—UVA and PhD Pol.. Sci.—Stanford, in “Controversies in Globalization: Contending Approaches to International Relations”, Ed. John A. Hird, Peter M. Haas and Beth McBratney, p. 167-168)

What about conflicts which, despite the shadow of nuclear weapons, nevertheless occur? Proliferation optimists argue that even if nuclear-armed states fight one another, their wars will not be intense: leaders will prevent such conflicts from escalating to avoid the risk that nuclear weapons might be used. As Waltz writes, "Everyone knows that if force gets out of hand all the parties to a conflict face catastrophe. With conventional weapons, the crystal ball is clouded. With nuclear weapons, it is perfectly clear" (Sagan and Waltz 2003, 114). This reasoning was borne out clearly by the 1999 Kargil War between India and Pakistan—the only war ever to occur between two nuclear states. The episode is instructive because the war entailed far fewer causalities than any of the prior wars between India and Pakistan (see Table 1), owing in part to the restraint of the Indian military in expelling Pakistani insurgents from the Kargil region. The Indian military could have reduced its own losses and ended the war more quickly by attacking critical communication and supply lines in Pakistani-controlled Kashmir, yet because crossing into Pakistani territory might have widened the war and risked provoking a Pakistani nuclear threat, Indian leaders instead opted for caution. It is not hard to find other military crises in which the risk of nuclear escalation induced restraint. In March 1969, Chinese forces ambushed Russian troops along the Ussuri River in northwest China, prompting a Soviet counterattack. But one important reason we do not read about the catastrophic Sino- Soviet War of 1969 is that a Soviet threat to launch preventive strikes against Chinese nuclear targets induced Chinese leaders to de-escalate the crisis. Despite having initiated the challenge, China backed down rather than risk letting events get out of hand. The Soviet Union, of course, had itself recently backed down from a crisis it precipitated when Nikita Khrushchev agreed in 1962 to remove Soviet missile bases from Cuba rather than risk a potentially nuclear conflict with the United States. These examples make clear that nuclear weapons cannot prevent all conflicts: indeed, the Cuban Missile Crisis, the Ussuri River crisis, and the Kargil War all came about because one nuclear power was bold enough to challenge another. But in a world without nuclear weapons, these clashes might have escalated to large-scale conventional wars. Instead, in each case the shadow of nuclear weapons helped to cool tempers and contain the crisis: retaliation remained limited, escalatory options were rejected, and eventually the challenger backed down.

### 2NC Preemptive Strikes

#### No incentive for preemptive strikes—they can’t solve—lack of delivery capabilities, decoys and target mobility

Seng 98 (Jordan, PhD Candidate in Pol. Sci.—U. Chicago, Dissertation, “STRATEGY FOR PANDORA'S CHILDREN: STABLE NUCLEAR PROLIFERATION AMONG MINOR STATES,” p. 156)

In sum, though Third World proliferators are likely to lack some of the technologies that dissipated preemptive incentives between the superpowers, they will also enjoy circumstances that allow them to protect their nuclear weapons from first strikes without those technologies. In some situations of Third World proliferation, preemptors will have to rely on bombers to deliver the preemptive strike. Bombers are relatively slow, which decreases the chances that preemptive strikes will eliminate nuclear weapons on the ground before counterlaunch. Bombers are also vulnerable to air defenses, which decreases the chances that a preemptive effort will be successful in eliminating all of its targets. Nuclear-capable missiles are becoming more and more plentiful in the Third World, and their addition to nuclear relationships is likely co increase the ease of weapons protection rather than increasing the viability of counterforce strategies. Third World missiles will not be as accurate as the superpower weapons, which makes them less appropriate for counterforce missions. In addition, the small size of Third World nuclear arsenals, the small size of Third World missiles, and the poor reconnaissance capabilities of Third World adversaries will facilitate missile mobility and effective hiding strategies. Third World proliferators may lack the hardening technologies and early warning systems of the superpowers but, on balance, there is no reason to expect preemptive incentives to be any stronger for Third World proliferators than they were for the U.S. and Soviets.

### Slow Prolif—1NC

#### Prolif will be slow even in the new era.

Tepperman 9 (Jonathon, former Deputy Managing Ed. Foreig Affairs and Assistant Managing Ed. Newsweek, Newsweek, “Why Obama should Learn to Love the Bomb,” 44:154, 9-7, L/N)

The risk of an arms race--with, say, other Persian Gulf states rushing to build a bomb after Iran got one--is a bit harder to dispel. Once again, however, history is instructive. "In 64 years, the most nuclear-weapons states we've ever had is 12," says Waltz. "Now with North Korea we're at nine. That's not proliferation; **that's spread at glacial pace**." Nuclear weapons are so controversial and expensive that only countries that deem them absolutely critical to their survival go through the extreme trouble of acquiring them. That's why South Africa, Ukraine, Belarus, and Kazakhstan voluntarily gave theirs up in the early '90s, and why other countries like Brazil and Argentina dropped nascent programs. This doesn't guarantee that one or more of Iran's neighbors--Egypt or Saudi Arabia, say--might not still go for the bomb if Iran manages to build one. But the risks of a rapid spread are low, especially given Secretary of State Hillary Clinton's recent suggestion that the United States would extend a nuclear umbrella over the region, as Washington has over South Korea and Japan, if Iran does complete a bomb. If one or two Gulf states nonetheless decided to pursue their own weapon, that still might not be so disastrous, given the way that bombs tend to mellow behavior.

## \*\*\* 1NR

### 2NC Overview

#### Speed is critical—rapid warming overwhelms adaptation.

Joseph Milton, 11/11/2010. PhD Evolutionary Biology @ St Andrews, science journalism @ City U London, writer for the Financial Times, New Scientist, Nature News, Research Fortnight, and Scientific American. “Rapid warming boosted ancient rainforest,” Scientific American, http://www.scientificamerican.com/article.cfm?id=rapid-warming-boosted-ancient.

Most scientists have assumed that, as carbon dioxide levels increase and the Earth warms, plant species diversity in the rainforests will start to dwindle, with [plants](http://www.scientificamerican.com/topic.cfm?id=plants) unable to adapt to the heat. But a new study suggests that the opposite may be true. In the past, rising atmospheric carbon dioxide and higher temperatures actually drove the evolution of far greater numbers of new rainforest plant species than were wiped out. ¶ But don't trade in your electric car for a gas-guzzler just yet--**if** rainfall drops as **temperatures** rise, or if they **rise too rapidly, the outcome** for rainforest diversity **could be much less positive**.¶ For clues to how rainforest diversity will be affected by increasing atmospheric carbon dioxide and the corresponding rise in temperatures, Carlos Jaramillo, a palaeobiologist at the Smithsonian Tropical Research Institute in Panama, and his colleagues decided to look at what happened during similar conditions in the past.¶ One such episode in Earth's history occurred 56.3 million years ago and is called the Palaeocene-Eocene Thermal Maximum (PETM). Within 10,000-20,000 years, the world warmed by 3-5 degrees Celsius and atmospheric carbon dioxide doubled to around two and a half times the levels we see today. These unusually warm conditions lasted for around 200,000 years. ¶ Pollen clues¶ To find out how this ancient climate change affected rainforest plants, Jaramillo and his team analyzed fossilized pollen trapped in rock cores from rainforests in Colombia and Venezuela. They spent seven years locating appropriate sites and taking samples, then used a battery of dating techniques to ensure that they were examining cores formed before, during and after the thermal maximum--a relatively narrow time window in geological terms. The results were published November 12 in Science.¶ Although some plant species disappeared, many more new species arose. That included entire families, suggesting that the increased temperatures and carbon dioxide levels actually boosted [biodiversity](http://www.scientificamerican.com/topic.cfm?id=biodiversity). "What we found was exactly the opposite of what we were expecting," says Jaramillo. "The diversity of the tropical forest increased really fast over a very short amount of time."¶ The pollen fossil record shows that some important plant families, such as Myrtaceae, which includes eucalyptus, and Passifloraceae--the passion flowers--made their first appearance during the thermal maximum. The tropics have remained the most species-diverse area of the world ever since.¶ This might sound like good news for the rainforest in the face of contemporary climate change. However, Guy Harrington, a palaeobiologist at the University of Birmingham, UK, warns that any positive effects on plant diversity could be canceled out if temperatures rise too quickly for plants to adapt. "**It's the rate--how fast you're turning up the heater--that's the most important thing**," he says.

### 2NC I/L Wall

#### AND—prefer our modeling—the Hadley Center model puts the rest to shame.

Olive Heffernan, February 2010. Editor of Nature Reports Climate Change. “Earth science: The climate machine,” Nature 463, 1014-1016.

This massive supercomputer at the UK Met Office in Exeter is home to what is **possibly the world's most sophisticated climate model**. Developed by researchers at the Hadley Centre, the Met Office's climate-change branch, the newly finished model will be put to its first big test over the coming months. It will run a series of climate simulations out to the year 2100 for the next report of the Intergovernmental Panel on Climate Change (IPCC), on the physical-science basis of climate change, which is due out in 2013.¶ Four years in the making, the model is known as HadGEM2-ES, short for the Hadley Centre Global Environmental Model, version two, with an added Earth-system component. It is one of a dozen Earth-system models under development worldwide that reach far beyond their distant forebears, which represented just the physical elements of the climate, such as air, sunlight and water. The new generation includes all that and much more: forests that can shrink or spread as conditions change; marine food webs that react as the oceans grow more acidic with carbon dioxide; aerosol particles in the atmosphere that interact with greenhouse gases, enhancing or sapping their warming power.¶ The Hadley Centre is at the forefront of efforts around the world to develop such complex climate models. "**It's really pushing the envelope**", says Andrew Weaver, a climate modeller at the University of Victoria in British Columbia, Canada.

#### Climate commitment means warming would be unmasked.

K. C. Armour 1 and G. H. Roe 2, 2010. 1Department of Physics, University of Washington, Seattle,; and 2Department of Earth and Space Sciences, University of Washington, Seattle. “Climate commitment in an uncertain world,” Geophysical Research Letters 38, L01707, 5 PP.

Climate commitment—the warming that would still occur given no further human influence—is a fundamental metric for both science and policy. It informs us of the min- imum climate change we face and, moreover, depends only on our knowledge of the natural climate system. Studies of the climate commitment due to CO2 find that global temperature would remain near current levels, or even decrease slightly, in the millennium following the cessation of emissions. However, this result overlooks the important role of the non-CO2 greenhouse gases and aerosols. This paper shows that **global energetics require an immediate and significant warming following the cessation of emissions as aerosols are quickly washed from the atmosphere**, and the large uncertainty in current aerosol radiative forcing implies a large uncertainty in the climate commitment. Fundamental constraints preclude Earth returning to pre-industrial temperatures for the indefinite future. These same constraints mean that observations are currently unable to eliminate the possibility that we are already beyond the point where the ultimate warming will exceed dangerous levels. Models produce a narrower range of climate commitment, but under- sample observed forcing constraints.

#### Short lifetime means SO2 reductions would immediately cause warming.

Zeke Hausfather, 6/24/2008. MA Environmental Management @ Yale, Chief Scientist and Executive Vice President of Energy at Efficiency 2.0. “Why Reducing Sulfate Aerosol Emissions Complicates Efforts to Moderate Climate Change,” Yale Climate Forum, http://www.yaleclimatemediaforum.org/2008/06/common-climate-misconceptions-why-reducing-sulfate-aerosol-emissions-complicates-efforts-to-moderate-climate-change/.

A reduction of anthropogenic SO2 of around 50 percent worldwide over the next century, as projected in the most recent IPCC report, would result in a significant warming effect on the global climate. Sulfates are extremely short-lived particles, and emission reductions **would have immediate effects on radiative forcing**. A 50 percent reduction in sulfate aerosol emissions would reduce by half their current radiative forcing of -0.83 W m-2. This change in forcings would increase global temperatures by roughly 0.36 degrees C (.64 F) relative to a scenario where aerosol emissions remain constant.¶ Figure three below shows the practical implications of a reduction in aerosols in the next century. If current greenhouse gas concentrations remain constant at current levels, scientists project about 1.34 degrees C (2.41 F) warming relative to pre-industrial temperatures by the end of the century (the world has already warmed 0.74 degrees C (1.33 F) in the past century, and 0.60 degrees C (1.08F) additional warming is in the pipeline as a result of Earth’s thermal inertia). A reduction of anthropogenic atmospheric sulfate aerosols by 50 percent means that 1.34 degrees C (2.41 F) warming suddenly becomes 1.70 degrees C (3.06 F).

#### More IPCC models show that aerosols are masking more than half of GHG warming—reduction in emissions would cause a doubling of warming, above 2-degrees, within decades.

V. Ramanathan\* and Y. Feng, 9/23/2008. Scripps Institution of Oceanography, University of California at San Diego. “On avoiding dangerous anthropogenic interference with the climate system: Formidable challenges ahead,” PNAS 105.38, 14245-14250, www.pnas.org/content/105/38/14245.full.pdf.

IPCC (12) recommends a climate sensitivity of 3°C (2–4.5°C) warming for a doubling of CO2. The radiative forcing (i.e., additional energy trapped) caused by CO2 doubling is 3.7 Wm􏲐2 (11). Thus it takes 􏲏1.2 Wm􏲐2 (0.8–1.9) of forcing to warm the planet by 1°C. The preindustrial to present (year 2005) GHGs forcing is 3 (2.6 to 3.5) Wm􏲐2 (Fig. 2). It then follows that the expected warming caused by the 3 Wm􏲐2 forcing is 2.4°C (1.4–4.3°C), i.e., if the only anthropogenic climate forcing on the planet is caused by the build-up of GHGs and even if we prevent further increases in the GHGs beyond their 2005 levels, the planetary warming (since the preindustrial era) would reach 2.4°C (1.4–4.3°C). The probability distribution of this committed warming, determined by the uncertainty of the current understanding in climate feed- back processes (7), is shown in Fig. 1. Why have we not seen this large warming? First, we have to consider the effect of aerosols, which start off as urban haze or rural smoke and ultimately be- come transcontinental and transoceanic plumes of ABCs (17) consisting of sulfate, nitrate, hundreds of organics, black carbon, soil dust, fly ash, and other aerosols (11). ABCs have masked GHG warming by enhancing the albedo (per- cent of incoming solar radiation reflected back to space) of the planet. A recent review of available literature (18) estimates the masking effect of ABCs to be 􏲏47% (􏲐1.4 Wm􏲐2) with a 90% confidence interval of 20–80%. The IPCC-AR4 (11) value for the masking is 40% (see Fig. 2). Effectively, the forcing ‘‘felt’’ by the climate system is only 53%, i.e., 1.3°C, which is identical to CEW􏲘G􏲑A, the committed warming adapted by earlier studies (13–15). About 8% of the committed warming (0.2°C) is compensated by increases in the surface albedo because of land-use changes; 􏲏20% (0.5°C) is delayed by the thermal inertia of the oceans (14, 15) and it is only the balance of 􏲏25%, i.e., 0.6°C, that should by now have manifested as observed warming (14). This algebraic exercise demonstrates that the observed surface warming of 0.76°C (since the latter half of 1800s) (12) is not inconsistent with the committed warming of 2.4°C.¶ The fundamental deduction (subject to the assumption of IPCC climate sensitivity) is that if we get rid of the ABCs today the Earth could warm another 1.6°C (which includes the delayed warming caused by ocean thermal inertia) unless we act now to reduce GHG concentrations. As shown by coupled ocean atmosphere models used in IPCC (14, 15), 50% of this warming can happen in few decades, and most of the balance will manifest during the course of this century. The situation with respect to sea-level rise is considerably more complex. Sea-level rise caused by thermal expansion (in the range of 10 to 30 cm per century; see refs. 13 and 14) is likely to continue for centuries (even if the warming asymptotes to values close to CEW􏲘G by 2100) because of the time required for mixing of the heating to deeper oceans. In addition, the range of CEW􏲘G (1.4—4.3°C) raises another major DA I-related issue. As suggested by the IPCC (12) the Greenland Ice Sheet can disappear completely if surface warming is maintained in excess of¶ 1.9—4.6°C for millennia and raise sea level by 7 m or more.

### 2NC Solves Warming

#### It’s the closest we’ve got to a silver bullet.

Alok Jha, 3/13/2009. Green technology correspondent for the Guardian (UK). “'Biochar' goes industrial with giant microwaves to lock carbon in charcoal,” The Guardian, <http://www.guardian.co.uk/environment/2009/mar/13/charcoal-carbon>.

Giant microwave ovens that can "cook" wood into charcoal could become our best tool in the fight against global warming, according to a leading British climate scientist. Chris Turney, a professor of geography at the University of Exeter, said that by burying the charcoal produced from microwaved wood, the carbon dioxide absorbed by a tree as it grows can remain safely locked away for thousands of years. The technique could take out billions of tonnes of CO2 from the atmosphere every year. Fast-growing trees such as pine could be "farmed" to act specifically as carbon traps — microwaved, buried and replaced with a fresh crop to do the same thing again. Turney has built a 5m-long prototype of his microwave, which produces a tonne of CO2 for $65. He plans to launch his company, Carbonscape, in the UK this month to build the next generation of the machine, which he hopes will process more wood and cut costs further. He is not alone in touting the benefits of this type of charcoal, known as biochar or biocharcoal. The Gaia theorist, James Lovelock, and Nasa's James Hansen have both been outspoken about the potential benefits of biochar, arguing that it is one of the most powerful potential solutions to climate change. In a recent paper, Hansen calculated that producing biocharcoal by current methods of burning waste organic materials could reduce global carbon dioxide levels in the atmosphere by 8ppm (parts per million) over the next 50 years. That is the equivalent of three years of emissions at current levels. **Turney said biochar was the closest thing scientists had to a silver-bullet solution to climate change**. Processing facilities could be built right next to forests grown specifically to soak up CO2. "You can cut trees down, carbonise them, then plant more trees. The forest could act on an industrial scale to suck carbon out of the atmosphere." The biochar could be placed in disused coal mines or tilled into the ground to make soil more fertile. Its porous structure is ideal for trapping nutrients and beneficial micro-organisms that help plants grow. It also improves drainage and can prevent up to 80% of greenhouse gases such as nitrous oxides and methane from escaping from the soil. In a recent analysis of geo-engineering techniques published in the journal Atmospheric Chemistry, Tim Lenton, a climate scientist at the University of East Anglia, **rated producing charcoal as the best technological solution to reducing CO2 levels**. He compared it to other geo-engineering techniques such as dumping iron in oceans or seeding clouds to reflect the sun's radiation and calculated that by 2100 a quarter of the effect of human-induced emissions of CO2 could be sequestered with biochar production from waste organic matter, giving a net reduction of 40ppm in CO2 concentration. Johannes Lehmann of Cornell university has calculated that it is realistically possible to fix 9.5bn tonnes of carbon per year using biochar. The global production of carbon from fossil fuels stands at 8.5bn tonnes.

#### Solves quickly --- we’d be out of the danger zone by the middle of the century.

Tim Flannery, 1/11/2008. Division of Environmental and Life Sciences Macquarie Uni. “Australian of the Year 2007, Tim Flannery talks bio char and why we need to move into the renewable age,” Beyond Zero Emissions, <http://www.beyondzeroemissions.org/2008/03/19/tim-flannery-australian-of-the-year-2007-talks-bio-char-why-we-need-to-move-into-the-renewable-age>.

Matthew Wright: In a recent address to the American Geophysical Union, Dr. James Hanson from NASA said that we need to go below 350 parts per million to have a stable atmosphere that we are used to experiencing for our agricultural needs, and our biodiversity and ecological systems. In terms of your call about trying to aim for say 5% sequestration per year over 20 years in order to remove that carbon debt, if we can get that going, how do you see, where do you see us going for a stable climate, a safe climate that can continue and maintain the huge populations that we've got around the world now?

Tim Flannery: Well that's a very good question. I mean I suppose implicit in James Hansons' comments is the reality that we are living right now with unacceptable climate risk, very high levels of unacceptable risk, and we need to draw that down as quickly as we can. Now if you used these agri-char based technologies and you have your aggressive reaforestation projects for the worlds tropics, you could conceivably be drawing down in the order of 10 to 15 tonnes, gigatonnes sorry, of carbon per annum by about 2030. **At that rate we could bring ourselves down below the dangerous threshold as early as the middle of this century**, but whether the world can actually get its act together and do that is another matter. This is the first real directed experiment at planetary engineering that we are talking about here, and we don't really have the political structures in place to enable us to implement the technology that we already have. So I would see the change basically as a political one. Its a global political change and the Kyoto process that rolls out now from Potsdam this year and then Copenhagen next year will be the key factors in the success or failure of us humans to do that.

#### Sequestration through ag can offset a third of emissions --- equivalent in magnitude to shifting to low-carbon energy.

Claire Schaffnit-Chatterjee, 9/19/2011. Deutsche Bank Research. “Mitigating climate change through agriculture,” [www.dbresearch.com/PROD/DBR\_INTERNET\_EN-PROD/PROD0000000000278568/Mitigating+climate+change+through+agriculture%3A+An+untapped+potential.pdf](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000278568/Mitigating+climate+change+through+agriculture%3A+An+untapped+potential.pdf).

The IPCC estimates the global technical potential for GHG mitigation in agriculture production at 5.5 to 6 Gt of CO2 equivalent per year by 2030. These figures do not include improved energy efficiency, biofuels or other changes in demand. This theoretical reduction in emissions, assuming adoption of all technical options is derived mostly (89%) from carbon sequestration in soil, 9% from methane reduction in rice production and livestock/manure management and 2% from nitrous oxide reduction through better cropland management40. It does not take into account fossil fuel offsets from biomass use.¶ The economic potential, taking into account the costs involved, is naturally much lower and depends on carbon prices. For a range of USD 50 to 60 per ton of CO2 eq mitigated, agriculture has a mitigation potential of over 4 billion tons CO2 eq. Even at prices below USD 20 per ton of CO2 eq mitigated, the mitigation potential in agriculture is still substantial at over 1.5 billion tons of CO2 eq. The current price for carbon is 13 EUR per ton.¶ McKinsey identifies terrestrial carbon in agriculture/forestry as one of the three major areas of GHG abatement opportunities (at 12 billion tons of CO2 eq per year in 2030) next to energy efficiency (14 billion) and low-carbon energy supply (also 12 billion). This means that the agriculture/forestry sector accounts for one-third of the total economic abatement potential, while agriculture alone accounts for 12%. In comparison, most of the promising solutions for reducing emissions in the energy sector are still in development and unlikely to be widely used in the next years or maybe decades. Curbing GHG emissions caused by farming practices and deforestation should be cheaper41. Alternative energy systems have the important advantage of lowering GHG emissions by replacing fossil fuels. Many options in the energy sector are subsidized and benefit from high oil prices.¶ The agriculture and forestry sectors provide the crucial possibility of sequestering the carbon already in the atmosphere. Carbon capture and storage from energy-related emissions is technically possible but not doable on a large-scale until 2020 or so42. Most importantly, it is not designed to capture GHGs already present in the atmosphere, which only terrestrial carbon sequestration can do.

### 2NC AT: Don’t Solve Global

#### Once the U.S. has established a domestic regulation, the political economy changes and businesses will push for the U.S. to take a leadership role expanding that policy internationally.

Elizabeth R. DeSombre, 2010. Frost Associate Professor of Environmental Studies and associate professor of political science at Wellesley College. “The United States and Global Environmental Politics: Domestic Sources of U.S. Unilateralism,” in Regina Axelrod and Stacy VanDeveer, eds., The Global Environment: Institutions, Law, and Policy, 3rd ed. CQ Press.

A more nuanced view about the extent to which U.S. industry will be able to marshal domestic political efforts to avoid international commitments would focus on specifying aspects of the domestic political process in the United States that allow those opposing international environmental leader- ship to have influence. One argument made on a different issue is that the United States has a set of decentralized political institutions that “empower small veto groups.”56 Peter Cowhey has suggested that “national politicians have been unlikely to accept any global regime that fails to reinforce the pre- ferred domestic regime.”57 Kal Raustiala points out that states rarely create completely new domestic regulatory structures to address international issues, but rather rely on existing institutional structures domestically. That observa- tion suggests that how domestic institutions are structured “influences what can be implemented, and often what is negotiated.”58 This explanation may help us identify either domestic structural determinants of U.S. global envi- ronmental leadership or simply content-based approaches to evaluating the likelihood of eventual U.S. international action on an issue.¶ The United States also has an admirable tradition of accepting only those international environmental obligations with which it intends to comply, unlike some states, including the European Union, that are more likely to see commitments as goals. Other states (such as the former Soviet Union) frequently accept obligations they have no intention of complying with or know that they will not be capable of fulfilling in the near future.59 This propensity may influence the degree to which the United States is willing to take on obligations, limiting them to those with which it intends to comply. Structural constraints only serve to magnify this tendency.¶ Structurally, the separation of powers between the executive and legis- lative branches of government and the fact that the Senate must ratify trea- ties by a two-thirds majority can be seen to have the effect of hindering U.S. international environmental action under certain circumstances. Although a domestic ratification process for treaties exists in most countries, the U.S. barrier is doubly high, requiring not only a supermajority vote but also one in a completely different branch of government. Oona Hathaway notes that the United States is nearly unique in its high barrier to ratification—it is¶ one of only six states worldwide that requires support by a supermajority of a legislative body, and it is one of only a few in which ratification involves automatic incorporation into domestic law.60 Many other advanced indus- trialized democracies operate under parliamentary systems in which the head of government is a member of the majority (or largest) party; thus, treaties submitted to parliament for ratification by the prime minister are likely to be accepted. Some have noted that the willingness of Congress to reassert its control over foreign policy increased in the post–Cold War era, when the need for strong central executive leadership lessened.61 Under this explanation, the two branches of government may be at odds about what a policy should be, resulting in a situation in which the president pushes an international approach that Congress refuses to go along with.¶ That it is the Senate that ratifies treaties by such a supermajority may be especially important. The U.S. Senate is particularly prone to economic pressure from special interest groups. Elections to the Senate ensure that each state is represented by two senators concerned about the issues that matter to their states to a greater degree than those that impact the country as a whole. This focus is an avenue for industry impact. And, as Hathaway points out, the ideological composition of the Senate also means that the two-thirds ratifica- tion threshold requires cooperation among senators on vastly different parts of the political spectrum. If senators serving in the 109th Congress are lined up on an ideological spectrum, the sixty-seventh senator is rated more than twice as conservative as the fifty-first; the same is true in the liberal direc- tion.62 Requiring a two-thirds majority makes agreement orders of magnitude more difficult than requiring a simple majority would. This difference may serve to explain increased U.S. reluctance on international environmental issues compared with other major industrialized states, but it alone cannot explain the variations in degrees of U.S. unilateralism on different environmental issues.¶ What is possible, however, is that the role of the Senate intersects with some characteristics of environmental issues to influence the likelihood of U.S. international leadership on a given issue. The Senate’s consideration and adoption of the Byrd-Hagel resolution is itself an indication of the important congressional role in addressing international environmental policy. The Sen- ate took up this issue on its own, not only without direction from the execu- tive branch, but without making President Clinton even aware, until the last minute, that such a debate would happen. At that point the White House could not hope to stop the adoption of the resolution, and it simply tried to moderate its language.63 In the case of this particular resolution, Democratic senator Robert C. Byrd represented West Virginia, a major coal producer, and Republican senator Chuck Hagel represented Nebraska, where agriculture, the most important economic sector, is highly mechanized and thus sensitive to the price of oil.64¶ What brings these explanations together is the process of domestic con- gressional regulation. One notable consistency with U.S. international environmental leadership is the extent to which the United States had already¶ undertaken domestic regulatory action—on the topic and in the form being considered internationally—at the point at which such action was being pushed internationally. Harold Jacobson’s description of the U.S. experience with environmental multilateralism is telling: he points to the U.S. wave of multilateral environmental diplomacy in the 1970s with the following description: “[A]s soon as U.S. legislation designed to protect and enhance the environment was in place, the United States typically proposed that multilateral treaties be negotiated to achieve the same objective.”65 Note, for example, that a major concern in the U.S. decision about whether to sign or ratify the CBD was the question of whether it could be implemented within the existing legal framework protecting endangered species and land resources. This understanding helps explain particularly well the U.S. reluctance on climate change: the United States not only has no preexisting domestic climate change mitigation policy but also has traditionally rejected any sort of tax on energy. This reluctance has been particularly demonstrated in Congress. One analyst points out that eliminating chemicals under the Stockholm Convention on Persistent Organic Pollutants that the United States has not already banned domestically is a particular sticking point in the effort at ratification.66¶ This analysis does not imply that U.S. industry is always cheerful about adopting international environmental regulations, but it does suggest that the existence of previous regulations on the domestic industry change its interests internationally. The example of ozone depletion, a potentially costly regula- tory issue with a reasonably high degree of uncertainty at the time of interna- tional regulation, is illustrative. Although the history of U.S. regulatory efforts on the subject shows that producers and large consumers of CFCs fought initial regulatory efforts (and invoked scientific uncertainty as well as indus- trial cost as arguments against regulation), industry eventually acquiesced to international regulation. The process began domestically, when consumer purchasing habits and pressure from domestic environmental organizations persuaded Congress to include a ban on CFCs in nonessential aerosols in the 1977 Clean Air Act Amendments. That regulation, which the main produc- ers of CFCs fought from the beginning (and attempted to get repealed after it had passed),67 nevertheless put CFC producers and consumers on notice that they would have to come up with alternatives for at least some of their activities. It also fundamentally changed their incentive structure (especially when they realized that increasingly severe domestic regulations were likely). They then were more likely to support international controls on CFCs so that foreign industries with which they competed internationally would have to be bound by the same costly restrictions.¶ Conclusion¶ U.S. leadership (or even level of participation) in international environ- mental agreements has been mixed, and even can be seen as declining in the last decade and a half. To simply attribute this trend to U.S. unilateral urges¶ misses the opportunity, however, to understand when and why the United States is more or less likely to lead internationally on environmental issues. Within a domestic framework that can make international participation dif- ficult, it is nevertheless possible for the United States to exercise international leadership. It tends to do so on issues it has already addressed domestically and where the form of the domestic regulation fits the format of the inter- national regulation being considered. **Under those circumstances, domestic opposition to international action is muted or even avoided because such domestic industries**, which have disproportionate influence on the senators who have to vote for ratification of any international agreements, **either are not additionally disadvantaged by new international regulations or even wel- come those that restrict the actions of their international competitors**. To the extent that the United States returns to global environmental leadership under President Obama, it is at least as likely to be attributable to the change in the composition of the Senate as it is to executive branch leadership.¶ The United States took an early lead in the domestic regulation of many environmental harms in the 1960s and 1970s, and those regulations set the groundwork for many international efforts to deal with the global versions of these problems. It is thus no surprise that the United States would be both willing and able to lead globally in addressing them. To the extent that the United States has more recently ceased in many issue areas to be a domestic innovator on environmental policy, it is also no surprise that the United States resists international action on newer international environmental issues. Although issues such as uncertainty and the effect on the United States of the environmental problem or the costliness of regulatory solutions certainly con- tribute to the difficulty of international regulation, where they are particularly important may be at the level of domestic regulation. **Those who would prefer that the United States lead internationally should perhaps focus their efforts at creating the domestic regulations that give it the incentive to do so**.

### 2NC Tax Solves

#### Taxes work when substitutes exist to replace fertilizer.

David Pearce and Phoebe Koundouri, 2003. University College London, Environmental Science and Technology, Imperial College London; and Reading University and Department of Economics/CSERGE, University College London. “Fertilizer and Pesticide Taxes for Controlling Non-point Agricultural Pollution,” joint report by the World Bank’s Agriculture and Rural Development, Environment, and Water Supply and Sanitation Departments and the International Food Policy Research Institute (IFPRI), siteresources.worldbank.org/INTWRD/903845-1112344347411/20424145/31203ARDenoteWRMEIPearceKoundouri.pdf.

Moreover, pesticides and fertilizers can be expected to be over-used due to risk aversion among farmers. This means that farmers will prefer to over-use them rather than under-use them, the latter option being associated with risks of unacceptable increases in the variance of the profit from crop yield. Hence a tax should reduce pesticide and fertilizer use without giving rise to profit reductions. **This can be achieved in the case of fertilizers, when other technologies are available for replacing artificial fertilizers** (e.g. leguminous crops). However, even if fertilizers and pesticides are used optimally from the standpoint of the farmer's interests, profit reductions may be justified as the price to be paid for reducing environmental externalities.

### 2NC AT: Land Use/Increase Warming

#### Enhancing soil carbon would boost productivity --- this would actually reduce the need for more land.

Claire Schaffnit-Chatterjee, 9/19/2011. Deutsche Bank Research. “Mitigating climate change through agriculture,” [www.dbresearch.com/PROD/DBR\_INTERNET\_EN-PROD/PROD0000000000278568/Mitigating+climate+change+through+agriculture%3A+An+untapped+potential.pdf](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000278568/Mitigating+climate+change+through+agriculture%3A+An+untapped+potential.pdf).

It is important to know whether achieving climate benefits in one place simply displaces land use pressures to another place, which may result in no net reduction in emissions. This concern applies to interventions such as preventing land-clearing in one place or implementing cropping systems which result in lower supply or higher prices: they may lead to non-climate friendly practices taking place somewhere else. There are ways to counter this problem, by assessing the climate impact on a larger scale (even at country level), or limiting the market access to producers who are certified ―climate-friendly‖. However, most types of climate-friendly farming involving carbon sequestration or emissions reduction do not lead to this issue of ―displacing the problem‖ or leakage since they do not significantly increase production costs. As discussed above, enhancing soil carbon in agricultural fields will actually normally increase crop yields and farm income, often resulting in reduced need for land, thus preventing land-clearing.

#### Multiple studies show biochar boosts yields significantly.

Tek Narayan Maraseni, Guangnan Chen, and Qian Guangren, October 2010. Australian Centre for Sustainable Catchments, University of Southern Queensland; National Centre for Engineering in Agriculture, Faculty of Engineering and Surveying, University of Southern Queensland; and School of Environmental & Chemical Engineering, Shanghai University. “Towards a faster and broader application of biochar: appropriate marketing mechanisms,” International Journal of Environmental Studies 67.6, 851–860.

Biochar can be injected directly into soil and can be retained there for several decades to centuries depending on the type of feedstock used and different pyrolysis conditions (temper- ature and heating time) [8–9]. Thus, it has enormous carbon sequestration benefits. Besides the carbon benefits, biochar has many co-benefits for soils, as it: (1) reduces leaching of soil nutrients; (2) enhances nutrient availability for plants; (3) increases water quality of runoff; (4) reduces dependency on artificial fertilizers; (5) reduces toxicity of aluminum to plant roots and microbiota; (6) increases soil structure and pH, thus reducing the need for lime; (7) reduces bioavailability of heavy metals, thus works as bioremediation; and (8) decreases N2O and CH4 emissions from soils, thus further reducing GHG emissions [10–12].¶ Global studies show that biochar has agricultural production benefits. For example in Indonesia, the application of tree bark charcoal at 10 kg/ha increased the yield of maize by about 50% to 15 t/ha largely due to increased fungal colonisation, when added at 500 kg/ha with a N:P:K (15:15:15) fertiliser on an acidic, highly weathered, infertile tropical soil [13]. Similarly in Western Australia, application of banded oil mallee charcoal improved income by up to $96/ha (depending on application amount) at 2007 wheat prices, as the charcoal application improves Vesicular-Arbuscular Mycorrhiza (VAM) colonisation of wheat roots threefold [14]. Experiments in New South Wales indicate that an application of biochar at 10–20 t/ha doubled sweet corn and soya bean yields [15].