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**Advantage One --- Offshoring**

**The solar industry is on the verge of collapse due to oversupply and lack of financing equity.**

**Hinckley 12**—Elias, leads the clean energy practice at Kilpatrick Townsend [“Perfect Storm Brewing for Troubled U.S. Solar Manufacturers,” http://www.consumerenergyreport.com/2012/10/18/perfect-storm-brewing-for-troubled-u-s-solar-manufacturers/]

Three Thoughts on the State of the Solar Market

There has been some upheaval upstream in the solar industry. If you follow the solar business for any reason you know that solar manufacturers are challenged by **excess supply** and dropping panel **prices**, just this week rumors that industry stalwart JA Solar was facing possible delisting by NASDAQ surfaced. There have obviously been some high-profile failures of solar manufacturing companies. None of this should have come as a surprise—industry consolidation was expected (or should have been). Consolidation occurs naturally when an industry or technology moves up the adoption curve—new participants, new approaches to technology, new manufacturing techniques, increased scale and competition all accelerate price declines, which inevitably leaves some early industry participants vulnerable because sunk investment forces higher per unit production costs. In the case of solar, a surprisingly rapid drop in prices for photovoltaic panels was further accelerated by significant Chinese government investment in panel manufacturing capacity. The pace of the price drop surprised much of the industry and **overleveraged** solar manufacturers were caught trying to meet price points that were economically unsustainable. (See more: Wind Tax Credits and the State of Solar: A Discussion With Admiral Dennis McGinn)

So is the industry ready to stabilize? Not quite yet. While longer term the industry looks extremely well positioned for very significant growth, here are three observations about the near-term state of the industry that would keep me awake at night if I were in the business of selling solar panels for the next 12 months.

1) Panel Oversupply is Worse Than You Think

Stories about oversupply and warehouses full of panels are **well documented** –– but this is not the whole story. At the end of December a number of companies (mostly, but not exclusively, developers) took large positions in panels in an effort to qualify the panels and associated projects under the safe harbor for the expiring 1603 Treasury Grant (allowed project owners to take a direct cash grant from the Treasury in lieu of applying tax credits to a renewable energy project). More than a few companies are still looking to place a lot of these panels (rumors are that more than 1GW — enough to put panels on roughly 200,000 houses — of ‘pre-qualified’ panels are sitting in warehouses), creating a disruptive secondary market and undercutting direct demand for new panels from manufacturers.

The disruption of these ‘pre-qualified’ panels may get worse. As more time lapses, the risk associated with the safe harbor qualification is quite **likely to increase**. Separation from purchase time to deployment makes the critical project narrative of a purchase attached to a specific project harder to hold together during the 1603 review process. Additionally, there is a real possibility that the scale of the claims made under the safe harbor may force the Treasury to increase scrutiny over safe harbor qualification. (NOTE: if you are considering buying safe harbored panels, do some serious diligence before committing). Also looming is a potential automatic haircut to the value of the 1603 grant in the event no resolution on sequestration is reached by Congress. In any event, as qualification risk increases discounting will become increasingly necessary to find buyers for these panels, creating further pricing disruption. (See more: First Solar May Supply World’s Largest Solar Farm)

2) The Industry is Short on Tax Equity

There is not nearly enough tax equity in the market to support the projected growth in solar deployment in the U.S. market. Tax equity represents an investment in the tax benefits— the Investment Tax Credit and accelerated tax depreciation—applied to a solar installation (tax equity is also used by other renewable energy projects, as well as low income housing and historic rehabilitation developments). These tax benefits are the **primary vehicles** for federal government subsidy of solar. Tax equity investors generally have low risk tolerance, and expect returns only slightly better than what would be paid for secured debt (really from the investor’s standpoint tax equity is quite similar in character to debt). During 2006 and 2007 there was abundant tax equity available for renewable energy projects, offered primarily by financial institutions. During the financial crisis in 2008 tax equity for energy projects disappeared, slowly returning in 2009, led by JPMorgan, and has grown steadily, albeit slowly through this year. From late 2008 through the end of 2011 the need for tax equity was limited, as the 1603 program was in place to bridge the shortfall in tax equity with respect to the tax credit portion of project finance. Despite some recovery, the return of several tax investors and the emergence of a handful of important new investors, the amount of tax equity available in the market remains far less than necessary to support renewable project development now that the 1603 program has expired.

Without tax equity, there is inadequate project financing capital available in the market and many projects won’t be able to obtain adequate financing and so will not get built (tax equity can provide 50% or more of necessary project finance capital). As of this writing and at least for the near future, the **shortage of tax equity** represents the **most significant bottleneck** in the U.S. solar market. The market will naturally expand to accommodate demand over time (and there are several in the industry, including this author, actively educating potential new investors in an effort to accelerate this expansion). However, tax equity investments are **complex transactions** and as a result the learning curve is steep and adding new investors to the market takes time. This complexity and learning process, combined with the lack of currently active participants is virtually guaranteed to act as **a throttle on the pace of deployment** over the next 12 to 18 months. Once this imbalance corrects itself, and as the importance of tax incentives diminishes, the extraordinary projections for solar deployment in the U.S. market through the next decade will accelerate.

3) We’re Starting to See Some State Regulatory Targets Met

An example is the market of California investor owned utilities (IOUs) as buyers of renewable energy (last year’s disruption in the New Jersey SREC market would be another). Until recently the California IOUs were an assumed off-taker for the electricity and, specifically the RECs, from a solar project—if a solar developer could get power into Cal ISO the IOUs would offer a PPA with some premium for the power being from a renewable source. Today, none of the three large California IOUs are actively engaging in negotiations for output from new projects generating renewable power outside of the state. There are limits on the amount of renewable power that counts against the state renewable portfolio target that can be procured from outside the state, and between active and committed projects, the IOUs have hit their limits for out of state RECs. The decline in certain state regulatory markets may not represent significant impact for solar growth in the U.S.—there is still market interest for California-based renewable generation by the IOUs and other California buyers are still sourcing outside of the state, while entirely new markets like Georgia are emerging—but it does create near-term challenges and uncertainty for developers, slowing project development and with it the immediate need for new panels.

What Does it Mean?

The secondary market created by 1603 safe harbored panels, the tax equity bottleneck and some potential near-term decline (or uncertainty) in the appetite for new RPS driven utility scale solar are combining to create something like a **perfect storm** for distressed panel manufacturers despite unprecedented growth in solar deployment. Distressed manufacturers are facing several more months of challenges in the important U.S. market. Regardless of the outcome of the election, the pace of consolidation will stay high and the downgrades, closures and struggles of solar manufacturers will be a regular part of the energy news cycle.

**The result is solar offshoring, which crushes manufacturing, explodes the trade deficit, and stunts innovation economy wide.**

**Denniger 12** [Matt, Senior Marketing Manager at Adanced Energy, Joe Berwind, AEI Consulting David Tavianini, Air Products Alan Weber, Alan Weber Associates Nasreen Chopra, Alta Devices Cathy Boone, Applied Materials William Morin, Applied Materials Doyle Edwards, Brewer Science Helfried Weinzerl, CH2M Hill Stanley D. Merritt, DuPont Sunil K. Panda, DuPont Greg Bausch, Hemlock Semiconductor Group Scott Graybeal, Intevac Mike Corbett, Linx Consulting Frank Mannarino, Madico Bruce Adams, Matheson Jeff Alleman, NREL John Wohlgemuth, NREL Sarah Kurtz, NREL Ted Quinby, NREL Chris Constantine, Oerlikon Christopher L. O’Brien, Oerlikon Jim Easton, Q Renu Archie Flores, REC Group Mark Williingham, Schiller LLC Brian McMorris, SICK Gordon Brinser, SolarWorld USA Ben Santarris, SolarWorld USA Blair Swezey, SunPower Corporation Doug Rose, SunPower Corporation Julie Blunden, SunPower Corporation Paul Charrette, SunPower Corporation Polly Shaw, Suntech America Kevin Lally, TEL Bill Rever, Consultant Jim Moreland, Consultant, \*All are on the advisory board of for Semiconductor Equipment and Materials International – the global industry association serving the nano—and microelectronics manufacturing supply chains. The SEMI North American PV Advisory Committee consists of representatives from equipment and materials suppliers, cell and module manufacturers, national laboratories and other entities, June 2012, “Manufacturing Solar Photovoltaic Products in the United States,” PV Group, http://www.pvgroup.org/sites/pvgroup.org/files/docs/SEMI-PVGrp\_WhPpr\_MnfctrngSlrPV.pdf]

I. Executive Summary

The objective of this White Paper is to articulate the necessity for U.S. economic development programs designed to retain, attract and increase manufacturing output and employment involved in the rapidly growing photovoltaic (PV) solar industry. Along with most **informed economists**, **analysts** and **researchers** in energy policy, the SEMI PV Group believes that solar PV is at the beginning of a long-term growth cycle and will be a major contributor to energy independence and break from our reliance on fossil fuels in the United States. Today’s approxi- mately $80 billion dollar global solar industry has the potential to grow to **a trillion dollars** in revenues and create as many as **10 million jobs** worldwide in the coming years. How many of these jobs will reside in the United States will be dependent on responsible, sustained public policies and government programs that support manufacturing and technology development. In addition to policies designed to stimulate and support the growth of PV power demand and use, forward-thinking policies are also necessary to assure the U.S. economy derives long-term benefits from job creation, increased adoption and other economic benefits of manufacturing solar products on U.S. soil.

The PV industry is a major job creation engine in the U.S. that accounted for over 100,000 jobs in 2011.1 However, only 24% of these jobs are in manufacturing as a majority of PV cells and modules are made overseas, including many of those manufactured overseas by U.S. companies. The U.S. PV manufacturing industry also includes a **long supply chain** of American equipment and materials suppliers, electrical and installation components, and balance of system products. A GTM Research report2 (2010 data) estimated that overall the U.S. solar supply chain contributed a positive $2 billion to the nation’s trade balance. However, in February 2012, a reversal in trade balance was reported which took the $2 billion surplus in solar products in 2010 to an over $1.5 billion deficit in 2011.3 The deficit in cell and module manufactur- ing will over time lead to migration of some key material manufacturing plants and R&D centers to overseas locations, nearer to their direct cus- tomers. It is a rare American industry that has a trade surplus with China, as was the case for the solar industry in 2010 when estimated surpluses between $247–540 million.

Some theories on globalization suggest that the United States could benefit from the growth of the solar energy industry through advanced technology and science while letting manufacturing investments and jobs migrate to low-cost labor countries in China and other Asian countries. SEMI PV Group believes that balancing PV energy supply and demand within each region will provide greater economic ben- efits and reduce the carbon emissions and dollars required to ship PV in the United StateS

products made in one area of the world for deployment in another. In addition, a recent NREL study,4 showed that shipping costs offset China’s core cost advantage for c-Si module from 1% to -5% and from 10% to -3% for CIGS. While PV creates significant job creation in the installation of solar modules (over 50% of total solar jobs are in installa- tion and sales), long-term job creation in manufacturing will create greater **economic stability** through a greater **multiplier effect** that will generate significant additional employment in **adjacent industries**. Reports from the National Association of Manufacturing (NAM) indicate that each dollar’s worth of manufactured goods creates another $1.43 of activity in other sectors, twice the $.71 multiplier for services. And a chart from U.S. Department of Commerce, Bureau of Economic Analysis provides similar findings.

While the U.S. leads the world in venture capital funding and patent activity for solar technologies, many of these early-stage firms face financing, policy inconsistencies, and other barriers in attempting to scale volume production.

It is important to identify and support ways to retain a sustainable regional manufacturing supply chain to serve the fast-growing regional market for solar power.

This White Paper will conclude with recommendations on key federal public policy issues that have emerged with the globalization of the solar energy supply chain. U.S. state and federal public policies that have fueled the demand for PV solar power have not kept pace with the policy requirements necessary to sustain and grow the supply of PV products and services. The gap between U.S. PV supply and demand needs to be addressed with public policies that enable U.S. manufacturers of solar energy and other renewable energy products to compete more effectively in both U.S. and global markets.

In support of a balanced demand and supply relationship in the solar PV industry, the SEMI PV Group recommends the following policy positions for federal and state policy makers:

• Large, long-term, stable, market-side support policies, including: a national Renewable Clean Energy Standard (RES), state Renewable Portfolio Standards, buyer incen- tive programs, sales and property tax credits, and so on.

• Maintain the Investment Tax Credit (ITC) through 2016

• Extend the Section 1603 Treasury Grant Program that has provided a grant in lieu of the advanced energy investment tax credit (ITC).

• Increase Department of Energy funding for both R&D and manufacturing infrastructure development of the U.S. solar industry

• Establish the R&D tax credit on a long-term basis to assure solar manufacturers greater consistency in tax and investment planning

• Revive the Advanced Energy Manufacturing Tax Credit (MTC), and creation of a federal Green Bank to supplement PV and other green energy projects, particularly for manufacturing.

• Work with foreign counterparts and the WTO to develop a strong, effective and enforceable rules-based international trading system that promotes free and open trade.

II. Solar Energy: A Trillion Dollar Industry

Prices for gasoline and home heating oil will continue to rise. The Middle East will continue to be a region of political, social and economic instability. China, India and other nations are rapidly increasing their demand for fossil fuels. Power plants that burn coal, oil and natural gas, as well as vehicles everywhere, continue to pour millions of tons of pollutants and greenhouse gases into the atmosphere annually, threatening the planet.

Scientists, engineers, investors, economists and policy- makers around the world are responding to these challenges by improving the performance and affordability of solar PV technology to meet an increasing share of new energy demands around the world. Solar PV is in the beginning stages of a 50-year growth cycle that may reach over 1 trillion dollars in revenues by 2030 globally.

Today the solar PV industry contributes less than 0.5% of the world’s electricity, but is already an $80 billion industry. The International Energy Agency (IEA) estimates that with the right support from government policies that PV power will grow its contribution to world’s electricity capacity over 5X by 2020, reaching nearly 5% by 2030 and nearly 11% by 2050.5

We are entering the rapid growth phase of the PV industry that will create financial opportunity, economic growth and jobs.

The conservative IEA solar energy estimates are one of many predictions that see a positive, long term growth for the solar PV industry. The European Photovoltaic Industry Association (EPIA) estimated that compound annual growth of the PV industry will exceed 12%.6 The U.S. Department of Energy says that the PV industry can grow 10-fold and provide up to 14% of the nation’s electricity by 2030 and 18% by 2050.7 **Industry researchers** Navigant Consulting, IMS Research, Solarbuzz, Gartner, Greentech Media, EuPD all see strong, double-digit growth throughout the decade. **Financial analysts** such as Bank of America, Bank Sarazin, Bloomberg New Energy Finance, and Deutsche Bank are all bullish on the long term growth of the solar power industry. Bank of America (Merrill Lynch) sees Clean Technology and PV to be the sixth revolution, on par with the Industrial and Agricultural Revolutions.8

The growth of the industry over the past decade was driven by strong regional governmental policies and incentives, reflecting policymakers’ recognition of the long-term growth potential for clean solar energy, and the substantial contri- bution that solar energy can play in addressing global envi- ronmental challenges. Virtually every developed country in Europe, Asia and North America has public policies that en- courage the use of renewable energies such as solar and wind. The goals of these policies are primarily to reduce the depen- dence on fossil fuels, reduce greenhouse gas emissions and to improve energy security. The primary policy mechanism in the world to promote solar energy has been feed-in-tariffs where energy producers are rewarded at a prescribed level for renewable electricity fed into the grid. Today, approximately 40 countries employ some form of feed-in-tariff to offset the higher price of solar energy and encourage PV deployments. In the United States, tax credits and grants from federal, state and or municipal governments are used to support the purchase of solar power by homeowners, businesses, and utili- ties. Government mandates and targets for renewable energy production, including solar power, have also been used in the United States. Approximately 30 states have implemented Renewable Portfolio Standards (RPS) mandating the use of a specified percentage of electricity generated by renewable sources. Several of those states include a specific portion to be supplied by solar power, supported by performance-based in- centives and procurement programs that reimburse owners for the generation and environmental value of solar production.

The result of these various government incentives and poli- cies has been to jump-start and accelerate the emergence of a truly global PV industry; this in turn has led to technology innovation, capacity expansion and steadily reduced costs to produce and install solar energy systems.

The price of solar power today is approximately **65% less** than 2005. Last year alone, the price of solar declined by 30%.9 As the solar industry continues to realize the benefits of economies of scale production, learning curve efficiencies, and increased PV device efficiency, the price of solar power will continue to decline, reducing the need for government subsidies and achieving the critical inflection point for solar power growth called grid parity.

Grid parity for solar power is the point at which the level- ized cost of electricity (LCOE) produced or delivered by solar panels is equal to or **cheaper than** electricity produced by traditional fossil fuels. Once grid parity is reached, demand for photovoltaic products will dramatically expand without price subsidies. Grid parity will be achieved first in those areas that have a combination of abundant sunshine and comparatively high grid electricity prices, places like California and Texas.

As solar PV power costs continue to decline, solar power will reach grid parity based on a levelized cost of energy (LCOE) beginning now and throughout the decade, depending on local electricity rates and received sunlight. Hawaii is already there; large portions of Southern California are at wholesale grid parity and residential and commercial solar markets and at retail grid parity in much of Northern California.

“Grid parity is not that far away,” said Navigant managing director Lisa Frantzis. “It’s only about two rate cases away.

It’s not 20 years out. It’s right around the corner, and a lot of these utilities are becoming more and more aware of that.”11

Virtually **every expert agrees**: solar power will make a sig- nificant, long-term contribution to the United States energy future. The current era of subsidies and state RPS man- dates—essential to accelerating the industry and establishing the financing and installation infrastructure—will ultimately transition to unsubsidized market-based economics, where solar is directly competitive with conventional grid electricity based on its inherent energy value alone. The solar energy industry will continue to grow and become a major economic force in the world economy, potentially larger than **computers**, **semiconductors** and **pharmaceuticals**.

Over the past decade, policymakers have mostly been focused on encouraging and supporting the demand and development of solar power. In the coming decades, policymakers in the U.S. need to focus on leveraging the economic developments of solar power, particularly the industry’s long-term need to expand manufacturing capacity and manufacturing employ- ment. The solar industry is a global industry serving custom- ers around the world. Companies that manufacture products for the solar PV industry have many options on where to locate manufacturing facilities. With the large volume of solar demand expected in the United States, there are strong economic advantages to locating manufacturing resources next to U.S.-based customers and markets. These economic advantages can be leveraged to increase economic growth and employment, but only if we develop effective public policies that understand the global competitive environment for plant and facility locations.

from such firms as Sunpower, SolarWorld and many Chinese suppliers utilizes many of the same materials and processes as semiconductor technology to optimize electrical perfor- mance. Like other semiconductor devices, the PV crystalline cell manufacturing process begins with raw material silicon that is processed into ingots with specific dopant (type and resistivity) characteristics and then cut into wafers which

are then processed in a “fab” to obtain the semiconducting properties desired. The majority of PV power today is supplied by crystalline silicon PV.

Thin film PV technology from First Solar, Sharp Solar, Oerlikon Solar and Stion use similar manufacturing methods as flat panel displays used in today’s computer monitors, mobile phone displays and flat screen TVs. Thin film solar

Cost reduction in PV modules from 1976 to 2010. Like other electronics industries, the cost to produce PV rapidly decline as volumes increase. As volumes double, PV module has consistently declined by about 20% with variations due to materials shortages, market dynamics and other short term factors.10

III. The Economic Development Opportunity

The solar industry is comprised of a diverse set of technolo- gies, products, manufacturing equipment, materials, sub- systems and ancillary components that collectively constitute a complex and valuable supply chain. According to a Green- tech Media report, there are more than 5,000 companies

in the U.S. solar value chain with at least 39 active facilities manufacturing PV components (polysilicon, wafers, cells, modules, inverters) spread across 17 states.12 While some solar manufacturing operation have closed due to obsolete equipment, uncompetitive technology and other reasons, according to SEIA, in 2010 and 2011, 27 new U.S. solar manufacturing facilities have begun or will begin operations across America, including in Arizona, Ohio, Michigan, Mississippi, Pennsylvania and Tennessee.

Solar PV technology is generally comprised of two types: crystalline silicon and thin film PV. Crystalline silicon PV panels are constructed by depositing extremely thin layers of photosensitive material on to a low-cost backing such as glass, stainless steel or plastic. Once the material is deposited it is typically patterned using laser scribing into thin electri- cally-interconnected strips (glass panels) or in the case of roll- to-roll sheets, mechanically cut into module-sized sections.

U.S. companies are represented in every step of the value chain in both technologies:

• Manufacturing Equipment: According to NPD Solarbuzz, in 2011 approximately $13.1 billion globally was spent on equipment to manufacture and process polysilicon, ingots, and wafers, cell and modules in the solar industry. Many of the leading semiconductor companies that provide manufacturing equipment to the PV industry also serve the semiconductor and flat panel display industries. Companies such as GT Advanced Technologies, Applied Materials, KLA-Tencor, Amtech, and others are key global suppliers to the crystalline silicon PV technology. In thin film, some of the equipment is built by the module manufacturers is customized, but utilizes critical subsystems and components manufactured in the U.S.

• Materials: Polysilicon is the largest cost contributor to crystalline silicon PV solar cells, representing approximately 25% of the total cost of a solar module. In the U.S., three leading polysilicon manufacturers have manufacturing plants: MEMC, Hemlock Semiconductor and REC. In addition, both Wacker Chemie and Hemlock Semicon- ductor have announced billion dollar projects to expand U.S.-based production. Other materials used in the manu- facturing process are glass, wet chemicals, gases, dopants, inks and pastes, encapsulation/backsheets and slurries.

• Solar Cells and Modules: According to Photon International, the U.S. produces 4.8% of the world’s PV solar cells.13 China’s contribution to global cell produc- tion has risen rapidly to account for approximately 48% of the world’s capacity. Rapid price declines of PV modules initiated plant closure announcements at several U.S.-based PV manufacturing facilities: BP Solar’s wafer-cell plant in Maryland, Spectrawatt’s cell plant in New York, Solyndra’s thin film plant in Fremont, California, Energy Conversion Devices plant in Auburn Hill, Michigan and Evergreen Solar’s wafer-cell-module plant in Massachusetts.

New U.S. PV manufacturing plants announced in 2011 include Stion’s CIGS (Copper Indium Gallium Selenide) facility in Mississippi, a 250MW manufacturing site for First Solar in Arizona, Flextronics module assembly plant in California (SunPower partner), and a 400 MW plant by General Electric for producing cadmium-telluride thin

film panels in Colorado. Several other companies have announced plants for new PV manufacturing plants, financed in part by DOE Loan Guarantees, including SoloPower (Oregon). Abound Solar (Colorado/Indiana) has already shut down one of its production lines and plans to upgrade their equipment to produce a more efficient solar panel design. These manufacturing plants represent a cross- section of all technologies. Many of these new facilities are start-ups (thin-film) and are not yet at full mass production.

• Balance of Systems: Manufactured products used in con- junction with solar power include inverters, junction boxes and connectors, transformers, racking, trackers, sensors and controls, anchors and ballasts, and optical components.

• CPV (Concentrated Photovoltaics): CPV uses highest efficiency solar cells originally developed for space applica- tions by leading space companies like Boeing/Spectralab, who manufactures these cells in Southern California. These cells are incorporated into large modules using concentrat- ing technologies. CPV requires high direct normal irradia- tion (DNI) in order to be competitive. The U.S. Southwest is one of the best DNI areas in the world. As CPV mod- ules are bulky and heavy, assembly plants are located close to end-user installation areas. A new assembly plant was opened by U.S. company Amonix in Las Vegas in 2011, however, in January 2012, it laid off 2/3 of the workforce as it retools production. Soitec Solar of France/Germany is currently setting up a 200MW assembly plant in San Diego. Soitec and Amonix are the two CPV players with the larg- est publicly declared project pipelines.

In a widely reported meeting between President Barack Obama and Silicon Valley high tech executives (New York Times, January 21, 2012), President Obama asked the late Steve Jobs, “what would it take to make iPhones in the United States?” Mr. Jobs’s, in reference to highly developed electronics assembly supply chain in China, replied, “Those jobs aren’t coming back.”

Unlike the electronics assembly supply chain, the U.S. solar supply chain is healthy and **among the leaders** in the world. But without effective policies, the U.S. **risks losing** not only solar cells and module manufacturing, but the entire supply chain of high tech and cleantech equip- ment, components, software and materials suppliers.The necessary manufacturing infrastructure of suppliers and service firms is in place; our policy choice is whether to support this source of jobs and competitive advantage or watch it **gravitate to offshore locations**.

IV. The Importance of Solar Products Manufacturing to U.S. Economic Development

Throughout U.S. history, state and federal governments have embraced the responsibility to support economic develop- ment by promoting innovation and competitiveness, and preparing American regions for growth and success in the worldwide economy. Economic development policies typi- cally have job creation and retention as a primary goal and often involve specific efforts in business finance (grants, loans and tax incentives), infrastructure development, technol- ogy transfer, workforce development, business retention and expansion. Policies that support solar products manufacturing in the United States would be consistent with these long-held goals of economic development: job creation and retention.

**Many researchers** have claimed that solar energy is the **most effective and efficient** job creator among all traditional and renewable energy sources. As much as 33 jobs are sup- ported per megawatt (MW) of solar power, in comparison to less than 10 jobs supported for every MW in coal, natural, nuclear and wind power generation. A study by M. Wei et al. also confirms solar PV creates more jobs per unit of electricity output than other alternatives.14 By 2030, an estimated

10 million full-time jobs will be created thanks to the de- velopment of solar energy around the world.15 Where these jobs locate will be subject to a variety of economic, social, geographic, and historical factors—working in concert with government-supported economic development policies. Nearly all developed countries in the world have policies designed to encourage the development of renewable and solar energy for the express goal of job creation and retention.

In the U.S., The Solar Foundation provides the most thor- ough overview of the U.S. solar employment outlook. As of August 2011, the National Solar Jobs Census 2011 identified more than 17,198 solar employment sites and 100,237 solar jobs in all 50 states. The solar workforce grew 6.8% from 2010 to 2011— nearly 10 times the overall national employ- ment growth rate—and is expected to grow an amazing 24% in 2012. Of the total jobs in 2011, 24% are involved in manufacturing.16

While the majority of jobs related to the solar industry have been in the sales and installation of solar products, the full value of manufacturing employment should not be underestimated. Employment multipliers measure how job creation or destruction in a particular industry translates into wider employment changes throughout the economy. Several **empirical studies** have shown that closing of an auto factory, for example, that employs 1,000 people will have a greater impact on the overall economy than the closing of a retail shopping mall that employs 1,000 people. The direct impacts (1,000 jobs lost) are the same; but employment multipliers indicate that manufacturing jobs—due to their relation with other suppliers and service firms—have a greater positive impact on the surrounding economy. The Economic Policy Institute estimates that every 100 jobs in manufacturing support 2.91 jobs elsewhere in the economy, compared to 1.54 jobs in business services.17 Another study by the National Association of Manufacturing (NAM) indicates that each dollar’s worth of manufactured goods creates another $1.43 of activity in other sectors, twice the $.71 multiplier for services.18

The U.S. Bureau of Economic Analysis (USBOA) estimates that about one in six U.S. private sector jobs depend on the U.S. manufacturing base. USBOA estimates that manufactur- ing supported an estimated 18.6 million jobs in the United States in 2009: 11.8 million jobs directly within manufac- turing and more than 6.8 million jobs in sectors outside of manufacturing such as professional services, transportation, retail and agriculture.19 The economic benefits of manufac- turing solar power products are significant and profound.

V. The Link Between U.S. Innovation and U.S. Manufacturing

A major competitive strength of the United States is the col- lective research and development ecosystem that has pro- pelled American high technology companies to world leader- ship positions. In the key sectors of information technology, life sciences, electronics, aerospace and defense, and energy,

a strong synergy between private and public R&D funding has been widely recognized as an essential component of U.S. global competitiveness. Over one-third of global R&D funds are spent in the U.S.; 25% of the global R&D spending on energy is in the U.S.; over 20% of the world’s R&D investment in chemicals and advanced materials is in America. Basic research funded by the National Science Foundation, the National Institute for Science and Technology, the National Institutes of Health, the Department of Defense, and the Department of Commerce enjoy bipartisan support to advance the national health, prosperity and welfare, to help secure the national defense.

It is essential that effective public policy work to link this global leadership in R&D and innovation with employment. The best way to ensure that solar PV innovations developed in government-supported labs benefit the most Americans is to ensure a high percentage of these innovations are manu- factured in the United States. As many new technologies reach volume production levels, they often move to non- U.S. manufacturing locations. Effective public policy and the State and Federal level must seek to retain positive manufacturing and employment outcomes as these firms scale to volume production.

As in other sectors, the United States currently leads the world in solar PV innovation, but has not leveraged this posi- tion into manufacturing job creation. More venture capital in solar energy, more patents and the world’s leading academic R&D efforts are all occurring in the United States than in any other country. According to the Cleantech Group, a San Francisco-based global research organization, venture fund investments in clean technologies reached $8.99 billion in 2011, a 13% increase over 2010.

North America led the world in venture investments with $6.8 billion, 76% of the world total, up 31% over 2010.

Financial Investment

Cleantech mergers and acquisitions reached record highs in 2011 with 391 deals and a dollar volume of $41.2 billion, a robust 153% growth over 2010. Solar was the leading sector by amount invested ($1.81 billion). According to Mercom Capital, over 90% of the VC funding activity in solar was

in the U.S.

In North America, California led the way with $3.69 billion in investments (54% share), followed by Massachusetts ($542 million, 8%) and Colorado (358 million, 5%).

The granting of patents by the United States Patent and Trademark Office (PTO) is another strong indicator of U.S. leadership in solar innovation. Patent awards measure the effectiveness of research and development investments, because not only does it account for the efforts of inventors to develop new and non-obvious innovations, but also the legal and financial requirements needed to shepherd a patent application through the PTO.

Through the first three quarters of 2011, nearly 400 U.S. patents were granted in solar energy, more than all of 2010 and more than double the patents granted in all of 2009. California ranks first in the U.S. in green-tech patents by a wide margin. It had 450 between 2007 and 2009, outpacing New York, which had 300.

Leadership in patents and venture capital funding, however, has not led to significant manufacturing job creation. Experts from NREL, Sandia National Laboratories and others have commented on the gaps in U.S. public policy that fails to leverage the U.S.’s leading role in high technology develop- ment to high volume manufacturing. Start-up companies and new corporate initiatives born in the USA through venture funding, academia connections and national science funding enter a “valley of death” at the commercialization and market entry stage that yield major economic benefits of employment and economic scale.

The challenge for U.S. policy makers is how to retain the benefits of this U.S. innovation to U.S. workers and taxpay- ers. Throughout the 1980s, the United States was the world’s leading producer of high-technology products, including solar products, responsible for more than one-third of total world

production from 1980 to 1987 and for about 30% from 1988 to 1995. In 1998, the United States high-technology industry accounted for 36% of world high-technology production, a level last reached in the 1980s.20

The U.S. share of global high technology exports declined from 21% in 1995 to 14% in 2008. During this time, China’s share of global high tech goods exports more than tripled, from 6% in 1995 to 20% in 2008. According to the National Science Foundation, The U.S. trade balance of high tech products shifted from surplus to deficit, starting in the late 1990s. In 2000, the deficit was $32 billion in current dollars; in 2008, increasing to $80 billion in 2008.21 Solar now has over a $1.5 billion trade deficit and is threatened by the same forces and international competition for manufacturing jobs that affect other high technology industries.

Many economists believe there is a **strong link** between manufacturing and R&D: lose manufacturing and you lose the high-paying jobs in R&D, design and other areas. Lose manufacturing and you lose the entire industry to foreign companies. This is particularly true for process engineering dependent industries like solar PV where continuous improvements in manufacturing processes play a major role in cost reduction and product improvement

In the Harvard Business Review, **Harvard professors** Pisano and Shih wrote, “the decline of manufacturing in a region sets off a chain reaction. Once manufacturing is outsourced, process-engineering expertise can’t be maintained, since it depends on daily interactions with manufacturing. Without process-engineering capabilities, companies find it increasing- ly difficult to conduct advanced research on next-generation process technologies. Without the ability to develop such new processes, they find they can no longer develop new products. In the long term, then, an economy that lacks an infrastructure for advanced process engineering and manufac- turing will lose its **ability to innovate**.”22

**The US is key to the global economy.**

**Caploe 9** (David, CEO of the Singapore-incorporated American Centre for Applied Liberal Arts and Humanities in Asia., *Focus still on America to lead global recovery*, April 7, The Strait Times, lexis)

IN THE aftermath of the G-20 summit, most observers seem to have missed perhaps the most crucial statement of the entire event, made by United States President Barack Obama at his pre-conference meeting with British Prime Minister Gordon Brown: 'The world has become accustomed to the US being a voracious consumer market, the engine that drives a lot of economic growth worldwide,' he said. 'If there is going to be renewed growth, it just can't be the US as the engine.' While superficially sensible, this view is deeply problematic. To begin with, it ignores the fact that the global economy has in fact been **'America-centred**' for more than 60 years. Countries - China, Japan, Canada, Brazil, Korea, Mexico and so on - either sell to the US or they sell to countries that sell to the US. This system has generally been advantageous for all concerned. America gained certain historically unprecedented benefits, but the system also enabled participating countries - first in Western Europe and Japan, and later, many in the Third World - to achieve undreamt-of prosperity. At the same time, this deep inter-connection between the US and the rest of the world also explains how the collapse of a relatively small sector of the US economy - 'sub-prime' housing, logarithmically exponentialised by Wall Street's ingenious chicanery - **has cascaded** into the worst global economic crisis since the Great Depression. To put it simply, Mr Obama doesn't seem to understand that there is **no other engine** for the world economy - and hasn't been for the last six decades. If the US does not drive global economic growth, growth is **not going to happen**. Thus, US policies to deal with the current crisis are critical not just domestically, but also to the entire world. Consequently, it is a matter of global concern that the Obama administration seems to be following Japan's 'model' from the 1990s: allowing major banks to avoid declaring massive losses openly and transparently, and so perpetuating 'zombie' banks - technically alive but in reality dead. As analysts like Nobel laureates Joseph Stiglitz and Paul Krugman have pointed out, the administration's unwillingness to confront US banks is the main reason why they are continuing their increasingly inexplicable credit freeze, thus ravaging the American and global economies. Team Obama seems reluctant to acknowledge the extent to which its policies at home are failing not just there but around the world as well. Which raises the question: If the US can't or won't or doesn't want to be the global economic engine, which country will? The obvious answer is China. But that is unrealistic for three reasons. First, China's economic health is more tied to America's than practically any other country in the world. Indeed, the reason China has so many dollars to invest everywhere - whether in US Treasury bonds or in Africa - is precisely that it has structured its own economy to complement America's. The only way China can serve as the engine of the global economy is if the US starts pulling it first. Second, the US-centred system began at a time when its domestic demand far outstripped that of the rest of the world. The fundamental source of its economic power is its ability to act as the global consumer of last resort. China, however, is a poor country, with low per capita income, even though it will soon pass Japan as the world's second largest economy. There are real possibilities for growth in China's domestic demand. But given its structure as an export-oriented economy, it is doubtful if even a successful Chinese stimulus plan can pull the rest of the world along unless and until China can start selling again to the US on a massive scale. Finally, the key 'system' issue for China - or for the European Union - in thinking about becoming the engine of the world economy - is monetary: What are the implications of having your domestic currency become the global reserve currency? This is an extremely complex issue that the US has struggled with, not always successfully, from 1959 to the present. Without going into detail, it can safely be said that though having the US dollar as the world's medium of exchange has given the US some tremendous advantages, it has also created huge problems, both for America and the global economic system. The Chinese leadership is certainly familiar with this history. It will try to avoid the yuan becoming an international medium of exchange until it feels much more confident in its ability to handle the manifold currency problems that the US has grappled with for decades. Given all this, the US will **remain the engine** of global economic recovery for the **foreseeable future**, even though other countries must certainly help. This crisis began in the US - and it is going to have to be solved there too.

**Economic decline causes nuclear war.**

**Kemp 10** (Geoffrey, Director of Regional Strategic Programs at The Nixon Center, served in the White House under Ronald Reagan, special assistant to the president for national security affairs and senior director for Near East and South Asian affairs on the National Security Council Staff, Former Director, Middle East Arms Control Project at the Carnegie Endowment for International Peace, 2010, *The East Moves West: India, China, and Asia’s Growing Presence in the Middle East*, p. 233-4)

The second scenario, called Mayhem and Chaos, is the opposite of the first scenario; everything that can go wrong does go wrong. The world economic situation weakens rather than strengthens, and India, China, and Japan suffer a major reduction in their growth rates, further weakening the global economy. As a result, energy demand falls and the price of fossil fuels plummets, leading to a financial crisis for the energy-producing states, which are forced to cut back dramatically on expansion programs and social welfare. That in turn leads to **political unrest**: and nurtures different **radical groups**, including, but not limited to, Islamic extremists. The internal stability of some countries is challenged, and there are more “failed states.” Most serious is the collapse of the democratic government in Pakistan and its takeover by Muslim extremists, who then take possession of a large number of **nuclear weapons**. The danger of war between India and Pakistan increases significantly. Iran, always worried about an extremist Pakistan, expands and weaponizes its nuclear program. That further enhances nuclear proliferation in the Middle East, with Saudi Arabia, Turkey, and Egypt joining Israel and Iran as nuclear states. Under these circumstances, the potential for nuclear terrorism increases, and the possibility of a **nuclear terrorist attack** in either the Western world or in the oil-producing states may lead to a further devastating collapse of the world economic market, with a tsunami-like impact on stability. In this scenario, major disruptions can be expected, with dire consequences for two-thirds of the planet’s population.

**There is strong statistical support.**

**Royal 10** (Jedidiah, Director of Cooperative Threat Reduction at the U.S. Department of Defense, M.Phil. Candidate at the University of New South Wales, 2010, *Economic Integration, Economic Signalling and the Problem of Economic Crises*, Economics of War and Peace: Economic, Legal and Political Perspectives, Edited by Ben Goldsmith and Jurgen Brauer, Published by Emerald Group Publishing, ISBN 0857240048, p. 213-215)

Less intuitive is how periods of economic decline may increase the likelihood of external conflict. Political science literature has contributed a moderate degree of attention to the impact of economic decline and the security and defence behaviour of interdependent states. Research in this vein has been considered at systemic, dyadic and national levels. Several notable contributions follow.

First, on the systemic level, Pollins (2008) advances Modelski and Thompson's (1996) work on leadership cycle theory, finding that rhythms in the global economy are associated with the **rise and fall** of a pre-eminent power and the often **bloody transition** from one pre-eminent leader to the next. As such, exogenous shocks such as economic crises could usher in a redistribution of relative power (see also Gilpin. 1981) that leads to **uncertainty** about power balances, increasing the risk of **miscalculation** (Feaver, 1995). Alternatively, even a relatively certain redistribution of power could lead to a permissive environment for conflict as a rising power may seek to challenge a declining power (Werner. 1999). Separately, Pollins (1996) also shows that global economic cycles combined with parallel leadership cycles impact the likelihood of conflict among major, medium and small powers, although he suggests that the causes and connections between global economic conditions and security conditions remain unknown.

Second, on a dyadic level, Copeland's (1996, 2000) theory of trade expectations suggests that 'future expectation of trade' is a significant variable in understanding economic conditions and security behaviour of states. He argues that interdependent states are likely to gain pacific benefits from trade so long as they have an optimistic view of future trade relations. However, if the expectations of future trade decline, particularly for difficult [end page 213] to replace items such as energy resources, the likelihood for **conflict increases**, as states will be inclined to use force to gain access to those resources. Crises could potentially be the trigger for decreased trade expectations either on its own or because it triggers protectionist moves by interdependent states.4

Third, others have considered the link between economic decline and external armed conflict at a national level. Blomberg and Hess (2002) find a strong correlation between internal conflict and external conflict, particularly during periods of economic downturn. They write,

The linkages between internal and external conflict and prosperity are strong and **mutually reinforcing**. Economic conflict tends to spawn **internal conflict**, which in turn returns the favour. Moreover, the presence of a recession tends to **amplify** the extent to which international and external conflicts self-reinforce each other. (Blomberg & Hess, 2002. p. 89)

Economic decline has also been linked with an increase in the likelihood of terrorism (Blomberg, Hess, & Weerapana, 2004), which has the capacity to spill across borders and lead to external tensions.

Furthermore, crises generally reduce the popularity of a sitting government. “Diversionary theory" suggests that, when facing unpopularity arising from economic decline, sitting governments have increased incentives to fabricate external military conflicts to create a **'rally around the flag'** effect. Wang (1996), DeRouen (1995). and Blomberg, Hess, and Thacker (2006) find supporting evidence showing that economic decline and use of force are at least indirectly correlated. Gelpi (1997), Miller (1999), and Kisangani and Pickering (2009) suggest that the tendency towards diversionary tactics are greater for democratic states than autocratic states, due to the fact that democratic leaders are generally more susceptible to being removed from office due to lack of domestic support. DeRouen (2000) has provided evidence showing that periods of weak economic performance in the United States, and thus weak Presidential popularity, are **statistically linked** to an increase in the use of force.

In summary, recent economic scholarship positively correlates economic integration with an increase in the frequency of economic crises, whereas **political science scholarship** links economic decline with external conflict at systemic, dyadic and national levels.5 This implied connection between integration, crises and armed conflict has not featured prominently in the economic-security debate and deserves more attention.

**The plan solves --- REIT’s provide certainty.**

**Runyon 12**—Managing Editor, RenewableEnergyWorld.com and Conference Chair, Renewable energy World North America [Jennifer, Renewable Energy REITs or MLPs Would Unlock Billions for Project Development http://www.power-eng.com/articles/2012/12/renewable-energy-reits-or-mlps-would-unlock-billions-for-project-development.html]

According to Richard Kauffman, Senior Advisor to Secretary of Energy Stephen Chu, making real estate investment trusts (REITs) or master limited partnerships (MLPs) available for renewable energy project financing is **the key** to advancing the industry.

Top engineering, procurement and construction firms gathered to network, learn and do business with corporate-level project developers at the PGI Financial Forum, one of four co-located events taking place in Orlando, Fla. this week. Richard Kauffman, Senior Advisor to the Secretary of the U.S. Department of Energy, gave the keynote address during a luncheon that took place on Wednesday afternoon.

During the luncheon, Kauffman explained to the 100 attendees that as someone who originated from the private sector, in his DOE role he is trying to understand where market forces can be harnessed in order to unleash the flood of investment that is needed to bring about large renewable energy projects.

Kauffman explained what he sees as a disconnect between returns in renewable energy projects compared to returns in other investments. On the one hand, today, renewable energy projects are financed in what he called an “old-fashioned, archaic way” where for the most part, projects rely on private sector money that is looking for high rates of returns, typically around 12-14 percent. On the other hand, money managers, wary of the stock market and its risks, have returned to the bond markets, which offer more steady (but lower) rates of return, in the 5 or 6 percent range. Kauffman explained that this “wall of money” that is looking for a stable rate of return, such as what can be found in the bond markets, could easily invest in renewable energy projects if only the financial vehicle existed that allowed it to. Renewable energy projects with signed power purchase agreements (PPAs) will deliver a healthy rate of return to their investors, one that will be stable for 20 years, exactly what the money managers are looking for.

In other words, he said, there is **all this money looking to invest** in yield but it can’t flow to where it is needed because the **financial vehicles don’t yet exist** that would allow it to.

Enter Real Estate Investment Trusts (REITs) or Master Limited Partnerships (MLPs).

According to Kauffman, REITs and MLPs, function like a bond and are currently used in more mature markets for project development. If they were available to renewable energy projects, said Kauffman, they would **unlock loads of money** for project development. Two separate bills have already been introduced in Congress seeking to allow renewable energy projects to be financed through REITs and MLPs but neither bill has come up for vote yet.

Kauffman asked Financial Forum attendees to imagine for a minute what would happen if MLPs or REITs could be used to finance renewable energy projects. He asked attendees to imagine that they would have a yield of 5 or 6 percent and simply through that yield, the cost of capital would go down **by 50 percent** (since private sector funding demands returns in the 12 to 14 percent range.)

“But I think it would do five other things,” he explained.

First, Kauffman said that renewable energy REITs or MLPs would **accelerate standardization** in the contracting process. With so many projects now eligible for project finance, the markets would demand a streamlined contracting process. This would remove more of the **soft costs** from project development.

Second, these renewable energy financial vehicles would continue to force down solar and other supply chain costs. Kauffman explained that we are good at logistics in the U.S. and if we were funding solar projects at increasing rates, we would improve the logistics in the supply chain. He pointed to the decreasing costs of residential solar customer origination through the explosion in solar leasing as an example of taking costs out of the supply chain.

Third, Kauffman said all of this would then lead to **greater market aggregation** of smaller projects. Large projects backed by stable project developers already have no trouble finding money to fund their projects. Smaller projects, however, have a much more difficult time finding cash. If there were REITs or MLPs available to renewable energy projects, smaller projects could be aggregated. This would again **improve efficiency** and unleash funding for smaller projects.

Fourth, Kauffman believes that REITs or MLPs would **encourage innovation** in the industry. He said that capital markets are **much better** than banks at assessing risk. If a bank provides debt to a large innovative project and that project is unsuccessful, it’s difficult for the bank to recover from that loss. However, imagine a $100 million fund that holds a portfolio of projects. If one project defaults, the fund would still be able to recover because it would hold many other projects as well. “That’s why the capital markets do a better job at assessing risk,” said Kauffman.

Finally, if REITs or MLPs were available to renewable energy projects, the industry would scale **very fast**, which would again drive down costs and even open up the possibility of a forward market. Kauffman said that renewable energy is the only energy source that gets cheaper the more you make. So, more projects coming online would help to align the supply chain and create a forward market.

Since renewable energy is all about the upfront costs, Kauffman believes that there hasn’t been enough thought put into how to reduce the cost of capital to finance projects. REITs or MLPs could play **a huge role** in the future because the way renewable energy projects are being financed today just doesn’t make sense, said Kauffman.

**1AC—Adv 2**

**Advantage Two --- Water**

**Domestic water shortages will become acute in the next decade if rising power demand is met by conventional plan construction.**

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INTRODUCTION

During the drought of 2002, lawmakers in Idaho ruled that five large coal—and gas-fired power plants should be denied water rights for cooling because they would deplete much needed freshwater for drinking and irrigation.1 In Nevada, the 1,580 megawatt (MW) coal-fired Mohave Generation Station was forced to close in 2005 due to lack of groundwater.2 A few years earlier, American National Power had to withdraw its application to build a 1,100 MW natural gas plant near Hillburn, New York, because it created a controversy concerning water rights.3 Far from being isolated examples, water issues have complicated power plant construction or operation in Arizona,4 Georgia,5 California,6 Colorado,7 Massachusetts,8 Missouri,9 New Mexico,10 North Carolina,11 Pennsylvania,12 Rhode Island,13 South Dakota,14 Tennessee,15 Texas,16 and Wisconsin.17

The situation underscores a problem as pressing as it is invisible to many electric utilities, water planners, and even ordinary people: burgeoning water use at conventional thermoelectric power plants. Water use for electric power plants increased five-fold from forty billion gallons per day in 1950 to 195 billion gallons per day in 2000.18 The average power plant in the United States uses about twenty-five gallons of water for every kilowatt-hour (kWh) generated.19 Given that electric utilities produced 4,159,514 gigawatt-hours (GWh) of power in 2007,20 these power plants ostensibly used **104 trillion gallons** of water.21 This amount is enough to **cover the entire country** in two inches of water,22 or to almost **completely fill Lake Erie**.23

This article explores the consequence of the growing water needs of the U.S. electric utility industry, and suggests that lack of water during the summer months in many regions could complicate continued reliance on thermoelectric power plants that combust coal, oil, natural gas, and biomass (or utilize nuclear fission) to generate power. Part I begins by noting the electricity-water nexus and explaining how conventional power plants “use” water by withdrawing and consuming it, placing a special emphasis on the different cooling cycles at thermoelectric power plants. Part II then focuses on how the water needs of the industry may engender a series of water and power crises in eight future metropolitan areas—Atlanta, Charlotte, Chicago, Denver, Houston, Las Vegas, New York, and San Francisco—where water resources will be scarce or declining, especially if electricity demand continues to grow as expected. Part III emphasizes what electric utilities can do to minimize their associated water needs, particularly by promoting energy efficiency, deploying wind and solar photovoltaic power stations, and distributing information and more accurate price signals to electricity customers. The importance of exploring the electricity-water nexus, its associated challenges, and its possible remedies is threefold.

First, a slew of government agencies and industry groups, including the National Research Council,24 U.S. Geologic Survey,25 U.S. Department of Energy,26 U.S. Department of Interior,27 Electric Power Research Institute28, Sandia National Laboratory29, National Energy Technology Laboratory (NETL),30 and the National Renewable Energy Laboratory,31 have recently issued reports focusing on the importance of water use at conventional power plants. These reports, however, mostly argue that better technologies will need to be developed in order to address the industry’s growing water needs. The National Research Council calls on the federal government to increase research and development (R&D) funding for innovative energy technologies that utilize less water,32 while both Sandia and NETL discuss treating and reusing brackish water,33 capturing water vapor from power plants,34 and diffusion driven desalination as important technical options.35 Another study argues that the President should issue an Executive Order granting the Federal Energy Regulatory Commission (FERC) authority to designate select parts of the country “National Electricity-Water Crisis Areas.”36 In December 2008, the Supreme Court heard arguments in Entergy Corporation v. Riverkeeper for and against strengthening the Environmental Protection Agency’s regulations concerning the intake of water at conventional power plants, but the Court has not yet made its decision and the case concerns only the damage of power plant intake structures to fish and aquatic biodiversity.37 Senators Bingaman and Murkowski even introduced legislation in early 2009 to commission a study on electricity-water problems and produce a roadmap, but their bill is uncertain to pass and again focuses on federal action.38 While focusing on federal research and national legislation is indeed important, equally significant is the role that electric utilities, public utility commissioners, and state regulators can undertake to avoid new thermoelectric power plant construction, invest in energy efficiency and **renewable power resources**, and alter electricity prices, either in conjunction with or independent of federal action.

Second, despite this collection of reports, existing electricity planners and water managers do not appear to be responding to electricity and water problems quickly or comprehensively. The Clean Air Task Force has also concluded that “water use and consumption have not been significant factors in decisions related to the permitting and siting of power plants.”39 Peter Gleick has noted that “energy and water issues are rarely integrated into policy.”40 Neither energy nor water planners are consequently trained to think about electricity and water in a systematic way.41 Electricity industry advocates continually downplay the importance of clean energy sources for minimizing thermoelectric water consumption. When assessing solutions to reduce the water use from conventional generators, the Electric Power Research Institute, for example, mentions variable speed electric drives, advanced membranes, ozone disinfection, electro-separation, and freeze-thaw wastewater treatment as important water technologies, but not energy efficiency, demand side management, or renewables.42 Conversely, an influential RAND report43 on water management focuses exclusively on tools such as “supply management” (including the location, development, and exploitation of new sources of water such as building new dams and control structures, desalination plants, arranging for inter-basin transfers of water, reclamation and reuse) and “demand management” (such as water quality matching, privatization, and water pricing) but never once mentions energy policy tools or more efficient power plants.44 This article is an important call for more synergistic thinking that views electricity and water problems as interconnected, especially insofar that energy efficiency and renewable power plants can simultaneously reduce demand for electricity and improve the availability of water.

Third and finally, the challenges related to water scarcity and electricity are not confined to the United States. The Central Intelligence Agency believes that more than three billion people will be living in water-stressed regions around the world by 2015 (with a majority concentrated in North Africa and China). Water tables for major grain producing areas in northern China are dropping at a rate of five feet per year, and per capita water availability in India expected to drop fifty to seventy-five percent over the next decade.45 The American Museum of Natural History reports that about 900 million people spread across twenty-seven developing countries already lack adequate access to water.46 Thus, an exploration of how utilities in the United States may respond to electricity-water crises **can offer policymakers insight** into how the industry can address what is sure to become a pressing **global dilemma**.

Almost all conventional power plants, including coal, oil, natural gas, and nuclear facilities, employ one of three types of cooling cycles in their generation of electricity. Once-through cooling systems withdraw water from a source, circulate it, and return it to the surface body. Re-circulating or closed-loop systems withdraw water and then recycle it within the power system instead of discharging it. Dry cooling systems, which are not widely adopted, use air instead of water to cool power stations.

As their name implies, once-through cooling systems, or “open-loop” systems, only use water once as it passes through a condenser to absorb heat. After it passes through the plant, heated and treated water is then discharged

downstream from its point of intake to a receiving body of water.47 Since such cooling systems release heated water back to the source, they can further contribute to evaporative loss by raising the temperature of receiving water bodies.48 Once-through systems are responsible for withdrawing ninety-one percent of the nation’s water used for power plants, and are also utilized by more than half of the country’s fleet of nuclear reactors.49

Re-circulating or closed-loop systems, by recycling water, withdraw much less of it but tend to consume more. To maintain plant performance, water is frequently discharged from the system at regular intervals into a receiving body of water or collection pond, but is otherwise recycled as much as possible. Since it is being reused, the water requires more chemical treatment to eliminate naturally occurring salts and solids that accumulate as water evaporates. Closed—loop systems also rely on greater amounts of water for cleaning and therefore return less water to the cooling cycle.50

Dry-cooling, an approach that replaces evaporative cooling towers in closed-loop systems with cooling towers dependent entirely on air, works best in colder weather and in arid environments.51 Only a very small number of plants rely on dry cooling, since they lower plant efficiency and cost the most.52

When taken together, the once-through, closed, and dry cooling systems in place at these power plants use a significant amount of water. (The term “use” encompasses both water consumption53 and water withdrawal).54 Using the most recently available data from the U.S. Geologic Survey,55 thermoelectric power plants used more than 195 billion of these gallons of water per day, or forty—seven percent of the nation’s total, in 2000 (See Figures 1 and 2). According to the U.S. Geologic Survey, water withdrawals for thermoelectric generators differ greatly by state. When looked at geographically, Texas withdrew the largest amount of water; Illinois, Texas, and Tennessee accounted for twenty-two percent of all total freshwater withdrawals; and California and Florida accounted for more than forty percent of saline surface water withdrawals (See Table 1 and Figure 3). This means that, on average, thermoelectric generators use more water than the entire country’s agricultural and horticultural industry.56

Such immense water needs produce equally immense concerns given the likelihood of future droughts and shortages, especially during the summer months. Even under normal conditions, water managers in thirty-six states anticipate shortages in the next ten years.61 Similarly, using a historical database of droughts going back to 1895, the U.S. Geologic Survey has predicted that almost one-fourth of the country will risk severe droughts by 2040.62 The most severely hit part of the country will be the West. As early as 2025, the U.S. Department of Interior cautions that “demands for water in many basins of the West exceed the available supply even in normal years.”63 Given the intensity of the existing electricity industry’s water needs, if it grows as predicted, it will **directly trade off** with the water available for drinking, **industry**, and **agriculture**. Utilizing data from the U.S. Census Bureau, U.S. Energy Information Administration, U.S. Geologic Survey and National Oceanic and Atmospheric Administration, it appears that these tradeoffs will become most severe in twenty large metropolitan areas.64

These regions of the country expect to add at least 2,700 MW of thermoelectric capacity and will experience population growth of at least 500 people per square mile. Thus, these regions will face water shortages of at least 1.52 inches in the summer by 2025 (See Table 2).65

**Solar power displaces enough water intensive production to avoid water shortages.**

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Finally, electric utilities can draw on two types of electricity generators that require almost **no water at all**: solar panels and wind farms. Solar PV systems use about 0.03 gal of water per kWh and wind turbines 0.001 gal of water per kWh. Solar thus uses **145 times less** water per unit of output and wind about 180 times less water than conventional coal and nuclear power plants (see Fig. 8).

Fortuitously, the United States has an **enormous cache** of these renewable energy resources. While a bit dated, a comprehensive study undertaken by the US Department of Energy (1989) calculated that more than fifty percent of all domestically available energy resources were in the form of just wind and solar (see Fig. 9). The amount of wind and solar resources found within the country, in other words, amounted to a resource base the equivalent of more than 300,000 billion barrels of oil, or over **20,000 times** the annual rate of national energy consumption at that time. Perhaps the only other terrestrial source of so much energy would be fast breeder nuclear reactors or nuclear fusion, both technologies that are still at least twenty to thirty years away and would likely require large amounts of water. While the DOE’s estimate is more than 20 years old, it is referenced here because it was reviewed and validated by researchers at USGS, ORNL, Pacific Northwest National Laboratory, Sandia National Laboratory, NREL, the Colorado School of Mines, and Pennsylvania State University. Using a compilation of **published**, **nonpartisan**, and **peer-reviewed** estimates (and excluding estimates from manufacturers and trade associations), the UnitedStates currently has about 2,998,000 MW of technical wind and solar PV potential (Sovacool, 2008, p. 95). That is, wind and solar PV power plants alone have the capability to provide almost three times the total amount of installed electricity capacity operating in 2008, and so far the country has harnessed less than one percent of this possible generation.

**Those shortages will collapse the American agricultural base.**

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If electric utilities build the thermoelectric capacity planned for by 2025, those new power plants would need about 14.6 billion gallons of water per day, potentially conflicting with the city’s drinking water needs. The Natural Resources Defense Council has noted that Houston used to depend primarily on groundwater to provide 80% of its drinking water supply, but rapid depletion has lowered that amount to only 67% today, forcing the city to take more water from the Trinity, San Leon, and San Jacinto Rivers (along with the reservoirs they support) (Natural Resources Defense Council, 2003). These rivers, however, are precisely the ones where new power plants will likely be built, and where existing power plants, such as the 2211 MW P.H. Robinson coal facility and the 1498 MW Cedar Bayou natural gas facility, already draw their water from. With Houston water planners predicting rising demands for drinking water, there may not be enough water for both power plants and Houston residents.

Surface water upstream from Houston is also needed to irrigate agriculture. During the last serious water shortage caused by a prolonged drought in 1996, the **agricultural sector** was the **first to suffer** as water was diverted to supply power plants and drinking water systems. In June 1996, for instance, lack of water induced agricultural losses for cotton, wheat, feed grains, cattle, and corn at a cost of $2.4 billion for Texas, with an additional $4.1 billion in losses for agriculture-related industries such as harvesting, trucking, and food processing. Reduced irrigation also contributed to a drop in vegetable production, with concomitant losses in jobs and income and drastic increases in the price of foodstuffs (Wilhite, 2006).

4.2. Atlanta, Georgia

Georgia Power and Southern Company have reported to the EIA that they intend to build at least 3480 MW of new capacity between 2000 and 2025, power plants that would consume 13.7 billion gallons of water per year and withdraw an additional 672.2 billion gallons of water. Fed by the waters of the Chattahoochee and Chestatee rivers, Lake Sidney Lanier, a federally managed reservoir, provides most of Atlanta’s drinking water. While Lake Lanier has the potential to hold almost 1.1 million acre feet of water, however, four years of a recent drought have taken their toll and the reservoir was at a historic 18 feet below its average level in late 2007. The drought was so serious that US Army Corps of Engineers is rewrote control manuals for vessel navigation on low river levels, and the federal government had to intervene in water discussions between Georgia, Tennessee, Alabama, and Florida.

Thermoelectric plants use slightly more than half of all surface water within Georgia, and those that consume and withdraw water in the northern part of the state reduce flows to Lake Lanier (Southern Alliance for Clean Energy, 2007). The most immediate consequence of increased thermoelectric water consumption in Atlanta could therefore be eventual tradeoffs with other major **industrial and commercial** water users in the region. These include Georgia-Pacific Corporation (one of the world’s largest manufacturers of tissue, packaging, paper, pulp and building products), Mohawk Industries (the world’s largest producer of flooring and carpets), and the city’s water utility, as well as the Coca-Cola Corporation, Pepsi Cola Corporation, Lockheed Martin Corporation, and Edwards Baking Corporation. Together, these industries and corporations report billions of dollars of gross sales every year.

If Atlanta runs drastically short of water, a state-wide crisis could ensue as inter-basin water transfers across the 17-county metropolitan area increase, especially from the **Coosa River Basin** (Johnson et al., 2007). Greater water consumption for new power plants near Atlanta could contribute to the deterioration of ground water quality throughout Georgia, especially since aquifers in the middle of the state are already heavily tapped. A 2005 assessment of ground water conditions found that at least 16 groundwater sources were below the 25th percentile water level for the period on record (Leeth, 2005). State policymakers seem to recognize this, and a fierce legal battle has erupted. Georgia is fighting to hold back more water along its river basins and reservoirs, but Florida and Alabama have argued that Georgia has mismanaged water resources and that extra Georgian withdrawals would dry up river flows that support out of state power plants, farms, fisheries, and industrial users along the river (Evans, 2008). Alabama, for example, says that restrictions on water use in Georgia would impede electricity production at their Farley Nuclear Plant, also on the Chathoochee River, threatening power outages among 8,00,000 residents in three states. Tri-statewater negotiations have so far only precipitated in eight active lawsuits, and Georgia’s state assembly passed a resolution calling on the governor to set up a commission looking into having the border redrawn through the middle of Chattanooga, Tennessee. Resolutions were later introduced in both the state House and Senate to annex part of Tennessee to increase Georgia’s access to water (Sovacool, 2009).

4.3. Las Vegas, Nevada

Nevada Power Company and Sierra Pacific Power Company intend to add 20,148 MW of thermoelectric capacity between 2000 and 2025, power plants that would consume 78.8 billion gallons of water per year and withdraw an additional 3.86 trillion gallons of water. State demographers expect the addition of another 1.6 million residents, or an increase in population of more than 80%, to the Las Vegas area from 2008 to 2026 (Illis, 2007). Water is so important for the region that state Representative Jon Porter calls it “liquid gold” (Young, 2003, p. 2). Because of its arid climate, more than 90% of the water for Las Vegas comes from Lake Mead on the Colorado River. Lake Mead, one of the largest reservoirs in the world, was created by the Hoover Dam’s blockage of the Colorado River (which receives most of its water from melting snowpack). It holds roughly the same amount of water flowing through that very river over a two-year period. During the past decade a shortage of precipitation has induced a widespread drought and a serious decline in water levels. The National Aeronautics and Space Administration (NASA, 2004) and the US Drought Monitor placed the Lake Mead region in “extreme hydrological drought,” only one category above the worst in their drought intensity scale. Researchers from the Federal Bureau of Land Reclamation estimate that the Lake Mead water system is losing 326 billion gallons of water per year (Madrigal, 2008). This water loss is so significant that it can easily be seen from satellite images from space.

An increase in the water needs for Nevada Power’s generation portfolio could directly deplete more water from Lake Mead, which supplies cooling water for a majority of the power plants operating in the region. The Nevada Department of Conservation and Natural Resources and the Nevada Division of Environmental Protection report that the thermoelectric capacity additions sought by Sierra Pacific and Nevada Power Company could need an additional 1.38 trillion gallons of water per year coming from Lake Mead by 2010 (Saunders, 2005).

If Lake Mead continues to be depleted, the result could be an agricultural crisis. Lake Mead, in addition to providing drinking water to the Las Vegas Valley Water District and cooling water for power plants, affects the availability of water for downstream withdrawals from the Colorado River. These downstream withdrawals directly irrigate about a million acres of farmland in southern California’s Imperial Valley, and another half million acres in northern Mexico as part of an international water treaty. In addition, the water in Lake Mead powers the Hoover dam whose electricity feeds into 5,00,000 homes and pumps water over the Sierra Nevada Mountains to irrigate southern California (Allen and Simmon, 2003). If water continues to be depleted from Lake Mead faster than it can be replenished, **agricultural collapse** could strike the entire region and possibly **spread to Mexico**.

**US agriculture is key to prevent global food wars.**

**Klare 12** [Michael, Professor of peace and world security studies at Hampshire College, As Food Prices Rise, Dangers of Social Unrest Seem Imminent, August 9, http://highbrowmagazine.com/1459-food-prices-rise-dangers-potential-social-unrest-seem-imminent]

The Great Drought of 2012 has yet to come to an end, but we already know that its consequences will be severe. With more than one-half of America’s counties designated as drought disaster areas, the 2012 harvest of corn, soybeans, and other food staples is guaranteed to fall far short of predictions. This, in turn, will boost food prices domestically and abroad, causing increased misery for farmers and low-income Americans and far greater hardship for poor people in countries that rely on imported U.S. grains.

This, however, is just the beginning of the likely consequences: If history is any guide, rising food prices of this sort will also lead to widespread social unrest and violent conflict.

Food—affordable food—is essential to **human survival** and well-being. Take that away, and people become anxious, desperate, and angry. In the United States, food represents only about 13 percent of the average household budget, a relatively small share, so a boost in food prices in 2013 will probably not prove overly taxing for most middle—and upper-income families. It could, however, produce considerable hardship for poor and unemployed Americans with limited resources.

“You are talking about a real bite out of family budgets,” commented Ernie Gross, an agricultural economist at Omaha’s Creighton University. This could add to the discontent already evident in depressed and high-unemployment areas, perhaps prompting an intensified backlash against incumbent politicians and other forms of dissent and unrest.

It is in the international arena, however, that the Great Drought is likely to have its most devastating effects. Because so many nations depend on grain imports from the U.S. to supplement their own harvests, and because intense drought and floods are damaging crops elsewhere as well, food supplies are expected to shrink and prices to rise across the planet.

“What happens to the U.S. supply has immense impact around the world,” says Robert Thompson, a food expert at the Chicago Council on Global Affairs. As the crops most affected by the drought, corn and soybeans, disappear from world markets, he noted, the price of all grains, including wheat, is likely to soar, causing immense hardship to those who already have trouble affording enough food to feed their families.

The Hunger Games, 2007-2011

What happens next is, of course, impossible to predict, but if the recent past is any guide, it could turn ugly. In 2007-2008, when rice, corn, and wheat experienced prices hikes of 100 percent or more, sharply higher prices—especially for bread—sparked “food riots” in more than two dozen countries, including **Bangladesh**, **Cameroon**, **Egypt**, **Haiti**, **Indonesia**, **Senegal**, and **Yemen**. In Haiti, the rioting became so violent and public confidence in the government’s ability to address the problem dropped so precipitously that the Haitian Senate voted to oust the country’s prime minister, Jacques-Édouard Alexis. In other countries, angry protestors clashed with army and police forces, leaving scores dead.

Those price increases of 2007-2008 were largely attributed to the soaring cost of oil, which made food production more expensive. (Oil’s use is widespread in farming operations, irrigation, food delivery, and pesticide manufacture.) At the same time, increasing amounts of cropland worldwide were being diverted from food crops to the cultivation of plants used in making biofuels.

The next price spike in 2010-11 was, however, closely associated with climate change. An intense drought gripped much of eastern Russia during the summer of 2010, reducing the wheat harvest in that breadbasket region by one-fifth and prompting Moscow to ban all wheat exports. Drought also hurt China’s grain harvest, while intense flooding destroyed much of Australia’s wheat crop. Together with other extreme-weather-related effects, these disasters sent wheat prices soaring by more than 50 percent and the price of most food staples by 32 percent.

Once again, a surge in food prices resulted in widespread social unrest, this time concentrated in North Africa and the Middle East. The earliest protests arose over the cost of staples in Algeria and then Tunisia, where—no coincidence—the precipitating event was a young food vendor, Mohamed Bouazizi, setting himself on fire to protest government harassment. Anger over rising food and fuel prices combined with long-simmering resentments about government repression and corruption sparked what became known as the Arab Spring. The rising cost of basic staples, especially a loaf of bread, was also a cause of unrest in **Egypt**, **Jordan**, and **Sudan**. Other factors, notably anger at entrenched autocratic regimes, may have proved more powerful in those places, but as the author of Tropic of Chaos, Christian Parenti, wrote, “The initial trouble was traceable, at least in part, to the price of that loaf of bread.”

As for the current drought, analysts are already warning of **instability in Africa**, where corn is a major staple, and of increased popular **unrest in China**, where food prices are expected to rise at a time of growing hardship for that country’s vast pool of low-income, migratory workers and poor peasants. Higher food prices in the U.S. and China could also lead to reduced consumer spending on other goods, further contributing to the slowdown in the global economy and producing yet more worldwide misery, with unpredictable social consequences.

The Hunger Games, 2012-?

If this was just one bad harvest, occurring in only one country, the world would undoubtedly absorb the ensuing hardship and expect to bounce back in the years to come. Unfortunately, it’s becoming evident that the Great Drought of 2012 is not a one-off event in a single heartland nation, but rather an inevitable consequence of global warming which is only going to intensify. As a result, we can expect not just more bad years of extreme heat, but worse years, hotter and more often, and not just in the United States, but globally for the indefinite future.

Until recently, most scientists were reluctant to blame particular storms or droughts on global warming. Now, however, a growing number of scientists believe that such links can be demonstrated in certain cases. In one recent study focused on extreme weather events in 2011, for instance, climate specialists at the National Oceanic and Atmospheric Administration (NOAA) and Great Britain’s National Weather Service concluded that human-induced climate change has made intense heat waves of the kind experienced in Texas in 2011 more likely than ever before. Published in the Bulletin of the American Meteorological Society, it reported that global warming had ensured that the incidence of that Texas heat wave was 20 times more likely than it would have been in 1960; similarly, abnormally warm temperatures like those experienced in Britain last November were said to be 62 times as likely because of global warming.

It is still too early to apply the methodology used by these scientists to calculating the effect of global warming on the heat waves of 2012, which are proving to be far more severe, but we can assume the level of correlation will be high. And what can we expect in the future, as the warming gains momentum?

When we think about climate change (if we think about it at all), we envision rising temperatures, prolonged droughts, freakish storms, hellish wildfires, and rising sea levels. Among other things, this will result in damaged infrastructure and diminished food supplies. These are, of course, manifestations of warming in the physical world, not the social world we all inhabit and rely on for so many aspects of our daily well-being and survival. The purely physical effects of climate change will, no doubt, prove catastrophic. But the social effects including, somewhere down the line, food riots, mass starvation, state collapse, mass migrations, and conflicts of every sort, up to and including full-scale war, could prove even more disruptive and deadly.

In her immensely successful young-adult novel, The Hunger Games (and the movie that followed), Suzanne Collins riveted millions with a portrait of a dystopian, resource-scarce, post-apocalyptic future where once-rebellious “districts” in an impoverished North America must supply two teenagers each year for a series of televised gladiatorial games that end in death for all but one of the youthful contestants.

These “hunger games” are intended as recompense for the damage inflicted on the victorious capitol of Panem by the rebellious districts during an insurrection. Without specifically mentioning global warming, Collins makes it clear that climate change was significantly responsible for the hunger that shadows the North American continent in this future era. Hence, as the gladiatorial contestants are about to be selected, the mayor of District 12’s principal city describes “the disasters, the droughts, the storms, the fires, the encroaching seas that swallowed up so much of the land [and] the brutal war for what little sustenance remained.”

In this, Collins was prescient, even if her specific vision of the violence on which such a world might be organized is fantasy. While we may never see her version of those hunger games, do not doubt that some version of them will come into existence—that, in fact, **hunger wars** of many sorts will fill our future. These could include any combination or permutation of the deadly riots that led to the 2008 collapse of **Haiti’s government**, the pitched battles between massed protesters and security forces that engulfed parts of Cairo as the Arab Spring developed, the ethnic struggles over disputed croplands and water sources that have made **Darfur** a recurring headline of horror in our world, or the inequitable distribution of agricultural land that continues to fuel the insurgency of the Maoist-inspired **Naxalites of India**.

Combine such conflicts with another likelihood: that persistent drought and hunger will force millions of people to abandon their traditional lands and flee to the squalor of shantytowns and expanding slums surrounding large cities, sparking hostility from those already living there. One such eruption, with grisly results, occurred in Johannesburg’s shantytowns in 2008 when desperately poor and hungry migrants from Malawi and Zimbabwe were set upon, beaten, and in some cases burned to death by poor South Africans. One terrified Zimbabwean, cowering in a police station from the raging mobs, said she fled her country because “there is no work and no food.” And count on something else: millions more in the coming decades, pressed by disasters ranging from drought and flood to rising sea levels, will try to migrate to other countries, provoking even greater hostility. And that hardly begins to exhaust the possibilities that lie in our hunger-games future.

At this point, the focus is understandably on the immediate consequences of the still ongoing Great Drought: dying crops, shrunken harvests, and rising food prices. But keep an eye out for the social and political effects that undoubtedly won’t begin to show up here or globally until later this year or 2013. Better than any **academic study**, these will offer us a hint of what we can expect in the coming decades from a hunger-games world of rising temperatures, persistent droughts, recurring food shortages, and **billions of famished**, **desperate people**.

**Extinction.**

**Lugar 2k**—Chairman of the Senator Foreign Relations Committee and Member/Former Chair of the Senate Agriculture Committee [Richard, a US Senator from Indiana, is Chairman of the Senate Foreign Relations Committee, and a member and former chairman of the Senate Agriculture Committee. “calls for a new green revolution to combat global warming and reduce world instability,” http://www.unep.org/OurPlanet/imgversn/143/lugar.html]

In a world confronted by global terrorism, turmoil in the Middle East, burgeoning nuclear threats and other crises, it is easy to lose sight of the long-range challenges. But we do so at our peril. One of the most daunting of them is meeting the world’s need for food and energy in this century. At stake is not only preventing starvation and saving the environment, but also world peace and security. History tells us that states may go to war over access to resources, and that poverty and famine have often bred fanaticism and terrorism. Working to feed the world will minimize factors that contribute to **global instability** and the proliferation of [**WMDs**] weapons of mass destruction. With the world population expected to grow from 6 billion people today to 9 billion by mid-century, the demand for affordable food will increasewell beyond current international production levels. People in rapidly developing nations will have the means greatly to improve their standard of living and caloric intake. Inevitably, that means eating more meat. This will raise demand for feed grain at the same time that the growing world population will need vastly more basic food to eat. Complicating a solution to this problem is a dynamic that must be better understood in the West: developing countries often use limited arable land to expand cities to house their growing populations. As good land disappears, people destroy **timber** resources and even **rainforests** as they try to create more arable land to feed themselves. The long-term environmental consequences could be disastrous for the entire globe. Productivity revolution To meet the expected demand for food over the next 50 years, we in the United States will have to grow roughly three times more food on the land we have. That’s a tall order. My farm in Marion County, Indiana, for example, yields on average 8.3 to 8.6 tonnes of corn per hectare—typical for a farm in central Indiana. To triple our production by 2050, we will have to produce an annual average of 25 tonnes per hectare. Can we possibly boost output that much? Well, it’s been done before. Advances in the use of fertilizer and water, improved machinery and better tilling techniques combined to generate a threefold increase in yields since 1935—on our farm back then, my dad produced 2.8 to 3 tonnes per hectare. Much US agriculture has seen similar increases. But of course there is no guarantee that we can achieve those results again. Given the urgency of expanding food production to meet world demand, we must invest much more in scientific research and target that money toward projects that promise to have significant national and global impact. For the United States, that will mean a major shift in the way we conduct and fund agricultural science. Fundamental research will generate the innovations that will be necessary to feed the world. The United States can take a leading position in a productivity revolution. And our success at increasing food production may play a decisive humanitarian role in the survival of billions of people and the health of our planet.

**1AC—Adv 3**

**Advantage Three --- Germany**

**The plan is key to German modeling --- moves them from away from feed-in-tariffs.**

**Sturtevant 10**—George Washington University Solar Institute [Josh, J.D. from George Washington University Law School, Legal Associate at Distributed Sun LLC, in-house legal fellow at a renewable energy financing and development firm, “The Solar REIT: A Vision for the Future of German Solar Development,” BlawgConomics, November 10, 2010, blawgconomics.blogspot.com/2010/11/solar-reit-vision-for-future-of-german.html]

As part of that proposal, we suggested that developers in other countries might eventually take advantage of such schemes as well, and since the initial posting we even posted a small blurb about the potential for a solar real estate investment trust (S-REIT) regime in Italy (albeit with little to no analysis on how such a change would be facilitated). Today our attention shifts slightly north of the Italian peninsula to Germany, another very logical candidate for S-REIT adoption. Germany currently has a comparatively robust renewables sector, greatly aided by current government regulatory schemes, most notably feed-in tariffs. However, feed-in tariffs are not permanent, and may outlive their useful lives. In this light, and based on the desire of Germany to continue to increase its percentage of energy mix from renewables, developing a more permanent means for facilitating solar development might be an attractive solution. Though this article will not address the exact changes to the German code that would be required to facilitate such a development, it is possible that, similar to the US, all that would be required is clarification from tax authorities. Indeed, as is noted below, the German and US REIT systems are quite similar, as many of the German REIT regulations are **borrowed directly** from the **US model**. Of course the political realities of the two nations are vastly different, and it is always tricky business to make broad generalizations (particularly as your author admittedly has limited experience with the German system). However, it is at least possible that any changes adopted in the US would be **considered favorably** by German officials, particularly with the existence of a poweful green lobby in the latter nation. In any case, with an established and growing REIT structure combined with a clear appetite for solar development, the pieces are already firmly in place if the political will for such a change were to develop. Future development may require further innovative thinking First, a brief description of Germany’s REIT system. German REITs, or G-REITs have only recently come into being. The establishment of the structure was meant to facilitate more tax-effective property ownership. According to the Deutsche Börse Group (the group that runs the main stock exchange for Germany, the Frankfurt Stock Exchange, which is the equivalent to the New York Stock Exchange in America) 73% of German companies own property while only 25% of companies own property in the US. Also according to Deutsche Börse, the largest 65 listed companies in Germany have property reserves of over €80 billion. REITs may allow some of this locked-up value to be realized, a potential boon for German companies and their shareholders. Following are some basics on G-REITs: • Companies pay no corporate income or trade tax. Earnings of G-REITs are paid to share holders and taxed individually. In other words, dividends paid are taxed as investment income for the shareholder. • At least 75 percent of the capital of G-REITs must be invested in property. • 90 percent of earnings must be paid out to share holders • 75 percent of revenue must be from fixed assets. • G-REITs must be listed in an organized market such as the General or Prime Standard. • G-REITs must have their headquarters in Germany. • Finally, G-REITs must have an initial capital of at least 15 million Euro. Those familiar with the REIT structure in the US will undoubtedly recognize that many of the general rules governing G-REITs **mirror** their American counterparts. While German REITs were only introduced in 2007, foreign REITs have been listed in the country for some time, and over 150 currently trade on the Frankfurt Stock Exchange. There now currently appear to be three German property companies trading as REITs on the Frankfurt including an office REIT, a diversified REIT and a retail REIT. It is clear that the trade of foreign REITs on the Frankfurt has created a familiarity with the structure in Germany. Meanwhile, the recent laws have facilitated the creation of Germany’s own REIT structure. This familiarity as well as the proper legal framework indicate that the nation is fully comfortable with the idea of publicly listed firms owning income-producing property, opening the door for broader use of the REIT structure in the future. We now turn to the appetite for solar development in Germany. Incidentally, it is enormous, and it is claimed that Germany is one of the top nations, if not the top nation, for solar development. It is generally accepted that the reason for Germany’s rise as a solar power is a result of its government subsidization scheme, heavily reliant on feed-in tariffs, which has stimulated developers to provide an ever-increasing proportion of the state’s energy mix. The most simple explanation of a feed-in tariff (FiT) is that it is a policy providing for grid access, long-term contracts and methodological pricing via government set compensation rates ( under contracts which usually last from 15-25 years). The goal of such policies is to stimulate development of solar and other renewables in the short-term, and push pricing of these sources toward levels comparable to fossil fuels (a concept referred to as grid parity) in the long-term. This long-term goal is facilitated by technological improvements made by the industry during the subsidy stage. There are several features which make FiTs possible. First, the set prices are usually maintained by passing costs through to consumers, whether directly or through taxes. Though it often takes some political capital to establish this initially, these costs are not typically prohibitive for reasons including the natural decrease in the FiT over time (a concept referred to as tariff digression), technological improvements, and the caps that many jurisdictions place on how much energy can be priced at the set compensation rate. There are also typically government mandates for utilities to provide a certain percentage of their energy supply from renewable sources, similar to renewable portfolio standards. Finally, it is important to note that feed-in tariffs are typically phased out over time as technology is presumed to improve over the life of the scheme, and as grid parity hopefully comes closer to being a reality. In Germany, FiT law underwent a restructuring in 2000 under the Act on Granting Priority to Renewable Energy Sources (‘Erneuerbare Energien Gesetz’). Some have claimed that this revamped structure has created the world’s most effective policy framework at accelerating the deployment of renewable energy technologies. The major features include: • purchase prices which are methodologically based on the cost of generation from the various renewable energy sources, leading to different prices for different sources and sizes to account for economies of scale; • purchase guarantees which last for a period of 20 years; • the ability for utilities to participate, and; • tariff degression In Germany and elsewhere, such mechanisms have proven necessary in the past as a lack of grid parity has made it difficult for solar developers to achieve solid returns otherwise. Indeed, according to a European Commission report, ‘well-adapted feed-in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity.’ According to at least one source, feed-in tariffs are used in one form or another in nearly 60 jurisdictions worldwide, indicating their popularity and possibly proving their worth. FiTs have shown the tremendous appetite many nations, including Germany, have for solar development. However, despite long-term contracts, feed-in tariffs don’t last forever. In addition, **political winds change** direction often enough that developers, particularly in emerging fields like solar, should rightfully be weary of government-run schemes. Finally, economic developments can often impact the decisions of investors even if tax incentive schemes prove popular and effective. This has been seen in, for example, the US as tax equity investors lost appetite for solar development during the economic downturn. How then, can Germany, and other countries with a desire to continue growth in the renewable sector, ensure that development continues? As noted in the admittedly conclusory introduction above, such nations could use existing REIT laws to help stimulate solar development. Quoting our earlier post on such a proposal in the US: One potential solution would be to use tax structures which already exist and benefit the commercial real estate market to stimulate large-scale solar development. Similar to the benefits that real estate investment trusts (REITs) have brought to both commercial real estate owners and investors, solar real estate investment trusts (S-REITs) could bring solar development to the masses, increase capital flows to the space and incentivize lawmakers give the solar industry the same treatment as fossil fuel counterparts. The S-REIT structure should not be viewed as the exclusive domain of solar developers either. Indeed, Germany’s wind sector is, perhaps, even more robust than its solar counterpart, and developers have managed to make wind more cost effective than in the US. Therefore, and particularly in nations with well-developed wind sectors such as Germany, it is possible that other renewable sources could benefit from gaining access to the REIT structure as well. This broader vision would lead to the potential formation of Renewable Energy REITs, providing diversification for investors based on the various geographic, technological, pricing and reliability differences between the various production methods. In the US, the creation of an S-REIT structure unencumbered by tax risk requires clarification on a particular section of the tax code dealing with REITs, §856 of the US Code. Once the IRS moves to clarify this section, and if it grants the proceeds of electric sales contracts the same status as rents under the REIT laws, solar developers will be entitled to benefit from the same tax status as commercial real estate developers. This will ensure start-up capital and a wide investor base of individuals seeking steady returns, allowing the solar sector to survive any storm, whether politically or economically generated. It is possible that similar clarification would be required in Germany (further research is needed on this point, which may include discussion with the appropriate tax authorities). However, despite some hurdles, it is clear that the S-REIT could potentially provide a way for Germany and other states currently relying on feed-in tariffs to continue the ambitious global push toward maintaining a self-sustaining, secure, and environmentally friendly energy sector in the future.

**Feed in tariffs massively increase German energy prices.**

**Wiesmann 12**—Financial Times Berlin correspondent [Gerrit, “German rush to renewables faces backlash,” Financial Times, October 15, 2012, www.ft.com/cms/s/0/347e5530-16b4-11e2-957a-00144feabdc0.html#axzz29TR3GknR]

The rapid proliferation of subsidised solar and wind plants in Germany will mean a sharp increase in electricity prices next year, it has emerged, dealing a blow to Angela Merkel’s ambitious plans to foster green energy. The price rise flies in the face of the chancellor’s previous pledge that energy costs would stay stable for households, despite the swift move away from nuclear power. Generous guaranteed prices for electricity generated by renewable sources have encouraged investors to build new capacity—so much so that consumers will have to pay green energy generators €20.4bn in feed-in tariffs in 2013. As a result, Germany’s power transmission companies revealed on Monday that the mandatory surcharge on every unit of electricity will rise to 5.3 cents next year from 3.6 cents per kWh. This will represent an overall price increase of about 7 per cent for consumers. With retail electricity prices already among the highest in Europe, many Germans have started to ask why households should bear the brunt of the subsidy for renewable energy—especially as many businesses, such as steel and glassmaking, are exempt to protect their competitiveness. Fears are mounting in Berlin that the decade-old renewable-energy subsidy could kill public acceptance of Ms Merkel’s energy policy before next autumn’s election. The question of how to deal with the obligation to pay ever more in feed-in tariffs—which will total “only” €14bn this year—has divided her coalition. The Free Democrats, Ms Merkel’s junior partner, have called for a cut in the tax levied on electricity and its surcharge. With business also worried about electricity price rises and possible scrutiny of its exemptions, Peter Altmaier, environment minister, called for “calm” and stressed that the looming increase would not be so large if Social Democrats and Greens had supported prior attempts to reform the surcharge system. The opposition last week rejected a call by Mr Altmaier to set a cap on the amount of green electricity eligible for guaranteed prices. The Social Democrats and the Greens, who introduced the surcharge to foster a nascent renewables industry when in government a decade ago, blamed its rise on what they see as a growing list of exemptions. The disaster at Japan’s Fukushima nuclear power plant last year saw Ms Merkel bring forward Germany’s phase-out of nuclear energy to 2022 from 2036 and promise to double renewable energy generation to 35 per cent by 2020. She played down warnings by industry that electricity prices could rise. But the generous price guarantees for green electricity have proved a big lure for investors. Solar power plants, in particular, still offer cast-iron returns, even after two cuts to feed-in tariffs. After 7.5gW last year, some 7gW in new capacity is expected to go live in 2012—plants that will receive guaranteed prices until 2032. While the rapid increase in solar power installations means that Mr Altmaier now expects Germany to produce 40 per cent of its electricity from renewable sources by 2020, he has warned that the “mis-allocation” and costs of the current system could lead to a backlash and erode public support for a **central** Merkel policy.

**That dooms Merkel and the German economy.**

**Dempsey 12**—Carnegie Europe senior associate [Judy, editor-in-chief of Strategic Europe, IHT columnist, former diplomatic correspondent for the Financial Times in Brussels, “Merkel pays price for shift on energy,” The International Herald Tribune, May 29, 2012, Lexis]

The chancellor faces the political repercussions of her decision to shut down Germany’s remaining 17 nuclear power plants after the nuclear disaster in Japan last year. FULL TEXT It was exactly the kind of news that Chancellor Angela Merkel did not want. Voerdal, an aluminum company employing more than 400 people, has gone into bankruptcy. It will close unless the state government of North Rhine-Westphalia comes up with a rescue package. This state-of-the art company is in such dire financial straits because of rising energy prices. Voerdal officials say that the company’s energy bill went up to 40 percent of total costs, all because of the government’s confused energy policies. Voerdal is not an isolated case in the energy-intensive sector, which is why Ms. Merkel, who faces re-election next year, is becoming worried. ‘‘High energy prices are the **Achilles heel** of the government,’’ said Tilman Mayer, a political science professor at Bonn University. ‘‘Merkel’s Christian Democrats know that energy price rises will erode their popularity. The chancellor has to reassure her supporters that her energy policies are the right ones.’’ The political repercussions of energy prices are all too familiar to leaders of other industrialized countries. In the United States, President Barack Obama is trying to avoid a confrontation with Iran because it would push up energy prices in the middle of his re-election campaign. Back in Germany, Ms. Merkel is now paying the price of the radical energy policies she introduced last year following the nuclear catastrophe in Japan. Then, in a decision that grabbed the headlines all over the world, she announced the closure of the last of Germany’s 17 nuclear power plants by 2022. It was extremely controversial even in her own party, which had voted to prolong the lifetime of Germany’s nuclear power plants just before the tsunami hit Japan. In the 14 months since Ms. Merkel’s dramatic announcement, little has happened to help one of the world’s most highly industrialized countries cope with the chancellor’s energy transformation, known in German as Energiewende. Much of the blame has fallen on Norbert Röttgen. As environment minister, he was supposed to ensure that Germany would have sufficient and affordable energy supplies once nuclear power was ended. Nuclear power provided 23 percent of electricity in Germany. ‘‘He failed to communicate to industry or the public how he was going to do that,’’ said Hermann-Josef Wagner, a professor of energy systems and energy economics at Ruhr-University-Bochum. Instead, Mr. Röttgen was more focused on his political career, with his sights on succeeding Ms. Merkel one day. His ambitions fell apart this month when he suffered a humiliating electoral defeat in his home state of North Rhine-Westphalia. Ms. Merkel stood by Mr. Röttgen for a few days, then fired him, and not just because of his miserable election campaign. He was not on top of the energy dossier. Analysts say Ms. Merkel is perfectly aware of the fact that she will be blamed personally should the Energiewende fail. That explains why she reacted so nervously when, over the past several months, industry officials began to complain about higher energy prices and how they would affect investments, growth and jobs. Until now, the German economy, Europe’s largest, has been insulated from the euro crisis because of exports and changes to the social welfare system that drove down unemployment. Any significant rise in energy prices, said economists, could make Germany vulnerable to the economic crisis that is pulling down the rest of Europe. McKinsey & Co., the consulting group, estimated in a recent study that by 2020, German consumers could be paying 60 percent more—to (EURO)21.5 billion from (EURO)13.5 billion, or $27.1 billion to $17 billion—for their energy bill. That does not include costs the industry will carry. ‘‘There were and still are a lot of unanswered questions about the costs of the transition,’’ Mr. Wagner said. Electricity grids would need to be built to connect north to south and east to west. There is an urgent need for storage facilities for surplus wind and solar energy to safeguard supplies on calm and cloudy days. And the pricing system for renewable energy needs to be overhauled. For example, if a grid operator asks a solar or wind power producer to stop generating energy in order to keep the grid stable, the grid operator is obliged by law to pay the producers for the power that has not been generated. Those costs fall on the consumer. There also is the question of the security of energy supply given that some of the nuclear plants were shut down in 2011. Germany had to cope with serious shortages during a bitterly cold spell last January. Industry officials proposed expanding coal and natural gas production even though that would jeopardize Germany’s commitment to a 40 percent reduction in greenhouse gas emissions by 2020 compared with 1990 levels. McKinsey now says that Germany can reach a reduction of only 31 percent. The big energy companies and nuclear producers accepted, with huge reservations, the government’s energy policy. That decision had a hugely negative impact on these companies. Because they are losing substantial income from nuclear plants, they have begun selling assets to offset losses and diversify into renewable energy. At the same time, they have made clear to Ms. Merkel that they are not prepared to invest in the new grids, or in coal or natural gas plants, until they understand how the Energiewende is going to be implemented and financed. Still, experts believe that Ms. Merkel will stick to her energy policy. Politically, she **cannot afford** to do another U-turn. But neither can she afford to anger voters with ever-rising energy prices. She has no choice but to make the Energiewende work—especially as other big industrial economies want to see if it is feasible.

**The German elections are close now. Growth and energy prices are key.**

**Janes 13** Jackson , 1/23/. PhD IR @ Claremont, Executive Director of the American Institute for Contemporary German Studies at the Johns Hopkins University. “Merkel's Setback in Lower Saxony,” The National Interest, http://nationalinterest.org/commentary/merkels-setback-lower-saxony-8003?page=1.

As President Obama began his second term in the White House this week, German Chancellor Angela Merkel is now wondering whether she can win a third term in next September’s national elections.¶ The results of this week’s regional elections in the state of Lower Saxony are not reassuring for Merkel. Her party—the Christian Democrats—lost the election and no longer control the state government, which it had ruled with the Free Democrats for over a decade. With only a single vote giving them a razor-thin majority, the Social Democrats (together with the Green party) will now govern Lower Saxony, one of Germany's largest states. But the elections also widen the political chess game to be played out over the next eight months for both the winners and the losers, and make predictions for September that much harder.¶ While everyone expected a close race in Lower Saxony between Merkel's Christian Democrats and rival Social Democrats, the main surprise came from the smaller parties—the Free Democrats and the Greens.¶ The Green party picked up a significant increase of seats in the state parliament in Hanover. The Free Democrats scored a smaller increase but they managed to defy all the polls prior to the election, which had predicted a much worse result in the wake of a very public and embarrassing debate within the party over its current chairman and an incoherent political platform. In fact, the Greens have occupied the political space formerly held by the Free Democrats during the past few years. In the state of Baden Württemberg, for example, they now govern with the Social Democrats as their junior partner. With an additional demonstration, winning the office of Lord Mayor of Stuttgart, the Greens have become a major force in the urban centers in Germany.¶ The Christian Democrats lost political ground, undercutting their chance to hold on to power in Hanover despite the slight pick-up by the Free Democrats. Those losses were a result of last minute tactical voting by supporters of Merkel's party who wanted to save the Free Democrats and the coalition government in Hanover. That loss now follows many other conservative losses in other states during the past few years.¶ Now Chancellor Merkel is facing a very tricky political landscape as she calculates her odds to win a third term. She is far more popular than the party she leads, but she cannot seem to translate that support to the state level. The coalition she leads in Berlin with the Free Democrats is duplicated in only a few other states now.¶ The Free Democrats have fallen significantly in the national polls since the last parliamentary election in 2009. Thus she cannot count on a strong coalition partner with whom she can govern unless the Free Democrats can pull themselves together between now and September. The unexpected bounce from this election may not be enough to keep them going until September.¶ Merkel is being challenged by her old coalition partner Peer Steinbrück, who is the Social Democrats’ candidate in the September elections. Since his nomination a few months ago, Steinbrück has made a number of mistakes in his campaign appearances and received very bad press, leading some Social Democrats to think they picked the wrong candidate. But now the win in Lower Saxony might offer Steinbrück another chance to regain his footing—and that of the party.¶ The Social Democrats and the Greens state that they want to form a coalition in Berlin to govern the country again, as they did for seven years when Gerhard Schroeder and Joschka Fischer were partners. Merkel is sticking by her public desire to continue her coalition with the Free Democrats, who in turn affirm the same commitment. But if her own party can sustain sufficient momentum between now and September, she has other options. If a coalition with the Free Democrats won't work, she can consider another coalition with the Social Democrats, as she had in her first term. That assumes the Social Democrats and the Greens can't make a governing coalition. That also assumes that neither opposition party would be inclined to approach the Free Democrats about forming a three-way coalition—a very unlikely scenario.¶ Given the electoral success the Greens are enjoying, there is speculation that Merkel might consider a coalition with them if the numbers add up. But that equation seems unlikely and probably needs additional time to gather support from either side before it could be viable.¶ There is one more regional contest just before the September elections. In Bavaria, the Christian Social Union—Merkel's sister party located only in that state—and the Free Democrats govern in a coalition. Results there could influence the profile of the parties as Germans prepare to elect their Chancellor two weeks later. In the meantime, the ongoing debates about the euro and **Germany's economic situation will continue to be the decisive factors**. Energy prices will be debated as they increase. Perhaps the pending withdrawal of troops from Afghanistan might play a limited role.

**A Merkel election loss kills the Euro zone.**

**WSJ 13** “Contemplating a Euro Without Chancellor Merkel,” Nicholas Hastings, http://blogs.wsj.com/eurocrisis/2013/01/21/contemplating-a-euro-without-chancellor-merkel/.

German Chancellor Angela Merkel’s personal popularity remains high.¶ But the weekend defeat for her ruling coalition in the Lower Saxony state election suggests that a victory in September’s national election is far from assured.¶ For the first time in seven years, financial markets have to contemplate a future for the euro without Mrs. Merkel.¶ This will be hard.¶ The German chancellor has been key to the success of negotiations to stop the single currency from falling apart during the recent euro-zone debt crisis.¶ Despite the political concerns that she might have raised at home, she has repeatedly ensured that bailout packages were made available to debtor countries to prevent sovereign default.¶ **Her departure could well leave the euro zone as a whole without the strong leadership that might still be needed to preserve the single currency**.

**Eurozone collapse causes World War III.**

**Gommes 11—**Former Columbia Law Review senior editor [Thomas, publisher of Periscope Post, former corporate lawyer, “Eurozone in crisis: The death of the euro could trigger World War III,” December 9, 2011, www.periscopepost.com/2011/12/eurozone-in-crisis-the-death-of-the-euro-could-trigger-world-war-iii/]

Eurozone in crisis: The death of the euro could trigger **World War III** The slow-motion demise of the euro isn’t just financial Armageddon—it could just be one step down the slippery path to World War III. At the risk of being accused of scaremongering, I’ll state my point simply and up front: Things in Europe are not as bad as they seem—they’re worse. And though the commentariat is queuing up to predict the imminent demise of the euro currency and to lament the ongoing recession, that’s not even the half of it: We’re looking at World War III. As major corporations start drawing up contingency plans for a world without the euro and as weaknesses in government finances become ever more glaring, the end of the euro currency becomes an increasingly realistic prospect. Related, the total absence of business growth, or trading among European nations raises the question of what benefits a unified trading block offers. The driving motive behind the original Coal and Steel alliance that ultimately became today’s European Union was a desire among nations, traumatised by the worst war in their collective history, to provide a deterrent against another war. My concern is that that trauma has faded, and that the fear of war has been replaced by the fear of recession. As anyone with even a fleeting familiarity with European history can confirm, ours is not exactly a history of love and peace. In fact, the period since the end of World War II has been probably the longest period of relative peace the region has ever known. Arguably, it’s no coincidence that that period of peace has coincided exactly with the ever strengthening ties that have been forged between European nations over these past 60 years. If the bonds that tie European nations together are weakened, the incentives to avoid **total war** dwindle. And its not as dramatic or far fetched a theory as it may at first sound. The end of the euro currency and a reversion to national currencies could quite possibly provide the impetus for a further dissolution of the union. The unraveling of painstakingly negotiated ties becomes easier and easier as each strand frays and breaks. Combine this unraveling with an ongoing or even deepening recession, and it all makes for a combustible atmosphere. Unfortunately, it is human nature to blame others for our woes. In an environment of unemployment, austerity, and general resentment, it is not difficult to imagine nations starting to point the finger at their neighbours. And without the unifying effect of a common currency, thriving trading relations, free movement of peoples, and common interests, Europe would find itself **increasingly susceptible to war**. Moreover, as so few Europeans in my generation, let alone subsequent generations, have even the slightest inkling about how horrific war is, it may be tempting to consider it as a solution to problems, or at minimum an acceptable response to perceived slights.

**Goes nuclear.**

**Glaser 93**—Assistant Prof @ Chicago [Charles, International Security Summer, 1993]

However, although the lack of an imminent Soviet threat eliminates the most obvious danger, U.S. security has not been entirely separated from the future of Western Europe. The ending of the Cold War has brought many benefits, but has not eliminated the possibility of major power war, especially since such a war could grow out of a smaller conflict in the East. And, although nuclear have greatly reduced the threat that a European hegemon would pose to U.S. security, a sound case nevertheless remains that a major European war could threaten U.S. security. The United States could be drawn into such a war, even if strict security considerations suggested it should stay out. A major power war could escalate to a **nuclear war** that, especially if the United States joins, could include attacks against the American homeland. Thus, the United States should not unconcerned about Europe’s future.

#### Strong Merkel key to reshape EU-Russia relations and put more pressure on Gazprom.

Judy Dempsey, 1/7/2013. Nonresident senior associate at Carnegie Europe and editor-in-chief of Strategic Europe. She is also a columnist for the International Herald Tribune. “Angela Merkel’s Here to Stay,” Strategic Europe (Carnegie), http://carnegieeurope.eu/strategiceurope/?fa=50512.

Voters like the way she has insisted on stringent cutbacks in those eurozone countries that have received loan guarantees— after all, it is the German taxpayer who will have to cover a large part of those loans in case of default. And as long as inflation remains low, voters here will not worry about the European Central Bank’s generous money and credit policy. But even beyond [Merkel’s contribution to contain the euro crisis](https://ip-journal.dgap.org/en/ip-journal/topics/berlin-getting-election-gear), Europe needs Germany.¶ It **needs** [**Berlin to shape a new strategic relationship with Russia**](http://carnegieeurope.eu/strategiceurope/?fa=show&id=50118), given that President Vladimir Putin will be in power for another five years. With her government now taking a much more critical stance towards the Kremlin, this is the time to build a [strategic policy](http://carnegieeurope.eu/publications/?fa=50154&solr_hilite=Merkel) around Berlin’s tougher attitude.¶ Europe also needs [Germany to influence the bloc’s energy policy](http://www.swp-berlin.org/en/publications/swp-comments-en/swp-aktuelle-details/article/globalising_the_german_energy_transition.html), particularly since Merkel is committed to ending nuclear power by 2022.¶ Europe, too, needs **Merkel to put pressure on Germany’s big gas energy companies** **to renegotiate** their long-term contracts with [Russia’s state-owned company Gazprom](http://carnegieeurope.eu/strategiceurope/?fa=show&id=49911). Cheaper gas would benefit consumers and give Europe’s economy a boost.

#### Lack of cohesive EU energy leverage vis-à-vis Russia blocks democracy promotion efforts in Central Asia and the Caucasus.

Zenyo Baran, Autumn 2007. Senior fellow and director of the Center for Eurasian Policy at the Hudson Institute in Washington, D.C. “EU Energy Security: Time to End Russian Leverage,” Washington Quarterly 30.4, http://mes.reviewhudson.org/files/publications/07autumn\_baran.pdf.

Much has been made of President Vladimir Putin’s recent aggressive posturing against Europe and the United States. In the past few months, the Russian leader imposed a “moratorium” on the Conventional Armed Forces in Europe (CFE) Treaty, compared U.S. government policies to those of the Third Reich, and threatened to aim nuclear-tipped missiles at European targets again. These developments are certainly troubling, but the days when NATO troops looked warily across the Folda Gap in Germany for signs of invading Soviet tanks are long gone. Russian power and influence is no longer measured in ballistic missile accuracy or bomber production but in miles of pipeline constructed and barrels of oil per day exported, and for Europe, this energy invasion has already begun. Questions regarding the security and sustainability of energy supply have mostly been left to individual EU member states and to the invisible hand of the market. Many European leaders preferred not to discuss the geopolitics of energy, instead delegating this portfolio to their economic ministries. Moreover, there is little unity among member states’ energy policies. Russia, the European Union’s primary oil and gas provider, has deliberately taken advantage of this lack of cohesion to gain favorable energy deals and heighten European dependence on Russian supplies. Moscow is pursuing a divide and conquer strategy of amassing bilateral deals with member states. This disunity has also allowed Moscow to preemptively block European attempts to construct transport routes for Caspian and Central Asian oil and gas that do not involve Russia. Given Russia’s high-level political involvement in energy issues, the EU needs a corresponding degree of intensity. Specifically, Europe must realize the very real foreign and security policy ramifications that the supply of energy has. Enhancing cooperation on energy security within the EU is essential to withstand Russian pressure. Europe’s Troubling Dependence The lack of reliable and sustainable European access to energy represents a clear threat to the continent’s security. Under the leadership of Putin, the Kremlin has pursued a strategy whereby Europe’s substantial dependence on Russian energy is leveraged to obtain economic and political gains. If this situation continues, the EU will find itself in further danger, as its dependence leaves it beholden to Russian interests. There simply is no readily available alternative to the supplies the EU receives from Russia, particularly natural gas. Unlike oil, gas is extremely difficult and costly to ship via tankers; pipelines are the preferred method of transportation. Thus, if a supplier refuses to provide gas or charges an unreasonable price, the consumer cannot quickly or easily turn to another source. The consumer state would have no choice but to accept the supplier’s conditions or go without natural gas, an option that is all but unacceptable for most. The unjust manipulation or interruption of energy supplies is as much a security threat as military action is, especially since the EU relies on Russia for more than 30 percent of its oil imports and 50 percent of its natural gas imports. 1 This dependence is not distributed evenly. As one heads eastward, Russia’s share of the energy supply grows ever larger. No fewer than seven eastern European countries receive at least 90 percent of their crude oil imports from Russia, and six EU nations are entirely dependent on Russia for their natural gas imports. The Ukrainian gas crisis in January 2006 catapulted energy security to the forefront of the EU agenda. On the very day it took over the presidency of the Group of Eight (G-8)—a presidency that had announced energy security as its key theme—Russia halted natural gas deliveries to Ukraine. Because the gas pipelines crossing Ukraine carry supplies destined for EU markets, this shutdown resulted in significant supply disruptions for several member states, raising awareness that dependence on Russia has increased Europe’s geopolitical vulnerability. Several EU states have experienced the misfortune of Russian supply cuts directly. Disputes between Russia and the Baltic states have led to the halt of pipeline deliveries of oil multiple times. In January 2003, Russia ceased supplying oil via pipeline to Latvia’s Ventspils Nafta export facility. This embargo, which followed Riga’s unwillingness to sell the facility to a Russian energy company, continues to this day. In July 2006, Moscow shut down a pipeline supplying Lithuania’s Mazeikiu Nafta refinery, which is the largest company in Lithuania and one of the biggest oil refineries in central and eastern Europe. As with Ventspils Nafta, this shutdown came after a Russian company failed to obtain the energy infrastructure it coveted. Moscow has further sought to increase Europe’s dependence on Russian energy supplies by acquiring significant stakes in the energy distribution companies and infrastructure of EU member states, typically through its proxy, Gazprom. This massive energy company—the world’s largest—has control over the Russian gas pipeline network and consequently handles all Russian and Central Asian exports, either directly or through wholly owned subsidiaries. Such a preponderance of power would be troubling enough if the company were transparent, privately owned, and played by the rules of the free market, but Gazprom is none of those things. It is majority state owned and has deep ties to the Russian government. Many of the company’s executive management and board members also occupy or previously occupied key positions within the Kremlin. For many years, Gazprom has owned significant portions of energy companies throughout the former Soviet Union. It is the largest or second-largest shareholder in the gas utilities of Estonia, Latvia, and Lithuania. Recently, Gazprom has been expanding its influence even further into the domestic gas distribution networks of western Europe. In the past two years, Gazprom has signed deals with Eni (Italy), Gasunie (the Netherlands), BASF (Germany), E.ON Ruhrgas (Germany), and Gaz de France. Desperate for access to energy and the profits it brings, European companies are played against each other by the Kremlin in order to secure more advantageous conditions for Russia. If one company does not want to agree to Moscow’s terms, a competitor will gladly accept them, leaving the first company with nothing. In addition to the economic disadvantages of such dependence, the broader foreign policy goals of EU states also suffer. Specifically, EU members limit their criticisms of Moscow, lest they be given a raw deal at the negotiating table. Russia’s increasingly tainted record on transparency, responsible governance, and human rights is thus allowed to stand unchallenged and unquestioned. Dependency also erodes EU support for key allies in Europe and Asia. Azerbaijan, Georgia, Kazakhstan, Turkmenistan, and Ukraine—all crucial energy producers or transit countries—have each been subject to intimidation by Moscow. Instead of standing up to this harassment, Europe’s dependence compels its leaders to look the other way. Most disturbing of all is that this dependence even leads the EU to turn a blind eye when Moscow utilizes these tactics against fellow EU members. The July 2006 shutdown of the Lithuanian pipeline, for example, drew little protest outside of Poland and the Baltic states. Russia claimed that this cutoff was the result of technical difficulties yet refused all offers from third parties to examine the damaged pipe or assist repairs in any way. Although this incident is suspicious enough on its own, it becomes a clear case of political manipulation given Russia’s status as a repeat offender. Many times over the past decade, Moscow has utilized near-identical tactics in countries it considers to be its near abroad. It has repeatedly cut off energy supplies during a political dispute, smugly blamed technical difficulties for the problem, and eventually shifted supplies to another destination unless the victim acceded to the Kremlin’s demands. Despite this history and repeated pleas from President Valdas Adamkus, the response from most western European countries was rather muted during the Lithuanian shutdown. The countries of the West have never experienced these strong-arm tactics firsthand and fail to view it as anything more than an economic dispute. Moreover, they were too concerned that standing up for Lithuania would ruin their chances to get preferential access to Russian oil and gas resources. By design, the Russian strategy is driving a wedge between eastern and western Europe, exacerbating the challenges the EU faces in devising a common energy policy, as was seen during the dispute between Poland and Germany ahead of the June EU summit. This diplomatic row was ostensibly over Russia’s failure to remove its embargo on Polish meat products but more broadly involved the perceived reluctance of Berlin to stand up to Moscow on a whole host of issues, not the least of which was energy. The EU’s inability to take Russia to task for its illiberal market actions threatens European energy security in another way. It decreases efficiency in an already inefficient Russian energy industry, raising costs for consumers. Russia’s increasingly state-owned energy industry is largely unregulated. Without competitive market forces, companies such as Gazprom have no reason to behave like commercially minded entities. The absence of market stimuli is having detrimental effects on Russian productivity. Between 1998 and 2005, output in Russia’s then-mostly privately owned oil sector rose by 50 percent. 2 During that same period, production in the gas sector (Gazprom) barely grew at all. Since 2004, when the Kremlin began its consolidation over the oil sector in earnest, Russian oil production has leveled off as well. 3 Due to the extremely close relationship between the energy industry and the Kremlin, Russia’s oil and gas companies can pursue strategies that make little economic sense but that serve the long-term interests of the Russian state, namely, ensuring European dependence on Russian energy supplies. For example, Russia’s undersea Nord Stream pipeline will cost at least three times more than a proposed overland route through Lithuania and Poland would have. Given the environmental sensitivity of the Baltic Sea, some industry insiders are predicting costs as high as $10 billion or even $15 billion. 4 By divorcing western Europe’s gas supply from eastern Europe’s, however, the undersea route grants Moscow the ability to manipulate the European energy market more effectively. Needless to say, the unnecessarily high cost of the pipeline’s construction will be passed on to European consumers. Many industry experts have expressed concern that corruption and inefficiency, coupled with Moscow’s refusal to allow significant foreign investment in the energy sector, will soon lead the Russian oil and gas industry to burn out. 5 Instead of developing new oil and gas fields or investing in its energy infrastructure, Russia has utilized windfall profits to pursue the aggressive policy of expansion and acquisition described above. Unless Moscow is able to secure additional gas supplies from fields in Central Asia, it may struggle to meet its commitments to Europe, which is why maintaining full control over Central Asia’s export routes is so critical for the Kremlin. Engaging the Caspian Enshrined as the second of the three pillars of the EU, the Common Foreign and Security Policy (CFSP) states that the EU should seek to promote democracy, rule of law, and respect for human rights within its borders and abroad. Yet, dependence on Russian energy supplies undermines Europe’s efforts to foster the ideals of good governance, market transparency, and democracy both in Russia and in Russia’s neighbors. Although the establishment of these principles in energy suppliers is a worthy goal in its own right, doing so will also create a more stable environment for energy sector development, thereby improving European security. Diversifying oil and gas supplies by constructing pipelines directly from the Caucasus and Central Asia to Europe would not only decrease Russia’s influence on EU countries but would also loosen Moscow’s grip on Europe’s neighbors. If the EU wishes to foster true reform within former Soviet states, it must offer them a non-Russian perspective, which can best be done through cooperation on joint energy projects. In the Caspian region, this strategy has been pursued with success by the United States. In the late 1990s, the United States pushed hard for the construction of several oil and gas pipelines that would carry Caspian energy westward without transiting Russia. It did so to break Russia’s monopoly on the region’s energy transportation system, thereby giving the Caspian countries greater economic and political independence from Moscow. Naturally, this proposal prompted strong objections and highpressure tactics by the Russian government.

#### That’s key to stability.

Ronald Asmus, Jan/Feb 2008. Executive Director of the Transatlantic Center at the German Marshall Fund of the United States, in Brussels. From 1997 to 2000, he served as U.S. Deputy Assistant Secretary of State for European Affairs. “Europe's Eastern Promise; Rethinking NATO and EU Enlargement,” Foreign Affairs 87.1, http://digilib.lib.unipi.gr/ket/bitstream/ket/739/1/Europe's\_Eastern\_Promise\_Asmus.pdf.

In light of these new circumstances in Russia, enlargement needs to be rethought from the ground up, starting with its strategic rationale. After the accession of a band of countries from the Baltic states in the north to Bulgaria and Romania in the south, many in the West assumed that the enlargement project was almost complete, with the western Balkans constituting the last piece of unfinished business. They were surprised to suddenly find new countries from Eurasia, and specifically the wider Black Sea region, starting to knock on the doors of NATO and the EU -- and unsure how to respond. In dealing with these new candidate countries, the West must stick to the values and diplomatic principles it laid down in the 1990s, including the notion that countries are free to choose their alliances. But that alone is unlikely to be enough, because although these countries clearly consider themselves European, many Europeans do not feel the same historical or moral commitment to them or see a compelling strategic need to integrate them. Thus, in addition to moral and political arguments, the United States and Europe need to articulate a strong strategic rationale for anchoring them to the West. That argument is straightforward. The challenge of securing Europe's eastern border from the Baltics to the Black Sea has been replaced by the need to extend peace and stability along the southern rim of the Euro-Atlantic community -- from the Balkans across the Black Sea and further into Eurasia, a region that connects Europe, Russia, and the Middle East and involves core security interests, including a critical energy corridor. Working to consolidate democratic change and build stability in this area is as important for Western security today as consolidating democracy in central and eastern Europe was in the 1990s. It is not only critical to expanding the democratic peace in Europe but also vital to repositioning the West vis-à-vis both Central Asia and the Middle East. This strategy presents an opportunity to redraw the strategic map of Europe and Eurasia in a way that enhances the security of countries on Europe's periphery as well as that of the United States and Europe. The United States and Europe also need to rethink what anchoring means in practice. In the 1990s, it meant pursuing membership in NATO and the EU roughly in parallel. Now the West needs to be more flexible and take a long-term view. The goal is to tie these countries as closely to the West as politics and interests on both sides allow. For some countries, this may mean eventual membership in both NATO and the EU; for others, it may mean membership only in NATO; and for the rest, it may mean membership in neither but simply much closer relations. Policy will have to be much more à la carte than prix fixe. The link between NATO membership and EU membership should be relaxed, if not dropped. The EU has enough on its plate sustaining its commitments to the western Balkans and Turkey; anything beyond that is probably a nonstarter for the time being. NATO will once again have to take the lead in anchoring countries such as Georgia and others in the wider Black Sea region. The West must also rethink how it should engage and reach out to these countries. If membership is less plausible as a short-term option, then the quality of ties short of membership must be improved to compensate. Outreach must grow in importance and may increasingly become the centerpiece of U.S. and European strategy. At the moment, the fear of future enlargement is one factor actually holding allies back, with institutions afraid of taking even small steps down what some fear could be a slippery slope. Yet precisely because the countries in question are weaker and more endangered, NATO and the EU should actually be reaching out and engaging them earlier. They need the security umbrella and engagement of the West as much, if not more, than the countries of central and eastern Europe did. The way out of this dilemma is to consider membership a long-term goal and focus in the mean time on strengthening Western outreach and engagement. This means recasting policy tools to address the different needs of the countries that are less developed politically and economically. Tools such as NATO's "membership action plan" should be extended earlier and tied less closely to actual membership commitments, thus allowing these countries to benefit from guidance and engagement while downplaying the question of the end goal. At the same time, the EU needs to enhance its own tools, such as the Common Foreign and Security Policy and the European Neighborhood Policy, as well as reach out to these countries more directly by offering them political and economic support. When communism collapsed, NATO and the EU had little idea how to reach out to postcommunist countries and anchor them to the West. Bureaucrats in both institutions said it could not be done. But political will and strategic imagination prevailed, and fresh approaches were developed. Political will can do the same today. As for Russia, neither Washington nor Brussels wants a confrontation with Moscow at a time when they face daunting challenges beyond Europe. But this does not mean the West should abandon its belief that the spread of democracy along Russia's borders contributes to peace and stability just because the current authoritarian rulers in Moscow disagree. Nor should the West abandon its principles and succumb to the sphere-of-influence thinking currently emanating from Moscow. If the United States and Europe still hope that democracy will eventually take root in Russia, they must recognize that consolidating a proWestern, democratic Ukraine would indirectly encourage democratization in Russia. Of course, antidemocratic forces in Russia will oppose such a move. After all, Moscow only acquiesced in previous rounds of NATO and EU enlargement because it concluded that the United States and Europe were determined to carry them out and that its efforts to oppose the West would be futile. Western unity on issues such as the future of Ukraine is therefore of the utmost importance. Still, holding true to NATO's and the EU's core principles and expanding these organizations' reach does not mean starting a new Cold War. The West and Moscow should look for other areas in which their interests are more aligned, such as expanding trade and investment or controlling nuclear proliferation and building a new arms control regime. The key question is whether Russia -- when faced with a unified West -- will start to look for common ground. As strong as Russia may appear at the moment, it remains a country with real long-term structural weaknesses and problems. It, too, needs friends and allies, and the United States and Europe should be among them. UNCERTAIN FUTURES Three very different scenarios for the future of Western policy toward Europe's periphery reveal just how high the stakes are in this region. In the bestcase scenario, the United States and Europe would regroup under the next U.S. president and launch a new era of transatlantic cooperation by overcoming differences on Iraq, avoiding disagreements over Iran, and stabilizing Afghanistan. This renaissance would include a new and ambitious democratic-enlargement strategy, and the results would be significant. Securing independence for Kosovo without turning Serbia against the West would facilitate the successful integration of the western Balkans into NATO and the EU. In Turkey, the AKP-led government would continue democratic reforms, bringing the country closer to EU accession. Georgia and Ukraine would continue to move closer to the West as well. That prospect would help create positive pressure for democratic change in Azerbaijan and encourage Armenia's reorientation toward the West. By 2012, a reunified West would have begun to build an arc of democratic stability eastward into Eurasia and especially the wider Black Sea region. Realizing that its real adversaries lie elsewhere, Russia would eventually have no choice but to reassess its policy and seek a new rapprochement with the West. A less optimistic scenario is stagnation. In this case, the United States and Europe would regain some political momentum after 2008 but fail to achieve any significant democratic breakthroughs. A new U.S. administration would manage to stabilize and then extricate itself from Iraq, but transatlantic tensions over Iran and other Middle Eastern issues would persist. Kosovo would achieve independence, but in a manner that leaves Serbia alienated and unable to find its way back onto the path toward EU accession. In the western Balkans, only Croatia would remain on track for both EU and NATO membership. Turkey's prospects for joining the EU would fade, and reforms in Georgia and Ukraine would stall. Azerbaijan would remain an autocratic pro-Western ally increasingly vulnerable to growing radicalization from within. By 2012, the West would have patched up relations across the Atlantic but without breakthroughs in the Balkans or Turkey -- let alone in Ukraine or the wider Black Sea region. All of this would lead to a more competitive relationship with Russia, resulting in stalemate and a new chill in relations with Moscow. In the worst-case scenario, rather than the West consolidating new democratic breakthroughs, Russia would succeed in a strategy of rollback. The United States and Europe would not achieve a meaningful rapprochement, and they would fail to consolidate democracy in the western Balkans. Kosovo would become independent, but without agreement from all sides. This would launch Serbia on a new nationalist trajectory, bringing further instability to the region. U.S. failure in Iraq would lead to partition, estranging Turkey and prompting Ankara to invade northern Iraq and further loosen its ties to the West. This, in turn, would badly damage Turkey's already strained relations with both Washington and Brussels. Ukraine would drift back to autocracy, and Georgia, the one liberal democratic experiment in the Black Sea region, would lose reform momentum and teeter toward failure. Last November's declaration of a state of emergency in Tbilisi was a reminder of how fragile and vulnerable this experiment is. Using its energy supplies and influence, Russia would emerge as an authoritarian capitalist alternative to the West, attracting autocratic leaders throughout Europe and Eurasia. Rather than a renaissance of the transatlantic alliance, the result would be a retreat of democracy and a further splintering of the democratic West. As these scenarios make clear, the western Balkans, Georgia, Ukraine, and the wider Black Sea region are less stable and more at risk today than central and eastern Europe were a decade ago. And the stakes are high. A world in which Ukraine has successfully anchored itself to the West would be very different from one in which it has failed to do so. A world in which Georgia's success has sparked democratic progress in the region and helped stabilize the southern flank of the Euro-Atlantic community would be a much safer one than a world in which Georgia has become an authoritarian state in Russia's sphere of influence. And a world in which the democratic West is ascendant would be very different from one in which an autocratic, nationalist Russia is on the rise.

#### Conflict will escalate to US-Russian nuclear war --- network-centric warfare compresses decision-making times and triggers miscalculation.

Roger McDermott, 12/6/2011. Honorary senior fellow, department of politics and international relations, university of Kent at Canterbury and senior fellow in Eurasian military studies, Jamestown Foundation. “General Makarov Highlights the “Risk” of Nuclear Conflict,” Eurasia Daily Monitor, <http://www.jamestown.org/programs/edm/single/?tx_ttnews%5Btt_news%5D=38748&tx_ttnews%5BbackPid%5D=27&cHash=dfb6e8da90b34a10f50382157e9bc117>.

In the current election season the Russian media has speculated that the Defense Minister Anatoliy Serdyukov may be replaced, possibly by Dmitry Rogozin, Russia’s Ambassador to NATO, which masks deeper anxiety about the future direction of the Armed Forces. The latest rumors also partly reflect uncertainty surrounding how the switch in the ruling tandem may reshuffle the pack in the various ministries, as well as concern about managing complex processes in Russian defense planning. On November 17, Russia’s Chief of the General Staff, Army-General Nikolai Makarov, offered widely reported comments on the potential for nuclear conflict erupting close to the country’s borders. His key observation was controversial, based on estimating that thepotential for armed conflict along the entire Russian periphery had grown dramatically over the past twenty years (Profil, December 1; Moskovskiy Komsomolets, November 28; Interfax, November 17). During his speech to the Defense Ministry’s Public Council on the progress and challenges facing the effort to reform and modernize Russia’s conventional Armed Forces, Makarov linked the potential for local or regional conflict to escalate into large-scale warfare “possibly even with nuclear weapons.” Many Russian commentators were bewildered by this seemingly “alarmist” perspective. However, they appear to have misconstrued the general’s intention, since he was actually discussing conflict escalation (Interfax, ITAR-TASS, November 17; Moskovskiy Komsomolets, Krasnaya Zvezda, November 18). Makarov’s remarks, particularly in relation to the possible use of nuclear weapons in war, were quickly misinterpreted. Three specific aspects of the context in which Russia’s most senior military officer addressed the issue of a potential risk of nuclear conflict may serve to necessitate wider dialogue about the dangers of escalation. There is little in his actual assertion about the role of nuclear weapons in Russian security policy that would suggest Moscow has revised this; in fact, Makarov stated that this policy is outlined in the 2010 Military Doctrine, though he understandably made no mention of its classified addendum on nuclear issues (Kommersant, November 18). Russian media coverage was largely dismissive of Makarov’s observations, focusing on the idea that he may have represented the country as being surrounded by enemies. According to Kommersant, claiming to have seen the materials used during his presentation, armed confrontation with the West could occur partly based on the “anti-Russian policy” pursued by the Baltic States and Georgia, which may equally undermine Moscow’s future relations with NATO. **Military conflict may erupt in Central Asia**, caused by instability in Afghanistan or Pakistan; or western intervention against a nuclear Iran or North Korea; energy competition in the Arctic or foreign inspired “color revolutions” similar to the Arab Spring and the creation of a European Ballistic Missile Defense (BMD) system that could undermine Russia’s strategic nuclear deterrence also featured in this assessment of the strategic environment (Kommersant, November 18). Since the reform of Russia’s conventional Armed Forces began in late 2008, Makarov has consistently promoted adopting network-centric capabilities to facilitate the transformation of the military and develop modern approaches to warfare. Keen to displace traditional Russian approaches to warfare, and harness military assets in a fully integrated network, Makarov possibly more than any senior Russian officer appreciates that the means and methods of modern warfare have changed and are continuing to change (Zavtra, November 23; Interfax, November 17). The contours of this evolving and unpredictable strategic environment, with the distinctions between war and peace often blurred, interface precisely in the general’s expression of concern about nuclear conflict: highlighting the risk of escalation. However, such potential escalation is linked to the reduced time involved in other actors deciding to intervene in a local crisis as well as the presence of network-centric approaches among western militaries and being developed by China and Russia. From Moscow’s perspective, NATO “out of area operations” from Kosovo to Libya blur the traditional red lines in escalation; further complicated if any power wishes to pursue intervention in complex cases such as Syria. Potential escalation resulting from local conflict, following a series of unpredictable second and third order consequences, makes Makarov’s comments seem more understandable; it is not so much a portrayal of Russia surrounded by “enemies,” as a recognition that, **with weak conventional Armed Forces, in certain crises Moscow may have few options at its disposal** (Interfax, November 17). There is also the added complication of a possibly messy aftermath of the US and NATO drawdown from Afghanistan and signs that the Russian General Staff takes Central Asian security much more seriously in this regard. The General Staff cannot know whether the threat environment in the region may suddenly change. Makarov knows the rather limited conventional military power Russia currently possesses, **which may compel early nuclear first use** likely involving sub-strategic weapons, in an effort to “de-escalate” an escalating conflict close to Russia’s borders. Moscow no longer primarily fears a theoretical threat of facing large armies on its western or eastern strategic axes; instead the information-era reality is that smaller-scale intervention in areas vital to its strategic interests may bring the country face-to-face with a network-centric adversary capable of rapidly exploiting its conventional weaknesses. As Russia plays catch-up in this technological and revolutionary shift in modern warfare capabilities, the age-old problem confronts the General Staff: the fastest to act is the victor (See EDM, December 1). Consequently, Makarov once again criticized the domestic defense industry for offering the military inferior quality weapons systems. Yet, as speed and harnessing C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) become increasingly decisive factors in modern warfare, **the risks for conflict escalation demand careful attention** – especially when the disparate actors possess varied capabilities. Unlike other nuclear powers, Russia has to consider the proximity of several nuclear actors close to its borders. In the coming decade and beyond, Moscow may pursue dialogue with other nuclear actors on the nature of conflict escalation and de-escalation. However, with a multitude of variables at play ranging from BMD, US Global Strike capabilities, uncertainty surrounding the “reset” and the emergence of an expanded nuclear club, and several potential sources of instability and conflict, **any dialogue must consider escalation in its widest possible context**. Makarov’s message during his presentation, as far as the nuclear issue is concerned, was therefore a much tougher bone than the old dogs of the Cold War would wish to chew on.

**1AC—Plan**

**Plan --- The United States federal government should issue a revenue ruling establishing that solar power production is a real estate investment trust qualified asset class.**

**1AC—Solvency**

**Contention Three --- Solvency**

**An IRS revenue ruling ensures certainty and guarantees massive investment.**

**Sturtevant 10**—George Washington University Solar Institute [Josh, J.D. from George Washington University Law School, Legal Associate at Distributed Sun LLC, in-house legal fellow at a renewable energy financing and development firm, “The Solar REIT: A Vision for the Future of German Solar Development,” BlawgConomics, November 10, 2010, blawgconomics.blogspot.com/2010/11/solar-reit-vision-for-future-of-german.html]

Frequent visitors to the site may be familiar with our proposal to allow solar developers to take advantage of the real estate investment trust (REIT) tax structure to stimulate development in the US (an unabridged copy can be found here). It is our belief that providing the tax benefits of the REIT regime and the broader investor base that would come with it would help to conquer certain existing up-front hurdles and allow the solar sector to grow **even in a world** of rapidly changing political and economic realities. For example, it is not always **clear** that government created rebates and incentive schemes will be available indefinitely, adding certain risk factors to the calculations of potential investors. Additionally, it has been noted that during economic downturns, and particularly in the US, investor appetite for funding solar development declines substantially. In light of such factors, our proposal was an attempt to facilitate market-based incentives for solar development simply by affording solar developers the opportunity to use the same tax structures as commercial real estate developers. Though it is unclear whether this is currently possible under US tax law, clarification from the Internal Revenue Service (IRS) would **help overcome any doubt**. As part of that proposal, we suggested that developers in other countries might eventually take advantage of such schemes as well, and since the initial posting we even posted a small blurb about the potential for a solar real estate investment trust (S-REIT) regime in Italy (albeit with little to no analysis on how such a change would be facilitated). Today our attention shifts slightly north of the Italian peninsula to Germany, another very logical candidate for S-REIT adoption. Germany currently has a comparatively robust renewables sector, greatly aided by current government regulatory schemes, most notably feed-in tariffs. However, feed-in tariffs are not permanent, and may outlive their useful lives. In this light, and based on the desire of Germany to continue to increase its percentage of energy mix from renewables, developing a more permanent means for facilitating solar development might be an attractive solution. Though this article will not address the exact changes to the German code that would be required to facilitate such a development, it is possible that, similar to the US, all that would be required is clarification from tax authorities. Indeed, as is noted below, the German and US REIT systems are quite similar, as many of the German REIT regulations are borrowed directly from the US model. Of course the political realities of the two nations are vastly different, and it is always tricky business to make broad generalizations (particularly as your author admittedly has limited experience with the German system). However, it is at least possible that any changes adopted in the US would be considered favorably by German officials, particularly with the existence of a poweful green lobby in the latter nation. In any case, with an established and growing REIT structure combined with a clear appetite for solar development, the pieces are already firmly in place if the political will for such a change were to develop. Future development may require further innovative thinking First, a brief description of Germany’s REIT system. German REITs, or G-REITs have only recently come into being. The establishment of the structure was meant to facilitate more tax-effective property ownership. According to the Deutsche Börse Group (the group that runs the main stock exchange for Germany, the Frankfurt Stock Exchange, which is the equivalent to the New York Stock Exchange in America) 73% of German companies own property while only 25% of companies own property in the US. Also according to Deutsche Börse, the largest 65 listed companies in Germany have property reserves of over €80 billion. REITs may allow some of this locked-up value to be realized, a potential boon for German companies and their shareholders. Following are some basics on G-REITs: • Companies pay no corporate income or trade tax. Earnings of G-REITs are paid to share holders and taxed individually. In other words, dividends paid are taxed as investment income for the shareholder. • At least 75 percent of the capital of G-REITs must be invested in property. • 90 percent of earnings must be paid out to share holders • 75 percent of revenue must be from fixed assets. • G-REITs must be listed in an organized market such as the General or Prime Standard. • G-REITs must have their headquarters in Germany. • Finally, G-REITs must have an initial capital of at least 15 million Euro. Those familiar with the REIT structure in the US will undoubtedly recognize that many of the general rules governing G-REITs mirror their American counterparts. While German REITs were only introduced in 2007, foreign REITs have been listed in the country for some time, and over 150 currently trade on the Frankfurt Stock Exchange. There now currently appear to be three German property companies trading as REITs on the Frankfurt including an office REIT, a diversified REIT and a retail REIT. It is clear that the trade of foreign REITs on the Frankfurt has created a familiarity with the structure in Germany. Meanwhile, the recent laws have facilitated the creation of Germany’s own REIT structure. This familiarity as well as the proper legal framework indicate that the nation is fully comfortable with the idea of publicly listed firms owning income-producing property, opening the door for broader use of the REIT structure in the future. We now turn to the appetite for solar development in Germany. Incidentally, it is enormous, and it is claimed that Germany is one of the top nations, if not the top nation, for solar development. It is generally accepted that the reason for Germany’s rise as a solar power is a result of its government subsidization scheme, heavily reliant on feed-in tariffs, which has stimulated developers to provide an ever-increasing proportion of the state’s energy mix. The most simple explanation of a feed-in tariff (FiT) is that it is a policy providing for grid access, long-term contracts and methodological pricing via government set compensation rates ( under contracts which usually last from 15-25 years). The goal of such policies is to stimulate development of solar and other renewables in the short-term, and push pricing of these sources toward levels comparable to fossil fuels (a concept referred to as grid parity) in the long-term. This long-term goal is facilitated by technological improvements made by the industry during the subsidy stage. There are several features which make FiTs possible. First, the set prices are usually maintained by passing costs through to consumers, whether directly or through taxes. Though it often takes some political capital to establish this initially, these costs are not typically prohibitive for reasons including the natural decrease in the FiT over time (a concept referred to as tariff digression), technological improvements, and the caps that many jurisdictions place on how much energy can be priced at the set compensation rate. There are also typically government mandates for utilities to provide a certain percentage of their energy supply from renewable sources, similar to renewable portfolio standards. Finally, it is important to note that feed-in tariffs are typically phased out over time as technology is presumed to improve over the life of the scheme, and as grid parity hopefully comes closer to being a reality. In Germany, FiT law underwent a restructuring in 2000 under the Act on Granting Priority to Renewable Energy Sources (‘Erneuerbare Energien Gesetz’). Some have claimed that this revamped structure has created the world’s most effective policy framework at accelerating the deployment of renewable energy technologies. The major features include: • purchase prices which are methodologically based on the cost of generation from the various renewable energy sources, leading to different prices for different sources and sizes to account for economies of scale; • purchase guarantees which last for a period of 20 years; • the ability for utilities to participate, and; • tariff degression In Germany and elsewhere, such mechanisms have proven necessary in the past as a lack of grid parity has made it difficult for solar developers to achieve solid returns otherwise. Indeed, according to a European Commission report, ‘well-adapted feed-in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity.’ According to at least one source, feed-in tariffs are used in one form or another in nearly 60 jurisdictions worldwide, indicating their popularity and possibly proving their worth. FiTs have shown the tremendous appetite many nations, including Germany, have for solar development. However, despite long-term contracts, feed-in tariffs don’t last forever. In addition, political winds change direction often enough that developers, particularly in emerging fields like solar, should rightfully be weary of government-run schemes. Finally, economic developments can often impact the decisions of investors even if tax incentive schemes prove popular and effective. This has been seen in, for example, the US as tax equity investors lost appetite for solar development during the economic downturn. How then, can Germany, and other countries with a desire to continue growth in the renewable sector, ensure that development continues? As noted in the admittedly conclusory introduction above, such nations could use existing REIT laws to help stimulate solar development. Quoting our earlier post on such a proposal in the US: One potential solution would be to use tax structures which already exist and benefit the commercial real estate market to stimulate large-scale solar development. Similar to the benefits that real estate investment trusts (REITs) have brought to both commercial real estate owners and investors, solar real estate investment trusts (S-REITs) could bring solar development **to the masses**, increase **capital flows** to the space and incentivize lawmakers give the solar industry the same treatment as fossil fuel counterparts. The S-REIT structure should not be viewed as the exclusive domain of solar developers either. Indeed, Germany’s wind sector is, perhaps, even more robust than its solar counterpart, and developers have managed to make wind more cost effective than in the US. Therefore, and particularly in nations with well-developed wind sectors such as Germany, it is possible that other renewable sources could benefit from gaining access to the REIT structure as well. This broader vision would lead to the potential formation of Renewable Energy REITs, providing diversification for investors based on the various geographic, technological, pricing and reliability differences between the various production methods. In the US, the creation of an S-REIT structure unencumbered by tax risk requires clarification on a particular section of the tax code dealing with REITs, §856 of the US Code. Once the IRS moves to clarify this section, and if it grants the proceeds of electric sales contracts the same status as rents under the REIT laws, solar developers will be entitled to benefit from the same tax status as commercial real estate developers. This will ensure **start-up capital** and a **wide investor base** of individuals seeking steady returns, allowing the solar sector to **survive any storm**, whether politically or economically generated.

## \*\*\* 2AC

**2AC—Squo Solves**

**IRS will only issue a private letter ruling that applies to one company, and is coming too soon for you to win a politics net benefit.**

**Bloomberg**, 1/21/**2013**. “Solar Costs to Fall as REITs Emerge as Source of Funding,” http://www.bloomberg.com/news/2013-01-21/solar-costs-to-fall-as-reits-emerge-as-source-of-funding.html.

Renewable Energy Trust asked the IRS at least four months ago for a private letter ruling that would grant it permission to become a REIT. It typically takes the IRS about four months to six months to respond to such requests, Fong said.

Ruling Imminent

The IRS may issue its first decision on solar REITs this month, according to Kogan, the Chadbourne & Parke attorney based in [Washington](http://topics.bloomberg.com/washington/). That’s the only regulatory hurdle Renewable Energy Trust will need to clear and a favorable ruling **will apply only to Fong’s company**.

**IRS ruling will only define PV as property --- won’t address PPA’s as rental income --- key to REIT value.**

[Jason **Deign**](http://news.pv-insider.com/users/jason-deign), 10/23/**2012**. “PV Finance: Is a REIT the right fit?” PV Insider, http://news.pv-insider.com/photovoltaics/pv-finance-reit-right-fit.

So far, so good. But what does the IRS think? Nobody knows. Which is why Renewable Energy Trust Capital’s query is so important. Following the query, the IRS has a duty to state its position on REITs and PV, and a response is expected imminently.

That response could come in the form of a public revenue ruling or a private letter ruling. If it is the latter, **as is likely to be the case** with Renewable Energy Trust Capital, neither party is obliged to make the ruling public and it is **not necessarily binding with respect to other situations**.

Nevertheless, the fact that Renewable Energy Trust Capital has gone on the record about its activities is a sure sign that the industry is eager for clarity of the issue of REITs, so a disclosure of the IRS position is probable soon.

That may not be the end of the story, however. **Even if the IRS accepts PV as ‘real property’, for solar investors to get the maximum benefit out of REITs the revenue from PPAs wil effectively have to be treated as ‘rental income’**, and it is not certain when or how this will be clarified.

**Ruling that PPA revenues are rents is the only way to make S-REITs effective.**

Josh **Sturtevant**, **2011**. George Washington University Solar Institute, J.D. from George Washington University Law School, Legal Associate at Distributed Sun LLC, in-house legal fellow at a renewable energy financing and development firm. “THE S-REIT: An Investment-Driven Solution to Solar Development Problems,” http://solar.gwu.edu/Research/Sturtevant\_S-REIT.pdf.

Although the REIT structure, with its ability to attract a broad base of investors, could be a very attractive tool for solar development, it is not clear that solar developments could, at this point, qualify for REIT status. There are some aspects of the REIT tax structure which would present little to no barrier for a solar developer. For example, the organizational and distributive requirements of REITs could effectively be satisfied with very little planning. Indeed, many solar developers likely satisfy many of the requirements already, such as having directors and transferable shares, inter alia. Additionally, it is not difficult to envision a solar developer satisfying the asset test as property is typically a significant category on many developers’ balance sheets. However, because of the novel approach of a solar development utilizing a REIT tax structure, whether or not an S-REIT could satisfy the income test as it is currently configured is less clear, **and could be the largest hurdle to the S-REIT structure**. As noted in discussion of the REIT structure, an entity must earn 75% of its income from rents. There is also a provision that part of this, 15% of total income, may come from personal 15 property related to the real property. Since the income gained by solar developments is in the form of payments based on a power purchase agreement linked to energy produced by solar panels, which could possibly be considered personal property, it is unclear whether all the income from a PPA could qualify as rents from real property. 57 58 I.R.C. 856 is silent in regard to solar development. Additionally, the IRS has not made any published rulings on whether income from a PPA would qualify as rent. 59 However, it is possible to find some support for the proposition that PPA income could qualify as rent from real property. As noted above, it might appear that solar panels are personal property. This would be problematic as rents gained from personal income can only contribute 15% to gross income. However, this personal property rule typically pertains to moveable property used in connection with broader business activities. For example, one retail mall was able to claim rents from baby strollers under this clause. 60 Immoveable solar panels, which serve the purpose of income generation, and not just add-ons to broader corporate activities, would not seem to fit into this category. A more appropriate comparison might be to the assets that railroads use to generate income, such as tracks and bridges. Therefore, a broad reading of ‘interests in real property’ that includes income gained from solar panels would likely be appropriate.

**Private rulings don’t solve and have been tipping against energy generators.**

**Laycock 12**—Stinson Morrison Hecker LLP attorney [Tim, and Tom Smallwood, SMH LLP attorney, “REITS’ potential to electrify Midwest real estate,” August 20, 2012, rejblog.com/2012/08/20/reits-potential-to-electrify-midwest-real-estate/]

New alternative energy projects of all shapes and sizes have recently sprung-up around the Midwest, including solar plants in Michigan and Ohio, wind farms in Illinois and Kansas, and biomass plants in Wisconsin. Federal and state funds are helping drive these projects, but developers and REITs alike may be missing a strong financing and investment opportunity. Placing wind, solar and other alternative energy assets in a REIT could create significant financial benefits for a developer. The primary challenge REITs and developers seeking REIT financing will face is that even with recent private letter rulings, power-generation equipment (as opposed to the transmission system) does not qualify for REIT investment. While this would appear to be a fatal flaw for the REIT model as it pertains to wind and solar assets, there are mechanisms to structure around the issue by including only the real property assets in a REIT, and excluding power-generation technology and equipment.

### 2AC—Water

#### Natural gas has little economic impact.

**Meyer 12** (Gregory, Writer @ the Financial Times, *Shale gas unlikely to reignite US economy*, April 13th, http://www.ft.com/intl/cms/s/0/50c5460a-856d-11e1-a75a-00144feab49a.html#axzz23U3hDs1P)

One million British thermal units is a lot of energy. It can warm the average American home for almost three winter days or get a car from New York to Baltimore.

This week, the price of a million Btus of natural gas tumbled below $2 for the first time in a decade. This astonishingly cheap energy price has important implications. But don’t expect gas to become **rocket fuel** for the US economy.

Gas has fallen thanks to the shale rock drilling boom that has spread from Louisiana to Pennsylvania. Last year the US produced record volumes. Academics, Wall Street analysts and the popular press are celebrating America’s newfound natural gas riches.

Citigroup has been circulating research saying North America could become the new Middle East, while the cover of Fortune magazine shows the oxidised hand of the Statue of Liberty holding a blue-flamed torch of freedom, highlighting a feature on how shale gas is reviving the US economy.

The benefits are clear: lower heating bills, potentially cheaper electricity and fewer US gas imports. But they should also be put in perspective.

For reference, look at a December 2011 study commissioned by America’s Natural Gas Alliance, US a coalition of 30 drillers. The report found that by 2015 shale gas would contribute $118bn to gross domestic product (in 2010 dollars) and “809,000 more Americans will be employed because of low gas prices”.

Before getting too excited, though, consider these facts. America’s GDP was $15tn last year. Assuming it keeps growing, shale’s contribution would be **less than 1 per cent** in 2015.

The US has a labour force of 155m people, of whom 12.7m were unemployed last month. If gas put 809,000 more Americans to work tomorrow, it would shave the unemployment rate from its current 8.2 per cent to a slightly less dismal 7.7 per cent.

“It’s certainly a good thing for the economy,” says John Parsons, economist at Massachusetts Institute of Technology and a member of the university’s natural gas study group. “But it’s **not any magical elixir**. It’s not that large a segment.”

Mr Parsons points out that the US economy has become much less energy-intensive than in past decades, meaning energy cost savings have less impact than they once did.

The ANGA study has even brighter forecasts for the year 2035. But anyone who has spent time on the energy patch knows forecasts can go awry. Indeed, 20 years ago the Financial Times was writing about a US “gas bubble” that had depressed prices. They later rose as high as $15.

This week the US Department of Energy’s analysis wing, the Energy Information Administration, said domestic gas production rose by a record 4.8bn cubic feet per day in 2011. This is more than three times its annual growth forecast made a year ago.

**Solve water!!**

**2AC—Topicality**

**We meet --- REITs are a financial incentive.**

**REIT 2011** (Money Zine, http://www.money-zine.com/Investing/Investing/Real-Estate-Investment-Trust/)

Benefits of Real Estate Investment Trusts

Historically, the wealth of an individual was measured in terms of the amount of land a person owned. Today, wealthy individuals can take partial ownership in companies by investing in stocks and bonds. But the door has also been opened for the average investor to participate in the real estate market through REITs.

In fact, when Congress passed the Real Estate Investment Trust Act of 1960, it allowed companies to be exempt from corporate income tax if the criteria mentioned above were met. Congress hoped this financial incentive would result in an increase in the number of investors pooling their money together to form real estate trusts.

**The plan a functional grant.**

**Mormann 12** (Felix Mormann is a fellow, and Dan Reicher is the executive director, both at Stanford’s Steyer-Taylor Center for Energy Policy and Finance. How to Make Renewable Energy Competitive, http://www.nytimes.com/2012/06/02/opinion/how-to-make-renewable-energy-competitive.html?pagewanted=all#h[])

¶ There is hope. Senator Chris Coons, Democrat of Delaware, plans to introduce a bill to allow master limited partnership investment in renewable energy. This approach is preferable to a recent proposal by Senator Bernard Sanders, independent of Vermont, and Representative Keith Ellison, Democrat of Minnesota, to eliminate this investment option for fossil-fuel projects. Both moves would level the playing field between conventional and renewable energy, but the Coons bill does so by promoting, rather than limiting, economic growth across the energy industry.

¶ These approaches could help renewable energy projects reduce their financing costs up to fivefold. These cost improvements could significantly reduce the price of renewable electricity and, over time, erase the need for costlier subsidies. Of course, making renewable energy eligible for master limited partnership and REIT financing would amount to a new kind of subsidy, because both are exempt from income tax. Indeed, some members of Congress fear that expanding master limited partnerships will erode the federal tax base. We don’t think so. Investors in master limited partnerships and REITs still pay taxes on dividends. Moreover, these investments would most likely bring many more renewable energy projects online, actually raising overall tax revenue.

**Financial incentives are government disbursements.**

**Webb 93** – lecturer in the Faculty of Law at the University of Ottawa(Kernaghan, “Thumbs, Fingers, and Pushing on String: Legal Accountability in the Use of Federal Financial Incentives”, 31 Alta. L. Rev. 501 (1993) Hein Online) – italics in the original

One of the obstacles to intelligent discussion of this topic is the tremendous potential for confusion about what is meant by several of the key terms involved. In the hopes of contributing to the development of a consistent and precise vocabulary applying to this important but understudied area of regulatory activity, various terms are defined below.

In this paper, "financial incentives" are taken to mean disbursements 18 of public funds or contingent commitments to individuals and organizations, intended to encourage, support or induce certain behaviours in accordance with express public policy objectives. They take the form of grants, contributions, repayable contributions, loans, loan guarantees and insurance, subsidies, procurement contracts and tax expenditures.19 Needless to say, the ability of government to achieve desired behaviour may vary with the type of incentive in use: up-front disbursements of funds (such as with contributions and procurement contracts) may put government in a better position to dictate the terms upon which assistance is provided than contingent disbursements such as loan guarantees and insurance. In some cases, the incentive aspects of the funding come from the conditions attached to use of the monies.20 In others, the mere existence of a program providing financial assistance for a particular activity (eg. low interest loans for a nuclear power plant, or a pulp mill) may be taken as government approval of that activity, and in that sense, an incentive to encourage that type of activity has been created.21 Given the wide variety of incentive types, it will not be possible in a paper of this length to provide anything more than a cursory discussion of some of the main incentives used.22 And, needless to say, the comments made herein concerning accountability apply to differing degrees depending upon the type of incentive under consideration.

By limiting the definition of financial incentives to initiatives where *public funds are either disbursed or contingently committed*, a large number of regulatory programs with incentive *effects* which exist, but in which no money is forthcoming,23 are excluded from direct examination in this paper. Such programs might be referred to as *indirect* incentives. Through elimination of indirect incentives from the scope of discussion, thedefinition of the incentive instrument becomes both more manageable and more particular. Nevertheless, it is possible that much of the approach taken here may be usefully applied to these types of indirect incentives as well.24 Also excluded from discussion here are social assistance programs such as welfare and *ad hoc* industry bailout initiatives because such programs are not designed primarily to *encourage* behaviours in furtherance of specific public policy objectives. In effect, these programs are assistance, but they are not incentives.

**2AC—States CP**

**The IRS is key.**

**Konrad 10/9**/12 [Tom, Forbes, Solar REITs: A Better Way to Invest in Solar [Updated] http://www.forbes.com/sites/tomkonrad/2012/10/09/solar-reits-a-better-way-to-invest-in-solar/2/]

A few REITs have dabbled with solar already as a revenue enhancement. IRS rules allow them to generate up to 25% of their income from sources other than real property, and this allows some scope for solar on REIT-owned buildings, for instance. Some solar developers are even specifically targeting the traditional REIT market. However, few REITs are likely to use this option to obtain more than a few percent of their income from solar because “ the IRS tends to be very wary of anything that doesn’t smell right in the context of REITs” and “ leads to wariness and conservatism by many REIT managers,” according to Sturtevant. REIT managers generally feel that a little extra revenue is not worth risking greater IRS scrutiny. The conservatism of REIT managers has most likely already **proven a barrier** to some potential solar installations on REIT property, and a positive revenue ruling would have the added advantage of giving a **green light** for existing REITs to install solar on their property.

**Federal action key.**

**Temkin 10**—Deloitte Tax LLP director

[Charles, and Jessica Duran, Deloitte senior manager, “The changing environment of R&R (REITs and Renewables),” https://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/FSI/us\_re\_changingenviroment%20of%20RR\_280910.pdf]

With The Housing Assistance Act of 2008, Congress empowered the Treasury to treat income which would not otherwise qualify for the gross income tests by either not taking it into account or by treating it as qualifying. Even with the various credits, incentives and potential for growth in the area of renewable energy credit exchanges (and with the broad ownership of real estate by REITs), it remains to be seen whether the Treasury will use its discretion to permit REITs to benefit from these incentives without being penalized under the REIT rules. One thing is certain — REITs have the potential to be substantial contributors to the success of these initiatives. Although the discussion above has merit and there is promise in the legislative proposals that have been set forth, **until there is specific guidance from the Federal level**, any REIT pondering a large solar panel purchase today may not fully enjoy the capital recovery incentives without some remedies to the current credit regime (as discussed above) and further guidance, in the area of income from PBIs.

**State spending kills the economy**

**Pollack 11**—Economic Policy Institute; Office of Management and Budget and the George Washington Institute of Public Policy; staff member for President Obama’s National Commission on Fiscal Responsibility and Reform; M.P.P. The George Washington University [Ethan, “Two years into austerity and counting…” October 19, http://www.epi.org/blog/years-austerity-counting/]

It’s popular to criticize Keynesian economics by alleging that the Recovery Act was an experiment in fiscal expansion, and because two-and-a-half years later the economy still hasn’t roared back to life, it must have failed. What this criticism forgets is that the federal government isn’t the only government setting fiscal policy. While the federal government did conduct Keynesian expansionary fiscal policy over the last few years, the states have been doing the reverse, acting, as Paul Krugman put it, like **“50 Herbert Hoovers”** as they cut budgets and raise taxes. They’re forced to do this because the cratering of private-sector spending which threw the economy into recession blew huge holes in their budgets (in particular with a huge fall in income, sales, and property taxes, and increases in demands on safety-net programs), and just about all of them are required to balance their budgets each year. Overall, states have had to close over $400 billion in shortfalls over the last few years—this is spending power siphoned off from the economy and acts as a significant “anti-stimulus.” This means that just looking at the amount of federal stimulus that’s been enacted significantly overestimates how much fiscal support has actually been pumped into the economy. In fact, as the Goldman Sachs graph below shows, the net fiscal expansion across all levels of government only lasted through the third quarter of 2009. For the last two years, state and local cuts have been overwhelming the federal fiscal expansion, making overall fiscal policy across all levels of government actually contractionary and creating a net drag on economic growth. What’s needed to reverse this drag of public-sector austerity on growth? The $35 billion for state and local aid that’s part of the American Jobs Act is a good start, as it would help keep states and local governments from being forced to cut further. As the last two years of austerity have shown, this would only serve to further weaken the economy. And if we’re going to get out of this economic hole, we first need to stop digging down further.

**States links to politics**

**Kiely 12** [[Eugene Kiely](http://www.factcheck.org/author/eugene-kiely/), Washington assignment editor USA today, February 17, 2012 Factcheck.org “Did Obama ‘Approve’ Bridge Work for Chinese Firms?” http://www.factcheck.org/2012/02/did-obama-approve-bridge-work-for-chinese-firms/]

Who’s to blame, if that’s the right word, if the project ends up using manufactured steel from China? The National Steel Bridge Alliance blames the state railroad agency. The Alliance for American Manufacturing says the federal Buy American laws have been “weakened with loopholes and various exemptions that make it easier for bureaucrats to purchase foreign-made goods instead of those made in American factories with American workers.” So, how did Obama get blamed for the decisions by state agencies and for state projects that, in at least one case, didn’t even use federal funds? The answer is a textbook lesson in how information gets distorted when emails go viral. We looked at the nearly 100 emails we received on this subject and found that Obama wasn’t mentioned at all in the first few emails. Typical of the emails we received shortly after the ABC News report aired was this one from Oct. 11, 2011: “I just got an email regarding Diane Sawyer on ABC TV stating that U. S. Bridges and roads are being built by Chinese firms when the jobs should have gone to Americans. Could this possible be true?” The answer: Yes, it’s true. End of story, right? Wrong. Days later, emails started to appear in our inbox that claimed ABC News reported that Chinese firm were receiving stimulus funds to build U.S. bridges — even though the broadcast news story didn’t mention stimulus funds at all. (The report did include a clip of Obama delivering a speech on the need to rebuild America’s bridges and put Americans to work, but said nothing about the president’s $830 billion stimulus bill.) Still, we received emails such as this one on Nov. 4, 2011, that included this erroneous claim language: “Stimulus money meant to create U.S. jobs went to Chinese firms. Unbelievable….” It didn’t take long for Obama to be blamed. That same day — Nov. 4, 2011 — we received an email that made this leap to Obama: “SOME CHINESE COMPANIES WHO ARE BUILDING ‘OUR’ BRIDGES. (3000 JOBS LOST TO THE CHINESE FIRM)…..AND NOW OBAMA WANTS ‘MORE STIMULUS MONEY’…..THIS IS NUTS ! ! ! If this doesn’t make you furious nothing will….” This year, Obama’s name started to surface in the subject line of such critical emails — raising the attack on the president to yet another level and perhaps ensuring the email will be even more widely circulated. Since Jan. 17, we have gotten more than a dozen emails with the subject line, “ABC News on Obama/USA Infrastructure,” often preceded with the word “SHOCKING” in all caps. The emails increasingly contain harsh language about the president. Since Jan. 11, 23 emails carried this added bit of Obama-bashing: “I pray all the unemployed see this and cast their votes accordingly in 2012!” One of those emails — a more recent one from Feb. 8 — contained this additional line: “Tell me again how Obama’s looking out for blue collar guys. He cancels pipelines, and lets Chinese contractors build our bridges…” And so it goes, on and on. **All from a news report that blamed state officials — not Obama — for spending taxpayer money** on Chinese firms to build U.S. bridges.

**2AC—Politics DA**

**Capital now on energy issues.**

**Kessler 1/9** Recharge News Political Analyst [Richard A. Kessler, ANALYSIS: Obama sticks by clean power, http://www.rechargenews.com/wind/article1313384.ece]

Barack Obama faces huge financial challenges – but he is still prepared to find money from the US government’s shrinking pie to finance renewables

The President is signalling that clean-technology development and renewables deployment will remain a focus during his second term, although his ambitions will be constrained by the government’s enormous fiscal problems.

The federal debt is soon expected to equal gross domestic product, and servicing it will consume a growing chunk of revenue.

Factor in out-of-control healthcare spending, and less money will be available for the green-energy programmes that Obama generously financed in his first term.

However, **he intends to expend political capital** gained from re-election **to find money to support renewables growth.** For instance, he has fought for and won a one-year extension of the crucial wind **p**roduction **t**ax **c**redit on more favourable terms for developers, and he will want to renew it again later this year.

Obama is also stacking his second-term cabinet with clean-energy advocates in key positions. Senator John Kerry will replace Secretary of State Hillary Clinton; Interior Secretary Ken Salazar has been persuaded to stay on; and the replacement for departing Environmental Protection Agency administrator Lisa Jackson is expected to have like-minded renewables-friendly views.

With Energy Secretary Steven Chu widely tipped to head back to California, potential replacements include former Colorado Governor Bill Ritter, a prominent wind and solar advocate.

Obama will ignore Republican demands that the **D**epartment **o**f **E**nergy stop picking clean-tech winners and then supporting its choices with funding. A prominent example of this strategy is offshore wind, which he believes could become a key part of the national energy mix.

The White House will also keep pressure on utilities to lessen their dependence on coal through tougher environmental regulations, which force them to retire older power plants, while bringing more wind and solar into their portfolios.

**Lots of fights coming up**

**McClatchy News 1/19** [Lesley Clark and Anita Kumar, Obama’s second term: Guns, immigration, taxes — and warnings of hubris, http://www.ohio.com/news/politics/obama-s-second-term-guns-immigration-taxes-and-warnings-of-hubris-1.366397]

Now as he inaugurates a second term, Obama faces a political climate even more riven by partisan divisions. And they pose sizable hurdles to any success he might hope for in a second term, including an aggressive call for overhauling the nation’s tax and immigration laws and an emerging fight to tighten gun regulations. The honeymoon will be brief. Obama’s nominees for several top Cabinet posts face confirmation fights. His outgoing secretary of state, Hillary Rodham Clinton, has been summoned by Congress to answer questions about the Sept. 11 terrorist attack in Benghazi, Libya, and will appear just two days after Obama’s ceremonial swearing-in at the Capitol. At the same time, Republicans in the House of Representatives have threatened to shut down the federal government if a vote to raise the debt ceiling is not accompanied by steep spending cuts — one of several looming fiscal fights that could set the tone for the entire second term. “**The fiscal situation is going to constrain the president every which way he turns**,” said Ken Duberstein, who served as chief of staff for President Ronald Reagan in his second term. “The trouble is you can’t so poison the atmosphere on the fiscal stuff that it drains whatever political capital you have to do your other priorities.” Obama has pledged to not negotiate with Republicans who want to use the debt ceiling vote as an opportunity to curtail federal spending, arguing at a news conference last week that the results of the November election show that voters agree with him that spending cuts should be accompanied by tax increases. Republicans argue that voters also elected them to lead the House. “I don’t think you can hide behind the mandate of re-election in a split government scenario, and certainly that’s a view widely held by House Republicans,” said Phil Musser, a political consultant who works to elect Republicans across the nation. “They feel they are just as entitled to their mandate as the president does to his.”

**No link --- IRS**

**Sturtevant 2011** (Joshua Sturtevant Program Manager for The Financial Literacy Group, JD from George Washington University Law School, BA in Economics from The University of Massachusetts, Amherst, THE S-REIT:  An Investment-Driven Solution to Solar Development Problems, <http://solar.gwu.edu/Research/Sturtevant_S-REIT.pdf>)

Based on the current lack of clarity regarding a potential S-REIT, a solar developer would require assurances that its development would be eligible for tax exempt status. Two different paths, one administrative, and one legislative seem to be open. The easiest and most efficient would be a revenue ruling declaring that the income gained from a power purchase agreement qualifies as rents from real property. This would come from the IRS and would be an administrative solution under the broad power given to the Secretary in defining what qualifies as rental income. Though a favorable revenue ruling seems likely and would be the easiest and quickest way for a solar developer to gain REIT status, REIT recognition could also be obtained via a slight legislative change to the code. A legislative solution where solar developments would be given treatment comparable to other niche REITs such as healthcare and hotel REITs would be a policy-based recognition of the fact that a unique revenue structure would require a unique solution under the tax code. However, the legislative solution is not likely necessary, and should only be recommended as an alternative to a failed revenue ruling.

**The plan is bipartisan.**

**Sturtevant 11** (Joshua Sturtevant Program Manager for The Financial Literacy Group, JD from George Washington University Law School, BA in Economics from The University of Massachusetts, Amherst, THE S-REIT:  An Investment-Driven Solution to Solar Development Problems, <http://solar.gwu.edu/Research/Sturtevant_S-REIT.pdf>)

61 Despite benefits, there could be some hurdles to this structure. For example, it is not likely that coal industry representatives would be the first in line to voice support for the S-REIT idea. Additionally, there could be some resistance to the possible tax changes recommended below. However, despite this, there is no reason to believe that utilizing the REIT tax structure to incentivize solar development would lack strong levels of investor and political support.62 This is truly an issue that could bring together both sides of the aisle as the goals of such a plan would satisfy everyone from environmentalists to capitalists to investor rights advocates. This breadth and depth of support would ensure that little resistance to such a plan would arise among these key constituencies and their representatives.

**The public loves the plan.**

**Lacey 12** – Climate Progress reporter (Stephen, "Poll: 72 Percent Of Swing Voters Say The Federal Government Should Do More To Promote Solar," Think Progress, thinkprogress.org/climate/2012/10/02/940721/poll-72-percent-of-swing-voters-say-the-federal-government-should-do-more-to-promote-solar/, accessed 10-20-12, mss)

Americans like solar. They like it a lot. A **new poll** shows that **92 percent** of registered voters feel it is either “very important” or “somewhat important” for the U.S. to develop more solar. Even more striking, the poll shows that 70 percent of voters believe the government should be doing more to help promote the technology through **financial incentives** — with 72 percent of swing voters saying they support increasing incentives. The takeaway: political ads around the failed solar manufacturer Solyndra that attack government support for the industry aren’t having much of an impact on voters. The poll, released this morning, was conducted by Hart Research for the solar industry’s trade group, the Solar Energy Industries Association. You can read all the questions here. Support for solar is strong across all political parties. According to the findings, 98 percent of Democrats, 95 percent of Independents, and 84 percent of Republicans say the country should develop more solar. The poll also shows that 87 percent of swing voters have a “very favorable” or “somewhat favorable” view of the technology. The Romney campaign, the Republican party, and third-party groups have spent millions of dollars this election season trying to politicize federal clean energy investments — particularly the solar manufacturer Solyndra, which received $527 million in loan guarantees before going bankrupt last year. But it doesn’t appear the message is sticking. According to the poll, 33 percent of voters say what they’ve heard in the media has given them mixed feelings or made them feel more negative about solar; however, 35 percent say they’ve heard “nothing recently” about solar and 32 percent say what they’ve heard has either made their feelings about solar more positive or made no difference on their perception. **Even with** the barrage of negative messaging this campaign season, 70 percent of all voters polled believe the U.S. should do more to encourage use of solar. This adds to the **long list of polls** showing that climate change and clean energy issues are positive ones for American voters — particularly for independents and swing voters. Last month, Yale University released a poll showing that 61 percent of undecided voters would consider a candidate’s stance on climate change when casting a ballot for president.

**Key to the agenda**

**Spitzer 93** [Prof of Poli Sci, State University of New York; Robert J., President and Congress: Executive Hegemony at the Crossroads of American Government]

An important empirical study of the relationship between the President’s public standing and presidential support in Congress concluded that the two are inextricably linked. Presidents who manage to satisfy public expectations are rewarded by high and stable public support. In turn, public support translates directly into success for the President in Congress. According to the data analysis of political scientists Charles Ostrom, Jr., and Dennis Simon, “the cumulative rate of roll-call victories [for the President in Congress] will decline by three points for every ten-point drop in [public] approval.” In turn, “Presidential effectiveness in the legislative arena is an important component in maintaining public support.” Naturally, many of the factors that influence the President’s standing are beyond direct control, such as the onset of a sharp economic downturn at the start of an administration. But Ostrom and Simon conclude that a shrewd President can influence public support and that the typical long-term decline in a President’s public standing is by no means inevitable.

**Political capital is irrelevant.**

**Dickinson 9** Professor of political science at Middlebury College and taught previously at Harvard University where he worked under the supervision of presidential scholar Richard Neustadt (5/26/09, Matthew, Presidential Power: A NonPartisan Analysis of Presidential Politics, “Sotomayor, Obama and Presidential Power,” http://blogs.middlebury.edu/presidentialpower/2009/05/26/sotamayor-obama-and-presidential-power/)

As for Sotomayor, from here the path toward almost certain confirmation goes as follows: the Senate Judiciary Committee is slated to hold hearings sometime this summer (this involves both written depositions and of course open hearings), which should lead to formal Senate approval before Congress adjourns for its summer recess in early August. So Sotomayor will likely take her seat in time for the start of the new Court session on October 5. (I talk briefly about the likely politics of the nomination process below). What is of more interest to me, however, is what her selection reveals about the basis of presidential power. Political scientists, like baseball writers evaluating hitters, have devised numerous means of measuring a president’s influence in Congress. I will devote a separate post to discussing these, but in brief, they often center on the creation of legislative “box scores” designed to measure how many times a president’s preferred piece of legislation, or nominee to the executive branch or the courts, is approved by Congress. That is, how many pieces of legislation that the president supports actually pass Congress? How often do members of Congress vote with the president’s preferences? How often is a president’s policy position supported by roll call outcomes? These measures, however, are a misleading gauge of presidential power – they are a better indicator of congressional power. This is because how members of Congress vote on a nominee or legislative item is rarely influenced by anything a president does. Although journalists (and political scientists) often focus on the legislative “endgame” to gauge presidential influence – will the President swing enough votes to get his preferred legislation enacted? – this mistakes an outcome with actual evidence of presidential influence. Once we control for other factors – a member of Congress’ ideological and partisan leanings, the political leanings of her constituency, whether she’s up for reelection or not – we can usually predict how she will vote without needing to know much of anything about what the president wants. (I am ignoring the importance of a president’s veto power for the moment.) Despite the much publicized and celebrated instances of presidential arm-twisting during the legislative endgame, then, most legislative outcomes don’t depend on presidential lobbying. But this is not to say that presidents lack influence. Instead, the primary means by which presidents influence what Congress does is through their ability to determine the alternatives from which Congress must choose. That is, presidential power is largely an exercise in agenda-setting – not arm-twisting. And we see this in the Sotomayer nomination. Barring a major scandal, she will almost certainly be confirmed to the Supreme Court whether Obama spends the confirmation hearings calling every Senator or instead spends the next few weeks ignoring the Senate debate in order to play Halo III on his Xbox. That is, how senators decide to vote on Sotomayor will have almost nothing to do with Obama’s lobbying from here on in (or lack thereof). His real influence has already occurred, in the decision to present Sotomayor as his nominee.

### 2AC Nat gas

**No natural gas- gas productivity and reserve size over-estimated--- insider knowledge proves**

**Urbina, 11** -- NY Times staff

(Ian, "Insiders Sound an Alarm Amid a Natural Gas Rush," NY Times, 6-25-11, www.nytimes.com/2011/06/26/us/26gas.html?pagewanted=all, accessed 6-4-12, mss)

Natural gas companies have been placing enormous bets on the wells they are drilling, saying they will deliver big profits and provide a vast new source of energy for the United States. But the gas may not be as easy and cheap to extract from shale formations deep underground as the companies are saying, according to **hundreds** of industry e-mails and **internal** documents and an analysis of **data from thousands of wells**. In the e-mails, energy executives, industry lawyers, state geologists and market analysts voice skepticism about lofty forecasts and question whether companies are intentionally, and even illegally, overstating **the** **productivity** of their wells **and** the **size of their reserves**. Many of these e-mails also suggest a view that is in stark contrast to more bullish public comments made by the industry, in much the same way that insiders have raised doubts about previous financial bubbles. “Money is pouring in” from investors even though shale gas is “inherently unprofitable,” an analyst from PNC Wealth Management, an investment company, wrote to a contractor in a February e-mail. “Reminds you of dot-coms.” “The word in the world of independents is that the **shale plays are just giant Ponzi schemes** and the economics just do not work,” an analyst from IHS Drilling Data, an energy research company, wrote in an e-mail on Aug. 28, 2009. Company data for more than 10,000 wells in three major shale gas formations raise further questions about the industry’s prospects. There is undoubtedly a vast amount of gas in the formations. The question remains how affordably it can be extracted. The data show that while there are some very active wells, they are often surrounded by vast zones of less-productive wells that in some cases cost more to drill and operate than the gas they produce is worth. Also, the amount of gas produced by many of the successful wells is falling much faster than initially predicted by energy companies, making it more difficult for them to turn a profit over the long run. If the industry does not live up to expectations, the impact will be felt widely. Federal and state lawmakers are considering drastically increasing subsidies for the natural gas business in the hope that it will provide low-cost energy for decades to come. But if natural gas ultimately proves more expensive to extract from the ground than has been predicted, landowners, investors and lenders could see their investments falter, while consumers will pay a price in higher electricity and home heating bills. There are implications for the environment, too. The technology used to get gas flowing out of the ground — called hydraulic fracturing, or hydrofracking — can require over a million gallons of water per well, and some of that water must be disposed of because it becomes contaminated by the process. If shale gas wells fade faster than expected, energy companies will have to drill more wells or hydrofrack them more often, resulting in more toxic waste. The e-mails were obtained through open-records requests or provided to The New York Times by industry consultants and analysts who say they believe that the public perception of shale gas does not match reality; names and identifying information were redacted to protect these people, who were not authorized to communicate publicly. In the e-mails, some people within the industry voice grave concerns. “And now these corporate giants are having an Enron moment,” a retired geologist from a major oil and gas company wrote in a February e-mail about other companies invested in shale gas. “They want to bend light to hide the truth.” Others within the industry remain optimistic. They argue that shale gas economics will improve as the price of gas rises, technology evolves and demand for gas grows with help from increased federal subsidies being considered by Congress. “Shale gas supply is only going to increase,” Steven C. Dixon, executive vice president of Chesapeake Energy, said at an energy industry conference in April in response to skepticism about well performance. Studying the Data “I think we have a big problem.” Deborah Rogers, a member of the advisory committee of the Federal Reserve Bank of Dallas, recalled saying that in a May 2010 conversation with a senior economist at the Reserve, Mine K. Yucel. “We need to take a close look at this right away,” she added. A former stockbroker with Merrill Lynch, Ms. Rogers said she started studying well data from shale companies in October 2009 after attending a speech by the chief executive of Chesapeake, Aubrey K. McClendon. The math was not adding up, Ms. Rogers said. Her research showed that wells were petering out faster than expected. “These wells are depleting so quickly that the operators are in an expensive game of ‘catch-up,’ ” Ms. Rogers wrote in an e-mail on Nov. 17, 2009, to a petroleum geologist in Houston, who wrote back that he agreed. “This could have profound consequences for our local economy,” she explained in the e-mail. Fort Worth residents were already reeling from the sudden reversal of fortune for the natural gas industry. In early 2008, energy companies were scrambling in Fort Worth to get residents to lease their land for drilling as they searched for so-called monster wells. Billboards along the highways stoked the boom-time excitement: “If you don’t have a gas lease, get one!” Oil and gas companies were in a fierce bidding war for drilling rights, offering people bonuses as high as $27,500 per acre for signing leases. The actor Tommy Lee Jones signed on as a pitchman for Chesapeake, one of the largest shale gas companies. “The extremely long-term benefits include new jobs and capital investment and royalties and revenues that pay for public roads, schools and parks,” he said in one television advertisement about drilling in the Barnett shale in and around Fort Worth. To investors, shale companies had a more sophisticated pitch. With better technology, they had refined a “manufacturing model,” they said, that would allow them to drop a well virtually anywhere in certain parts of a shale formation and expect long-lasting returns. For Wall Street, this was the holy grail: a low-risk and high-profit proposition. But by late 2008, the recession took hold and the price of natural gas plunged by nearly two-thirds, throwing the drilling companies’ business model into a tailspin. In Texas, the advertisements featuring Mr. Jones disappeared. Energy companies rescinded high-priced lease offers to thousands of residents, which prompted class-action lawsuits. Royalty checks dwindled. Tax receipts fell. The impact of the downturn was immediate for many. “Ruinous, that’s how I’d describe it,” said the Rev. Kyev Tatum, president of the Fort Worth chapter of the Southern Christian Leadership Conference. Mr. Tatum explained that dozens of black churches in Fort Worth signed leases on the promise of big money. Instead, some churches were told that their land may no longer be tax exempt even though they had yet to make any royalties on the wells, he said. That boom-and-bust volatility had raised eyebrows among people like Ms. Rogers, as well as energy analysts and geologists, who started looking closely at the data on wells’ performance. In May 2010, the Federal Reserve Bank of Dallas called a meeting to discuss the matter after prodding from Ms. Rogers. One speaker was Kenneth B. Medlock III, an energy expert at Rice University, who described a promising future for the shale gas industry in the United States. When he was done, Ms. Rogers peppered him with questions. Might growing environmental concerns raise the cost of doing business? If wells were dying off faster than predicted, how many new wells would need to be drilled to meet projections? Mr. Medlock conceded that production in the Barnett shale formation — or “play,” in industry jargon — was indeed flat and would probably soon decline. “Activity will shift toward other plays because the returns there are higher,” he predicted. Ms. Rogers turned to the other commissioners to see if they shared her skepticism, but she said she saw only blank stares. Bubbling Doubts Some **doubts about the industry are being raised by people who work inside energy companies**, too. “Our engineers here project these wells out to 20-30 years of production and in my mind that has yet to be proven as viable,” wrote a geologist at Chesapeake in a March 17 e-mail to a federal energy analyst. “In fact I’m quite skeptical of it myself when you see the % decline in the first year of production.” “In these shale gas plays no well is really economic right now,” the geologist said in a previous e-mail to the same official on March 16. “They are all losing a little money or only making a little bit of money.” Around the same time the geologist sent the e-mail, Mr. McClendon, Chesapeake’s chief executive, told investors, “It’s time to get bullish on natural gas.” In September 2009, a geologist from ConocoPhillips, one of the largest producers of natural gas in the Barnett shale, warned in an e-mail to a colleague that shale gas might end up as “the world’s largest uneconomic field.” About six months later, the company’s chief executive, James J. Mulva, described natural gas as “nature’s gift,” adding that “rather than being expensive, shale gas is often the low-cost source.” Asked about the e-mail, John C. Roper, a spokesman for ConocoPhillips, said he absolutely believed that shale gas is economically viable. A big attraction for investors is the increasing size of the gas reserves that some companies are reporting. Reserves — in effect, the amount of gas that a company says it can feasibly access from its wells — are important because they are a central measure of an oil and gas company’s value. Forecasting these reserves is a tricky science. Early predictions are sometimes lowered because of drops in gas prices, as happened in 2008. Intentionally overbooking reserves, however, is illegal because it misleads investors. Industry e-mails, mostly from 2009 and later, include language from oil and gas executives questioning whether other energy companies are doing just that. The e-mails do not explicitly accuse any companies of breaking the law. But **the** **number of e-mails**, the **seniority of** the **people writing** **them**, the **variety of positions they hold** **and** the **language they use** — including comparisons to Ponzi schemes and attempts to “con” Wall Street — suggest that questions about the shale gas industry exist in many corners. “Do you think that there may be something suspicious going with the public companies in regard to booking shale reserves?” a senior official from Ivy Energy, an investment firm specializing in the energy sector, wrote in a 2009 e-mail. A former Enron executive wrote in 2009 while working at an energy company: “I wonder when they will start telling people these wells are just not what they thought they were going to be?” He added that the behavior of shale gas companies reminded him of what he saw when he worked at Enron. Production data, provided by companies to state regulators and reviewed by The Times, show that many wells are not performing as the industry expected. In three major shale formations — the Barnett in Texas, the Haynesville in East Texas and Louisiana and the Fayetteville, across Arkansas — less than 20 percent of the area heralded by companies as productive is emerging as likely to be profitable under current market conditions, according to the data and industry analysts. Richard K. Stoneburner, president and chief operating officer of Petrohawk Energy, said that looking at entire shale formations was misleading because some companies drilled only in the best areas or had lower costs. “Outside those areas, you can drill a lot of wells that will never live up to expectations,” he added. Although energy companies routinely project that shale gas wells will produce gas at a reasonable rate for anywhere from 20 to 65 years, these companies have been making such predictions based on limited data and a certain amount of guesswork, since shale drilling is a relatively new practice. Most gas companies claim that production will drop sharply after the first few years but then level off, allowing most wells to produce gas for decades. Gas production data reviewed by The Times suggest that many wells in shale gas fields do not level off the way many companies predict but instead decline steadily. “This kind of data is making it harder and harder to deny that **the** shale gas **revolution is being** **oversold**,” said Art Berman, a Houston-based geologist who worked for two decades at Amoco and has been one of the most vocal skeptics of shale gas economics. The Barnett shale, which has the longest production history, provides the most reliable case study for predicting future shale gas potential. The data suggest that if the **wells’** production continues to decline in the current manner, many **will become** financially **unviable within 10** to 15 **years**. A review of more than 9,000 wells, using data from 2003 to 2009, shows that — based on widely used industry assumptions about the market price of gas and the cost of drilling and operating a well — less than 10 percent of the wells had recouped their estimated costs by the time they were seven years old.

### 2AC Nat Gas- russia

**Gazprom is dying now**

**Matlack 12** (Carol Matlack, “Europe's Price Vengeance on Gazprom,” 11/8/12) http://www.businessweek.com/articles/2012-11-08/europes-price-vengeance-on-gazprom

From the Baltics to the Mediterranean, Russia’s Gazprom (GAZP) has long been the dominant supplier of natural gas to heat homes, run factories, and generate electricity. Even if its European customers grumbled about high prices, they didn’t do it too loudly: Gazprom could cut them off, as Ukraine learned during its price disputes with the company between 2005 and 2010. A global production boom led by U.S. shale gas has turned the tables. While the U.S. is now awash in cheap gas, Gazprom’s European customers pay about three times the U.S. price. European utilities are demanding—and winning—price concessions that are clobbering Gazprom’s bottom line. On Nov. 2, the company reported second-quarter profits down 50 percent, as discounts to clients reached $4.25 billion so far this year. As recently as a decade ago, Gazprom accounted for almost half of Europe’s gas imports. That figure has since fallen to about 33 percent, as customers switched to Norwegian or Algerian gas—and, more recently, to imported American coal, which has become plentiful because U.S. utilities are burning cheap gas instead. Even Vladimir Putin has acknowledged something has to change. Gazprom, he said at an energy meeting near Moscow on Oct. 23, must “find new, mutually acceptable forms of cooperation to be closer to the end users.” Europe is Gazprom’s biggest customer, paying it $57 billion last year—almost 40 percent of revenues. Russian plans for a pipeline to China have stalled over pricing disagreements, and the Chinese have started importing gas from Central Asia and developing their own shale gas. Gazprom on Oct. 29 said it would invest $45 billion to produce and ship natural gas from eastern Siberia to Asia via a liquefied natural gas plant in the port of Vladivostok. “The prospects are very big,” said Gazprom Chief Executive Alexey Miller, a Putin ally who has headed the company since 2001. Those projects will take years to finish. Meanwhile, the outlook for Gazprom’s finances is “alarming,” VTB Capital analysts in Moscow said in a Nov. 1 research note. Most of Gazprom’s European contracts are linked to the price of oil, which roughly doubled over the past four years. Customers such as German utility E.ON (EOAN) now lose nearly €12 per megawatt hour when they burn gas, according to Bloomberg estimates. If they switch to coal, they make a profit of nearly €12. U.S. coal exports to Europe jumped 31.5 percent this year. Despite environmental risks, “commercial realities force companies to do that,” says Walter Boltz, vice chairman of the European Union’s Agency for the Cooperation of Energy Regulators. To appease big customers in Western Europe, Gazprom has offered discounts of as much as 10 percent. That angers the Eastern Europeans, who are locked into Soviet-era pipelines and lack alternative sources to use as bargaining chips. “We suffer a quite significant price difference compared to our Western competitors,” says Gérard Bourland, chief executive of utility Dalkia Energia in Budapest. Utilities in the East are now taking Gazprom into court or arbitration. Gazprom this month settled an arbitration case filed by Polish utility PGNiG by agreeing to rebates of up to $930 million. Two weeks earlier, Gazprom lost a case filed by RWE Transgas, the Czech subsidiary of German utility RWE. Gazprom says it may appeal that ruling, which RWE said would save it hundreds of millions of euros annually. EU regulators in September opened an antitrust investigation, saying Gazprom may have hindered East European customers from finding other suppliers. Gazprom disputes that. The investigation “can be viewed as pressure from the European Commission on Gazprom with the aim of influencing prices and the results of commercial negotiations,” Gazprom spokesman Sergey Kupriyanov says. Gazprom still controls 18 percent of global gas reserves and has the Kremlin’s backing. But, says Pierre Noël, director of the Energy Policy Forum at Cambridge University, “the EU-Russia relationship is changing, and there is no possibility of going back.” The bottom line: Though Gazprom’s European sales were $57 billion last year, its share of European imports is falling as customers find alternatives.

### AT: russia econ

**Economic decline has no effect on Russian foreign policy**

**Blackwill 2009** – former US ambassador to India and US National Security Council Deputy for Iraq, former dean of the Kennedy School of Government at Harvard (Robert D., RAND, “The Geopolitical Consequences of the World Economic Recession—A Caution”, http://www.rand.org/pubs/occasional\_papers/2009/RAND\_OP275.pdf, WEA)

Now on to Russia. Again, five years from today. Did the global recession and Russia’s present serious economic problems substantially modify Russian foreign policy? No. (President Obama is beginning his early July visit to Moscow as this paper goes to press; nothing fundamental will result from that visit). Did it produce a serious weakening of Vladimir Putin’s power and authority in Russia? No, as recent polls in Russia make clear. Did it reduce Russian worries and capacities to oppose NATO enlargement and defense measures eastward? No. Did it affect Russia’s willingness to accept much tougher sanctions against Iran? No. Russian Foreign Minister Lavrov has said there is no evidence that Iran intends to make a nuclear weapon.25 In sum, Russian foreign policy is today on a steady, consistent path that can be characterized as follows: to resurrect Russia’s standing as a great power; to reestablish Russian primary influence over the space of the former Soviet Union; to resist Western efforts to encroach on the space of the former Soviet Union; to revive Russia’s military might and power projection; to extend the reach of Russian diplomacy in Europe, Asia, and beyond; and to oppose American global primacy. For Moscow, these foreign policy first principles are here to stay, as they have existed in Russia for centuries. 26 None of these enduring objectives of Russian foreign policy are likely to be changed in any serious way by the economic crisis.

**Russian economic collapse is inevitable**

**Khrushcheva 2008** (Nina L. Khrushcheva is an associate professor of international affairs at the New School, Chronicle of Higher Education, 9-5)

That scenario, however, is unlikely. The unstable conditions that are stoking Russia's current economic boom may soon bring about a crisis similar to the financial meltdown of 1998, when, as a result of the decline in world commodity prices, Russia, which is heavily dependent on the export of raw materials, lost most of its income. Widespread corruption at every level of private and state bureaucracy, coupled with the fact that the government invests little of its oil money in fostering areas like technological innovation, corporate responsibility, and social and political reform, could spin the economic balance out of control. Rampant inflation might bring the Putin-Medvedev Kremlin down. Even if Russia withstands that scenario, global forces will ultimately burst its economic bubble. The temporary release of the U.S. oil reserves, and tough economic and legal sanctions against oil speculators around the world, should end Russia's oil supremacy and hasten its economic collapse. And sooner or later, alternative solutions to the world's dependence on oil and gas will be found.

**Russian economic decline limits adventurism**

**Bandow, 08** – Robert A. Taft Fellow at the American Conservative Defense Alliance (Doug, “The Russian Hangover,” http://www.nationalinterest.org/Article.aspx?id=20088)

But we need not wait until 2020 for evidence of Russian weakness. Economic uncertainty and falling energy prices have combined to deflate Russia’s pretensions of being a great power again. The stock market is down 70 percent from May, with one-time billionaire oligarchs scurrying to the Kremlin begging for relief. The ruble has lost two year’s worth of appreciation as anxious citizens, so recently celebrating their new prosperity, change their savings into dollars and euros. Heretofore abundant foreign-exchange reserves have dissipated as oil prices have fallen by more than half and the government has attempted to prop up the ruble. Investment-rating services are threatening to downgrade Russian debt. As its economy weakens, Russia is less able to threaten its neighbors and the West—by cutting off energy shipments, for instance///

—should its demands not be met. Moreover, declining revenues will crimp the Kremlin’s plans to sharply enhance its military. Not only will there be less money available overall, but more funds will have to be plowed into business investment and social programs. Economic growth has been the foundation of Vladimir Putin’s popularity. He will be loath to risk popular displeasure by allowing the economy to continue sinking.

Indeed, Russia’s present financial difficulties are likely to force Moscow to accelerate economic integration with the West, which will force the Kremlin to moderate its foreign policy. Last year, then–President Putin issued an updated economic development strategy for 2020, which envisioned Russia as sporting one of the globe’s five-largest economies and acting as an international financial center and technological leader. Those are challenging goals under any circumstances, but almost certainly will be impossible to achieve without abundant Western investment, trade and cooperation

## \*\*\* 1AR

### Loose nukes

#### Small risk of successful bomb construction

**Mueller 07** - Professor of political science at Ohio State University[John Mueller, “Apocalypse Later,” The National Interest, 11.12.2007, pg. http://www.nationalinterest.org/Article.aspx?id=15998]

There are literally dozens of major hurdles, **all of which must be conquered**.Even if the terrorist stands a fifty-fifty chance of overcoming each of these, the chances of ultimate success—that is, of coming up with and successfully setting off a bomb that would be, as Allison puts it in his book, “large, cumbersome, unsafe, unreliable, unpredictable, and inefficient”—arealmost**vanishingly small**. As Christoph Wirz and Emmanuel Egger,two senior physicists in charge of nuclear issues at Switzerland’s Spiez Laboratory, havesaid, the construction of even a simple bomb is difficult, dangerous and extremely exacting; the technical requirements “in several fields verge on the unfeasible”; and the task “**could hardly be accomplished by a subnational group**.” I have much expanded my argument and presented it as an academic paper.2

#### Safety and security measures solve

**Wirz & Egger 05** - Senior physicists incharge of nuclear issues at the Spiez Laboratory, the Swiss Nuclear, Biological and ChemicalDefence Establishment. [Christoph Wirz (Dr. phil. nat.)& Emmanuel Egger (Dr. rer. nat.), “Use of nuclear and radiological weapons by terrorists?,”International Review of the Red Cross, Volume 87 Number 859 September 2005

Several different types ofsafety and security systemsexist,ensuring that**under no circumstances** can an unwanted nuclear explosion take place. These are some of them:

• inertial switches and acceleration sensors allow priming only after a threshold level has been reached;

• certain types require a high energy electrical impulse;

• environmental sensing devicesmonitor the trajectory andswitch on only at a distinct ratio of the longitudinal to lateral acceleration;

• a barometric switch activates the electric circuit only at a distinct height above ground;

• aso-called permissive-action link(PAL) is needed, consisting for instance of several number codes with up to 12 digits and allowing a limited number of tries.The code has to be entered by more than one person, i.e. each person concerned knows only part of the entire code.

It is also known that since the 1970s, security systemsfor nuclear weaponsexistin the USA that will **destroy** critical components or **render them useless** if someone handles the weapon improperly or tries to open it. Similar safety and security systems arealso incorporated in Russian nuclear weapons.

If the nuclear weapon is not completely destroyed when it is opened, and the fissile material can be removed, the quantity will not be sufficient for a primitive design; to obtain enough, several weapons would have to be stolen.

These safety and security systems also ensure that the **successful use of a stolen weapon would be very unlikely**. Pg. 502 //1nc

### 1AR Public Popularity Link Turn

#### Solar incentives are nearly as popular as killing Osama

Romm, 12 -- Climate Progress editor

(Joe, Ph.D. in physics from MIT, American Progress fellow, former acting assistant secretary of energy for energy efficiency and renewable energy, "Government Investment in Renewable Energy Nearly as Popular With Swing Voters as Death of Osama bin Laden," Think Progress, 1-25-12, thinkprogress.org/climate/2012/01/25/411355/government-investment-in-renewable-energy-popular-with-swing-voters-death-of-osama-bin-laden/?mobile=nc, accessed 10-19-12)

Government Investment in Renewable Energy Nearly as Popular With Swing Voters as Death of Osama bin Laden Voters just **love** government investment in renewable energy — much more than their representatives in Washington, it seems. I was reading an analysis of the State of the Union Address based on the response of “a group of 50 swing voters armed with dial meters” and came across this nugget: Not surprisingly, the moment in the speech that brought the most positive reaction was Obama’s mention of the death of Osama bin Laden. It drew an average reading of 80 on the 0-100 scale used by the meters. Obama’s call for more investment in renewable energy drew nearly as strong a reaction, however, said Andrew Baumann, another of the pollsters who conducted the study. The passages of the speech that talked about phasing out subsidies for oil companies and competing with China and Germany for new developments in wind power and solar energy did particularly well. And while small dial groups are hardly definitive by themselves, Climate Progress readers know that poll after poll after pollshow the same thing (see Democrats Taking “Green” Positions on Climate Change “Won Much More Often” Than Those Remaining Silent and links to polls therein). This enthusiasm has not waned even with all the attacks on clean energy — see Independents Support Federal Investment in “Green Jobs” 2-to-1 Despite Solyndra Media Storm: In dozens of focus groups we have conducted this month across the country on a wide variety of subjects, when voters are asked where they would like new jobs in their state to come from, the first words out of their mouths are almost always the same – clean energy and related technology. Voters believe that the clean energy economy is here and is growing, and they want their state to have a part of it.