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#### Plan: The United States Federal Government should substantially increase its economic engagement toward Mexico through the joint construction of a transmission grid system.

# Advantage 1: Grid Collapse

#### Development of a hemispheric energy partnership insulates the US from inevitable energy shocks that would collapse the new and critical infrastructure –

Alison Terry, 2012, International Affairs Review, Vol. 20, No. 3., "Policy and Practice in North American Energy Security," <http://www.iar-gwu.org/sites/default/files/articlepdfs/North%20American%20Energy%20Security.pdf>

The United States, Canada, and Mexico each has a unique history in the ¶ development of their national energy policies, however, all three countries ¶ continue to struggle with growing domestic demands for energy. ¶ Developing renewable energy resources and improving technologies for ¶ extracting unconventional resources will promote energy security by ¶ increasing supply.1¶ However, instead of realizing these gains ¶ independently, energy security for the United States, Canada, and Mexico ¶ should be incorporated into the existing trade and security relationships ¶ between the three countries. This holistic perspective would promote ¶ North American energy security by improving efficiency of production ¶ and distribution and will be best achieved by a strategy of energy ¶ interdependence.¶ Threats to energy security can take the form of natural disasters, cyber attacks, or regional disputes involving exporting countries. Each of these ¶ situations has the potential to disrupt supply flows and impair the ¶ functioning of critical infrastructure. Hurricane Katrina served as an ¶ integrated shock because it simultaneously interrupted flows of oil, natural ¶ gas, and electricity throughout North America.2¶ Canada and Mexico ¶ assisted the US Federal Emergency Management Agency with disaster ¶ response. This event demonstrates that cooperative continental defense ¶ strategies can help to ensure energy security. ¶ The idea of energy interdependence is particularly relevant to North ¶ America because the United States, Canada, and Mexico import and ¶ export energy from one another. Rather than operating the North ¶ American energy markets individually for each country, the United States, ¶ Canada, and Mexico should develop regional markets that can overlap ¶ easily across the international borders.3¶ For example, Canada is currently ¶ the largest supplier of energy to the United States.4¶ In 2010, 25.1 percent ¶ of net US oil imports came from Canada and 8.5 percent came from ¶ Mexico.5¶ The United States provides 65.9 percent of Mexico’s net natural ¶ gas imports.6¶ Although the three countries cannot completely satisfy their ¶ energy needs in a North American triad, the relationship of energy sharing ¶ could act as a stabilizing force for the continent in the face of tenuous ¶ import-export relationships in the international energy trade.

#### The Electric grid is extremely unstable- anything can cause a shut down.

Tollefson, Jeff 8/26/13 http://www.scientificamerican.com/article/us-electrical-grid-on-failure/AY

The electric grid, which operates as a series of networks that are defined by geography, is a prime example, says Havlin. “Whenever you have such dependencies in the system, failure in one place leads to failure in another place, which cascades into collapse.”¶ “I suppose I should be open-minded to new research, but I'm not convinced,” says Jeff Dagle, an electrical engineer at the Pacific Northwest National Laboratory in Richland, Wash., who served on the government task force that investigated the 2003 outage. “The problem is that this doesn’t reflect the physics of how the power grid operates.”The warning [comes ten years after a blackout](http://www.nature.com/news/is-the-us-grid-better-prepared-to-prevent-a-repeat-of-the-2003-blackout-1.13559) that crippled parts of the midwest and northeastern United States and parts of Canada. In that case, a series of errors resulted in the loss of three transmission lines in Ohio over the course of about an hour. Once the third line went down, the outage cascaded towards the coast, cutting power to some 50 million people. Havlin says that this outage is an example of the inherent instability his study describes, but others question whether the team’s conclusions can really be extrapolated to the real world

#### Grid collapse causes massive nuclear meltdownsCaldicott 5(Helen, Australian physician who won the Nobel Peace Prize in 1985 and is the president of the Nuclear Policy Research Institute based in Washington. She spoke with UPI National Security Correspondent Martin Sieff., Titel: Nuclear-war threat still very real, http://www.airpower.at/forum/viewtopic.php?t=900)And if you detonate a single nuclear weapon in the upper atmosphere you will produce an electric magnetic pulse, or EMP. One nuclear weapon detonated in near space would therefore melt down the entire electronic communications network of the United States. ¶ This would of course ruin the U.S. economy and utterly disrupt society across the country. But it would have even more grave consequences. There are 103 nuclear power plants across the United States. They all rely on external electricity supply that powers their water-coolant systems. If these were all knocked out, you would run the risk of more than 100 Chernobyl-scale nuclear core meltdowns across the United States. ¶ All the power plants have their own back-up generators, of course, but they would all need time crank up and too often their testing and maintenance has been neglected because they so seldom, if ever, have had to be used in the past, and some of them don't work when they're supposed to. Therefore there would indeed be a real risk of many Chernobyls all over the place. Thus a single EMP detonation in space aimed against U.S. military space-based assets could produce a truly cataclysmic outcome, and it would be very easy to do.

#### And, even a Small grid failure brings down the entire system – impact is chemical plant explosions which are worse than atomic bombsLatynina 2003**Yulia Latynina, journalist for Novaya Gazeta[World Press Review (VOL. 50, No. 11) www.worldpress.org/Americas/1579.cfm ]**The scariest thing about the cascading power outages was not spoiled groceries in the fridge, or elevators getting stuck, or even, however cynical it may sound, sick patients left to their own devices without electricity-powered medical equipment.¶ The scariest thing of all was chemical plants and refineries with 24-hour operations, which, if interrupted, can result in consequences even more disastrous and on a larger scale than those of an atomic bomb explosion. So it is safe to say that Americans got lucky this time.¶ Several hours after the disaster, no one could know for certain whether the power outage was caused by an accident or someone’s evil design. In fact, the disaster on the East Coast illustrates just one thing: A modern city is in itself a bomb, regardless of whether someone sets off the detonator intentionally or by accident.¶ As I recall, when I was writing my book Industrial Zone, in which business deals were bound to lead to a massive industrial catastrophe, at some point in time I was considering making a cascading power outage the cause of a catastrophe.¶ Back then, I was amazed and shocked at the swiftness of the process. Shutting down at least one electric power plant is enough to cause a drop in power output throughout the entire power grid. This is followed by an automatic shutdown of nuclear power plants, a further catastrophic drop in power, and finally a cascading outage of the entire grid system.¶ To start with, the electric power plant may burn out because of just about anything. In Ekibastuz [Kazakhstan] under the Soviet regime, a large hydroelectric power station was burned to the ground because of the negligence of one extremely smart worker, who used a wrench to unscrew the cap from a pressurized oil vessel.¶ A stream of oil shot up to the ceiling; the worker got scared and dropped the wrench, which hit against the steel floor and created a spark that set the stream of oil on fire. Then the lights went off.¶ Which brings us back to our main thesis. In order to destroy a modern city, one does not need to have nuclear weapons, because the modern city is in itself a weapon. The city infrastructure is an infrastructure with dual purpose.¶ Why should terrorists need chemical weapons if their enemies already have chemical plants?¶ Why should terrorists need nuclear weapons if their enemies already have skyscrapers and airplanes with tanks full of fuel, which can be hijacked with the help of a penknife?¶ Why would they need sophisticated military technologies and stolen explosives if the KamAZ truck that blew up the hospital in Mozdok was carrying a load of, let us say, fertilizer? So-called dictatorship regimes and terrorists themselves have long since figured that out.¶ That is exactly why there were no nuclear or bacteriological weapons in Iraq. Why not? A bomb planted on an airplane would kill dozens fewer people than a failure of the air traffic control system of a large airport.¶ Sept. 11 taught the world that the infrastructure of the modern civilization could be as lethal as the weapons themselves.¶ Last week, a significant and major addition was made to the lesson of Sept. 11: The actions of terrorists can’t always be distinguished from the actions of a drunken dispatcher or random lightning.

#### Statistics prove economic collapse causes war

Royal ‘10 (Director of CTR Jedediah, Director of Cooperative Threat Reduction – U.S. Department of Defense, “Economic Integration, Economic Signaling and the Problem of Economic Crises”, Economics of War and Peace: Economic, Legal and Political Perspectives, Ed. Goldsmith and Brauer, 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 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.

# Advantage 2: Clean Tech

#### US-Mexico collaboration creates an expertise bank – spurs global modeling –

Bennett 11 (Nicholas, Regional Sales Representative – Terryberry Company, “Smart Grid Technology – Mexico’s Upcoming Market Boon,” University of Arizona, <http://next.eller.arizona.edu/courses/BusinessInternationalEnvironments/Fall2011/student_papers/finalnicholasbennett.pdf>)

The lack of synchronicity and communication between competing smart grid providers is possibly the most detrimental factor hampering the industry. Reviewing the companies examined before, Austin Energy is a city-owned public utility company, while Mexico City’s smart grid provider, Elster, is a third-party private company. The right to choose the most advantageous and cost-effective smart grid servicer is discretionary as it should be. The issue stems from a highly competitive atmosphere in a field that is still relatively volatile and still developing. Also, the importance of successful implementation of smart grid technologies is vital for the day-to-day operations in cities across the world. Major mistakes could lead to detrimental effects in their respective regions. The foundation of an international committee or board of regents consisting of smart grid professionals and approved providers would increase shared information and provide a reliable resource for prospective customers. Mexico and the United States could instigate the formation of this committee. Their existing relationship regarding the smart grid field is already close, so support should be mutual. With two of the most promising nations moving forward to a collaborative smart grid committee, other nations will likely want to join. The incentives of international support and training would lead to even more effective solutions to energy usage. The committee could also be used to raise funds for countries who cannot afford the upfront capital to begin smart grid programs. The provision of numerous jobs, strengthened international relationships, and the culmination of smarter energy solutions are only some of the benefits such a committee could provide. Strict regulations regarding privacy and control between public and private companies will be enforced, limiting the barriers of entry for prospective members. The details and complexities of formation of this committee would be subject to its representatives. A global committee focusing on the details of smart grid systems is a proactive response to an emerging and exciting new market.

#### Mexico set to be model for energy efficiency, poor energy infrastructure stops it

Lundin 13 (Barbara Vergetis Lundin, July 31, 2013, FierceSmartGrid, “Mexico's unprecedented smart grid opportunity”, <http://www.fiercesmartgrid.com/story/mexicos-unprecedented-smart-grid-opportunity/2013-07-31>)

Mexico is poised to become a major smart grid market over the next decade. Zpryme's research indicates that Mexico's smart grid technology market will grow from $1.23 billion in 2012 to $7.42 billion in 2020, according to research from Zpryme, at a compound annual growth rate (CAGR) of 25 percent and representing an attractive regional opportunity in a large market poised for aggressive investment to modernize their power grid. The 25 percent CAGR indicates that Mexico is poised for a long cycle of sustained growth. This is a healthy environment for centralized planning, and if the levers for investment and policy change can keep pace with the growing need for energy, Mexico will serve as a model for other countries to follow for rapid and environmentally responsible modernization efforts, according to Zpryme. Currently, however, Mexico faces problems such as power outages, electrical theft, and poor energy infrastructure, not unlike many Latin American countries, providing an unprecedented opportunity for Mexico to improve both functionally and economically with smart grid technology. Currently, Mexico's electricity market is federally owned, with the Federal Electricity Commission (Comisión Federal de Electricidad or CFE) essentially controlling the whole sector. This level of control has stifled innovation to date, but Zpryme believes things will change with broader participation coming from the private sector. Private power generation in Mexico is done on a self-supply basis, where players can only generate electricity for their own consumption, and can only sell excess electricity back to CFE. As modernization advances, private power producers will have new opportunities, thus bringing more secondary buyers into the market for smart grid technologies. Zpryme concludes that these and other positive opportunities will drive overall growth for Mexico due to the confluence of several trends, including forward-thinking energy policies designed to raise the country's international competitiveness which entail the integration of renewable energy, energy efficiency and sustainability goals into broader programs driven by smart grid initiatives.

#### This is integral for scaling up transmission connectivity and renewable tech –creates anticipatory planning processes that solves status quo deficiencies

Marcelino Madrigal (senior energy specialist in the World Bank’s Energy Anchor Unit of the Sustainable Energy Department (SEGEN). He has previously held positions at the Inter-American Development Bank and the Ministry of Energy, Energy Regulatory Commission, and Morelia Institute of Technology in Mexico. He holds a B.Sc, M.Sc, and Ph.D in Electrical Engineering with emphasis in Power Systems and Markets’ Operations and Planning) and Steven Stoft (consulted for PJM Interconnection and ISO New England and is now a member of the Market Surveillance Committee of the California ISO. He holds a Ph.D. in economics and a B.S. in engineering from the University of California at Berkeley) June 2011 “Transmission Expansion for Renewable Energy Scale-Up Emerging Lessons and Recommendations” <http://siteresources.worldbank.org/EXTENERGY2/Resources/Transmission-Expansion-and-RE.pdf>

Scaling up renewable energy, such as wind and solar, goes hand in hand with the expansion of transmission infrastructure . The richest solar and wind renewable energy sites are often located far away from consumption centers or existing transmission networks. Unlike fossil fuel–based power sources, renewable energy sources are greatly site-constrained and, for this reason, transmission networks need to be expanded to reach the renewable energy sites. Delivering transmission is a challenge, given the dispersion and granularity of renewable sources. Tapping a few hundred megawatts of renewable energy sources, such as wind and solar power, will likely require delivering transmission to several sites. Furthermore, transmission is also required to smooth out the variability of new renewable sources in a large geographical area. For these reasons, countries’ renewable energy scale-up efforts are being challenged by the need for timely and efficient delivery of transmission networks. Investment needs for transmission expansion to accommodate renewable energy are significant and growing in both developed and developing countries, and they are challenging existing planning and cost-recovery practices. Although the cost of transmission continues to be a relatively small percentage of overall electricity costs, the investments in transmission required to scale up renewable energy are rapidly growing. In some subregions in the United States and countries in Europe, the transmission investment needs already approved by regulators or forecast by transmission companies double or quadruple recent investment trends. Developing countries face a similar situation. Incipient renewable energy scale-up efforts are being challenged by the need to expand transmission to remote sites. Investment needs in Brazil, Egypt, Mexico, and other countries have triggered new approaches to plan and recoup the cost of transmission associated with renewable energy. For instance, in some specific regions in Brazil, the investment needs for renewable energy surpass the asset value of the distribution utilities closest to the renewable energy sites, which has triggered the establishment of a new model to award private transmission-owning concessions to serve renewable energy sites. In Mexico, the need to accommodate various wind power developments led to a new planning process to determine the cost-sharing of the transmission facilities between renewable energy providers and the utility and to a revision of the network wheeling charges paid by renewable energy providers. The objective of this report is to present emerging lessons and recommendations on approaches to efficiently and effectively expand transmission networks for renewable energy scale-up. The report focuses on the planning and regulatory aspects of transmission expansion that are relevant to transmission utilities and electricity regulators. Chapter 1 of the report describes the special features of renewable energy scale-up that make transmission development a new challenge from the technical and the regulatory perspective. The chapter describes in detail the above-mentioned increase in transmission investment needs in both developed and developing countries as a consequence of the need to integrate more renewable energy into their systems. The chapter describes long- and short-term assessments performed to determine transmission investment needs to achieve certain renewable energy targets or to serve the immediate needs of specific renewable energy projects, respectively. Efficiently and effectively developing transmission for renewable energy requires a new vision for the long-term planning and regulation of transmission services. For this reason, this report focuses on such aspects and does not deal with other short-term operational issues that arise in operating transmission systems with large amounts of renewable energy. While also important, environmental, social, and financing aspects of transmission are not within the scope of this report. The main audience of this report is utilities that provide transmission services and electricity regulatory commissions. At the same time, this summary highlights important messages for renewable energy policy makers. To circumvent the impact of the cost of transmission on renewable energy producers, electricity regulators are adjusting transmission cost-recovery practices. Existing regulations on transmission broadly categorize transmission costs associated with generation projects as connection and network costs. Connection costs refer to the transmission investments that are required for the sole purpose of connecting an individual generator’s premises to the transmission network. Network costs refer to all other investments necessary to reinforce the entire network, so that it can adequately and reliably transport all generation to the consumption center. Connection cost and network cost, along with an appropriate maintenance and return on investment allowance, must be recouped through tariffs to ensure sustainability of transmission utilities. Chapter 2 provides an overview of different alternatives to allocate connection and network costs, an international overview of practices, and the qualitative and quantitative impacts—through an example—on renewable energy of different cost allocation policies. Regarding connection costs, Chapter 2 describes how policies vary from options that place the highest burden on the renewable energy provider to options that place little or no burden. In the first category is the deep cost allocation policy where renewable energy providers bear the cost of all enabler facilities (substations), the extension to the grid, and reinforcements that are necessary to integrate the project into the transmission network. In the second category is the shallow cost allocation policies whereby power generators are responsible only for the cost of the enabling facilities, and the cost of system extension and reinforcements is passed on to consumers through network prices. Although countries that have experienced more growth in renewable energy have adopted shallower cost allocation procedures, there is no clear evidence that generators should not bear any connection costs at all. Regarding network costs, there is a trend toward allocating most of these costs to consumers and using simpler methodologies that do not rely on engineering-based methodologies based on “use of system” estimations. Postage stamp- like methodologies are seen as effective and efficient enough to ensure that long-term network costs are efficiently recovered, which is the main obstacle to tackle in systems with high-demand growth for transmission services triggered by electricity demand or renewable energy growth. Although adjusting cost-recovery regulations can have positive short-term impacts, improving planning practices is a necessary condition for ensuring a sustained and cost-effective development of the required transmission investment needs. Planning transmission for renewable energy based on responding to individual interconnection requests is not well suited for renewable energy scale-up for different reasons. First, transmission solutions to individually interconnect dispersed resources can lead to suboptimal, more expensive solutions. Second, an interconnection request planning-driven process will significantly “clog” transmission providers’ processes and scarce human resources, leading to delays in the process to scale up renewable energy. Implementing anticipatory planning practices is emerging as the best way to organize the planning process. Anticipatory planning will design transmission solutions for sets of projects in geographical areas, thereby reducing costs and improving the efficiency of the process. Anticipatory planning has been used in a number of jurisdictions, including Brazil, Mexico, the United Kingdom, and the United States, as described in the first two sections of Chapter 3 . To ensure that the most cost-effective solution, combined transmission and generation cost, is exploited first to achieve renewable energy goals efficiently, proactive planning—a step forward to anticipatory planning—is required. This is the case of recent efforts in the Midwest ISO and Texas regions in the United States, where planning for transmission networks considers the trade-off between spending more in transmission and accessing higher-quality resource sites. While planning for transmission does not always affect decisions in generation, prioritizing transmission investments through planning is a way to influence outcomes that lead to the lowest overall generation and transmission costs. The first three sections of Chapter 3 describe new institutional approaches for planning that have been implemented in a number of jurisdictions to expand transmission services for renewable energy. Anticipatory and proactive planning approaches accompanied by simple yet efficient cost-allocation rules are facilitating the implementation of new regulatory models to develop transmission with help from the private sector. Organizing the transmission planning process is facilitating the development of new regulatory models to bring private sector participation to the transmission sector. This is especially important, given the increased investment needs triggered by renewable energy and the need to speed up and complement efforts by incumbent transmission utility or utilities. A public sector–led proactive planning effort followed by competition to finance, build, and maintain the requisite transmission projects is emerging in different countries. Presented in Chapter 3 , Brazil, Texas, the Midwest ISO, and the United Kingdom are examples of such new approaches. In these countries, a proactive planning process identifies the transmission investments, and the cost-allocation rules are such that competing transmission providers have a regulated and assured return on the investment. In the case of Brazil, the approach has been used to develop high-voltage transmission networks, but has now been extended to the subtransmission segment where investment needs to interconnect renewable energy have been considerable. In the case of Texas, the approach has been used to develop the transmission project associated with the renewable energy zones procedure. In the case of the Midwest ISO, a similar approach has been used to plan and cost-allocate the regional transmission needed to serve the needs of various states’ renewable energy targets. Finally, in the case of the United Kingdom, the approach is being used to develop the rapidly growing transmission needs for offshore wind development. New planning methodologies and tools can greatly assist transitioning from reactive to anticipatory or proactive planning approaches to expand transmission. No single tool has been able to solve all transmission planning problems, but new methodologies and tools have emerged, which are increasingly helping transmission utilities to implement proactive transmission planning processes in relation to renewable energy scale-up efforts. These tools are described in the last section of Chapter 3 . Scenario and robust planning methodologies have been used before for generation and to some extent for transmission planning, and they are reemerging as a powerful tool in transmission planning for renewable energy. Long-term transmission planning is subject to a number of uncertainties, such as technology costs, choice of regulations, carbon prices, and development in the generation market— including renewable generation—outside the control of the transmission planner. To incorporate such uncertainties and understand the associated risk, scenario or robust planning methodologies are proving extremely useful when implementing proactive transmission planning for renewable energy. These methodologies are useful for understanding the long- term implications of policy choices, such as the cost implications of meeting renewable energy targets from local or regional renewable energy sources, and the cost and environmental implications of different transmission technologies, as well as to identify priority and sequencing of projects to achieve renewable energy goals. Chapter 3 describes the application of scenario planning utilized in regional transmission planning efforts highlighting the case of the Midwest ISO. Scenario or robust planning methodologies do not necessarily require new planning tools; these methodologies can be implemented with the existing tools for transmission planning. Helping implement anticipatory planning to determine transmission expansion solutions to dispersed renewable energy sites can be assisted greatly by new tools that have the capability to automatically generate transmission expansion options that exploit the geometrical location of sites to define minimum-cost transmission options that can serve collectively—and not individually—all the sites. This approach has been implemented in Brazil’s biomass cogeneration, and its application has also been shown to be useful for analyzing alternatives in the Philippines. Such new tools are often able to process locational information on existing networks and potential renewable energy sites based on a geographic information system (GIS). Tools that are used to plan transmission, while at the same time optimize the amount of renewable energy source that is tapped, are increasingly useful for proactive renewable energy planning. Such types of tools are increasingly useful to determine longer- term transmission investment needs to achieve certain renewable energy targets or to determine proxy solutions to the problem of minimizing renewable generation plus transmission costs. New tools in this arena are increasingly being developed and used in the United States to determine long-term transmission needs to achieve renewable energy targets at the national or regional levels. Tools to assist proactive planning require large amounts of data, especially on the projected output of renewable generation, such as solar and wind power output projects that ideally must be provided with an hourly resolution to capture the complementarities of different variable resources across the transmission network better. Successfully applying new approaches and tools requires a certain level of technical capacity that may not be available to all utilities that provide transmission services and other entities involved in the planning process. For this reason, in some circumstances, it may be equally or more important to increase technical skills as new approaches and tools are adopted. Maintaining overall efficiency of renewable energy support policies requires that transmission planners and regulators make trade-offs between the cost of transmission and, ideally, a value of renewable energy determined by policy makers

#### Global grid is feasible – status quo innovation solves tech gaps – plan kick-starts global conversation

Peter Ruegg (studied Biology at ETH Zurich with focus on Ecology, Phytogeography and Biosystematics) 2013 “Green super power grid for the world” https://www.ethlife.ethz.ch/archive\_articles/130312\_global\_grid/index\_EN

 If we want to obtain power on a large scale from renewable energy sources such as the sun or wind, there are certain natural constraints. Where most people live and need electricity, the potential for wind or solar power is not always as great. On the other hand, in desert regions such as the Sahara, where the sun always shines, enough energy could be produced in a relatively small area to supply the entire world population with power. Similar is the situation with wind power. Zones where a constant strong wind blows mostly lie in inhospitable corners of the globe, such as Patagonia or the Arctic. The problem in both cases is how to transport the power to where it is effectively needed. Göran Andersson, professor of electric power systems at ETH Zurich, his doctoral student Spyros Chatzivasileiadis and Damien Ernst, professor at the Université de Liège see a “global grid” as a solution and have developed a concept that has just been published in the journal Renewable Energy. This provides an idea of where the greatest potential for wind and solar energy is and how a global transmission network would have to be organised to get the power to the consumers. Wind power from Greenland The researchers identified the areas of the globe where solar radiation is particularly high or constantly high winds prevail, for instance. They placed solar power plants and wind farms in their model and connected them to existing power grids, which provided a rough idea of how the global grid might supply the world with clean power from wind farms and solar power plants in future. The three authors placed an offshore wind farm off the coast of Greenland as the first piece in the overall puzzle of the global power grid. The conditions there are ideal for a large wind power station: on average, the wind blows at over thirty kilometres an hour and the sea is not very deep. The three energy researchers assume an output of three gigawatts from an offshore wind farm. The power would be transmitted via Iceland and the Faroe Islands to the UK and from there to the mainland. The Icelandic and British governments are already discussing the realisation of such a power line to transport geothermal power from Iceland to the British Isles. Better a long line than a reservoir The Greenlandic wind farm could possibly be connected via a line also to North-Eastern Canada and the USA. Such a line would have a length of over 3,200 kilometres, a third of which being submarine cables. While this would increase the costs per kilowatt hour supplied by up to 25 per cent, it would have a major advantage: the peak consumption times in the USA and Europe would be shifted by several hours, making it possible to cover both peak times without having to store the wind power temporarily in the reservoir of a pump storage station. While the day begins in the USA and the peak consumption period is just getting underway, the consumption in Europe plummets due to the time difference. This would enable the wind power from Greenland to be always sold at higher prices – half of the day to Europe and half of the day to North America. According to the initial estimates, the total production and transmission costs for the wind power from the far north should not be more than for power from conventional stations which are closer to the consumption centres. The authors estimate that except for the most expensive renewable generators, it would be more economical for the USA to import renewable power from Europe than operate its own fossil fuel power plants. Technically feasible thanks to high-voltage direct current transmission Technically, says Spyros Chatzivasileiadis, the global power grid and the corresponding power stations are feasible. For instance, there are already technologies that transport power over several thousand kilometres with minimal losses. The laying of submarine cables is established and floating offshore oil platforms form the technical basis for the construction of offshore wind turbines. High-voltage direct current technology (HVDC) was developed to transfer power over large distances and is already used on a large scale in China, but also Brazil, the USA and partly in Europe. Especially in China, very high amounts of power are transferred with this technology, thanks to which transmission losses – around three per cent per 1,000 kilometres – can be minimised. Big money well invested Professor Andersson refuses to accept the argument that it would be far too expensive to realise the global power grid. Even if millions of dollars were necessary to produce only one single section of the network, the investments would be comparable to those currently being made for the development and expansion of the power network. Estimates expect the construction of the submarine cable network for the transfer of power from numerous wind farms in the North Sea to cost between EUR 70 and 90 billion. However, Andersson expects that possible investments in the “Global Grid” could soon be recovered. The submarine power line between Norway and the Netherlands that has been in operation since 2008, recorded a return of EUR 50 million in the first two months in service – equivalent to one eighth of the capital invested. Let’s not miss the boat The ETH-Zurich researchers are also confident that certain technical gaps which would complicate the realisation of a global grid can be eliminated in the next few years. For instance, an 800-kilovolt submarine cable and a breaker to interrupt the high-power direct current are still needed. However, the researchers expect solutions from industry in the near future. What is still required most of all are bold investors and a large international organisation such as the OECD or World Bank, for instance, to back a global grid. Consequently, in their paper, the researchers propose the formation of working groups to pursue the plans for the global grid further. Both the advantages of a global grid with renewable energies and the risks need to be weighed up. A solar power station in the Sahara, for instance, is currently unfeasible from a political standpoint as the region is at war. “It is worth discussing the topic in depth,” Andersson believes. “If we want clean energy in fifty years, we need to do something about it today.” The European power grid is currently undergoing large changes and we must not miss the opportunity to integrate the alternative energies, he explains. Andersson and his colleagues hope that they will be able to start the discussion on a global network fed from renewable energy sources with their project.

#### Plan modelled globally – structural political and economic factors

Sierra Coughlin (member of IEEE's Society on Social Implications of Technology) 2011 “Smart Grid: A Smart Idea For America?” http://smartgrid.ieee.org/highlighted-papers/493-smart-grid-a-smart-idea-for-america

It is only in recent years that the U.S. government has invested a significant interest in the promotion and use of renewable energy technologies. Because global analysis concludes that Global Warming is a great threat for the future of human existence, there is much pressure from the public to change outdated policies in the United States. It has become evident that policy change will need to occur on a large scale, and the reevaluation of existing policies is a necessary step to fully ensure that the U.S. is operating on a sustainable level. Because the United States relies heavily on foreign commerce transactions, many operations and laws stem beyond local transactions. The United States serves as a foundation for foreign economic and political processes, consequently much of the legislation developed and used within the U.S. can often serve as a basis in regards to international political systems. Likewise, the United States adopts foreign policies as a means to learn from foreign government systems and how such laws influence the general population. The basis of political investment and policy naturally correlates with the need to protect local citizens first and foremost. Addressing the problems, which plague the citizens of the United States is of prime importance and is often addressed in new legislation regarding the Smart Grid movement.

#### The global ‘transmission diplomacy’ de-escalates conflict and solves global instability

Daniel Kammen (Distinguished Professor of Energy at UC-Berkeley - directs the Renewable and Appropriate Energy Laboratory. From 2010 to 2011, he was the inaugural Chief Technical Specialist for Renewable Energy and Energy Efficiency at the World Bank. ) November 20**,** 2013 “Good electricity grids make good neighbors” http://blogs.berkeley.edu/2013/11/20/good-electricity-grids-make-good-neighbors/

Today we face a different situation, where “front lines” of conflict have blurred and disappeared, and non-state actors dominate the threat-scape. Instability in Iraq, Afghanistan, Syria, Kenya, Somalia, and elsewhere require a different form of engagement. Important steps have been made in peace-building and post-conflict resolution, but so far we have not taken advantage of a major opportunity to use some of our greatest infrastructure investments to build peaceful, prosperous, and cooperative regional economies. That asset is the electricity transmission and distribution system, or “the grid.” The irony is that while the grid has been recognized as the greatest engineering achievement of the 20th Century, building partnerships through shared energy commerce has been until now an afterthought, at best. This has to change, for security, economic growth, environmental, and ethical reasons. When I served as the Chief Technical Specialist for Renewable Energy and Energy Efficiency at the World Bank, a project of special interest to me was the construction of an electricity highway between the rich geothermal energy fields of the Rift Valley in Kenya, through the Lake Turkana plains — where the best wind resource identified to date in Africa was recently mapped — to newly constructed hydroelectric facilities in Ethiopia. Not only are these indigenous renewable energy resources largely untapped, but the policy tools to build clean energy markets could have some of their most effective deployment in poor, power-starved nations. As Kenya and Ethiopia negotiated, the opportunity to build a regional clean energy market picked up speed, with both nations seeing the benefits of indigenous, regional energy capacity that was stable. Domestic renewable energy also would result in greater job creation than continued reliance and exposure to the price fluctuations of imported fossil fuels. Last week, the Africa Development Bank announced a $1.2 billion dollar loan to fully fund the 1,000-kilometer (621-miles) line that will provide 2,000 megawatts (MW) of transfer capacity in either direction. That is more transfer capacity than either nation currently has generating capacity, and the line will critically link the best renewable energy resource field in each country. Today both nations are progressing on their Feed-in Tariff policies to reward clean energy development, and a wider East African Power Pool is emerging to coordinate energy sales among up to 20 African nations. Donor nations need to make projects of this nature an international development priority. Not only are roughly 1.5 billion people living today without electricity access worldwide, and perhaps another billion have access on paper, but the reliability and the cost of service keeps the resource out of reach. President Obama’s Powering Africa initiative is a tremendous start on such a platform of engagement[1], but it needs to aggressively expand into transmission and distribution grid infrastructure, not just power generation. Critical opportunities now exist to build cooperative regional economies, build local industry, and address the global climate crisis. South Sudan is a striking case in point. At an important visioning and partnership conference held at Chatham House in London in September, 2013[2], the point was driven home that engagement with fragile states around infrastructure is a far better investment than triage-based emergency assistance, or in ‘wall-mentality’ projects that seek to insulate nations from regional instability. South Sudan will hold a vitally important investors’ conference in early December. At that meeting, overwhelming attention will be given to the so-far failed dialogue with President Omar al-Bashir’s government in Khartoum over the oil fields and pipeline. Instead, investors could focus on connecting South Sudan to the emerging East African Power Pool through transmission projects that would permit the world’s newest nation to pivot away from the ever-tense relationship with Sudan. Instead, the new independent nation could build a network like Kenya and Ethiopia are doing, where solar, wind, geothermal, and other indigenous energy. It could cheaply power the local economy where less than two percent of the population has electricity today. The grid alone will not meet South Sudan’s energy demands. As in much of the developing world, off-grid communities will persist, so attention to the grid needs to be balanced with efforts to build home and village energy mini-grids and individual energy products, and to ensure that ‘sustainable’ is the hallmark of hydropower and bioenergy projects that are developed. South Sudan is far from the country where a policy of engagement around energy infrastructure can yield huge development and peace dividends. Kosovo, the poorest nation in Europe, has been a battleground over a proposed coal-fired power plant. In October, 2013, the U. S. joined several European nations in releasing White Papers and policy directives restricting international lending for coal-based projects, as has the World Bank. Kosovo, has significant wind, biomass and hydropower, much of which would most efficiently be developed jointly with Albania. This approach would make the former coal plant project–a pollution-belcher only six kilometers from the capital city, using poor-quality coal and adding to the burden of disease– an unnecessary anachronism. Nations linked by energy commerce, and in particular clean, local energy are at far lower risk to enter into hostilities than those who see each other only as regional rivals. Thus, while Robert Frost and his neighbor may have both found safety in the wall, their most productive cooperation came when they “meet to walk the line.” The U. S., U. K., and other governments seeking to build strong international partnerships would be well to make transmission diplomacy and development a centerpiece of foreign policy.

#### Troops realigning in Africa, flashpoint developing in South Sudan

Klapper 1/9 (Bradley, The Globe and Mail, U.S. scrambles to prevent civil war in South Sudan, http://www.theglobeandmail.com/news/world/us-scrambles-to-prevent-civil-war-in-south-sudan/article16273917/)

Three years after midwifing South Sudan’s birth, the United States is desperately trying to prevent the world’s youngest nation from falling apart.¶ Yet despite shared consternation by the Obama administration and Congress, no one is quite sure what the U.S. can do to bring peace to a country that in many ways owes its existence to the United States. The violence has killed more than 1,000 people and driven 180,000 from their homes in the last month, and spread to neighbours killing each other purely on tribal identification, threatening a place that until recently was viewed by Democrats and Republicans alike as an American success story in Africa.¶ MORE RELATED TO THIS STORY¶ CIDA recommends cutting Sudan aid as South spirals into new violence¶ GEOFFREY YORK U.S. pushes for ‘credible talks’ on South Sudan¶ South Sudan peace talks delayed as officials cite need for an agenda¶ ¶ INFOGRAPHIC¶ South Sudan locator map¶ Hundreds of people have been killed in South Sudan, with reports of ethnically targeted killings. The U.N.'s Ban Ki-moon is recommending more peacekeepers. Jillian Kitchener reports.¶ VIDEO¶ Video: Battle rages in South Sudan, UN wants more peacekeepers¶ Officials say hospitals are becoming inundated with people injured in South Sudan's conflict. Nathan Frandino reports.¶ VIDEO¶ Video: Hospital resources growing scarce in South Sudan¶ ¶ VIDEO¶ Video: South Sudan offers olive branch to rebels¶ “Each day that the conflict continues, the risk of all-out civil war grows,” Linda Thomas-Greenfield, the top U.S. diplomat for Africa, warned Thursday. “There is clear evidence that targeted killings have taken place, with Dinka killing Nuer, and Nuer killing Dinka. Countless civilians, particularly women and children, have become victims.”¶ For the United States, South Sudan’s instability isn’t just another example of a weak African state struggling to deal with political infighting, endemic poverty and deadly battles between the military and rebel groups. Because of its history as a largely Christian nation that was able to win its freedom from Muslim-dominated Sudan, South Sudan has a powerful constituency in Washington. And the bloodshed is proving an embarrassment to the U.S., which has provided hundreds of millions of dollars in aid to the country and been its strongest international champion.¶ The crisis began with a political dispute on Dec. 15 as President Salva Kiir, an ethnic Dinka, accused his former vice-president, Riek Machar, an ethnic Nuer, of trying to overthrow the government. Machar denies the accusation, accusing the government of rooting out political opponents. Thomas-Greenfield said the U.S. had no evidence of a coup attempt, putting the initial blame on the government for raiding Machar’s home.¶ But the violence has spread significantly since, sparking a series of ethnically motivated attacks and counterattacks while groups allied to Machar have claimed military victories and greater control of territory. Meanwhile, Uganda has sent in hundreds of troops and provided Sudanese government forces with military hardware, and threatened deeper intervention if militants move on the capital, Juba.¶ Washington has mobilized on two fronts, organizing peace talks between representatives of both sides in Addis Ababa, Ethiopia, and getting the United Nations Security Council last month to approve 5,500 more peacekeepers to South Sudan.¶ The peace talks have yet to stop the fighting, though Thomas-Greenfield said a cease-fire was all but agreed if Kiir releases 11 high-level political detainees. Help also could also come soon for the 7,600-strong UN force in South Sudan, she added, even if only a Bangladeshi police unit has arrived thus far.¶ “For 30 years the United States has been supporting the people of South Sudan, even before South Sudan became an entity, supporting their right to exist, their right to freedom of religion, and their fight against the government of Sudan,” Thomas-Greenfield told the Senate Foreign Relations Committee. “We birthed this nation and there are Americans from all walks of life ... who are concerned about what is happening.”¶ Senators agreed. “This is a place people expect us to make a difference,” Sen. Bob Corker, the committee’s top Republican said.¶ Washington has clear security interests at stake. Having seen al-Qaeda gain a foothold in several nearby countries over the last couple of years, the U.S. doesn’t want to see terrorist groups infiltrate yet another place wracked by internal fighting. And it also is keeping a wary eye on Sudan, which fought for 22 years to hold onto the oil-rich territory and which the United States still considers a state sponsor of terrorism. Its president has suggested joint security patrols with South Sudan’s government, which the U.S. has yet to respond to.¶ While the focus is currently on diplomacy, U.S. officials and congressional aides said the military also has begun studying scenarios under which the United States could consider supporting local partners such as Uganda, Ethiopia or Kenya to move into South Sudan to restore order. They spoke on condition of anonymity because they said they weren’t authorized to speak publicly on the matter. Under no scenario are U.S. military boots on the ground envisioned in the country.¶ The United States has some leverage. After helping secure peace with the north in 2005, Washington guided South Sudan through a referendum three years ago to the day approving its independence. Since, the U.S. has intervened to secure a series of agreements with Sudan on sharing oil revenue and managing, if not solving, their border disputes. When South Sudan became its own country in July, 2011, President Barack Obama hailed it as a “reminder that after the darkness of war, the light of a new dawn is possible.”¶ But since winning freedom, South Sudan’s patchwork of ethnic loyalties and political rivalries has been tearing at the seams. Before even the latest bout of violence, Secretary of State John Kerry and members of Congress warned Kiir this summer to halt a series of ethnically motivated atrocities against minorities or risk losing vital U.S. aid and diplomatic support.¶ American security funds – representing just a fraction of the $1.8-billion in total assistance that has been approved since 2011 – have dried up. And the White House recently vowed a complete aid cutoff to anyone who seizes power by force. The threat carries greater force than in Egypt, for example, because the United States has been so instrumental in creating and sustaining South Sudan over its short history.¶ In response to the violence, Thomas-Greenfield said the U.S. was providing an additional $50-million in humanitarian assistance to South Sudan. But with the fighting preventing access to many parts of the country and a dearth of aid workers on the ground to deliver assistance, it is unclear what that commitment will mean in the short-term.¶ Underscoring the danger, four U.S. Navy commandos were injured last month when rebel forces fired on three helicopter-airplane Ospreys during an evacuation mission. The U.S. has sharply drawn down its diplomatic presence in South Sudan. The Juba embassy is currently being staffed only by an ambassador and two aides, Thomas-Greenfield said. They’re being protected by nine diplomatic security agents, seven Marines and 45 additional forces.¶ Despite frustration with Kiir, the U.S. and its African partners still see him as the best of bad options. Kiir is the democratically elected president. His opponents include rebels who’ve employed child soldiers. Since taking territory, their disruption of oil exports has worsened South Sudan’s already miserable economic condition

#### That escalates to great power war status

**Sachs 8** (Jeffrey, Dir. Earth Institute – Columbia U., National Interest, “A User’s Guide to the Century”, July/August, L/N)

THE NEW world order is therefore crisis prone. The existence of rapidly emerging regional powers, including Brazil, China and India, can potentially give rise to conflicts with the United States and Europe.  The combination of rapid technological diffusion andtherefore convergent economic growth, coupled with the natural-resource constraints of the Anthropocene, could trigger regional-scale or global-scale tensions and conflicts. China’s rapid economic growth could turn into a strenuous, even hot, competition with the United States over increasingly scarce hydrocarbons in the Middle East, Africa and Central Asia. Conflicts over water flow in major and already-contested watersheds (among India, Bangladesh and Pakistan; China and Southeast Asia; Turkey, Israel, Iraq and Jordan; the countries of the Nile basin; and many others) could erupt into regional conflicts. Disagreements over management of the global commons—including ocean fisheries, greenhouse gases, the Arctic’s newly accessible resources, species extinctions and much more—could also be grounds for conflict.  The continuation of extreme poverty, and the adverse spillovers from laggard regions, could trigger mass violence. Local conflicts can draw in major powers, which then threaten expanded wars—as inAfghanistan, Somalia and Sudan. When poverty is combined with rapid population growth and major environmental shocks (such as prolonged droughts in the Sahel and the Horn of Africa) there is a distinct likelihood of mass population movements, such as large-scale illegal migrations of populations escaping hunger and destitution. Such movements in the past have contributed to local violence, as in South Africa of late, and even to war, as in Darfur.

#### Afghan instability goes global causing nuclear war

**Morgan in ‘7**

(Stephen, Former Member of the British Labour Party Executive committee, “Better another Taliban Afghanistan, than a Taliban NUCLEAR Pakistan!?” http://www.electricarticles.com/display.aspx?id=639)

However events may prove him sorely wrong. Indeed, his policy could completely backfire upon him. As the war intensifies, he has no guarantees that the current autonomy may yet burgeon into a separatist movement. Appetite comes with eating, as they say. Moreover, should the Taliban fail to re-conquer al of Afghanistan, as looks likely, but captures at least half of the country, then a Taliban Pashtun caliphate could be established which would act as a magnet to separatist Pashtuns in Pakistan. Then, the likely break up of Afghanistan along ethnic lines, could, indeed, lead the way to the break up of Pakistan, as well. Strong centrifugal forces have always bedevilled the stability and unity of Pakistan, and, in the context of the new world situation, the country could be faced with civil wars and popular fundamentalist uprisings, probably including a military-fundamentalist coup d’état. Fundamentalism is deeply rooted in Pakistan society. The fact that in the year following 9/11, the most popular name given to male children born that year was “Osama” (not a Pakistani name) is a small indication of the mood. Given the weakening base of the traditional, secular opposition parties, conditions would be ripe for a coup d’état by the fundamentalist wing of the Army and ISI, leaning on the radicalised masses to take power. Some form of radical, military Islamic regime, where legal powers would shift to Islamic courts and forms of shira law would be likely. Although, even then, this might not take place outside of a protracted crisis of upheaval and civil war conditions, mixing fundamentalist movements with nationalist uprisings and sectarian violence between the Sunni and minority Shia populations. The nightmare that is now Iraq would take on gothic proportions across the continent. The prophesy of an arc of civil war over Lebanon, Palestine and Iraq would spread to south Asia, stretching from Pakistan to Palestine, through Afghanistan into Iraq and up to the Mediterranean coast. Undoubtedly, this would also spill over into India both with regards to the Muslim community and Kashmir. Border clashes, terrorist attacks, sectarian pogroms and insurgency would break out. A new war, and possibly nuclear war, between Pakistan and India could no be ruled out. Atomic Al Qaeda Should Pakistan break down completely, a Taliban-style government with strong Al Qaeda influence is a real possibility. Such deep chaos would, of course, open a “Pandora's box” for the region and the world. With the possibility of unstable clerical and military fundamentalist elements being in control of the Pakistan nuclear arsenal, not only their use against India, but Israel becomes a possibility, as well as the acquisition of nuclear and other deadly weapons secrets by Al Qaeda. Invading Pakistan would not be an option for America. Therefore a nuclear war would now again become a real strategic possibility. This would bring a shift in the tectonic plates of global relations. It could usher in a new Cold War with China and Russia pitted against the US.

# Advantage 3: Mexico

#### Domestic Mexican energy production is falling rapidly and a shift to reliance on US imports is unsustainable. Mexico needs a new and reliable source of power

Petroleum Economist 7/18 “Mexico relies on US as oil supply falls and gas demand rises,” Petroleum Economist, 7/18/2013, http://www.petroleum-economist.com/Article/3232708/Mexico-relies-on-US-as-oil-supply-falls-and-gas-demand-rises.html

As its oil production keeps falling, Mexico is turning to natural gas to diversify its energy supply and fuel economic growth. Increasingly, it is relying on booming US supplies to do the job. According to the World Bank, Mexico's economy grew at an impressive 3.9% in 2012 and is on track to post growth of 3.5% in 2013. Yet 52 million people - almost half of the population - live in poverty. Another 11.7 million, or 10%, live in 'extreme' poverty, earning less than $76 per month. President Enrique Peña Nieto took office in December 2012 promising to increase living standards. But falling oil production, historically the mainstay of the country's export revenues, is threatening his ambition. In 2010, oil accounted for 14% of export earnings and 32% of government revenues, according to the Mexican central bank. Rising crude prices have offered some relief. The value of Mexican oil exports to the US has doubled in the past eight years, to $35.7 billion in 2012. But the export and production data tell a different story. Oil output has fallen to 2.5 million barrels a day (b/d) from a peak of 3.4 million b/d in 2004. Crude exports to the US have fallen by a third, to 970,000 barrels per day (b/d) in 2012 from 1.48 million b/d in 2004, the first time since 1994 that annual shipments to the US have fallen below 1 million b/d. The country's share of total US oil imports has plummeted, too, from 16% a decade ago to 11% in 2012, according to the Energy Information Administration (EIA). Production of heavy oil from the Cantarell and Ku-Maloob-Zaap offshore oilfields - which supply grades favoured by US Gulf Coast refineries - fell 46% or 1.1 million b/d from 2004 to 2012. This was partially offset by a 200,000 b/d increase of light oil in the same period, but the trend is well established by now. The question facing policy makers is whether the country can afford to maintain a nationalist energy stance. Mexico nationalised its oil industry in 1938 and its constitution continues to prohibit foreign ownership in the strategically vital oil and gas sector. In 2008 Mexico's congress passed limited energy sector reforms in a bid to address declining production and attract much needed foreign technical expertise, but the efforts failed. Pemex, the state oil company, retains ownership of all crude oil produced in the country, but has entered into partnerships with foreign companies through multiple services contracts. But major international oil companies have stayed away. Nieto aims to introduce further reforms in September aimed at increasing private investment. But this is sure to run into opposition from those opposed to opening the country's energy sector. However, if Mexico's energy sector continues down the path it is on the country risks becoming a net oil importer by the end of the decade. This is already the case in natural gas. Mexican imports of US gas have increased 92% since 2008 as production has fallen by 15% and demand has risen sharply. Mexico now imports 2 billion cubic feet a day from the US, or 3% of Lower 48 production. At least six new pipelines have been proposed from southern US unconventional gasfields like the Eagle Ford to meet surging demand in Mexico. Imports could reach 7 billion cf/d, or 10% of US gas production, by the end of the decade. On 5 May, US pipeline operator El Paso announced long-term agreements to extend its Wilcox lateral from Arizona, adding 185 million cf/d of incremental capacity for Pemex Gas and Mexican de Cobre, one of the world's largest copper producers. The US drilling boom couldn't have come at a better time for gas-starved Mexico. Mexico's proved gas reserves have fallen to 17 trillion cf from more than 60 trillion cf a decade ago, largely as a result of under-investment in the upstream. In the same period, Mexico's gas consumption has risen 160%, to 2.36 trillion cf per year, or 6.5 billion cf/d, driven by fuel switching in the electricity sector. In 2000, gas supplied a fifth of Mexican power generation. By 2007, this had risen to half. Consequently, Mexican gas imports have doubled since 2003, to 767 billion cf per year. It will keep growing: plans are afoot to add 28 gigawatts of new generating capacity, most of it to be fuelled by gas. Mexico's energy secretariat forecasts that gas demand will grow at a rate of more than 3% annually through 2016. In June, Gdf Suez Mexico and GE Financial unveiled plans to extend the Mayakan pipeline to the Yucatan Peninsula, adding an incremental 300 million cf/d of supply under a contract with Mexican power producer CFE. But it's not just pipelines that have seen growth. In 2012 the country completed the $900 million Manzanillo liquefied natural gas import terminal, a partnership of Pemex, South Korea's Kogas, Mitsubishi and Samsung on the Pacific coast. Full capacity of 3.8 million tonnes per year is expected online later this year. At this point, it makes sense for Mexico to import cheap US gas to fuel its economic growth. But the surge in demand is expected to increase North American natural gas prices. Henry Hub futures have inched higher in recent months to more than $4 per million British thermal units (Btu), although lower demand in the summer eased levels back to $3.63 on 17 July. Longer term rises in prices will eventually force Mexico to decide whether it wants to depend on foreign supplies or open its upstream to investors that could unlock more domestic energy.

#### Oil-based cooperation is unsustainable – the plan is key to sustainable US-Mexico relations

-currently happening

Donnelly, Program Associate, Mexico Institute, ‘10

(Robert, 5/24/10, <http://www.wilsoncenter.org/event/us-mexico-cooperation-renewable-energy-building-green-agenda>, “U.S.-Mexico Cooperation on Renewable Energy: Building a Green Agenda”, js)

Wood cited recent developments that have encouraged renewable energy investment in Mexico. Mexico's oil fields are in long-term and, in some cases, precipitous decline, and the country is plotting a "future as a green nation," shifting the policy focus toward alternative energy development. Additionally, a U.S.-Mexico taskforce on renewables was recently formed—its announcement timed with President Felipe Calderon's May 2010 state visit to Washington—and there has been high-level engagement on the issue by both administrations. Mexico also will host the next U.N. Climate Change Conference, to be held in Cancún in fall 2010. Further encouraging investment in renewables, there are not the blanket prohibitions on private ventures that exist in the hydrocarbons sector, and regulatory adjustments over the past few administrations have enabled a more robust private stake in electricity generation and transmission. Collaboration between Mexico and U.S. government agencies, such as the Department of Energy and the U.S. Agency for International Development, through the framework of the Mexico Renewable Energy Program, have enabled the richer development of Mexico's renewable resources while at the same time promoting the electrification and greater general economic development of parts of rural Mexico, Wood said. Impulses to develop Mexico's renewables sector further align with regional efforts to make North America energy interdependent. Discussant Joe Dukert pointed out that U.S.-Mexico cooperation on renewables is a little-acknowledged area of binational cooperation, and he stressed the economic complementarities that exist between the two countries on the issue. For example, he noted that Mexico was well-positioned to help furnish the power from renewable sources that must account for up to a third of all electricity used in California by 2020, as dictated by the state's renewable power standard (RPS). "Mexico can help them reach these (renewable energy) targets," he said. Yet at the same time, Dukert said that Mexico needs to do more to enhance its profile as a renewable-energy supplier, and specifically suggested that energy attaches be assigned to the embassy and consulates

#### Energy infrastructure integration is key to broader border cooperation

Sweedler et al 5 (Alan, \*Assistant Vice President for International Programs at San Diego State University, Director of the Center for Energy Studies and the Environmental Sciences Program and Professor of Physics, Founder of SDSU's program on International Security and Conflict Resolution, Congressional Science Fellow in the US Senate, and a Carnegie Science Fellow at Stanford University in the area of arms control and international security, Margarito Quintero Núñez, Kimberly Collins, “Energy Issues in the U.S.-Mexican

Binational Region: Focus on California-Baja California,” <http://scerp.org/pubs/m11/chapter%201-5.pdf>)

Energy is an indispensable lifeblood of the U.S.-Mexican border region and it is a key issue in the binational region’s future. The energy sectors in the United States, Mexico, and Canada are undergoing changes that will affect how energy is produced, transmitted, distributed, and sold throughout North America. These changes will directly influence energy use and energy-related infrastructure in the U.S.-Mexican border region. This chapter focuses on national energy issues in the United States and Mexico, border-wide topics of concern, and the California-Baja California section on the border. Population growth is the main force behind the increasing demand for energy services in the binational region. The expanding economy is another important factor. These factors have led to a greater demand for energy services in the border region than is expected for other areas of North America. To meet the expected demand in northern Mexico, new and upgraded interconnections of the transmission system with the United States will be needed. The North American Free Trade Agreement (NAFTA) does provide new opportunities for private energy companies, particularly those in the electric power industry. In addition to the increased need for power, there will be significant pressure on supplies of natural gas and associated infrastructure, such as high-pressure gas pipelines, distribution systems, and pumping stations. As prices for fossil fuels and electricity continue to rise, it is expected that solar energy (both thermal and electric) will also become more important in the border region than in the past. A secure supply of reasonably priced energy with a minimal environmental impact will be needed for the U.S.-Mexican border region if it is to remain competitive in the global economy. Given the expected increase in population and living standards on the Mexican side of the border, it is difficult to see how power demand can be met without the construction of new generating facilities in the border region. However, if environmental degradation is to be avoided and quality of life standards improved, the type of generation will be important. Heavy reliance of fossil fuels, even natural gas, will inevitably degrade air quality, contribute to global climate change, and stress limited water supplies. There are several ways to enhance crossborder cooperation in the energy field and provide the energy services needed for border residents in the future. But doing so will require effective cooperation and coordination between the privatized energy market players and the local and state agencies still responsible for regulating the energy sector in both the United States and Mexico.

#### SEQUENCING is vital – Focusing on renewables spills over to the rest of the relationship

Donnelly 10 – Program Associate, Mexico Institute @ Wilson Center

(Robert, “U.S.-Mexico Cooperation on Renewable Energy: Building a Green Agenda,” http://www.wilsoncenter.org/event/us-mexico-cooperation-renewable-energy-building-green-agenda)//BB

Discussant Johanna Mendelson Forman stressed the linkages connecting climate change, energy, and economic development. It is a problem for the United States, too, that Mexico not have adequate energy stocks, she said, adding that "energy poverty is a real issue in Mexico." The CSIS senior associate remarked that energy and climate, which are perceived as less polemical than other issues, are good entry points for a broader U.S.-Mexico dialogue. And she said financing needs for the development of renewables businesses are felt on both sides of the border and not just in Mexico, as U.S. companies suffer from a lack of adequate export-import financing.

#### This outweighs alternate causes

Wood 10 (Duncan, Director of the Mexico Institute at the Woodrow Wilson International Center for Scholars, “Environment, Development and Growth: U.S.-Mexico Cooperation in Renewable Energies,” Woodrow Wilson International Center for Scholars (Mexico Institute), May, <http://www.statealliancepartnership.org/resources_files/USMexico_Cooperation_Renewable_Energies.pdf>)

This study examines one of the most important and potentially lucrative dimensions of the growth of the renewable energy sector in Mexico, namely bilateral cooperation between Mexico and the United States. The 2009 bilateral framework should be seen in the context of an emerging trend in Mexico towards renewable energy, and as recognition of the need for the United States to take advantage of this if it is to meet its own carbon emissions reduction goals. The long border shared by the two countries, so often seen as a point of conflict due to the thorny issues of migration, drugs and security, holds the potential to benefit both states through the trade in renewable energy from wind, geothermal, biomass and solar sources. But the promise of collaboration in the sector goes far beyond the border. The US has been engaged with Mexico in RE issues for over 15 years now on multiple levels, and this has brought tangible results that have had a significant impact on both Mexico and on bilateral relations.

#### Energy cooperation’s key to the overall relations

Roberts and Walser 13 (James M., Research Fellow for Economic Freedom and Growth in the Center for International Trade and Economics – The Heritage Foundation, and Dr. Ray, Senior Policy Analyst for Latin America in the Douglas and Sarah Allison Center for Foreign Policy Studies – Heritage Foundation, “The Hagel, Kerry, and Brennan Senate Confirmation Hearings: U.S. Policy for the Western Hemisphere,” Heritage Foundation, 1-18, <http://www.heritage.org/research/reports/2013/01/kerry-hagel-and-brennan-senate-confirmation-hearings-us-policy-for-the-western-hemisphere>)

Mexico’s fight against organized crime has cast a doleful shadow over U.S.–Mexican relations. New Mexican President Enrique Peña Nieto promises to restore citizen security and continue overhauling Mexico’s police and judiciary. Often overlooked in the U.S. is Mexico’s emerging economic status—the world’s 11th largest economy and growing. If Mexico opens its energy sector to equity participation with American companies (with their advanced deepwater, fracking, and horizontal drilling technologies) and makes other serious reforms, it can reverse an alarming decline in its oil production and tap massive shale gas deposits. The U.S. should continue to help Mexico fight organized crime with a continuation of the Merida Initiative, enhanced military-to-military ties, and serious attention to building real citizen security. The U.S. and Mexico need to act jointly in troubled Central America, particularly in the Northern Triangle (El Salvador, Guatemala, and Honduras) to combat trafficking organizations and shore up weak police and judicial institutions. Investing in border infrastructure, avoiding protectionist flare-ups, and exploring new cross-border energy alternatives can also cement a stronger U.S.–Mexico relationship. The U.S. will find it hard to project global leadership without a democratic, prosperous, and stable Mexico.

#### Relations solve border terrorism and drug networks

Storrs 6 (K. Larry Storrs, Specialist in Latin American Affairs, Foreign Affairs, Defense, and Trade Division of CRS, 1/18/2006 “Mexico’s Importance and MultipleRelationships with the United States”, <http://assets.opencrs.com/rpts/RL33244_20060118.pdf>)//JG
Sharing a 2,000-mile border and extensive interconnections through the Gulf of Mexico, the United States and Mexico are so intricately linked together in an enormous multiplicity of ways that President George W. Bush and other U.S. officials have stated that no country is more important to the United States than Mexico. At the same time, Mexican President Vicente Fox (2000-2006), the first president to be elected from an opposition party in 71 years, has sought to strengthen the relationship with the United States through what some have called a “grand bargain.” Under this proposed bargain, the United States would regularize the status of undocumented Mexican workers in the United States and economically assist the less developed partner in the North American Free Trade Agreement (NAFTA), while Mexico would be more cooperative in efforts to control the illegal traffic of drugs, people, and goods into the United States. The southern neighbor is linked with the United States through trade and investment, migration and tourism, environment and health concerns, and family and cultural relationships. It is the second most important trading partner of the United States, and this trade is critical to many U.S. industries and border communities. It is a major source of undocumented migrants and illicit drugs and a possible avenue for the entry of terrorists into the United States. As a result, cooperation with Mexico is essential to deal effectively with migration, drug trafficking, and border,terrorism, health, environment, and energy issues.

#### The impact is an attack on US soil

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(Michael, “A LINE IN THE SAND: COUNTERING CRIME, VIOLENCE AND TERROR AT THE SOUTHWEST BORDER,” UNITED STATES HOUSE COMMITTEE ON HOMELAND SECURITY, Lexis)//BB
Terrorism remains a serious threat to the security of the United States. The Congressional Research Service reports that between September 2001 and September 2012, there have been 59 homegrown violent jihadist plots within the United States. Of growing concern and potentially a more violent threat to American citizens is the enhanced ability of Middle East terrorist organizations, aided by their relationships and growing presence in the Western Hemisphere, to exploit the Southwest border to enter the United States undetected. This second edition emphasizes America’s ever-present threat from Middle East terrorist networks, their increasing presence in Latin America, and the growing relationship with Mexican DTOs [Drug Trafficking Organizations] to exploit paths into the United States. During the period of May 2009 through July 2011, federal law enforcement made 29 arrests for violent terrorist plots against the United States, most with ties to terror networks or Muslim extremist groups in the Middle East. The vast majority of the suspects had either connections to special interest countries, including those deemed as state sponsors of terrorism or were radicalized by terrorist groups such as al Qaeda. American-born al Qaeda Imam Anwar al Awlaki, killed in 2011, was personally responsible for radicalizing scores of Muslim extremists around the world. The list includes American-born U.S. Army Major Nidal Hassan, the accused Fort Hood gunman; “underwear bomber” Umar Faruk Abdulmutallab; and Barry Bujol of Hempstead, TX, convicted of providing material support to al Qaeda in the Arabian Peninsula. In several documented cases, al Awlaki moved his followers to commit “jihad” against the United States. These instances, combined with recent events involving the Qods Forces, the terrorist arm of the Iranian Revolutionary Guard Corps, and Hezbollah, serve as a stark reminder the United States remains in the crosshairs of terrorist organizations and their associates. In May of 2012, the Los Angeles Times reported that intelligence gleaned from the 2011 raid on Osama bin Laden’s compound indicated the world’s most wanted terrorist sought to use operatives with valid Mexican passports who could illegally cross into the United States to conduct terror operations.3 The story elaborated that bin Laden recognized the importance of al Qaeda operatives blending in with American society but felt that those with U.S. citizenship who then attacked the United States would be violating Islamic law. Of equal concern is the possibility to smuggle materials, including uranium, which can be safely assembled on U.S. soil into a weapon of mass destruction.

#### Nuclear war

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(Robert, “After a Terrorist Nuclear Attack: Envisaging Catalytic Effects,” Studies in Conflict & Terrorism, 33.7, InformaWorld)//BB
But these two nuclear worlds—a non-state actor nuclear attack and a catastrophic interstate nuclear exchange—are not necessarily separable. It is just possible that some sort of terrorist attack, and especially an act of nuclear terrorism, could precipitate a chain of events leading to a massive exchange of nuclear weapons between two or more of the states that possess them. In this context, today’s and tomorrow’s terrorist groups might assume the place allotted during the early Cold War years to new state possessors of small nuclear arsenals who were seen as raising the risks of a catalytic nuclear war between the superpowers started by third parties. These risks were considered in the late 1950s and early 1960s as concerns grew about nuclear proliferation, the so-called n+1 problem. It may require a considerable amount of imagination to depict an especially plausible situation where an act of nuclear terrorism could lead to such a massive inter-state nuclear war. For example, in the event of a terrorist nuclear attack on the United States, it might well be wondered just how Russia and/or China could plausibly be brought into the picture, not least because they seem unlikely to be fingered as the most obvious state sponsors or encouragers of terrorist groups. They would seem far too responsible to be involved in supporting that sort of terrorist behavior that could just as easily threaten them as well. Some possibilities, however remote, do suggest themselves. For example, how might the United States react if it was thought or discovered that the fissile material used in the act of nuclear terrorism had come from Russian stocks,40 and if for some reason Moscow denied any responsibility for nuclear laxity? The correct attribution of that nuclear material to a particular country might not be a case of science fiction given the observation by Michael May et al. that while the debris resulting from a nuclear explosion would be “spread over a wide area in tiny fragments, its radioactivity makes it detectable, identifiable and collectable, and a wealth of information can be obtained from its analysis: the efficiency of the explosion, the materials used and, most important … some indication of where the nuclear material came from.”41 Alternatively, if the act of nuclear terrorism came as a complete surprise, and American officials refused to believe that a terrorist group was fully responsible (or responsible at all) suspicion would shift immediately to state possessors. Ruling out Western ally countries like the United Kingdom and France, and probably Israel and India as well, authorities in Washington would be left with a very short list consisting of North Korea, perhaps Iran if its program continues, and possibly Pakistan. But at what stage would Russia and China be definitely ruled out in this high stakes game of nuclear Cluedo? In particular, if the act of nuclear terrorism occurred against a backdrop of existing tension in Washington’s relations with Russia and/or China, and at a time when threats had already been traded between these major powers, would officials and political leaders not be tempted to assume the worst? Of course, the chances of this occurring would only seem to increase if the United States was already involved in some sort of limited armed conflict with Russia and/or China, or if they were confronting each other from a distance in a proxy war, as unlikely as these developments may seem at the present time. The reverse might well apply too: should a nuclear terrorist attack occur in Russia or China during a period of heightened tension or even limited conflict with the United States, could Moscow and Beijing resist the pressures that might rise domestically to consider the United States as a possible perpetrator or encourager of the attack? Washington’s early response to a terrorist nuclear attack on its own soil might also raise the possibility of an unwanted (and nuclear aided) confrontation with Russia and/or China. For example, in the noise and confusion during the immediate aftermath of the terrorist nuclear attack, the U.S. president might be expected to place the country’s armed forces, including its nuclear arsenal, on a higher stage of alert. In such a tense environment, when careful planning runs up against the friction of reality, it is just possible that Moscow and/or China might mistakenly read this as a sign of U.S. intentions to use force (and possibly nuclear force) against them. In that situation, the temptations to preempt such actions might grow, although it must be admitted that any preemption would probably still meet with a devastating response.

#### We solve - Lines are chosen, presidential permit required

Dombek 12 (Carl, Renewablesbiz.com-covering the business of renewable and sustainable energy, Route recommended for US/Mexico transmission line Access for cross-border wind development, http://www.renewablesbiz.com/article/12/06/route-recommended-usmexico-transmission-line)

The U.S. Department of Energy (DOE) has identified its preferred route for a 1.7-mile transmission line that would transmit energy from Mexico to the U.S. In its final environmental impact statement (FEIS) on the project, DOE identified the route called “alternative 4A” as its preferred route for the Energia Sierra Juarez (ESJ) transmission line, which would connect San Diego Gas & Electric’s (SDG&E) ECO substation near the town of Jacumba, Calif., on the border 75 miles east of San Diego, to an ESJ substation at the first phase of an ESJ wind development near the town of La Rumorosa, Baja California. The FEIS also identified a double-circuit 230-kV line as DOE’s preference over a single-circuit 500-kV connection. About 0.65 miles of the line would be in the U.S. The line would transmit up to 1,250 MW of wind-generated electricity. Because the project crosses an international boundary, a presidential permit is required. In addition to identifying the preferred route for the project, the FEIS includes DOE’s recommendation for the granting of a presidential permit to the line’s developer, Energia Sierra Juarez U.S. Transmission. “This presidential permit represents the last of the major permits that we need,” a spokesperson for the line’s developer told TransmissionHub on June 13. “This is a project we’ve been permitting for about 4-1/2 years so to get the final EIS out is a major milestone for the cross-border transmission line.” The developer is also building the wind farm just south of the international border. “This is one of the last remaining high-value, high-capacity factor wind resources that’s left on the West Coast, and right now, it’s essentially untapped,” the spokesperson said. “This is a resource that can serve the green energy demands of California and other states in the U.S. as well as Mexico.” The developer does not disclose the capital costs of its projects, but did confirm that the cost of the lines will represent only a small portion of the overall project cost. DOE filed the FEIS with the EPA, which then published the notice of availability (NOA) in the Federal Register on June 8. As required by federal regulations, DOE will announce its decision on the proposed action no sooner than 30 days after the NOA was published.

#### Obama approved a presidential permit in November

Platts 11/12 (US FERC approves permit for gas export facilities at Mexican border, http://www.platts.com/latest-news/natural-gas/washington/us-ferc-approves-permit-for-gas-export-facilities-21813412)

The US Federal Energy Regulatory Commission has approved a presidential permit allowing a subsidiary of Houston-based NET Midstream to build natural gas export facilities at the US-Mexico border, the latest government approval in a growing trend of US gas exports into Mexico.¶ The November 8 FERC order, made public Tuesday, permits NET Mexico to build a 1,400 foot, 48-inch diameter pipeline with a 2.1 Bcf/d capacity between Starr County, Texas, under the Rio Grande River to the Mexican border.¶ The $2.7 million export facility will be linked to a 120-mile, 42-inch diameter intrastate pipeline NET is planning, which will transport as much as 2.1 Bcf/d of gas from the Agua Dulce Hub in Nueces County, Texas, to the export facility, according to the order.