### 2NC China Impact

#### China will respond to a rare earth shortage by cutting off exports – they’ve done it before in 2007 and 2010, and won’t let the U.S. beat them in the clean tech without putting up a fight. Resource conflicts spill over to the broader relationship and U.S.-China miscalculation leads to extinction. That’s Cohen and White.

### 2NC Turns Case

#### Link turns the case – Epstein says immediate high price shocks make it impossible to manufacture affordable products because factories and energy companies haven’t currently budgeted in a huge demand increase in the materials market chain.

#### Changes to the cost-curve crush the energy industry.

Pell 11 [Ezra, Environmental Finance | Mon, 12 December 2011, Rare Earth Shortages - A Ticking Timebomb for Renewables? http://oilprice.com/Alternative-Energy/Renewable-Energy/Rare-Earth-Shortages-A-Ticking-Timebomb-For-Renewables.html]

A global scarcity of rare earth metals over the next five years could be **“a ticking timebomb”** for renewables and clean-tech, according to consultancy PwC. Hybrid cars, rechargeable batteries and wind turbines are among the sectors which could be affected by a shortage of these metals, which include cobalt, lithium and platinum, says PwC’s report Minerals and metals scarcity in manufacturing: A ‘ticking timebomb’. Rare earth metals are a key element for producing gearless wind turbines using permanent magnet generators, said Daniel Guttmann, London-based director for renewables and clean-tech at PwC. Manufacturers favour gearless turbines increasingly as they are more reliable than geared turbines, which are heavier and have more moving parts. “This is a **real headache** for the industry and may **negatively impact the cost-curve** of offshore wind,” he said. Guttman added that two ways that automotive manufacturers expect to meet tightening emission regulations are electric vehicles and reducing vehicle weight, and rare earth metals are required to construct batteries of the right cost, weight and size. “Scarce supply and the associated price implications could make it more difficult for [manufacturers] to keep pushing emissions down cost effectively,” he said.

#### Drives companies out of business.

Pappagallo 12 [Linda, Masters Student at Columbia University - School of International and Public Affairs, Writer at Green Prophet and US Ambassador for Carboun - Author/ Researcher for an infographic chapter on Ecology and the Environment in the Middle East. Rare Earth Metals Limits Clean Technology’s Future August 5th, 2012 http://www.greenprophet.com/2012/08/rare-earth-metal-peak/]

As the world moves toward greater use of zero- carbon energy sources, the supply of certain key metals needed for such clean-energy technologies may **dry up**, inflating per unit costs and **driving the renewable energy market out of business.** We’ve talked about peak phosphorus for food; now consider that rare earth metals like neodymium which are used in magnets to help drive wind energy turbines, and dysprosium needed for electric car performance are becoming less available on the planet.

#### Independently, this also reduces the incentive for additional innovation in tech that require rare earths because there’s no guarantee that they’ll be able to sell future tech on the market absent a consistent, cheap supply chain.

#### Even if China doesn’t cut off rare earth, huge price fluctuations prevent tech dissemination – if India, China, and developing countries say they can’t afford alternatives to coal now, they certainly won’t get on board when energy technologies become even more expensive.

### 2NC Turns Econ

#### Mere perception of a shortage crushes the economy – more important than the debt crisis.

Trigaux 12 [David, A thesis submitted in partial fulfillment of the requirements of the University Honors Program University of South Florida St. Petersburg May 2nd 2012 Thesis Director: Thomas Smith Ph. D. Director of the Honors Program and Associate Professor of Political Science Committee Member: Dr. Ty Solomon, Visiting Assistant Professor of Political Science “The U.S., China and Rare Earth Metals” The Future Of Green Technology, Military Tech, and a Potential Achilles‟ Heel to American Hegemony. http://dspace.nelson.usf.edu/xmlui/bitstream/handle/10806/4632/David%20Trigaux%20Honors%20Thesis%5B1%5D.pdf?sequence]

Additional concern should be placed on the effects that this has on the economy. As mentioned above, rare earth metals are **necessary in virtually every important sector of the economy**, from health and energy to commercial electronics and aerospace and other high-tech manufacturing. Shortages of rare earth metals make every one of these products more expensive, as the cost of the materials will invariably trickle down to the consumers. Cost increases could make some of these industries unprofitable, causing layoffs. More importantly, the **perception** of a shortage in these areas could be equally as devastating as an actual shortage. The free market economy is very susceptible to the manipulations of government-based corporations in China. A proposed solution-to refer China to the WTO-is unlikely to settle economic jitters, and could even worsen the situation because of retaliation from China. 92 The shift of many industries that use rare earth metals to China creates a structural barrier to long-term US economic health and competitiveness. 93 The traditional narrative to explain American economic prosperity is the entrepreneurial spirit, creating the products of tomorrow. If the companies responsible for doing this leave the United States, then this recipe for success will no longer be viable. 94 The current economic climate, complicated by the European debt crisis caused by Greece, Spain, Italy and others, economic stagnation in Japan, and instability in the oil markets and the Middle East, has put people on edge, and introduced great volatility into the stock markets, the confidence of investors, and everyday consumers. Some executives are **even more worried** about the rare earth shortage than the debt crisis, seeing it as a structural issue that doesn‟t have any easy or immediately foreseeable solution. 95

### Turns Fin.

#### Increased production of so-called clean energy technologies requires mining rare earth minerals. The costs of Western demands for more and more energy are displaced onto populations of marginalized Chinese citizens.

Shimatsu 12 [Yoichi Shimatsu, former associate editor of Pacific News Service, is an environmental writer and consultant based in Hong Kong. The New Opium War: China's Rare Earth Minerals New America Media, News Analysis, Yoichi Shimatsu, Posted: Mar 15, 2012 http://newamericamedia.org/2012/03/the-new-opium-war-chinas-rare-earth.php]

The very same “humanitarian” countries that complain so vociferously about workers’ rights and environmental degradation in China have **silently tolerated the cancer risk to expendable Chinese miners**. The Western message is clear: Hurry up and do the dirty work **but not in our backyard.** In a further cynical twist, the European Union trade commissioner Karel De Gucht said that China’s restrictions on rare earths harm “green business applications.” (CITE SOURCE) In fact, most of the world’s photovoltaic cells are produced inside China, often in partnership with Western companies. Likewise is the case of neodymium magnets, abundantly available at low cost through web marketing sites. Foreign companies can thereby profit while **washing their hands** of the high costs for pollution clean up and health care.

### A2: Impact Defense

#### Interdependence doesn’t check.

Friedberg 10 [Aaron L., Professor of Politics and International Affairs, Woodrow Wilson School, Implications of the Financial Crisis for the US-China Rivalry Survival, Volume 52, Issue 4 August 2010 , pages 31 - 54]

The assumption that deep financial interdependence will lead to stable, mutual deterrence is more comforting than it ought to be. It may well be true that economic warfare, like nuclear war, would do terrible damage to all involved but, as with nuclear weapons, this does not mean that such a conflict is impossible. Leaders may miscalculate the extent of the damage they would suffer, conclude that the stakes in a given confrontation are so high that they justify running extraordinary risks, or feel compelled to act in potentially self-destructive ways by domestic political pressure. As risky as a confrontation between two nuclear-armed nations might be, there are also special dangers of unintended escalation in the financial arena where 'panics' are always possible and relevant decisions are made not merely by a handful of 'national command authorities', but by large numbers of independent investors.

#### Miscalculation and war are probable – relations are precarious.

Lee 10 [John, a foreign-policy fellow at the Centre for Independent Studies in Sydney, a visiting scholar at the Hudson Institute in Washington and the author of "Will China Fail?" (CIS, 2007), China's Rise and the Road to War, August 5, 2010, http://online.wsj.com/article/SB10001424052748703748904575410580240721848.html?mod=googlenews\_wsj]

What are the lessons for Asia? While economic interdependence and American attempts to "manage" China's rise has so far succeeded in preventing war, the recent diplomatic conflagration over the Chinese reiteration that its claims in the South China Sea are part of Beijing's "core interests" validates what scholars such as Aaron Friedberg have been saying for a decade: East Asia today has the potential to recreate the European situation at the turn of the previous century. When it comes to strategic goals, China is re-entering into a regional order not of its making after decades of self-imposed isolation. By virtue of Beijing's fundamental dissatisfaction with several of its land and maritime borders, it is a revisionist power. As it rises, the desperation to secure its "core interests" will deepen. Chinese grand strategy since the days of former leader Deng Xiaoping has been to avoid conflict with a much more formidable competitor (i.e., America) while China builds its "comprehensive national power." In favor of "winning Asia without fighting," as Chinese General Ma Xiaotian once put it, are many of the older generation of leaders who see caution as prudence, even if they relentlessly seek "windows of opportunity" to extend Beijing's power at the expense of America's. They still remember the suffering and humiliation of the Mao Zedong years, when an isolated China tried to achieve too much too quickly. Yet, as history reaffirms, a peace built on continued political skill, dexterity and restraint rather than a harmony of strategic interest is **inherently precarious**. Without personal experience of China's recent traumatic history, future generations of leaders will be more confident and assertive. Even now, emerging Communist Party and People's Liberation Army leaders argue that China is moving too slowly on securing its foreign-policy goals. The danger is that, just as Germany did in Europe a century ago, China's overestimation of its own capabilities, and underestimation of American strengths and resolve—combined with strategic dissatisfaction and impatience—is the fast way toward disastrous miscalculation and error.

### 2NC U

#### Rare earth demand is slowly picking up now, but the supply is limited – MIT studies prove.

#### Recent Chinese regulations prove the market is tightening.

Voigt 8/8 [Kevin Voigt, CNN China cuts mines vital to tech industry, August 8, 2012 -- Updated 1130 GMT (1930 HKT)]

Hong Kong (CNN) -- China will cut production of rare earths -- minerals vital for technology makers worldwide -- by 20%, a move that threatens to inflame trade tensions between Beijing and Washington. Rare earths are 17 minerals with magnetic and conductive properties that are used in most of today's electronic devices, including flat-screen televisions, smart phones, hybrid cars and weapons. Nearly all of the world's supply of rare earths comes from China. China changed production rules, which will close down one-third of the nation's 23 mines and about half of 99 smelting companies, Jia Yinsong, director of the ministry's rare earths office, told China Daily Wednesday. U.S. military's rare earth concerns China implemented the rules to improve environmental conditions and help consolidate the industry, officials said. The new regulations boost the minimum annual output at mines to 20,000 metric tons and 2,000 tons per year for smelting operation -- a move which will weed out smaller operations.

#### And supply isn’t picking up anywhere else – the development of a mine takes a decade or more – makes a bottleneck very likely. That’s Seeking Alpha.

Seeking Alpha 8/29 [Qineqt, Team of investment professionals including former hedge fund manager, trader and analyst at top tier $10 billion hedge fund. Members include investment professionals who oversaw research and trading organization of 50+. Avoid Molycorp Until Its Liquidity Position Improves August 29, 2012 http://seekingalpha.com/article/834711-avoid-molycorp-until-its-liquidity-position-improves]

According to a recent MIT study, the demand for two of these REMs, neodymium and dysprosium, is expected to increase significantly in future, as the world transitions to renewable energy sources. This is because neodymium is an essential ingredient of magnets used in wind turbines, while dysprosium is used in some electric vehicles' motors. The research predicted that the demand for neodymium and dysprosium is expected to increase by as much as 700% and 2,600% over the next 25 years. While these raw materials are abundantly available in the ground, their supply needs to be paced up so as to match the rate of increase in expected demand. However, the development of a mine takes a decade or more, and unless noteworthy steps are taken in the short-term, such as new mines' development and recycling, a bottleneck will very likely lead to severe price hikes in future.

### Ext. No Supply

Ballentine 6/11 [Roger, President, Green Strategies, Clean Technology Depends On Rare Earth Elements, 2012, http://www.thehorinkogroup.org/featured\_column/2012/06/11/clean-technology-depends-on-rare-earth-elements/]

Unfortunately, wind turbines and electric engines both rely on the same key REEs: neodymium (Nd) and dysprosium (Dy). A recent MIT study conducted on behalf of Ford predicts global demand for these REEs outstripping supply over the medium-term if worldwide production does not increase by eight percent for Nd and 14 percent for Dy. Rare earth production currently is increasing at approximately six percent per year. The problem of future access to rare earth resources is exacerbated by China’s recent imposition of REE export quotas, which caused some users of REEs to charge REE surcharges to their customers. A shrinking supply of REEs almost ensures higher costs for industries striving to be cost-competitive and could set back solar and wind at a time when we need more energy diversity.

### A2: Other Countries Check Supply

#### Other countries won’t mine – environmental costs.

Shimatsu 12 [Yoichi Shimatsu, former associate editor of Pacific News Service, is an environmental writer and consultant based in Hong Kong. The New Opium War: China's Rare Earth Minerals New America Media, News Analysis, Yoichi Shimatsu, Posted: Mar 15, 2012 http://newamericamedia.org/2012/03/the-new-opium-war-chinas-rare-earth.php]

Beijing limited foreign shipments due to shortages caused by “environmental issues” and “health hazards” to miners, according to news reports. The toxic threats of water contamination and air pollution are serious enough for other countries with rare-earth resources to block plans for extraction. In Malaysia’s Pahang state, for instance, thousands of villagers are now protesting the planned $230 million refining plant by Australian-owned Lynas, the first new rare-earth operation outside of China. Local residents claim that the open-pit mine releases radioactive dust and carcinogenic wastewater. The problem of downstream contamination – and not the lack of potential mining sites – is the reason that China has been left with a near-monopoly on rare earth mining. Before 1990, before other nations suspended their mining operations, China produced less than 30 percent of the world supply.

### A2: Japan Checks

#### Japan’s twenty years away from production.

WSJ 6/29 [Yoree Koh, Clear As Mud: The Answer to Japan’s Rare Earth Concerns, 6/29/12, http://blogs.wsj.com/japanrealtime/2012/06/29/clear-as-mud-the-answer-to-japans-rare-earth-concerns/]

But considerable challenges lie ahead before the underwater treasure trove can be accessed. Namely, the 5,600 meters to the seabed. Mr. Kato also led the group of researchers that discovered the wealth of rare-earth minerals blanketing the floor of the Pacific Ocean last July. But industry specialists have expressed skepticism over the commercial viability of mining the minerals from the Pacific. Costs could soar, the timeline could be extremely long and the extraction could prove more difficult than expected, they say. What is more, techniques to lift the mineral-rich mud from such depths have yet to be developed. “This is welcome news. But the professor also says that a more detailed survey is necessary and that technology has to be developed to make commercial development possible,” said Japan’s Minister of Economy, Trade and Industry Yukio Edano on Friday. Mr. Edano said the ministry, which had been planning on conducting its own survey of the area, will cooperate with the researchers. But Mr. Kato shrugs off the naysayers. “When people hear about developing resources they tend to immediately assume it will come with high costs. But, in fact, the cost of developing it is comparable to how much it costs to import rare earths now.” He also estimates the costs to develop the minerals found in the ocean will be lower than when dealing with those discovered on land because the latter are heavily loaded with persnickety traces of radiogenic elements such as uranium that need to be disposed of. Mr. Kato also estimates the mud containing the rare-earth minerals could be taken out of the ocean in three to five years. But other industry insiders have said commercializing the resource rich spots in the Pacific Ocean **could take as long as 20 years**, though that estimate took international wrangling over divvying up the area into consideration. Mitsui Ocean Development & Engineering Co., a Tokyo-based firm that specializes in deep-sea oil exploration, will join the team to help survey and potentially dredge up the mud, said Mr. Kato. The team will survey the area to determine where the most mineral-rich mud is located. Mr. Kato estimates that will take about two years.

### 2NC Link – Solar

#### All solar materials are produced in China.

Nyaradi 12 [John, publisher of Wall Street Sector Selector, China’s Challenge: Solar Panels and Rare Earths April 12, 2012, http://wallstcheatsheet.com/stocks/chinas-challenge-solar-panels-and-rare-earths.html/]

In the transition to cleaner energy sources (NYSEARCA:GEX), it is important to consider the reality that many economies may be trading a fossil fuel addiction for a dependence on rare earth metals. Even as the US applies tariffs to Chinese solar panels (NYSEARCA:TAN) and seeks to strengthen domestic industry, more advanced solar technologies, such as thin-film solar panels, require indium—another rare earth metal, 100 percent of which is produced in China. Though the US mining company Molycorp has bought and plans to reopen the Mojave Desert rare earth mine, the promises of robust production by mid-2012 seem unlikely.

#### PV cells require tellurium – only in China.

Burnett 11 [H. Sterling Burnett is a senior fellow with the National Center for Policy Analysis. BURNETT: Obama’s green power builds China’s red power Environmentalist dogma threatens job growth and national security The Washington Times 6:15 p.m., Wednesday, February 16, 2011 http://www.washingtontimes.com/news/2011/feb/16/obamas-green-power-builds-chinas-red-po-814258565/]

The Obama administration promotes solar-panel production as one area that could see job growth under its push for green jobs. Production of photovoltaic cells relies on the rare element tellurium. However, the only tellurium mine that exists on Earth is in China. And China, in part through its control of tellurium, is increasingly dominating the market for solar manufacturing. In 2003, China produced just 1 percent of the world’s solar panels, but by 2009, its share rose to 43 percent. By contrast, in 2003, U.S. production of solar panels accounted for 14 percent of the world total, but now it stands at just 4 percent. And because the rare earths neodymium and lanthanum are essential to the newest generation of batteries that power new hybrid and electric vehicles, U.S. auto companies are, in part, placing their hope in revitalizing the domestic auto industry on China‘s continued goodwill.

### Solar – A2: Won’t Use REE

#### All solar power uses rare earths – substitutes are inefficient and don’t solve.

Trigaux 12 [David, A thesis submitted in partial fulfillment of the requirements of the University Honors Program University of South Florida St. Petersburg May 2nd 2012 Thesis Director: Thomas Smith Ph. D. Director of the Honors Program and Associate Professor of Political Science Committee Member: Dr. Ty Solomon, Visiting Assistant Professor of Political Science “The U.S., China and Rare Earth Metals” The Future Of Green Technology, Military Tech, and a Potential Achilles‟ Heel to American Hegemony. http://dspace.nelson.usf.edu/xmlui/bitstream/handle/10806/4632/David%20Trigaux%20Honors%20Thesis%5B1%5D.pdf?sequence=1]

For example, solar power has been touted as a new, clean, renewable technology that can help power houses and businesses individually, and also done in massive energy farms in regions that receive a lot of daily sun. Solar power converts energy from the sun, which isn‟t likely to run out of its heat any time soon. Rare Earth Metal indium is used to build thin-film solar panels. Using indium, because of its versatile properties, allows solar to be used in new and smaller places. Older or larger scale solar projects use tellurium, which also has restricted supplies. Substitutes for these two rare earths have distinctively lower energy conversion rates. 58

### A2: Substitutes Check

#### Successful substitutes aren’t coming anytime soon.

Irvine 6/26 [Graeme Irvine, Rare Metal Blog, has been involved in commodities markets and trading since 1968, working on the floor trader on the floor of the old London Commodity Exchange, Are Rare Earth Substitutes Real?, 6/26/12, http://www.raremetalblog.com/2012/06/are-ree-substitutes-real.html#more]

In one form or another this story has been around for the last several years, although last year’s REE price surge drove a surge in substitution articles. To this commodities following dinosaur from the late 60s, these articles seem **more aspirational than reality based**. Manufacturers talking up the substitution pressure **in a bid to drive down REE prices.** In reality, successful substitution even if possible, is **very hard** to do, and brings with it **very high retooling costs.** Almost as bad, if your competitors don’t also substitute, a manufacturer runs the risk of being perceived of offering a **lower quality product.** There being no such thing as a free lunch, every substitution brings with it a trade off somewhere else. That’s not to say that some degree of substitution doesn’t happen over time. But more often progress comes by using the existing REE more efficiently, thereby reducing the amount needed. It’s generally more cost effective over setting up a completely new line of components and reinventing the wheel. I have my doubts that these articles cause much concern at Molycorp or Lynas. I doubt that most REEs are really substitutable in a way that’s acceptable to the end consumer, though our new arriving graphene/nano-carbon age opens up some possibilities for later in the decade and next. I suspect that Reuters will still be writing similar stories in another few years.

#### Their ev concedes we need nanotubes

ScienceDaily 11 April 12 Complex Composite Materials: Replacement Found for Rare Material Indium Tin Oxide http://www.sciencedaily.com/releases/2011/04/110411083748.htm

Researchers at Eindhoven University of Technology (TU/e, Netherlands) have developed a replacement for indium tin oxide (ITO), an important material used in displays for all kinds of everyday products such as TVs, telephones and laptops, as well as in solar cells. Unfortunately indium is a rare metal, and the available supplies are expected to be virtually exhausted within as little as ten years. The replacement material is a transparent, conducting film produced in water, and based on electrically conducting carbon nanotubes and plastic nanoparticles. It is made of commonly available materials, and on top of that is also environment-friendly. The researchers successfully developed a replacement material by combining a small amount of readily available nanotubes, a solution of latex beads, and a small amount of binding polystyrene beads in water. When the solution is heated, the polystyrene beads fuse creating a network of carbon nanotubes which are surrounded by the highly conductive latex. The current material is not quite as conductive as indium tin oxide, but researchers are confident that by manipulating the number of carbon nanotubes used they can increase electrical conductivity. The new material stands to match tin oxide in terms of transparency and electric conductivity, and it also includes no heavy earth sensitive metals and is extremely flexible, making it perfect for bendable applications.

#### **No ev it would scale up**

#### Concedes it’s 20 years away

ACS 12 American Chemical Society “New solar panels made with more common metals could be cheaper and more sustainable” August 21 http://portal.acs.org/portal/acs/corg/content?\_nfpb=true&\_pageLabel=PP\_ARTICLEMAIN&node\_id=222&content\_id=CNBP\_030557&use\_sec=true&sec\_url\_var=region1&\_\_uuid=a40f1dc0-419f-494a-af74-6fbc3293c09f

Atwater and Stevens described development and testing of new devices made with zinc phosphide and copper oxide that broke records for both electrical current and voltage achieved by existing so-called thin-film solar energy conversion devices made with zinc and copper. The advance adds to evidence that materials like zinc phosphide and copper oxide should be capable of achieving very high efficiencies, producing electricity at a cost approaching that of coal-fired power plants. That milestone could come within 20 years, Atwater said.

### Grid

#### Don’t solve financial speculation – their impact evidence is in the context of predatory lending and other bad practices, not goldman making money off of the PTC.

#### Impact is in context of financial deregulation – no evidence that is occurring now. Evidence concedes the impact only occurs

#### PTC extension takes out the case – can still speculate -

#### No volatility – global markets solve – Enron example is outdated and won’t happen anymore

**Skutnik, 12** -- University of Tennessee nuclear engineering professor

(Steve, "The End of Natural Gas Price Volatility?" 2-13-12, theenergycollective.com/skutnik/76356/end-natural-gas-price-volatility, accessed 10-5-12, mss)

Conoco Phillips recently put up a great video on youtube making the point that NG has been volatile in the past due to reasons mostly having little to do with the nature of production (instead, the nature of the use), and that the volatility will be less in the future given **recent developments**. Here is the video: Because these are such important points that get to the core of the issue, I want to list them. I'm going to tackle the 2 arguments I mentioned above. Why Natural Gas is Volatile in the first place: It's a commodity and all commodities have price volatility It is a margin fuel for power production (because it has the highest variable cost) Once before, the long-term price of NG made a major move upward after much investment into NG power plants that left decision makers regretting that and leaving them skeptical of NG commitment in the future Why it will be less volatile in the future: We have more storage than in the past We can bring in LNG (liquified natural gas, a way to import the commodity) to up to 25% of our demand Shale gas is like a manufacturing process, and it's something you can ramp up very rapidly The on-shore production is not subject to weather related disruptions, like hurricanes which have **historically been the reasons for major disruptions** The abundance of resources and diversity of supply makes long-term price **much more stable and confident**

#### Rising energy costs are inevitable – cost and demand