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## Advantage 1 is Synthetic Natural Gas

China SNG plants reverse emissions reductions from wind and solar, and cause water shortages and mercury pollution. **Science Daily 13** writes[[1]](#footnote-1)

Coal-powered **s**ynthetic **n**atural **g**as **plants** being planned in China would produce seven times more greenhouse gas emissions than conventional natural gas plants, and use up to 100 times the water as shale gas production, according to a new study by Duke University researchers. These environmental costs have been largely neglected in the drive to meet the nation's growing energy needs, the researchers say, and **might lock China on an irreversible and** **unsustainable path for decades** to come. "Using coal to make natural gas may be good for China's energy security, but it's an environmental disaster in the making," said Robert B. Jackson, Nicholas Professor of Environmental Sciences and director of the Duke Center on Global Change. "At a minimum, **Chinese policymakers should** delay implementing their synthetic natural gas plan to avoid a potentially costly and environmentally damaging outcome," said Chi-Jen Yang, a research scientist at Duke's Center on Global Change. "An even better decision would be to **cancel the program entirely**." Yang is lead author of the new study, which was published Thursday in the peer-reviewed journal Nature Climate Change. As part of the largest investment in coal-fueled synthetic natural gas plants in history, the central Chinese government recently has approved construction of nine large-scale plants capable of producing more than 37 billion cubic meters of synthetic natural gas annually. Private companies are planning to build more than 30 other plants, capable of producing as much as 200 million cubic meters of natural gas each year -- far exceeding China's current natural gas demand. "These plants are coming online at a rapid pace. If all nine plants planned by the Chinese government were built, they would emit 21 billion tons of carbon dioxide over a typical 40-year lifetime, seven times the greenhouse gas that would be emitted by traditional natural gas plants," Jackson said. "**If all 40** of the **facilities are built,** their **carbon** dioxide **emissions would be** an astonishing **110 billion tons**," Jackson said. The analysis by Yang and Jackson finds that if the gas produced by the new plants is used to generate electricity, the total lifecycle greenhouse gas emissions would be 36 percent to 82 percent higher than pulverized coal-fired power. If the synthetic natural gas made by the plants were used to fuel vehicles, the lifecycle greenhouse gas emissions would be twice as large as from gasoline-fueled vehicles. "The **increased** carbon dioxide **emissions from the nine government-approved plants alone will more than cancel out** all of the **reductions in** greenhouse gas **emissions from China's recent investments in wind and solar** electricity," Yang said. "While we applaud China's rapid development in clean energy, we must be cautious about this simultaneous high-carbon leapfrogging." The study notes that the **plants would also emit** hydrogen sulfide and **mercury, which, if not properly scrubbed and treated, are potentially harmful to human health**. Excessive water consumption by the plants is also a concern. "Producing synthetic natural gas requires 50 to 100 times the amount of water you need to produce shale gas," Yang said. "**The nine plants** approved by the government -- **most of which are located in desert** or semi-desert **regions** in Xinjiang and Inner Mongolia -- **will consume more than 200 million tons of water annually and could worsen water shortages in areas that already are under significant water stress**." The overall environmental impacts will be severe, Jackson said. "It will lock in high greenhouse gas emissions, water use and mercury pollution for decades. Perhaps there's still time to stop it."

CO2 emissions release methane into the atmosphere which risks extinction. This is historically confirmed. **Daily Take 13** writes[[2]](#footnote-2)

If you were standing outdoors looking at the distant and reddening sky 250 million years ago as the Permian Mass Extinction was beginning, unless you were in the region that is known as Siberia you would have no idea that a tipping point had just been passed and soon 95% of all life on earth would be dead. It's almost impossible to identify tipping points, except in retrospect. For example, we have almost certainly already past the tipping point to an ice-free Arctic. And we are just now realizing it, even though that tipping point was probably passed a decade or more ago. This is critically important because in the history of our planet **there have been five times when more than half of** all **life on Earth died**. They're referred to as "mass extinctions." One – the one that killed the dinosaurs – was initiated by a meteorite striking the Earth. The rest all appear to have been initiated by tectonic and volcanic activity. **In each case**, however,what happened was that massive amounts of carbon-containing **g**reen**h**ouse **g**ase**s – principally carbon dioxide, were released** from beneath the Earth's crust and up **into the atmosphere. This provoked** global **warming intense enough to melt billions of tons of frozen methane on the ocean**s **floor**s**. That** pulse of methane - an intense greenhouse gas - then **brought** the **extinction** to its full of intensity. While in the past it took continental movement or an asteroid to break up the crust of the earth enough to release ancient stores of carbon into the atmosphere, we humans have been doing this very aggressively for the past 150 years by drilling and mining fossil fuels. So the question: Will several centuries of burning fossil fuels release enough carbon into the atmosphere to mimic the effects of past volcanic and asteroid activity and provoke a mass extinction? Geologists who study mass extinctions are becoming concerned. As more and more research is coming out about the massive stores of methane in the Arctic and around continental shelves, climate scientists are beginning to take notice, too. The **fossil fuel companies are sitting on** roughly **2 trillion tons of underground carbon. That**, in and of itself, **is enough to warm the earth by 5 or 6°C, and is** an amount of carbon **consistent with tipping points during past mass extinctions**. There are an additional estimated 2 trillion tons of methane stored in the Arctic and probably 2 to 5 times that much around continental shelves all around the Earth. **If our burning fossil fuels warms the oceans enough** that that methane melts and is quickly released into the atmosphere, **the Earth will be in its sixth mass extinction**. And make no mistake about it, the **animals and plants** that are **most heavily hit by mass extinctions are those** that are largest and **at the top of the food chain. That means us.** We must stop the carbon madness and move, worldwide, to renewable 21st century energy sources.

SNG independently contributes to methane emissions. **Zhang 3-9** writes[[3]](#footnote-3)

Coal-fired power plants, which China relies on for most of its energy, are the main cause for the smog. Although China has tried hard to diversify its energy sector and made progress, in the near future, coal consumption is expected to continue rising. **China’s solution of cutting air pollution while using coal is** to use coal-to-gas process to produce synthetic natural gas (**SNG**), which is similar to natural gas and is a lot cleaner. Last June, the largest coal-fired furnace within the Fourth-Ring Road of Beijing was shut down and the plant was retrofitted to burn natural gas. New coal-to-gas plants near coal mines and the pipeline connecting them to urban centers are built rapidly. The decision seems reasonable based on the high price of importing natural gas, the vast coal reserve in China and the unbearable air pollution, but the SNG operation will worsen the already existing water shortage in their locations. The national average of water consumed per person per year in China is 450 cubic meters, which is way below the 1,000 cubic meters defined as the threshold of “severe water stress”. Looking under this low national average number, the uneven distribution of water among regions is even more alarming. South China has four-fifths of the water, mainly in the Yangtze River basin. With only 20 percent of the water, north China struggles to support half the population and two-thirds of the farmland, mainly in the Yellow River basin. There is just 100 cubic meters per person per year in Beijing. Underground aquifers in north China are heavily used, way faster than its recharging speed. For example, the water table under Beijing has fallen by 1,000 feet in two decades, and the dropping water table in some parts of Inner Mongolia has worsened soil degradation and expanded the mobile sand area. The perched north in China is also the home to most of the coal reserves. Most of the SNG plants, either existing or under construction, are located in Xinjiang province and Inner Mongolia province. Building SNG plants in these areas will worsen the already existing water shortage. **Extreme heat and pressure are needed to turn coal into carbon monoxide and hydrogen, then steam and catalysts are added to convert them to natural gas, methane**. Shale gas is criticized as a water-intensive process, but its water usage pales in comparison to SNG, which uses at least 50 times more water. The water-intensive nature of SNG was the reason for the very slow development of this industry—before 2013, there were only four projected approved. But the pace has picked up in recent years promoted by the air pollution. By the end of last year, there are 18 projected approved. The largest one is in Inner Mongolia and has started operation already, it will complete expansion in 2017 and supply almost half of the current gas demand of Beijing. Water treatment plants and recycling plants are badly needed to ease the water shortage. Such operations need energy, adding to the energy-hunger of China. There is a pilot SNG plant in Xinjiang province which uses a new process and only needs half of the water in comparison to the traditional process. Still, the water usage in this best case for SNG is at least 25 times more than that in shale gas. Breakthroughs on technologies are expected to happen and the hope is it can happen fast enough. China won the war on poverty by unprecedented economic growth, which is the root cause for the complex environmental crisis. **The war on pollution** China declared recently **should not create a** situation that a short-term gain of air pollution is achieved on the expense of **more** complicated **long-term crisis** associated with worsening water shortage. The **g**reen**h**ouse **g**as **emission from SNG is** also **significantly higher than simply burning coal**. Experts advocate diversification of energy sector and improvement of energy efficiency, instead of charging ahead with so many big scale SNG plants so fast.

Advantage 2 is China Stability

Environmental hazards are the main source of Chinese instability, and current policies fail. Genuine prioritization of the environment is key.

**Stanway 11-8** writes[[4]](#footnote-4)

**Three decades of industrialization and double-digit growth in China have left the country badly polluted.** **With public anger mounting over a series of scandals involving** hazardous **smog, contaminated soil and toxic water** supplies, **China** has **identified the environment as one of the biggest** potential **sources of instability.** But **despite a pledge to create a "beautiful China" over the next decade, Beijing continues to struggle to bring polluting state-owned industrial enterprises and growth-obsessed local governments to heel.** **The new policy document** said China **would "correct the bias toward**s assessing (officials) on the speed of economic **growth and increase the weight placed on** other indicators such as resource use, **environment**al damage, ecological benefits, industrial overcapacity, scientific innovation, work safety and newly-added debt." **China already assesses local officials on** the way they handle **the environment, but with** the **economy still considered the priority, local authorities** stress their green credentials by **build**ing ostentatious **national parks**, wetlands or reforestation projects **rather than address the cause of pollution and risk** revenues and **jobs.** "**Before, they were just using environmental protection as another way of generating** economic **growth and even if something causes** a **great** deal of **immediate environmental damage, they would still consider the short-term economic benefits,**" said Zhou Lei at Nanjing University, who studies the impact of industry on the environment.

Environmental strains cause Chinese collapse and extinction.

**Yee and Storey 2** write[[5]](#footnote-5)

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

## Advantage 3 is Politics

Backsliding on environmental reforms undermines the credibility of Chinese president Xi Jinping.

**Hilton 13** writes[[6]](#footnote-6)

There was not much cheer for environmentalists in the meeting that was billed as the most significant of Xi Jinping's administration. At the close of the Chinese Communist Party's Third Plenum on November 13, China's official news agency, Xinhua, failed even to list the environment among its key points, focusing instead on the promise of economic reform. **Xi** has recognized that prioritizing economic growth for 30 years has brought China to the edge of environmental collapse and he has **promised to give environment the same weight as** economic **development.** But 2013 was a year of dramatically worsening air pollution and mounting public frustration at the government's apparent inability to halt China's deforestation, maritime pollution, desertification and water and soil pollution. Xi said China must build what it calls "ecological civilization" -- a top-level slogan that officials are still struggling to flesh out. **He** talked of "establishing a complete system" of ecological civilization, **promised to improve** the **management of natural resources, and to establish "red lines" in ecological protection**, along with ecological compensation for pollution victims. It is **how these** and other **promises shape up** that **will decide Xi's** environmental **legacy.** So far, his government has announced plans to clean up lethal air pollution but they will take many years to take effect. In other respects, environmental protection risks clashing with other concerns: **a new** Environmental Protection **Law** that is **moving** slowly **through China's parliament** threatens serious financial penalties for polluting companies, but **has** also **been heavily criticized for restricting** the rights of NGOs to take **legal action against polluters, as Xi tightens** the **state**'s **control** of civil society. It also plays a role in the rising incidence of protest and chronic rural poverty, which President Xi has promised to reverse. The environment could benefit from Xi's commitment to a greater role for the market, which might boost China's pilot carbon-trading schemes, and from his promise of a stronger legal system and greater transparency. **High-level promises set the policy direction, but Xi's environmental record will be judged by results.** Key issues include cleaning up China's Environmental Impact Assessments, boosting the Ministry of Environmental Protection and putting it in charge of the provincial and local bureaus, building a robust, legally enforced system of fines for polluters and lifting restrictions on China's tightly controlled environmental NGOs.

Xi’s polcap is waning now, but he needs every ounce to pass economic reforms which avert multiple scenarios for Chinese economic crisis.

**McElveen and Li 13** write[[7]](#footnote-7)

When Xi Jinping assumed his position as the new face of the Chinese leadership in November 2012, the optimism was palpable. Emerging from what some considered to be a “lost decade” under the leadership of Hu Jintao, China was ready for a new approach to steering the Middle Kingdom’s continued global rise. In his first days, Xi earned deserved praise at home and abroad as he embarked on an anti-corruption campaign, called on officials to use plain language and avoid ostentation, proclaimed the ultimate importance of the rule of law, and followed in Deng Xiaoping’s economic reformist footsteps by traveling south to Shenzhen, the site of China’s first special economic zone. As Xi’s honeymoon has progressed, however, the initial deluge of optimism has slowed to a trickle. Many watchers of the Chinese leadership have become dispirited by a lack of substantive progress toward much-needed political reform, while Chinese public intellectuals have been dismayed by orders instructing them not to speak about seven sensitive issues: universal values, freedom of the press, civil society, civil rights, past mistakes by the Chinese Communist Party (CCP), crony capitalism, and judicial independence. Media censorship has tightened, and participants in human rights activities have encountered increasing political harassment and even arrest. In an attempt to consolidate his footing among party conservatives, Xi in July traveled to Xibaipo village, the People’s Liberation Army headquarters at the end of the civil war, where he quoted Mao Zedong to bolster Communist spirit. Following his trip, the leadership launched an effort to bar construction of new government buildings for the next five years. As Xi works to revitalize his image, he continues to favor superficial party controls and propaganda over substantive political and judicial reform. Cognizant that his ideas did not fully catch on initially—with officials turning to online shopping and secret dining clubs to avoid being seen consuming in public, and with citizens expressing cynicism about the government’s anti-corruption rhetoric—**Xi appears to realize that his political capital is waning and his honeymoon is reaching its end.** Equally important, China’s economic slowdown has prompted growing concerns about the ability of the new leadership to deliver on its promises. **This** climate has **roused Xi’s sense of urgency to adop**t more **liberal economic policies**, stimulate China’s weakening growth, and regain the confidence of his wary fellow leaders and the middle class at large. Xi is not the only Chinese leader in recent decades to have entered office facing high expectations in the realms of political and economic reform. His predecessors discovered that economic reforms were easier to pursue than political reforms. Xi now confronts this same reality, yet he also faces deeper and rougher political waters than any Chinese leader since Mao, with the very survival of the party-state resting in his hands. Despite these dire circumstances, the economic reforms wrought by his predecessors have nurtured in Xi and other leaders of his generation great confidence in their economic management skills, as they have helped shape China into the world’s second-biggest economy. Those same reforms have also bred a rapidly growing middle class that now holds greater consumer power and higher levels of education, and makes more political demands, than ever before. As these trends converge at a political crossroads, will Xi be able to utilize his team’s economic skills to implement reforms that both please the middle class and break the political bottleneck? Can further economic reforms succeed without any accompanying political reforms? **It is vitally important** for the Chinese **to explore these questions surrounding Xi’s** politically conservative, economically liberal **approach** to governing while there is still time to change course. ELITISTS AND POPULISTS The leadership transition of 2012–13 brought the promotion and retention of experienced economic reformers, in addition to the exclusion of a couple of political reform–minded heavyweights from top leadership positions. Although this once-a-decade power transfer usually takes place behind closed doors, stained by backroom deal making, the most recent transition was muddied more than usual by major political scandals. Yet, even as uncertainty surrounded the leadership selection and the country’s political trajectory, one policy goal remained clear: Economic reform would endure as a priority. As in any society, the identities of the political players help shape the policies they will implement. China is a one-party state, but this does not necessarily mean that the leadership is monolithic. On the contrary, China’s leadership can be divided into two informal but well-known coalitions: the “elitist coalition,” which emerged during the era of former President Jiang Zemin, and the “populist coalition,” once headed by former President Hu. The top two current leaders, President Xi and Prime Minister Li Keqiang, now head these two coalitions, respectively. This informal division of power is sometimes referred to as the “one party, two coalitions” political mechanism. The two coalitions represent different socioeconomic and geographical constituencies and differ in expertise, credentials, and experience. Most of the top leaders in the elitist coalition, for instance, are “princelings” from families of veteran revolutionaries and high-ranking officials. Princelings often began their careers in rich and economically well-developed coastal cities. The elitist coalition usually represents the interests of China’s business elites, especially the state-owned enterprises (SOEs), and the vast majority of the emerging middle class. Most of the populist coalition’s leading figures, by contrast, come from less-privileged families and tend to have accumulated much of their leadership experience in less-developed inland provinces. Many of these leaders began their climbs up the political ladder through leadership in the Chinese Communist Youth League and are known as tuanpai (League faction). The populists often voice the concerns of vulnerable social groups such as farmers, migrant workers, and the urban poor. More than any other leadership organization, the makeup of the Politburo Standing Committee (PSC), China’s top ruling body, will determine the direction and pace of the next phase of economic reform, as well as the arc of sociopolitical change in the country. In this latest leadership changeover, only one of the seven top leaders in the PSC—Prime Minister Li—represents the populist coalition, while the other six are all protégés of Jiang. However, the balance between the two camps on the Politburo and the Central Military Commission has largely stayed intact, and many of Hu’s people made it onto the 376-member Central Committee. In any case, the dominance of elitists on the PSC reduces the chance for policy deadlock as a result of factional infighting, giving Xi tremendous power to carry out his policy objectives. MARKET FRIENDLY Although the strong presence of princelings in the top leadership likely will reinforce public perceptions of the convergence of power and wealth in the country, the four princeling leaders on the PSC—Xi, Zhang Dejiang, Yu Zhengsheng, and Wang Qishan—all have decades of experience leading China’s major cities and provinces, and are highly competent in economic and financial affairs. Some Chinese analysts argue that, due to their princeling background, these leaders have more political capital and resources than did their predecessors Hu and Prime Minister Wen Jiabao (who came from humble family backgrounds) in terms of running the Chinese economy and coordinating various governmental agencies. Xi has long been known for his market-friendly approach to economic development for domestic and foreign businesses alike. Xi’s experience leading Fujian, Zhejiang, and Shanghai, three economically advanced regions, has prepared him well to promote the development of the private sector, foreign investment and trade, and the liberalization of China’s financial system—all of which experienced serious setbacks under the previous administration. Another example of effective leadership is Wang Qishan, now serving as the anticorruption czar. Over the past few years Wang served as a principal convener in the Sino-US Strategic and Economic Dialogue. Wang, whose nickname is “chief of the fire brigade,” is arguably the most competent policy maker in economic and financial affairs in the Chinese leadership. The public regards him as capable and trustworthy during times of emergency or crisis, whether it be the country’s response to the 1997–98 Asian financial crisis, the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic, or ongoing rampant official corruption. Wang likely will promote the continued development of foreign investment and trade, the liberalization of the financial system, tight control of government spending, and tax revenue reforms, all of which are crucial for maintaining smooth central-local economic relations. The members of this PSC are clearly interested in economic reform, but their views regarding political reform are notably conservative. For proponents of political reform, the exclusion from the PSC of two key liberals, Vice President Li Yuanchao and Vice Prime Minister Wang Yang, was a setback. Wang Yang lost out because many conservative leaders saw him as a threat. His main political rival was Bo Xilai, before Bo’s dramatic fall in 2012. As Bo succumbed to political scandal, the conservatives clearly wanted to exclude Wang. That Li Yuanchao also did not get promoted, however, was surprising to many. An instrumental voice for liberal intellectuals who demand the rule of law, governmental accountability, and intra-party democracy, Li has many supporters. Both of these tuanpai leaders will still meet age eligibility requirements for the next PSC in 2017. TECHNOCRATS IN CHARGE Beyond the PSC, Xi has recruited or retained a capable and well-regarded team to shepherd monetary and fiscal policy reforms at the ministry level. The team includes an impressive mix of experienced economic technocrats, including Zhou Xiaochuan, Lou Jiwei, and Liu He. Zhou has become the longest serving governor of the People’s Bank of China, which he has led since 2002 and to which he was reappointed this year. Zhou has participated in economic reforms since the 1990s and has been an assertive advocate of further liberalizing the financial sector. He has helped transform the struggling state-owned banks into commercial lenders, accelerate the opening of the capital account, and loosen restrictions on the Chinese currency. Lou, appointed finance minister this year, has also been active in economic reform since the 1990s, when he was a critical player in the transformation of China’s tax system and planning for a domestic bond market. A protégé of former Prime Minister Zhu Rongji, Lou served as vice minister of finance from 1998 to 2007, and gained international attention in 2007 when he was appointed chairman and CEO of the start-up China Investment Corporation, becoming one of the most powerful fund managers in the world. In charge of that $200 billion sovereign wealth fund, he was tasked with generating higher returns for the country in the midst of the world economy’s downturn. Finally, Liu, the new deputy director of the National Development and Reform Commission (NDRC), will also take on the powerful role of director of the Office of the Central Leading Group on Financial and Economic Affairs. A graduate of Harvard’s Kennedy School of Government, Liu began his work on China’s economic policy in the 1990s, when he helped shape China’s five-year plans at the State Development Planning Commission (today’s NDRC). As one of the most influential economists of his generation and a proponent of financial liberalization, Liu served as a major collaborator in a World Bank report published in 2012 that advocated market-driven change to constrain SOE monopolies. Now, as a key player in financial policy over the coming years, he will help lead the attempted structural transformation from an export-driven economy to a domestic consumption–driven economy. Together, these leaders could combine experience with innovation to help accelerate this transformation, and their patrons on the PSC will support this trajectory. It is particularly encouraging that this team of economic technocrats is planning a comprehensive economic reform agenda that includes financial liberalization, central-local tax reform, pricing reform, greater incentives for private sector development, deregulation, SOE reform, land use rights, and more accommodating policies for rural-urban migration, among other measures. Some of these liberal economic policies have already been adopted, and more likely will be approved at the CCP’s Third Plenary meeting in October. REFORM TENSIONS Such an economic reform–minded and experienced group of policy makers could not have been elevated to positions of power at a more opportune time. **It will take** such **an accomplished team to steer China through** the deep, rough waters ahead. From a **chaotic urbanization** push, **a housing bubble,** and an impending **banking crisis** to a **falling GDP growth** rate **and** persistent **college** graduate **unemployment,** the need for innovative policy making is clear. Over his first year in office, **Xi has set the stage for economic reform through his actions** and statements, and a growing sense of crisis will compel the leadership to embark on these reforms with a sense of urgency. Nonetheless, the tensions within Xi’s politically conservative, economically liberal approach to governing mirror those confronted by his predecessors, who always seemed to take one step forward economically while taking a step backward politically. During his famous “southern tour” in 1992, Deng called for greater market reform and economic privatization, while continuing to crack down on political dissent. Jiang broadened the CCP’s power base by recruiting entrepreneurs and other new socioeconomic players (a formulation known as the “three represents”), while launching a harsh political campaign against the Falun Gong, an emerging group of religious believers. Hu’s populist appeal for a “harmonious society” sought to reduce economic disparities and social tensions while he tightened censorship over the media and police control of society, especially in ethnic minority regions. In all of these major socioeconomic and political developments, the CCP leadership made a calculated but far reaching ideological and policy move in one area, but resisted political pressure in another. Xi’s recent pronouncement of the “Chinese dream” presented the slogan that will likely encapsulate his time in the leadership and serve as the objective by which he hopes to be judged in history books. In his vague explanation of the Chinese dream, Xi paired nationalistic sentiment (or national rejuvenation) with an economically liberal desire to accommodate the wants and needs of a middle class lifestyle, also implying an equal opportunity for all Chinese to rise to middle class status. When Xi held his first summit with President Barack Obama in June 2013, he expanded on the definition of the Chinese dream, highlighting its similarity to the American dream and calling for “economic prosperity, national rejuvenation, and people’s well-being.” While the official meaning of the Chinese dream has become better defined over time, CCP conservative leaders have strongly rejected the notion it might include dreams of constitutionalism and political democracy. The Chinese people, hearing these ambiguous messages emanating from the leadership and state run media, do not know whom to trust. Forced to turn to social media for unfiltered (albeit often censored) news, they continue to express feelings of deep political uncertainty and fear for their country’s socioeconomic stability. Many wonder how they can realize a Chinese dream when their country is facing declining economic prospects, especially when they have economic statistics to validate their concerns. China’s economic growth rate slowed from 9.3 percent in 2011 to 7.8 percent last year, the lowest growth rate since 1999. In 2013, debates have raged over whether the country will even be able to reach its initial 7.5 percent growth target. At the same time, **China’s** Gini coefficient, which measures **economic inequality** (with zero representing perfect equality and 1 representing perfect inequality), **continues to far exceed the** 0.44 **threshold** generally thought to indicate potential **for social destabilization.** Independent estimates have shown the figure rising to 0.47 in 2009 and 0.61 in 2010, significantly surpassing official government estimates. In an attempt to measure official corruption, the Washington-based group Global Financial Integrity has shown that cumulative illicit financial flows from China totaled $3.8 trillion from 2000 to 2011. Facing these dire economic trends, the leadership cannot afford to vacillate: The time has come for bolder, more comprehensive action. CONFLICTING INTERESTS As he seeks to impose his Chinese dream on concerned Chinese citizens (while confronting liberal intellectuals who have become increasingly skeptical of the concept), **Xi will** also **have to navigate a murky political climate.** When Xi first took office, Hu’s unpopularity among opinion leaders and the middle class initially enhanced Xi’s public support—giving the sense that he had a new mandate. Furthermore, in the wake of the Bo Xilai scandal, all party elites regardless of factional affiliation united under Xi’s leadership in order to defend CCP rule. But will the leadership remain united and retain the fortitude necessary to enact meaningful economic reforms while balancing the demands of interest groups? Xi’s leadership team has strong incentives to embrace economic reforms. On the one hand, successful reform will greatly enhance the public’s confidence in the CCP, providing the leadership with the political capital to confront many other problems in Chinese society. On the other hand, failure to act will increase the likelihood of domestic instability (and potentially a bottom-up revolution). Despite these incentives, there are many external factors that could come into play and erode the support for Xi’s factional majority on the PSC or the leadership’s inherent interest in economic reform. It remains possible that new political scandals, economic crises, **environmental disasters, or public health hazards might** emerge and **affect China’s political climate.** As we learned from the spate of events that preceded the 18th Party Congress last year, including the purge of Bo, the demotion of Hu’s chief of staff, and a New York Times report accusing Wen’s family of corruption, timing is everything. However, beyond unpredictable events and continuing intra-party machinations, the greatest obstacles to economic reform are the companies that are part of the State-owned Assets Supervision and Administration Commission (SASAC), which accounted for 43 percent of China’s GDP in 2012. The formidable power of this group explains why it took 13 years for China to pass an anti-monopoly law, why the macroeconomic control policy of the past decade was largely ineffective, and why the widely acknowledged property bubble has continued to grow. In each of these cases, corporate and industrial interest groups have encroached on the governmental decision-making process, either by inducing policy deadlock or manipulating policies in their favor. Under the SASAC, various players associated with property development have emerged as one of the most powerful special interest groups in present-day China. According to official state accounts, more than 70 percent of the total of 120 SASAC companies engaged in the real estate business and property development in 2010. In response, the State Council ordered 78 SASAC companies to withdraw their real estate investments. But resistance from these companies made the government order largely ineffective. In the first half of 2013, SASAC companies saw their profits increase by 18.2 percent over 2012. This profitable trend will only increase tensions surrounding new market-oriented policies. Pressure from these powerful and well-connected SASAC companies, however, will not be enough to derail economic reform. Other interest groups—primarily made up of members of the rising middle class who hold a negative impression of SOEs—will also weigh heavily on the minds of the leadership. For example, college graduates, who often come from middle class families, continue to face a high unemployment rate, with nearly two million failing to find work each year. A shrinking private sector has alerted the middle class to the increasingly obvious oligarchic power of SOEs and their inability to innovate. Indeed, a study conducted by Chinese scholars shows that the profits made by China’s 500 largest private companies in 2009 amounted to less than the total revenues of just two SOE firms, China Mobile and Sinopec. With no incentive to innovate, these and other SOE monopolies will continue to hamper China’s economic growth, severely undermining the leadership’s effort to generate an innovation-led and consumption-driven economy. As potent and profitable SOEs push back against reform, and the middle class pushes back against them, the ultimate shape of the economic reforms will reveal which group holds the real economic and sociopolitical upper hand in society: state-owned corporations or the middle class. POLITICAL PERILS Even with varied interest groups holding sway over the eventual outcome, China’s leadership is poised to adopt some economic reforms to promote the private sector. But SOEs are not the only obstacles the country faces. The road ahead is also far from certain because of the leadership’s ambivalence toward—or outright avoidance of—discussions of the political reform that must accompany any successful economic reform effort. Just as past economic reforms bred the need for current economic reforms, economic transformation today will breed the need for political reform tomorrow. Both China’s emerging middle class and its lower class have taken note of the economic problems that arise from a closed political environment. A truly innovation-driven economy requires political openness, just as a service sector–led economy requires a developed legal system, the rule of law, and the ability to contain widespread official corruption. As China’s economy undergoes the transformation from an export-driven to a consumption-driven model, the middle class likely will sit in the driver’s seat of economic development. Adopting political as well as economic policies that please those economic drivers is the key to ensuring a smoother economic transformation. No group in Chinese society better exemplifies the conundrum of the government’s development policies than the middle class. Born from the economic reforms of the past, the middle class believes its interests have been ignored by the government for too long. Even if members of the middle class obtain the resources to consume everything they desire, they will ultimately want a say in what the future holds for them. **Recent studies** conducted **in China** have **found that the middle class**, more than other social groups, **tends to be cynical about** the policy **promises** made by authorities, more **demanding of** policy **implementation**, and more sensitive when it comes to official corruption. As middle class Chinese realize that their voices are being suppressed, that their access to information is being blocked, and that their space for social action is being unduly confined, increased political dissent may take shape.

Chinese economic downturn causes World War III

**Plate 3** writes[[8]](#footnote-8)

But **imagine** a **China disintegrating**- on its own, without neo-conservative or Central Intelligence Agency prompting, much less outright military invasion **because the economy** (against all predictions) suddenly **collapses. That would knock Asia into chaos. A massive flood of refugees would head for** Indonesia and other **places** with poor border controls, **which don’t’ want them and cant handle them**; some in **Japan might** lick their lips at the prospect of of World War II revisited and look to **annex a slice of China. That would send Singapore and Malaysia-** once occupied by Japan- **into** nervous **breakdowns.** Meanwhile, **India might** make a **grab for Tibet, and Pakistan for Kashmir. Then you can say hello to World War III**, Asia style. That’s why **wise policy encourages Chinese stability**, security **and** economic **growth** – the very direction the White House now seems to prefer.

## Advocacy

Thus the **plan**: China should prioritize environmental protection over resource extraction when the two conflict. I reserve the right to clarify.

## Framework

Moral uncertainty is high now, but there’s room for improvement. **Parfit 84** writes[[9]](#footnote-9)

Some people believe that there cannot be progress in Ethics, since everything has been already said. Like Rawls and Nagel, I believe the opposite. How many people have made Non-Religious Ethics their life's work? Before the recent past, very few. In most civilizations, **most people have believed in** the existence of a **God**, or of several gods. A large minority were in fact Atheists, whatever they pretended. But, **before the recent past, very few Atheists made Ethics their life’s work.** Buddha may be among this few, as may Confucius, and a few Ancient Greeks and Romans. After more than a thousand years, there were a few more between the Sixteenth and Twentieth centuries. Hume was an atheist who made Ethics part of his life's work. Sidgwick was another. **After Sidgwick,** there were several **atheists** who were professional moral philosophers. But most of these **did not do Ethics. They did Meta-Ethics.** They did not ask which outcomes would be good or bad, or which acts would be right or wrong. They asked, and wrote about, only the meaning of moral language, and the question of objectivity. **Non-Religious Ethics has been systematically studied**, by many people, **only since the** 19**60s. Compared with the other sciences**, Non-Religious **Ethics is** the youngest and **the least advanced.**

Adopt a parliamentary model to account for moral uncertainty. This entails minimizing existential risks. **Bostrom 9** writes[[10]](#footnote-10)

It seems people are overconfident about their moral beliefs.  But **how should one** reason and **act if one** acknowledges that one **is uncertain about morality** – not just applied ethics but fundamental moral issues? if you don't know which moral theory is correct?

It doesn't seem **you can[’t] simply plug your uncertainty into expected utility** decision theory and crank the wheel; **because many** moral **theories** state that you **should not** always **maximize** expected **utility.**

Even if we limit consideration to consequentialist theories, it still is hard to see how to combine them in the standard decision theoretic framework.  For example, suppose you give X% probability to total utilitarianism and (100-X)% to average utilitarianism.  Now an action might add 5 utils to total happiness and decrease average happiness by 2 utils.  (This could happen, e.g. if you create a new happy person that is less happy than the people who already existed.)  Now what do you do, for different values of X?

The problem gets even more complicated if we consider not only consequentialist theories but also deontological theories, contractarian theories, virtue ethics, etc.  We might even throw various meta-ethical theories into the stew: error theory, relativism, etc.

I'm working on a paper on this together with my colleague Toby Ord.  We have some arguments against a few possible "solutions" that we think don't work.  On the positive side we have some tricks that work for a few special cases.  But beyond that, the best **we have managed** so far is **a** kind of **metaphor, which** we don't think is literally and exactly correct, and it is a bit under-determined, but it **seems to get things roughly right** and it might point in the right direction:

**The Parliamentary Model.**  Suppose that you have a set of mutually exclusive moral theories, and that you assign each of these some probability.  Now imagine that **each** of these **theorie**s **gets to send** some number of **delegates to The Parliament**.  The number of delegates each theory gets to send is **proportional to the probability of the theory.**  Then the delegates bargain with one another for support on various issues; and the Parliament reaches a decision by the delegates voting.  What you should do is act according to the decisions of this imaginary Parliament.  (Actually, we use an extra trick here: we imagine that the delegates act as if the Parliament's decision were a stochastic variable such that the probability of the Parliament taking action A is proportional to the fraction of votes for A.  This has the effect of eliminating the artificial 50% threshold that otherwise gives a majority bloc absolute power.  Yet – unbeknownst to the delegates – the Parliament always takes whatever action got the most votes: this way we avoid paying the cost of the randomization!)

The idea here is that moral theories get more influence the more probable they are; yet **even a** relatively **weak theory can still get its way on some issues** that the theory think are extremely important **by sacrificing** its influence **on other** i**s**sues that other theories deem more important.  For example, **suppose you assign 10% probability to** total **util**itarianism and 90% to moral egoism (just to illustrate the principle).  Then **the Parliament** would mostly take actions that maximize egoistic satisfaction; however it **would make some concessions to util**itarianism **on** issues that utilitarianism thinks is especially important.  In this example, the person might donate some portion of their income to **existential risks** research and otherwise live completely selfishly.

I think there might be wisdom in **this model**.  It **avoids the** dangerous and **unstable extremism** that would result **from letting one’s current favorite moral theory completely dictate action**, while still allowing the aggressive pursuit of some non-commonsensical high-leverage strategies so long as they don’t infringe too much on what other major moral theories deem centrally important.

I don’t need to win that weighing values is possible. Extinction precludes all values, so it is wrong under any moral code. **Seeley 86**[[11]](#footnote-11)

In moral reasoning prediction of consequences is nearly always impossible. One balances the risks of an action against its benefits; one also considers what known damage the action would do. Thus a surgeon in deciding whether to perform an operation weighs the known effects (the loss of some nerve function, for example) and risks (death) against the benefits, and weighs also the risks and benefits of not performing surgery. Morally, however, **human extinction is unlike any other risk. No conceivable human good could be worth** the **extinction** of the race, **for** in order **to be a human good it must be experienced by human beings.** Thus extinction is one result we dare not-may not-risk. Though not conclusively established, **the risk of extinction is real enough to make nuclear war** utterly **impermissible under any** sane **moral code.**

No theory is so absolute that extinction is irrelevant. Even deon has a threshold.

**Korsgaard 02** writes[[12]](#footnote-12)

But actions are also events in the world (or correspond to events in the world, at least), and they too have consequences. There are a number of different ways in which one can deal with worries about what happens to the consequences in Kant’s ethical theory. It is worth pointing out that **Kant himself** not only **did not ignore** the **consequences**, but took the fact that good actions can have bad effects as the starting point for his religious philosophy. In his religious thought, Kant was concerned with the question how the moral agent has to envision the world, how he has to think of its metaphysics in order to cope with the fact that the actions morality demands may have terrible effects that we never intended, or may simply fail to have good ones. **I** myself **see** the development of what Rawls has called **“nonideal theory” to be the right way of taking care of** a certain class of **cases, in which the consequences** of doing the right thing just **seem too appalling** for us **to simply wash our hands of.** But I do not want to say that just having bad consequences is enough to put an action into the realm of nonideal theory. I think there is a range of bad consequences that a decent person has to be prepared to live with, out of respect for other people’s right to manage their own lives and actions, and to contribute to shared decisions. But I also think that **there are cases where our actions go wrong in such a way that they turn out** in a sense **not to be the act**ions **we intended** to do, or to instantiate the values we meant them to instantiate. I think that some of **these cases can be dealt with by** introducing **the** kind of **double-level structure** into moral philosophy that I have described in the essay on “The Right to Lie: Kant on Dealing with Evil.” 3 But I also think there are cases that cannot be domesticated even in this way, cases in which, to put it paradoxically, the good person will do something “wrong.” I have written about that sort of case too, in “Taking the Law into Our Own Hands: Kant on the Right to Revolution.” 4

Infinite values don’t paralyze calculation. **Lauwers and Vallentyne 4** write[[13]](#footnote-13)

**Zero Independence holds that the ranking of two worlds is determined by** the pattern of **differences in local value. This**, we claim, **is highly plausible** in the context of finitely additive value theories. In the finite case, finitely additive value theories always satisfy Zero Independence. Although they typically get expressed as judging a world as at least as good as another (having the same locations) if and only if its total value is at least as great, the **reference to the total is not needed.** An equivalent statement is that one world as at least as good as the second if and only if the sum of the differences in value is at least as great as zero. **Only the pattern of differences matters**. **Even in the infinite case**, Zero Independence is “partially” implied by Sum and Loose Pareto. Sum ranks U as at least as good as V if and only if Sum ranks U-V as at least as good as its zero world. Moreover, if two worlds U and V satisfy the antecedent clause of Loose Pareto, then Loose Pareto ranks U as at least as good as V if and only if it ranks U-V above its zero world. Zero Independence is thus, we claim, highly plausible for finitely additive theories.

Zero Independence is equivalent to a condition in social choice theory known as Translation Scale Invariance when it is restricted to the case where locations are the same.[[14]](#footnote-14) This latter condition holds that interlocational comparisons of zero points are irrelevant to the ranking of worlds. The zero point for value at each location, that is, can be set independently of how it is set for other locations (although, of course, when comparing two worlds, the zero point used for a given location in one world must also be used for that location in the second world). For example, if a location has values of 10 in world U and 5 in world V, both measured on the basis of some particular zero point (the same for both worlds), those values could be changed to 7 and 2 (by making the zero point 3 units higher for that location), and this, according to Translation Scale Invariance, would not alter how the two worlds are ranked.

Zero Independence is equivalent to Translation Scale Invariance (restricted to the case where locations are the same), since any change in the zero points for the locations in worlds U and V can, for some W, be represented by U+W and V+W. (For example, if there are just two people, and the first person’s zero point is decreased by two units, and the second person’s zero point is increased by one unit, then the resulting two representations of the value of U and V are simply U+W and V+W, where W is <2,-1>.) Zero Independence and Translation Scale Invariance thus each hold that U ≥ V if and only if U+W ≥ V+W.

Translation Scale Invariance (and hence, Zero Independence) is highly plausible for finitely additive value theories. (Recall that our goal is to defend a particular extension of finite additivity, not to defend finite additivity against non-additive theories.) **If there is no natural zero point that separates positive from negative value** (if there is just more or less value with no natural separating point), **then any particular zero point is arbitrary** (not representing a real aspect of value). In this case, interlocational comparisons of zero-points are uncontroversially irrelevant. **If**, on the other hand, **there is a natural zero for value, it is still** plausible for finitely additive value theories to hold that it is **irrelevant** for ranking worlds. **What matters** (e.g., **from** a **util**itarian perspective), as argued above, **are** the **differences in value at each location between two worlds—not the absolute level of values** at locations. No interlocational comparison of zero points is needed for this purpose.

Cost-benefit analysis is feasible. Ignore any util calc indicts. **Hardin 90** writes[[15]](#footnote-15)

**One** of the **cute**r **charge**s **against util**itarianism **is that** it is irrational in the following sense. **If I take the time to calculate** the consequences of various courses of action before me, **then** I will ipso facto have chosen the course of action to take, namely, to sit and calculate, because while I am calculating the other **courses of action will cease to be open to me. It should embarrass philosophers that they have ever taken this** objection **seriously. Parallel considerations in other realms are dismissed** with eminently good sense. Lord Devlin notes, “If the reasonable man ‘worked to rule’ by perusing to the point of comprehension every form he was handed, the commercial and administrative life of the country would creep **to** a standstill.” James March and Herbert Simon **escape** the quandary of **unending calculation** by noting that often we satisfice, **we do not maximize: we stop calculating** and considering **when we find a merely adequate choice** of action. **When**, in principle, **one cannot know what is** the **best** choice, **one can nevertheless be sure that** sitting and **calculating is not the best choice.** But, one may ask, How do you know that another ten minutes of calculation would not have produced a better choice? And one can only answer, You do not. At some point the quarrel begins to sound adolescent. It is ironic that **the point** of the quarrel **is almost never at issue in practice** (as Devlin implies, **we are** almost all **too reasonable** in practice **to bring the world to a standstill**) but only in the principled discussions of academics.

Ignore permissibility and presumption because moral uncertainty means we’ll always have a non-zero credence in the existence of morality, so there’s always a risk of offense in favor of one action.

The standard is **maximizing happiness**.

First, revisionary intuitionism is true and leads to util.

**Yudkowsky 8** writes[[16]](#footnote-16)

I haven't said much about metaethics - the nature of morality - because that has a forward dependency on a discussion of the Mind Projection Fallacy that I haven't gotten to yet. I used to be very confused about metaethics. After my confusion finally cleared up, I did a postmortem on my previous thoughts. I found that my object-level moral reasoning had been valuable and my **meta-level moral reasoning had been worse than useless.** And this appears to be a general syndrome - **people do much better when discussing whether torture is** good or **bad than when they discuss the meaning of "good" and "bad". Thus, I deem it prudent to keep moral discussions on the object level** wherever I possibly can. Occasionally **people object** to any discussion of morality on the grounds **that morality doesn't exist**, and in lieu of jumping over the forward dependency to explain that **"exist" is not the right term to use** here, I generally say, "But **what do you do anyway?**" and **take the discussion back down to the object level.** Paul Gowder, though, has pointed out that both the idea of choosing a googolplex dust specks in a googolplex eyes over 50 years of torture for one person, and the idea of "utilitarianism", depend on "intuition". He says I've argued that the two are not compatible, but charges me with failing to argue for the utilitarian intuitions that I appeal to. Now "intuition" is not how I would describe the computations that underlie human morality and distinguish us, as moralists, from an ideal philosopher of perfect emptiness and/or a rock. But I am okay with using the word "intuition" as a term of art, bearing in mind that "intuition" in this sense is not to be contrasted to reason, but is, rather, the cognitive building block out of which both long verbal arguments and fast perceptual arguments are constructed. **I see** the project of **morality as a project of renormalizing intuition.** We have intuitions about things that seem desirable or undesirable, intuitions about actions that are right or wrong, intuitions about how to resolve conflicting intuitions, intuitions about how to systematize specific intuitions into general principles. **Delete all** the **intuitions, and** you aren't left with an ideal philosopher of perfect emptiness, **you're left with a rock. Keep all your** specific **intuitions and** refuse to build upon the reflective ones, and you aren't left with an ideal philosopher of perfect spontaneity and genuineness, **you're left with a** grunting **caveperson** running in circles, due to cyclical preferences and similar inconsistencies. "Intuition", as a term of art, is not a curse word when it comes to morality - there is nothing else to argue from. **Even modus ponens is an "intuition"** in this sense - **it**'s **just** that modus ponens **still seems like a good idea after being** formalized, **reflected on**, extrapolated out to see if it has sensible consequences, etcetera. So that is "intuition". However, Gowder did not say what he meant by "utilitarianism". Does utilitarianism say... That right actions are strictly determined by good consequences? That praiseworthy actions depend on justifiable expectations of good consequences? That probabilities of consequences should normatively be discounted by their probability, so that a 50% probability of something bad should weigh exactly half as much in our tradeoffs? That virtuous actions always correspond to maximizing expected utility under some utility function? That two harmful events are worse than one? That two independent occurrences of a harm (not to the same person, not interacting with each other) are exactly twice as bad as one? That for any two harms A and B, with A much worse than B, there exists some tiny probability such that gambling on this probability of A is preferable to a certainty of B? If you say that I advocate something, or that my argument depends on something, and that it is wrong, do please specify what this thingy is... anyway, I accept 3, 5, 6, and 7, but not 4; I am not sure about the phrasing of 1; and 2 is true, I guess, but phrased in a rather solipsistic and selfish fashion: you should not worry about being praiseworthy. Now, what are the "intuitions" upon which my "utilitarianism" depends? This is a deepish sort of topic, but I'll take a quick stab at it. First of all, it's not just that someone presented me with a list of statements like those above, and I decided which ones sounded "intuitive". Among other things, **if you try to violate** "**util**itarianism", **you run into paradoxes, contradictions**, circular preferences, **and other** things that aren't **symptoms of** moral wrongness so much as **moral incoherence.** After you think about moral problems for a while, and also find new truths about the world, and even discover disturbing facts about how you yourself work, you often end up with different moral opinions than when you started out. This does not quite define moral progress, but it is how we experience moral progress. As part of my experienced moral progress, I've drawn a conceptual separation between questions of type Where should we go? and questions of type How should we get there? (Could that be what Gowder means by saying I'm "utilitarian"?) The question of where a road goes - where it leads - you can answer by traveling the road and finding out. If you have a false belief about where the road leads, this falsity can be destroyed by the truth in a very direct and straightforward manner. When it comes to wanting to go to a particular place, this want is not entirely immune from the destructive powers of truth. You could go there and find that you regret it afterward (which does not define moral error, but is how we experience moral error). But, even so, wanting to be in a particular place seems worth distinguishing from wanting to take a particular road to a particular place. Our intuitions about where to go are arguable enough, but our intuitions about how to get there are frankly messed up. **After** the two hundred and eighty-seventh **research** study **showing that people will chop their own feet off if you frame the problem the wrong way, you start to distrust first impressions. When you've read enough research on scope insensitivity** - people will pay only 28% more to protect all 57 wilderness areas in Ontario than one area, **people will pay the same amount to save 50,000 lives as 5,000 lives**... that sort of thing... Well, the worst case of scope insensitivity I've ever heard of was described here by Slovic: Other recent research shows similar results. Two Israeli psychologists asked people to contribute to a costly life-saving treatment. They could offer that contribution to a group of eight sick children, or to an individual child selected from the group. The target amount needed to save the child (or children) was the same in both cases. Contributions to individual group members far outweighed the contributions to the entire group. There's other research along similar lines, but I'm just presenting one example, 'cause, y'know, eight examples would probably have less impact. If you know the general experimental paradigm, then the reason for the above behavior is pretty obvious - focusing your attention on a single child creates more emotional arousal than trying to distribute attention around eight children simultaneously. So people are willing to pay more to help one child than to help eight. Now, **you could** look at this intuition, and **think it was** revealing **some** kind of **incredibly deep moral truth** which shows that one child's good fortune is somehow devalued by the other children's good fortune. But what about the billions of other children in the world? Why isn't it a bad idea to help this one child, when that causes the value of all the other children to go down? How can it be significantly better to have 1,329,342,410 happy children than 1,329,342,409, but then somewhat worse to have seven more at 1,329,342,417? **Or you could** look at that and **say: "The intuition is wrong: the brain can't** successfully **multiply** by eight and get a larger quantity than it started with. **But it ought to**, normatively speaking." And once you realize that the brain can't multiply by eight, then the other cases of scope neglect stop seeming to reveal some fundamental truth about 50,000 lives being worth just the same effort as 5,000 lives, or whatever. You don't get the impression you're looking at the revelation of a deep moral truth about nonagglomerative utilities. It's just that the brain doesn't goddamn multiply. Quantities get thrown out the window. If you have $100 to spend, and you spend $20 each on each of 5 efforts to save 5,000 lives, you will do worse than if you spend $100 on a single effort to save 50,000 lives. Likewise if such choices are made by 10 different people, rather than the same person. As soon as you start believing that it is better to save 50,000 lives than 25,000 lives, that simple preference of final destinations has implications for the choice of paths, when you consider five different events that save 5,000 lives. (It is a general principle that Bayesians see no difference between the long-run answer and the short-run answer; you never get two different answers from computing the same question two different ways. But the long run is a helpful intuition pump, so I am talking about it anyway.) The aggregative valuation strategy of "shut up and multiply" arises from the simple preference to have more of something - to save as many lives as possible - when you have to describe general principles for choosing more than once, acting more than once, planning at more than one time. Aggregation also arises from claiming that the local choice to save one life doesn't depend on how many lives already exist, far away on the other side of the planet, or far away on the other side of the universe. Three lives are one and one and one. No matter how many billions are doing better, or doing worse. 3 = 1 + 1 + 1, no matter what other quantities you add to both sides of the equation. And if you add another life you get 4 = 1 + 1 + 1 + 1. That's aggregation. **When you've read enough** heuristics and **biases research, and enough coherence** and uniqueness **proofs for** Bayesian probabilities and **expected utility**, and you've seen the "Dutch book" and "money pump" effects that penalize trying to handle uncertain outcomes any other way, **then you don't see** the **preference reversals** in the Allais Paradox **as** revealing **some** incredibly **deep moral truth** about the intrinsic value of certainty. **It just goes to show that the brain doesn't** goddamn **multiply.** The primitive, perceptual intuitions that make a choice "feel good" don't handle probabilistic pathways through time very skillfully, especially when the probabilities have been expressed symbolically rather than experienced as a frequency. So you reflect, devise more trustworthy logics, and think it through in words. When you see people insisting that no amount of money whatsoever is worth a single human life, and then driving an extra mile to save $10; or when you see people insisting that no amount of money is worth a decrement of health, and then choosing the cheapest health insurance available; then you don't think that their protestations reveal some deep truth about incommensurable utilities. Part of it, clearly, is that **primitive intuitions don't successfully diminish the emotional impact of** symbols standing for **small quantities** - anything you talk about seems like "an amount worth considering". And part of it has to do with preferring unconditional social rules to conditional social rules. Conditional rules seem weaker, seem more subject to manipulation. If there's any loophole that lets the government legally commit torture, then the government will drive a truck through that loophole. So it seems like there should be an unconditional social injunction against preferring money to life, and no "but" following it. Not even "but a thousand dollars isn't worth a 0.0000000001% probability of saving a life". Though the latter choice, of course, is revealed every time we sneeze without calling a doctor. The rhetoric of sacredness gets bonus points for seeming to express an unlimited commitment, an unconditional refusal that signals trustworthiness and refusal to compromise. So you conclude that moral rhetoric espouses qualitative distinctions, because espousing a quantitative tradeoff would sound like you were plotting to defect. On such occasions, people vigorously want to throw quantities out the window, and they get upset if you try to bring quantities back in, because quantities sound like conditions that would weaken the rule. But you don't conclude that there are actually two tiers of utility with lexical ordering. You don't conclude that there is actually an infinitely sharp moral gradient, some atom that moves a Planck distance (in our continuous physical universe) and sends a utility from 0 to infinity. You don't conclude that utilities must be expressed using hyper-real numbers. Because the lower tier would simply vanish in any equation. It would never be worth the tiniest effort to recalculate for it. All decisions would be determined by the upper tier, and all thought spent thinking about the upper tier only, if the upper tier genuinely had lexical priority. As Peter Norvig once pointed out, if Asimov's robots had strict priority for the First Law of Robotics ("A robot shall not harm a human being, nor through inaction allow a human being to come to harm") then no robot's behavior would ever show any sign of the other two Laws; there would always be some tiny First Law factor that would be sufficient to determine the decision. Whatever value is worth thinking about at all, must be worth trading off against all other values worth thinking about, because thought itself is a limited resource that must be traded off. When you reveal a value, you reveal a utility. I don't say that morality should always be simple. I've already said that the meaning of music is more than happiness alone, more than just a pleasure center lighting up. I would rather see music composed by people than by nonsentient machine learning algorithms, so that someone should have the joy of composition; I care about the journey, as well as the destination. And I am ready to hear if you tell me that the value of music is deeper, and involves more complications, than I realize - that the valuation of this one event is more complex than I know. But that's for one event. When it comes to multiplying by quantities and probabilities, complication is to be avoided - at least if you care more about the destination than the journey. **When you've reflected** on enough intuitions, **and corrected enough absurdities, you** start to **see a common denominator, a meta-principle** at work, **which one might phrase as "Shut up and multiply."** Where music is concerned, I care about the journey. When lives are at stake, I shut up and multiply. It is more important that lives be saved, than that we conform to any particular ritual in saving them. And the optimal path to that destination is governed by laws that are simple, because they are math. **And that's why I'm a utilitarian** - at least when I am doing something that is overwhelmingly more important than my own feelings about it - which is most of the time, because there are not many utilitarians, and many things left undone.

Second, reductionism.

Brain studies prove personal identity doesn’t exist. **Parfit 84** writes[[17]](#footnote-17)

Some **recent medical cases provide striking evidence in favour of the Reductionist View.** Human beings have a **lower brain and** two **upper hemispheres**, which **are connected by a bundle of fibres.** In treating a few people with severe epilepsy, **surgeons have cut these fibres.** The aim was to reduce the severity of epileptic fits, by confining their causes to a single hemisphere. This aim was achieved. But the operations had another unintended consequence. **The effect**, in the words of one surgeon, **was the creation of ‘two separate spheres of consciousness.’ This effect was revealed by** various **psychological tests.** These made use of two facts. We control our right arms with our left hemispheres, and vice versa. And what is in the right halves of our visual fields we see with our left hemispheres, and vice versa. When someone’s hemispheres have been disconnected, **psychologists can thus present** to this person two different written **questions in the two halves of his visual field, and can receive two different answers** written by this person’s two hands.

In the absence of personal identity, only end states can matter. **Shoemaker 99**[[18]](#footnote-18)

Extreme reductionism might lend support to utilitarianism in the following way. Many people claim that we are justified in maximizing the good in our own lives, but not justified in maximizing the good across sets of lives, simply because each of us is a single, deeply unified person, unified by the further fact of identity, whereas there is no such corresponding unity across sets of lives. But if the only justification for the different treatment of individual lives and sets of lives is the further fact, and this fact is undermined by the truth of reductionism, then nothing justifies this different treatment. **There are no deeply unified subjects of experience. What remains are merely the experiences themselves, and so any ethical theory distinguishing between individual lives** and sets of lives **is mistaken.** If the deep, further fact is missing, then there are no unities. **The morally significant units should then be the states people are in at particular times, and an ethical theory that focused on them** and attempted to improve their quality, whatever their location, **would be the most plausible. Util**itarianism **is just such a theory.**

Third, the ultimate human good is happiness. **Darwish 9**[[19]](#footnote-19)

Let’s start with knowledge. It is clear that **those who value knowledge for its own sake** (for instance, highly motivated professionals) **find pleasure in** both the **pursuit** and attainment **of knowledge**, however exhausted they become in either case. So, granted that **knowledge**, for them, is a value that **has intrinsic worth** in itself, and is thus sought for itself, **[because] it** is a value that **yields** their pleasure or **happiness. The same can be said about** the **other values.** Let’s take autonomy in the sense expressed by Hooker as “control over one’s own life” as another example. Here one needs to say no more than that **the mere fact that people seek autonomy explains** the satisfaction or the **pleasure autonomy brings.** Those who value autonomy, thus seek it for itself, cannot feel happy when their decisions are not in their hands, or when they do not have control over their own life. In short, they cannot be happy otherwise. Moore, who explicitly differs from the classical utilitarians in holding that pleasure is not the sole good, 20 says that “the most valuable things… are pleasures of human intercourse and the enjoyment of beautiful objects,” 21 which seems to mean that such things are valued for the pleasures and the enjoyment they bring. These examples clearly show that **though these values have intrinsic worth, they** bring or **constitute our pleasure.**

Fourth, respect for human worth would justify util. **Cummiskey 90**[[20]](#footnote-20)

We must not obscure the issue by characterizing this type of case as the sacrifice of individuals for some abstract “social entity.” It is not a question of some persons having to bear the cost for some elusive “overall social good.” Instead, the question is whether some persons must bear the inescapable cost for the sake of other persons. Robert Nozick, for example, argues that “to use a person in this way does not sufficiently respect and take account of the fact that he is a separate person, that his is the only life he has.” But why is this not equally true of all those whom we do not save through our failure to act? **By emphasizing solely the one who must bear the cost if we act, we fail to** sufficiently **respect** and take account of **the many other** separate **persons**, each with only one life, **who will bear the cost of our inaction**. In such a situation, what would a conscientious Kantian agent, an agent motivated by the unconditional value of rational beings, choose? A morally good agent recognizes that the basis of all particular duties is the principle that “rational nature exists as an end in itself”. Rational nature as such is the supreme objective end of all conduct. If one truly believes that all rational beings have an equal value, then the rational solution to such a dilemma involves maximally promoting the lives and liberties of as many rational beings as possible. In order to avoid this conclusion, the non-consequentialist Kantian needs to justify agent-centered constraints. As we saw in chapter 1, however, even most Kantian deontologists recognize that agent-centered constraints require a non- value-based rationale. But we have seen that Kant’s normative theory is based on an unconditionally valuable end. How can a concern for the value of rational beings lead to a refusal to sacrifice rational beings even when this would prevent other more extensive losses of rational beings? If the moral law is based on the value of rational beings and their ends, then what is the rationale for prohibiting a moral agent from maximally promoting these two tiers of value? If I sacrifice some for the sake of others, I do not use them arbitrarily, and I do not deny the unconditional value of rational beings. **Persons** may **have “dignity**, that is, an unconditional and incomparable worth” **that transcends any market value, but persons also have** a fundamental **equality that dictates that some must** sometimes **give way for the sake of others.** The concept of the end-in-itself does not support the view that we may never force another to bear some cost in order to benefit others.

And fifth, act-omission distinction doesn’t apply to states.

**Sunstein and Vermuele 05** write[[21]](#footnote-21)

The most fundamental point is that unlike individuals, **governments always** and necessarily **face a choice between** or among **possible policies for regulating third parties. The distinction between acts and omissions may not be intelligible in this context,** and even if it is, the distinction does not make a morally relevant difference. Most generally, government is in the business of creating permissions and prohibitions. When it explicitly or implicitly authorizes private action, it is not omitting to do anything or refusing to act. **Moreover, the distinction between authorized and unauthorized private action** – for example, private killing – **becomes obscure when government** formally **forbids private action but chooses a** set of **policy** instruments **that do[es] not** adequately or **fully discourage it.**

## Theory Preempts

**Aff gets RVIs** on I meets and counter-interps because

(a) 1AR time skew means I can’t cover theory and still have a fair shot at substance.

(b) no-risk theory gives her a free source of no-risk offense which allows her to moot the AC.

Reject the argument theory also triggers the RVI. It still causes a time skew and allows her to moot the AC at no risk.

I’m willing to clarify or alter my advocacy in cross-ex.

If the aff specifies a country, they can only specify that China holistically prioritize environmental protection over resource extraction when the two conflict.

1. Topic lit. The China aff is indicative of the topic as a whole. It entails over a billion people shifting away from RE and China’s trade relations prove the shift affects resource extraction in Latin America and Africa.

2. Education. Learning about China is good because China is a rising global power.

3. Ground. There are great disads that link to China. Trust me, I have them. They’re predictable since a. people have disclosed China disads, and b. they’re based in the lit. A

Also, no ground loss because she gets virtually all NCs and disads that link to a mindset of EP.

4. Predictability. Wiki solves it. China affs have been disclosed by La Jolla, Turlock, and Randolph.

5. More aff ground is good. It compensates for side bias. Side bias is also a reason to err aff on theory. If the round takes over six minutes to evaluate, vote aff because I had to overcome structural skews so the round was close.

China is a developing country.

**Khor 11** writes[[22]](#footnote-22)

The answer depends on what criteria are used. In absolute terms, **China is** indeed **a big economy**. Its GNP is second only to the United States. It has become the biggest emitter of Greenhouse Gases, having overtaken the United States. But this is **mainly because China is a big country**, in terms of population. With 1.3 billion people, it’s the world’s most populous country. India is not far behind with 1.2 billion people and is on track to overtake China in two decades. **However,** despite the mighty image it has been given by the world media, **China looks like a very ordinary developing country, once we look** at **per capita** indicators. Whether one is a developed or **developing country is defined by the UN** and by the **IMF and World Bank, and the most important criterion is income per capita. By that yardstick, China is very much a developing country.**

Gutcheck against dumb theory. Competing interps leads to a race to the bottom where every round comes down to theory, killing substantive education. Intervention is inevitable in blippy theory debates.

Prefer aff interpretations. Key to clash. **O’Donnell 4** writes[[23]](#footnote-23)

**AFC preserves the value of the first aff**irmative constructive **speech. This speech is the starting point for the debate.** It is a function of necessity. The debate must begin somewhere if it is to begin at all. **Failure to grant AFC** is a denial of the service rendered by the affirmative team’s labor when they crafted this speech. Further, if the affirmative does not get to pick the starting point, **[renders] the opening speech** act is essentially rendered **meaningless while the rest of the debate becomes a debate about what we should be debating about.**

Err aff on theory because of time skew. This also means presume aff if presumption matters.

Err towards small schools on theory to account for resource disparity that makes it harder for me to win.

Err against debaters who don’t disclose. It gives me an infinite research burden which kills fairness and pre-round topic education.

# Other Prep

## Extra SNG Card

China is producing synthetic natural gas which increases CO2 emissions and water shortages. **Yang and Jackson 13** write[[24]](#footnote-24)

China’s ambitious plans **China is embarking on the largest SNG investment in history**. As of 2013, the central government has approved nine large-scale SNG plants with a total capacity of 37.1 billion m3 of natural gas per year (Table 1). In comparison, the Great Plains Synfuels Plant has a much smaller annual capacity of 1.5 billion m3. Chinese companies are planning many more projects in addition to the nine already approved. There were more than 30 proposed SNG projects in 2012 with a combined capacity of 120 billion m3 yr−1 (ref. 6). A news report in 2013 stated that the number of proposed SNG projects had grown to over 40, with a total capacity of nearly 200 billion m3 yr−1, far exceeding China’s total natural gas demand7. Even if only part of these announced plans will be implemented, **the consequences for** energy and **the environment** in China **would be substantial for decades**. Potential technological lock-in Once built, a SNG plant would operate for as long as its revenues exceed fuel and operation and maintenance (O&M) costs, even if it cannot recover initial capital investments. As operation of the plant would probably continue even with low or no profitability, such an investment represents a technological lock-in that will deliver a water- and GHG-intensive fuel for decades. Synthetic natural gas has a heavy carbon and environmental footprint — the lifecycle GHG emissions are roughly seven times that of conventional natural gas (Fig. 1)6,8,9. If SNG is used to generate electricity, its life-cycle GHG emissions are ~36–82% higher than pulverized-coalfired power6,8. If used to drive vehicles, **SNG has emissions twice as large as those from gas**oline **vehicles**6. Based on these estimates, the **nine approved SNG plants in China would emit 21 billion tonnes of CO2**, assuming use of 90% of production capacity over a 40-year lifetime, compared to 3 billion tonnes for conventional natural gas over the same period. Under such a scenario, China will inevitably struggle to reduce its future GHG emissions. **If all 40** or so of the **projected facilities are built,** the GHG **emissions would be** an astonishing ~**110 billion tonnes** of CO2 **over 40 years**. In addition to GHG emissions, the production of coal-fuelled SNG emits hydrogen sulphide and mercury that, if not properly scrubbed or treated10, are potentially harmful. The **production of SNG is also water intensive, requiring 6–12 litres of water per m3** of SNG4,11, whereas shale gas needs roughly 0.1–0.2 litres of water per m3 of methane produced, 50 to 100 times less12. The **nine approved SNG plants**, most of them in desert or semidesert environments in Xinjiang and Inner Mongolia, **will therefore consume over 200 million tonnes of water annually**, assuming operation at 90% of production capacity. The water **consumption** for SNG production **could worsen water shortages in areas already under significant water stress**. Overall, the large-scale deployment of SNG will dramatically increase water Table 1 | National government-approved SNG projects. Company Location (Region/Locality) Planned capacity (billion m3 yr−1) Datang Inner Mongolia/Chifeng 4.0 Datang Liaoning/Fuxin 4.0 Huineng Inner Mongolia/Ordos 1.6 China Kingho Group Xinjiang/Ili 5.5 CPI Corporation Xinjiang/Ili 6.0 Xinwen Mining Group Xinjiang/Ili 4.0 Guodian Inner Mongolia/Hinggan League 4.0 use, GHG emissions and additional air and water pollution compared to conventional natural gas.

## Senkaku Adv

ECS is on the brink of nuclear war

**Goldstein 13** writes[[25]](#footnote-25)

Much of the debate about China’s rise in recent years has focused on the potential dangers China could pose as an eventual peer competitor to the United States bent on challenging the existing international order. But another issue is far more pressing. For at least the next decade, while China remains relatively weak compared to the United States, there is a real danger that Beijing and Washington will find themselves in a crisis that could quickly escalate to military conflict. Unlike a long-term great-power strategic rivalry that might or might not develop down the road, **the danger of a crisis involving the two nuclear-armed countries is a tangible, near-term concern** -- **and** the **events of the past few years suggest the risk might be increasing.** Since the end of the Cold War, Beijing and Washington have managed to avoid perilous showdowns on several occasions: in 1995–96, when the United States responded to Chinese missile tests intended to warn Taiwanese voters about the danger of pushing for independence; in 1999, when U.S. warplanes accidentally bombed the Chinese embassy in Belgrade during the NATO air assault on Serbia; and in 2001, when a U.S. spy plane collided with a Chinese fighter jet, leading to the death of the Chinese pilot and Beijing’s detention of the U.S. plane and crew. But the lack of serious escalation during those episodes should not breed complacency. None of them met the definition of a genuine crisis: a confrontation that threatens vital interests on both sides and thus sharply increases the risk of war. If Beijing and Washington were to find themselves in that sort of showdown in the near future, they would both have strong incentives to resort to force. Moreover, the temptations and pressures to escalate would likely be highest in the early stages of the face-off, making it harder for diplomacy to prevent war. THIN RED LINES It might seem that the prospects for a crisis of this sort in U.S.-Chinese relations have diminished in recent years as tensions over Taiwan have cooled, defusing the powder keg that has driven much Chinese and U.S. military planning in East Asia since the mid-1990s. But other potential flash points have emerged. **As China and its neighbors squabble over islands and maritime rights in the East China** and South China **sea**s, **the U**nited **S**tates **has** reiterated its treaty **commitments to** defend two of the **countries** that are **contesting China’s claims** (Japan and the Philippines) and has nurtured increasingly close ties with a third (Vietnam). Moreover, the Obama administration’s “pivot,” or “rebalancing,” to Asia, a diplomatic turn matched by planned military redeployments, has signaled that Washington is prepared to get involved in the event of a regional conflict. China might be less cautious about triggering a crisis -- and less cautious about firing the first shot if a crisis ensued. Also, the United States insists that international law affords it freedom of navigation in international waters and airspace, defined as lying beyond a country’s 12-mile territorial limit. China, by contrast, asserts that other countries’ military vessels and aircraft are not free to enter its roughly 200-mile-wide “exclusive economic zone” without express permission -- a prohibition that, given Beijing’s territorial claims, could place much of the South China Sea and the airspace above it off-limits to U.S. military ships and planes. Disputes over freedom of navigation have already caused confrontations between China and the United States, and they remain a possible trigger for a serious crisis. It is true that China and the United States are not currently adversaries -- certainly not in the way that the Soviet Union and the United States were during the Cold War. But the risk of a U.S.-Chinese crisis might actually be greater than it would be if Beijing and Washington were locked in a zero-sum, life-and-death struggle. As armed adversaries on hair-trigger alert, the Soviet Union and the United States understood that their fundamentally opposed interests might bring about a war. After going through several nerve-racking confrontations over Berlin and Cuba, they gained an understanding of each other’s vital interests -- not to be challenged without risking a crisis -- and developed mechanisms to avoid escalation. China and the United States have yet to reach a similar shared understanding about vital interests or to develop reliable means for crisis management. Neither China nor the United States has clearly defined its vital interests across broad areas of the western Pacific. In recent years, China has issued various unofficial statements about its “core interests” that have sometimes gone beyond simply ensuring the territorial and political integrity of the mainland and its claim to sovereignty over Taiwan. **Beijing** has suggested, for example, that it might **consider the disputed areas of the East China** and South China **sea**s **to be core** interests. Washington has also been vague about what it sees as its vital interests in the region. The United States hedges on the question of whether Taiwan falls under a U.S. security umbrella. And the United States’ stance on the maritime disputes involving China and its neighbors is somewhat confusing: Washington has remained neutral on the rival sovereignty claims and insisted that the disputes be resolved peacefully but has also reaffirmed its commitment to stand by its allies in the event that a conflict erupts. Such Chinese and U.S. ambiguity about the “redlines” that cannot be crossed without risking conflict increases the chances that either side could take steps that it believes are safe but that turn out to be unexpectedly provocative. MORE DANGEROUS THAN THE COLD WAR? Uncertainty about what could lead either Beijing or Washington to risk war makes a crisis far more likely, since neither side knows when, where, or just how hard it can push without the other side pushing back. This situation bears some resemblance to that of the early Cold War, when it took a number of serious crises for the two sides to feel each other out and learn the rules of the road. But today’s environment might be even more dangerous. The balance of nuclear and conventional military power between China and the United States, for example, is much more lopsided than the one that existed between the Soviet Union and the United States. Should Beijing and Washington find themselves in a conflict, the huge U.S. advantage in conventional forces would increase the temptation for Washington to threaten to or actually use force. Recognizing the temptation facing Washington, Beijing might in turn feel pressure to use its conventional forces before they are destroyed. Although China could not reverse the military imbalance, it might believe that quickly imposing high costs on the United States would be the best way to get it to back off. The fact that both sides have nuclear arsenals would help keep the situation in check, because both sides would want to avoid actions that would invite nuclear retaliation. Indeed, if only nuclear considerations mattered, U.S.-Chinese crises would be very stable and not worth worrying about too much. But the two sides’ conventional forces complicate matters and undermine the stability provided by nuclear deterrence. During a crisis, either side might believe that using its conventional forces would confer bargaining leverage, manipulating the other side’s fear of escalation through what the economist Thomas Schelling calls a “competition in risk-taking.” In a crisis, China or the United States might believe that it valued what was at stake more than the other and would therefore be willing to tolerate a higher level of risk. But because using conventional forces would be only the first step in an unpredictable process subject to misperception, missteps, and miscalculation, **there is no guarantee that brinkmanship would end before it led to an unanticipated nuclear catastrophe**. China, moreover, apparently believes that nuclear deterrence opens the door to the safe use of conventional force. Since both countries would fear a potential nuclear exchange, the Chinese seem to think that neither they nor the Americans would allow a military conflict to escalate too far. Soviet leaders, by contrast, indicated that they would use whatever military means were necessary if war came -- which is one reason why war never came. In addition, China’s official “no first use” nuclear policy, which guides the Chinese military’s preparation and training for conflict, might reinforce Beijing’s confidence that limited war with the United States would not mean courting nuclear escalation. As a result of its beliefs, Beijing might be less cautious about taking steps that would risk triggering a crisis. And if a crisis ensued, China might also be less cautious about firing the first shot. Such beliefs are particularly worrisome given recent developments in technology that have dramatically improved the precision and effectiveness of conventional military capabilities. Their lethality might confer a dramatic advantage to the side that attacks first, something that was generally not true of conventional military operations in the main European theater of U.S.-Soviet confrontation. Moreover, because the sophisticated computer and satellite systems that guide contemporary weapons are highly vulnerable to conventional military strikes or cyberattacks, today’s more precise weapons might be effective only if they are used before an adversary has struck or adopted countermeasures. If peacetime restraint were to give way to a search for advantage in a crisis, neither China nor the United States could be confident about the durability of the systems managing its advanced conventional weapons. Chinese analysts seem to overestimate how easy it is to send signals through military actions and underestimate the risks of miscommunication. Under such circumstances, both Beijing and Washington would have incentives to initiate an attack. China would feel particularly strong pressure, since its advanced conventional weapons are more fully dependent on vulnerable computer networks, fixed radar sites, and satellites. The effectiveness of U.S. advanced forces is less dependent on these most vulnerable systems. The advantage held by the United States, however, might increase its temptation to strike first, especially against China’s satellites, since it would be able to cope with Chinese retaliation in kind. COMMUNICATION BREAKDOWN A U.S.-Chinese crisis might also be more dangerous than Cold War showdowns because of the unreliability of the existing channels of communication between Beijing and Washington. After the Cuban missile crisis, the Soviet Union and the United States recognized the importance of direct communication between their top leaders and set up the Moscow–Washington hot line. In 1998, China and the United States also set up a hot line for direct communication between their presidents. But despite the hot line’s availability, the White House was not able to contact China’s top leaders in a timely fashion following the 1999 Belgrade embassy bombing or the 2001 spy-plane incident. China’s failure to use the hot line as intended might have reflected the reluctance of its leaders to respond until they had reached an internal consensus or until they had consulted widely with their military. The delay might also have reflected China’s difficulties in coordinating policy, since China lacks a dependable counterpart to the U.S. National Security Council. Whatever the reason, experience suggests that frustrating delays in direct communication are likely during what would be the crucial early moments of an unfolding U.S.-Chinese crisis. Instead, communication between the two countries might initially be limited to either public statements or tacit signals sent through actions. But public statements are aimed at multiple audiences, and nationalist passions in either China or the United States, as well as pressure from allies, might force either side to take a more aggressive public stance than it actually felt was warranted. Absent direct and confidential communication, the two countries might be unable to discuss politically sensitive proposals. They might also be unable to share information that could help head off a disastrous escalation, such as classified details about military capabilities or military maneuvers already under way. Communicating through actions is also problematic, with many possibilities for distortion in sending messages and for misinterpretation in receiving them. Chinese analysts seem to overestimate how easy it is to send signals through military actions and underestimate the risks of escalation resulting from miscommunication. For example, the analysts Andrew Erickson and David Yang have drawn attention to Chinese military writings that propose using China’s antiship ballistic missile system, designed for targeting U.S. aircraft carriers, to convey Beijing’s resolve during a crisis. Some Chinese military thinkers have suggested that China could send a signal by firing warning shots intended to land near a moving U.S. aircraft carrier or even by carefully aiming strikes at the command tower of the U.S. carrier while sparing the rest of the vessel. But as the political scientist Owen Coté has noted, even a very accurate antiship ballistic missile system will inevitably have some margin of error. Consequently, **even the smallest salvo** of this kind **would entail a risk of** inadvertent **serious damage and thus unintended escalation.** A final important factor that could make a U.S.-Chinese crisis more dangerous than those during the Cold War is geography. The focus of Cold War confrontations was primarily on land, especially in central Europe, whereas a future confrontation between China and the United States would almost certainly begin at sea. This difference would shape a U.S.-Chinese crisis in a number of ways, especially by requiring both sides to make some fateful choices early on. China’s small fleet of nuclear-armed ballistic missile submarines (SSBNs) and its much larger fleet of conventionally armed attack submarines are most secure when they remain in the shallow waters near the Chinese mainland, where poor acoustics compromise the effectiveness of U.S. undersea antisubmarine operations. Their proximity to Chinese land-based aircraft and air defenses also limits Washington’s ability to rely on its airpower and surface ships to counter them. For China’s submarine forces to play a role in a showdown with the United States, however, they would have to move out of those safer waters. The prospect of China’s submarines breaking out would dramatically increase the instability of a crisis. Although U.S. antisubmarine warfare technology would be more effective against China’s submarines operating in less noisy open waters (where the United States also enjoys air superiority), it would not be perfect: some U.S. naval assets that came within range of surviving Chinese submarines would be at risk. Early in a crisis, therefore, the United States would be tempted to minimize this risk by sinking Chinese attack submarines as they tried to leave their home waters. Especially because there are only a few narrow routes through which Chinese submarines can reach deeper waters, the United States would be tempted to strike early rather than accept an increased risk to U.S. naval forces. Regardless of the U.S. decision, any **Chinese attack submarines that** managed to **reach distant** deeper **waters would face a “use them or lose them” dilemma**, thanks to their greatervulnerability to U.S. antisubmarine forces -- **one more potential trigger for escalation.** China’s nuclear-armed SSBNs present other risks. Under its no-first-use policy, **China has clearly stated that any attack on its strategic nuclear forces would justify nuclear retaliation**, making a U.S. strike against its SSBNs seem unlikely. Early in a crisis, therefore, Beijing would probably believe that it could safely deploy its SSBNs to distant, deeper waters, where they would be best positioned to execute their launch orders. Such a deep-water deployment, however, would introduce new dangers. One is the possibility that **U.S. naval forces might mistake a Chinese SSBN for a conventional attack submarine and fire on it, inviting Chinese nuclear retaliation**. Another is the danger that **a Chinese SSBN could escalate the conflict without** explicit **orders from Beijing, owing to** the **limited communication** such submarines maintain with the mainland in order to avoid detection.

Rare earth metals are the root cause. **Klabin 13** writes[[26]](#footnote-26)

While China’s sociopathic neighbor-ward North Korea ratchets up regional tensions by cutting all communication channels with South Korea in preparation for war, other geopolitical conflicts are spreading well beyond the region. World wars have been started over smaller offenses, so politicians have been eagerly trying to blow out various lit fuses. **Amid** disputed **Chinese** ownership **claims for** various **Pacific islands, Japan**ese scientists **ha[s]**ve **discovered** vast reserves of **rare earth metals in the**ir territorial **seabed. These** are the precious metal **types** which **fuel**ed the **high-tech** personal **computing** revolution, **and** are essential for the development of complex **weapons systems. China has enjoyed a long-lasting monopoly on** many of **these resources for years, but the recently discovered** Japanese **deposit** could be mined cheaply without any environmental harm and almost **doubles China’s reserve** size**.** This discovery carries many economic and political implications as well. China currently supplies over 95% of the rare metals needed for high-tech industries (think iPads, lasers, and plasma screens) as well as military weapons systems (avionics, satellites, and missiles.) In the 1990s, they flooded the market and undercut the value of these metals, forcing several international mining operations to shut down. China then cultivated this monopoly, and the rest of the world was happy to let them destroy their environment with the dirty, radioactive process of extracting the metals. The unfortunate catch, however, was that companies were forced to move their manufacturing operations to Chinese soil – where their technological designs have often been stolen. In 2009, China surprised the world by utilizing its monopoly to restrict exports and increase the price of rare earth metals. Most countries were hostage to their environmental policies, and couldn't restart their own mining operations. But **Japan’s** recent **discovery may force the Chinese to reduce prices** again, and in turn drastically drop retail prices in the tech industries. Amazon.com behaves in a similar fashion with companies it wants to acquire. If Amazon wants to buy you and you don’t want to sell, it will just flood the market with your products at a lower cost, and then buy your company when you can no longer compete. Japan’s recent discovery **[and] is the equivalent of a whole new Amazon site emerging on the precious metals scene overnight.**  If the U.S. really wanted to reopen their mining operations, they could subsidize a program — but it would be better to store our reserves of these critically strategic metals for another time, if we have that option. Rare earth metals are often found with thorium, and the process of removing them can produce a lot of radioactive waste. However, thorium has massive potential as a near limitless energy resource, especially in molten salt reactors. These fuel cycle reactors would be an ideal place to dispose of thorium and provide vast quantities of energy for the country.

EP solves by creating the conditions for cooperation. **Weston 6**[[27]](#footnote-27)

**An**other **issue that could impact negatively on** positive **Sino-Japanese environmental collaboration is tensions** between both countries **over energy resources**. The unresolved issue of ownership of gas fields for example, **in the East China Sea** remains. However, that both nations recently set up guidelines to deal with the East China Sea problem is a positive mechanism for further dialogue and negotiations. Also high level talks about energy resources between both countries have been established. Finally, during President Hu Jintao’s visit to Japan both sides agreed to speed up talks regarding disputed gas fields in the East China Sea before the G‐8 summit. Although in June of 2008, China and Japan then agreed to joint development of the Shirakaba as well as another unnamed area in the East China Sea, there are still other disputed areas in the region. Moreover, this agreement still needs be formalized through a treaty. **Future Linkages** What are some of the future linkages or tradeoffs **for enhanced Sino-Japanese environmental cooperation**? As previously discussed, one important area is improved international standing. Another **is the generation of a positive atmosphere** or political will **for further dialogues**, **negotiations or different approaches**, for example, **concerning claims to East China Sea areas** ; the race for natural resources as well as historical issues. In line with this premise, Nippon Oil, the largest oil company in Japan, and the state owned China National Petroleum, China’s largest integrated oil and gas company, have recently signed an agreement for long term cooperation, including overseas oil and natural gas resources development. Enhanced **commitment by both governments to work on environmental issues** including energy **could serve as a platform to reach alternative conclusions regarding the East China Sea** area.

## Space Adv (In Progress)

China’s Jade Rabbit lunar mission aims at resource extraction in space.

**Rincon 13** writes[[28]](#footnote-28)

The Chang'e-3 mission blasted off from Xichang in the south at 01:30 Monday local time (17:30 GMT Sunday). The Long March rocket's payload includes a landing module and a six-wheeled robotic rover called Yutu (or Jade Rabbit). The mission should land in the Moon's northern hemisphere in mid-December. **Chinese** state **TV carried** live **pictures of the launch of the** Chinese-developed Long March 3B **rocket carrying the** lunar probe. This will be the third **robotic rover** mission to land on the lunar surface, but the Chinese vehicle carries a more sophisticated payload, including ground-penetrating radar which will gather measurements of the lunar soil and crust. The 120kg (260lb) **Jade Rabbit** rover can climb slopes of up to 30 degrees and travel at 200m (660ft) per hour, according to its designer the Shanghai Aerospace Systems Engineering Research Institute. Its name - chosen in an online poll of 3.4 million voters - derives from an ancient Chinese myth about a rabbit living on the moon as the pet of the lunar goddess Chang'e. Last week, Prof Ouyang Ziyuan told the BBC's science editor David Shukman that the mission would test key technology and carry out science, adding: "In terms of the talents, China needs its own intellectual team who can explore the whole lunar and solar system - that is also our main purpose." The lander's target is Sinus Iridum (Latin for Bay of Rainbows) a flat volcanic plain thought to be relatively clear of large rocks. It is part of a larger feature known as Mare Imbrium that forms the right eye of the "Man in the Moon". Other details of the mission are sketchy; the rover and lander are powered by solar panels but other sources suggest they also carry radioisotope heating units (RHUs) containing plutonium-238 to keep them warm during the cold lunar night. The US Apollo astronauts Eugene Cernan and "Buzz" Aldrin have also remarked in a recent article that the landing module is substantially bigger than it needs to be to carry the rover, suggesting that it could be precursor technology to a human landing. If successful, **the mission, aimed at exploring the Moon's** surface and looking for **natural resources** such as rare metals, **will be a milestone in China's long-term space ex**ploration programme, which includes establishing a permanent space station in Earth orbit. Assertive China Chang'e 3 is "the most complicated and difficult task yet in China's exploration of space" and incorporates lots of new technology, Xinhua reported Wu Zhijian, a spokesman with the State Administration of Science, Technology and Industry for National Defence, as saying. But one unnamed US scientist recently told the magazine Aerospace America: "Except for a ground-penetrating radar on the rover, none of many science instruments on the lander/rover are expected to discover much new on the Moon." The launch comes at a time when the Asian superpower is asserting itself in other areas, such as control of airspace over the East China Sea. **China considers its space programme a symbol of its rising global stature** and technological advancement, as well as of the Communist Party's success in reversing the fortunes of the once impoverished nation. **Future lunar launches planned** by China **include a mission to bring back** samples of **lunar soil** to Earth. But officials have also stated an ambitious goal of sending humans to the Moon, in what could be the first manned lunar missions since the US Apollo programme in the 1960s and 1970s. **Prof Ouyang, from the Chinese Academy of Sciences**, also highlighted the potential for exploiting the Moon's environment and natural resources. With only a very thin atmosphere, solar panels would operate far more efficiently, he **believes,** and a "belt" of them could "support the whole world". He also pointed out the **potential** riches in terms of **minerals and metals**, which **could eventually be mined**. "**The Moon is full of** resources - mainly **rare earth elements, titanium, and uranium**, which the Earth is really short of, and these resources can be used without limitation."

Jade Rabbit makes future Chinese demand for helium-3 likely. They’ll stake property claims in the Moon and ILaw can’t stop them.

**Brooks 2-25** writes[[29]](#footnote-29)

“I know I may not make it through this lunar night.” The China Academy of Space Technology laid the pathos on thick when it gave its lunar robot **Jade Rabbit** a farewell speech at the end of last month. The rover had become mired in moon dust and was unable to enter hibernation. Facing 14 days without sunlight, the solar-powered robot, launched on 2 December, was unlikely to survive. “Good night, Planet Earth,” it said. “Good night, humanity.” It looked like the end of a venture that **could have** **accelerated the process of finding out who** – if anyone – **owns the moon**. The ultimate goal for Jade Rabbit was to bore a hole in the moon and see what moon rock is made of. That’s because **the Chinese** think the moon’s minerals might be worth extracting. “They **are looking at feasibility for mining** the moon**, and** they **are likely to do it if there’s a strong business case**,” says Richard Holdaway, director of the space division at the UK’s Rutherford Appleton Laboratory, which collaborates closely with China’s space programme. There would be nothing illegal about such an operation because international laws covering the moon are “way, way behind”, as Holdaway puts it. In theory, anyone who could manage it (and afford it) could go to the moon tomorrow, dig out a huge chunk of lunar rock, bring it back to earth and sell it off to the highest bidder. **The Chinese could take the moon apart and sell it bit by bit without breaking i**nternational **law**. The question we have to ask ourselves is simple: do we see a need to prevent that happening? The moon’s bounty is not fanciful science fiction. “There is stuff on the moon to mine – no doubt about it,” Holdaway says. We know that minerals that are hard to find on earth, such as the “rare earth” elements and the metals titanium and uranium, are abundant up there. But **the main prize is** the lighter isotope of helium, known as **helium-3. This** gas **is** the **critical** fuel **for nuclear fusion reactors**, which promise an energy yield many times higher than the present generation of fission-powered reactors. Helium-3 costs roughly $10m a kilo. Though we don’t yet have commercial fusion reactors, these might not be far off. **When they arrive,** the **demand for helium-3 will outstrip supply, and the easiest place to get more will be** from **moon rock**. It couldn’t be easier: heat the rock and the gas comes out. It’s not just the Chinese who have ambitions in this direction. Some private companies also have their eye on lunar rock as a source of riches. Most are based in the US, and they are actively working on lunar landers that will eventually be able to perform mineral extraction. As yet, it is very hard to know whether the business case will stand up. It’s not a small endeavour to set up a factory on the moon. It is horrendously expensive to leave Planet Earth. Space on a shuttle is sold, like poultry, by weight. The cost of escaping the earth is roughly $25,000 per kilo. Anyone paying that kind of money upfront needs strong guarantees that the investment is worthwhile. That is why the space entrepreneur Robert Bigelow has asked the US government to nail down issues raised by who can mine the moon. “The time has come to get serious about lunar property rights,” he told a press briefing last November. Bigelow made his money in hotels and property and has decided to pursue accommodation in space as his next venture. He already has a contract to supply astronaut habitats to Nasa; he has also said he wants to build habitats on the moon and, eventually, Mars. That plan, he argues, will be compromised unless issues of lunar ownership are clarified. Two treaties cover the beyond-earth behaviour of nations and private companies. The oldest is the Outer Space Treaty of 1967. It says that “the exploration and use of outer space … shall be carried out for the benefit and in the interests of all countries … and shall be the province of all mankind”. The agreement wasn’t drawn up to deal with questions of property rights, however. “It strictly prohibits claims by sovereign nations, but it does not expressly prohibit private entities from claiming private property rights,” says Michael J Listner, a New Hampshire-based lawyer specialising in space policy. “Depending on who you talk to, that omission creates a loophole for private ownership rights.” One of the purposes of the treaty was to allow private companies to engage in activities in space, creating the opportunity for establishing commercial satellite networks, for instance. Back when the pact was developed, the Soviet Union argued that nation states were the only proper actors in space; the US wanted to give private companies a chance to exploit the new frontier. So, a compromise was reached: Article VI says that non-governmental organisations have to be supervised by their nation states. The treaty says nothing about those non-governmental actors claiming property rights, however. “It doesn’t prohibit them, it doesn’t allow them. It’s completely silent,” says Joanne Gabrynowicz, a professor emerita of space law at the University of Mississippi who acts as an official observer to the UN effort to oversee the legal framework governing use of space. **This gaping hole** in the legislation **is where the** 1984 **Moon Agreement comes in.** **The U**nited **N**ations Office for Outer Space Affairs hosts the agreement, which **states that the moon’s environment should not be disrupted**, that it should be used only for peaceful purposes, “that the moon and its natural resources are the common heritage of mankind” and that “an international regime” should be established “to govern the exploitation of the natural resources of the moon when such exploitation is about to become feasible”. It sounds cut and dried: no one can own bits of the moon without further negotiations. **The problem is that the seven nations which** have **ratified the Moon Agreement** have no investment in it – they **are not space-faring.** “It’s considered pointless because **the US, China and Russia didn’t even become a party** to it,” Listner says. “If any of the three had done that, it might have been more meaningful.” Holdaway agrees: “**It’s not legally binding. China could** send armies of robots and humans and effectively **stick a flag in the ground and say: ‘It’s ours.’** ” In truth, there is no cause for alarm. The technology required for commercial exploitation is still decades away. The main question for now is whether it will ever be worth anyone’s while to develop the landers and infrastructure necessary to kick-start lunar-based industry. Google has given some an incentive to develop our lunar capabilities. It is offering $20m to anyone who is the first to land on the moon’s surface, travel 500 metres and then send a couple of high-definition broadcasts back to earth. Eighteen teams are aiming at this “Lunar XPrize”, which expires at the end of next year. One of the front-runners is Moon Express, a company based in Silicon Valley, California. In December, it unveiled its design for a lunar lander named MX-1. MX-1 is “the size of a large coffee table” and will get into space in the same way most satellites are deployed: aboard a conventional rocket that releases the lander once it has reached roughly 2,000 kilometres in altitude. Fuelled by hydrogen peroxide, the MX-1 will then wend its way to the moon to carry out whatever tasks are required. Bob Richards, the founder and chief executive of Moon Express, calls the lander the “iPhone of space”, because it can perform a variety of roles on the lunar surface. Moon Express intends to accomplish its first lunar sample return mission by 2020. “We expect that material to be very valuable, with a global market,” Richards says. Though it sounds impressive, MX-1 is so far nothing more than a design. Things get a lot harder once they need to become reality, Listner points out. “It’s fun to talk about it on a blog. It’s another thing to get down to doing it,” he says. “This isn’t like opening up the Wild West: space is hard and dangerous. You’ve got to bring your air, your water, your food – and we need to develop an understanding of how the lunar environment affects the human physiology.” It’s likely that the labour of resource extraction will involve human beings as well as robots, and we don’t know what it will be like to do a long stint on the moon. “We have some experience with the Apollo missions, but, between all those missions, humans have spent less than 100 hours performing activities on the surface,” Listner says. Clearly there’s a long way to go – and it is entirely possible that nothing will be done about the legal issues until the first claims are staked. That’s what is so useful about China’s **Jade Rabbit** project: it **makes** it **clear claims will be staked soon. Once a claim is laid, something will have to give**, Gabrynowicz reckons. “When it becomes apparent that there are going to be credible attempts at resource extraction, there will have to be some diplomatic discussions,” she says. According to Richard Bilder, a space law specialist at the University of Wisconsin-Madison, the high probability of those discussions hitting an impasse makes it worth pushing nations to start the process of setting up a legal regime right away. “This is likely to be easier to accomplish now, while prospects for lunar extraction are still only speculative, than after one or several countries succeed in establishing a lunar base and have clear special stakes and interests,” he says. Yet Bilder remains pessimistic about the likelihood of this happening. The United States, he notes, seems uninterested, and there is little incentive for China and India to attempt to resolve the legal problems now – they will just want to get on with establishing lunar bases and launching whatever activities they deem worth pursuing. Others are more upbeat. Some concerns about Chinese ambition derive from a cold war perspective that is no longer relevant, Gabrynowicz argues. The truth is, nations are now far more likely to become partners in seeking to exploit lunar resources. Holdaway points out that the UK and China are already working together in space, and says there is little reason to think both countries won’t be open to partnerships concerning the moon. And even if it’s not nations but private companies, there could still be international collaboration, Listner reckons. “Some companies might form conglomerates to combine their resources to do it,” he says. We shouldn’t necessarily be concerned about that: private enterprises are still accountable to national governments and so will be subject to regulation – especially as governments are likely to be among their main customers, Gabrynowicz notes. Last month, Nasa raised the game by launching a competitor to the Lunar XPrize. Under the Catalyst scheme, Nasa will share its experience and resources with private firms; in return it will get access to the companies’ designs for lunar landers. There’s a twist: US security regulations will make it much easier for US firms to co-operate with Nasa than businesses based abroad. So if Catalyst works as a stimulus to moon mining, the spoils will most likely belong to America. Whether it’s helium-3 fuel, mineral resources or plain water – what Richards calls “the oil of the solar system”, because it is vital for life support and rocket fuel – **lunar resources will** almost certainly **be used first to support further space ex**ploration. It makes much more sense to launch a manned mission to Mars from the moon than from earth: that way overcomes the difficulties of escaping our planet’s gravity. Operators of fusion-powered Mars probes, crewed by astronauts from a lunar base, are the most likely customers of the first lunar industries. It remains to be seen whether we will be happy with any of that, Holdaway says. “Will this be acceptable to the rest of world? I don’t think anyone really knows the answer to that.”

Jade Rabbit will spark a new space race for helium-3. **Reynolds 13** writes[[30]](#footnote-30)

On Saturday, a Chinese lunar probe made the first soft landing anyone's made on the moon since 1976. The Chang'e-3 probe means that China is one of only three countries -- joining the United States and the old Soviet Union -- to accomplish such a feat. The probe includes an unmanned rover named **Yutu** that **will** spend several months exploring "geological structure and surface substances and **look**ing **for** natural **resources**.'' But will China try to claim the ground it explores? Possibly. Though the landing was a big deal in China, most of the rest of the world responded with a yawn. Moon landing? Been there, done that. But October Sky author Homer Hickam was more excited. He wondered on Twitter if China might want to make a territorial claim on the moon, noting that the area the lander is exploring may contain an abundance of **Helium-3**, a potentially valuable fusion energy fuel that **is found only on the moon**. According to former astronaut/geologist Harrison Schmitt, **China "has made no secret" of** its **interest in Helium-3**. Schmitt observes, "I would assume that **this mission is** both **a geopolitical statement** and a test of some hardware and software related to mining and processing of the lunar regolith." Followed by a mining claim, perhaps. Is that possible? Well, **China seems** pretty **big on making territorial claims lately. And**, really, **there's not a lot to stop them**. The 1967 Outer Space Treaty provides that "outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." But that's not much of a barrier. First, the treaty only prohibits "national appropriation." If a Chinese company, instead of the Chinese government, were to stake a claim, it wouldn't apply. And, at any rate, China -- which didn't even join the treaty until 1983 -- can, like any other nation, withdraw at any time. All that's required under the treaty is to give a year's notice. So if the the Yutu rover finds something valuable, Chinese mining efforts, and possibly even territorial claims, might very well follow. And that would be a good thing. What's so good about it? Well, two things. First, **there are American companies looking at doing business on the moon**, too, **and a Chinese venture would probably boost their prospects**. More significantly, a Chinese claim might spur a new space race, which would speed development of the moon. **The** 1960s **space race between the U**nited **S**tates **and** the old **Soviet Union saw rapid progress in space tech**nology. We went from being unable to put people in Earth orbit, to landing men on the moon and returning them safely to earth, repeatedly, in less than a decade. **It happened so fast because each nation was afraid the other would get there first**. The 1967 Outer Space Treaty, in fact, was basically a deal to throw the contest out. Each nation was more afraid of being beaten than it was, really, anxious to win itself. As soon as the ink on the treaty was dry, space efforts began to dry up, too. That's one reason why no one has had a soft landing on the moon in almost 40 years -- and why it's been 41 years almost to the day since the last man, astronaut Eugene Cernan, stood on the moon. **If**, like me, **you'd like to see** a gold rush on the moon -- or, at least, **a Helium-3 rush** -- then **a Chinese claim might** be just the thing to **get it started**. Personally, I'm hoping Hickam's prediction is right.

The US will get involved to make up for its depleting helium reserves.

**Ouellette 11** writes[[31]](#footnote-31)

Helium wasn’t technically “discovered” on Earth until about 1895, despite being abundant in the universe. **Almost all of the global supply of helium is located** with**in** 250 miles of **Amarillo, Texas**; it’s distilled from accumulated natural gas and extracted during the refining process. Since the 1920s, **the US has considered its helium stockpile** as **an important strategic natural resource**, amassing some 32 billion cubic feet in an underground bunker in Texas, but for several years now, it’s been selling off that stockpile bit by bit to interested industrial buyers. Helium is used for arc welding and leak detection, mostly, although NASA uses it to pressurize space shuttle fuel tanks. Liquid helium cools infrared detectors, nuclear reactors, and the superconducting magnets used in MRI machines, too. **The fear is** that, at current consumption rates, **that underground bunker will be empty within 20 years, leaving the earth almost helium-free** by the end of the 21st century. **This could be bad for US industry**. Fusion Power? It also bodes ill for the prospect of fusion using helium-3, a rare helium isotope that is missing a neutron. Physicists have yet to achieve pure helium-3 fusion, but if they did, we’d have a clean, virtually infinite power source. Or so the theory goes. And that’s where the moon comes in. The moon’s lunar soil is chock-full of helium reserves, thanks to the solar wind. In fact, every star emits helium constantly, suggesting that one day, spaceships will carry on a brisk import and export trade to harvest this critical element — assuming we can figure out how to make such a process economically viable. But helium-3 isn’t the only resource the moon might have to offer. It could also be a source for rare earth elements, such as europium and tantalum, which are in high demand on Earth for electronics and green energy applications (solar panels, hybrid cars), as well as being used in the space and defense industries. China is the largest exporter of rare earth elements, but there are growing concerns over supply vulnerability as China drastically reduces its rare earth exports. Scientists know that there are pockets or rare earth deposits on the moon, but as yet they don’t have detailed maps of those areas. Potassium, phosphorus and thorium are other elements that lunar rocks have to offer a potential mining venture. Lunar Prospecting? And there’s more! In 2009, NASA bombed the moon — part of its Lunar CRater Observation and Sensing Satellite (LCROSS) mission — and observed grains of water ice in the remnants of the resulting plume, as well as light metals such as sodium and mercury, and volatile compounds like methane, ammonia, carbon dioxide, carbon monoxide and hydrogen. This implies that the moon is chemically active — via a process called “cold grain chemistry” — and also has a water cycle. Where you have water ice, you have a potential mother lode for lunar prospecting of hydrogen. Of course, we’re talking about **huge capital expenditures** just **to set up** a **mining** base camp **on the moon**, and the economies of scale might not be there. If the benefits don’t outweigh the costs, we might never see bona fide lunar prospecting. But **i**t’**s a possibility that the US** — not to mention China — **is taking very seriously.**

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