# KEY

**What is the warrant?**

**UNIQ**

**QUANT**

# 1AC

**We Affirm**

**Resolved:** The European Union should join the belt and road initiative

**First with an observation**

The BRI is dying now. **Ing 19 explains[[1]](#endnote-1)** that Overseas direct investment in China jumped in 2016, followed by two consecutive years of decline growth started to slow as a result of regulatory controls and tighter liquidity conditions in China. China cannot afford to build the belt and road without the EU. **Ciurtin 17 finds[[2]](#endnote-2)** that the Belt-and-Road is a task that China cannot finance alone. He furthers without European public AND private cash; it is highly improbable that other actors could feasibly join China in funding the initiative.

**Our First Contention is Healthcare**

**Chen 19 finds[[3]](#endnote-3)** that China is creating its own multilateral funds and banks, to promote regional cooperation in the framework of the BRI. The multilateral funds are substantial, adding up to 267 billion dollars, with China securing major pledges mainly from the Silk Road Fund. Apart from funding infrastructure construction, which supplies delivery and research, the BRI also advocates improved professional and organizational capabilities targeting specific diseases. China will, together with World Health Organization, take on infectious disease control, implementing professional support, training of medical staff, and healthcare delivery. China will strengthen cooperation with particular regard to TB and research leading to the elimination of LF, malaria, and schistosomiasis.

**The impact is elimination of TB and Malaria**

**The World Health Organization reports[[4]](#endnote-4)** that the estimated number of malaria deaths stood at 435,000 in 2017. Even more, **The CDC furthers[[5]](#endnote-5)** that In 2017 there were 1.3 million TB-related deaths worldwide.

**Our Second Contention is Nuclear Power**

**La Shier finds[[6]](#endnote-6)** that China’s investment in nuclear energy capacity as BRI develops is estimated at 80 percent of the 300 new reactors planned by 2030. This is magnified by the United States. **Luongo 19 explains[[7]](#endnote-7)** that for the U.S to fade away from the nuclear export arena will have consequences for the intensifying great power rivalry, the ability to win the vital global technology competition, and the future strength of global nuclear non-proliferation and security. As such, **DiChristopher 19 indicates[[8]](#endnote-8)** that the Trump administration is preparing American companies compete in the race to build the next generation of nuclear power plants around the world to push back on the growing dominance of China in the space.

**The impact is pollution**

**Rhodes estimates[[9]](#endnote-9)** that nuclear power produces energy at least 3 times as consistently as renewables and twice as consistently as fossil fuels. **Knoth 15 writes[[10]](#endnote-10)** that poor and inconsistent power supply for lighting, cooking and heating leads to the high use of open indoor fires and kerosene lamps which contribute to over 4.3 million deaths worldwide.

**Contention Three is Nonperforming Loans**

**Huang 19 finds[[11]](#endnote-11)** that China may fall victim under which a foreign investor starts to lose bargaining power over time as it invests more in a host country. Infrastructure projects are a classic example, because they are bulky, bolted to the ground and have zero economic value if left incomplete. Allowing China’s current trajectory of bad quality, risky investments will lead to an economic disaster. **Gilchrist 17 of CNBC** **explains[[12]](#endnote-12)** that China’s Belt and Road infrastructure could amass hundreds of billions of dollars in nonperforming loans if the projects fail. The impact could be damaging not just for China, but for the global financial system.

**The Impact is Global Recession**

**Blakely 19 explains[[13]](#endnote-13)** that because China is the engine of growth for so many countries and economically interdependent with the world economy, any Chinese recession would go global. This would create a contracting of the global economy, forcing losses in jobs, government revenue and economic growth. Overall, the **IMF finds[[14]](#endnote-14)** that the next global economic shock could push as many as 900 million people into poverty.

**Affirm**

# 2AC

## FL: Observation

### AT: China Slowly Builds Alone

1. **Wharton[[15]](#endnote-15) 19** **finds** that because of accumulating debt on behalf of beneficiary countries, ballooning project costs, and domestic financial issues, BRI lending by Chinese banks has fallen by 89% and commercial lending has ceased entirely.

### AT: EU Cannot Afford

1. **Chandran 19 writes[[16]](#endnote-16)** that the BRI faces a funding gap of up to $500 billion a year which **Ciurtin concludes** can be filled with European cash.
2. They assume European investment exists in a vacuum, but it doesn’t. **The EIB 18 writes[[17]](#endnote-17)** that the EU bank helping to build crucial infrastructure provided 78.16 billion euros, supporting total investment of around 250 billion euros by crowding in private capital. **The EIB furthers[[18]](#endnote-18)** that it has unique experience in crowding in private investment as they bundle development finance activities into a dedicated structure within the Group to deliver EU development policy more efficiently.

### AT: 20 Million a Year

1. This is empirically not true. **The European Investment Bank reports[[19]](#endnote-19)** thatthey provided 84 billion Euros to finance new investment in 2016. This argument is clearly squirrely.
2. Even if that were true, debaters must fiat the construction of the belt and road. The AFF can’t physically prove that the BRI can be built by China because it is already failing to do so. In the meantime, the negative can say presume neg which makes every round flow to the negative. Since debaters will only participate if the debate is fair, you drop the argument.

### AT: EU Too Busy

1. This is not how a government works. They are capable of multi-tasking and this response’s warrant is absurdly oversimplifying the EU’s capabilities.

### AT: Unanimous Support

The affirmative must assume fiat or else the topic would be a reality. Since the topic does not give a specific definition to join, the affirmative has the topical fiat to increase funding

The literal definition of join assumes the receiving and spending sides of the spectrum as **The Oxford Dictionary finds[[20]](#endnote-20)** that join means to

1. To partake in an activity
2. Support an entity in an activity

This means that our fiat is entirely topical. They may contest the resources of which the EU can fund the BRI, but not the inherent willingness.

**Even more**, they will probably point out Italy as another major economy who only received. The issue is that

1. Italy is 2/3 the GDP size than that of the UK which is then 3/4 than that of Germany.
2. Even if they say EU economy is not ready because of domestic economic problems, Ciurtin is written amidst the 2017 EU slowdown so our evidence context still applies

### AT: EIB Isn’t EU

**WNN 18 finds[[21]](#endnote-21)** that the EIB is the EU's bank, and is owned by and represents the interests of the EU Member States. It works with other EU institutions to implement EU policy and provides finance and expertise for sustainable investment projects that contribute to EU policy objectives.

## FL: Healthcare

### AT: Other Countries

1. Name another country willing to spend 267 billion dollars on healthcare in developing countries.
2. **Renwick explains[[22]](#endnote-22)** that the most significant challenge to fighting will be maintaining funding and political will to eradicate malaria.
3. **Alonso 16 finds[[23]](#endnote-23)** that global investment will need to triple from current levels, reaching an estimated US$ 8.7 billion annually by 2030 in order to eliminate malaria. Progress can be accelerated through strong and sustained political commitment, increased multi-sectoral collaboration and continued investment in the development of new malaria control tools.

### AT: Current Healthcare Projects

1. **Alonso 16 finds[[24]](#endnote-24)** that ***global*** investment will need to triple from current levels, reaching an estimated US$ 8.7 billion annually by 2030 in order to eliminate malaria alone. Progress can be accelerated through strong and sustained political commitment, increased multi-sectoral collaboration and continued investment in the development of new malaria control tools.

### AT: EU Won’t Fund

1. The EU does not need to fund the Health Silk Road directly but creates the incentive for effective Chinese healthcare construction in the developing world. **Ma 19 indicates[[25]](#endnote-25)** that the Health Silk Road objective is to provide medical backup to investors when economic activities increase along the corridor which means that the projects must only exist in the first place.

### AT: Fake Medicine

1. **Empirically False:** **Bate and Porter[[26]](#endnote-26)** find that data suggest that the percentage of substandard drugs circulating in China’s market is small. For 100,000 batches of antimalarial pharmaceutical drugs in mobile labs, only 2.8 percent contained counterfeit or substandard drugs.

## FL: Nuclear Power

### AT: Creates Pollution

1. Nuclear power makes big differences empirically. **Biello 13 explains[[27]](#endnote-27)** that the speediest drop in greenhouse gas pollution on record occurred in France when they transitioned from burning fossil fuels to nuclear fission for electricity
2. **Stanford University explains[[28]](#endnote-28)** that current underground conventional mining uses more energy than in-situ leach mining techniques However, low-energy, in-situ mining techniques are also becoming more widespread, and increased uranium exploration could result in additional higher-grade resources becoming available.
3. **Rhodes 18 of Yale finds[[29]](#endnote-29)** that nuclear power produces energy via nuclear fission rather than chemical burning, it generates baseload electricity with no output of carbon. This makes nuclear power radically decarbonizing, since nuclear power plants release greenhouse gases only from the ancillary use of fossil fuels during their construction, mining, fuel processing, maintenance, and decommissioning which is about 4 to 5 percent as much as a natural gas-fired power plant

### AT: Nuclear Waste

1. **Rhodes 18 of Yale writes[[30]](#endnote-30)** that Nuclear waste disposal could be recycled to extend nuclear power production by hundreds of years and is stored at present safely in impenetrable concrete-and-steel dry casks on the grounds of operating reactors. He quantifies that 90% of the fuel is easily recyclable in the status quo.

### AT: Dangerous

1. **Wilkerson of Harvard University reports[[31]](#endnote-31)** that nuclear power is the benchmark to beat, outranking coal, oil, gas, and even wind by a slight margin as the least deadly major energy resource in application. **He explains** that newer generations of nuclear reactors, particularly what is called a pebble-bed reactor, are designed so that the nuclear chain reaction cannot run away and cause a meltdown – even in the event of complete failure of the reactor’s machinery.

# Short-Circuits

## LT: Poverty

**Summers 13 finds[[32]](#endnote-32)** that If you could only do one thing to reduce poverty and inequity around the world the best thing you could do is reduce the disproportionate burden of disease on those living in the poorest communities. Improving health remains the most powerful tool for improving lives and reducing extreme poverty worldwide.

## LT: Climate Change

Our nuclear power contention has a cleaner link as the BRI will establish clean nuclear power

# Weighing

## W: War

**Asher 01 finds[[33]](#endnote-33)** that throughout history, epidemics have been responsible for millions of deaths and the number will undoubtedly rise, due in part to the increasing ease and speed of international travel. Statistically, disease is a more formidable killer than war

1. Abigail **Ng**, 8-21-**2019**, “Why Chinese overseas investment growth is set to slow further,” **CNBC**, https://www.cnbc.com/2019/08/21/moodys-chinese-overseas-infrastructure-investment-growth-to-slow.html

**Overseas direct investment in China jumped** 49.3% **in 2016, followed by two consecutive years of decline**. It fell 23% year-on-year in 2017, and dropped 13.6% in 2018 compared to the previous year, Moody’s said, citing Chinese government data. After its peak in 2016, **growth started to slow as a result of regulatory controls and tighter liquidity conditions in China, according to Moody’s**. “We believe the reduction in 2018 also reflected a pullback by infrastructure companies as complications began to surface with investments they made in previous years, particularly in the Belt and Road emerging markets,” the report said. “There are increasingly unpredictable changes in foreign governments’ attitudes toward Chinese investors, especially when overseas elections bring leadership change,” it added. In recent years, countries such as Pakistan, Malaysia and Sierra Leone shelved or canceled their planned commitments to the Belt and Road project due to various reasons including political changes and resistance from local communities. The U.S.-China trade dispute is also “affecting other countries’ views on investments by Chinese companies and Chinese companies’ views on investing in other countries.” [↑](#endnote-ref-1)
2. **Implications**

New econ growth still does not solve because Ciurtin accounts

EU is unique actor to fund

China cannot fund

Horia **Ciurtin**, 12-xx-**2017**, " A PIVOT TO EUROPE: CHINA’S BELT-AND-ROAD BALANCING ACT," **European Institute of Romania**, <http://ier.gov.ro/wp-content/uploads/publicatii/Final_Policy-Brief-5_Horia-Ciurtin-A-Pivot-to-Europe_web.pdf>

***Qualifications: Amsterdam Center for International Law; European Federation for Investment Law and Arbitration; VERSO Journal [Cluj-Napoca/Bucharest]:***

For attaining these objectives (and the stated grand finale of reaching Europe), China not only integrated other ancillary projects (such as the proposed China-Pakistan and Bangladesh-ChinaIndia-Myanmar Economic Corridors), but also devised several financing instruments in order to fund all the needed infrastructure. Thus, beside its already existing domestic banks and investment funds, Beijing poured an initial $100 billion in three different institutions that the Chinese state directly controls: the Silk Road Fund, the Asian Infrastructure Investment Bank and the BRICS’ New Development Bank.34 This is another type of – financial – move away from the American-dominated international system, trying to avoid the constraints of World Bank, IMF or other multilateral development instruments.35 **However impressive the sums might appear at a first glance**, **they [China] fall[s] short of the needed amount. The first stages of developing the Belt-and-Road require no less than $3 trillion [which]** (according to some accounts, even more). And this **is a task that China – despite its constant growth and increasing economic power – cannot accomplish alone**.36 It really needs co-interested parties. And **that is where the European Union** (with its unbearable economic force) **comes into the spotlight**: **it is not supposed to be just a “passive” destination at the end of the road, but also a co-owner in this joint venture. Without European cash – from public and private sources – it is highly improbable that other actors could feasibly join China in funding the initiative.** **Russia, Iran, Turkey or Kazakhstan** (or even Japan and India37) **are in an entirely different economic league than what is needed for such a massive project**. For a path to Europe to emerge, Europe itself is needed along the way. In reality, EU-based institutions already are the largest lenders in the region (see Figure 3 below). And Europe is highly interested in developing infrastructure and connectivity with its marginal areas. [↑](#endnote-ref-2)
3. Jin **Chen**, Robert **Bergquist** , Xiao-Nong Jing-Bo **Xue**, MenBao **Qian**, 4-18-**2019**, "Combating infectious disease epidemics through China’s Belt and Road Initiative," **PLOS**, <https://journals.plos.org/plosntds/article/file?id=10.1371/journal.pntd.0007107&amp;type=printable>

***PLOS ONE is a peer reviewed scientific journal with a rigorous editorial screening and assessment process made up of several stages. PLOS ONE considers original research articles from all disciplines within the natural sciences, medical research, engineering, as well as the related social sciences and humanities. The editors make decisions on submissions based on scientific rigor, regardless of novelty.***

Financial and human resource support **Ending infectious disease epidemics demands intensified funding, preferably delivered at the international level, to strengthen advocacy, research, and the global control effort**. Besides being a sincere collaborator in the area of global health and a board member of UNAIDS and the Global Fund [11], **China is creating its own multilateral funds and banks, e.g., the Asia Infrastructure Investment Bank and the New Development Bank, to promote regional cooperation in the framework of the BRI.** **The multilateral funds are substantial, adding up to USD 267 billion, with China securing major pledges, mainly** from the two banks and **the Silk Road Fund.** Part of the financial aid is supposed to contribute to research and innovation with respect to medical products and diagnostic skills. The initiative also encourages discovery and production of new drugs and vaccines [4, 44]. Specifically, a total of USD 2 billion has gone to the South–South Cooperation Trust Fund to support developing countries in implementing the SDGs, and a further fund of USD 2 billion (to be increased to USD 12 billion by 2030) will assist many developing countries to meet the SDGs. Also, an additional voluntary contribution of USD 20 million will be provided to support WHO’s global health work, especially on infectious diseases[11]. The initiative is also working on poverty reduction to alleviate the epidemics—for example, the East Asia Poverty Reduction, Pilot China–Africa Cooperation Plan for Poverty Reduction, and People’s Benefit programmes, which provide aid in the fields of poverty reduction and healthcare. In addition, China will cancel the debt of the least developed countries, launch 600 specific projects to end poverty, and support better health services [11]. In this way it can alleviate regional poverty so that the income of local people will increase and their living standards will improve, and it can reduce the risk and burden of infectious diseases caused by poverty. **Apart from funding infrastructure construction, which supplies delivery and research, the BRI also advocates improved professional and organisational capabilities targeting specific diseases** [4]. As one of the WHO Emergency Medical Teams, **China** has distributed medical supplies and **will, together with WHO, take on infectious disease control, implementing professional support, training of medical staff, and healthcare delivery**. For instance, during the Ebola pandemic, China sent 1,200 medical experts and committed an additional USD 120 million for training more than 13,000 local medical workers in response to Ebola infections in West Africa [11]. China will assist in training more medical personnel for Africa and continue to send medical teams to meet Africa’s requirements [45]. More global health human resources and specific medical workers will be brought in, together with global health departments being established in universities and institutions [47]. China is pursuing discussions about cooperation with multilateral initiatives at the highest level, aligning relevant health agreements under the BRI theme. Compared with other initiatives, this initiative stands out because of its political commitment, which advances the health SDGs and solves current constraints to the progress of UHC [5, 48]. Chinese channels of funding and expenditure on health focus are different from those in the United States when it comes to funding in that the US focuses on specific diseases like HIV/AIDS, malaria, and TB through bilateral and multilateral channels, whereas China mainly focuses on medical facilities, health supplies, technical support, and training through governmental funding. However, the situation is changing, as the Belt and Road multilateral funding initiative is substantial, with a total planned to reach USD 267 billion, exceeding the USD 253 billion capitalisation of the World Bank [4]. As an ambitious, long-term initiative that is extremely open and inclusive, the BRI meets the great challenges of cultural differences and economic risks and has questioned the viability of some infrastructure investments. However, with the goal of a shared benefit for all humankind, an increasing number of countries have engaged in building the initiative. **Enhanced interconnectivity will bring about** **not only international health risks but also, more importantly**, **new opportunities for global health cooperation and development**. So far there is a lack of specific indicators for each disease and detailed procedures regarding cooperation with respect to disease control and elimination. The current study is expected to result in recommendations to policy makers on an overall policy plan and a road map for the imminent future. **All aforementioned experiences, platforms, and programmes as well as financial and personnel resources provide useful opportunities for cooperation among involved countries with respect to the threat of infectious disease**s. More importantly, pilot research and demonstration projects in line with the BRI have been proposed and, in some cases, have already started. China has demonstrated strong and sustained political leadership to ensure its core role of global health collaboration in economic development. Conclusion and implication A major part of the BRI focuses on support and communication to build a new mechanism for global health, prioritising the prevention and control of infectious diseases, preventing outbreaks becoming epidemics, and providing UHC, thus overcoming the vicious circle of poverty and ill health. **China will strengthen cooperation with particular regard to the control of TB, echinococcosis, and dengue within the 69 countries and deliver enhanced communication and research leading to the elimination of LF, malaria, and schistosomiasis.** Based on opportunities the BRI provides and the cooperative experience gained, the framework shown in Fig 3 should become available and applicable to the response to these challenges by sharing information, joint control, and technical know-how. UHC and response to the challenges posed by infectious disease epidemics are vital for the new era, with health considerations at the core of the BRI. Despite the serious threats of the infectious disease epidemics, the emphasis on health through the BRI puts us in an excellent position to achieve the health-related aspects of the SDGs by implementing the Health Silk Road concept of improved life through health-related communication. Based on technical experience in this field, mature collaborating mechanisms, and the provision of financial support, the strategies in the context of the BRI reinforce the various countries’ extensive engagement in combating infectious disease epidemics. [↑](#endnote-ref-3)
4. Tedros Adhanom **Ghebreyesus**, 9-xx-**2018**, “World malaria report 2018”, **World Health Organization**, <https://www.who.int/news-room/fact-sheets/detail/malaria>

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. It is preventable and curable. In 2017, there were an estimated 219 million cases of malaria in 87 countries. **The estimated number of malaria deaths stood at 435 000 in 2017. The WHO African Region carries a disproportionately high share of the global malaria burden. In 2017, the region was home to 92% of malaria cases and 93% of malaria deaths.** Total funding for malaria control and elimination reached an estimated US$ 3.1 billion in 2017. Contributions from governments of endemic countries amounted to US$ 900 million, representing 28% of total funding. Malaria is caused by Plasmodium parasites. The parasites are spread to people through the bites of infected female Anopheles mosquitoes, called "malaria vectors." There are 5 parasite species that cause malaria in humans, and 2 of these species – P. falciparum and P. vivax – pose the greatest threat. In 2017, P. falciparum accounted for 99.7% of estimated malaria cases in the WHO African Region, as well as in the majority of cases in the WHO regions of South-East Asia (62.8%), the Eastern Mediterranean (69%) and the Western Pacific (71.9%). P. vivax is the predominant parasite in the WHO Region of the Americas, representing 74.1% of malaria cases. Symptoms Malaria is an acute febrile illness. In a non-immune individual, symptoms usually appear 10–15 days after the infective mosquito bite. The first symptoms – fever, headache, and chills – may be mild and difficult to recognize as malaria. If not treated within 24 hours, P. falciparum malaria can progress to severe illness, often leading to death. Children with severe malaria frequently develop one or more of the following symptoms: severe anaemia, respiratory distress in relation to metabolic acidosis, or cerebral malaria. In adults, multi-organ failure is also frequent. In malaria endemic areas, people may develop partial immunity, allowing asymptomatic infections to occur. Who is at risk? In 2017, nearly half of the world's population was at risk of malaria. Most malaria cases and deaths occur in sub-Saharan Africa. However, the WHO regions of South-East Asia, Eastern Mediterranean, Western Pacific, and the Americas are also at risk. In 2017, 87 countries and areas had ongoing malaria transmission. Some population groups are at considerably higher risk of contracting malaria, and developing severe disease, than others. These include infants, children under 5 years of age, pregnant women and patients with HIV/AIDS, as well as non-immune migrants, mobile populations and travellers. National malaria control programmes need to take special measures to protect these population groups from malaria infection, taking into consideration their specific circumstances. [↑](#endnote-ref-4)
5. No Author, 3-28-**2019**, "Data &amp; Statistics," **Center for Disease Control**, https://www.cdc.gov/tb/statistics/default.htm

Tuberculosis (TB) is one of the world’s deadliest diseases: One fourth of the world’s population, is infected with TB. **In 2017**, 10.0 million people around the world became sick with TB disease. **There were 1.3 million TB-related deaths worldwide**. TB is a leading killer of people who are HIV infected. A total of 9,105 TB cases (a rate of 2.8 cases per 100,000 persons) were reported in the United States in 2017. This is a decrease from the number of cases reported in 2016 and the lowest case count on record in the United States. The case rate of 2.8 per 100,000 persons is a 2.3% decrease from 2016. Ending TB requires maintaining and strengthening current TB control priorities while increasing efforts to identify and treat latent TB infection among high-risk populations. CDC estimates that about 13% of U.S. TB cases with genotype data are attributed to recent transmission. Distinguishing the numbers of cases attributed to recent transmission from those likely due to reactivation of longstanding, untreated latent TB infection is one of many tools state and local TB programs can use to design and prioritize effective public health interventions.. [↑](#endnote-ref-5)
6. Brian La **Shier**, 10-30-**2018**, "Exploring the Environmental Repercussions of China’s Belt and Road Initiative," **Environmental and Energy Study Institute**, <https://www.eesi.org/articles/view/exploring-the-environmental-repercussions-of-chinas-belt-and-road-initiativ>

However, China also has reason to avoid exporting a fossil fuel-based energy system. As the world’s leading producer of renewable energy products (e.g., PV cells, windmills, etc.), China is using BRI as an opportunity to promote norms of renewable energy in host nations and secure new markets for its products. According to the Institute for Energy Economics and Financial Analysis (IEEFA), BRI has already helped enable the exportation of $8 billion of solar goods, which in 2017 allowed China to surpass Germany as the world’s leading exporter of environmental goods and services. To encourage the growth of its own domestic solar industry, however, India recently enacted tariffs on Chinese solar products, which made up 89 percent of solar imports to India during the 2017 fiscal year. Satiating energy demand in these new markets with older technologies could reduce demand for China’s popular solar products and limit the growth of a thriving solar industry. **China’s investment in nuclear energy capacity further complicates the energy investment picture**. According to an annual infrastructure publication by the law firm Norton Rose Fulbright, “**nuclear is an area to watch” as BRI develops**. The publication claims that China has “almost half of the global nuclear pipeline up to 2030” and notes that “**a leading Chinese nuclear developer estimates 80 percent of the 300 new reactors planned by 2030 will be in [BRI] countries.**” [↑](#endnote-ref-6)
7. Kenneth **Luong**, 4-8-**2019**, "China’s Nuclear Export Strategy Clarifies and Concerns," **Partnership for Global Security**, <https://partnershipforglobalsecurity.org/chinas-nuclear-export-strategy-clarifies-and-concerns/>

The geopolitics of the global export nuclear market is shifting, and new dangers are emerging that may not be adequately apparent to, or appreciated by, nuclear experts and policymakers. Russia is dominant now, but China is making all the moves that are required to unseat it. Both nations’ nuclear industries are state-controlled and fully integrated into their geostrategic objectives. The U.S. is not in a strong position to stand alone in the nuclear market. Its industrial base has atrophied, its political institutions are divided and distrustful, and its export financing is in shambles. It can take actions to fix these flaws and it can partner with one or more close allies on sales opportunities. However, a decision – through intention or indifference - **to fade away from the nuclear export arena will have consequences for the intensifying great power rivalry, the ability to win the vital global technology competition, and the future strength of global nuclear non-proliferation and security.** [↑](#endnote-ref-7)
8. Tom **Dichristopher**, 10-10-**2018**, “The US is losing the nuclear energy export race to China and Russia. Here’s the Trump team’s plan to turn the tide,” CNBC, https://www.cnbc.com/2019/03/21/trump-aims-to-beat-china-and-russia-in-nuclear-energy-export-race.html

**The Trump administration is preparing a new push to help American companies compete in the race to build the next generation of nuclear power plants around the world** — a competition the U.S. is currently losing. In doing so, the administration also aims **to push back on the growing dominance of** Russia and **China in the space**, preventing them from expanding their international influence by forging long-lasting nuclear ties with foreign powers. The State Department plans to expand cooperation with countries pursuing atomic energy long before those nations ever purchase a nuclear reactor. By facilitating early stage talks, the U.S. intends to put American companies first in line to build tomorrow’s fleet of nuclear power plants overseas. We still lead the world in nuclear technology innovation. Our big challenge is taking that incredible IP and those incredible technological innovative breakthroughs and bringing them to market. Ed McGinnis U.S. DEPUTY ASSISTANT SECRETARY FOR NUCLEAR ENERGY To be sure, the Energy and Commerce departments actively facilitate U.S. nuclear cooperation with their foreign counterparts. But the State Department now intends to push the issue in talks at the highest levels of government, making it clear that Washington believes cooperation in the nuclear realm is central to its strategic relationships. But even with the State Department lending its diplomatic heft, winning nuclear energy contracts won’t be easy. Russia and China are aggressively pursuing those deals at a time when the U.S. has struggled to build reactors at home and no longer enriches uranium to fuel those facilities. “We have lost tremendous ground. We were once 90 percent of the market globally. We’re down to 20 [percent] if we’re lucky,” Ed McGinnis, the Department of Energy’s principal deputy assistant secretary for nuclear energy, said in an interview. “The majority of the big 80- to 100-year nuclear power deals being made overseas are Russian and Chinese and other state-owned corporations,” said McGinnis, who has worked in government on nuclear energy and nonproliferation issues for 27 years. Rise of Russia and China The U.S. dominated nuclear energy exports decades ago, but faces stiff competition today, including from allies like France and South Korea. But it’s the growing dominance of adversaries in Beijing and Moscow that worries the Trump administration and nonproliferation experts. China is building more reactors at home than any other country, and its state-owned nuclear companies are beginning to enter the international market in Pakistan, Argentina and the UK. Russia’s Rosatom, already an established exporter, is providing reactors for plants in Eastern Europe, India, Bangladesh and Turkey. Russia is also changing the rules of the game by offering generous financing that makes nuclear energy affordable to more nations. Moscow is targeting non-nuclear states in the Middle East and Africa with a model to build, own and operate the plants. The State Department intends to actively dissuade its partners from working with China and Russia, according to Christopher Ford, assistant secretary for international security and nonproliferation. Ford previewed that message last month at the Hudson Institute in Washington DC: “Russia and China also use reactor sales by their heavily state-supported nuclear industries as a geopolitical tool to deepen political relationships with partner countries, to foster energy dependence by foreign partners, and sometimes even to use predatory financing to lure foreign political leaderships into ‘debt traps’ that give Beijing or Moscow leverage that it can exploit later for geopolitical advantage.” New plan takes shape During the address, Ford outlined State’s plan to help American companies compete with Chinese and Russian firms. The department will more closely coordinate nuclear cooperation efforts across agencies and ramp up informal, non-binding talks with nations that might pursue nuclear energy technology. The goal is to expand the number of countries engaged in ongoing communication with U.S. government agencies, nuclear energy companies and researchers. **The State Department will do this by signing nuclear cooperation memorandums of understanding with the countries. Under the MOUs, American experts would help foreign nations develop the apparatus necessary to accommodate a nuclear energy industry. That includes creating safety, security and non-proliferation protocols, as well as an independent regulatory system.** That will **make more countries “fully prepared to take advantage of the emerging technologies and coming innovations in reactor design and other areas that are being pioneered in the United States,”** Ford said. That marks a change from the past, said Ted Jones, director for national security and international programs at the Nuclear Energy Institute, the industry’s main trade group. “We’ve long urged greater coordination among the many agencies involved in U.S. nuclear exports and a genuinely strategic approach to U.S. nuclear cooperation,” he said. “The State Department’s plans for nuclear cooperation MOUs indicate that this Administration is moving in the right direction.” There has long been an instinct within U.S. foreign policy circles to limit nuclear energy exports, if only to reduce the risk that those transfers will open the door to nuclear weapons proliferation. But if the U.S. continues to lose sales to other countries, its ability to set strong nonproliferation standards around the world will fade. GP: Rosatom's Central Mechanical Engineering Design Bureau in St Petersburg Primary coolant pumps assembled by St Petersburg’s Central Mechanical Engineering Design Bureau, a member of the Atomenergomash company group, and shipped to the Belarusian nuclear power plant. Peter Kovalev | TASS | Getty Images The State Department now plans to address nuclear energy cooperation in high-level meetings with presidents, prime ministers and foreign ministers, a senior State Department official told CNBC. The department is currently drawing up priorities with two major considerations in mind, the official said. First, the State Department is identifying geostrategic opportunities, with a focus on the parts of the world where the U.S. is at risk of losing bids to rivals like Russia and China. Second, the government will consult nuclear energy companies about where they see the brightest opportunities and the best chances of closing deals. Next generation technology The industry is already on board with State’s new initiative. The Nuclear Energy Institute regularly polls members on where they see opportunities overseas. In the survey that went out a few weeks ago, NEI asked members to identify their long-term market opportunities, a question that is consistent with the State Department initiative. State’s focus is on teeing up sales of a new generation of nuclear technology expected to come online in the next five to 10 years, the official said. CNBC: 2019 CERAWeek Mike Pompeo Rick Perry Secretary of State Mike Pompeo and Secretary of Energy Rick Perry at the 2019 CERAWeek in Houston, TX. Mary Catherine Wellons | CNBC Those include small modular reactors that can be bolted together to form larger units, Terrapower’s traveling wave reactor backed by Bill Gates and microreactors meant to provide enough power for a few thousand homes. Altogether, there are about two dozen serious designs for advanced nuclear reactors trying to break into the market, said McGinnis. Under McGinnis and Secretary Rick Perry, one of the Energy Department’s top priorities is facilitating the development of these new technologies. “We still lead the world in nuclear technology innovation,” he said. “Our big challenge is taking that incredible IP and those incredible technological innovative breakthroughs and bringing them to market. That’s been our challenge.” On Tuesday, NuScale Energy signed a memorandum to explore deploying its small modular reactors in Romania, after signing similar agreements with Canada and Jordan. The U.S. will still have to reach so-called 123 Agreements with foreign countries before American firms can sell nuclear reactors overseas. These agreements place limits on the use of nuclear technology and must be approved by Congress. These agreements have recently drawn scrutiny from Democratic and Republican lawmakers as Westinghouse bids for nuclear power contracts in Saudi Arabia. The Saudis have long insisted on their right to enrich uranium, something the U.S. usually opposes. The bidding also comes as tension between Riyadh and Capitol Hill has escalated after Saudi agents killed Washington Post columnist Jamal Khashoggi in October. The United States has signed about two dozen 123 Agreements, but Jones says those don’t come close to addressing the potential global market for next generation technology, especially as smaller reactors make nuclear energy more accessible. There are currently about 30 countries considering adopting nuclear energy, according to the World Nuclear Association. “Given that Russia and China are aggressively seeking to tie up commitments from countries in these future markets, it behooves the United States to take an active role in nuclear cooperation before countries are ready to engage in 123 agreements,” Jones said. [↑](#endnote-ref-8)
9. Richard Rhodes, xx-xx-xxxx, "Why Nuclear Power Must Be Part of the Energy Solution," Yale E360, https://e360.yale.edu/features/why-nuclear-power-must-be-part-of-the-energy-solution-environmentalists-climate

**For too many environmentalists concerned with global warming, nuclear energy is today’s Devil’s excrement. They condemn it for its production and use of radioactive fuels and for the supposed problem of disposing of its waste.** In my judgment, their condemnation of this efficient, low-carbon source of baseload energy is misplaced. **Far from being the Devil’s excrement, nuclear power can be, and should be, one major component of our rescue from a hotter, more meteorologically destructive world.** Like all energy sources, nuclear power has advantages and disadvantages. What are nuclear power’s benefits? First and foremost, **since it produces energy via nuclear fission rather than chemical burning, it generates baseload electricity with no output of carbon, the villainous element of global warming**. Switching from coal to natural gas is a step toward decarbonizing, since burning natural gas produces about half the carbon dioxide of burning coal. But switching from coal to nuclear power is radically decarbonizing, since nuclear power plants release greenhouse gases only from the ancillary use of fossil fuels during their construction, mining, fuel processing, maintenance, and decommissioning — about as much as solar power does, which is about 4 to 5 percent as much as a natural gas-fired power plant. Nuclear power releases less radiation into the environment than any other major energy source. Second, nuclear power plants operate at much higher capacity factors than renewable energy sources or fossil fuels. Capacity factor is a measure of what percentage of the time a power plant actually produces energy. It’s a problem for all intermittent energy sources. **The sun doesn’t always shine, nor the wind always blow, nor water always fall through the turbines of a dam. In the United States in 2016, nuclear power plants, which generated almost 20 percent of U.S. electricity, had an average capacity factor of 92.3 percent, meaning they operated at full power on 336 out of 365 days per year. (The other 29 days they were taken off the grid for maintenance.) In contrast, U.S. hydroelectric systems delivered power 38.2 percent of the time (138 days per year), wind turbines 34.5 percent of the time (127 days per year) and solar electricity arrays only 25.1 percent of the time (92 days per year). Even plants powered with coal or natural gas only generate electricity about half the time for reasons such as fuel costs and seasonal and nocturnal variations in demand. Nuclear is a clear winner on reliability**. **Third, nuclear power releases less radiation into the environment than any other major energy source.** This statement will seem paradoxical to many readers, since it’s not commonly known that non-nuclear energy sources release any radiation into the environment. They do. **The worst offender is coal, a mineral of the earth’s crust that contains a substantial volume of the radioactive elements uranium and thorium. Burning coal gasifies its organic materials, concentrating its mineral components into the remaining waste, called fly ash.** So much coal is burned in the world and so much fly ash produced that coal is actually the major source of radioactive releases into the environment. Anti-nuclear activists protest the construction of a nuclear power station in Seabrook, New Hampshire in 1977. Anti-nuclear activists protest the construction of a nuclear power station in Seabrook, New Hampshire in 1977. AP PHOTO In the early 1950s, when the U.S. Atomic Energy Commission believed high-grade uranium ores to be in short supply domestically, it considered extracting uranium for nuclear weapons from the abundant U.S. supply of fly ash from coal burning. In 2007, China began exploring such extraction, drawing on a pile of some 5.3 million metric tons of brown-coal fly ash at Xiaolongtang in Yunnan. The Chinese ash averages about 0.4 pounds of triuranium octoxide (U3O8), a uranium compound, per metric ton. Hungary and South Africa are also exploring uranium extraction from coal fly ash. ALSO ON YALE E360 Industry Meltdown: Is the era of nuclear power coming to an end? Read more. **What are nuclear’s downsides? In the public’s perception, there are two, both related to radiation: the risk of accidents, and the question of disposal of nuclear waste.** There have been three large-scale accidents involving nuclear power reactors since the onset of commercial nuclear power in the mid-1950s: Three-Mile Island in Pennsylvania, Chernobyl in Ukraine, and Fukushima in Japan. **Studies indicate even the worst possible accident at a nuclear plant is less destructive than other major industrial accidents**. The partial meltdown of the Three-Mile Island reactor in March 1979, while a disaster for the owners of the Pennsylvania plant, released only a minimal quantity of radiation to the surrounding population. According to the U.S. Nuclear Regulatory Commission: “The approximately 2 million people around TMI-2 during the accident are estimated to have received an average radiation dose of only about 1 millirem above the usual background dose. To put this into context, exposure from a chest X-ray is about 6 millirem and the area’s natural radioactive background dose is about 100-125 millirem per year… In spite of serious damage to the reactor, the actual release had negligible effects on the physical health of individuals or the environment.” The explosion and subsequent burnout of a large graphite-moderated, water-cooled reactor at Chernobyl in 1986 was easily the worst nuclear accident in history. Twenty-nine disaster relief workers died of acute radiation exposure in the immediate aftermath of the accident. In the subsequent three decades, UNSCEAR — the United Nations Scientific Committee on the Effects of Atomic Radiation, composed of senior scientists from 27 member states — has observed and reported at regular intervals on the health effects of the Chernobyl accident. It has identified no long-term health consequences to populations exposed to Chernobyl fallout except for thyroid cancers in residents of Belarus, Ukraine and western Russia who were children or adolescents at the time of the accident, who drank milk contaminated with 131iodine, and who were not evacuated. By 2008, UNSCEAR had attributed some 6,500 excess cases of thyroid cancer in the Chernobyl region to the accident, with 15 deaths. The occurrence of these cancers increased dramatically from 1991 to 1995, which researchers attributed mostly to radiation exposure. No increase occurred in adults. The Diablo Canyon Nuclear Power Plant, located near Avila Beach, California, will be decommissioned starting in 2024. The Diablo Canyon Nuclear Power Plant, located near Avila Beach, California, will be decommissioned starting in 2024. PACIFIC GAS AND ELECTRIC “The average effective doses” of radiation from Chernobyl, UNSCEAR also concluded, “due to both external and internal exposures, received by members of the general public during 1986-2005 [were] about 30 mSv for the evacuees, 1 mSv for the residents of the former Soviet Union, and 0.3 mSv for the populations of the rest of Europe.” A sievert is a measure of radiation exposure, a millisievert is one-one-thousandth of a sievert. A full-body CT scan delivers about 10-30 mSv. A U.S. resident receives an average background radiation dose, exclusive of radon, of about 1 mSv per year. The statistics of Chernobyl irradiations cited here are so low that they must seem intentionally minimized to those who followed the extensive media coverage of the accident and its aftermath. Yet they are the peer-reviewed products of extensive investigation by an international scientific agency of the United Nations. They indicate that even the worst possible accident at a nuclear power plant — the complete meltdown and burnup of its radioactive fuel — was yet far less destructive than other major industrial accidents across the past century. To name only two: Bhopal, in India, where at least 3,800 people died immediately and many thousands more were sickened when 40 tons of methyl isocyanate gas leaked from a pesticide plant; and Henan Province, in China, where at least 26,000 people drowned following the failure of a major hydroelectric dam in a typhoon. “Measured as early deaths per electricity units produced by the Chernobyl facility (9 years of operation, total electricity production of 36 GWe-years, 31 early deaths) yields 0.86 death/GWe-year),” concludes Zbigniew Jaworowski, a physician and former UNSCEAR chairman active during the Chernobyl accident. “This rate is lower than the average fatalities from [accidents involving] a majority of other energy sources. For example, the Chernobyl rate is nine times lower than the death rate from liquefied gas… and 47 times lower than from hydroelectric stations.” Nuclear waste disposal, although a continuing political problem, is not any longer a technological problem. ALSO ON YALE E360 In Fukushima, a bitter legacy of radiation, trauma, and fear. Read more. The accident in Japan at Fukushima Daiichi in March 2011 followed a major earthquake and tsunami. The tsunami flooded out the power supply and cooling systems of three power reactors, causing them to melt down and explode, breaching their confinement. Although 154,000 Japanese citizens were evacuated from a 12-mile exclusion zone around the power station, radiation exposure beyond the station grounds was limited. According to the report submitted to the International Atomic Energy Agency in June 2011: “No harmful health effects were found in 195,345 residents living in the vicinity of the plant who were screened by the end of May 2011. All the 1,080 children tested for thyroid gland exposure showed results within safe limits. By December, government health checks of some 1,700 residents who were evacuated from three municipalities showed that two-thirds received an external radiation dose within the normal international limit of 1 mSv/year, 98 percent were below 5 mSv/year, and 10 people were exposed to more than 10 mSv… [There] was no major public exposure, let alone deaths from radiation.” Nuclear waste disposal, although a continuing political problem in the U.S., is not any longer a technological problem. Most U.S. spent fuel, more than 90 percent of which could be recycled to extend nuclear power production by hundreds of years, is stored at present safely in impenetrable concrete-and-steel dry casks on the grounds of operating reactors, its radiation slowly declining. An activist in March 2017 demanding closure of the Fessenheim Nuclear Power Plant in France. Authorities announced in April that they will close the facility by 2020. An activist in March 2017 demanding closure of the Fessenheim Nuclear Power Plant in France. Authorities announced in April that they will close the facility by 2020. SEBASTIEN BOZON / AFP / GETTY IMAGES The U.S. Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico currently stores low-level and transuranic military waste and could store commercial nuclear waste in a 2-kilometer thick bed of crystalline salt, the remains of an ancient sea. The salt formation extends from southern New Mexico all the way northeast to southwestern Kansas. It could easily accommodate the entire world’s nuclear waste for the next thousand years. Finland is even further advanced in carving out a permanent repository in granite bedrock 400 meters under Olkiluoto, an island in the Baltic Sea off the nation’s west coast. It expects to begin permanent waste storage in 2023. A final complaint against nuclear power is that it costs too much. Whether or not nuclear power costs too much will ultimately be a matter for markets to decide, but there is no question that a full accounting of the external costs of different energy systems would find nuclear cheaper than coal or natural gas. ALSO ON YALE E360 Rocky Flats: A wildlife refuge confronts its radioactive past. Read more. Nuclear power is not the only answer to the world-scale threat of global warming. Renewables have their place; so, at least for leveling the flow of electricity when renewables vary, does natural gas. But nuclear deserves better than the anti-nuclear prejudices and fears that have plagued it. It isn’t the 21st century’s version of the Devil’s excrement. It’s a valuable, even an irreplaceable, part of the solution to the greatest energy threat in the history of humankind. [↑](#endnote-ref-9)
10. GRETCHEN **Knoth**, 6-30-**2015**, "6 ways energy poverty impacts health care," **ONE**, https://www.one.org/us/blog/six-ways-energy-poverty-threatens-health-care-for-the-poorest/

***The ONE Campaign is an international, nonpartisan, non-profit, advocacy and campaigning organization that fights extreme poverty and preventable disease, particularly in Africa, by raising public awareness and pressuring political leaders to support policies and programs that are saving lives and improving futures.***

Access to energy services lengthens the work day for those in the medical profession and allows them to see a greater number of patients in a day. When facilities without electric lighting do see patients after dark, they have to depend on paraffin lamps, candles or torches that provide low-quality light, give off harmful fumes and, in some cases, present a fire hazard. These types of lights are also often more expensive per unit of energy than electric lighting. A women right after giving birth at a health center in Senegal. Photo credit: Jonathan Torgovnik/Images of Empowerment A women right after giving birth at a health center in Senegal. Photo credit: Jonathan Torgovnik/Images of Empowerment 2. Life-saving operations, examinations and procedures cannot be performed without good lighting. Conducting medical examinations, not to mention invasive surgeries or childbirth, with poor lighting unsurprisingly poses additional risk to the patient. In fact, some studies have found that maternal and child mortality can be reduced by up to 70 percent at night with the provision of even minimal lighting and medical devices. 3. Vaccines, blood work and medications are not stored in proper conditions. Vaccines that protect against preventable diseases can lose their effectiveness when they aren’t refrigerated properly. Even when health clinics do have access to power, it is often intermittent, with outages lasting an average of 4.5 hours at a time in Kenya. Indeed, 60 percent of health center refrigerators are thought to have inconsistent power supplies. RELATED: More statistics about energy poverty from Practical Action. 4. Small health facilities cannot communicate with specialists or get patient transportation to other facilities in the case of an emergency. Energy poverty also limits interactions between health care professionals and obstructs the transfer of information and knowledge. Communication technology, such as mobile phones and VHF radios, are necessary to ensure that there is sufficient support during emergencies and enable better treatment decisions by connecting to specialists from referral hospitals. Photo credit: Jonathan Torgovnik/Images of Empowerment Photo credit: Jonathan Torgovnik/Images of Empowerment 5. Health care facilities cannot power laboratory equipment such as ultrasound and X-ray machines as well as incubators. Electricity is especially important in carrying out reliable and rapid diagnostic testing to help prevent medical emergencies before they occur. But even the most routine procedures require medical tools like ultrasounds and X-ray machines that are impossible to use without a reliable power source. For example, access to electricity has had an astounding impact on child survival rates. In 2012 the neonatal mortality rate (the probability of a child dying in the first 28 days after birth) decreased from 40 percent to 28 percent per 1000 births in Kenyan health facilities as a result of powering incubators for newborn babies. 6. **Poor power supply for lighting, cooking and heating leads to the high use of open indoor fires and kerosene lamps**. Both of the energy sources named above are heavily polluting and toxic and globally **[which] contribute to over 4.3 million deaths worldwide**, mainly of women and girls. According to the WHO indoor pollution from biomass cooking is a bigger killer than malaria and HIV/AIDS combined. rsz\_energy\_twitter\_1024x512\_2 Tell Congress to pass the Electrify Africa Act – a bill that will help provide 50 million people with access to electricity for the first time. [↑](#endnote-ref-10)
11. Yasheng **Huang**, 3-24-**2019**, "Why China is most at risk of a belt and road debt trap," **South China Morning Post**, <https://www.scmp.com/comment/insight-opinion/article/3011546/its-belt-and-road-projects-china-risks-falling-biggest-debt>

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But, as John Maynard Keynes memorably put it: “If you owe your bank a hundred pounds, you have a problem. But if you owe your bank a million pounds, it has.” In the context of the belt and road, China may turn out to be the banker who is owed a million pounds. China bets on belt and road to drive the economy forward In particular, **China may fall victim** to the “obsolescing bargain model”, **under which a foreign investor starts to lose bargaining power over time as it invests more in a host country. Infrastructure projects are a classic example, because they are bulky, bolted to the ground and have zero economic value if left incomplete**. Unsurprisingly, some belt and road partner countries are now demanding to renegotiate terms, and typically after the projects have started. China may be forced to offer ever more favourable concessions to keep the projects on track. In mid-April, for example, Malaysia announced that a major belt and road rail project, put on hold by the government after last year’s election, would now go ahead “after renegotiation”. According to media reports, the costs of construction were reduced by as much as one-third. Other belt and road countries will probably also ask for debt forgiveness and write-offs, the costs of which will ultimately be borne by Chinese savers. [↑](#endnote-ref-11)
12. Karen **Gilchrist**, 8-24-**2017**, “China’s ‘Belt and Road’ initiative could be the next risk to the global financial system,” **CNBC**, <https://www.cnbc.com/2017/08/24/chinas-belt-and-road-initiative-could-be-the-next-risk-to-the-global-financial-system.html>

**China[‘s]** has pitched its mammoth, pan-Eurasian “**Belt and Road” infrastructure initiative** as a means of promoting economic prosperity and fostering diplomatic ties on a global scale. That rhetoric may win plaudits at a time when other global powers are voicing increasingly protectionist agendas, but it also comes with risks, and **increasing levels of state-backed funding have raised concerns about just how safe of a gamble it is.** Reports on Tuesday claimed that some of China’s biggest state-owned commercial banks will begin raising capital to fund investments into the initiative, also known as “One Belt, One Road,” which aims to connect more than 60 countries across Asia, Europe and Africa with physical and digital infrastructure. China Construction Bank, the country’s second-largest bank by assets, has been conducting roadshows to raise at least 100 billion yuan ($15 billion) from on- and offshore investors, sources familiar with the matter told Reuters. Bank of China, Industrial and Commercial Bank of China, and Agricultural Bank of China are also said to be raising tens of billions of dollars, though none of the banks responded to Reuters’ request for comment. **The news highlights the risk that the state could amass hundreds of billions of dollars in nonperforming loans if the projects fail.** For Xu Chenggang, professor of economics at Cheung Kong Graduate School of Business in Beijing, it was not a surprise. A risk to China’s banking system is, by default, a risk to the global banking system “It supports my concerns,” Xu told CNBC over the phone. **“The impact could be damaging not just for China, but for the global financial system.” “These loans are being extended to governments in risky countries to fund risky infrastructure projects**. If the projects were launched by private firms we wouldn’t have to worry because they would know they had to bear the consequences. But here we are talking about government-to-government lending and, ultimately, intergovernmental relations.” Xu attributed that issue to a phenomenon known as soft budget constraints. Soft budget constraints refer to the idea that state-owned firms will not be allowed to go bankrupt if they go insolvent because the state has vested interests in keeping them afloat**. A country with high soft budget constraints and a large number of insolvent firms may then struggle for financing, which could have global financial implications. For a country like China, where state-ownership has historically been high, this is a matter of particular concern.** It took decades of economic reforms and loss-making firms before it succeeded in what Xu termed a process of “quiet privatization” at the turn of the 21st century. However, the process has lost momentum over the past 10 years, and the state remains burdened with issues of overcapacity and myriad “zombie firms,” especially within the metals and construction and materials sectors. Xu said that has partially been the motivation for the “Belt and Road” initiative: “Instead of solving the overcapacity problems, they are expanding the problem to projects overseas.” “They (China) are proposing lending money to foreign governments, who will then use the Chinese funds to pay the Chinese companies,” he explained. China’s debt to gross domestic product (GDP) ratio surpassed 300 percent in June, according to the Institute for International Finance. And that’s before the extension of further loans. “**Expansion of these soft budget constraints at such an unprecedented rate and in such a large scale is going to generate unprecedented consequences,**” Xu noted. Crucially, the countries tied to the “Belt and Road” initiative are some of the riskiest developing countries in the world. A number of research bodies are now risk assessing the political, economic and business landscapes of the involved nations. **“There is no doubt in my mind that there will be a large number of projects that will have unforeseen problems,”** Bjorn Conrad, vice president at the Mercator Institute for China Studies, told CNBC. “**There are considerable risks of nonperforming credit in many of these projects and high risks of default.” “A risk to China’s banking system is, by default, a risk to the global banking system**,” he continued. However, he noted that the government would be working hard to assess risks after it was badly burned by lending to volatile countries such as Venezuela. China’s National Development and Reform Commission announced last week that it would strengthen regulation to reduce risk for domestic firms investing overseas and prevent “irrational” investment in the “Belt and Road” initiative. “**There will be an enormous amount of loans to give out, on a different scale to ever before**, but also an awareness that they (the Chinese government) have to keep these at a manageable scale,” Conrad said. “There will still be risks, but an understanding that they have to be managed with more scrutiny.” [↑](#endnote-ref-12)
13. In the trade-off between financial stability and growth, China is likely to continue to favour the latter. And when the bubble does eventually burst, while the Chinese financial system is relatively insulated, some parts of the the world will feel the effects. Indeed, the UK, as host to the Hong Kong and Shanghai Banking Corporation (HSBC), is more exposed than almost any other economy. But **the main impact of any crisis in China would be the global chain reaction it sets off, because it is the engine of growth for so many other economies. Coupled with a US recession** – an eventuality that most analysts consider likely over the next three years – **events in China could lead to a new global downturn.** As Adam Tooze, the economic historian and author of Crashed, told me: “The hopes of the West continue to rest on Beijing pulling off a stunning exercise in macroeconomic juggling while Donald Trump hurls knives at them.” \*\*\*\* The second economic trend to worry about is monetary tightening. After the 2008 crash, interest rates were reduced to record lows, while central banks sought to boost demand through QE; $10trn of new money was injected into the global financial system by purchasing government bonds. But this year may herald the end of the post-crash decade of easy money as interest rates are increased across the world and QE is unwound. [↑](#endnote-ref-13)
14. Harry Bradford, 4-5-2013, "Three Times The Population Of The U.S. Is At Risk Of Falling Into Poverty," HuffPost, <span class="skimlinks-unlinked">https://www.huffpost.com/entry/global-poverty-900-million-economic-shock\_n\_3022420</span>

Hundreds of millions of people worldwide are on the brink of poverty. **A recent study by the International Monetary Fund warns that as many as 900 million people could fall back into poverty in the event of an economic shock like the Great Recession**. That figure is three times the size of the U.S. population. According to the World Bank, 1.2 billion people are currently living on less than $1.25 a day. While the report acknowledges that progress has been to made to reduce global poverty and strengthen the world economy following the financial crisis, the world is still in a vulnerable situation. Global unemployment, for example, is the highest it’s been in two decades with 40 percent of the world’s population out of work, according to the report. And things could get much worse in the event of a macroeconomic shock, of which the Europe and U.S. are dangerously close. The recent bailout of Cyprus threw the eurozone into chaos, igniting fears that the situation could lead to the next financial crisis. Here in the U.S., a series of automatic spending cuts know as the sequester could cost the economy hundreds of thousands of jobs. The cuts have already threatened the stability of safety nets designed to aid the nation’s poorest.. [↑](#endnote-ref-14)
15. No Author, 4-30-**2019**, "China’s Belt and Road Initiative: Why the Price Is Too High," **Wharton School at University of Pennsylvania**, <https://knowledge.wharton.upenn.edu/article/chinas-belt-and-road-initiative-why-the-price-is-too-high/>

Venezuela was another wakeup call. China had struck a series of oil-for-loans agreements with Venezuela in 2007, but “a political crisis in that country … is threatening China’s payout and drawing Beijing into a proxy standoff as it supports a Venezuelan leader the U.S. is intent on toppling (Nicolas Maduro, Venezuela’s president),” according to a Wall Street Journal report. Venezuela owes Beijing around $20 billion, according to estimates by China’s Commerce Ministry, the report added. Along with the debt piling up at BRI beneficiary countries, China, too, is facing constraints in investing in the projects. China’s plan was to use at least $400 billion in funding from government-run banks, but the program has ballooned beyond infrastructure construction. “**BRI lending by major [Chinese]banks has dropped by 89% since 2015, and lending by commercial banks — who are dealing with their own financial issues domestically — has ceased almost entirely**,” according to a report last August by The Jamestown Foundation**. “Policy banks have also scaled back, despite their status as arms of government policy.”** “It appears that China is extending its influence economically and even militarily way beyond its national borders and beyond its traditional peripheral tributary states.” –Marshall W. Meyer Growing Security Concerns Another increasing concern – raised especially by the U.S. — is the potential use of the BRI as a vehicle to extend China’s military presence beyond permissible limits. “It appears that China is extending its influence economically and even militarily way beyond its national borders and beyond its traditional peripheral tributary states,” said Meyer. Many Americans fear that the Belt and Road Initiative is an extension of efforts by the Chinese Communist Party (CCP) to undermine the security and economic architecture of the international order, according to an article last December in Foreign Policy magazine titled “One Belt, One Road, One Big Mistake.” [↑](#endnote-ref-15)
16. Nyshka **Chandran**, 1-18-**2019**, “Fears of excessive debt drive more countries to cut down their Belt and Road investments,” **CNBC**, https://www.cnbc.com/2019/01/18/countries-are-reducing-belt-and-road-investments-over-financing-fears.html

The worries among BRI countries aren’t surprising given the numerous warnings of sovereign debt risks — the Center for Global Development last year said 23 countries faced high risks of debt distress. Fears are also rampant that the Belt and Road project may be running out of money. Private investment remains limited and even with capital from international institutions such as the Asian Infrastructure Investment Bank, **the BRI faces a funding gap of up to $500 billion a year**, Wang Yiming, deputy head of the Development Research Centre of China’s State Council, said in April. [↑](#endnote-ref-16)
17. **European Investment Bank**, 1-17-**2018**, "EU bank tackles investment gaps in innovation and development," https://www.eib.org/en/press/all/2018-006-eu-bank-tackles-investment-gaps-in-innovation-and-development

“Since its establishment in 1958 **the EU bank**, which celebrates its 60th anniversary this year, has **invested over one trillion euros** based on a cash contribution by the Member States of just 14 billion euros,” European Investment Bank President Werner Hoyer said today. “**It is an excellent deal for Europeans.** **That** trillion **attracted other investment from the private sector, generating total investment of over three trillion euros.** All this money went into making Europe more open, competitive, cohesive and fair, and into doing our part in global development over the decades”, stated Hoyer at the EIB Group’s annual press conference in Brussels. “60 years after it was founded, the EU bank’s mission to invest in viable projects across Europe and across the world, focusing on where investment is most needed, is more relevant than ever. But we are not complacent and continuously work to increase our impact”, he added. The EU bank also continuously works to improve its governance. This week, the first Gender Action Plan was approved. It reflects the EIB Group’s commitment to supporting the rights of girls and women and their financial inclusion in the EIB’s activities in Europe and beyond. In 2017, **the EU bank**: approved a record number of 901 projects, supporting small and medium-sized companies, fostering innovation, protecting the environment and **helping to build crucial infrastructure; provided 78.16 billion euros** to help deliver on EU policy goals in Europe and worldwide**, supporting total investment of around 250 billion euros by crowding in private capital.** [↑](#endnote-ref-17)
18. **European Investment Bank**, 1-17-**2018**, "EU bank tackles investment gaps in innovation and development," <https://www.eib.org/en/press/all/2018-006-eu-bank-tackles-investment-gaps-in-innovation-and-development>

Development finance can benefit from a similar paradigm shift from grants and subsidies to loans and guarantees. **The EIB has unique experience in crowding in private investmen [as they]**“We **have** begun **discussions with [their]** our **shareholders, the EU Member States, and the European Commission on bundling our development finance activities into a dedicated structure within the Group to deliver EU development policy more efficiently**”, President Hoyer said. “We want to enhance our impact and make sure we get better at partnering with others”. President Hoyer said. “**There isn’t enough public money in the world to address global development challenges. Catalysing private investments is the only way to finance the achievement of the Sustainable Development Goals**,” he added. “Multilateralism has been criticised and attacked recently. The EU bank remains committed to international and multilateral cooperation. No-one is stronger alone. In an interconnected world, it is absurd to think that we can achieve success in delivering global development and prosperity if we don’t work together”, he added. The EU bank is already one of the largest multilateral development banks: in 2017, it invested almost eight billion euros, a tenth of its financing volume, in projects outside of the EU. Tackling climate change Two focus areas of its investment outside the EU are climate change and economic resilience. The EU bank is the biggest single multilateral financier of projects to fight climate change and mitigate the effects of this man-made global threat. In 2017, it invested 19 billion euros for this cause, more than 27 percent of its total financing. It stands by its pledge to invest 100 billion euros in this area over the period 2016-2020. [↑](#endnote-ref-18)
19. **European Investment Bank**, 5-15-**2017**, "China: EIB confirms support for Belt and Road initiative," <https://www.eib.org/en/press/all/2017-119-eib-confirms-support-for-belt-and-road-initiative.htm>

Reflecting the European Investment Bank’s experience gained across 160 countries worldwide it is expected that projects supported under the Belt and Road initiative will include support for both sustainable and inclusive investment across a range of sectors and that schemes are strengthened through open competition. The European Investment Bank has financed projects in China since 1995 and last year **the European Investment Bank Group provided EUR 84 billion to finance new investment** around the world, including EUR 19.6 billion for climate related investment. [↑](#endnote-ref-19)
20. Lexico Dictionaries English, xx-xx-xxxx, "Definition of Join”, **Oxford University**, <https://www.lexico.com/en/definition/join>

Take part in. ‘I joined the demonstration’ no object ‘I joined in and sang along’

Support (someone) in an activity. ‘I am sure you will join me in wishing him every success’ [↑](#endnote-ref-20)
21. No Author, 12-11-**2018**, "European bank loan for Slovak investments," **World Nuclear News**, https://www.world-nuclear-news.org/Articles/European-bank-loan-for-Slovakia-investments

Construction of two further units at Mochovce - of an evolutionary design based on the VVER-440 V-213 pressurised water reactor with safety upgrades that make the units compliant with current national and international nuclear safety standards - resumed in 2008 after a 16-year hiatus. Mochovce unit 3 is currently expected to start up in 2019 and unit 4 in 2020. **The EIB is the EU's bank, and is owned by and represents the interests of the EU Member States. It works with other EU institutions to implement EU policy, and provides finance and expertise for sustainable investment projects that contribute to EU policy objectives.** [↑](#endnote-ref-21)
22. Danielle **Renwick**, 10-5-**2016**, "Can Malaria Be Eradicated?," **Council on Foreign Relations**, https://www.cfr.org/backgrounder/can-malaria-be-eradicated

Malaria, a mosquito-borne illness, is one of the world’s deadliest infectious diseases. More than two hundred million people contract the disease each year, and more than four hundred thousand die from it. Once transmitted in nearly every country on earth, today the vast majority of infections occur in sub-Saharan Africa. Nearly 70 percent of malaria deaths are in children under five. More From Our Experts Jendayi E. Frazer What to Expect at the U.S.-Africa Summit The number of people who die from malaria each year has fallen by more than half since 2000, and many scientists, policymakers, and philanthropists say eradication is in sight. The Bill & Melinda Gates Foundation has committed nearly $2 billion to antimalaria efforts, and Bill Gates has said he believes the disease can be wiped out by 2040. In 2015, the United Nations and Gates Foundation issued a road map to eradicating the disease that calls on world leaders to increase funding to public-health efforts. More on: Sub-Saharan Africa Public Health Threats and Pandemics Despite these ambitious targets, **weak health systems and drug and insecticide resistance hobble efforts to diagnose, treat, and control the disease.** Climate change and increased migration have further complicated efforts to combat mosquito-borne illnesses. But **some experts say the most significant challenge will be maintaining funding and political will to eradicate the disease**. What is malaria? Malaria is caused by Plasmodium parasites. P. falciparum, the most common form of malarial parasite in sub-Saharan Africa, is responsible for the most deaths worldwide; P. vivax is the most common malarial parasite outside of sub-Saharan Africa. References to the disease date back to the fifth century BCE in Greece, although scientists only discovered that the disease is transmitted by mosquitoes in the late nineteenth century. Plasmodium parasites are transmitted to humans through female Anopheles mosquitoes. The parasites travel through the infected person’s blood to the liver, where they grow, multiply, and then spread throughout the body’s red blood cells, destroying them in the process. Individuals with weaker immune systems, particularly children under five, are the most vulnerable. Pregnant women are also at high risk for becoming sick and passing the disease to the fetus (the parasites take hold in the nonimmune placenta), and malaria contracted during pregnancy is thought to contribute to low birth weights that result in a hundred thousand infant deaths each year. Symptoms range widely, often depending on the individual’s previous exposure to the parasite. (Most people develop some immunity to the parasite with repeated exposure.) Most people experience just mild symptoms, which can include chills, fever, or headache. Severe infections can cause organ failure, seizures, coma, or death. Symptoms last between a few hours and several months, and the P. vivax parasite can remain dormant in the host’s liver for years, causing relapses. [↑](#endnote-ref-22)
23. Dr Pedro **Alonso**, xx-xx-**2016**, " ELIMINATING MALARIA," **World Health Organization**, <https://apps.who.int/iris/bitstream/handle/10665/205565/WHO_HTM_GMP_2016.3_eng.pdf?sequence=1>

To address remaining challenges, the World Health Assembly adopted in 2015 the Global Technical Strategy for Malaria 2016-2030 (GTS), a 15-year blueprint for malaria control and elimination. This WHO-led strategy is complemented by the advocacy plan Action and Investment to Defeat Malaria 2016- 2030 (AIM), developed by the Roll Back Malaria Partnership. Both documents share the same timeline as the 2030 Sustainable Development Goals. The objectives of the Global Technical Strategy can be achieved only through robust, **predictable and long-term financing: global investment will need to triple from current levels, reaching an estimated US$ 8.7 billion annually by 2030. Progress can be accelerated through strong and sustained political commitment, increased multi-sectoral collaboration and continued investment in the development of new malaria control tools.** [↑](#endnote-ref-23)
24. Dr Pedro **Alonso**, xx-xx-**2016**, " ELIMINATING MALARIA," **World Health Organization**, <https://apps.who.int/iris/bitstream/handle/10665/205565/WHO_HTM_GMP_2016.3_eng.pdf?sequence=1>

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25. Josephine **Ma**, 8-07-**2019**, "The Chinese medical clinic in Pakistan on the belt and road security front line," **South China Morning Post**, <https://www.scmp.com/news/china/diplomacy/article/3007059/dominance-or-development-whats-end-chinas-new-silk-road>

 [↑](#endnote-ref-25)
26. Bate and Porter April 23, 2009 | American Enterprise Institute

<http://www.aei.org/publication/the-problems-and-potential-of-chinas-pharmaceutical-industry/>

The identity of the company remained unknown until September 11, 2008, when a Chinese journalist, frustrated by the government’s inaction, revealed it in a blog post. Nearly three months later, officials announced that five times more children had taken ill than originally reported.[14] When Zhao Lianhai, a former employee of the Chinese Food Safety Board whose son was sickened by the tainted milk, tried to hold a press conference to lobby for more compensation for the victims, Beijing authorities told him that negotiation was possible–but only if he stopped publicizing the scandal.[15] In another instance, when the deadly additive diethylene glycol was discovered in Chinese-produced toothpaste in Panama in 2007, China defended its manufacturers at first by saying that the substance was commonly used as a thickening agent and caused no health problems among Chinese consumers.[16] Official government **data suggest that the percentage of substandard drugs circulating in China’s market is small.** Between March and August 2006, the Chinese State Food and Drug Administration (SFDA) screened **110,426 batches of antimalarial pharmaceutical drugs in mobile labs and found that only 2.8 percent contained counterfeit or substandard drugs.** Zhong-Yuan Yang, the former head of the Guangzhou Municipal Institute for Drug Control, a division of the local SFDA, reports that approximately 0.5 percent of all medicines in China are counterfeit, depending on the sampling venue.[17] But these figures differ markedly from other independent reports, do not differentiate between “counterfeit” and “substandard” drugs,[18] and mask regional and product-specific differences.[19] In 2002, the Shanghai Drug Administration Bureau found that 12.2 percent of the 14,980 drugs it inspected were below quality standards.[20] Jin Shaohong, director of China’s National Institute for the Control of Pharmaceutical and Biological Products, says that his research suggests that less than 10 percent of drugs are substandard.[21] Gao Jingde, acclaimed by the Chinese media as China’s foremost leader in the fight against counterfeit and substandard medicine, claims that his own studies since 2004 have revealed that two-thirds of Chinese drugstores sell counterfeit medicine.[22] Estimating the precise size of the problem is difficult, given the lack of reliable data. But with a pharmaceutical market valued at $86 billion, even the most conservative estimates suggest that there is between $450 million and $7.2 billion worth of poor-quality drugs circulating in the country.[23] [↑](#endnote-ref-26)
27. David **Biello**, 12-12-**2013**, "How Nuclear Power Can Stop Global Warming," **Scientific American**, https://www.scientificamerican.com/article/how-nuclear-power-can-stop-global-warming/

And that's why Hansen, among others, such as former Secretary of Energy Steven Chu, thinks that nuclear power is a key energy technology to fend off catastrophic climate change. "We can't burn all these fossil fuels," Hansen told a group of reporters on December 3, noting that as long as fossil fuels are the cheapest energy source they will continue to be burned. "Coal is almost half the [global] emissions. If you replace these power plants with modern, safe nuclear reactors you could do a lot of [pollution reduction] quickly." Indeed, he has evidence: **the speediest drop in greenhouse gas pollution on record occurred in France in the 1970s and ‘80s, when that country transitioned from burning fossil fuels to nuclear fission for electricity**, lowering its greenhouse emissions by roughly 2 percent per year. The world needs to drop its global warming pollution by 6 percent annually to avoid "dangerous" climate change in the estimation of Hansen and his co-authors in a recent paper in PLoS One. "On a global scale, it's hard to see how we could conceivably accomplish this without nuclear," added economist and co-author Jeffrey Sachs, director of the Earth Institute at Columbia University, where Hansen works. The Clean Energy Wars Read more from this special report: The Clean Energy Wars The only problem: the world is not building so many nuclear reactors. Nuclear future China leads the world in new nuclear reactors, with 29 currently under construction and another 59 proposed, according to the World Nuclear Association. And China has not confined itself solely to the typical reactors that employ water and uranium fuel rods; it has built everything from heavy-water reactors originally designed in Canada to a small test fast-reactor. [↑](#endnote-ref-27)
28. No Author, xx-xx-**2009**, "Nuclear Energy and Addressing Climate Change," **Stanford University**, <http://large.stanford.edu/courses/2015/ph241/thorne1/docs/addressing-climate-change.pdf>

Unlike the combustion of fossil fuels, the process of nuclear fission does not produce any CO 2 or other GHGs. However, **some indirect emissions can be attributed to nuclear energy, principally due to the use of fossil fuel-based energy sources in the various steps of the nuclear fuel cycle, such as uranium mining and enrichment.** Energy used in these steps varies significantly from case to case. For example, **underground conventional mining uses more energy than in-situ leach mining techniques**, where liquid is pumped through boreholes in the ore to extract uranium in solution, avoiding the need to extract ore. If there is greater use of nuclear power in the future, lower grade uranium resources might become more economic, which could lead to somewhat higher energy use. **However, low-energy, in-situ mining techniques are also becoming more widespread, and increased uranium exploration could result in additional higher grade resources becoming available**. As more energyintensive gaseous diffusion plants, used for uranium enrichment, are phased out over the next few years, energy use will decrease. And as the use of fossil fuels in the electricity sector is reduced, indirect emissions from nuclear will also fall. Figure 1. Direct and indirect greenhouse gas emissions for alternative electricity generation systems LIGNITE with FGD, high with FGD, low COAL with FGD, high with FGD, low with CCS HEAVY FUEL OIL low NOx combined cycle NATURAL GAS CC high low with SCR with CCS PHOTOVOLTAIC high low HYDRO high low BIOMASS high low WIND oﬀshore, high oﬀshore, low onshore, high onshore, low NUCLEAR high low Direct emissions Indirect emissions FGD: ﬂue gas desulphurisation CC: combined cycle CCS: carbon capture and storage SCR: selective catalytic reduction 0 100 200 300 400 500 600 700 800 900 1 000 1 100 1 200 1 300 1 400 Tonnes CO 2 eq./GWh Source: Mitigation of Climate Change, Intergovernmental Panel on Climate Change, 2007. Figure 1 compares the GHG emissions per unit of electricity generated from various full life cycle electricity generation chains averaged across several European countries. This shows that lignite and coal have the highest GHG emissions, with natural gas having the lowest emissions among fossil systems. The indirect emissions of nuclear and renewable energy chains are at least an order of magnitude below the emissions of fossil chains. [↑](#endnote-ref-28)
29. Richard **Rhodes**, 7-19-**2018**, "Why Nuclear Power Must Be Part of the Energy Solution," **Yale University**, https://e360.yale.edu/features/why-nuclear-power-must-be-part-of-the-energy-solution-environmentalists-climate

For too many environmentalists concerned with global warming, nuclear energy is today’s Devil’s excrement. They condemn it for its production and use of radioactive fuels and for the supposed problem of disposing of its waste. In my judgment, their condemnation of this efficient, low-carbon source of baseload energy is misplaced. Far from being the Devil’s excrement, nuclear power can be, and should be, one major component of our rescue from a hotter, more meteorologically destructive world. Like all energy sources, **nuclear power** has advantages and disadvantages. What are nuclear power’s benefits? First and foremost, since it **produces energy via nuclear fission rather than chemical burning, it generates baseload electricity with no output of carbon**, the villainous element of global warming. Switching from coal to natural gas is a step toward decarbonizing, since burning natural gas produces about half the carbon dioxide of burning coal. But switching from coal to **nuclear power is radically decarbonizing, since nuclear power plants release greenhouse gases only from the ancillary use of fossil fuels during their construction, mining, fuel processing, maintenance, and decommissioning — about as much as solar power does, which is about 4 to 5 percent as much as a natural gas-fired power plant.** Nuclear power releases less radiation into the environment than any other major energy source. Second, nuclear power plants operate at much higher capacity factors than renewable energy sources or fossil fuels. Capacity factor is a measure of what percentage of the time a power plant actually produces energy. It’s a problem for all intermittent energy sources. The sun doesn’t always shine, nor the wind always blow, nor water always fall through the turbines of a dam. [↑](#endnote-ref-29)
30. Richard **Rhodes**, 7-19-**2018**, "Why Nuclear Power Must Be Part of the Energy Solution," **Yale University**, <https://e360.yale.edu/features/why-nuclear-power-must-be-part-of-the-energy-solution-environmentalists-climate>

“No harmful health effects were found in 195,345 residents living in the vicinity of the plant who were screened by the end of May 2011. All the 1,080 children tested for thyroid gland exposure showed results within safe limits. By December, government health checks of some 1,700 residents who were evacuated from three municipalities showed that two-thirds received an external radiation dose within the normal international limit of 1 mSv/year, 98 percent were below 5 mSv/year, and 10 people were exposed to more than 10 mSv… [There] was no major public exposure, let alone deaths from radiation.” **Nuclear waste disposal**, although a continuing political problem in the U.S., is not any longer a technological problem. Most U.S. spent fuel, more than 90 percent of which **could be recycled to extend nuclear power production by hundreds of years, is stored at present safely in impenetrable concrete-and-steel dry casks on the grounds of operating reactors**, its radiation slowly declining. An activist in March 2017 demanding closure of the Fessenheim Nuclear Power Plant in France. Authorities announced in April that they will close the facility by 2020. An activist in March 2017 demanding closure of the Fessenheim Nuclear Power Plant in France. Authorities announced in April that they will close the facility by 2020. SEBASTIEN BOZON / AFP / GETTY IMAGES The U.S. Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico currently stores low-level and transuranic military waste and could store commercial nuclear waste in a 2-kilometer thick bed of crystalline salt, the remains of an ancient sea. The salt formation extends from southern New Mexico all the way northeast to southwestern Kansas. It could easily accommodate the entire world’s nuclear waste for the next thousand years. Finland is even further advanced in carving out a permanent repository in granite bedrock 400 meters under Olkiluoto, an island in the Baltic Sea off the nation’s west coast. It expects to begin permanent waste storage in 2023. A final complaint against nuclear power is that it costs too much. Whether or not nuclear power costs too much will ultimately be a matter for markets to decide, but there is no question that a full accounting of the external costs of different energy systems would find nuclear cheaper than coal or natural gas. ALSO ON YALE E360 Rocky Flats: A wildlife refuge confronts its radioactive past. Read more. Nuclear power is not the only answer to the world-scale threat of global warming. Renewables have their place; so, at least for leveling the flow of electricity when renewables vary, does natural gas. But nuclear deserves better than the anti-nuclear prejudices and fears that have plagued it. It isn’t the 21st century’s version of the Devil’s excrement. It’s a valuable, even an irreplaceable, part of the solution to the greatest energy threat in the history of humankind. [↑](#endnote-ref-30)
31. Jordan **Wilkerson**, 8-25-**2016**, "Reconsidering the Risks of Nuclear Power," **Harvard University**, http://sitn.hms.harvard.edu/flash/2016/reconsidering-risks-nuclear-power/

Natural gas has a lower output at 490 g CO2eq/kWh. Nuclear power, though? A mere 16 g CO2/kWh. This is the lowest of all commercial baseload energy sources (see Figure 2). Figure 2: The amount of greenhouse gases emitted from each energy source is shown above. Notice that, unsurprisingly, sources that don’t use carbon-based fuel release the least amount of CO2. Figure 2: The amount of greenhouse gases emitted from each energy source is shown above. Notice that, unsurprisingly, sources that don’t use carbon-based fuel release the least amount of CO2. The Problems with Nuclear Energy Nuclear energy isn’t all good news, though. The Fukushima Nuclear Disaster is the latest testament to that. This disaster was a consequence of the combination of a tsunami and a powerful earthquake in March 2011. Although the chain fissile reactions were shut down automatically in response to the earthquake, the tsunami damaged generators responsible for cooling the reactors of the plant. Without cooling, the components of the core of the reactors can literally melt from all the energy released from these reactions. In this case, they did. Radioactive material was subsequently released along with several chemical explosions, which were initiated by the immense heat released by the nuclear reactions. Why is radioactive material dangerous? To start with, to be radioactive refers to the fact that this material is actively emitting radiation. This is not the same kind of radiation we’re familiar with such as visible electromagnetic radiation from a light bulb. Electromagnetic radiation emitted as a result of nuclear fission, known as gamma rays, has 100,000 times more energy than visible light. Radioactive material can also emit highly energetic electrons (beta particles) and small clusters of protons and neutrons (alpha particles). This concentrated energy causes the molecules in our body to react in ways that can be extremely damaging, sometimes giving rise to cancer. Radioactivity isn’t just a characteristic of the material being used in the nuclear reactor. Even in the absence of a nuclear accident, nuclear power inevitably produces dangerous materials: radioactive waste. This waste, composed of mostly unconverted uranium along with intermediate products plutonium and curium, stays radioactive for extremely long periods, too, presenting a major problem in regards to storage. Putting Nuclear Power in Perspective There is no doubt that nuclear power has problems that can cost human lives, but such risks are borne by all major modes of energy production. Therefore, the question shouldn’t be, ‘is nuclear energy deadly?’ Instead, we should ask ‘is nuclear energy more dangerous than other energy sources?’ Fossil fuels have a host of problems themselves. The byproducts from burning fossil fuels are toxic pollutants that produce ozone, toxic organic aerosols, particulate matter, and heavy metals. The World Health Organization has stated the urban air pollution, which is a mixture of all of the chemicals just described, causes 7 million deaths annually or about 1 in 8 of total deaths. Furthermore, **coal power plants release more radioactive material per kWh into the environment in the form of coal ash than does waste from a nuclear power plant under standard shielding protocols**. This means that, under normal operations, the radioactive waste problem associated with one of the most mainstream energy sources in use actually exceeds that from nuclear energy. In fact, on a per kWh of energy produced basis, both the European Union and the Paul Scherrer Institute, the largest Swiss national research institute, found an interesting trend regarding the fatalities attributable to each energy source. Remarkably, **nuclear power is the benchmark to beat, outranking coal, oil, gas, and even wind by a slight margin as the least deadly major energy resource in application** (see Figure 3). Figure 3: **The figure is based on estimates from Europe Union, which account for immediate deaths from accidents and projected deaths from exposure to pollutants.** These estimates do not incorporate fatality rates in countries such as China where cheap coal combined with poor regulation are causes of considerably more fatalities. Figure 3: The figure is based on estimates from Europe Union, which account for immediate deaths from accidents and projected deaths from exposure to pollutants. These estimates do not incorporate fatality rates in countries such as China where cheap coal combined with poor regulation are causes of considerably more fatalities. The nuclear industry is constantly developing innovative technologies and protocols towards making the energy production process failsafe. **Newer generations of nuclear reactors, particularly what is called a pebble-bed reactor, are designed so that the nuclear chain reaction cannot run away and cause a meltdown – even in the event of complete failure of the reactor’s machinery.** Geological stability considerations will also likely play a bigger role in approving new sites of construction. And although long-lived nuclear waste may remain dangerous for considerable periods of time, that timescale is not prohibitive. In fact, even without recycling the fuel, which would further shorten the lifetime of radioactive waste, the radioactivity of the waste is reduced to around 0.1% of the initial value after about 40-50 years. The primary proposal for long-term storage of nuclear waste is burial in very carefully selected deep geological repositories. Yucca Mountain in Nevada was once a promising candidate, though this option was shut down in 2011 due to strictly political reasons. There is now only one deep waste repository in the US: the Waste Isolation Pilot Plant in New Mexico. However, this plant itself has faced some problems that highlight the need to research better alternatives for the Yucca Mountain repository. Unfortunately, the same sentiments that inspired closure of the Yucca Mountain repository have also inspired reducing research funding and preventing investigations of other potential geological locations. Finding a replacement for the Yucca Mountain repository is possible, but this requires greater cooperation between researchers and policy makers than is currently taking place. Dangers associated with nuclear power are, in many ways, different from the dangers we face from other methods of getting energy. This might explain why fear of nuclear power persists and why the above fatality rates may surprise you. However, we know that nuclear energy does not produce the greenhouse gases that fossil fuels have been producing for over a century. Research also concludes that the more familiar dangers from using fossil fuels claim far more lives. Furthermore, with the advent of modern reactors such as the pebble-bed reactor and careful selection of plant sites, nuclear accidents like the one in Fukushima are actually not possible. When balanced with these notable benefits, the problems associated with nuclear power do not justify its immediate dismissal as a potential energy source for the world. [↑](#endnote-ref-31)
32. ***The Lancet is a weekly peer-reviewed general medical journal. ... The journal publishes original research articles, review articles***

**Jameson** **and Summers**, December 3, 20**13** <http://globalhealth2035.org/sites/default/files/report/global-health-2035.pdf>

Researchers Discover Powerful Cure for Poverty and Inequality –**If you could only do one thing to reduce poverty and inequity around the world**, say experts in global development, **the best thing you could do is reduce the disproportionate burden of disease on those living in the poorest communities. Improving health**, according to a relatively new and perhaps still under-appreciated report written by a blue-ribbon panel, **remains the most powerful tool for improving lives and reducing extreme poverty worldwide**. But it’s still a woefully underused tool that, as Humanosphere will report on tomorrow, is actually losing ground on the anti-poverty agenda even as the evidence of its import swells. Dean Jamison Dean Jamison “We have an unprecedented opportunity, unlike any time before in human history, to significantly reduce the level of inequity in the world,” said Dean Jamison, a health policy expert at the University of Washington and, with Harvard University’s Lawrence Summers, one of the lead authors of the report, dubbed Global Health 2035. [↑](#endnote-ref-32)
33. Lauren Z. **Asher**, Law Student, Cardozo **Journal of International and Comparative** Law, Spring, 2001, 9 Cardozo J. Int'l & Comp. L. 135, p. 135

The spread of infectious disease is surging and as it spreads, the need for international regulation also expands. **Throughout history epidemics have been responsible for millions of deaths and the number will undoubtedly rise, due in part to the increasing ease and speed of international travel. Statistically, disease is a more formidable killer than war**, with the power to completely destabilize governments. [↑](#endnote-ref-33)