# 1nc r5 Pen

### 1

#### Their failure to specify an agent is a voting issue – makes mechanism counterplans and agent-based disads impossible – it’s a voter for fairness because the 1AR can spike out of DAs and CPs, which kills clash and nuance. Means stick them with governments implementing the plan – that’s normal means since it’s what the literature assumes and what most disad links are about

### 2

#### Cyber attacks on critical infrstructure are coming now

Underwood 20 [Kimberly Underwood is a reporter on emerging communication technologies, cyberwarfare, the intelligence community, military command operations and weaponry research. “China is Retooling, and Russia Seeks Harm to Critical Infrastructure.” June 24, 2020. https://www.afcea.org/content/china-retooling-and-russia-seeks-harm-critical-infrastructure]

Intelligence leader warns of the mounting threats of cyber espionage, digital attacks and influence operations from adversaries. U.S. adversaries are trying to take control of cyberspace as a medium, resulting in implications to our freedom of maneuver and access in cyberspace, says Brig. Gen. Gregory Gagnon, USAF, director of Intelligence (A2), Headquarters Air Combat Command (ACC), Joint Base Langley-Eustis. Increasing cyberspace activity is coming from China, Russia, Iran and North Korea. “We are seeing it not just in volume, but we are seeing an expansion in the ways that they use cyberspace, whether it is to steal information, whether it is to directly influence our citizens or whether it is to disrupt critical infrastructure,” Gen. Gagnon reports. The general spoke at the AFCEA Tidewater chapter’s recent monthly virtual luncheon. China and Russia continue to pose the greatest espionage and cyber attack threats to the United States, but the intelligence leader anticipates that other adversaries and strategic competitors will also build and integrate cyber espionage, cyber attacks and influence operations into how they conduct business. “Our strategic competitors will increasingly use cyber space capabilities including cyber espionage, cyber attack and continued influence operations to seek political, economic and military advantage over the United States, our allies and our partners,” he said. “This is not an ‘if,’ it is a yes. They are doing it and they will continue.” Gen. Gagnon warned that China in particular is using cyber espionage to collect intelligence, target critical infrastructure and steal intellectual property. It is all part of China’s plan to move from being a regional actor to being seen as a global power. The shift also means a greater role for the adversary’s military. The Chinese military is in the process of transitioning from a defensive, inflexible ground-based force charged with domestic and peripheral security to a joint, highly agile, expeditionary and power projecting arm of Chinese foreign policy, he noted. “What is going on in China is a dynamic revectoring of the objectives and goals of the People's Liberation Army,” Gen. Gagnon said. “This is not a small change. This is a major change in course and direction. They're doing it to be a power projection arm of a Chinese foreign policy that engages both in military diplomacy and operations around the globe, but also in predatory economic activity.” Moreover, China’s military spending in 2018 exceeded $200 billion, an increase of about 300% since 2002, the general stated. And while it is not the $750 billion that the United States government spends every year on military defense, the Chinese funding does not reflect the same level of investment in manpower or healthcare. A good portion of their $200 billion directly funds technology and capabilities. “A big chunk of our budget is not buying kit,” Gen. Gagnon explained. “If you're the CCP [Chinese Communist Party], you don't have the same extensive retirement programs that you have to pay for,” he said. “You don't have this extensive healthcare which you have to provide. So, when you think about $200 billion, think about that buying kit and buying operations. That is significant.” To the industry, Gen. Gagnon warned companies that Beijing will authorize Chinese espionage against key U.S technologies. “Many of your corporations hold this technology,” he stressed. “They are trying to undercut your ability to be profitable by developing those same technologies in China. They are competing against us in the international market. I will tell you that China's persistent cyber espionage threat and their growing tech threat to our core military and critical infrastructure will continue to be persistent. China remains the most active strategic competitor responsible for cyber espionage against corporations and allies.” China, like Russia, is also increasing its information warfare against the United States. “They are becoming more adept at using social media to deliver messages directly to the U.S. population that alter the way we think, the way we behave and the way we decide,” the general observed. The improvement of their cyber attack capabilities and ways to alter information online is intended to shape views inside China, shift the mindset of Chinese people around the world, as well as to try to shape the world’s view, not just of China, but also of the United States. “You are seeing that play out in the pandemic, how people view us around the world,” he offered. “We're also concerned about Chinese intelligence and security services,” the A2 continued. “They use Chinese information technology firms as routine and systemic espionage platforms against the United States and against our allies. Many of you are tracking what is in the news about 5G and Huawei, and that's what we're talking about.” As for Russia, their highly capable operations of cyber espionage, influence and cyber attacks continue to target the United States and its allies. In particular, Russia’s form of integrating cyber espionage attacks and influence operations, or information confrontation, is very effective, Gen. Gagnon emphasized. “If you think about it, they’re generally playing with the weaker hand, so they have been rather brilliant on the international stage in achieving their foreign policy objectives,” he said. In addition, Moscow is staging cyberattack assets to disrupt or damage U.S. military or civilian information systems during the COVID-19 pandemic. “There is activity that they undertake on a day-to-day basis to try to gain a decisive military intelligence,” he stated. “Their security services continue to target our systems, both for U.S. information systems and critical infrastructure, as well as the networks of our NATO and Five-Eye partners. They do it for positional advantage in cyberspace to be able to do the five Ds: deceive, deny, disrupt, degrade and destroy our assets, but also to gain intelligence on how systems are established and set up so that they can maintain attack vectors.” Russia also is targeting U.S. critical infrastructure, the general cautioned. “Russia has the ability to execute cyber attacks in the United States that can generate localized temporary disruptive effects on critical infrastructure, such as disrupting electric distribution networks for at least a few hours.” In fact, he warned, Moscow is mapping out critical infrastructure with the long-term goal of being able to cause “substantial damage.”

#### Megaconstellations function as critical infrastructure that increase resiliency and protect against cyberattacks

Hallex and Cottom 20 [Matthew A. Hallex is a Research Staff Member at the Institute for Defense Analyses. Travis S. Cottom is a Research Associate at the Institute for Defense Analyses. “Proliferated Commercial Satellite Constellations: Implications for National Security.” 2020. https://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-97/jfq-97\_20-29\_Hallex-Cottom.pdf?ver=2020-03-31-130614-940]

While potentially threatening the sustainability of safe orbital operations, new proliferated constellations also offer opportunities for the United States to increase the resilience of its national security space architectures. Increasing the resilience of U.S. national security space architectures has strategic implications beyond the space domain. Adversaries such as China and Russia see U.S. dependence on space as a key vulnerability to exploit during a conflict. Resilient, proliferated satellite constellations support deterrence by denying adversaries the space superiority they believe is necessary to initiate and win a war against the United States.28 Should deterrence fail, these constellations could provide assured space support to U.S. forces in the face of adversary counterspace threats while imposing costs on competitors by rendering their investments in counterspace systems irrelevant. Proliferated constellations can support these goals in four main ways. First, the extreme degree of disaggregation inherent in government and commercial proliferated constellations could make them more resilient to attacks by many adversary counterspace systems. A constellation composed of hundreds or thousands of satellites could withstand losing a relatively large number of them before losing significant capability. Conducting such an attack with kinetic antisatellite weapons—like those China and Russia are developing—would require hundreds of costly weapons to destroy satellites that would be relatively inexpensive to replace. Second, proliferated constellations would be more resilient to adversary electronic warfare. Satellites in LEO can emit signals 1,280 times more powerful than signals from satellites in GEO.29 They JFQ 97, 2nd Quarter 2020 Hallex and Cottom 25 also are faster in the sky than satellites in more distant orbits, which, combined with the planned use of small spot beams for communications proliferated constellations, would shrink the geographic area in which an adversary ground-based jammer could effectively operate, making jammers less effective and easier to geolocate and eliminate.30 Third, even if the United States chooses not to deploy national security proliferated constellations during peacetime, industrial capacity for mass-producing proliferated constellation satellites could be repurposed during a conflict. Just as Ford production lines shifted from automobiles to tanks and aircraft during World War II, one can easily imagine commercial satellite factories building military reconnaissance or communications satellites during a conflict. Fourth, deploying and maintaining constellations of hundreds or thousands of satellites will drive the development of low-cost launches to a much higher rate than is available today. Inexpensive, high-cadence space launch could provide a commercial solution to operationally responsive launch needs of the U.S. Government. In a future where space launches occur weekly or less, the launch capacity needed to augment national security space systems during a crisis or to replace systems lost during a conflict in space would be readily available.31

#### Cyberattacks cause extinction---false warnings, stealing nukes, and introducing vulnerability

Ernest J. Moniz et al. 18, Ernest J. Moniz is the CEO of the Nuclear Threat Initiative, served as the thirteenth United States Secretary of Energy from 2013 to January 2017. Sam Nunn, and Des Browne, September 2018, “Nuclear Weapons in the New Cyber Age,” https://media.nti.org/documents/Cyber\_report\_finalsmall.pdf

The Cyber Threat to Nuclear Weapons and Related Systems

Cyber-based threats target all sectors of society—from the financial sector to the entertainment industry, from department stores to insurance companies. Governments face an even more critical challenge when it comes to cyberattacks on their most critical systems. Attacks on critical infrastructure could have extraordinary consequences, but a successful cyberattack3 on a nuclear weapon or related system—a nuclear weapon, a delivery system, or the related Nuclear Command, Control, and Communications (NC3) systems—could have existential consequences. Cyberattacks could lead to false warnings of attack, interrupt critical communications or access to information, compromise nuclear planning or delivery systems, or even allow an adversary to take control of a nuclear weapon.

Given the level of digitization of U.S. systems and the pace of the evolving cyber threat, one cannot assume that systems with digital components—including nuclear weapons systems—are not or will not be compromised. Among the reasons: nuclear weapons and delivery systems are periodically upgraded, which may include the incorporation of new digital systems or components. Malware could be introduced into digital systems during fabrication, much of which is not performed in secure foundries. In addition, there are a range of external dependencies, such as connections to the electric grid, that are outside the control of defense officials but directly affect nuclear systems. Finally, the possibility always exists that an insider, either purposefully or accidentally, could enable a cybersecurity lapse by introducing malware into a critical system.

Increased use of digital systems may also adversely affect the survivability of nuclear systems. New technologies can enhance reliability and performance, but they can also lead to new vulnerabilities in traditionally survivable systems, such as submarines or mobile missile launchers.4

### 3

#### NASA is preserving resources by leveraging private partnerships

Miriam Kramer 21, author of Space, “NASA's plans for the future hinge on the success of private companies,” Axios, 12-7-2021, https://www.axios.com/nasa-private-spaceflight-plans-5a5710e6-5223-4da3-8c5d-5a712e1d862e.html

The private space players who will drive NASA's plans for the coming decade are declaring themselves and defining the stakes. Why it matters: NASA plans to focus on getting people to Mars and the Moon, and its deep space exploration ambitions hinge on the agency being able to successfully hand over major operations in low-Earth orbit to private companies. The space agency hopes companies will build private space stations that its astronauts can use and to continue to buy space on private rockets for launching its satellites and other payloads to orbit and beyond. NASA's "big experiment" right now is to test where these commercial partnerships work, the Planetary Society's Casey Dreier told Axios. What's happening: Last week, NASA announced it would award multimillion-dollar contracts to three teams of commercial space companies to start designing and building privately operated space stations.

#### Plan forces spending trade-offs that crush effective Earth sciences --- risks catastrophic climate change

Haymet 7 (Tony, Director of the Scripps Institution of Oceanography – University of California, San Diego, Mark Abbott, Dean of the College of Oceanic and Atmospheric Science – Oregon State University, and Jim Luyten, Acting Director – Woods Hole Oceanographic Institution, “The Planet NASA Needs to Explore”, Washington Post, 5-10, [http://www.washingtonpost.com/wp-dyn/content/article/2007/05/09/AR2007050902451.html](http://www.lexis.com/research/retrieve))

Decades ago, a shift in NASA priorities sidelined progress in human space exploration. As momentum gathers to reinvigorate human space missions to the moon and Mars, we risk hurting ourselves, and Earth, in the long run. Our planet -- not the moon or Mars -- is under significant threat from the consequences of rapid climate change. Yet the changing NASA priorities will threaten exploration here at home.

NASA not only launches shuttles and builds space stations, it also builds and operates our nation's satellites that observe and monitor the Earth. These satellites collect crucial global data on winds, ice and oceans. They help us forecast hurricanes, track the loss of Arctic sea ice and the rise of sea levels, and understand and prepare for climate changes.

NASA's budget for science missions has declined 30 percent in the past six years, and that trend is expected to continue. As more dollars are reallocated to prepare for missions back to the moon and Mars, sophisticated new satellites to observe the Earth will be delayed, harming Earth sciences.

The National Academy of Sciences has noted that the Landsat satellite system, which takes important measurements of global vegetation, is in its fourth decade of operation and could fail without a clear plan for continuation. The same is true for the QuikSCAT satellite, which provides critical wind data used in forecasting hurricanes and El Niño effects.

In January, a partnership of university and NASA scientists demonstrated that climate change and higher ocean temperatures were reducing the growth of microscopic plants and animals at the heart of the marine food web.

Their analysis was based on nearly a decade of NASA satellite measurements of ocean color, which unfortunately are at risk of being interrupted for several years.

Sea levels are rising, and the Arctic Ocean may be ice-free in summer. The buildup of carbon dioxide in the oceans threatens to make them more acidic, which may in turn hinder the ability of some types of marine life, including corals, to build their shells and skeletons. We must learn as much as we can to assess these threats and develop solutions.

Satellites provide coverage of vast, remote regions of our planet that would otherwise remain unseen, especially the oceans, which play an important role in climate change. Without accurate data on such fundamentals as sea surface height, temperatures and biomass, as well as glacier heights and snowpack thickness, we will not be able to understand the likelihood of dangers such as more severe hurricanes along the Gulf Coast or more frequent forest fires in the Pacific Northwest.

Climate change is the most critical problem the Earth has ever faced.

Government agencies and the private sector, as well as individual citizens, need to better grasp the risks and potential paths of global climate change. Mitigating these risks and preparing for the effects of warming will require scientific understanding of how our complex planet operates, how it is changing, and how that change will affect the environment and human society.

John F. Kennedy's brilliant call to put a man on the moon by the end of the 1960s set an arbitrary deadline, but the deadline we face today is set by nature. NASA must continue to play a vital role in helping find ways to protect our planet for (and perhaps from) its intelligent life. Exploration of space is a noble quest. But we can't afford to be so starry-eyed that we overlook our own planet.

#### Climate Change Causes Extinction and mass suffering – 12 studies

Ng ’19 [Yew-Kwang; May 2019; Professor of Economics at Nanyang Technology University, Fellow of the Academy of Social Sciences in Australia and Member of the Advisory Board at the Global Priorities Institute at Oxford University, Ph.D. in Economics from Sydney University; Global Policy, “Keynote: Global Extinction and Animal Welfare: Two Priorities for Effective Altruism,” vol. 10, no. 2, p. 258-266; RP]

Catastrophic climate change Though by no means certain, CCC causing global extinction is possible due to interrelated factors of non‐linearity, cascading effects, positive feedbacks, multiplicative factors, critical thresholds and tipping points (e.g. Barnosky and Hadly, [2016](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0005); Belaia et al., [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0008); Buldyrev et al., [2010](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0016); Grainger, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0027); Hansen and Sato, [2012](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0029); IPCC [2014](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0031); Kareiva and Carranza, [2018](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0033); Osmond and Klausmeier, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0056); Rothman, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0066); Schuur et al., [2015](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0069); Sims and Finnoff, [2016](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0072); Van Aalst, [2006](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0079)).[7](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-note-1009_67) A possibly imminent tipping point could be in the form of ‘an abrupt ice sheet collapse [that] could cause a rapid sea level rise’ (Baum et al., [2011](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0006), p. 399). There are many avenues for positive feedback in global warming, including: the replacement of an ice sea by a liquid ocean surface from melting reduces the reflection and increases the absorption of sunlight, leading to faster warming; the drying of forests from warming increases forest fires and the release of more carbon; and higher ocean temperatures may lead to the release of methane trapped under the ocean floor, producing runaway global warming. Though there are also avenues for negative feedback, the scientific consensus is for an overall net positive feedback (Roe and Baker, [2007](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0065)). Thus, the Global Challenges Foundation ([2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0026), p. 25) concludes, ‘The world is currently completely unprepared to envisage, and even less deal with, the consequences of CCC’. The threat of sea‐level rising from global warming is well known, but there are also other likely and more imminent threats to the survivability of mankind and other living things. For example, Sherwood and Huber ([2010](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0071)) emphasize the adaptability limit to climate change due to heat stress from high environmental wet‐bulb temperature. They show that ‘even modest global warming could … expose large fractions of the [world] population to unprecedented heat stress’ p. 9552 and that with substantial global warming, ‘the area of land rendered uninhabitable by heat stress would dwarf that affected by rising sea level’ p. 9555, making extinction much more likely and the relatively moderate damages estimated by most integrated assessment models unreliably low. While imminent extinction is very unlikely and may not come for a long time even under business as usual, the main point is that we cannot rule it out. Annan and Hargreaves ([2011](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0004), pp. 434–435) may be right that there is ‘an upper 95 per cent probability limit for S [temperature increase] … to lie close to 4°C, and certainly well below 6°C’. However, probabilities of 5 per cent, 0.5 per cent, 0.05 per cent or even 0.005 per cent of excessive warming and the resulting extinction probabilities cannot be ruled out and are unacceptable. Even if there is only a 1 per cent probability that there is a time bomb in the airplane, you probably want to change your flight. Extinction of the whole world is more important to avoid by literally a trillion times.

### 4

#### Climate change makes water shortages inevitable – that causes hydro-political conflict escalation which goes nuclear

Jamail 19 [(Dahr, writes for *Truthout* about climate change issues, recipient of the 2008 Martha Gellhorn Prize for Journalism, frequent guest on *Democracy Now!*) “The World Is on the Brink of Widespread Water Wars,” Truth Out, 2/11/2019] JL

Mark’s words should be a call to attention, and a call to action. The plight of farmers in Australia illustrates a larger reality: As planetary temperatures continue to increase and rainfall patterns shift due to human-caused climate disruption, our ability to grow crops and have enough drinking water will become increasingly challenged, and the outlook is only going to worsen.

The most recent United Nations Intergovernmental Panel on Climate Change report warned of increasingly intense droughts and mass water shortages around large swaths of the globe.

But even more conservative organizations have been sounding the alarm. “Water insecurity could multiply the risk of conflict,” warns one of the World Bank’s reports on the issue. “Food price spikes caused by droughts can inflame latent conflicts and drive migration. Where economic growth is impacted by rainfall, episodes of droughts and floods have generated waves of migration and spikes in violence within countries.”

Meanwhile, a study published in the journal Global Environmental Change, looked at how “hydro-political issues” — including tensions and potential conflicts — could play out in countries expected to experience water shortages coupled with high populations and pre-existing geopolitical tensions.

The study warned that these factors could combine to increase the likelihood of water-related tensions — potentially escalating into armed conflict in cross-boundary river basins in places around the world by 74.9 to 95 percent. This means that in some places conflict is practically guaranteed.

These areas include regions situated around primary rivers in Asia and North Africa. Noted rivers include the Tigris and Euphrates, the Indus, the Nile, and the Ganges-Brahmaputra.

Consider the fact that 11 countries share the Nile River basin: Egypt, Burundi, Kenya, Eritrea, Ethiopia, Uganda, Rwanda, Sudan, South Sudan, Tanzania and the Democratic Republic of Congo. All told, more than 300 million people already live in these countries, — a number that is projected to double in the coming decades, while the amount of available water will continue to shrink due to climate change.

For those in the US thinking these potential conflicts will only occur in distant lands — think again. The study also warned of a very high chance of these “hydro-political interactions” in portions of the southwestern US and northern Mexico, around the Colorado River.

Potential tensions are particularly worrisome in India and Pakistan, which are already rivals when it comes to water resources. For now, these two countries have an agreement, albeit a strained one, over the Indus River and the sharing of its water, by way of the 1960 Indus Water Treaty.

However, water claims have been central to their ongoing, burning dispute over the Kashmir region, a flashpoint area there for more than 60 years and counting.

The aforementioned treaty is now more strained than ever, as Pakistan accuses India of limiting its water supply and violating the treaty by placing dams over various rivers that flow from Kashmir into Pakistan.

In fact, a 2018 report from the International Monetary Fund ranked Pakistan third among countries facing severe water shortages. This is largely due to the rapid melting of glaciers in the Himalaya that are the source of much of the water for the Indus.

To provide an idea of how quickly water resources are diminishing in both countries, statistics from Pakistan’s Islamabad Chamber of Commerce and Industry from 2018 show that water availability (per capita in cubic meters per year) shrank from 5,260 in 1951, to 940 in 2015, and are projected to shrink to 860 by just 2025.

In India, the crisis is hardly better. According to that country’s Ministry of Statistics (2016) and the Indian Ministry of Water Resources (2010), the per capita available water in cubic meters per year was 5,177 in 1951, and 1,474 in 2015, and is projected to shrink to 1,341 in 2025.

Both of these countries are nuclear powers. Given the dire projections of water availability as climate change progresses, nightmare scenarios of water wars that could spark nuclear exchanges are now becoming possible.

#### Asteroid mining solves water access – only NEOs are sufficiently proximate and hydrated – independently, storing launch fuel on asteroids reduces space debris – turns case

Tillman 19 [(Nola Taylor, has been published in Astronomy, Sky & Telescope, Scientific American, New Scientist, Science News (AAS), Space.com, and Astrobiology magazine, BA in Astrophysics) “Tons of Water in Asteroids Could Fuel Satellites, Space Exploration,” Space, 9/29/2019] JL

When it comes to mining space for water, the best target may not be the moon: Entrepreneurs' richest options are likely to be asteroids that are larger and closer to Earth.

A recent study suggested that roughly 1,000 water-rich, or hydrated, asteroids near our planet are easier to reach than the lunar surface is. While most of these space rocks are only a few feet in size, more than 25 of them should be large enough to each provide significant water. Altogether, the water locked in these asteroids should be enough to fill somewhere around 320,000 Olympics-size swimming pools — significantly more than the amount of water locked up at the lunar poles, the new research suggested.

Because asteroids are small, they have less gravity than Earth or the moon do, which makes them easier destinations to land on and lift off from. If engineers can figure out how to mine water from these space rocks, they could produce a source of ready fuel in space that would allow spacecraft designers to build refuelable models for the next generation of satellites. Asteroid mining could also fuel human exploration, saving the expense of launching fuel from Earth. In both cases, would-be space-rock miners will need to figure out how to free the water trapped in hydrated minerals on these asteroids.

"Most of the hydrated material in the near-Earth population is contained in the largest few hydrated objects," Andrew Rivkin, an asteroid researcher at Johns Hopkins University Applied Physics Research Laboratory in Maryland, told Space.com. Rivkin is the lead author on the paper, which estimated that near Earth asteroids could contain more easily accessible water than the lunar poles.

According to the United Nations Office for Outer Space Affairs, more than 5,200 of the objects launched into space are still in orbit today. While some continue to function, the bulk of them buzz uselessly over our heads every day. They carry fuel on board, and when they run out, they are either lowered into destructive orbits or left to become space junk, useless debris with the potential to cause enormous problems for working satellites. Refueling satellites in space could change that model, replacing it with long-lived, productive orbiters.

"It's easier to bring fuel from asteroids to geosynchronous orbit than from the surface of the Earth," Rivkin said. "If such a supply line could be established, it could make asteroid mining very profitable."

Hunting for space water from the surface of the Earth is challenging because the planet's atmosphere blocks the wavelength of light where water can be observed. The asteroid warming as it draws closer to the sun can also complicate measurements.

Instead, Rivkin and his colleagues turned to a class of space rocks called Ch asteroids. Although these asteroids don't directly exhibit a watery fingerprint, they carry the telltale signal of oxidized iron seen only on asteroids with signatures of water-rich minerals, which means the authors felt confident assuming that all Ch asteroids carry this rocky water.

Based on meteorite falls, a previous study estimated that Ch asteroids could make up nearly 10% of the near-Earth objects (NEOs). With this information, the researchers determined that there are between 26 and 80 such objects that are hydrated and larger than 0.62 miles (1 km) across.

Right now, only three NEOs have been classified as Ch asteroids, although others have been spotted in the asteroid belt. Most NEOs are discovered and observed at wavelengths too short to reveal the iron band that marks the class. Carbon-rich asteroids, which include Ch asteroids and other flavors, are also darker than the more common stony asteroids, making them more challenging to observe.

Although Ch asteroids definitely contain water-rich minerals, that doesn’t necessarily mean that they will always be the best bet for space mining. It comes down to risk. Would an asteroid-mining company rather visit a smaller asteroid that definitely has a moderate amount of water, or a larger one that could yield a larger payday but could also come up dry?

"Whether getting sure things with no false positives, like the Ch asteroids, is more important or if a greater range of possibilities is acceptable with the understanding that some asteroids will be duds is something the miners will have to decide," Rivkin said.

In addition to estimating the number of large, water-rich asteroids might be available, the study also found that as many as 1,050 smaller objects, roughly 300 feet (100 meters) across, may also linger near Earth. Their small bulk will make them easier to mine because their low gravity will require less fuel to escape from, but they will produce less water overall, and Rivkin expects that the handful of larger space rocks will be the first targets.

"It seems likely that the plan for these companies will be to find the largest accessible asteroid with mineable material with the expectation that it will be more cost-effective than chasing down a large number of smaller objects," Rivkin said. "How 'accessible' and 'mineable material' and 'cost-effective' are defined by each company is to be seen."

### 5

#### CP: The appropriation of outer space by private entities is unjust except for satellite broadband services

### 6

#### SpaceX satellites are key to solving inequality globally – empirics prove

James Pethokoukis 11/30 [James Pethokoukis, a columnist and an economic policy analyst, is the Dewitt Wallace Fellow at the American Enterprise Institute, where he writes and edits the AEIdeas blog and hosts a weekly podcast, “Political Economy with James Pethokoukis.” He is also a columnist for The Week and an official contributor to CNBC. “Why a SpaceX bankruptcy would hurt the global poor” Faster, Please! November 30, 2021 <https://fasterplease.substack.com/p/-why-a-spacex-bankruptcy-would-hurt>

I don’t have enough deep knowledge about SpaceX’s business or financials to reliably gauge the actual bankruptcy risk here, and the piece’s reporter is skeptical. I will note, however, that although the company is currently valued at around $100 billion, the bank Morgan Stanley assigns it a valuation “of somewhere between $5bn and $200bn, with uncertainty about its success accounting for the wide range,” according to The Economist. Starship and Starlink are key to that upper bound. (Also: A Morgan Stanley survey of “institutional investors and industry experts” expect SpaceX to become more valuable than Tesla, currently a trillion-dollar company. We’ll see.) So it’s not surprising that Musk emphasizes the importance of the Starlink internet satellite venture here, especially its next incarnation. Now go and Twitter search on the terms “Musk,” “ruining,” and “sky,” and you’ll find plenty of complaints about the Starlink constellation — with currently more than 1,700 satellites in low-Earth orbit. For many of these keyboard critics, Starlink is nothing more than an uberbillionaire's reckless effort to become an even wealthier uberbillionaire. Or maybe it’s just another Muskian vanity project, like building rockets to Mars. Either way, these diehard anti-Muskers see a cluttered sky for visual astronomers, both amateur and professional, as a horrific tradeoff just so the entrepreneur can sell global internet access. Now, the extreme version of this critique is unserious, little more than anti-billionaire emoting. The profit potential of Starlink is unclear, though it seems to be Musk’s goal that the telecom business will one day help fund his Mars ambitions. But the venture isn’t there yet. Last summer, Musk estimated that Starlink would likely need between $20 billion and $30 billion in investment. "If we succeed in not going bankrupt, then that'll be great, and we can move on from there," Musk said. For now, Starlink aims to add another 1,000 satellites a year, even more when Starship is operational. That is, assuming Starship become operational. But the astronomy issue is a real one, as SpaceX has acknowledged. And after astronomer complaints about the brightness of the first group of 60 satellites launched in 2019, SpaceX developed a work-around to minimize the glare from solar reflection on subsequent launches. Of course, some scientists don’t want to rely on the goodwill of SpaceX and other satellite companies. They see an international regulatory agreement, perhaps a new protocol under the Outer Space Treaty, as a necessity. But as such an add-on is unlikely to happen anytime soon, notes The Economist, “not least because other issues raised by the mega constellations, such as risks from debris, will doubtless seem more pressing.” Here’s one of the many pictures floating around the Internet showing the impact of Starlink satellites — “the 333-second exposure shows at least 19 satellites passing overhead” — on astronomical observations, via the IFLScience website: Of course, framing the trade-off as the above picture vs. “better global internet” doesn’t quite capture the benefits of the latter. And they are considerable. There remains a stark digital divide in global internet access. As the World Economic Forum notes: “Globally, only just over half of households (55 percent) have an internet connection, according to UNESCO. In the developed world, 87 percent are connected compared with 47 percent in developing nations, and just 19 percent in the least developed countries.” It seems pretty clear that broadband internet access brings considerable economic gains, particularly to poorer countries. (Musk has specifically said this is a goal of Starlink.) Here are a few examples from the August 2021 analysis “The Economic Impact of Internet Connectivity in Developing Countries” by Jonas Hjort (Columbia University) and Lin Tian (INSEAD): Quite a few studies convincingly estimate the effect on consumption of specific internet-enabled technologies (rather than internet connectivity itself) through model-based approaches, and a few do so more directly. Jack & Suri (2014) show that access to mobile money decreased consumption poverty by two percentage points in Kenya. In contrast, Couture et al. (2021) finds that expansion of e-commerce in China has little effect on income to rural producers and workers. Different areas of Sub-Saharan Africa got access to basic internet at different times starting in the early 2000s. Exploiting variation arising from the gradual arrival of submarine cable connections and using nighttime satellite image luminosity as a proxy for economic activity, Goldbeck & Lindlacher (2021) estimate that basic internet availability leads to about a two percentage point increase in economic growth. As we briefly discussed in Sub-section 3.1.1, Bahia et al. (2020) show evidence that the gradual roll-out of mobile broadband in Nigeria between 2010 and 2016 increased labor force participation and employment. The paper also shows that household consumption simultaneously increased and poverty decreased. Households that had at least one year of mobile broadband coverage experienced an increase in total consumption of about 6 percent. Masaki et al. (2020) document a similarly striking result. Combining household expenditure surveys with data on the location of fiber-optic transmission nodes and coverage maps of 3G mobile technology, they show that 3G coverage is associated with a 14 percent increase in total consumption and a 10 percent decline in extreme poverty in Senegal. Finally, Bahia et al. (2021) use a similar empirical approach to study the effect of mobile broadband roll-out in Tanzania and find a comparable increase in household consumption and decline poverty in this setting. The eventual endgame here is that there are going to be many tens of thousands more satellites in orbit, enabling total global internet coverage. And they will be joined by all manner of human-occupied installations for tourist, commercial, and scientific endeavors. (You may have missed the late October announcement that Blue Origin, the space company owned by Jeff Bezos, is teaming up with other firms to build a space station in Earth orbit.) Stargazing from Earth will never be the way it used to be. Then again, people still complain about shadows from skyscrapers even as humanity continues to build them. But recall one of the running themes of this newsletter: Technology solves one problem, creates another, then solves that one — rinse and repeat — even as the overall direction is forward. More astronomy in the future will be space based. And if all those space objects and structures make even low-Earth orbit astronomy difficult, more of it will need to be performed further out, as with the James Webb Space Telescope. Or maybe via telescopes on the Moon, such as the proposed Lunar Crater Radio Telescope, which would deploy robots to transform a half-mile wide crater into an observatory by attaching a wire mesh along the crater walls. And once there are lots of satellites around a fully colonized Moon, off to Mars — which might be accessible thanks to Starlink funding Musk’s deep-space ambitions. Meanwhile, there will be a lot less global poverty here on Earth than otherwise.

## Case

### Framing

**1] Moral uncertainty means preventing extinction should be our highest priority.  
Bostrom 12** [Nick Bostrom. Faculty of Philosophy & Oxford Martin School University of Oxford. “Existential Risk Prevention as Global Priority.” Global Policy (2012)]  
These reflections on **moral uncertainty suggest** an alternative, complementary way of looking at existential risk; they also suggest a new way of thinking about the ideal of sustainability. Let me elaborate.¶ **Our present understanding of axiology might** well **be confused. We may not** nowknow — at least not in concrete detail — what outcomes would count as a big win for humanity; we might not even yet **be able to imagine the best ends** of our journey. **If we are** indeedprofoundly **uncertain** about our ultimate aims,then we should recognize that **there is a great** option **value in preserving** — and ideally improving — **our ability to recognize value and** to **steer the future accordingly. Ensuring** that **there will be a future** version of **humanity** with great powers and a propensity to use them wisely **is** plausibly **the best way** available to us **to increase the probability that the future will contain** a lot of **value.** To do this, we must prevent any existential catastrophe.

2] Independently, extinction turns suffering impacts – mass death causes massive amounts of structural violence

### Solvency

#### Vote neg on presumption – space privatization may be an example of neolib, but no chance that they solve it:

#### Vote neg on presumption – space privatization may be an example of neolib, but no chance that they solve it:

#### None of their ev is reverse causal – industrial agriculture, the defense industrial base, Amazon, Koch Industries are all examples of capitalism – plus capitalism predates space exploration, which proves they don’t control the root cause

#### Penny and Schultz are critiques of growth mindset writ large – if governments are fundamentally neoliberal, they have the same incentives to appropriate space as private companies – the aff has zero bearing on NASA – means they don’t solve spatial fixes because NASA can appropriate space resources, then sell them to private companies – proven by existing contracts between NASA and NewSpace –

#### No brightline for when spatial fixes on Earth are exhausted – corporations will continue extracting resources from Earth even if it’s less lucrative

* 1. 1AC Penny is about the militarization of space by programs like Space Force which are *FEDERAL* programs – that’s a massive alt cause

#### No evidence that the plan actually shifts space to the public sector – either a) it isn’t fiated and they haven’t read normal means evidence or b) it is and that is extra T because it fiats something beyond the scope of the resolution and you should drop the extra topical planks because each extra-topical plank changes the nature of the affirmative and requires starkly different case negs. There are also no predictable parameters to dictate what plank will be added.

That means only let them weigh the sum total of capitalism that they resolve – I’ll give you a hint – it’s *next to nothing*.

No methodological offense – it’s infinitely regressive and super subjective – only evaluating the direct consequences of the affirmative solves.

Independently err neg – their authors are just a bunch of anti-capitalist hacks with 0 qualifications to talk ab this – ours are people with PhDs, DOD directors, and heads of NASA programs.

### Contention 1

#### Plan doesn’t get rid of global institutions like the IMF and World Bank and has no way to get rid of the neoliberalism engrained in society – absent a link between “tax some companies a bit more” and “global collapse of capitalism” you should vote neg on presumption since they have no impact outside of removing capitalism entirely.

#### LBL aff cards about cap bad –

#### Penny has no terminal impact to colonialism – just vague posturing. Prefer materiality – that was above.

#### Marx ev just says that there is some chance that colonization couldn’t help space, but we won that capitalism is good writ large so that doesn’t matter

#### Spencer ev is incorrect – this indicates that the colonization of mars leads to like rich people still joining but whats the terminal impact to that lol

### C1

#### Colonization of outer space is essential to humanity – 5 warrants (good, diverse non just extinction impacts)

Orwig 15 [(Jessica, a senior editor at Insider. She has a Master of Science in science and technology journalism from Texas A&M University and a Bachelor of Science in astronomy and physics from The Ohio State University. Before NY she spent time as an intern at: American Physical Society in MD International Center for Theoretical Physics in Italy Fermi National Accelerator Laboratory in IL American Geophysical Union in DC), “5 undeniable reasons humans need to colonize Mars — even though it's going to cost billions,” Slate, 4/21/2015, https://www.businessinsider.com/5-undeniable-reasons-why-humans-should-go-to-mars-2015-4] MN

Establishing a permanent colony of humans on Mars is not an option. It's a necessity. At least, that's what some of the most innovative, intelligent minds of our age — Buzz Aldrin, Stephen Hawking, Elon Musk, Bill Nye, and Neil deGrasse Tyson — are saying. Of course, it's extremely difficult to foresee how manned missions to Mars that would cost hundreds of billions of dollars each, could benefit mankind. It's easier to imagine how that kind of money could immediately help in the fight against cancer or world hunger. That's because humans tend to be short-sighted. We're focused on what's happening tomorrow instead of 100 years from now. "If the human race is to continue for another million years, we will have to boldly go where no one has gone before," Hawking said in 2008 at a lecture series for NASA's 50th anniversary. That brings us to the first reason humans must colonize Mars: 1. Ensuring the survival of our species The only home humans have ever known is Earth. But history shows that surviving as a species on this tiny blue dot in the vacuum of space is tough and by no means guaranteed. The dinosaurs are a classic example: They roamed the planet for 165 million years, but the only trace of them today are their fossilized remains. A colossal asteroid wiped them out. Putting humans on more than one planet would better ensure our existence thousands if not millions of years from now. "Humans need to be a multiplanet species," Musk recently told astronomer and Slate science blogger Phil Plait. Musk founded the space transport company SpaceX to help make this happen. Mars is an ideal target because it has a day about the same length as Earth's and water ice on its surface. Moreover, it's the best available option: Venus and Mercury are too hot, and the Moon has no atmosphere to protect residents from destructive meteor impacts. 2. Discovering life on Mars Nye, the CEO of The Planetary Society, said during an episode of StarTalk Radio in March that humanity should focus on sending humans instead of robots to Mars because humans could make discoveries 10,000 times as fast as the best spacecraft explorers we have today. Though he was hesitant to say humans should live on Mars, he agreed there were many more discoveries to be made there. One monumental discovery scientists could make is determining whether life currently exists on Mars. If we're going to do that, we'll most likely have to dig much deeper than NASA's rovers can. The theory there is that life was spawned not from the swamps on adolescent Earth, but from watery chasms on Mars. The Mars life theory suggests that rocks rich with microorganisms could have been ejected off the planet's surface from a powerful impact, eventually making their way through space to Earth. It's not a stretch to imagine, because Martian rocks can be found on Earth. None of those, however, have shown signs of life. "You cannot rule out the fact that a Mars rock with life in it landing on the Earth kicked off terrestrial life, and you can only really test that by finding life on Mars," Christopher Impey, a British astronomer and author of over a dozen books in astronomy and popular science, told Business Insider. 3. Improving the quality of life on Earth "Only by pushing mankind to its limits, to the bottoms of the ocean and into space, will we make discoveries in science and technology that can be adapted to improve life on Earth." British doctor Alexander Kumar wrote that in a 2012 article for BBC News where he explored the pros and cons of sending humans to Mars. At the time, Kumar was living in the most Mars-like place on Earth, Antarctica, to test how he adapted to the extreme conditions both physiologically and psychologically. To better understand his poignant remark, let's look at an example: During its first three years in space, NASA's prized Hubble Space Telescope snapped blurry pictures because of a flaw in its engineering. The problem was fixed in 1993, but to try to make use of the blurry images during those initial years, astronomers developed a computer algorithm to better extract information from the images. It turns out the algorithm was eventually shared with a medical doctor who applied it to the X-ray images he was taking to detect breast cancer. The algorithm did a better job at detecting early stages of breast cancer than the conventional method, which at the time was the naked eye. "You can't script that. That happens all the time — this cross pollination of fields, innovation in one, stimulating revolutionary changes in another," Tyson, the StarTalk radio host, explained during an interview with Fareed Zakaria in 2012. It's impossible to predict how cutting-edge technologies used to develop manned missions to Mars and habitats on Mars will benefit other fields like medicine or agriculture. But we'll figure that out only by "pushing humankind to its limits" and boldy going where we've never been before. 4. Growing as a species Another reason we should go to Mars, according to Tyson, is to inspire the next generation of space explorers. When asked in 2013 whether we should go to Mars, he answered: "Yes, if it galvanizes an entire generation of students in the educational pipeline to want to become scientists, engineers, technologists, and mathematicians," he said. "The next generation of astronauts to land on Mars are in middle school now." Humanity's aspirations to explore space are what drive us toward more advanced technological innovations that will undoubtedly benefit mankind in one way or another. "Space is like a proxy for a lot of what else goes on in society, including your urge to innovate," Tyson said during his interview with Zakaria. He added: "There's nothing that drives ambitions the way NASA does." 5. Demonstrating political and economic leadership At a February 24 hearing, Aldrin told the US Senate's Subcommittee on Space, Science and Competitiveness that getting to Mars was a necessity not only for science, but also for policy. "In my opinion, there is no more convincing way to demonstrate American leadership for the remainder of this century than to commit to a permanent presence on Mars," he said. If Americans do not go to Mars, someone else will. And that spells political and economic benefit for whoever succeeds. "If you lose your space edge," Tyson said during his interview with Zakaria, "my deep concern is that you lose everything else about society that enables you to compete economically."

#### Space colonization solves otherwise inevitable extinction.

Zarkadakis 19 [George; December 26; Ph.D. in Artificial Intelligence; George Zardakis, “Abandoning the metropolis: space colonisation as the new imperative,” <https://georgezarkadakis.com/2019/12/26/abandoning-the-metropolis-space-colonisation-as-the-new-imperative/>]

Space colonization is not only the subject of fiction but of serious science too. The late physicist Stephen Hawking argued that unless colonies were established in space the human race would become extinct. There are several natural phenomena beyond our control that could spell our obliteration. Over a long enough period of time our planet is vulnerable to catastrophic meteorite strikes, or getting exposed to the deadly radiation of a nearby supernova explosion. As our Sun burns its fuel it will start to expand and, in a few million years, will scorch Earth. We can also self-destruct by waging nuclear war, or by tilting our planet’s climate towards a runaway greenhouse effect. Space colonization is therefore the ultimate insurance policy of long-term human survival[4].

### 1NC – T/L – Impact

#### Neoliberalism is sustainable, reduces violence and improves quality of life.

Steven Radelet 16 – (PhD, Chair in Global Human Development at Georgetown University, Nonresident Senior Fellow at the Brookings Institution, “Prosperity Rising - The Success of Global Development—and How to Keep It Going,” Foreign Policy, p. 85)

Since the early 1990s, daily life in poor countries has been changing profoundly for the better: one billion people have escaped extreme poverty, average incomes have doubled, infant death rates have plummeted, millions more girls have enrolled in school, chronic hunger has been cut almost in half, deaths from malaria and other diseases have declined dramatically, democracy has spread far and wide, and the incidence of war—even with Syria and other conflicts—has fallen by half. This unprecedented progress goes way beyond China and India and has touched hundreds of millions of people in dozens of developing countries across the globe, from Mongolia to Mozambique, Bangladesh to Brazil. Yet few people are aware of these achievements, even though, in aggregate, they rank among the most important in human history. In 2013, the Swedish survey organization Novus Group International asked Americans how they thought the share of the world’s population living in extreme poverty had changed over the last two decades. Sixty-six percent of respondents said that they thought it had doubled, and another 29 percent said that it hadn’t changed. Only five percent knew (or guessed) the truth: that the share of people living in extreme poverty had fallen by half. Perhaps that ignorance explains why Washington has done so little to take advantage of these promising trends, giving only tepid support to nascent democracies, making limited investments in economic development and in new health and agricultural technologies, and failing to take the lead in building more effective international institutions. Whatever the reason, many developing countries are now responding to what they perceive as the United States’ indifference by looking elsewhere—especially toward China—for deeper engagement and advice on how to keep growing. At the same time, climate change, the slowdown in global growth, and rising tensions in the Middle East and beyond have begun to threaten further progress. As a result, the United States now risks missing out on a historic chance to strengthen its global leadership and help create a safer, more prosperous, and more democratic world—just at the moment when it could help the most. ONE GIANT LEAP Global poverty is falling faster today than at any time in human history. In 1993, about two billion people were trapped in extreme poverty (defined by the World Bank as living on less than $1.90 per day); by 2012, that number had dropped to less than one billion. The industrialization of China is a big part of the story, of course, but even excluding that country, the number of extreme poor has fallen by more than 400 million. Since the 1980s, more than 60 countries have reduced the number of their citizens who are impoverished, even as their overall populations have grown. This decline in poverty has gone hand in hand with much faster economic growth. Between 1977 and 1994, the growth in per capita GDP across the developing countries averaged zero; since 1995, that figure has shot up to three percent. Again, the change is widespread: between 1977 and 1994, only 21 developing countries (out of 109 with populations greater than one million) exceeded two percent annual per capita growth, but between 1995 and 2013, 71 such countries did so. And going backward has become much less common: in the earlier period, more than 50 developing countries recorded negative growth, but in the later one, just ten did. The improvements in health have been even bigger. In 1960, 22 percent of children in developing countries died before their fifth birthday, but by 2013, only five percent did. Diarrhea killed five million children a year in 1990 but claimed fewer than one million in 2014. Half as many people now die from malaria as did in 2000, and deaths from tuberculosis and AIDS have both dropped by a third. The share of people living with chronic hunger has fallen by almost half since the mid-1990s. Life expectancy at birth in developing countries has lengthened by nearly one-third, from 50 years in 1960 to 65 years today. These improvements in health have left no country untouched, even the worst-governed ones. Consider this: the rate of child death has declined in every single country (at least those where data are available) since 1980. Meanwhile, far more children are enrolling in and completing school. In the late 1980s, only 72 percent of all primary-school-age children attended school; now, the figure exceeds 87 percent. Girls in developing countries have enjoyed the biggest gains. In 1980, only half of them finished primary school, whereas four out of five do so today. These leaps in education are beginning to translate into better-skilled workers. Then there is the shift to democracy. Prior to the 1980s, most developing countries were run by left- or right-wing dictators. Coups and countercoups, violence and assassinations, human rights abuses—all formed part of regular political life. But starting in the 1980s, dictators began to fall, a process that accelerated after the Cold War. In 1983, only 17 of 109 developing countries qualified as democracies, based on data from Freedom House and the Center for Systemic Peace; by 2013, the number had more than tripled, to 56 (and that’s not counting the many more developing countries with populations of less than one million). As those numbers suggest, power today is far more likely to be transferred through the ballot box than through violence, and elections in most countries have become fairer and more transparent. Twenty years ago, few Indonesians could have imagined that a furniture maker from central Java would beat one of Suharto’s relatives in a free and fair election, as Joko Widodo did in 2014. Nor would many have predicted that Nigeria, then still under military rule, would in 2015 mark its first peaceful transfer of power between parties, or that Myanmar (also called Burma) would hold its most successful democratic election the same year. Across the developing world, individual freedoms and rights are honored to a much greater degree, human rights abuses are rarer, and legislative bodies have more power. Yes, many of these new democracies have problems. And yes, the march toward democracy has slowed since 2005—and even reversed in some countries, such as Thailand and Venezuela. But in many more—from Brazil to Mongolia to Senegal—democracy has deepened. Never before in history have so many developing countries been so democratic. As states have become wealthier and more democratic, conflict and violence within them have declined. Those who think otherwise should remember that as recently as the 1980s and early 1990s, much of the world was aflame, from Central America to Southeast Asia to West Africa. There were half as many civil wars in the last decade as there were in the 1980s, and the number of people killed in armed conflicts has fallen by three-quarters. Three major forces sparked this great surge in development progress. First, the end of the Cold War brought an end to the superpowers’ support for some of the world’s nastiest dictators and reduced the frequency of conflict. As ideas about economic and political governance began to change, developing countries introduced more market-based economic systems and more democracy. Second, globalization created vast new opportunities for economic growth. Increased flows of trade, investment, information, and technology created more jobs and improved living standards. Third, new and more effective leaders—in politics, business, religion, and civil society—began to forge deep change. Where courageous figures, such as Nelson Mandela in South Africa, stepped forward, countries progressed; where old-style dictators, such as Robert Mugabe in Zimbabwe, remained in power, countries languished. This incredibly wide-ranging progress should not obscure the considerable work that remains: progress has not reached everyone, everywhere. One billion people still live in extreme poverty, six million children die every year from preventable diseases, too few girls get the education they deserve, and too many people suffer under dictatorships. Countries such as Haiti, North Korea, Uzbekistan, and Zimbabwe lag far behind. But the fact remains that an enormous transformation is under way—one that has already substantially improved the lives of hundreds of millions of people. WIN-WIN The United States should welcome and encourage this progress. For starters, broad-based development enhances global security. It is not true that poverty necessarily breeds terrorism, as some argue—after all, most poor people are not terrorists, and many terrorists are not poor. But it is true that poor states tend to be weak states unable to prevent terrorist and criminal networks from operating on their soil. Sustained development strengthens government institutions and reduces the need for outside intervention. As former U.S. Secretary of Defense Robert Gates put it, “Development is a lot cheaper than sending soldiers.” Development also builds states’ capacities to fight pandemic disease. Guinea, Liberia, and Sierra Leone were overwhelmed by Ebola in 2014 largely because they all had weak health systems. The same was true in many of the countries hit hardest by the HIV/AIDS epidemic decades ago. As poor countries grow wealthier, however, they become better equipped to fight diseases that can spread quickly beyond their borders. A more prosperous developing world also benefits the U.S. economy. The spread of economic growth creates new markets for American businesses not just in China but also in Brazil, Indonesia, South Africa, and beyond. Developing countries are buying more and more aircraft, automobiles, semiconductors, medical equipment, pharmaceuticals, consultancy services, and entertainment. Although the growth in trade with developing countries has slowed during the last year, their economies will no doubt remain major market opportunities for U.S. companies. In 1990, such states accounted for one-third of the global economy; today, their share is half, and they purchase more than half of U.S. exports. In 2011, Walmart spent $2.4 billion to acquire a controlling share of a holding company that operates more than 350 retail stores in South Africa and 11 other African countries, signaling a level of interest in African consumers that would have been unimaginable two decades ago. To be sure, emerging markets also create competition for U.S. businesses and hardship for American workers who lose their jobs as a result. But they also create many new jobs, as American firms expand abroad and as companies in the developing world send more capital to the West. Moreover, developing countries are increasingly coming up with their own innovations and technologies, in medicine, agriculture, energy, and more. The United States should respond to this growing competition not with protectionism but by strengthening its own capacities: rebuilding its infrastructure, improving its educational system, and investing in new technologies. Finally, development helps spread and deepen the values that Americans hold dear: openness, economic opportunity, democracy, and freedom. These values tend to go hand in hand with growing prosperity: as incomes rise, citizens demand greater freedoms. History suggests that even governments that do not welcome these ideas eventually embrace them or are replaced by those that do. And as more developing countries achieve progress under market-based economic systems and democracy, other countries seek to emulate the model. The United States and Europe have a strong self-interest in encouraging this process, since it will enhance global stability and add to the number of like-minded partners that can help address future challenges. SUSTAINING THE SURGE What makes all this progress especially impressive is that it has continued despite a number of major shocks that in an earlier age could well have stopped it: the outbreak of the HIV/AIDS pandemic in the 1980s, the Asian financial crisis in 1997–98, the 9/11 attacks, the global food crisis of 2007–8, and the global financial crisis of 2008. In each case, pundits predicted that the disaster of the day would set back progress. Yet in each case, the gains continued. There are good reasons to believe they can continue well into the future. The forces that sparked these changes were fundamental, not transitory. Governments have learned from their mistakes and gotten much better at managing inevitable downturns. Global integration has made critical technologies available to more and more people. State institutions have become more effective, with improved (if imperfect) legal systems, clearer property rights, and greater respect for individual liberties. Democratic rules and norms governing the transfer of political power, free speech, and accountability have become more deeply entrenched. Civil society groups are more active. These deep-seated changes have put enormous additional gains well within reach. If economic growth proceeds along the lines of most projections over the next two decades, some 700 million more people will escape extreme poverty. Per capita incomes in poor countries will double again, millions of childhood deaths will be avoided, tens of millions of children will get the education they deserve, hunger will decline, and basic rights and freedoms will spread further. At least, that’s what should happen—but none of these future gains is guaranteed. Growth has slowed markedly since 2008 in emerging economies such as Brazil and China and throughout the developing world. Russia, Thailand, and Venezuela have turned less democratic, and South Africa and Turkey seem to be headed in that direction as well. The Middle East has seen the return of conflict and authoritarian rule. China’s aggressive actions in the South China Sea could spark a major conflict that could kill tens of thousands of people and devastate the region’s economies. Outbreaks of SARS and the H1N1 and Ebola viruses underscore humanity’s vulnerability to disease, and many doctors worry that growing resistance to antibiotics could reverse some of the hard-fought gains in health. Meanwhile, global population is on track to exceed nine billion by 2050, and the combination of more people, higher incomes, and warmer climates will place enormous strains on the world’s supplies of fresh water, food, and energy. Although there are ample grounds for pessimism, the doomsayers continue to underestimate humanity’s growing ability to cooperate in the face of new challenges. In the eighteenth century, when Thomas Malthus looked at population growth and foresaw catastrophic famine, he failed to appreciate the advances in agriculture, health, and governance that human ingenuity could create. The same was true for those that predicted a population disaster in Asia in the 1960s and 1970s. Today, the problems facing developing countries are plain to see, while the new ideas and innovations that will overcome them are harder to picture. Continued progress isn’t automatic or guaranteed. But with smart choices, it is within reach.

#### Capitalism is sustainable – self-correcting, wealth-generating, and ensures sustainability.

Goklany 07 Julia Simon Fellow @ the Political Economy Research Center [Indur, Reason.com, “Now for the Good News,” 3/23/2007, <http://reason.com/archives/2007/03/23/now-for-the-good-news>]

Environmentalists and globalization foes are united in their fear that greater population and consumption of energy, materials, and chemicals accompanying economic growth, technological change and free trade—the mainstays of globalization—degrade human and environmental well-being. Indeed, the 20th century saw the United States’ population multiply by four, income by seven, carbon dioxide emissions by nine, use of materials by 27, and use of chemicals by more than 100. Yet life expectancy increased from 47 years to 77 years. Onset of major disease such as cancer, heart, and respiratory disease has been postponed between eight and eleven years in the past century. Heart disease and cancer rates have been in rapid decline over the last two decades, and total cancer deaths have actually declined the last two years, despite increases in population. Among the very young, infant mortality has declined from 100 deaths per 1,000 births in 1913 to just seven per 1,000 today. These improvements haven’t been restricted to the United States. It’s a global phenomenon. Worldwide, life expectancy has more than doubled, from 31 years in 1900 to 67 years today. India’s and China’s infant mortalities exceeded 190 per 1,000 births in the early 1950s; today they are 62 and 26, respectively. In the developing world, the proportion of the population suffering from chronic hunger declined from 37 percent to 17 percent between 1970 and 2001 despite a 83 percent increase in population. Globally average annual incomes in real dollars have tripled since 1950. Consequently, the proportion of the planet's developing-world population living in absolute poverty has halved since 1981, from 40 percent to 20 percent. Child labor in low income countries declined from 30 percent to 18 percent between 1960 and 2003. Equally important, the world is more literate and better educated than ever. People are freer politically, economically, and socially to pursue their well-being as they see fit. More people choose their own rulers, and have freedom of expression. They are more likely to live under rule of law, and less likely to be arbitrarily deprived of life, limb, and property. Social and professional mobility have also never been greater. It’s easier than ever for people across the world to transcend the bonds of caste, place, gender, and other accidents of birth. People today work fewer hours and have more money and better health to enjoy their leisure time than their ancestors. Man’s environmental record is more complex. The early stages of development can indeed cause some environmental deterioration as societies pursue first-order problems affecting human well-being. These include hunger, malnutrition, illiteracy, and lack of education, basic public health services, safe water, sanitation, mobility, and ready sources of energy. Because greater wealth alleviates these problems while providing basic creature comforts, individuals and societies initially focus on economic development, often neglecting other aspects of environmental quality. In time, however, they recognize that environmental deterioration reduces their quality of life. Accordingly, they put more of their recently acquired wealth and human capital into developing and implementing cleaner technologies. This brings about an environmental transition via the twin forces of economic development and technological progress, which begin to provide solutions to environmental problems instead of creating those problems. All of which is why we today find that the richest countries are also the cleanest. And while many developing countries have yet to get past the “green ceiling,” they are nevertheless ahead of where today’s developed countries used to be when they were equally wealthy. The point of transition from "industrial period" to "environmental conscious" continues to fall. For example, the US introduced unleaded gasoline only after its GDP per capita exceeded $16,000. India and China did the same before they reached $3,000 per capita. This progress is a testament to the power of globalization and the transfer of ideas and knowledge (that lead is harmful, for example). It's also testament to the importance of trade in transferring technology from developed to developing countries—in this case, the technology needed to remove lead from gasoline. This hints at the answer to the question of why some parts of the world have been left behind while the rest of the world has thrived. Why have improvements in well-being stalled in areas such as Sub-Saharan Africa and the Arab world? The proximate cause of improvements in well-being is a “cycle of progress” composed of the mutually reinforcing forces of economic development and technological progress. But that cycle itself is propelled by a web of essential institutions, particularly property rights, free markets, and rule of law. Other important institutions would include science- and technology-based problem-solving founded on skepticism and experimentation; receptiveness to new technologies and ideas; and freer trade in goods, services—most importantly in knowledge and ideas. In short, free and open societies prosper. Isolation, intolerance, and hostility to the free exchange of knowledge, technology, people, and goods breed stagnation or regression.

#### Capitalism is the only system that can solve warming – we don’t have time for whats next

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There is one last imperative question. Several strands of green thinking maintain that capitalism is incapable of arriving at a sustainable relationship with nature because, as an economic system, capitalism must grow exponentially, while the earth is finite. You will find this argument in the literature of ecosocialism, deep ecology, and ecoanarchism. The same argument is often cast by liberal greens in deeply ahistorical and antitheoretical terms that, while critical of the economic system, often decline to name it. Back in the early 1970s, the Club of Rome’s book Limits to Growth fixated on the dangers of “growth" but largely avoided explaining why capitalism needs growth or how growth is linked to private ownership, profits, and interfirm competition. Whether these literatures describe the problem as “modern industrial society," “the growth cult," or the profit system, they often have a similar takeaway: we need a totally different economic system if we are to live in balance with nature. Some of the first to make such an argument were Marx and Engels. They came to their ecology through examining the local problem of relations between town and country—which was expressed simultaneously as urban pollution and rural soil depletion. In exploring this question they relied on the pioneering work of soil chemist Justus von Liebig. And from this small- scale problem, they developed the idea of capitalism’s overall “metabolic rift” with nature. Here is how Marx explained the dilemma: Capitalist production collects the population together in great centres, and causes the urban population to achieve an ever-growing preponderance. This has two results. On the one hand it concentrates the historical motive force of society; on the other hand, it disturbs the metabolic interaction between man and the earth, i.e. it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the lasting fertility of the soil .... All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil. From that grew the Marxist belief that capitalism, as a whole, is irreconcilably in contradiction with nature; that the economic system creates a rift in the balance of exchanges, or metabolism, connecting human society and natural systems. As with “soil robbing," so too with forests, fish stocks, water supplies, genetic inheritance, biodiversity, and atmospheric CO2 concentrations. The natural systems are out of sync; their elements are being rearranged and redistributed, ending up as garbage and pollution. As Mary Douglas, paraphrasing William James, put it, “Uncleanliness is matter out of place.”At a large enough scale, that disruption of elements threatens environmental catastrophe. It may be true: capitalism may be, ultimately, incapable of accommodating itself to the limits of the natural world. However, that is not the same question as whether capitalism can solve the climate crisis. Because of its magnitude, the climate crisis can appear as if it is the combination of all environmental crises—overexploitation of the seas, deforestation, overexploitation of freshwater, soil erosion, species and habitat loss, chemical contamination, and genetic contamination due to transgenic bioengineering. But halting greenhouse gas emissions is a much more specific problem; it is only one piece of the apocalyptic panorama. Though all these problems are connected, the most urgent and all encompassing of them is anthropogenic climate change. The fact of the matter is time has run out on the climate issue. Either capitalism solves the crisis or it destroys civilization. Capitalism begins to deal with the crisis now, or we face civilizational collapse beginning this century. We cannot wait for a socialist, or communist, or anarchist, or deep- ecology, neoprimitive revolution; nor for a nostalgia-based localista conversion back to the mythical small-town economy of preindustrial America as some advocate. In short, we cannot wait to transform everything—including how we create energy. Instead, we must begin immediately transforming the energy economy. Other necessary changes can and will flow from that. Hopeless? No. If we put aside the question of capitalism’s limits and deal only with greenhouse gas emissions, the problem looks less daunting.