## 1NC – Off

#### CP: Outer space should be recognized as a global commons by countries excluding the United States. The United States should submit an environmental impact assessment of the appropriation of outer space by private entities to the UN Office of Outer Space Affairs for public comment, modification, and approval. The United States federal government should implement the approved version of the submitted proposal.

**Counterplan competes and creates the least environmentally damaging version of the aff.**

William R. **Kramer**, PhD Polisci/Futures Studies @ U of H Manoa, Currently HDR Inc. Extraterrestrial Environmental Analyst, **’14**, “Extraterrestrial environmental impact assessments A foreseeable prerequisite for wise decisions regarding outer space exploration, research and development” Space Policy 30 (2014) 215-222

To be most effective, all spacefaring nations and enterprises would voluntarily participate in assessing their extraterrestrial environmental impacts prior to undertaking actions in space. A hypothetical chronology of such a process might include: (1) Impact assessments are prepared by the action proponent and submitted to an impartial international panel or board; (2) The panel determines the assessment's sufficiency; (3) The assessment is published in an electronic or other format accessible to the public followed by a comment period; (4) The action proponent addresses comments and submits responses to the panel; (5) The panel publishes its approval or concerns; (6) The action proceeds, is **modified or is abandoned**; and (7) should the action proceed, periodic reports of the action's progress and impacts are filed for future reference in a digital format to allow broad access. The process would support the spirit of both **NEPA** to “fulfill the responsibilities of each generation as trustee of the environment for succeeding generations” (42 USC x4331(b)(1)) and Article 4(1) of the Moon Agreement's directive that “due regard shall be paid to the interests of present and future generations.” Given the likelihood that all states would appreciate the need for maintaining extraterrestrial environments and landscapes for both future research and exploitation, pressure from peer states and space industries may be sufficient to **encourage a trend of compliance**.

Such a review and approval system (perhaps similar to NEPA's relationship with the Council on Environmental Quality and its oversight function) could be attempted within the structure of the UN, such as within the **UN Office of Outer Space Affairs**. The spirit of an extraterrestrial environmental assessment program would be likely to fit within the mandate of the organization. However, amending the Outer Space Treaty or otherwise developing an administrative UN capacity to achieve the goals proposed in this paper would require a level of international commitment and cooperation that may be both lengthy and difficult to achieve. Spacefaring nations and international organizations are already invited to submit annual reports on their space activities and research to the UN Committee on the Peaceful Uses of Space, **so a precedent for reporting exists.** **Presently, however, reports tend to document positive actions and research, not details of extraterrestrial environmental impacts**.

**Extinction. EIA is key to preserve space resources, stop resource wars, and extra-terrestrial environmental damage.**

William R. **Kramer**, Hawaii Research Center for Futures Studies @ University of Hawaii, **'17**, In dreams begin responsibilities – environmental impact assessment and outer space development, ENVIRONMENTAL PRACTICE, VOL. 19, NO. 3, 128–138

**Benefits of extraterrestrial environmental impact assessment** Most publications regarding outer space resources maintain that those resources are nearly limitless, and many business models for exploitation do not imagine that resources on Mars, for example, will ever be exhausted (Lewis, 1996; Zubrin, 1996; Renstrom, 2016). Ever is a long time. While the statement may be figuratively true for some mineral ores that may last through an individual company’s project timeline, it is not necessarily true for long-term planning. **There will likely be competition for the rarest (most valuable) minerals**. Without some form of planning and regulation, they may be extracted in an inefficient and environmentally damaging manner and be **quickly depleted** (as exemplified by hydraulic mining for gold on Earth, which wasted much of the resource and resulted in extensive environmental damage) (Merchant, 1998).

How might resources be put to their highest and best use unless regulated? Both the Moon and Mars have water ice which will be **crucial for human survival**, but water also has lucrative industrial uses; it is potentially the raw material for manufacturing both rocket fuel and oxygen. **Conflicts over resource allocation** may be better addressed during an **assessment process** that seeks to balance highest and best use with discovery and first use. Who gains access to specific areas for mining becomes more problematic in that the Outer Space Treaty does not allow “ownership” of extraterrestrial territory; there is no guarantee that companies such as those listed previously will gain access to the most productive sites. The China National Space Administration is planning to place a crew on the Moon by 2024, so **competition for the best sites will be intense** (Kramer, 2015b; China Digital Times, 2012).

Space industries generally are not considering that their proposed actions may preclude alternative uses such as scientific research and human settlement. There will be a stream of not yet imagined uses that could be adversely affected or foreclosed. Many of the same conflicts between land use and human habitation experienced on Earth may emerge on extraterrestrial sites. On the Moon, for example, there are preferable sites for collecting solar energy. These “peaks of eternal light” are areas nearly always or constantly exposed to sunlight at the poles. They are very limited in both distribution and size (Elvis, Milligan, and Krolikowski, 2016). If a mining operation were to determine such areas suitable for their operations, or if mining created a constant plume of dust that would diminish the effectiveness of solar panels, how might such a situation be resolved?

Should potentially dangerous industries such as fuel manufacturing or storage be located near living areas? Would hydraulic fluid pipelines be closely monitored for leaks that may affect subsurface ice deposits mined for drinking water? How might vibrations from detonations affect unrelated structures or scientific instrumentation, such as telescopes? And how might a search for life, whether extinct or still living, be affected by human presence and our trail of bacteria and organic wastes? Humans’ biological pollution of Mars, for example, may greatly affect the results of any search for extraterrestrial life there (Kramer, 2009; McKay, 2009). Peter Doran of the Planetary Protection Subcommittee of the NASA Advisory Council offered, “The big issue with all missions to Mars is we don’t want to create a situation where we are impacting future life-detection science. Picture humans … walking around shedding microbes everywhere we go. Space suits as we know them do not take care of this problem (Mack, 2016).”

## 1NC – Off

#### JCPOA passes now – political will is key

Reuters 2/18 [(Reuters) “Iran nuclear deal could be agreed very soon, EU official says” Reuters, 2/18/2022. https://www.reuters.com/world/middle-east/iran-nuclear-deal-could-be-agreed-very-soon-eu-official-says-2022-02-18/] BC

BRUSSELS:

A senior European Union official said on Friday that a US-Iranian deal to revive Iran's 2015 nuclear agreement was close but success depended on the political will of those involved.

"I expect an agreement in the coming week, the coming two weeks or so," the EU official said. "I think we have now on the table text that are very, very close to what is going to be the final agreement," the official said.

Reuters reported on Feb 17 details of a possible deal negotiated by envoys from Iran, Russia, China, Britain, France, Germany, the European Union and United States.

"Most of the issues are already agreed. But as a principle in this kind of negotiations, nothing is agreed until everything is agreed. So we still have...some questions, some of them rather political and difficult to agree," the official said.

The official said a deal was necessary as Iran's sensitive uranium enrichment programme was moving ahead quickly. Iran has always denied it is seeking nuclear weapons.

"On the ground they are advancing very much at a speed that is not compatible with the long-term survival of the JCPOA," the official said, referring to the Joint Comprehensive Plan of Action, as the 2015 nuclear deal between Iran and world powers is formally titled.

#### Space diplomacy directly trades off with nonproliferation agreements – finite manpower, money, and political will within the AVC

Johnson-Freeze 16 [(Joan, Professor and former Chair of National Security Affairs at the US Naval War College, Newport, Rhode Island) “Space Warfare in the 21st Century: Arming the Heavens,” Cass Military Studies, 11/8/2016] JL

 \*The plan is legislated in the AVC (same bureau of the State Department that’s concerned with the JCPOA)

Proactive policymaking takes commitment, manpower, and money. A quick look at the money and manpower devoted to diplomacy in the US State and Defense departments compared to the resources available for the hardwareproducing military–industrial complex efforts described in Chapter 5 is enlightening. The Assistant Secretary of State for Arms Control, Verification, and Compliance (AVC) leads space-related diplomacy in the State Department. The AVC Bureau is responsible for “all matters related to the implementation of certain international arms control, nonproliferation, and disarmament agreements and commitments; this includes staffing and managing treaty implementation commissions.”34 The AVC arms control portfolio includes nuclear, biological, and chemical weapons and all related issues. The AVC section charged with space issues is the Office of Emerging Security Challenges; this office also handles missile defense issues and the promotion of transparency, cooperation, and building confidence regarding cybersecurity. As of financial year 2013, AVC had a budget of $31.2 million and 141 employees35 to be active participants and leaders in all of these issues.

By way of comparison, the Space Security and Defense Program, a joint program of the DoD and the Office of the Director of National Intelligence (ODNI) was programmed for a similar budget amount in financial year 2015: $32.3 million. That program is described as a “center of excellence for options and strategies (materiel, non-materiel, cross-Title, cross-domain) leading to a more resilient and enduring National Security Space (NSS) Enterprise.”36 A majority of SSDP funding is allocated to the development of offensive space control strategies. So basically, the same budget is allocated for all US global space diplomacy efforts as for an in-house Pentagon think tank to devise counterspace strategies.

Within the Pentagon, the Deputy Assistant Secretary of Defense for Space Policy is charged with all issues related to space policy, including diplomacy. The responsibilities of the Space Policy office are to:

• Develop policy and strategy for a domain that is increasingly congested, competitive, and contested

• Implement across DoD — plans, programs, doctrine, operations — and with the IC and other agencies

• Engage with allies and other space-faring countries in establishing norms and augmenting our capabilities.37

The breadth of those responsibilities, which includes reviewing space acquisitions, means that there may be only a handful of individuals actually engaged in multilateral diplomatic efforts, acting, for example, as advisors to diplomatic discussions such as those through the United Nations. Additionally, the expanse of the Pentagon results in a chain of command that makes organizational competition for attention to subject matter challenging at best. The Deputy Assistant Secretary of Defense for Space Policy reports to the Assistant Secretary of Defense for Homeland Defense, who then reports to the Principle Deputy Secretary of Defense for Homeland Defense and Global Security, who then reports to the Under Secretary of Defense for Defense Policy. There are also a multitude of space players in other governmental organizations to coordinate and contend with, particularly within the Air Force and intelligence communities. Personnel are spread thin.

US government-wide space diplomacy needs a mandate, manpower, and a supporting budget. Diplomacy, especially multilateral diplomacy, can be timeconsuming, manpower-intensive, and frustrating; and patience is not a strong American virtue. The recent experience in the UN LTS Working Group is emblematic of everything that causes the United States to shun multilateralism. Under the auspices of this group, countries had worked in good faith over the past five years to develop technical guidelines as reciprocal constraints, as insisted upon by the developing countries when they rejected the ICOC. Yet group success appeared thwarted at the February 2016 meeting of the LTS Working Group by one country, Russia.

#### Iranian proliferation goes nuclear – causes regional war and spurs proliferation cascades across the Middle East

Chilton and Hoshovsky 20 – [(Kevin, led U.S. Strategic Command and has participated in the Jewish Institute for National Security of America’s Generals and Admirals Program; Harry, policy analyst at JINSA’s Gemunder Center for Defense and Strategy) "Avoiding a nuclear arms race in the Middle East," Defense News, 2-13-2020, https://www.defensenews.com/opinion/commentary/2020/02/13/avoiding-a-nuclear-arms-race-in-the-middle-east/] TDI

This raises two immediate concerns. First, **should Iran race for the bomb, it is** almost inevitable that the United States and/or Israel will take preventative military action **to stop it from crossing that fateful threshold**. This could easily spiral into a regional war as Iran activates its various proxy forces against the United States and its allies.

Second, **an Iranian nuclear breakout attempt could** spur a proliferation cascade throughout the Middle East, **beginning with Saudi Arabia.**

Mohammed bin Salman, **the Saudi crown prince, openly stated in 2018 that if Iran developed nuclear weapons**, Riyadh would quickly “follow suit.” **One suggested approach would see Saudi Arabia purchase a nuclear power reactor from a major supplier like South Korea and then build a reprocessing plant that would yield enough weapons-grade plutonium in five years**.

A half-decade delay isn’t optimal, however, when the goal is achieving nuclear deterrence quickly. Thus, there is the so-called Islamabad option.

This refers to Riyadh’s role in financing Pakistan’s nuclear weapons program and an alleged commitment from Islamabad that it would repay the favor. While Pakistani and Saudi officials have denied any such understanding, **there is the possibility that the two could work out an arrangement where Islamabad could deploy some of its nuclear arsenal on Saudi soil following a successful Iranian breakout.**

Although this maneuver would draw sharp, international criticism, in theory, it would allow Riyadh to remain in good standing vis-a-vis the nuclear nonproliferation treaty. Nevertheless, Pakistan might not be willing to play spoiler against a nuclearized Iran. If it is, Middle Eastern geopolitics would become extremely unstable.

**If Saudi Arabia acquires nuclear weapons**, many believe Turkey would follow suit. Last September, Turkish President Recep Tayyip **Erdogan declared that he “cannot accept” the argument from Western nations that Turkey should not be allowed to attain nuclear weapons.** In 1958, Charles de Gaulle proclaimed that a nation without nuclear weapons “does not command its own destiny”; two years later, France tested its first bomb. Erdogan’s comments echo those earlier remarks and raise the possibility that Ankara could become the second NATO member to leave the alliance’s nuclear umbrella in favor of its own independent arsenal.

#### Prolif cascades undermine deterrence and cause nuclear war – this is predictive of what a multi-nuclear Middle East would look like

Krepinevich 13 – [(Dr. Andrew F, the President of the Center for Strategic and Budgetary Assessments) “Critical Mass: Nuclear Proliferation in the Middle East,” 2013, https://csbaonline.org/uploads/documents/Nuclear-Proliferation-in-the-Middle-East.pdf] TDI

As more countries over time develop nuclear capabilities and build up their nuclear arsenals, the competition will evolve from an Israeli-Iranian affair to a multi-state rivalry. For illustrative purposes **we will assume that** in the 2025-2030 timeframe, **Iran**, **Saudi Arabia, Turkey, and perhaps Egypt** and/or Iraq **have nuclear arsenals** in the low double-digit range (i.e., ten to forty weapons). What form might a nuclear competition among these powers and Israel assume? The remainder of this chapter attempts to shed some light on this issue, and its potential implications, with emphasis on those affecting regional stability.

The challenge of preserving stability when confronted with military competition among five nuclear-armed states within the Middle East and with other powers external to the region engaged in a Great Game for influence is formidable. At first blush, one thing seems apparent: **many** Cold War-era metrics **for assessing the competition and gauging where it might be headed** appear to be of little utility; in fact, **they may actually prove misleading and dangerous**. The same can be said of those looking to apply Cold War-era arms control metrics as a way of keeping the peace in general and avoiding nuclear use in particular.

**During the Cold War, many nuclear strategists came to view nuclear parity** (the possession of roughly equivalent arsenals capable of inflicting roughly equivalent levels of destruction) **between the United States and the Soviet Union as stabilizing**. The perception of these strategists is that the rough equivalence contributed to the tradition of non-use of nuclear weapons, and was thus desirable. Parity enabled both sides to avoid the perception of being inferior to their rival, and perceptions are critical to deterrence and to preserving the confidence of one’s allies and security partners. If accepted by both sides, parity could enable them to avoid the cost and instability associated with “racing” toward ever-larger arsenals. Accordingly, maintaining parity was a major objective of U.S.-Soviet (and later U.S.-Russian) arms control negotiations. Yet irrespective of its merits, parity is not an option for states engaged in an n-player competition. Each competitor cannot have a nuclear force equivalent to all the others. Even if the competition should solidify into two coalitions so as to mimic the two-player Cold War competition, questions would almost certainly arise regarding the willingness of a coalition partner that has not been attacked to risk its own destruction by using its nuclear weapons in response to an attack on its ally. Indeed, these concerns were raised during the Cold War, and formed a major justification for France pursuing its own force de frappe. 93

**In a Middle Eastern “n-player” competition, all nuclear powers would be** challenged to establish an “assured destruction” capability **against all the other regional nuclear powers**, another Cold War desideratum, **given their relatively modest economies. An “assured destruction” capability in an n-state competition would require that each state have weapons sufficient to survive an initial attack by all potential rivals and still be able to devastate the countries of all attackers**. It would also require that the source of the attack be reliably identified. As noted earlier, this may prove difficult given likely limitations on these states’ ability to field advanced early warning systems. For example, would Israel be able to determine with confidence the owner of a ballistic missile launched from a location along the Iranian-Turkish border? The origin of any cruise missile launched from a sea-based platform? Even assuming a state could identify the source (or sources) of an attack, could its command and control systems survive the attack sufficiently intact to execute a retaliatory strike? **A decapitation strike could preclude an “assured destruction” retaliatory strike even if sufficient weapons survive to execute one.**

**This, in turn,** raises the possibility of a “catalytic” war**—one that is initiated between two states by a third party. Given a proliferated Middle East as described above, the chances that a regime would incorrectly attribute the source of an attack cannot be easily dismissed. To the extent** cyber weapons can introduce false information **into a state’s decision-making process, the risks of catalytic war only increase.**

Further complicating matters, **the early warning requirement following a proliferation cascade could be multidirectional, and at some point perhaps 360 degrees**, especially if nuclear rivals begin deploying a portion of their nuclear forces at sea. **Early warning requirements would be stressed even further** (and the costs of such a system increase correspondingly) **if a neighboring state** (e.g., Iran in the case of Turkey or Iraq; Turkey in the case of Israel; etc.) **were to acquire nuclear weapons**. In this case warning times would be even more compressed than in an Israeli-Iranian competition. Owing to its proximity to Iran, **Saudi Arabia**, for example, **could have less than five minutes to react to an Iranian ballistic missile attack no matter how advanced its early warning and command and control systems are.**

As noted earlier in this assessment, regardless of what assumptions are made regarding a regional nuclear power’s early warning system, given the short ballistic missile flight times it seems likely that preserving command and control of the state’s nuclear forces while under attack will prove challenging. **States might be tempted to adopt a launch-on-warning posture**, but this requires both early warning and a highly responsive command and control system. Should a state determine that it will not be able to launch-on-warning and instead attempt to “ride-out” a nuclear first strike and retaliate, it would still need its command and control system to function effectively in the wake of the nuclear attack. **Absent a highly resilient command and control system,** a state’s ability to launch a retaliatory **nuclear strike** may require nuclear release authority to be diffused to lower-level commanders. But again, absent an effective early warning system it may not be possible to determine the attack source with confidence in a region with multiple nuclear powers.

#### Nuclear war causes extinction – famine and climate change

Starr 15 [(Steven, Director of the University of Missouri’s Clinical Laboratory Science Program and a senior scientist at the Physicians for Social Responsibility) “Nuclear War, Nuclear Winter, and Human Extinction,” Federation of American Scientists, 10/14/2015] DD

While it is impossible to precisely predict all the human impacts that would result from a nuclear winter, it is relatively simple to predict those which would be most profound. That is, a nuclear winter would cause most humans and large animals to die from nuclear famine in a mass extinction event similar to the one that wiped out the dinosaurs.

Following the detonation (in conflict) of US and/or Russian launch-ready strategic nuclear weapons, nuclear firestorms would burn simultaneously over a total land surface area of many thousands or tens of thousands of square miles. These mass fires, many of which would rage over large cities and industrial areas, would release many tens of millions of tons of black carbon soot and smoke (up to 180 million tons, according to peer-reviewed studies), which would rise rapidly above cloud level and into the stratosphere. [For an explanation of the calculation of smoke emissions, see Atmospheric effects & societal consequences of regional scale nuclear conflicts.]

The scientists who completed the most recent peer-reviewed studies on nuclear winter discovered that the sunlight would heat the smoke, producing a self-lofting effect that would not only aid the rise of the smoke into the stratosphere (above cloud level, where it could not be rained out), but act to keep the smoke in the stratosphere for 10 years or more. The longevity of the smoke layer would act to greatly increase the severity of its effects upon the biosphere.

Once in the stratosphere, the smoke (predicted to be produced by a range of strategic nuclear wars) would rapidly engulf the Earth and form a dense stratospheric smoke layer. The smoke from a war fought with strategic nuclear weapons would quickly prevent up to 70% of sunlight from reaching the surface of the Northern Hemisphere and 35% of sunlight from reaching the surface of the Southern Hemisphere. Such an enormous loss of warming sunlight would produce Ice Age weather conditions on Earth in a matter of weeks. For a period of 1-3 years following the war, temperatures would fall below freezing every day in the central agricultural zones of North America and Eurasia. [For an explanation of nuclear winter, see Nuclear winter revisited with a modern climate model and current nuclear arsenals: Still catastrophic consequences.]

Nuclear winter would cause average global surface temperatures to become colder than they were at the height of the last Ice Age. Such extreme cold would eliminate growing seasons for many years, probably for a decade or longer. Can you imagine a winter that lasts for ten years?

The results of such a scenario are obvious. Temperatures would be much too cold to grow food, and they would remain this way long enough to cause most humans and animals to starve to death.

Global nuclear famine would ensue in a setting in which the infrastructure of the combatant nations has been totally destroyed, resulting in massive amounts of chemical and radioactive toxins being released into the biosphere. We don’t need a sophisticated study to tell us that no food and Ice Age temperatures for a decade would kill most people and animals on the planet.

## 1NC – Off

#### South Korea is looking into 6G programs now but continued private sector investment is key.

Fletcher 7/1 [(Bevin, editor of FierceWireless. She previously served as senior reporter for Wireless Week and CED Magazine, covering the wireless industry on a variety of topics including regulation, technology, and business. She has also worked as a journalist at biotech and finance trade publications. Bevin has a bachelor's degree in journalism from West Virginia University.) “South Korea kickstarts 6G plans,” Fierce Wireless, 7/1/21. <https://www.fiercewireless.com/tech/south-korea-kickstarts-6g-plans>] RR

South Korea’s Ministry of Science and ICT this week established a 6G R&D implementation plan that calls for investing around $194 million by 2025 in six focus areas.

The plan targets government investment totaling KRW 17.9 billion ($15.78 million) in 2021 across 10 strategic technologies, including Low Earth Orbit (LEO) satellites, with KRW 220 billion within four years.

The technologies correlate with the focus areas, including performance, Terahertz bands, space communications, ultra-precision; artificial intelligence; and reliability.

Specifically MSIT outlined strategic technologies that include Tbps-capable wireless and optical communication for maximum 1 Tbps speeds; Terahertz RF components and spectrum model for bands between 100-300 GHz; space mobile and satellite communications to help expand support altitude to 10 km above ground; end-to-end ultra-precision networking for 1/10 latency compared to 5G; intelligent wireless access and network with a focus on applying AI to all sections of the network; and technology for constant network quality monitoring for 5G focused on embedded security.

This year the focus is on laying the groundwork for technologies and identifying technical requirements for key areas of the 6G network. The government is also establishing 6G research centers at three universities in 2021, including KAIST, Sungkyunkwan University and Korea University.

South Korea is also targeting leadership in international standards and patents, with an emphasis on active public-private cooperation in the early stages of 6G.

“As next-generation communications network lays foundation for digital innovation, the public and private sector should work together to take challenges in leading global market in 6G era based on our experiences and knowhow in network,” said Minister Lim Hyesook of Science and ICT. “Furthermore, as both countries have solid foundation for collaboration thanks to Korea-U.S. Summit, we will work together in the early stage of 6G deployment based on such cooperation. We will continue to closely cooperate with relevant ministries, large companies and small and medium-sized enterprises to secure competitiveness in the future and further strengthen Korea’s position as a digital powerhouse.”

In May U.S. and South Korea agreed to encourage joint R&D on emerging technology including 6G.

South Korea and the U.S. signed a Memorandum of Understanding (MoU) through the National Science Foundation (NSF) and the South Korean Institute of Information & Communications Technology Planning & Evaluation (IITP) for collaborative research opportunities, including 6G.

South Korea plans to promote joint studies on core 6G technologies and spectrum, including 11 studies with the U.S., one study with China and two studies with Finland. The country’s 5G Forum will sign MoUs for 6G collaboration with organizations in the private sector, like the Next G Alliance in the U.S.

While 5G deployments are still largely in early phases, industry and governments are turning an eye toward 6G. Europe started a flagship program called Hexa-X, targeting 6G leadership. Groups like ATIS’ Next G Alliance in North America are looking to form next steps and roadmaps for 6G. China has indicated the start of 6G efforts as well.

The U.S. and U.K. earlier this month announced plans to create a detailed science and technology partnership agreement, including collaboration on 6G.

Executives from Qualcomm and Ericsson testified on Wednesday before the U.S. House Committee on Energy and Commerce Subcommittee on Communications and Technology for a legislative hearing focused on securing U.S. wireless networks and supply chain.

Qualcomm SVP of Spectrum Strategy & Tech Policy Dean Brenner said at the hearing that 5G still has a long runway, but the company has started early work on 6G. He emphasized that there won’t be 6G without spectrum, allocated by the FCC, and that spectrum and technology interactions need to take place at a very early stage.

Jason Boswell, head of security and network product solutions for Ericsson North America, said before the subcommittee that if they had not already started on the race to 6G, “we would already be behind.”

In addition to the vendor’s own R&D, he noted it’s important to show collaborations including public-private partnerships. Boswell cited involvement with the NSF RINGS (Resilient & Intelligent NextG Systems) program, noting a focus on potentially significantly impactful technologies such as artificial intelligence, quantum computing, kilohertz spectrum. There will be many different things needed to take advantage of 6G – “not just make it go faster,” he added.

#### A strong South Korean space sector is key to launching 6G networks.

Clarke 10/24 [(Carrington, he ABC's Seoul Correspondent, covering East Asia for the network. He works across digital, television and radio) “Asia is in the midst of a space race, but it's not just about exploration. It's also a military flex,” ABC Net News, 10/24/21. <https://www.abc.net.au/news/carrington-clarke/8042208>] RR

South Korea may not yet have its own dedicated 'Space Force' like the US, but it has made clear that space is crucial to its defence.

However, there are also legitimate civilian and scientific motivations for its ambitions for a space industry.

South Korea's capacity to launch its own rockets is a critical step for reaching goals like a national 6G cellular network and a sovereign radio navigation system like the American GPS.

Lee Hyung-mok, who is a professor emeritus in physics and astronomy at Korea National University, said he and his fellow scientists were excited about the opportunity to use these rockets.

He said they will help transport observation equipment outside the earth's atmosphere, allowing them to better understand our universe.

#### Encourages other countries to adopt 6G networks.

Castro 20 [(Caio, Journalist since eight years old, when I would read the newspaper out loud and pretend it was a radio show. Based in São Paulo, I have worked for Brazilian websites as reporter and editor before joining 6GWorld) “Korea lays out plan to become the first country to launch 6G,” 6G World, 11/5/20. <https://www.6gworld.com/exclusives/korea-lays-out-plan-to-become-the-first-country-to-launch-6g/>] RR

Pushing for 6G at the United Nations

Patents and standardization are two other areas where Korea wants to become a leader. And the push for that has already begun.

On September 24 2020, Korea’s delegation at the International Telecommunication Union (ITU) – the UN body responsible, among others, for global communications standards – filed a proposal for ITU members to start developing a 6G vision.

This is part of an articulated attempt to put Korea at the centre of discussions on the next generation of networks before other well-established countries do the same.

According to the MSIT’s strategy, the effort comes as a “pre-emptive response to global hegemony battle,” and the two core actions in this field are “applying to 3GPP, ITU Standards of 6G core technology.”

Still, the plan also envisions mutual collaboration with other nations regarding research and training specialized workforce.

Setting the environment

Besides establishing the R&D committee, the provisional strategy also has an eye on network development’s educational aspect.

The idea includes building four Network Research Centres by 2022, plus an investment in a platform for knowledge exchange, featuring Massive Open Online Courses about 6G technology evolution and “real-time sharing of best ideas.”

Another effort planned by the MSIT regards how to combine the private sector and academia. The plan states that universities could support companies’ R&D while they act on retraining the workforce. On the other hand, it would be the industry’s role to ” support field training of university students and [offer] student mentoring.”

The document to which 6GWorld has had access envisions 6G commercialization starting in 2028. In August, the Korean government published a provisional timetable including details for each phase of the process:

#### 6G is key to cyber security –

Ziegler et al. 10/14 [(Volker, (Senior Member, IEEE) received the Dipl.-Ing. (M.Sc.) and Dr.-Ing. (Ph.D.) degrees from the Department of Electrical Engineering, Universität (TH) Karlsruhe, Germany.) “Security and trust in the 6G era,” Nokia Bell Labs, 10/14/21. Graphs/Figures Omitted <https://d1p0gxnqcu0lvz.cloudfront.net/documents/Nokia_Security_and_trust_in_the_6G_era_White_Paper_EN.pdf>] RR

In our 6G security vision, we cluster security technology enablers into domains of cyber-resilience, privacy and trust, and their respective intersection as shown in Figure 3. Our approach emphasizes the need to extend cyber-resilience technologies by privacy-preserving technologies and on top of that, trust-creating technologies in order to achieve the ultimate goal of trustworthy 6G networks. We consider resilience against all kinds of cyber-attacks as the core element and indispensable foundation — a network that lacks these attributes of cyber-resilience will not be able to protect privacy and enable trust. While cyberresilience protects privacy against external attacks, end users may in addition want to reduce the amount of sensitive information that is revealed internally, i.e., to the multiple stakeholders involved in providing the communication services. Enabling technologies are needed beyond those in the area of cyberresilience. By adding specific technologies focusing on creating trust, we complete the overall picture of a resilient, privacy-preserving and trustworthy 6G network. In this paper, we have decomposed technology enablers into the following categories: pervasive AI/ML, automated SW creation, automated closed loop security operation, privacy preserving technologies, HW and cloud embedded anchors of trust, quantum safe mechanisms, physical layer security and distributed ledger.

Successful standardization has been the cornerstone of a unified technology landscape that has enabled the proliferation of the mobile communication generations to date. The ecosystem of standardization organizations that has been involved in the architecture and specification of 4G and 5G systems has its sights firmly set on the 6G future as well. Timing is of the essence for creating the optimal impact of standardization. Most SDOs start with studies on technology enablers first before moving into a normative phase of specification. While we expect normative 6G standardization work to start no earlier than 2024/25, we see the precursors of related studies in several technology fields, which we reference in the following.

Pervasive use of AI/ML can be considered a mega-trend of security relevance and driving force to help define the next generation of the Telecom Operation Map (eTOM) [20] and business process framework. In the section below on automated security operations, AI/ML is identified as one of the key drivers for a comprehensive vision of a Secure Telecom Operation Map (SecTOM) for the 6G era. AI/ML w

ill enable and transform automation and analytics for e2e delivery of services to customers as well as for processes to design, create, deliver and support the entire software lifecycle. AI/ML-enabled 6G must include an AI/ ML-enabled 6G security architecture in both SW creation and network operations. Notwithstanding, the complexity and the challenge of continuous adaption requires practical implementations of such a concept, without detailed continuous logging and synchronization across the stacks and processes, but rather, based on smart and representative thread sampling. Mitigation of adversarial attacks will need dedicated research as part of a comprehensive “AIOps” paradigm (cf. “Automated security operations” below), which will include adversarial training to improve robustness, continual adaption of the algorithms that an ML model uses to classify data, and omni-present checks for consistency and integrity of the ML models.

In short, AI/ML will be used pervasively across 6G security architecture, process and technology domains. As discussed in Section III, along with its benefits, there will be new and emerging threats rooted in AI/ ML. ETSI Industry Specification Group (ISG) Securing Artificial Intelligence (SAI) is already working on these aspects and this domain will gain more significance with the proliferation of AI/ML use towards 6G.

With AI/ML-supported, automated SW creation and secure network operations, 6G will address two of the major root causes of unsatisfactory security in today’s information and communication technology systems: vulnerable software and unsecure operational practices. Beyond this, 6G cyber-resilience clearly requires quantum-safe cryptography, considering the progress in the area of quantum computing. Physical layer security, i.e., exploiting the 6G radio technology not only for higher data rates and lower latency, but also for improved security, complements the set of cyber-resilience enablers we consider most relevant for the 6G area. Clearly, on the way towards 6G, these technology enablers will need to be broken down into more granular security mechanisms and further refined and optimized. They will also be part of the expected 5G security evolution, as described in Section II. New requirements coming up in the future as well as yet unknown technologies may also call for enhancing this initial set of cyber-resilience technology enablers.

Building on cyber-resilience, it is commonly agreed that privacy-preserving technologies need to be enhanced in 6G.

In our high-level view, we group all these into a single technology enabler, but we discuss the relevant technologies one-by-one in the following section below on privacy-preserving technologies. To complete the picture, two technologies aiming at enhancing trust are essential for trustworthy 6G networks: First, HW trust anchors that are resistant against tampering via software, with the challenge to apply them in a highly dynamic cloud environment, where workloads are no longer tightly coupled to specific hardware platforms.

#### Cyberattacks risk electric grid shutdowns that collapse the military. This prompts nuclear retaliation.

Tilford 12 — Robert Tilford, Wichita Military Affairs Contributor for the *Examiner*, retired Private in the United States Army, Graduate of the U.S. Army Infantry School and U.S. Army Airborne School at Fort Benning, Georgia, quoting Chuck Grassley, Member of the United States Senate (R-IA), 2012 (“Cyber attackers could shut down the electric grid for the entire east coast,” *Examiner*, July 27th, Available Online at <http://www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa>, Accessed 08-09-2015)

In a speech before members of the United States Senate on July 26, 2012, Republican Chuck Grassley spoke about the need to protect the country from a devestating cyber attack. He didn't mince words either: “Cyber attackers could all too easily shut down the electric grid for the entire east coast, the west coast, and the middle part of our country”, said Senator Grassley on July 26, 2012. “Any one attack could leave dozens of major cities and tens of millions of Americans without power. We know, because we were shown in a room here in the Capitol, how an attack could take place and what damage it would do, so we know this is not just make believe”, he said. So what would a cyber attack look like anyway? The Senator explained: “Without ATMs or debit card readers, commerce would immediately grind to a halt. My daughter, who lives here in the DC area, lost power when the storm hit. They waited for a number of hours, and then they took all the food out of their freezer, they gave away what they could, and they threw the rest away. And that was the way it was all over. Their power was out for about a week, and it made it very difficult. They are fortunate enough to have a basement, and the heat wasn’t oppressive down there. Without refrigeration, food would rot on the shelves, the freezers would have to be emptied, and people could actually go hungry. Without gas pumps, transportation arteries would clog with abandoned vehicles. Without cell phones or computers, whole regions of the country would be cut off from communication and families would be unable to reach each other. Without air conditioning and without lifesaving technology and the service of hospitals and nursing homes, the elderly and sick would become much sicker and die. Most major hospitals have backup power, but it is only for a limited amount of time. It depends on how much fuel they can store, and that is very limited”, Senator Grassley said. The devastation that the Senator describes is truly unimaginable. To make matters worse a cyber attack that can take out a civilian power grid, for example could also cripple the U.S. military. The senator notes that is that the same power grids that supply cities and towns, stores and gas stations, cell towers and heart monitors also power “every military base in our country.” “Although bases would be prepared to weather a short power outage with backup diesel generators, within hours, not days, fuel supplies would run out”, he said. Which means military command and control centers could go dark. Radar systems that detect air threats to our country would shut down completely.

“Communication between commanders and their troops would also go silent. And many weapons systems would be left without either fuel or electric power”, said Senator Grassley. “So in a few short hours or days, the mightiest military in the world would be left scrambling to maintain base functions”, he said. We contacted the Pentagon and officials confirmed the threat of a cyber attack is something very real. Top national security officials—including the Chairman of the Joint Chiefs, the Director of the National Security Agency, the Secretary of Defense, and the CIA Director— have said, “preventing a cyber attack and improving the nation’s electric grids is among the most urgent priorities of our country” (source: Congressional Record). So how serious is the Pentagon taking all this? Enough to start, or end a war over it, for sure (see video: Pentagon declares war on cyber attacks http://www.youtube.com/watch?v=\_kVQrp\_D0kY&feature=relmfu ). A cyber attack today against the US could very well be seen as an “Act of War” and could be met with a “full scale” US military response. That could include the use of “nuclear weapons”, if authorized by the President.

## Case

**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.

### 1NC-Solvency

#### Presumption – there’s zero legal basis or enforcement mechanism for space as a “commons”

Herzfeld et al 15 [(Dr. Henry, Research Professor of Space Policy and International Affairs at George Washington University) “How Simple Terms Mislead Us: The Pitfalls of Thinking about Outer Space as a Commons,” Secure World Foundation, 2015] JL

Furthermore, there is a logical contradiction in this discussion about outer space being treated as a commons. If a commons needs a sovereign government to grant the open territory to the use of all people, it is that government that has to oversee, regulate, and enforce that charter. Art. II of the OST prohibits national sovereignty in outer space. Thus, it is an area without a government. Even if all nations regard outer space as a “commons,” it is a very different concept from any commons that has been established in the past. There is no real legal precedent, no true means of oversight or enforcement, and therefore should not be confused with any of the many ways that concept has been applied to the territory or oceans of the Earth. Thinking about space as a global commons may be a laudatory ideal, and one that perhaps can be regarded as a very long-term goal for society. But, it is hardly a practical solution or goal for the problems we face today, witnessed by at least a thousand years of precedent in law and practice coupled with radically different technologies, exponential world population growth from 500 million people (at most) in Roman times and the Middle Ages to over 7 billion people today,38 and other radical political and social changes.

### Debris

#### Can’t solve--- the aff only restricts the amount of space debris means any more accumulation of debris causes their impact—and public thumps—countries like the US, China, Russia, etc can develop technology on their own

#### Reject laundry list impacts on both adv— none of them have external impacts and don’t let them sandbag on more in the 1ar—also means they don’t cause any extinction level impact means all NC impacts o/w

1. **Probability – 0.1% chance of a collision.**

**Salter 16** [(Alexander William, Economics Professor at Texas Tech) “SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS” 19 STAN. TECH. L. REV. 221 \*numbers replaced with English words] TDI

The probability of a collision is currently low. Bradley and Wein estimate that the maximum probability in LEO of a collision over the lifetime of a spacecraft remains below one in one thousand, conditional on continued compliance with NASA’s deorbiting guidelines.3 However, the possibility of a future “snowballing” effect, whereby debris collides with other objects, further congesting orbit space, remains a significant concern.4 Levin and Carroll estimate the average immediate destruction of wealth created by a collision to be approximately $30 million, with an additional $200 million in damages to all currently existing space assets from the debris created by the initial collision.5 The expected value of destroyed wealth because of collisions, currently small because of the low probability of a collision, can quickly become significant if future collisions result in runaway debris growth.

1. **Time frame – Kessler effect 200 years away**

**Stubbe 17** [(Peter, PhD in law @ Johann Wolfgang Goethe University Frankfurt) “State Accountability for Space Debris: A Legal Study of Responsibility for Polluting the Space Environment and Liability for Damage Caused by Space Debris,” Koninklijke Brill Publishing, ISBN 978-90-04-31407-8, p. 27-31] TDI

The prediction of possible scenarios of the future evolution of the debris p o p ulation involves many uncertainties. Long-term forecasting means the prediction of the evolution of the future debris environment in time periods of decades or even centuries. Predictions are based on models84 that work with certain assumptions, and altering these parameters significantly influences the outcomes of the predictions. Assumptions on the future space traffic and on the initial object environment are particularly critical to the results of modeling efforts.85 A well-known pattern for the evolution of the debris population is the so-called Kessler effect’, which assumes that there is a certain collision probability among space objects because many satellites operate in similar orbital regions. These collisions create fragments, and thus additional objects in the respective orbits, which in turn enhances the risk of further collisions. Consequently, the num ber of objects and collisions increases exponentially and eventually results in the formation of a self-sustaining debris belt aroundthe Earth. While it has long been assumed that such a process of collisional cascading is likely to occur only in a very long-term perspective (meaning a time 1 n of several hundred years),87 a consensus has evolved in recent years that an uncontrolled growth of the debris population in certain altitudes could become reality much sooner.88 In fact, a recent cooperative study undertaken by various space agencies in the scope of i a d c shows that the current l e o debris population is unstable, even if current mitigation measures are applied. The study concludes:

Even with a 90% implementation of the commonly-adopted mitigation measures [...] the l e o debris population is expected to increase by an average of 30% in the next 200 years. The population growth is primarily driven by catastrophic collisions between 700 and 1000 km altitudes and such collisions are likely to occur every 5 to 9 years.89

#### No impact to debris –

Cain ’15 (Fraser; 12/23/15; writer for Universe Today; “How Do Astronauts Avoid Debris”; http://www.universetoday.com/121067/how-do-astronauts-avoid-debris)

So, just how do we keep our space stations, ships and astronauts from being riddled with holes from all of the space junk in orbit around Earth? We revel in the terror grab bag of all the magical ways to get snuffed in space. Almost as much as we celebrate the giant brass backbones of the people who travel there. We’ve already talked about all the scary ways that astronauts can die in space. My personal recurring “Hail Mary full of grace, please don’t let me die in space” nightmare is orbital debris. We’re talking about a vast collection of spent rockets, dead satellites, flotsam, jetsam, lagan and derelict. It’s not a short list. NASA figures there are **21,000 bits of junk** bigger than 10 cm, **500,000 particles** between 1 and 10 cm, and more than **100 million** smaller than 1 cm. Sound familiar, humans? This is our high tech, sci fi great Pacific garbage patch. Sure, a tiny rivet or piece of scrap foil doesn’t sound very dangerous, but consider the fact that astronauts are orbiting the Earth at a velocity of about 28,000 km/h. And the Tang packets, uneaten dehydrated ice cream, and astronaut poops are also traveling at 28,000 km/h. Then think about what happens when they collide. Yikes… or yuck. Here’s the International Space Station’s solar array. See that tiny hole? Embiggen and clarinosticate! That’s a tiny puncture hole made in the array by a piece of orbital crap. The whole station is **pummeled by tiny pieces of space program junk drawer contents**. Back when the Space Shuttle was flying, NASA had to **constantly replace their windows because of the damage they were experiencing** from the orbital equivalent of Dennis the Menace hurling paint chips, fingernail clippings, and frozen scabs.

### Neolib

#### 1AC Wehrlhof doesn’t say extinction – hold them to their evidence – and reject value to life

#### c/a presumption on solvency