# 1N

## 1 – Can’t Spec Form of Appropriation

#### Interp – they can’t spec a form of appropriation

#### Violation: The specify megaconstellations.

#### Now negate –

#### [1] Limits – you explode them since you can specify any form of appropriation

#### A] Cherry-picking – you can select a trivially true aff or a specific form of appropriation that makes it impossible to affirm

#### B] prep skew – you can always leverage your hyper specific aff to beat back generic neg prep which makes the neg prep burdens impossible to meet

#### [2] Clash – destroys clash because I can’t leverage most of my prep against their hyperspecific aff – means we’ll be two shi[ps passing by and they auto extend stuff and win – links to ed bc no in depth debates and fairness bc I’m at a massive skew

#### [2] Accessibility – spec privileges people from big schools because they’ll have the most prep for the widest range of affs and prep squads, so they’ll know what spec affs are hot on the circuit – small school debaters have no chance of beating these affs because they’ll have way less prep against them making debate an unequal playing field – accessibility first because it pushes people out of the activity meaning they can’t get fairness or education and it’s the judges proximal obligation as an educator to adjudicate accessibility issues

#### Fairness first – a] it’s a procedural constraint

#### No RVI’s –

#### (a) chilling effect – aff is dangerous on theory because they get to prep a long counterinterp in the 1ar and then get the 2ar to collapse, weigh, and contextualize - negs would always be disincentived from reading theory against good theory debaters which leads to infinite abuse so it outweighs time skew

#### (b) they’re illogical - “I’m fair vote for me” doesn’t make any sense - you dont win for meeting ur burden of being fair - logic comes first on theory since all args need to make sense in order to be evaluable.

#### Drop the debater –

#### A] Epistemic Skew - I was structurally precluded from engaging in substance given the time spent reading the shell and the abuse itself, means you can’t truly evaluate substance because they are always ahead

#### B] Illogical – can’t DTA b/c the shell indicts their advocacy

#### C] Deter’s future abuse

#### Competing interps –

#### A] reasonability’s arbitrary & forces judge intervention especially with 2ar recontextualizations to always sound like the more reasonable debater

#### B] norm setting - we find the best possible norms through robust theory debates

## 2 – SBSP DA

#### Space-Based Solar Power (SBSP) is a megaconstellation, and it’s going to happen within 10 years in the squo. Aff banning private megaconstellations kills the necessary tech – David 21:

David, Leonard. 11/03/21 Space Solar Power’s Time May Finally Be Coming.”https://www.space.com/space-solar-power-research-advances // LHP BT + LHP PS

The sun never sets in space. **The idea of** harvesting solar energyvia power-beaming satelliteshas therefore long intrigued researchers looking for ways to feed an energy-ravenous [Earth](https://www.space.com/54-earth-history-composition-and-atmosphere.html). That reflection has fomented for decades but is now garnering new looks all over the world: Technologists in the U.S. and China, experts in Japan and researchers within the European Space Agency and the United Kingdom Space Agency are all working to make space-based solar power a reality. Related: [Solar power stations in space could be the answer to our energy needs](https://www.space.com/solar-power-stations-in-space-could-be-the-answer-to-our-energy-needs.html) History machine Peter Glaser, the father of the solar power satellite concept. (Image credit: Arthur D. Little Inc.) The idea of wireless power transmission dates back to [Nikola Tesla](https://www.livescience.com/45950-nikola-tesla-biography.html) near the end of the 19th century. Fast-forwarding to 1968, the notion of a solar power satellite was detailed and patented by U.S. space pioneer Peter Glaser. He blueprinted a novel way to collect energy from sunlight using solar cells and beam down an energetic muscle of microwaves to receiving antennas ("rectennas") on Earth. Those microwaves could then be converted to electrical energy and supplied to the power grid. Then, in the mid-1970s, microwave power transmission experiments in the tens of kilowatts were successfully conducted at the Goldstone Deep Space Communications Complex in California, a facility of NASA's [Jet Propulsion Laboratory](https://www.space.com/16952-nasa-jet-propulsion-laboratory.html). And this "power trip" doesn't stop there.The Space Solar Power Incremental and Demonstrations Research (SSPIDR) project is designed to beam power from space to Earth. SSPIDR consists of several small-scale flight experiments that will mature technology needed to build a prototype solar power distribution system. (Image credit: Air Force Research Laboratory (AFRL)) Impressive **advances Over the past decade,** researchers have made impressive advances **that** increase **the** likelihood **that space solar power (**SSP**)** will be realized during the next decade, said John Mankins, president of Artemis Innovation Management Solutions of Santa Maria, California. His view: the longstanding vision for SSP as a sustainable energy alternative should be revisited in light of such recent advances.Bolstering that outlook is a set of key perspectives, Mankins told Space.com. "Climate change is really going to be a disaster. Nations are committed to go [carbon net-zero](https://www.livescience.com/climate-report-net-zero.html) … and they have no idea how to do it."**The** rapidly unfolding value of "NewSpace**" is also** reshaping the landscape of 21st century space activities**, he added. "Two of the biggest hurdles to the realization of SSP have always been the cost of launch and the cost of hardware**," said Mankins. "Add flight rate, and all of a sudden you're looking at numbers always talked about for solar power satellites."Related: [What is climate change?](https://www.livescience.com/climate-change.html) Megaconstellations **Another** recent change isthedawn of the megaconstellations, Mankins added. **That's** exemplified by SpaceX's [Starlink](https://www.space.com/spacex-starlink-satellites.html) broadband network**, a** mass-production effort that now cranks out 30 tons of satellites a month**. SpaceX is on course to potentially manufacture 40,000 satellites within five years, and launch all of them. "The path to low-cost hardware has been shown," Mankins said. "It's modular and mass-produced. The hurdles of less-expensive launch and lowering hardware costs have been overcome.**"Mankins said that the economics of SSP concepts in the near term, within the next decade, have never been more viable. He flagged advances in space launch capabilities; progress in robotics for space assembly, maintenance and servicing systems; and the growth in various component technologies, such as high-efficiency solid state power amplifiers. **As a result, SSP is ready to see the light of day,** Mankins said.Astroelectricity An early entrant in focusing on understanding the energy policy needed and establishment of SSP is James Michael Snead, president of the Spacefaring Institute. He's adopted the use of the term "astroelectricity" to describe the transmitted electrical power produced by SSP systems.In looking at what he terms the "[coming age of astroelectricity](https://www.youtube.com/watch?v=5E-0NYnAaUA)," he sees a world needing a replacement for oil and natural gas, the two primary sources of energy currently maintaining an industrial standard of living. Snead envisions a world in the year 2100 where about 20% of electrical power comes from terrestrial nuclear and renewables, with 80% supplied by astroelectricity."Just as the military, economic and diplomatic control of Middle East oil has substantially influenced world events for the past 80 years, the control of space solar power platforms will come to dominate outer space activities this century," Snead told Space.com. Wanted: high-priority leadershipIf SSP becomes a reality later this century, Snead said, the U.S. military will be required to protect and defend these new sources of national energy security just as it guards oil infrastructure in the Persian Gulf today."While some people are developing SSP concepts that would be launched from the Earth and autonomously assembled in geostationary Earth orbit, I do not see this as a successful proposition," said Snead. He believes that building the thousands of SSP platforms needed requires a substantial [space industrialization effort](https://www.space.com/nasa-low-earth-orbit-iss-commercialization.html) involving more than a million people in space by the end of the century. The starting point, Snead said, will be establishing the enabling "astrologistics" infrastructure operating throughout the Earth-moon system. He stressed that those astrologistics require high-priority U.S. Air Force — not [Space Force](https://www.space.com/42089-space-force.html) — leadership to draw upon nearly a century of human flight/operational logistics experience and expertise.That is necessary to manage industry's efforts to design and build the required new human spaceflight systems, with a clearly needed emphasis on safety and effectiveness, Snead said. As these new military astrologistics capabilities begin, Snead contends, commercialization of these capabilities will extend these safety and operational benefits to support the coming space industrial revolution needed to undertake SSP. "This is exactly what happened to enable U.S. airline manufacturers to dominate the airline and air cargo industry for decades. It is a successful model to now replicate in space — a model that neither NASA nor the U.S. Space Force can effectively execute," Snead said. The U.S. Naval Research Laboratory’s Paul Jaffe holds a module designed for space solar power investigations in front of a customized vacuum chamber used to test the device. (Image credit: NRL/Jamie Hartman) 'Performing like a champ' While new artwork, economic plots and conceptual SPS thinking and visions flow, there's an in-space technology experiment already underway. On its latest mission, which launched in May 2020, the Space Force's robotic [X-37B space plane](https://www.space.com/25275-x37b-space-plane.html) is toting the Photovoltaic Radio-frequency Antenna Module Flight Experiment (PRAM-FX), a Naval Research Laboratory (NRL) investigation into transforming solar power into radio-frequency microwave energy. The focus of that X-37B investigation is not establishing an actual power-beaming link, but more on appraising the performance of sunlight-to-microwave conversion. "It is performing like a champ," said Paul Jaffe, an NRL electronics engineer working on power beaming and solar power satellites. "We are getting data regularly, and that data is exceeding our expectations," he told Space.com. [PRAM-FX](https://www.space.com/x-37b-space-plane-solar-power-beaming) is principally made out of commercial parts, not "space-grade" hardware. "The fact that it is continuing to operate and give us positive results is quite encouraging," Jaffe said. Commercial parts are mass-produced, while many space-grade parts are one-offs. Solar power satellites, like those envisioned in high Earth orbit, would have thousands of elements made out of similar components being tested onboard the X-37B, Jaffe said. [The US Space Force's secretive X-37B space plane: 10 surprising facts](https://www.space.com/x-37b-military-space-plane-surprising-facts) Space-based solar power could help the UK achieve net-zero emissions by 2050, according to a leading British systems, engineering and technology company. (Image credit: Frazer-Nash Consultancy) Making the economics work There's much more work ahead, of course. "The big strike against space solar power has always been making the economics work. People who have looked at the idea seriously do understand that, from a physics standpoint, there is no reason you couldn't do it," Jaffe said. "With mass production of space hardware, and with the cost reduction of space access, it is more plausible that it could work," he added. "I would caution against excessive optimism … but also point out that things are changing. There are a lot of encouraging developments." SPS will assuredly be compared to a "levelized cost of energy" metric, Jaffe concluded. "There's just not enough data to come up with a levelized cost of energy basis for space solar power. It's premature. What you are seeing now is laying the foundation for that sort of evaluation." Clear, affordable path To that end, Mankins of Artemis Innovation Management Solutions has rolled out SPS-ALPHA ("Solar Power Satellite by means of Arbitrarily Large Phased Array"), a design he showcased at the 72nd International Astronautical Congress, which was held from Oct. 25 to Oct. 29 in Dubai, United Arab Emirates. Detailing a business model and step-by-step SSP roadmap, he feels the concept promises a clear, affordable path to deploying a critically needed new energy option. "**I believe you could have operational solar power satellites to scale within a decade,"** Mankins said. That possibility, combined with the fact that multiple nations are eying SSP as a promising power generation system of the future, begs a question: Is there a solar power satellite race afoot? It is close to that, Mankins said. "I think it has to be cooperation among friends and allies. But I think it's very likely to end up being competition with China. The longer we wait with regard to the urgency of policies on [climate change](https://www.space.com/climate-change-dimming-earth), the more likely it is we're going to miss the boat." Mankins is a 26-year veteran of assessing SSP and the technologies required. "The moment has come," he said. "I think the right answer is really clear: We need to just go do it."

#### SBSP key to solve climate change – Katete 21 – the evidence is from December 17:

Katete, Esthere. (December 17 2021) “Space-Based Solar Power: The Future Source of Energy?”https://www.greenmatch.co.uk/blog/2020/02/space-based-solar-power // LHP BT + LHP PS

Space-based solar power (SBSP) involves collecting the sun’s energy in space, and then wirelessly transmitting it to Earth. There are several [advantages to solar energy](https://www.greenmatch.co.uk/blog/2014/08/5-advantages-and-5-disadvantages-of-solar-energy). Although expensive, it **is** **a** great source of [clean energy](https://www.greenmatch.co.uk/blog/clean-energy) that has the capacity to provide more energythan the world consumes **or is predicted to consume in the future**. A space-based solar power technological process includes using [solar panels](https://www.greenmatch.co.uk/solar-energy/solar-panels) to collect solar energy in space with reflectors or inflatable mirrors that direct solar radiation onto solar panels, and then beaming it on Earth through a microwave or laser. The energy is then received on Earth via a microwave antenna (a rectenna). **According to the** [**National Space Society**](https://space.nss.org/space-solar-power/)**,** space-based solar power **has the** potential to dwarf all the other sources of energy combined**. They argue that space-based solar power can provide large quantities of energy** with very little negative environmental impact**. It can also** solve our current energy and greenhouse gas emissions problems**.** The infographic below highlights information about space-based solar power, current related trends, and what different countries are doing in terms of research and funding. Current Global Energy Consumption and Trends **The** world’s energy consumption is only growing. According to a report by the University of Oxford’s Our World in Data, on the global primary energy consumption, the current world consumption is over 160,000 TWh annually. Solar energy contributes only 585 TWh. Although there is an increase in renewable energy solutions, investments, and usage, oil, coal, and gas still generate more than 80% of the global energy that is consumed - with solar energy generating less than 1%. Between 2004 and 2015, investments in renewable energy increased by 600% from £36.2 billion (US$46.7 billion) to £220.6 billion (US$284.8 billion). Current predictions indicate that the world population will reach [9.7 billion by 2050](https://www.un.org/development/desa/en/news/population/world-population-prospects-2019.html). With the increase in population, the world energy consumption is also predicted to grow by 50% by 2050. In addition, climate change impacts are accelerating. Although we generate a big percentage of the world energy from fossil fuels, fossil fuels contribute significantly to the increase of climate change. **Comparatively,** solar energy is the [safest source of energy](https://ourworldindata.org/uploads/2020/02/Safest-source-of-energy.png) today - though it still only contributes a small percentage of the global energy production. The death rates from solar production are 1,230 times lower than coal, and it has one of the lowest CO2 emissions, at 5g CO2 eq per kWh. Why Space-Based Solar Power? Space-based solar power has several benefits; unlike solar panels on our roofs that can only generate electricity during the day, space-based solar power can generate continuous electricity, 24 hours a day, 99% of the year. This is because, unlike Earth, the space environment does not have night and day, and the satellites are in the Earth's shadow for only a maximum of 72 minutes per night. **Space-based solar panels can generate** 2,000 gigawatts of power constantly. This is **40 times more energy than a solar panel would generate on Earth annually**. This is also several folds higher than the [efficiency of solar panels](https://www.greenmatch.co.uk/blog/2014/11/how-efficient-are-solar-panels) today. **What’s more, is that space-based** solar power would generate [0% greenhouse gas emissions](https://space.nss.org/space-solar-power/) unlike other alternatives **energy like nuclear, coal, oil, gas, and ethanol**. The current source of energy that generates the lowest CO2 is nuclear power, which generates CO2 of 5g CO2 eq per kWh. **Space-based solar power** generates almost 0% hazardous waste to our environment **compared to nuclear power**. Why Are We Not There Yet? While space-based solar power is an innovative concept, we are not able to fully launch a system into space yet. Launching a space-based solar system is very expensive. In fact, the cost is estimated to be about 100 times too high to compete with current utility costs. One of the causes of the high costs is the high cost of launching the panels to space, which is mostly due to the high mass per watt generated by the current solar panels. In other words, the solar panels are currently too heavy per watt generated to make it feasible. Currently, the cost of launching in space is estimated to be £7,716 per kilogram - approximately £154 per watt. In comparison to the cost that homeowners pay today, which is approximately £2 per watt peak, the cost in space is extremely high to be competitive. In UK homes, the [installation cost of solar panels](https://www.greenmatch.co.uk/blog/2014/08/what-is-the-installation-cost-for-solar-panels) can be as low as £1.5 per watt. Other reasons for high costs include the overall high transport costs to space. This is because transporting all other materials that are needed to space would require many space shuttle launches, and these space shuttles are currently not reusable. So, not only is the launch of solar panels themselves expensive, but the additional materials needing to be transported is also expensive. A lot of research and engineering is still ongoing to find the most feasible way to launch space-based solar panels and launch systems, at a lower cost. The environment out in space also has several hazards that could cause damage to the solar panels. These include space debris and extreme solar radiation, which could degrade the solar panels up to 8 times faster than panels installed on Earth. Finally, there is a potential of wasting large amounts of energy when transporting or during transmission from space to Earth. Therefore, scientists and engineers must continue their R&D efforts to ensure little to no energy is lost during the process. Current SBSP Projects and Progress The key players in SBSP include China, the US, and Japan, who have shown progress in terms of technology advancements, partnerships, and launch plans. China is already progressing to launch into space. The China Aerospace Science and Technology Corporation plans to launch small to medium solar satellites in the stratosphere that can harness energy in space between 2021 and 2025. China also plans to generate one megawatt of energy from space-based solar panels by 2030, and to be operating a commercially viable solar space station by 2050. In the US, there are ongoing partnerships and investments. For example, a $100 million partnership between Northrop Grumman and U.S. Air Force Research Laboratory has been established to provide advanced technology for SBSP. Also in the US, a $17.5 million collaboration between Northrop Grumman Corporation and Caltech was set up to develop the space solar power project called ‘The Space Solar Power Initiative’. The initiative’s goal was to develop scientific and technological innovations that would enable a space-based solar power system generate electricity at a cost comparable to current sources of electricity. There has been ongoing research and technological advancements. In the US, the development of the SPS-ALPHA Mark-II concept is underway. This, if successful, would enable construction of huge platforms in space that can remotely deliver tens of thousands of megawatts of electricity to Earth, using wireless power transmissions. This will also enable delivery of affordable power to Earth and on space missions. In addition, progress is being made to build reusable launch systems. Success in this will lower the cost of transport to space and overall cost of space-based solar power. An example is SpaceX, that is currently working on reusable launch vehicles that can be used for transport to space. In Japan, researchers successfully transmitted electric power wirelessly using microwaves. Researchers transformed 1.8 kW of electric power into microwaves and accurately transmitted it into a receiver that was 55 metres away. This was a technological advancement towards bringing SBSP closer to reality. Japan also made space-based solar systems part of its future space exploration vision. Future Outlook for SBSP Fossil fuels are finite and can eventually run out. According to predictions, oil and natural gas could run out in 50 years and coal production in 115 years. With ongoing research and investments, there is a high possibility that space-based solar power is the viable [future of solar power](https://www.greenmatch.co.uk/blog/2015/01/the-future-for-solar-power-in-the-uk). If the cost of space-based solar power can be lowered, it is likely to be a major source of sustainable energy that cannot diminish. Major players like China, who already have timelines of implementing the technology in space, may be able to provide some key learnings for future improvements in the technology.

#### Warming causes extinction - Xu 17:

Yangyang Xu 17, Assistant Professor of Atmospheric Sciences at Texas A&M University; and Veerabhadran Ramanathan, Distinguished Professor of Atmospheric and Climate Sciences at the Scripps Institution of Oceanography, University of California, San Diego, 9/26/17, “Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes,” Proceedings of the National Academy of Sciences of the United States of America, Vol. 114, No. 39, p. 10315-10323

We are proposing the following extension to the DAI risk categorization: warming greater than 1.5 °C as “dangerous”; warming greater than 3 °C as “catastrophic?”; and warming in excess of 5 °C as “unknown??,” with the understanding that changes of this magnitude, not experienced in the last 20+ million years, pose **existential threats** to a majority of the population. The question mark denotes the subjective nature of our deduction and the fact that catastrophe can strike at even lower warming levels. The justifications for the proposed extension to risk categorization are given below. From the IPCC burning embers diagram and from the language of the Paris Agreement, we infer that the DAI begins at warming greater than 1.5 °C. Our criteria for extending the risk category beyond DAI include the potential risks of climate change to the physical climate system, the ecosystem, human health, and **species extinction**. Let us first consider the category of catastrophic (3 to 5 °C warming). The first major concern is the issue of **tipping points**. Several studies (48, 49) have concluded that 3 to 5 °C global warming is likely to be the threshold for tipping points such as the collapse of the western Antarctic ice sheet, shutdown of deep water circulation in the North Atlantic, dieback of Amazon rainforests as well as boreal forests, and collapse of the West African monsoon, among others. While natural scientists refer to these as **abrupt and irreversible climate changes**, economists refer to them as catastrophic events (49). Warming of such magnitudes also has **catastrophic human health effects**. Many recent studies (50, 51) have focused on the direct influence of extreme events such as heat waves on public health by evaluating exposure to heat stress and hyperthermia. It has been estimated that the likelihood of extreme events (defined as 3-sigma events), including heat waves, has increased 10-fold in the recent decades (52). Human beings are extremely sensitive to heat stress. For example, the 2013 European heat wave led to about 70,000 premature mortalities (53). The major finding of a recent study (51) is that, currently, about 13.6% of land area with a population of 30.6% is exposed to deadly heat. The authors of that study defined deadly heat as exceeding a threshold of temperature as well as humidity. The thresholds were determined from numerous heat wave events and data for mortalities attributed to heat waves. According to this study, a 2 °C warming would double the land area subject to deadly heat and expose 48% of the population. A 4 °C warming by 2100 would subject 47% of the land area and almost 74% of the world population to deadly heat, which could pose **existential risks to humans** and mammals alike unless massive adaptation measures are implemented, such as providing air conditioning to the entire population or a massive relocation of most of the population to safer climates. Climate risks can vary markedly depending on the socioeconomic status and culture of the population, and so we must take up the question of “dangerous to whom?” (54). Our discussion in this study is focused more on people and not on the ecosystem, and even with this limited scope, there are multitudes of categories of people. We will focus on the poorest 3 billion people living mostly in tropical rural areas, who are still relying on 18th-century technologies for meeting basic needs such as cooking and heating. Their contribution to CO2 pollution is roughly 5% compared with the 50% contribution by the wealthiest 1 billion (55). This bottom 3 billion population comprises mostly subsistent farmers, whose livelihood will be severely impacted, if not destroyed, with a one- to five-year megadrought, heat waves, or heavy floods; for those among the bottom 3 billion of the world’s population who are living in coastal areas, a 1- to 2-m rise in sea level (likely with a warming in excess of 3 °C) poses **existential threat** if they do not relocate or migrate. It has been estimated that several hundred million people would be subject to famine with warming in excess of 4 °C (54). However, there has essentially been no discussion on warming beyond 5 °C. Climate change-induced species extinction is one major concern with warming of such large magnitudes (>5 °C). The current rate of loss of species is ∼1,000-fold the historical rate, due largely to habitat destruction. At this rate, about 25% of species are in danger of extinction in the coming decades (56). Global warming of 6 °C or more (accompanied by increase in ocean acidity due to increased CO2) can act as a major force multiplier and **expose** as much as **90% of species to** the dangers of **extinction** (57). The bodily harms combined with climate change-forced species destruction, biodiversity loss, and threats to water and food security, as summarized recently (58), motivated us to categorize warming beyond 5 °C as unknown??, implying the possibility of **existential threats**. Fig. 2 displays these three risk categorizations (vertical dashed lines).

## 2 – Starlink DA

#### SpaceX’s Starlink satellites, which are megaconstellations, have already seen a beta rollout and are on path for delivery by 2022 – Supan 21:

Supan, Joe. “Starlink Wait Times Extended to Late 2022 to Early 2023.” Allconnect, 8 Nov. 2021, https://www.allconnect.com/blog/starlink-delays-service-expansion-to-2022. // LHP GB + LHP PS

**Elon Musk recently announced via Twitter that the beta testing for his low-orbit satellite program, Starlink, will be ending in October 2021.** Musk’s company, **SpaceX**, **launched Starlink in a beta** **phase** **and**, **as of** the end of **July** 2021, **reported it had customers in 12 countries**, **serving a total of 900,000 customers**. But if you didn’t sign up during the beta testing period, it might be a while before you can try out the new satellite internet service. **Until recently, Starlink’s website had been telling customers that they could expect to get coverage in 2021.** But as customers on Starlink’s Reddit page began noticing, **the arrival dates were being pushed back a full year to “late 2022 to early 2023.”** That said, **users who pre-ordered during the beta phase were still seeing an expected delivery date of late 2021.** Once those delays became apparent, **Starlink updated the FAQ section of its website** to include a question on when customers can expect to get coverage. “**Silicon shortages have delayed production which has impacted our ability to fulfill orders,”** it says. “Please visit your Account page for the most recent estimate on when you can expect your order to be fulfilled.”While **Musk initially expected a nationwide rollout by the end of October**, **these silicon shortages have apparently set Starlink back by a full year in many areas**. **You can still get in line for Starlink now** — the company says “orders will be fulfilled on a first-come, first-served basis in each area” — but you shouldn’t plan on using it for a while.

#### Starlink is coming now – but the aff bans it – Crist 12/03/21:

Crist, Ry. “What Is Starlink? Elon Musk's Satellite Internet Venture Explained.” CNET, 3 Dec. 2021, https://www.cnet.com/home/internet/starlink-satellite-internet-explained. // LHP GB + LHP PS

**After years of development within SpaceX -- and securing nearly $885.5 million in grant funds from the Federal Communications Commission at the end of 2020 -- Starlink picked up the pace in 2021**. **In January, after three years' worth of successful launches, the project surpassed 1,000 satellites delivered into orbit.** And **by June, SpaceX said the number was roughly 1,800**. In February, Musk's company disclosed that Starlink was serving more than 10,000 customers. Now, **after expanding preorders to even more potential customers and exploring the possibility of providing in-flight Wi-Fi for passenger aircraft, Musk says that Starlink has shipped more than 100,000 satellite internet terminals to customers in 14 countries**.**SpaceX said that it expected Starlink to reach global serviceability sometime in fall 2021** -- though **regional availability will depend on regulatory approval**. During a talk at Mobile World Congress in June 2021, Musk told an audience that Starlink would be available worldwide except at the North and South Poles starting in August. In September, Musk tweeted that Starlink would exit its initial beta phase in October, which indicates that the service is continuing to ramp up and expand -- though the budding broadband provider faces a backlog of prospective customers waiting to receive equipment and start service. Starlink isn't without its controversies. Members of the scientific community have raised concerns about the impact of Starlink's low-earth orbit satellites on night sky visibility. **Meanwhile, satellite internet competitors including Viasat, HughesNet and Amazon's Project Kuiper have taken notice of Starlink's momentum, too, prompting plenty of regulatory jousting and attempts to slow Musk down.**

#### Scenario – Starlink is crucial to the democratization of access to high quality and reliable internet connections worldwide – laundry list of impacts – Holden 21:

Holden, Andrew. “Are Starlink Satellites the Solution to Rural Internets Setbacks? .” Ohio Ag Manager, 9 Apr. 2021, https://u.osu.edu/ohioagmanager/2021/04/09/are-starlink-satellites-the-solution-to-rural-internets-setbacks/. // LHP GB + LHP PS

Slow internet can frustrate almost anyone, but if **you live in a rural area, slow internet, if any, can often be your only choice**. **The lack of highspeed internet access has been a concern for many years in rural America**. **While companies slowly improve service and governmental programs try to address these issues, many rural residents are left waiting for faster internet that can’t come soon enough**. **One company that is attempting to close this digital divide is SpaceX, with their high-speed satellite internet system called Starlink.** While Starlink is just beginning to roll out service, **the initial results appear to be promising. Rural communities and Tribal lands have far less access to high-speed internet compared to those in more populated areas**. **The Federal Communications Commission considers high-speed broadband internet as being able to provide 25 Mbps download speeds and 3 Mbps upload speeds. According to the FCC’s, 2020 Broadband Deployment Report, “22.3% of Americans in rural areas and 27.7% of Americans in Tribal lands lack coverage from fixed terrestrial 25/3 Mbps broadband, as compared to only 1.5% of Americans in urban areas”. Those without high-speed internet access can often be categorized under the phrase ‘last mile’ customers. The last mile problem can be described as the customers at the end of the communication line that are more expensive to reach and located farther apart**. As unfortunate as it is, in basic terms, **companies would rather run a mile of infrastructure in an area that will yield 25 customers than run a mile for just one customer.** **Diminishing returns leads to internet companies being unwilling to improve internet in rural areas, as well as less competition for existing providers. The impact of the digital divide can be felt across the US by those living in small and rural towns**. Many aspects of **modern life are affected by access to high-speed internet, including education, healthcare, entertainment, and employment**. In a report from Michigan State University’s Quello Center, **students with slow or limited internet access lacked digital skills and performed lower on standardized tests**. In addition to education, 2020 highlighted **the future of working remotely and virtual healthcare appointments which rely on faster internet.** **Rural businesses**, from farms to manufacturing, **benefit from better internet speeds as well, making it quicker to send and receive information**. As technology improves and expands, more people in rural areas are slowly receiving better internet services, but **one company that may have the ability to close the gap seemingly overnight is SpaceX.** SpaceX, short for the Space Exploration Technologies Corporation, is an aerospace manufacturer founded by Elon Musk. Musk is also the founder of the popular electric  vehicle company Tesla Motors. One of SpaceX’s business endeavors is providing satellite internet access via a satellite consolation called Starlink. This isn’t like the traditional satellite internet that has been offered over the years. **Starlink uses satellites in low Earth orbit that allow for shorter distances and speeds over 100 mbps for those in the beta testing program**. **Speeds like that would be a huge improvement for almost anyone in a rural area and can be offered remotely to the hardest to reach places**. In February, Starlink opened pre-orders to the public and has been slowly filling orders ever since. With the high demand for the service, many orders are slated to be filled by the end of 2021 depending on your location. The current advertised cost for the service is $99.00 per month with the hardware, including a small satellite dish and a router, for a $499.00 onetime payment. On their website Starlink states service will be offered on a first come, first served basis, and is currently taking $100 down payments to get in line for the service. If you are interested in seeing if service is available in your area, or signing up yourself, you can visit [www.Starlink.com](http://www.starlink.com/) to do so. Will Starlink satellites be the solution to our rural internet woes? When considering access to high-speed internet service in rural areas, one thing that has historically lacked were options to choose from. **Starlink will provide another option, or possibly the first option, to those living with poor to no access to internet and may solve the last mile problem for many rural communities**. Even those who do not use Starlink’s service could benefit from the competition that will encourage traditional internet providers to improve their infrastructure and speeds. Rural communities here in Ohio and across the United States could benefit greatly with better internet access and Starlink is on its way to providing it.

#### Starlink is uniquely equipped to help rural communities – Cesta 21:

Cesta, Luciano. “SpaceX's Starlink May Help Bring Internet to Rural Areas.” Boston University News Service, 2 Apr. 2021, https://bunewsservice.com/spacexs-starlink-may-help-bring-internet-to-rural-areas/. // LHP GB + LHP PS

**Due to** the **COVID-19 pandemic**, the **internet has played an increasingly important role in many people’s lives.** **Work, school and entertainment have become an online endeavor. Connection to the outside world has been made possible by technology**.These servi**ces require reliable internet service**. However, many **people still do not have access to reliable broadband internet**. This is especially the case in **poorer and more rural areas**. In **rural areas of Canada and the United States, it can be more difficult to get high-speed internet access**. **As of 2018, 78 percent of the U.S. population in rural areas had access to home, non-cellular broadband internet with download speeds over 25 megabits per second**. According to the Federal Communications Commission, **25 megabits per second is fast enough to stream HD video or videoconference at the same time for more than one person.** Meanwhile, **99 percent of the urban population has access to high speed internet.** The Canadian Radio-Television and Telecommunications Commission says that around 45.6 percent of rural households have broadband internet with at least a 50 megabits per second download speed. **Starlink, SpaceX’s foray into satellite internet, which launched in late 2020, wants to close this divide with its faster satellite technology.** According to the company, **download speeds during the current beta-test period should range from 50 to 150 — enough for multiple people to use Zoom with no issue.** **Starlink does not currently have any data limits. Older competing satellite providers do not offer Starlink’s competitive speeds. Instead, they often impose slower speeds after a certain threshold of data consumption.** **Viasat offers up to 50 megabits per** second on their marketing materials. Depending on an individual’s plan, the company may make the internet slower after a certain threshold of data is reached.**HughesNet offers up to 25 megabits per second** **speeds**. However, **the company says that they will slow an individual’s internet to 1-3 megabits per second after the data cap is exceeded**. There are also other options available when no ground-based internet exists. Some areas have access to cellular home internet. This internet is similar to regular home internet. However, it connects to a nearby LTE cell tower. T-Mobile promises speeds over 50 megabits per second with no data caps. AT&T offers speeds of around 25 megabits per second with a data cap of 350 gigabytes. Verizon promises up to 25 megabits per second with no data caps. Bill Tetley, from Wellesley Township, Ontario, has struggled with internet service in the past. He says that his LTE-**based internet from his Canadian provider had a low data cap of 100 gigabytes. It was also inconsistent**. **His download speeds ranged from 10 to 15 megabits per second**. Though he still has some consistency issues **with Starlink,** **he no longer has a data cap and the speeds he experiences are faster at around 30 to 130 megabits per second.** “We would try hard to stay under 100 gigabytes, but routinely went over and that got very expensive,” Tetley said. Starlink is not cheap. Users are required to buy a starter kit that includes a satellite antenna —affectionately named dishy by Starlink’s users — which costs $499. Service itself costs $99 per month; in contrast, according to data from market research consultancy BVA-BDRC and Cable.co.uk, Americans pay an average of $66 per month for broadband internet. Canadians spend even lower rates than Americans, at an average of $55 per month on the internet. While the initial reception of the service has been positive, Starlink has its detractors. The International Astronomical Union says that satellite constellations like Starlink’s may make it more difficult to use sensitive ground-based telescopes. Radio telescopes, which recently were instrumental in producing the first image of a black hole, can also be threatened by the interference that the Starlink constellations create.Starlink is currently in its beta-testing phase where they are limiting the number of users in a given area, but, according to their website, they “will continue expansion to near-global coverage of the populated world in 2021.”

## Case

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#### Drop them for not specifying an enforcement mechanism or fiating anything – decks my ability to do things like make larp offense destroying policymaking – also stops us from debating about enforcement – lots of affs have that – destroys ed.