# 1nc r3 BERK

## Off

### 1

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

#### No RVIs, illogical they shouldn’t win for meeting our interp

### 2

#### Interpretation: The resolution defines the division of affirmative and negative ground; affirmative debaters may only garner offense from the hypothetical implementation of the resolution.

#### Violation: They garner offense through a ROTB which is external to the advocacy

**Resolved denotes a proposal to be enacted by law   
Words and Phrases** 1964 Permanent Edition   
Definition of the word “resolve,” given by Webster is “**to express an opinion or determination by resolution or vote; as ‘it was resolved by the legislature;**” It is of **similar** force **to the word “enact,”** which is **defined** by Bouvier **as** meaning “**to establish by law**”.

#### Cross-apply the definition of private entity

#### Article 2 of the Outer Space Treaty defines outer space and appropriation

OST 66 “2222 (XXI). Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.” UN Office for Outer Space Affairs, 1499th plenary meeting, Dec 19, 1966, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html> TG

ARTICLE II. Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

#### Private entities are non-governmental corporations

UpCounsel ND [(UpCounsel is an interactive online service that makes it faster and easier for businesses to find and hire legal help solely based on their preferences. “Private Entity: Everything You Need to Know”, UpCounsel, https://www.upcounsel.com/private-entity#importance-of-private-entities, No Date] SS

A private entity can be a partnership, corporation, individual, nonprofit organization, company, or any other organized group that is not government-affiliated. Indian tribes and foreign public entities are not considered private entities.

Unlike publicly traded companies, private companies do not have public stock offerings on Nasdaq, American Stock Exchange, or the New York Stock Exchange. Instead, they offer shares privately to interested investors, who may trade among themselves.

#### Justice is a policy question

Merriam Webster ND [(Mesrriam Webster) “Justice” https://www.merriam-webster.com/dictionary/justice] BC

Essential Meaning of justice

1: the process or result of using laws to fairly judge and punish crimes and criminals

#### Now negate:

#### Vote negative to preserve limits and equitable division of ground – the resolution is the most predictable stasis point for debates, anything outside of that ruins prep and clash by allowing the affirmative to pick any grounds for debate. That greenlights a race away from the core topic controversies that allow for robust contestation, which favors the aff by making neg ground inapplicable, susceptible to the perm, and concessionary. Three additional impacts:

#### Accessibility – Cutting negs to every possible aff wrecks small schools, which has a disparate impact on under-resourced and minority debaters. Counter-interpretations are arbitrary, unpredictable, and don’t solve the world of neg prep because there’s no grounding in the resolution

#### Link turns their education offense – getting to the third and fourth level of tactical engagement is only possible with refined and well-researched positions connected to the resolutional mechanism. Repeated debates over core issues incentivize innovative argument production and improved advocacy based on feedback and nuanced responses from opponents.

#### Jurisdiction – if they are non topical, you don’t have the jurisdiction to vote for them because you abide by contractual rules so even if they win their model of debate is good you can’t vote aff

#### Prefer our impact: they’ve skewed the game which necessarily comes first because it makes evaluating the aff impossible. The role of individual debate rounds on broader subject formation is white noise – *can you remember what happened in doubles of the Loyola tournament your junior year?* – individual rounds don’t affect our subjectivity, so fairness is the only impact your ballot can resolve. You should presume all their truth claims false because they have not been properly tested

#### They can’t get offense: we don’t exclude them, only persuade you that our methodology is best. Every debate requires a winner and loser, so voting negative doesn’t reject them from debate, it just says they should make a better argument next time.

#### Fairness and education are voters – debate’s a game, and fairness is necessary to determine the winner of the game, and education is the reason why schools fund debate.

#### Drop the debater – dropping the argument doesn’t rectify abuse since winning T proves why we don’t have the burden of rejoinder against their aff.

#### Use competing interps – reasonability invites arbitrary judge intervention since there’s no consensus as to what’s reasonable.

### 3

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### 4

#### Transition Wars DA – Rejection of capitalism causes massive transition wars.

Harris 03 Lee, Analyst – Hoover Institution and Author of The Suicide of Reason, “The Intellectual Origins of America-Bashing”, Policy Review, January, http://www.hoover.org/publications/policyreview/3458371.html

This is the immiserization thesis of Marx. And it is central to revolutionary Marxism, since if capitalism produces no widespread misery, then it also produces no fatal internal contradiction: If everyone is getting better off through capitalism, who will dream of struggling to overthrow it? Only genuine misery on the part of the workers would be sufficient to overturn the whole apparatus of the capitalist state, simply because, as Marx insisted, the capitalist class could not be realistically expected to relinquish control of the state apparatus and, with it, the monopoly of force. In this, Marx was absolutely correct. No capitalist society has ever willingly liquidated itself, and it is utopian to think that any ever will. Therefore, in order to achieve the goal of socialism, nothing short of a complete revolution would do; and this means, in point of fact, a full-fledged civil war not just within one society, but across the globe. Without this catastrophic upheaval, capitalism would remain completely in control of the social order and all socialist schemes would be reduced to pipe dreams.

#### Extinction

Nyquist 05 [J.R., renowned expert in geopolitics and international relations, WorldNetDaily contributing editor. 02/04/2005. “The Political Consequences of a Financial Crash.”]

Should the United States experience a severe economic contraction during the second term of President Bush, the American people will likely support politicians who advocate further restrictions and controls on our market economy – guaranteeing its strangulation and the steady pauperization of the country. In Congress today, Sen. Edward Kennedy supports nearly all the economic dogmas listed above. It is easy to see, therefore, that the coming economic contraction, due in part to a policy of massive credit expansion, will have serious political consequences for the Republican Party (to the benefit of the Democrats). Furthermore, an economic contraction will encourage the formation of anti-capitalist majorities and a turning away from the free market system. The danger here is not merely economic. The political left openly favors the collapse of America’s strategic position abroad. The withdrawal of the United States from the Middle East, the Far East and Europe would catastrophically impact an international system that presently allows 6 billion people to live on the earth’s surface in relative peace. Should anti-capitalist dogmas overwhelm the global market and trading system that evolved under American leadership, the planet’s economy would contract and untold millions would die of starvation. Nationalistic totalitarianism, fueled by a politics of blame, would once again bring war to Asia and Europe. But this time the war would be waged with mass destruction weapons and the United States would be blamed because it is the center of global capitalism. Furthermore, if the anti-capitalist party gains power in Washington, we can expect to see policies of appeasement and unilateral disarmament enacted. American appeasement and disarmament, in this context, would be an admission of guilt before the court of world opinion. Russia and China, above all, would exploit this admission to justify aggressive wars, invasions and mass destruction attacks. A future financial crash, therefore, must be prevented at all costs.

#### Independently turns their impact – the transition magnifies every flaw of capitalism.

Gurbud 97 [Mark, Graduate Research Assistant – Center for Superconductivity Research at the University of Maryland, “Nanotechnology and International Security”, http://www.foresight.org/Conferences/MNT05/Papers/Gubrud/]

With molecular manufacturing, international trade in both raw materials and finished goods can be replaced by decentralized production for local consumption, using locally available materials. The decline of international trade will undermine a powerful source of common interest. Further, artificial intelligence will displace skilled as well as unskilled labor. A world system based on wage labor, transnational capitalism and global markets will necessarily give way. We imagine that a golden age is possible, but we don’t know how to organize one. As global capitalism retreats, it will leave behind a world dominated by politics, and possibly feudal concentrations of wealth and power. Economic insecurity, and fears for the material and moral future of humankind may lead to the rise of demagogic and intemperate national leaders. With almost two hundred sovereign nations, each struggling to create a new economic and social order, perhaps the most predictable outcome is chaos: shifting alignments, displaced populations, power struggles, ethnic conflicts inflamed by demagogues, class conflicts, land disputes, etc. Small and underdeveloped nations will be more than ever dependent on the major powers for access to technology, and more than ever vulnerable to sophisticated forms of control or subversion, or to outright domination. Competition among the leading technological powers for the political loyalty of clients might imply reversion to some form of nationalistic imperialism.

#### Elite backlash turns the alt

Kagarlitsky 96 [Boris](http://findarticles.com/p/search?tb=art&qa=Boris+Kagarlitsky), Senior Research Fellow at the Institute of Comparative Political Studies – Russian Academy of Sciences “The Agony Of Neo-Liberalism Or The End Of Civilization?”, Monthly Review, June, <http://findarticles.com/p/articles/mi_m1132/is_n2_v48/ai_18375973>//[edited for ableist language]

It would seem that the time for alternatives has now come. But where are these alternatives? When the American philosopher Francis Fukuyama declared that with the triumph of neo-liberalism the end of history had arrived, people first argued with him, then began laughing at him, and finally forgot about him. This, however, was a mistake. When Fukuyama declared the end of history, he did not by any means base his thesis on the economic or social successes of capitalism. In practice, he measured the success of the victorious ideology by a single criterion: the ability of the world ruling class to destroy, suffocate, corrupt or discredit any constructive alternative to itself. If there were no alternatives to capitalism, everything would stay the same whether capitalism was good or bad. In this sense, we are now even closer to the end of history than in 1989. The economic failure of neo-liberalism has not led and will not lead automatically to the collapse of its ideological hegemony. The elites of contemporary capitalism cannot resolve the system's objective contradictions, and cannot and do not want to solve its growing problems, but they are capable of [preventing] ~~paralyzing~~ any attempts to solve these problems on the basis of alternative approaches. Technological development is not paralyzed by social structures that are clearly outdated and increasingly absurd. This development continues; the only difference is that it ceases to improve people's lives. Indeed, technological development becomes a negative factor. With every turn in the spiral of technological revolution, more and more new contradictions and disproportions accumulate. Relationships become confused, the structures and systems of rule grow steadily more complex, and the processes become less and less predictable. The "repressive tolerance" of the 1960s has been replaced by repressive or coercive hegemony. The official ideologies no longer convince anyone, but this scarcely troubles the authorities, since they do not allow alternative ideologies to be propagated. Or else, such ideologies are disseminated in fragmentary form, and in this way simply demonstrate their inadequacy as genuine alternatives.

### 5

#### Power Repetition DA – The revolution itself is violent – capitalism will re-form itself around regimes of accumulation.

Wendling 06 [Amy, professor of philosophy at Creighton College. 2006. “Reading Bataille Now.”]

Sovereignty and the Revolutionary Subject Bataille's discussion of "sovereignty" occupies the entire third volume of The Accursed Share. This volume explains the final two chapters of volume 1, in which Bataille sketches the forms of consumption characteristic of Soviet industrialization as a modality of the forms of consumption characteristic of the bourgeois world, as a cruel accumulation. In sovereign consumption, consumption is not subjected to an end outside of itself. In the terms of classical Marxism, to act sovereignly is to privilege use over exchange value, or individual over productive consumption. In a temporal schema, to act sovereignly is to privilege the present over the past or future. We might recognize sovereign consumption as noncoercive pleasure or play, consumption that exceeds a productive, work‑driven economy. A sovereign world would have the vision‑and the language‑to accommodate such a recognition and to accommodate it in a mode other than dubbing it irresponsible, irrational, childlike, or mad. Let me offer an example of sovereign consumption from the realm of sexuality, a realm that Bataille also highlights in both his fiction and his philosophy. The compulsory productive heterosexuality characteristic of bourgeois cultures is also part of the coercion to production. Bataille's por­ [p. 47] nography, all of which describes nonreproductive if mostly heterosexual sex, fits into his project for this reason. Nonreproducrive sex‑sex for sex's sake, queer sex, or sex for pleasure‑are all modes of nonproductive, or sovereign consumption: consumption that does no work, produces no new workers, and uses energy without recompense. All bourgeois cultural taboos about sexuality are rooted in the coercion to production. For Bataille, the sovereign individual, a version of the Nietzschean noble or Hegelian master (1991b, 219; 1973, 267), "consumes and doesn't labor" (199lb, 198; 1973, 248). Like Nietzsche, Bataille argues that bourgeois societies‑we readily recognize them as our own‑have made this sort of consumption impossible for us by inverting the values attached to it. Accumulation eclipses the character of the sovereign: we stockpile, hoard, and hold in reserve rather than use or enjoy. Our deepest pleasures derive from the hoarding itself: from the security of knowing it is there, should we want it. Because of this out pleasures remain vicarious, theoretical, indefinitely deferred and abstract. In an inversion of economic values, the pressure to accumulate eclipses Bataille's sovereign consumption. Similarly, in Nietzsche, the priest's inversion of moral values eclipses the goodness of nobility. For Bataille, the bourgeois class is the first‑and ultimately only‑ r revolutionary class: an ascetic class that revolts specifically against the sovereign nobility in favor of accumulation. The bourgeois revolution over against sovereignty conditions and inescapably schematizes all subsequent revolution and appeals to revolution. The very idea and practice of revolution is itself bourgeois. Revolution is a bourgeois concept, and the world in which Bataille finds himself continues to be the world of a feudal order that is breaking down. Bataille writes: 1 cannot help but insist on these aspects: I wish to stress, against both classical and present‑day Marxism, the connection of all the great modern revolutions, from the English and the French onward, with a feudal order that is breaking down. There have never been any great revolutions that have struck down an established bourgeois domination. All those that overthrew a regime started with a revolt motivated by the sovereignty that is implied in feudal society. (1991b, 279; 1973, 321) Conceptually, revolution demarcates the transition from sovereignty to accumulation. Revolution will always be connected with the dissolution of a feudal order and the privileges emblematized by such an order: access to nonproductive consumption, enjoyment, or use‑value itself, by right of birth. [p. 48] But why not, rather, a conception of plenitude and entitlement for all, also by right of birth, instead of competition and struggle for survival? Such a view is impossible when Nietzschean ressentiment is the impetus for liberation, because postrevolutionary subjects have learned to demonize the very things that they most desire. This point goes some distance toward explaining why revolutionary class hatred is insufficiently analytic and confuses the aristocracy with the bourgeoisie. It also explains why the revolution attempted in 1848 was a disaster. Bataille writes: The days ofJuue, the Commune, and Spartakus are the only violent convulsions of the working masses struggling against the bourgeoisie, but these movements occurred with the help of a misunderstanding. The workers were misled by the lack of obstacles encountered a little earlier when the bourgeoisie, in concert with them, rose up against men born of that feudality which irritated everybody. (1991b, 289) Under this historical error, born of the precipitous mixing of classes, the particularity of the bourgeoisie is misunderstood. The bourgeois is no lord or lady waited upon, but a money‑grubbing, guilt‑ridden, obsessive worker, too cheap to hire help, self‑righteously confirmed in his or her work ethic and ascetic way of life. I am not suggesting that the bourgeois does not have privileges. He or she does, but not in the same way as the feudal lord or lady. The bourgeois goal is always further accumulation, never consumption, and therefore never sovereignty. Bataille writes, "The masses have never united except in a radical hostility to the principle of sovereignty" (l99lb, 288; 1973, 329). The masses do not unite against accumulation, except when that accumulation is expressed as sovereignty, and therefore not as accumulation at all, but as consumption. The proletarian worker perceives an excessive consumption as the necessary result of the bourgeois accumulation of property. But this is a misperception, for the bourgeois does not enjoy but accumulates. When the proletarian worker comes to power, a bourgeois revolution recurs because this mass worker, the slave ascendant, forever operates in an economy of scarcity: hoarding resources from the memory of being deprived. The problem of accumulation begins again. The structure is of actual scarcity, followed by perceived scarcity and hoarding that holds on as a historical remainder. Never fully overcome, this remainder becomes part of the historically sedimented fear through which bourgeois cultures function. The problem is that a resentful revolutionary subject is unfit and unable to enjoy wealth and, by extension, political sovereignty. In The German Ideal­ [p. 49] ogy, Marx answers this criticism by claiming that through the process of revolutionary action, the proletariat is able to overcome accumulated habit and conditioning, learn to consume well, and thus become fit for rule (1978, 193). Only an upsurge of violent revolutionary action will be a sufficient lesson in consumption, a trial by violence that returns the bondsman back to the scene of the struggle to the death. For Marx, the emergent subject, baptized by fire, is transformed into a being capable of sovereignty‑or dead‑at the end of the process. But we have seen that the process of revolutionary action instills not liberation but a fearful repetition of servitude, now internal. In short, transformation is never so neat as Marx would have it.

## Case

#### The Role of the Judge is to determine the better debater and the Role of the Ballot is to communicate that decision to tab – anything else is an arbitrary and self-serving impact filter which can't account for switching sides or the fact that one team has to take an L. Weigh the implications of the aff advocacy vs the impacts of the neg and status quo – reject anything else on engagement and accessibility from the tfw shell.

### Topline

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

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

#### 1AC Shammas is critiques of growth mindset writ large – if governments are fundamentally neoliberal, they have the same incentives to appropriate space as private companies – the aff has zero bearing on NASA – means they don’t solve spatial fixes because NASA can appropriate space resources, then sell them to private companies – proven by existing contracts between NASA and NewSpace –

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

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

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

#### Vote neg on presumption

#### Solvency – can’t spill outwards

#### Can’t get rid of all academic capitalism – other examples thump

#### Ballot isn’t key – no warrant for why you need to win especially because ballots are probs capitalist

#### No spillover – capitalism has never stopped with ppl running cap since 90s means debate space isn’t key

#### The aff fails — capitalism is inevitable.

Jackson 05 Tim Jackson is Professor of Sustainable Development at the University of Surrey and Director of RESOLVE. He also directs the follow-on project: the Sustainable Lifestyles Research Group (SLRG). Tim joined the University of Surrey in 1995 under a Royal Academy of Engineering fellowship on the thermodynamics of clean technology, after five years as Senior Researcher at the Stockholm Environment Institute. In April 2000, he was appointed as Professor of Sustainable Development at Surrey, the first such chair to be created in the UK. Between January 2003 and April 2005, Tim held a research fellowship on the social psychology of sustainable consumption, supported by the ESRC's Sustainable Technologies Programme. (“Motivating Sustainable Consumption”, Centre for Environmental Strategy, http://hiveideas.com/attachments/044\_motivatingscfinal\_000.pdf, January 2005)

Consumption, in the words of one author (Miller 1995) represents the ‘vanguard of history’. The historical and contemporary literature suggests a huge variety of different roles for consumption in modern society. These include its functional role in satisfying needs for food, housing, transport, recreation, leisure, and so on. But consumption is also implicated in processes of identity formation, social distinction and identification, meaning creation and hedonic ‘dreaming’. Some authors argue that these processes are driven by evolutionary imperatives of status and sexual selection. Two key lessons flow from this literature. The first is that material goods are important to us, not just for their functional uses, but because they play vital symbolic roles in our lives. This symbolic role of consumer goods facilitates a range of complex, deeply engrained ‘social conversations’ about status, identity, social cohesion, group norms and the pursuit of personal and cultural meaning. In the words of Mary Douglas (1976) ‘An individual’s main objective in consumption is to help create the social world and to find a credible place in it.’ The second key lesson is that, far from being able to exercise deliberative choice about what to consume and what not to consume, for much of the time people find themselves ‘locked in’ to unsustainable consumption patterns. Consumer 'lock-in' occurs in part through the architecture of incentive structures, institutional barriers, inequalities in access, and restricted choice. But it also flows from habits, routines, social norms and expectations and dominant cultural values. These lessons emphasise the difficulty and complexity associated with negotiating pro-environmental behavioural change. They also highlight the need for policy to come to grips with (and to influence) the social and institutional context of consumer action, as well as attempting to affect individual behaviours (and behavioural antecedents) directly. A key aim of this report is to provide an overview of different models of consumer behaviour and of behavioural change. Conceptual models play two important roles in understanding what motivates consumer behaviour and drives behavioural change. In the first place, they provide heuristic frameworks for exploring and conceptualising consumer behaviour. In particular, they can help us understand the social and psychological influences on both mainstream and pro-environmental (or pro-social) consumer behaviour. For example, some models offer conceptual insights into the psychological antecedents of behaviour; others illustrate the way in which social norms are contextualised; others again highlight the impact of different value orientations on behaviour, and so on. These heuristic understandings also help us to identify points of policy intervention. Secondly, these models can be (and have been) used as frameworks to test empirically the strength of different kinds of relationships (between values and behaviours for example) in different circumstances. This is important for several reasons, not the least of which is that it enables us to develop an empirical evidence base for particular assertions about consumer behaviour and consumer motivation. It also allows us to interrogate the strength of these relationships under specific conditions, and to explore the possibilities for behavioural change. Models that are good for heuristic understanding are not necessarily good for empirical testing, and vice versa. A good conceptual model requires a balance between parsimony and explanatory completeness. The starting point for the discussion of models of consumer behaviour is the familiar ‘rational choice model’ that guides much of existing policy. This model contends that consumers make decisions by calculating the individual costs and benefits of different courses of action and choosing the option that maximises their expected net benefits. Several key assumptions underlie the model. These are that: individual self-interest is the appropriate framework for understanding human behaviour; ‘rational’ behaviour is the result of processes of cognitive deliberation; and that consumer preferences are exogenous to the model – that is to say they are taken as given without further elaboration as to their origins or antecedents. The policy interventions that flow from this perspective are relatively straightforward. In the first place, it is argued, policy should seek to ensure that consumers have access to sufficient information to make informed choices about the available options. Secondly, it is recognised that private decisions do not always take account of social costs. Policy is therefore required to ‘internalise’ these external costs and make them ‘visible’ to private choice. Though familiar, and clearly parsimonious, the rational choice model has been extensively criticised. One central criticism is that there are cognitive limitations on our ability to take deliberative action. In fact, we use a variety of mental ‘short-cuts’ – habits, routines, cues, heuristics – which reduce the amount of cognitive processing needed to act and often bypass cognitive deliberation entirely. A degree of automaticity enters our behaviour, making it much more difficult to change, and undermining a key assumption of the model. Another problem is that affective (emotional) responses confound cognitive deliberation. It is well-known in marketing theory, for example, that consumers build affective relationships with products and respond at an emotional level to decisions about what to buy and how to behave. Some evolutionary neuro-physiology even suggests that emotion ‘precedes’ cognition in decision contexts. Our behaviours are based more on emotional response than on conscious deliberation. The self-interest assumption of the rational choice model has also been attacked. In fact, human behaviour consists of social, moral and altruistic behaviours as well as simply self-interested ones. To make matters worse, the assumption of individuality is also suspect. Individual deliberations clearly do play some part on our behaviour. But behaviours are usually embedded in social contexts. Social and interpersonal factors continually shape and constrain individual preference. Some social psychological models attempt to conceptualise human behaviour in a more nuanced way. Rational choice theory is a form of ‘expectancy value’ theory. In this kind of theory, choices are supposed to be made on the basis of the expected outcomes from a choice and the value attached to those outcomes. A range of ‘adjusted’ social psychological models of consumer behaviour seek to use this basic idea to go beyond assumptions of rational choice and unravel the psychological antecedents of consumer preferences. Some theories also respond to critics by expanding on the expectancy value structure of the rational choice model in various ways. In particular, they attempt to account for the influence of other people’s attitudes on individual behaviour. The most famous example of this kind of theory is Ajzen and Fishbein’s ‘Theory of Reasoned Action’. Ajzen’s ‘Theory of Planned Behaviour’ extends the same model to incorporate the influence of people’s perceptions about their own control over the situation. These conceptual models are useful in understanding the structure of some intentional behaviours. But they also leave out some key aspects of consumer behaviour. In particular, they do not offer clear insights into normative (moral), affective (emotional) and cognitive (e.g. habitual) dimensions of people’s behaviour. Furthermore, the social psychological evidence suggests that some behaviours are not mediated by either attitude or intention at all. In fact the reverse correlation, in which attitudes are inferred from behaviours, is sometimes observed. This has important implications for motivating sustainable consumption, because it suggests that behaviours can be changed without necessarily changing attitudes first. Moreover, these behaviour changes could be valuable in changing people’s environmental attitudes more generally. People may recycle simply as a result of changes in municipal waste collection services, without ever having decided that ‘recycling is a good thing’. But once they start recycling, some people will infer from this that they are (to some extent) ‘green’. The possibility that this new attitude will ‘spill over’ into other behaviours is an intriguing one. Moral and normative considerations are inherent in any discussion of environmentally-significant consumer behaviour. Rational choice models eschew discussion of moral behaviour and assume that it reflects an aspect of self-interest. But incorporating moral beliefs into adjusted expectancy value models appears to improve their predictive power. Moreover, some authors have made explicit attempts to understand the dimensions and the antecedents of moral or pro-social behaviours. For example, Schwartz’s ‘Norm-Activation Theory’ suggests that moral behaviours are the result of a personal norm to act in a particular way. These norms arise, according to Schwartz, from an awareness of the consequences of one’s actions and the ability and willingness to assume responsibility for those consequences. The most well-known work on the moral dimensions of pro-environmental behaviours is that of Paul Stern and his colleagues. Their Value-Belief-Norm theory attempts to elucidate a chain of influence from people’s value sets and beliefs to the emergence of a personal norm to act in a given way. The importance of this work is its insight into the value basis of different behaviours and behavioural intentions. Cialdini’s Focus Theory of Normative Behaviour also has important ramifications for understanding consumer behaviour. Cialdini suggests that people are continually influenced in their behaviours by social norms which prescribe or proscribe certain behavioural options. The existence of such social norms can be a powerful force both in inhibiting and in encouraging pro-environmental behaviour. At one level, pro-environmental behavioural change can be thought of as a transition in social norms. 8. The Matter of Habit Expectancy value models still assume that behaviour is the result of deliberative, cognitive processes. But in practice, many of our ordinary, everyday behaviours are carried out with very little conscious deliberation at all. Cognitive psychology suggests that habits, routines and automaticity play a vital role in the cognitive effort required to function effectively. This ability for efficient cognitive processing becomes increasingly important in a message-dense environment, such as the modern society in which we live. At the same time, the process of ‘routinization’ of everyday behaviours makes them less visible to rational deliberation, less obvious to understand, and less accessible to policy intervention. Habitual behaviours often undermine our best intentions to change and are an important structural feature of behavioural ‘lock-in’. Habit is one of the key challenges for behavioural change policy since many environmentally-significant behaviours have this routine character. 9. Sociality and Self Many social-psychological models assume an individual approach to human behaviour. But experience tells us that we are often constrained by what others think, say and do. Some social theories go even further than this and suggest that our behaviours, our attitudes, and even our concepts of self are (at best) socially constructed and (at worst) helplessly mired in a complex ‘social logic’. Social identity theory, for example, regards key aspects of our behaviour as being motivated by a tendency towards intra-group solidarity and inter-group competition. These kinds of theories provide a rich evidence base for the social embeddedness of environmentally significant behaviour. They also suggest that behavioural change must occur at the collective, social level. Individual change is neither feasible nor sufficient.

### Turn – Cap good

#### Capitalism is adaptable and sustainable – it reforms with new technologies and innovations in a way that benefits the whole of society. Any alternative is a system of oppression and mitigation of the poor.

Ashworth 10 [Stephen, academic publishing at Oxford, December 18, Oxford, “Towards the Sociology of the Universe, part 2,” http://www.astronist.demon.co.uk/space-age/essays/Sociology2.html, 7/2/11]

Under capitalism, social benefit is primarily expressed in monetary terms, and society is stratified economically, with richer classes nearer the top of the social scale and poorer classes nearer the bottom. Under the socialist mode of society, the central function of capital – deciding the allocation of resources – is performed by political ideology. Social benefit is now primarily expressed in terms of ideological capital, being the level of influence, official or unofficial, which an individual enjoys within the institutions, such as in the Soviet Union the Communist Party, which express, teach and propagate that ideology. The rich in such a system are therefore the ideologically rich: those who rise to prominence in the political process and occupy official posts in the Party apparatus; while the poor are those who merely dutifully consume the Party propaganda. The poorest are those who disagree with or actively resist the ruling ideology, and who end up marginalised or criminalised as a result. In view of historical precedents such as the Soviet Union, it is highly unlikely that any realistic socialist society represents an advance over capitalist society in terms of the well-being of the majority of its members (as judged by those members). It is not known whether any third option exists that is compatible with industrialism; however, it is highly plausible that new options will appear in due course, given continued technological development and corresponding social change. Recent history suggests that politically driven attempts at creating a socially just society put all its members, except those at the very top of the Party hierarchy, at a considerable material disadvantage to corresponding members of capitalist societies. One reason for this is that democratic capitalist institutions tend to be flexible and thus capable of responding to changing circumstances, while ideology tends to resist change even in changing circumstances. It must also be clear that any beneficial changes to the modern global liberal democratic market capitalist order can only come about in an incremental fashion, as argued in the social philosophy of Karl Popper (in his book The Open Society and its Enemies). Violent political revolution would, judging by historical precedents, be so destructive that it cannot be contemplated except with extreme horror. Incremental changes in technology, for example the recent introduction of the internet, allow the institutions of democratic capitalism to evolve in ways which are unpredictable but generally beneficial to most groups in society. As civilisation continues to change under the influence of new technologies of computing, medicine and transport, particularly space transport, the democratic capitalist system will naturally also change. Considering the freedoms and privileges enjoyed by the peoples of developed countries compared with their forebears of a few generations ago, it is reasonable to look forward to continued incremental social evolution with optimism concerning the nature of future society, while setting impractical utopian dreams aside

#### Growth is sustainable – absolute decoupling

Hausfather 4/6 [(Zeke, climate scientist and energy systems analyst whose research focuses on observational temperature records, climate models, and mitigation technologies, PhD in climate science from the University of California, Berkeley, former research scientist with Berkeley Earth, senior climate analyst at Project Drawdown, and US analyst for Carbon Brief) “Absolute Decoupling of Economic Growth and Emissions in 32 Countries,” Breakthrough Institute, 4/6/2021] JL

The past 30 years have seen immense progress in improving the quality of life for much of humanity. Extreme poverty — the number of people living on less than $1.90 per day — has fallen by nearly two-thirds, from 1.9 billion to around 650 million. Life expectancy has risen in most of the world, along with literacy and access to education, while infant mortality has fallen. Despite perceptions to the contrary, the average person born today is likely to have access to more opportunities and have a better quality of life than at any other point in human history. Much of this increase in human wellbeing has been propelled by rapid economic growth driven largely by state-led industrial policy, particularly in poor-to-middle income countries.

However, this growth has come at a cost: between 1990 and 2019, global emissions of CO2 increased by 56%. Historically, economic growth has been closely linked to increased energy consumption — and increased CO2 emissions in particular — leading some to argue that a more prosperous world is one that necessarily has more impacts on our natural environment and climate. There is a lively academic debate about our ability to “absolutely decouple” emissions and growth — that is, the extent to which the adoption of clean energy technology can allow emissions to decline while economic growth continues.

Over the past 15 years, however, something has begun to change. Rather than a 21st century dominated by coal that energy modelers foresaw, global coal use peaked in 2013 and is now in structural decline. We have succeeded in making clean energy cheap, with solar power and battery storage costs falling 10-fold since 2009. The world produced more electricity from clean energy — solar, wind, hydro, and nuclear — than from coal over the past two years. And, according to some major oil companies, peak oil is upon us — not because we have run out of cheap oil to produce, but because demand is falling and companies expect further decline as consumers increasingly shift to electric vehicles.

The world has long been experiencing a relative decoupling between economic growth and CO2 emissions, with the emissions per unit of GDP falling for the past 60 years. This is the case even in countries like India and China that have been undergoing rapid economic growth. But relative decoupling alone is inadequate in a world where global CO2emissions need to peak and decline in the next decade to give us any chance at limiting warming to well below 2℃, in line with Paris Agreement targets.

Thankfully, there is increasing evidence that the world is on track to absolutely decouple CO2 emissions and economic growth — with global CO2 emissions potentially having peaked in 2019 and unlikely to increase substantially in the coming decade. While an emissions peak is just the first and easiest step towards eventually reaching the net-zero emissions required to stop the world from continuing to warm, it demonstrates that linkages between emissions and economic activity are not an immutable law, but rather simply a result of our current means of energy production.

In recent years we have seen more and more examples of absolute decoupling — economic growth accompanied by falling CO2 emissions. Since 2005, 32 countries with a population of at least one million people have absolutely decoupled emissions from economic growth, both for terrestrial emissions (those within national borders) and consumption emissions (emissions embodied in the goods consumed in a country). This includes the United States, Japan, Mexico, Germany, United Kingdom, France, Spain, Poland, Romania, Netherlands, Belgium, Portugal, Sweden, Hungary, Belarus, Austria, Bulgaria, El Salvador, Singapore, Denmark, Finland, Slovakia, Norway, Ireland, New Zealand, Croatia, Jamaica, Lithuania, Slovenia, Latvia, Estonia, and Cyprus. Figure 1, below, shows the declines in territorial emissions (blue) and increases in GDP (red).  
To qualify as having experienced absolute decoupling, we require countries included in this analysis to pass four separate filters: a population of at least one million (to focus the analysis on more representative cases), declining territorial emissions over the 2005-2019 period (based on a linear regression), declining consumption emissions, and increasing real GDP (on a purchasing power parity basis, using constant 2017 international $USD). We chose not to include 2020 in this analysis because it is not particularly representative of longer-term trends, and consumption and territorial emissions estimates are not yet available for many countries.

There is a wide range of rates of economic growth between 2005-2019 among countries experiencing absolute decoupling. Somewhat counterintuitively, there is no significant relationship between the rate of economic growth and the magnitude of emissions reductions within the group. While it is unlikely that there is not at least some linkage between the two factors, there are plenty of examples of countries (e.g., Singapore, Romania, and Ireland) experiencing both extremely rapid economic growth and large reductions in CO2 emissions.

One of the primary criticisms of some prior analyses of absolute decoupling is that they ignore leakage. Specifically, the offshoring of manufacturing from high-income countries over the past three decades to countries like China has led to “illusory” drops in emissions, where the emissions associated with high-income country consumption are simply shipped overseas and no longer show up in territorial emissions accounting. There is some truth in this critique, as there was a large increase in emissions embodied in imports from developing countries between 1990 and 2005. After 2005, however, structural changes in China and a growing domestic market led to a reversal of these trends; the amount of emissions “exported” from developed countries to developing countries has actually declined over the past 15 years.

This means that, for many countries, both territorial emissions and consumption emissions (which include any emissions “exported” to other countries) have jointly declined. In fact, on average, consumption emissions have been declining slightly faster than territorial emissions since 2005 in the 32 countries we identify as experiencing absolute decoupling. Figure 2, below, shows the change in consumption emissions (teal) and GDP (red) between 2005 and 2019.  
There is a pretty wide variation in the extent to which these countries have reduced their territorial and consumption emissions since 2005. Some countries — such as the UK, Denmark, Finland, and Singapore – have seen territorial emissions fall faster than consumption emissions, while the US, Japan, Germany, and Spain (among others) have seen consumption emissions fall faster. Figure 3 shows reductions in consumption and territorial emissions for each country, with the size of the dot representing the size of the population in 2019.  
Absolute decoupling is possible. There is no physical law requiring economic growth — and broader increases in human wellbeing — to necessarily be linked to CO2 emissions. All of the services that we rely on today that emit fossil fuels — electricity, transportation, heating, food — can in principle be replaced by near-zero carbon alternatives, though these are more mature in some sectors (electricity, transportation, buildings) than in others (industrial processes, agriculture).

This is not to say that infinite economic growth is desirable (or even possible), particularly given that the global population is expected to start to shrink by the end of the 21st century (and well before that in most currently wealthy countries). There will be some tradeoffs between economic growth and climate mitigation — particularly if the world is to meet ambitious mitigation targets. But it is possible to envision a world that is prosperous, equal, and at net-zero emissions; indeed, all of the future emissions scenarios used by the Intergovernmental Panel on Climate Change (IPCC) do just that.

#### **Even if capitalism has caused environmental degradation, now it’s key to solve – the money is moving away from degradation and towards mitigation.**

Fitzmaurice 15 [Matthew, CEO of EcoAlpha Asset Management LLC, an asset management firm that invests in companies that provide solutions to global burdened resources with a specific emphasis on water, agriculture and energy efficiency. EcoAlpha focuses on public securities and seeks to generate superior risk-adjusted returns for investors. 03/23/2015. “Only Capitalism Can Save the Planet.” <https://ensia.com/voices/only-capitalism-can-save-the-planet/>] JCH-PF

To say the world has changed a lot in the last century is a huge understatement. Industrial, medical and social progress has resulted in unprecedented growth in the world’s population and economy, and that growth has placed tremendous burdens on the planet’s resources. These burdens create problems — perhaps the most substantive problems we have faced as a species: from water scarcity and pollution to climate change, reliable access to nourishing food, and affordable energy. Here’s the thing, though: where there are problems to be solved, there’s money to be made. And where there’s money to be made, we awaken one of the world’s most powerful forces for change: capitalism. Of course capitalism has played a starring role in distressing the planet’s resources. Historically, the combination of unchecked industry, a readiness to externalize costs and a relentless thirst for growth have plundered and polluted the earth. It’s not a debate, but simple fact that our population size and economies cannot continue on their present trajectories without exhausting the world’s resources. Yet, a rapidly expanding global middle class — increasingly urbanized and hungry for protein — threatens further and accelerating distress. The hopeful news is that businesses, with their almost singular focus on economic self-interest, and governments, motivated by a variety of interests, are beginning to recognize and address in earnest these inevitable problems. Today, the businesses that develop practical and affordable solutions to burdened resource problems will end up being the world’s most profitable companies. No longer can they be considered “sustainability” businesses. They are everyday businesses with a long view, targeting problems that are not going away. That’s smart business. Burdened resources have become a strong economic driver for businesses of all sizes, in all industries everywhere to spend and change — and one that will only grow in scope and intensity over time. The companies that provide effective solutions to burdened resources will provide superior risk-adjusted returns to their investors as business and governments accelerate their solutions spending out of their own economic self-interest. And because the products, technologies and services these companies provide are common solutions to global problems — and are therefore exponentially repeatable — these investments will have amplified positive impact on global resource scarcity issues. Too often people have a narrow view of these solutions, thinking only of solar panels and windmills. But solutions are enormously diverse: They include, among many others, agricultural drones that monitor soil conditions, smart irrigation technology that delivers water only where and when it’s really needed, more efficient distributed energy generation and component suppliers that make cars use less gas. As a whole, the human race has a poor track record when it comes to altruism. Although there are a great many saints among us who spend — and even sacrifice — their lives to help others, most of us are hard pressed to take care of ourselves and our families. We have a much better track record when it comes to investing money in our own self-interest, which has fueled the unprecedented innovation, economic and life-expectancy growth of the past century. In the past, many people who invested in sustainable solutions were motivated principally by conscience, willing to accept reduced returns in order to invest their money in a way that was consistent with their beliefs and convictions — be they religious, social or environmental. Now, however, we face a new reality in which our economic self-interest and the long-term well-being of the planet are coming into alignment. Because we have to face the reality of burdened resources, there’s money in it.

**Warming causes extinction**

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**Climate change is becoming an existential threat with warming in excess of 2°C within the next three decades and 4°C to 6°C within the next several decades. Warming of such magnitudes will expose as many as 75% of the world’s population to deadly heat stress in addition to disrupting the climate and weather worldwide. Climate change is an urgent problem requiring urgent solutions**. This paper lays out urgent and **practical solutions that are ready for implementation now, will deliver benefits in the next few critical decades**, and places the world on a path to achieving the longterm targets of the Paris Agreement and near-term sustainable development goals. The approach consists of four building blocks and 3 levers to implement ten scalable solutions described in this report by a team of climate scientists, policy makers, social and behavioral scientists, political scientists, legal experts, diplomats, and military experts from around the world. These solutions will enable society to decarbonize the global energy system by 2050 through efficiency and renewables, drastically reduce short-lived climate pollutants, and stabilize the climate well below 2°C both in the near term (before 2050) and in the long term (post 2050). It will also reduce premature mortalities by tens of millions by 2050. As an insurance against policy lapses, mitigation delays and faster than projected climate changes, the solutions include an Atmospheric Carbon Extraction lever to remove CO2 from the air. The amount of CO2 that must be removed ranges from negligible, if the emissions of CO2 from the energy system and SLCPs start to decrease by 2020 and carbon neutrality is achieved by 2050, to a staggering one trillion tons if the carbon lever is not pulled and emissions of climate pollutants continue to increase until 2030.

There are numerous living laboratories including 53 cities, many universities around the world, the state of California, and the nation of Sweden, who have embarked on a carbon neutral pathway. These laboratories have already created 8 million jobs in the clean energy industry; they have also shown that **emissions of greenhouse gases and air pollutants can be decoupled from economic growth**. Another favorable sign is that **growth rates of worldwide carbon emissions have reduced from 2.9% per year during the first decade of this century to 1.3% from 2011 to 2014 and near zero growth rates during the last few years. The carbon emission curve is bending, but we have a long way to go and very little time for achieving carbon neutrality**. We need institutions and enterprises that can accelerate this bending by scaling-up the solutions that are being proven in the living laboratories. We have less than a decade to put these solutions in place around the world to preserve nature and our quality of life for generations to come. The time is now.

The Paris Agreement is an historic achievement. For the first time, effectively all nations have committed to limiting their greenhouse gas emissions and taking other actions to limit global temperature change. Specifically, 197 nations agreed to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels,” and achieve carbon neutrality in the second half of this century.

**The climate has already warmed by 1°C. The problem is running ahead of us, and under current trends we will likely reach 1.5°C in the next fifteen years and surpass the 2°C guardrail by mid-century with a 50% probability of reaching 4°C by end of century**. Warming in excess of 3°C is likely to be a global catastrophe for three major reasons:

• **Warming in the range of 3°C to 5°C is suggested as the threshold for several tipping points in the physical and geochemical systems; a warming of about 3°C has a probability of over 40% to cross over multiple tipping points, while a warming close to 5°C increases it to nearly 90%, compared with a baseline warming of less than 1.5°C, which has only just over a 10% probability of exceeding any tipping point.**

**• Health effects of such warming are emerging as a major if not dominant source of concern. Warming of 4°C or more will expose more than 70% of the population, i.e. about 7 billion by the end of the century, to deadly heat stress and expose about 2.4 billion to vector borne diseases such as Dengue, Chikengunya, and Zika virus among others**. Ecologists and paleontologists have proposed that warming in excess of 3°C, accompanied by increased acidity of the oceans by the buildup of CO2 , can become a major causal factor for exposing more than 50% of all species to extinction. 20% of species are in danger of extinction now due to population, habitat destruction, and climate change.

The good news is that **there may still be time to avert such catastrophic changes**. The Paris Agreement and **supporting climate policies must be strengthened substantially within the next five years to bend the emissions curve down faster, stabilize climate, and prevent catastrophic warming**. To the extent those efforts fall short, societies and **ecosystems will be forced to contend with substantial needs for adaptation—a burden that will fall disproportionately on the poorest three billion**

**who are least responsible for causing the climate change problem.**

Here we propose a policy roadmap with a realistic and reasonable chance of limiting global temperature to safe levels and preventing unmanageable climate change—an outline of specific science-based policy pathways that serve as the building blocks for a three-lever strategy that could limit warming to well under 2°C. The projections and the emission pathways proposed in this summary are based on a combination of published recommendations and new model simulations conducted by the authors of this study (see Figure 2). We have framed the plan in terms of four building blocks and three levers, which are implemented through 10 solutions. The first building block would be fully implementing the nationally determined mitigation pledges under the Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC). In addition, several sister agreements that provide targeted and efficient mitigation must be strengthened. Sister agreements include the Kigali Amendment to the Montreal Protocol to phase down HFCs, efforts to address aviation emissions through the International Civil Aviation Organization (ICAO), maritime black carbon emissions through the International Maritime Organization (IMO), and the commitment by the eight countries of the Arctic Council to reduce black carbon emissions by up to 33%. There are many other complementary processes that have drawn attention to specific actions on climate change, such as the Group of 20 (G20), which has emphasized reform of fossil fuel subsidies, and the Climate and Clean Air Coalition (CCAC). HFC measures, for example, can avoid as much as 0.5°C of warming by 2100 through the mandatory global phasedown of HFC refrigerants within the next few decades, and substantially more through parallel efforts to improve energy efficiency of air conditioners and other cooling equipment potentially doubling this climate benefit.

For the second building block, numerous subnational and city scale climate action plans have to be scaled up. One prominent example is California’s Under 2 Coalition signed by over 177 jurisdictions from 37 countries in six continents covering a third of world economy. The goal of this Memorandum of Understanding is to catalyze efforts in many jurisdictions that are comparable with California’s target of 40% reductions in CO2 emissions by 2030 and 80% reductions by 2050—emission cuts that, if achieved globally, would be consistent with stopping warming at about 2°C above pre-industrial levels. Another prominent example is the climate action plans by over 52 cities and 65 businesses around the world aiming to cut emissions by 30% by 2030 and 80% to 100% by 2050. There are concerns that the carbon neutral goal will hinder economic progress; however, real world examples from California and Sweden since 2005 offer evidence that economic growth can be decoupled from carbon emissions and the data for CO2 emissions and GDP reveal that growth in fact prospers with a green economy.

The third building block consists of two levers that we need to pull as hard as we can: one for drastically reducing emissions of short-lived climate pollutants (SLCPs) beginning now and completing by 2030, and the other for decarbonizing the global energy system by 2050 through efficiency and renewables. Pulling both levers simultaneously can keep global temperature rise below 2°C through the end of the century. If we bend the CO2 emissions curve through decarbonization of the energy system such that global emissions peak in 2020 and decrease steadily thereafter until reaching zero in 2050, there is less than a 20% probability of exceeding 2°C. This call for bending the CO2 curve by 2020 is one key way in which this report’s proposal differs from the Paris Agreement and it is perhaps the most difficult task of all those envisioned here. Many cities and jurisdictions are already on this pathway, thus demonstrating its scalability. Achieving carbon neutrality and reducing emissions of SLCPs would also drastically reduce air pollution globally, including all major cities, thus saving millions of lives and over 100 million tons of crops lost to air pollution each year. In addition, these steps would provide clean energy access to the world’s poorest three billion who are still forced to resort to 18th century technologies to meet basic needs such as cooking. For the fourth and the final building block, we are adding a third lever, ACE (Atmospheric Carbon Extraction, also known as Carbon Dioxide Removal, or “CDR”). This lever is added as an insurance against surprises (due to policy lapses, mitigation delays, or non-linear climate changes) and would require development of scalable measures for removing the CO2 already in the atmosphere. The amount of CO2 that must be removed will range from negligible, if the emissions of CO2 from the energy system and SLCPs start to decrease by 2020 and carbon neutrality is achieved by 2050, to a staggering one trillion tons, if CO2 emissions continue to increase until 2030, and the carbon lever is not pulled until after 2030. This issue is raised because the NDCs (Nationally Determined Contributions) accompanying the Paris Agreement would allow CO2 emissions to increase until 2030. We call on economists and experts in political and administrative systems to assess the feasibility and cost-effectiveness of reducing carbon and SLCPs emissions beginning in 2020 compared with delaying it by ten years and then being forced to pull the third lever to extract one trillion tons of CO2

The fast mitigation plan of requiring emissions reductions to begin by 2020, which means that many countries need to cut now, is urgently needed to limit the warming to well under 2°C. Climate change is not a linear problem. Instead, we are facing non-linear climate tipping points that can lead to self-reinforcing and cascading climate change impacts. Tipping points and selfreinforcing feedbacks are wild cards that are more likely with increased temperatures, and many of the potential abrupt climate shifts could happen as warming goes from 1.5°C in 15 years to 2°C by 2050, with the potential to push us well beyond the Paris Agreement goals.

Where Do We Go from Here?

**A massive effort will be needed to stop warming at 2°C, and time is of the essence. With unchecked business-as-usual emissions, global warming has a 50% likelihood of exceeding 4ºC and a 5% probability of exceeding 6ºC in this century, raising existential questions for most, but especially the poorest three billion people. A 4ºC warming is likely to expose as many as 75% of the global population to deadly heat.** Dangerous to catastrophic impacts on the health of people including generations yet to be born, on the health of ecosystems, and on species extinction have emerged as major justifications for mitigating climate change well below 2ºC, although we must recognize that the uncertainties intrinsic in climate and social systems make it hard to pin down exactly the level of warming that will trigger possibly catastrophic impacts. To avoid these consequences, we must act now, and we must act fast and effectively. This report sets out a specific plan for reducing climate change in both the near- and long-term. With aggressive urgent actions, we can protect ourselves. Acting quickly to prevent catastrophic climate change by decarbonization will save millions of lives, trillions of dollars in economic costs, and massive suffering and dislocation to people around the world. This is a global security imperative, as it can avoid the migration and destabilization of entire societies and countries and reduce the likelihood of environmentally driven civil wars and other conflicts.

Staying well under 2°C will require a concerted global effort. We must address everything from our energy systems to our personal choices to reduce emissions to the greatest extent possible. We must redouble our efforts to invent, test, and perfect systems of governance so that the large measure of international cooperation needed to achieve these goals can be realized in practice. The health of people for generations to come and the health of ecosystems crucially depend on an energy revolution beginning now that will take us away from fossil fuels and toward the clean renewable energy sources of the future. It will be nearly impossible to obtain other critical social goals, including for example the UN agenda 2030 with the Sustainable Development Goals, if we do not make immediate and profound progress stabilizing climate, as we are outlining here.

1. The Building Blocks Approach The 2015 Paris Agreement, which went into effect November 2016, is a remarkable, historic achievement. For the frst time, essentially all nations have committed to limit their greenhouse gas emissions and take other actions to limit global temperature and adapt to unavoidable climate change. Nations agreed to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels” and “achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century” (UNFCCC, 2015). Nevertheless, the initial Paris Agreement has to be strengthened substantially within fve years if we are to prevent catastrophic warming; **current pledges place the world on track for up to 3.4°C by 2100 (UNEP, 2016b). Until now, no specifc policy roadmap exists that provides a realistic and reasonable chance of limiting global temperatures to safe levels and preventing unmanageable climate change**. This report is our attempt to provide such a plan— an outline of specifc solutions that serve as the building blocks for a comprehensive strategy for limiting the warming to well under 2°C and avoiding dangerous climate change (Figure 1). The frst building block is the full implementation of the nationally determined mitigation pledges under the Paris Agreement of the UN Framework Convention on Climate Change (UNFCCC) and strengthening global sister agreements, such as the Kigali Amendment to the Montreal Protocol to phase down HFCs, which can provide additional targeted, fast action mitigation at scale. For the second building block, numerous sub-national and city scale climate action plans have to be scaled up such as California’s Under 2 Coalition signed by 177 jurisdictions from 37 countries on six continents. The third building block is targeted measures to reduce emissions of shortlived climate pollutants (SLCPs), beginning now and fully implemented by 2030, along with major measures to fully decarbonize the global economy, causing the overall emissions growth rate to stop in 2020-2030 and reach carbon neutrality by 2050. Such a deep decarbonization would require an energy revolution similar to the Industrial Revolution that was based on fossil fuels. The fnal building block includes scalable and reversible carbon dioxide (CO2 ) removal measures, which can begin removing CO2 already emitted into the atmosphere. Such a plan is urgently needed. Climate change is not a linear problem. Instead, climate tipping points can lead to self-reinforcing, cascading climate change impacts (Lenton et al., 2008). Tipping points are more likely with increased temperatures, and many of the potential abrupt climate shifts could happen as warming goes from 1.5°C to 2°C, with the potential to push us well beyond the Paris Agreement goals (Drijfhout et al., 2015). In order to avoid dangerous climate change, we must address these concerns. **We must act now, and we must act fast. Reduction of SLCPs will result in fast, near-term reductions in warming, while present-day reductions of CO2 will result in long-term climate benefts**. This two-lever approach—aggressively cutting both SLCPs and CO2 –-will slow warming in the coming decades when it is most crucial to avoid impacts from climate change as well as maintain a safe climate many decades from now. To achieve the nearterm goals, we have outlined solutions to be implemented immediately. These solutions to bend down the rising emissions curve and thus bend the warming trajectory curve follow a 2015 assessment by the University of California under its Carbon Neutrality Initiative (Ramanathan et al., 2016). The solutions are clustered into categories of social transformation, governance improvement, market- and regulation-based solutions, technological innovation and transformation, and natural and ecosystem management. Additionally, we need to intensely investigate and pursue a third lever—ACE (Atmospheric Carbon Extraction). While many potential technologies exist, we do not know the extent to which they could be scaled up to remove the requisite amount of carbon from the atmosphere in order to achieve the Paris Agreement goals, and any delay in mitigation will demand increasing reliance on these technologies. Yet, there is still hope. Humanity can come together, as we have done in the past, to collaborate towards a common goal. We have no choice but to tackle the challenge of climate change. We only have the choice of when and how: **either now, through the ambitious plan outlined here, or later, through radical adaptation and societal transformations in response to an ever-deteriorating climate system that will unleash devastating impacts—some of which may be beyond our capacity to fully adapt to or reverse for thousands of years.**

2. Major Climate Disruptions: How Soon and How Fast? “Without adequate mitigation and adaptation, climate change poses unacceptable risks to global public health.” (WHO, 2016)

The planet has already witnessed nearly 1°C of warming, and another 0.6°C of additional warming is currently stored in the ocean to be released over the next two to four decades, if climate warming emissions are not radically reduced during that time (IPCC, 2013). The impacts of this warming on extreme weather, droughts, and foods are being felt by society worldwide to the extent that many think of this no longer as climate change but as climate disruption. Consider the business as usual scenario:

15 years from now: In 15 years, planetary warming will reach 1.5°C above pre-industrial global mean temperature (Ramanathan and Xu, 2010; Shindell et al., 2012). This exceeds the 0.5°C to 1°C of warming during the Eemian period, 115,000– 130,000 years ago, when sea-levels reached 6-9 meters (20-30 feet) higher than today (Hansen et al., 2016b). The impacts of this warming will affect us all yet will disproportionately affect the Earth’s poorest three billion people, who are primarily subsistence farmers that still rely on 18th century technologies and have the least capacity to adapt (IPCC, 2014a; Dasgupta et al., 2015). They thus may be forced to resort to mass migration into city slums and push across international borders (U.S. DOD, 2015). The existential fate of lowlying small islands and coastal communities will also need to be addressed, as they are primarily vulnerable to sea-level rise, diminishing freshwater resources, and more intense storms. In addition, many depend on fsheries for protein, and these are likely to be affected by ocean acidifcation and climate change. Climate injustice could start causing visible regional and international conficts. All of this will be exacerbated as the risk of passing tipping points increases (Lenton et al., 2008).

30 years from now: By mid-century, warming is expected to exceed 2°C, which would be unprecedented with respect to historical records of at least the last one million years (IPCC, 2014c). Such a warming through this century could result in sea-level rise of as much as 2 meters by 2100, with greater sea-level rise to follow. A group of tipping points are clustered between 1.5°C and 2°C (Figure 2) (Drijfhout et al., 2015). The melting of most mountain glaciers, including those in the Tibetan-Himalayas, combined with mega-droughts, heat waves, storms, and foods, would adversely affect nearly everyone on the planet.

80 years from now: In 80 years, warming is expected to exceed 4°C, increasing the likelihood of irreversible and catastrophic change (World Bank, 2013b). 4ºC warming is likely to expose as much as 75% of the global population to deadly heat (Mora et al., 2017). The 2°C and 4°C values quoted above and in other reports, however, are merely the central values with a 50% probability of occurrence (Ramanathan and Feng, 2008). There is a 5% probability the warming could be as high as 6°C due to uncertainties in the magnitude of amplifying feedbacks (see Section 4). This in turn could lead to major disruptions to natural and social systems, threatening food security, water security, and national security and fundamentally affecting the great majority of the projected 11.2 billion inhabitants of the planet in 2100 (UN DESA, 2015).

3. What Are the Wild Cards for Climate Disruption? Increasing the concentrations of greenhouse gases in the atmosphere increases radiative forcing (the difference between the amount of energy entering the atmosphere and leaving) and thus increases the global temperature (IPCC, 2013). However, climate wild cards exist that can alter the linear connection with warming and anthropogenic emissions by triggering abrupt changes in the climate (Lenton et al., 2008). Some of these wild cards have not been thoroughly captured by the models that policymakers rely on the most. These abrupt shifts are irreversible on a human time scale (<100 years) and will create a notable disruption to the climate system, condemning the world to warming beyond that which we have previously projected. These climate disruptions would divert resources from needed mitigation and upset mitigation strategies that we have already put in place.

1. Unmasking Aerosol Cooling: The frst such wild card is the unmasking of an estimated 0.7°C (with an uncertainty range of 0.3°C to 1.2°C) of the warming in addition to mitigating other aerosol effects such as disrupting rainfall patterns, by reducing emissions of aerosols such as sulfates and nitrates as part of air pollution regulations (Wigley, 1991; Ramanathan and Feng, 2008). Aerosol air pollution is a major health hazard with massive costs to public health and society, including contributing to about 7 million deaths (from household and ambient exposure) each year (WHO, 2014). While some aerosols, such as black carbon and brown carbon, strongly absorb sunlight and warm the climate, others refect sunlight back into space, which cools the climate (Ramanathan and Carmichael, 2008). The net impact of all manmade aerosols is negative, meaning that about 30% of the warming from greenhouse gases is being masked by co-emitted air pollution particles (Ramanathan and Carmichael, 2008). As we reduce greenhouse gas emissions and implement policies to eliminate air pollution, we are also reducing the concentration of aerosols in the air. Aerosols last in the atmosphere for about a week, so if we eliminate air pollution without reducing emissions of the greenhouse gases, the unmasking alone would lead to an estimated 0.7°C of warming within a matter of decades (Ramanathan and Feng, 2008). We must eliminate all aerosol emissions due to their health effects, but we must simultaneously mitigate emissions of CO2 , other greenhouse gases, and black carbon and co-pollutants to avoid an abrupt and very large jump in the near-term warming beyond 2°C (Brasseur and Roeckner, 2005).

2. Tipping Points**: It is likely that as we cross the 1.5°C to 2°C thresholds we will trigger so called “tipping points” for abrupt and nonlinear changes in the climate system with catastrophic consequences** for humanity and the environment (Lenton, 2008; Drijfhout et al., 2015). Once the tipping points are passed, the resulting impacts will range in timescales from: disruption of monsoon systems (transition in a year), loss of sea ice (approximately a decade for transition), dieback of major forests (nearly half a century for transition), reorganization of ocean circulation (approximately a century for transition), to loss of ice sheets and subsequent sea-level rise (transition over hundreds of years) (Lenton et al., 2008). Regardless of timescale, once underway many of these changes would be irreversible (Lontzek et al., 2015). There is also a likelihood of crossing over multiple tipping points simultaneously. Warming of close to 3°C would subject the system to a 46% probability of crossing multiple tipping points, while warming of close to 5°C would increase the risk to 87% (Cai et al., 2016). Recent modeling work shows a “cluster” of these tipping points could be triggered between 1.5°C and 2°C warming (Figure 2), including melting of land and sea ice and changes in highlatitude ocean circulation (deep convection) (Drijfhout et al., 2015). This is consistent with existing observations and understanding that the polar regions are particularly sensitive to global warming and have several potentially imminent tipping points. The Arctic is warming nearly twice as quickly as the global average, which makes the abrupt changes in the Arctic more likely at a lower level of global warming (IPCC, 2013). Similarly, the Himalayas are warming at roughly the same rate as the Arctic and are thus also more susceptible to incremental changes in temperature (UNEP-WMO, 2011). This gives further justifcation for limiting warming to no more than 1.5°C.

While all climate tipping points have the potential to rapidly destabilize climate, social, and economic systems, some are also **self-amplifying feedbacks that once set in motion increase warming in such a way that they perpetuate yet even more warming. Declining Arctic sea ice, thawing permafrost, and the poleward migration of cloud systems are all examples of self-amplifying feedback mechanisms, where initial warming feeds upon itself to cause still more warming acting as a force multiplier (Schuur et al., 2015).**

#### Key to solve disease.

Jackson ‘16 (Kerry, Pacific Research Institute; 12/19/16; Free Market Policies Needed To Incentivize Creation Of New Life-Saving Treatments; https://www.pacificresearch.org/article/free-market-policies-needed-to-incentivize-creation-of-new-life-saving-treatments/)

“Our strongest antibiotics don’t work and patients are left with potentially untreatable infections,” Director Dr. Tom Frieden said when the CDC issued its warning. He asked doctors, hospitals and public health officials to “work together” to “stop these infections from spreading.” The 2014 Report to the President expressed a similar concern: “The evolution of antibiotic resistance is now occurring at an alarming rate and is outpacing the development of new countermeasures capable of thwarting infections in humans. This situation threatens patient care, economic growth, public health, agriculture, economic security and national security.” For those thinking this sort of thing shouldn’t be happening when medical science is more advanced than can almost be conceived, be assured that it is. And unless there are public policy interventions, it’s likely to get worse. “More and more microorganisms will continue to gain resistance to the current drug therapies because (antimicrobial resistance, or AMR) is basic evolution,” Wayne Winegarden writes in the Pacific Research Institute’s newly-released report “Incenting the Development of Antimicrobial Medicines to Address the Problem of Drug-Resistant Infections.” The International Federation of Pharmaceutical Manufacturers says the problem is caused by “a dearth of new antibiotic medicines.” At the same time that there’s been an increase in AMR, there has been “a sharp decline in the development of new antibiotic medicines.” The group reports that only two new classes of antibiotics have been discovered in the last three decades compared to 11 in the previous 50 years. The answers to many medical problems are still not within reach of researchers. But the hazards of AMR can be diminished. Winegarden suggests we begin with public health campaigns that encourage handwashing, which he calls a highly effective and low-cost way to reduce the spread of infection. He further recommends policy that would address the problem of antibiotic overuse and greater use of vaccines to cut the incidents of infection. But Winegarden’s primary concern is establishing the correct incentives for developing new antimicrobial medicines that would be effective against AMR microorganisms. He’s specifically referring to policies “based on a thorough understanding of the disincentives that are currently inhibiting their development.” “These disincentives are well-recognized,” he writes. “Despite the medical need, and despite the generally strong return on investment for many other drug classes, the return on investment for developing new antimicrobial medicines (particularly antibiotics) is too low.” Producing a new drug is a grinding and expensive endeavor. It can take 10 to 15 years to develop a single prescription drug that is introduced to the market, and a company can spend as much as $5.5 billion on research and development for each medication that is eventually approved and prescribed. Less than 2 percent of all projects launched to create new drugs succeed. This is not an environment in which pharmaceutical companies can get too amped up about pursuing new treatments. Yet new drug approvals increased over the last decade. Don’t look for a surge of antimicrobial drugs in that pipeline, though. Winegarden says that particular drug class is among several that “face unique impediments” that serve as disincentives for innovation. To overcome the steep hill that impedes the development of new AMR drugs, lawmakers must implement policies that unleash the incentives of the free market. Policymakers also should look at the 1983 federal Orphan Drug Act and its market-oriented reforms that increased the number of drugs developed to treat rare diseases. More than 400 have been introduced to the market since the law was enacted, compared to fewer than 10 in the 1970s. Put another way, government needs to remove its anchors from the process and let the market do what it does so well. In this case, that’s restoring patients’ health, enriching innovative companies that create jobs, and inspiring biotech start-ups such as the group of Stanford undergraduates that has been capitalized to develop new antibiotics. If the proper incentives are in place, the needed treatments will follow.

#### Extinction – defense is wrong

Piers Millett 17, Consultant for the World Health Organization, PhD in International Relations and Affairs, University of Bradford, Andrew Snyder-Beattie, “Existential Risk and Cost-Effective Biosecurity”, Health Security, Vol 15(4), http://online.liebertpub.com/doi/pdfplus/10.1089/hs.2017.0028

Historically, disease events have been responsible for the greatest death tolls on humanity. The 1918 flu was responsible for more than 50 million deaths,1 while smallpox killed perhaps 10 times that many in the 20th century alone.2 The Black Death was responsible for killing over 25% of the European population,3 while other pandemics, such as the plague of Justinian, are thought to have killed 25 million in the 6th century—constituting over 10% of the world’s population at the time.4 It is an open question whether a future pandemic could result in outright human extinction or the irreversible collapse of civilization.

A skeptic would have many good reasons to think that existential risk from disease is unlikely. Such a disease would need to spread worldwide to remote populations, overcome rare genetic resistances, and evade detection, cures, and countermeasures. Even evolution itself may work in humanity’s favor: Virulence and transmission is often a trade-off, and so evolutionary pressures could push against maximally lethal wild-type pathogens.5,6

While these arguments point to a very small risk of human extinction, they do not rule the possibility out entirely. Although rare, there are recorded instances of species going extinct due to disease—primarily in amphibians, but also in 1 mammalian species of rat on Christmas Island.7,8 There are also historical examples of large human populations being almost entirely wiped out

by disease, especially when multiple diseases were simultaneously introduced into a population without immunity. The most striking examples of total population collapse include native American tribes exposed to European diseases, such as the Massachusett (86% loss of population), Quiripi-Unquachog (95% loss of population), and theWestern Abenaki (which suffered a staggering 98% loss of population).

In the modern context, no single disease currently exists that combines the worst-case levels of transmissibility, lethality, resistance to countermeasures, and global reach. But many diseases are proof of principle that each worst-case attribute can be realized independently. For example, some diseases exhibit nearly a 100% case fatality ratio in the absence of treatment, such as rabies or septicemic plague. Other diseases have a track record of spreading to virtually every human community worldwide, such as the 1918 flu,10 and seroprevalence studies indicate that other pathogens, such as chickenpox and HSV-1, can successfully reach over 95% of a population.11,12 Under optimal virulence theory, natural evolution would be an unlikely source for pathogens with the highest possible levels of transmissibility, virulence, and global reach. But advances in biotechnology might allow the creation of diseases that combine such traits. Recent controversy has already emerged over a number of scientific experiments that resulted in viruses with enhanced transmissibility, lethality, and/or the ability to overcome therapeutics.13-17 Other experiments demonstrated that mousepox could be modified to have a 100% case fatality rate and render a vaccine ineffective.18 In addition to transmissibility and lethality, studies have shown that other disease traits, such as incubation time, environmental survival, and available vectors, could be modified as well.19-2

## Framing

**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.

**Reducing the risk of extinction is always priority number one.   
Bostrom 12** [Faculty of Philosophy and Oxford Martin School, University of Oxford.], Existential Risk Prevention as Global Priority.  Forthcoming book (Global Policy). MP. http://www.existenti...org/concept.pdfEven if we use the most conservative of these estimates, which entirely ignores the   possibility of space colonization and software minds, **we find that the expected loss of an existential   catastrophe is greater than the value of 10^16 human lives**.  **This implies that the expected value of   reducing existential risk by a mere one millionth of one percentage point is at least a hundred times the   value of a million human lives.**  The more technologically comprehensive estimate of 10  54 humanbrain-emulation subjective life-years (or 10  52  lives of ordinary length) makes the same point even   more starkly.  Even if we give this allegedly lower bound on the cumulative output potential of a   technologically mature civilization a mere 1% chance of being correct, we find that the expected   value of reducing existential risk by a mere one billionth of one billionth of one percentage point is worth   a hundred billion times as much as a billion human lives. **One might consequently argue that even the tiniest reduction of existential risk has an   expected value greater than that of the definite provision of any ordinary good, such as the direct   benefit of saving 1 billion lives.**  And, further, that the absolute value of the indirect effect of saving 1  billion lives on the total cumulative amount of existential riskâ€”positive or negativeâ€”is almost   certainly larger than the positive value of the direct benefit of such an action.