

The New Consensus Platform Wiki: Environment and Climate Change

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The Enormous Costs of Climate Change:

http://mudancasclimaticas.cptec.inpe.br/~rmclima/pdfs/destaques/sternreview_report_complete.pdf
<https://www.cnbc.com/2015/08/18/cost-of-not-acting-on-climate-change-44-trillion-citi.html>
<https://www.bloomberg.com/news/articles/2014-01-16/climate-protection-may-cost-4-of-world-gdp-by-2030>
<http://www.oecd.org/env/the-economic-consequences-of-climate-change-9789264235410-en.htm>
<https://www.earth-syst-dynam.net/8/577/2017/>
<https://link.springer.com/article/10.1007/s10584-012-0649-4>
<http://science.sciencemag.org/content/356/6345/1362>
<https://www.aeaweb.org/articles?id=10.1257/jel.51.3.838>
<http://www.pnas.org/content/108/7/2678.short>
<https://cdn.americanprogress.org/wp-content/uploads/2016/09/21081429/CostsOfClimate.pdf>
https://www.nature.com/polopoly_fs/1.149911/menu/main/topColumns/topLeftColumn/pdf/508173a.pdf?origin=ppub
<https://pubs.aeaweb.org/doi/pdf/10.1257/aer.98.2.1>
<https://www.nature.com/articles/nature11787>
<https://www.nature.com/articles/nclimate1979>
<http://science.sciencemag.org/content/328/5985/1517>
<https://repository.library.noaa.gov/view/noaa/11124>
<https://news.nationalgeographic.com/2017/09/climate-change-costs-us-economy-billions-report/>
<https://hbr.org/2017/06/if-you-think-fighting-climate-change-will-be-expensive-calculate-the-cost-of-letting-it-happen>

Legal Policy to Encourage Renewable Energy:

_____ In order to enable an energy transition to renewable sources, legislation will have to be put in place allowing renewable energy sources priority metering over fossil fuels. However, the one stipulation is that the electricity supplied be cheaper than the fossil it is replacing. This means energy providers using renewable sources get first dibs on electricity demand, non-renewable power generation will be left to pick up whatever demand is left, and American consumers won't see it affect their energy bills. This system will encourage the prompt construction of renewable sources wherever they can undercut the price of fossils due to a guaranteed market, with renewable employment progressing to completion as costs further decline vs fossil. In addition, it will encourage the construction of utility-scale renewables which are either cheaper than existing energy, or at very least the same price.

- <http://www.ourenergypolicy.org/wp-content/uploads/2015/06/20150604091846-Amin-Maaterials-PUF-1503.pdf>
- <https://ieeexplore.ieee.org/abstract/document/6011696/>
- <https://ieeexplore.ieee.org/abstract/document/6099519/>
- <https://ieeexplore.ieee.org/abstract/document/5357331/>
- <https://ieeexplore.ieee.org/abstract/document/5467283/>
- <https://www.sciencedirect.com/science/article/pii/S0301421509004212>
- https://inis.iaea.org/search/search.aspx?orig_q=RN:46105565
- <https://www.sciencedirect.com/science/article/pii/S0301421509007915>
- <https://onlinelibrary.wiley.com/doi/abs/10.1111/psj.12066>
- <https://www.sciencedirect.com/science/article/pii/S0301421507004983>
- <https://www.sciencedirect.com/science/article/pii/S0301421508007556>
- <https://www.sciencedirect.com/science/article/pii/S0301421511000292>
- <https://www.sciencedirect.com/science/article/pii/S1364032111004564>
- <https://www.sciencedirect.com/science/article/pii/S0959652609000249>
- <https://www.sciencedirect.com/science/article/pii/S030142151100396X>
- <https://www.sciencedirect.com/science/article/pii/S1364032112005205>
- <https://www.sciencedirect.com/science/article/pii/S1364032114003748>

Reaching Global Climate Goals:

Achieving the global transition to renewable energy is something that will require a great deal of work. However, the US is in a unique position of being able to finance the construction of renewable utilities around the world. Much in the same spirit as the Marshall Plan, US economic investment will help to spur the transition to renewables in as many parts of the world as feasible. Electricity could be metered just enough to break even on the costs of construction, thus allowing affordable electricity access

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- <https://www.annualreviews.org/doi/full/10.1146/annurev-environ-021113-095626>
- <https://link.springer.com/article/doi/10.1007/s11077-012-9151-0>
- <https://www.sciencedirect.com/science/article/pii/S0040162513002539>
- <https://pubs.acs.org/doi/abs/10.1021/es072023k>
- <https://www.sciencedirect.com/science/article/pii/S0301421511010354>

Plastics:

Petroleum derived, some are poisonous, many don't biodegrade, we should be working to phase out plastics from all non-essential applications.

- <https://www.nature.com/articles/494169a>
- <https://www.annualreviews.org/doi/abs/10.1146/annurev.publhealth.012809.103714>
- <https://pubs.acs.org/doi/abs/10.1021/cr200162d>
- <https://www.degruyter.com/view/j/reveh.2013.28.issue-1/reveh-2012-0030/reveh-2012-0030.xml>
- https://link.springer.com/chapter/10.1007%20978-1-4614-3414-6_1
- <https://www.sciencedirect.com/science/article/pii/S0734975008000141>
- <https://onlinelibrary.wiley.com/doi/abs/10.1002/mnfr.201000121>
- http://ja.accessdance.com/files/danandjaniece/articles_v1_00/happenings/packing-lunches.pdf
- <https://www.nature.com/articles/srep21982>
- <https://www.sciencedirect.com/science/article/pii/S0304389410008848>
- <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1440-1789.2011.01287.x>
- <https://www.tandfonline.com/doi/abs/10.1080/10937404.2011.578557>
- <http://journals.sagepub.com/doi/abs/10.1177/1559325815590394>
- <https://www.sciencedirect.com/science/article/pii/S0018506X10002540>

Conservation:

Preserving our planet's wilderness and wildlife is an important task for posterity. The utility of biodiversity is enormous. New chemicals, potential medicines, scientific discoveries and more stem from the life that we share this planet with. It would not take much effort to avert the destruction of entire ecosystems. Many, such as mangrove forests and seagrass plains, actually sequester carbon out of the atmosphere and thus lower global CO2 levels. There are probably many more useful things yet to be discovered floating around in earth's rich ecosystems which we will lose if actions are not taken to conserve these areas of wilderness and protect them from human intrusion.

- <https://www.sciencedirect.com/science/article/pii/S0921800901002336>
- <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1523-1739.2008.00921.x>
- <https://www.sciencedirect.com/science/article/pii/S092180090800133X>
- <https://www.sciencedirect.com/science/article/pii/S0921800905003149>

Food Waste:

The UN estimates that close to 1/3 of all edible products produced globally are relegated to the trash. In reality, we could be sustaining the entire planet on just 67% of the land currently being farmed. Global overpopulation would be much less of a concern if we were able to avoid this level of waste.

- <https://feedbackglobal.org/food-waste-scandal/>
- <https://www.ifama.org/resources/files/2013-Symposium/TFFox.pdf>
- <http://rstb.royalsocietypublishing.org/content/365/1554/3065.short>
- <https://www.degruyter.com/view/j/eng.2013.3.issue-2/s13531-012-0058-5/s13531-012-0058-5.xml>

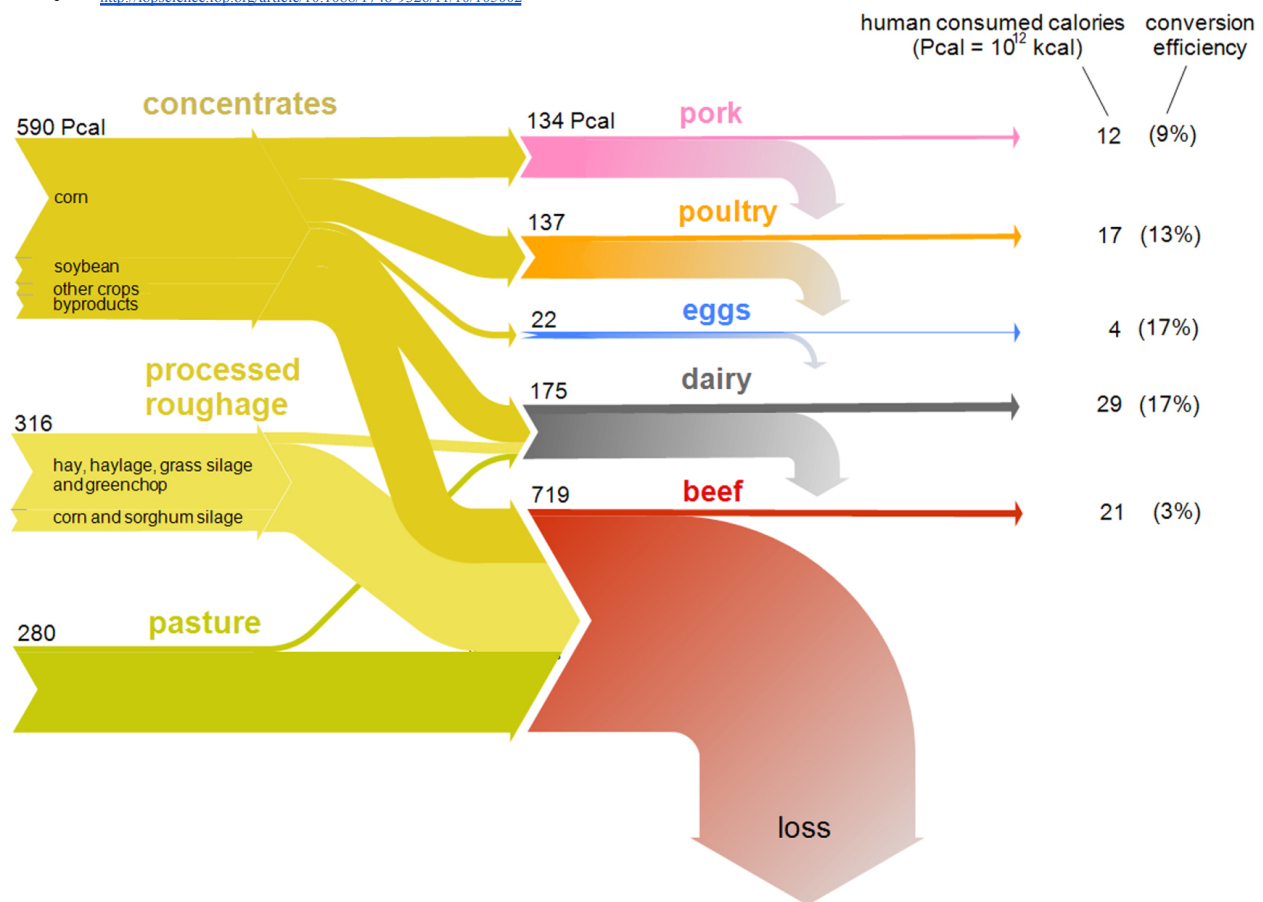
Dietary Efficiency:

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Another matter of importance is the relative efficiency of different types of foods. For example, meats are a much less efficient form of food than primary producers like plant crops. It's estimated that between 6 and 20 lbs of corn are required to produce 1 pound of beef meat. Much of the food we currently grow to feed livestock could simply be converted into cropland for human consumption instead. We would be able to extract far more calories from the 6-20 lbs of corn than 1 lb of beef. In order to accommodate a planet with increasingly fewer acres of arable land left and a growing population, we are going to have to start prioritizing calorically efficient food sources over those which might taste better but are a poor use of land.

That isn't to say meats will need to be done away with altogether. There is a lot of research currently looking into the possibility of growing meats in the lab from cell culture. If we can find a way to produce meat more efficiently in the lab than using livestock, meats could remain a staple part of human food consumption worldwide. Such technology promises cruelty-free, highly caloric-efficient meat production from stem cells in culture.

- <http://iopscience.iop.org/article/10.1088/1748-9326/11/10/105002>
- <http://articles.extension.org/pages/35850/on-average-how-many-pounds-of-corn-make-one-pound-of-beef-assuming-an-all-grain-diet-from-background>
- <https://www.noble.org/news/publications/ag-news-and-views/2011/february/the-efficiency-of-beef-production/>
- <http://iopscience.iop.org/article/10.1088/1748-9326/11/10/105002>



Amino Acid Synthesis and Cellulose Metabolism GMO:

A few other ways we could reduce our impact on the planet involve intentional genetic modification of humans to be able to digest cellulose and also to synthesize all amino acids. Humans currently require certain (essential) amino acids from food sources due to our inability to synthesize them from scratch, but many animals possess the cellular machinery to produce all amino acids from scratch.

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The ability to do this would allow humans to avoid protein deficiency and to subsist off of vegetables alone. The ability to break down cellulose into its constituent glucose monomers can be found throughout the animal kingdom. Giving humans the ability to digest the most abundant organic polymer on the planet has obvious advantages when it comes to sustaining a large population. People would be able to live off of sawdust if necessary. Such adaptations would likely be a godsend for those in the developing world, and would enable human civilization to be fed on pretty much any source of vegetation.

- https://en.wikipedia.org/wiki/Essential_amino_acid
- <https://en.wikipedia.org/wiki/Cellulose>
- <https://www.nature.com/scitable/topicpage/an-evolutionary-perspective-on-amino-acids-14568445>

GMO Crops:

The growing world population and relative scarcity of unexploited, arable farmland demand that existing farms continue to increase yields per acre in order to keep up with increases in demand for food. GMO plants designed to do just this are a very promising means of resolving this issue. While there are issues surrounding the patenting of seeds and the engineering of crops resistant to possibly carcinogenic pesticides, GMO crops are not intrinsically bad or good. Their value depends entirely on how they are used. In order to keep up with increases in global food demand, we propose that the US government (along with a consortium of other major nations) fund the public research and production of GMO plant strains designed to increase crop yields for global use. These seeds will be made fertile and distributed around the world at the lowest possible cost. In this way, we hope to leverage the power of public research and GMO crops to improve yields and production around the world.

- <https://allianceforscience.cornell.edu/blog/2018/02/gmo-crops-increasing-yield-20-years-progress-ahead/>
- <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0111629>
- <https://link.springer.com/article/10.1007/s13593-013-0138-9>
- <https://www.sciencedirect.com/science/article/pii/S1877343510001120>

The Future of the Human Economy:

_____ Designing an economy which exists within the boundaries and limitations of nature is no easy task, but it is an essential one we will have to do. Water stress, waste, pollution, inefficiency and more all plague the economy of today. Moving forward, we are going to have to seriously begin considering how to maintain a functional economy with as little inefficiency, waste and pollution as possible. Cities will need to recycle much more of the water that is currently sent to waste treatment. Energy efficiency needs to increase, packaging and goods should be made with recyclable materials, food will be produced with less waste and inefficiency, transit will have to be made possible without emissions, and the human economy will need to shift from one of extraction, to one that is a closed loop of material.

- <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1540-6210.2010.02249.x>
- <http://journals.sagepub.com/doi/abs/10.1177/0020715209105141>
- <https://www.sciencedirect.com/science/article/pii/S0959652609002200>
- <http://www.mdpi.com/2071-1050/2/6/1784/htm>
- <http://www.pnas.org/content/108/9/3465.short>
- <https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/2163/sdc-2009-pwg.pdf?seq>

Further Resources:

- <https://earth.nullschool.net/>
- <http://maps.tnc.org/migrations-in-motion/#4/19.00/-78.00>
- <https://blog.nature.org/science/2016/08/19/migration-in-motion-visualizing-species-movements-due-to-climate-change/>
- <https://www.bloomberg.com/graphics/2015-whats-warming-the-world/>
- <http://www.pewresearch.org/fact-tank/2018/01/30/more-americans-oppose-than-favor-increased-offshore-drilling/>

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- <http://www.pewresearch.org/fact-tank/2018/05/16/most-americans-say-climate-change-affects-their-local-community-including-two-thirds-living-near-coast/>
- <http://www.pewresearch.org/fact-tank/2017/03/22/how-much-does-science-knowledge-influence-peoples-views-on-climate-change-and-energy-issues/>
- <http://www.pewresearch.org/fact-tank/2016/12/14/most-americans-favor-stricter-environmental-laws-and-regulations/>
- <http://www.pewresearch.org/fact-tank/2016/12/05/many-americans-are-skeptical-about-scientific-research-on-climate-and-gm-foods/>
-