

# How energy efficiency and degrowth backfire

but decarbonization might work!

Valerie Aurora, RIPE Green Tech Hackathon, 11 December 2024

# How energy efficiency and degrowth backfire

**... but decarbonization might work!**

Energy efficiency and/or degrowth alone produces ever-increasing use of energy at the global scale, because:

1. Making something more energy efficient makes it cheaper, which results in greater use of energy (Jevons Paradox)
2. Societies with higher-energy intensity outcompete and replace lower-energy ones (e.g., farming replaced most hunter-gatherers)
3. International agreements won't work because biggest emitters get more benefit than damage from energy use (benefits go to them, damages get spread out across the world)

# Bad news: energy efficiency backfires

## The Jevons Paradox

Increasing energy efficiency results in greater total energy usage

The Jevons Paradox came out of the observation that as coal-powered steam engines used coal more efficiently, total coal use increased

<https://economicsfromthetopdown.com/2024/05/18/a-tour-of-the-jevons-paradox-how-energy-efficiency-backfires/>

The Jevons Paradox happens whenever demand is "elastic" - the amount "bought" is strongly dependent on "price." This describes a lot of energy-intensive goods and services.

# Bad news: self-limiting energy use fails

## A game you can't fix by refusing to play

Organizations that limit their energy use are at a competitive disadvantage with those that do not

Other organizations snap up unused energy and use it anyway

Total energy use will not decline, so the organization becomes less powerful for no local or global benefit

People and organizations that limit their energy use end up being replaced or overpowered by those that do not

Farming societies replaced hunter-gatherer societies—long before capitalism

# Bad news: international agreements fail

## Time for some game theory

The benefit of energy use goes mostly to the energy user

The damages of greenhouse gases are distributed unevenly across the world

Countries with high power are high energy use, high emissions, low damages

High emitting countries are incentivized NOT to join a global agreement limiting energy use

A survey of the research: <https://www.researchgate.net/publication/307869078> International Environmental Agreements Doomed to Fail or Destined to Succeed A Review of the Literature

# Good news: decarbonization might work

## Decoupling energy use and greenhouse gas emissions

We have to interrupt one or more of these cycles, which is easiest?

✗ more efficient energy use <-> more total energy use

✗ more greenhouse gas emissions by a nation <-> more benefit than damage for the nation

✗ more energy use by a nation <-> more competitive/powerful nation

**? ? ? more energy use <-> more greenhouse gas emissions**

Decarbonization is hard but not as hard as the rest of these problems!

# More info

- Longer description as text <https://etherpad.servus.at/p/GreenTechHackathonDecember2024-backfire-keep>
- Fediverse thread <https://wandering.shop/@vaurora/113635048986317768>
- The articles on degrowth on Economics from the Top Down <https://economicsfromthetopdown.com/tag/degrowth/>
- Sustainability Environmental Economics and Dynamics Studies <https://www.sustainability-seeds.org/>
- International Environmental Agreements: Doomed to Fail or Destined to Succeed? A Review of the Literature [https://www.researchgate.net/publication/307869078\\_International\\_Environmental\\_Agreements\\_Doomed\\_to\\_Fail\\_or\\_Destined\\_to\\_Succeed\\_A\\_Review\\_of\\_the\\_Literature](https://www.researchgate.net/publication/307869078_International_Environmental_Agreements_Doomed_to_Fail_or_Destined_to_Succeed_A_Review_of_the_Literature)
- An Evolutionary approach to International Environmental Agreements <http://www.sustainability-seeds.org/papers/RePec/srt/wpaper/0517.pdf>
- Shorting the Grid: The Hidden Fragility of Our Electric Grid <https://www.amazon.com/Shorting-Grid-Hidden-Fragility-Electric/dp/1735358002/>