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# Creating a Social Cost Framework for an AI Data Centre Life Cycle: A Proposal for Space-Based Mitigation

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# ABSTRACT

Every arms race follows a pattern. In the 20th century, the pursuit of nuclear superiority and the original Space Race pushed risk onto local communities, placing national prestige above environmental and social safety. The race to scale AI is repeating it. AI runs on physical infrastructure, and its cost lands on people who never agreed to carry it: rising utility bills, land displacement, water scarcity, mined minerals, and the waste left at the end.

This dissertation asks who bears the social cost of AI infrastructure expansion, how that cost can be measured across the full lifecycle, and whether moving the infrastructure into orbit would reduce it.

I ran a content frequency analysis of 90 papers to identify ten social cost drivers across five lifecycle phases, then quantified them against a representative 100 MW facility using a modular social cost formula and PERT three point estimation.

The model returned roughly $2.14 billion over a 20 year operational life. Operational electricity was 95.4 percent of it, and water came second at $60.5 million. Labour exploitation, e waste toxicity and community disruption priced low, because they are hard to measure in money.

The carbon intensity of the grid matters more than the efficiency of the building. A low PUE on a high carbon supply still causes enormous harm.

Orbital deployment could reduce land use, local disruption, water demand and possibly operational carbon if powered by solar. It would not remove the Earth based supply chain harms, and it adds new risks from launch, debris and re entry.