

The Webs that Define Us:

An analysis of our ecological connections, our shared destruction, and our power to remake the future

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*“The consequences of actions which desecrate Nature are often untraceable
to those who are responsible” – Dasgupta*

How does the Dutch Circular Economy model address the systemic causes of overconsumption and waste in ways that the NYC Zero Waste plan fails? What broader transformations are needed to overcome these limitations within the context of global capitalist systems?

Part I: Tracking Down Trash

Where does our trash come from, and where does it go? It starts as something other than trash, but most things we consume end up as such. If we look back on the life of a candy bar, its components begin from all corners of the globe. The cocoa beans may originate in West Africa, the nuts may come from South America, and the preservative palm oil comes from Indonesia. The plastic wrapping may come from India, and the packaging and processing may happen in Mexico before it is distributed worldwide. What starts as a raw material eventually turns into a finished product that is then sold in the bodega down the street, where we buy it, eat it, and throw what is left of it in the garbage can on the street corner. In New York, the department of sanitation then takes over collecting it from that corner, where it is brought to a transfer station. Eventually, the candy bar remnant finds itself in a dump, maybe upstate, maybe back across the

world, it is hard to know for sure. But while this final destination may be unknown, the used-up candy bar finds itself in a permanent home, surrounded by trash just like itself. What happens then? And how does the item's origin relate to the landfill that becomes its final destination?

A deeper understanding of these relationships is crucial to fighting the climate crisis. What and how we consume lies at the heart of the ecological havoc our species has brought about. This paper investigates two different plans for addressing the trash crisis. Through the theoretical threads derived from *Climate Leviathan* (Wainwright & Mann, 2018), *Systems Theory* (Skene & Oarga-Mulec, 2019), *Planetary Boundaries* (Rockström et al., 2009), and *Undoing the Demos* (Brown, 2015), it will analyze both the Dutch Circular Economy Plan (2016) and the NYC Zero Waste Plan (2015). Building upon these frameworks, this paper introduces the spider web as a conceptual model—a metaphor for the intricate, interdependent systems of political, ecological, social, and economic relationships that both sustain and imperil life on Earth. Just as a spider web's delicate strands rely on balance and interconnectedness to remain intact, so too do planetary systems depend on human action operating within ecological limits to avoid collapse. This web is strained by neoliberal economic systems that prioritize endless growth and commodification (Brown), destabilize planetary thresholds (Rockström et al., 2009), and perpetuate ecological destruction through linear resource extraction and waste production (Skene & Oarga-Mulec, 2019). The web's fragility is further exacerbated by Climate Leviathan's technocratic responses, which seek to manage symptoms without addressing the root causes of environmental degradation (Wainwright & Mann, 2018).

. This paper argues that a revolutionary web of transformation—grounded in refusal, circularity, and systemic equity—is needed to tackle the trash problem in New York and, by extension, around the globe. Such transformation must align local actions with global responsibilities,

reimagining humanity's place within this interdependent web as stewards rather than exploiters of its interconnected systems.

Part II: The Monochromatization of Humanity's Vibrance

The ecological systems that give life to all things, the nitrogen and water cycle, the rotation of the planet, or the intricate network of mycelium that breaks down the dead rely on a delicate balance. The origins of humanity come from the same dirt, salt, water, and decay that all other life forms rely on for success. Without them, we could never be. Yet, the inner ring of the web of life that sustains us, represents the economic system that started as a survival mechanism and has evolved into a disease that threatens the outer web of social connection, personal development, and planetary stability. Our economic system and its constant growth commandment, to which we much more strictly adhere than the physical ecological realities of our planet, are forever at odds with the delicate balance of the systems that keep us breathing.

Our planet has boundaries that, if crossed, will undo life on Earth as we know it. The Planetary Boundaries framework, introduced by Johan Rockström and a team of scientists in the article "*A Safe Operating Space for Humanity*" (Nature, 2009), defines nine critical Earth system processes that regulate the planet's stability and resilience. These boundaries, including but not limited to, ocean acidification, a warming atmosphere, or the destruction of crucial nitrogen and phosphorus flows, act as thresholds that, if crossed, could destabilize the planet's capacity to support life. Humanity must transform its ways of being to work within such boundaries and find a "safe operating space" to keep our planet in balance (Nature, 2009).

Similarly, Skene and Oarga-Mulec's *Systems Theory* describes our current linear economy as a microsystem within the larger socio-ecological realities of our planet. Human activities, though often spatially separated from the habitats and environments outside of their immediate domain, cannot be extricated from ecological realities that make them possible (Skene & Oarga-Mulec, 2019). Crucial to this analysis is the never-ending expansion of the economy. Product life is perpetually shortened under the profound influence of advertising and peer-to-peer consumptive competition. Combined with the rapid pace of technological advancements, this accelerates product turnover, generating increasing amounts of emissions and waste that our planet and atmosphere struggle to absorb (Skene & Oarga-Mulec, 2019). The neoliberal model is inherently at odds with the physical necessities of saving our planet from climate catastrophe. "Supply chain networks now stretch around the world, reaching across cultures and ecologies, as design processes incorporate an increasingly diverse range of materials. Each new technology leads to a new part of the planet becoming the focus of intense resource extraction. The 'green' revolution has massively increased the use of lithium, cobalt, copper, and rare earth metals, each delivering significant damage to environments and societies" (Skene & Oarga-Mulec, 2019).

The constant growth of the linear model heavily relies upon the perpetuation of neoliberal ideology and global policy. Wendy Brown's writing on the economization of all life, where neoliberalism turns social and political domains into sites for capital enhancement, prioritizing financial goals over democratic values (Brown), parallels the commodification of humanity and flattens the human experience to fit within the boundaries of linear consumption and constant growth. Just as the citizen is flattened into a simple consumer and producer, the neoliberal zeitgeist undermines humanity's ability to exist as an animal dependent on or respectful of that which gives her life. This robs her of her ability to think more freely and to imagine a system

where the value of old-growth forests or coral reefs exists outside of the demand to exploit them. When everything exists in the context of financial gain, what it means to be human is decolored. We are no longer citizens, we are no longer humans, we are not even animals anymore, we exist only as and for financial exploitation. Similar to the collapse of an ethical system where values and critical thinking as citizens no longer feed our society, the question of what value means within ecological systems is largely eradicated from the human imagination, and what it means to be human has lost millions of years of evolutionary vibrancy. It regresses the human-ness of humans to something much smaller and returns the social, scientific, creative, and cultural revolutions of the last thousand years to the cave from which they emerged (Plato, trans. 2008).

Climate change management thus far has focused on the symptoms of the crisis as opposed to the core of the problem (Wainwright & Mann, 2018). Wainwright and Mann's *Climate Leviathan* argues that attempts to heal these outer threads of the spider web through technocratic fixes and market-driven solutions fail to confront the underlying structures of global capitalism that prioritize endless growth and resource exploitation. Without dismantling this foundation, any intervention remains superficial, offering no real transformation or pathway toward a just and sustainable future. The technocratic approach of this leviathan assumes that environmental degradation can be mitigated without fundamentally transforming global patterns of production and consumption (Wainwright and Mann, 2018, p. 8). This explains the failures of the NYC Zero Waste Plan and the revolutionary and promising successes of the Dutch Circular economy.

Part III: The Dutch Circular Economy

Possibilities outside the Neoliberal

A circular economy is an economic system designed to eliminate waste and pollution. Aiming to extend the life of products, reintegrate available materials, build a regenerative system as opposed to a linear one, and reimagine how to design and repurpose items to intentionally challenge the traditional “take, make, dispose” model of our current global economy. In 2016 the Dutch government introduced a comprehensive circular economy plan. The goal is to achieve a fully circular economy by 2050. The plan focuses on the entire product life cycle including the design, production, use, refurbishment, repurposing, re-use and finally recycling of goods. The plan dives deeper into the culture of consumption and linear usage patterns by expanding the traditional reduce, reuse, and recycle model and including refuse, rethink, reuse, repair, refurbish, recycle, and finally recover. Within our current collective imagination, the notion of refusing is revolutionary. Asking oneself if an item is truly needed before purchasing or consuming it challenges a culture that uses things to define people. If you’re identity is decoupled from your purchasing power or your belongings, the ability to become more than the consumer opens up as an option.

The use of refuse as the first step in the process of adopting a new economic model represents revolutionary planning methods forcing individuals and systems to confront the upstream drivers of waste production—overconsumption, unsustainable design, and the neoliberal imperative of constant economic growth. By prioritizing refusal, the Dutch Circular Economy plan embodies a radical departure from traditional planning that focuses on managing waste *after* it is created. This aligns with the principles of advocacy planning and radical planning, which seek not only to challenge dominant systems but to empower individuals and communities to imagine alternative ways of living and consuming (*Davidoff 331; Friedmann*

67). Davidoff's advocacy planning is particularly relevant here, as the circular economy challenges the status quo by advocating for systemic change in production and consumption patterns. Just as advocacy planners represent marginalized voices, the circular economy advocates for ecological systems and future generations that have no voice to speak up and are regularly ignored in the planning process as a result.

In addition to that personal, cultural, and planning revolution within the "refuse first" policy the Dutch plan rethinks the design of products so that they are made to not only last but to be flexible in their usage. This centralized the durability and flexibility of commodities and spaces to dramatically extend lifetimes, forcing an end to planned obsolescence (J.B. MacKinnon, *The Day the World Stopped Shopping*, 2021) and replacing it with its opposite. Focusing not only downstream, but upstream as well challenges the hyper-individualist nature neoliberalism enriching humanity's way of being, and posing a critically important threat to the climate leviathan and creating a new, more durable, strand of silk within the inner ring of the spider web.

The Dutch plan discusses in detail the "Four Knobs" that need to be turned to make this transition possible (Dutch National Circular Economy Plan). The first and most crucial step is the reduction of raw material usage. This strategy, known as "narrowing the loop" focuses on minimizing the demand for primary raw materials by promoting efficient resource use, shared consumption models, and rethinking unnecessary production and consumption habits. The second knob in the plan substitutes raw materials with secondary materials. This includes not only recycled materials but also repurposed ones. In addition, this knob focuses on transitioning to biobased materials as opposed to finite resources with negative social and environmental externalities. The Third Knob focuses on extending the product lifecycle, including reuse, repair,

and refurbishment to slow resource demands, aka slowing the loop (Dutch National Circular Economy Plan). Finally, the fourth knob, or “closing the loop” focuses on high-grade processing, which ensures that products retain their highest possible value through effective recycling and ending the use of low-grade materials that cannot be remade.

The Dutch plan targets key product value chains with the greatest environmental impacts, implementing tailored measures to address each. For consumer goods, the focus is on improving sustainability in electronics, packaging, textiles, and furniture. In plastics, the strategy emphasizes phasing out virgin materials, promoting recycled alternatives, and adopting sustainable design practices. The construction sector prioritizes reusing building materials, advancing modular construction techniques, and minimizing waste generation. Finally, in manufacturing, the plan supports the development of circular systems for wind farms, solar technologies, and climate control systems to ensure long-term resource efficiency and reduced environmental impact (Circular economy plan).

Part IV: Impacts

The impacts of the Dutch model are layered, showing incredibly encouraging and promising environmental results, while raising questions about the inner ring of the system web and the impacts of changing the global economic model on countries in the global south. In their study “*Global Environmental and Socio-Economic Impacts of a Transition to a Circular Economy in Metal and Electrical Products: A Dutch Case Study*,” Bertram F. de Boer et al. (2021) examine the environmental and socio-economic effects of transitioning to a circular

economy (CE) within the Dutch metal and electrical products sector. Using Environmentally Extended Multi-Regional Input-Output (EEMRIO) modeling, the authors assess how CE interventions—particularly repair, reuse, refurbishment, and recycling—alter environmental footprints and economic activity at both domestic and global levels, highlighting the interwoven impacts of circular policies across global supply chains.

The study finds that transitioning to a circular economy significantly reduces global environmental impacts, including carbon emissions, material use, and water consumption, with an average decrease of 7% Bertram F. de Boer et al. The Dutch model demonstrates resource decoupling, where economic growth outpaces environmental impacts, as well as modest impact decoupling, where economic activity increases while environmental pressures remain stable. Circular activities such as repair and refurbishment stimulate labor-intensive domestic employment and reduce reliance on imported resources. However, the authors note a slight increase in domestic environmental impacts (1% on average), such as energy consumption and emissions, driven by the resource intensity of circular processes (Bertram F. de Boer et al). The implications of this success are far-reaching and critical in addressing emissions, climate change, and the global waste crisis. The circular model disrupts overconsumption as the defining characteristic of humanity by offering an alternative ideology and a radically different physical manifestation of the innermost ring of the spider web of systems that maintain our world. By reimagining capitalism and rejecting the commodification of humanity, it creates both physical and mental space for individuals to understand themselves and their relationships outside the oppressive framework of consumption. This shift can only be realized through the adoption of radical ideas and the implementation of transformative plans that embrace fundamentally different ways of being. Moreover, the Dutch circular model defies the Climate Leviathan by

rejecting the burden of constant economic growth and offering a path toward balance. It stands as the most promising approach to date for keeping humanity within planetary boundaries, aligning economic activity with ecological limits, and fostering a sustainable, regenerative future.

That being said, the neo-colonial context of our economic system persists outside of a singular state focusing inwardly on closing, tightening, and slowing the loop of resource use. After several hundred years of colonial extraction, the Global South has been robbed of its often more environmentally sustainable and self-reliant economic structures (Davis, 2004) and is now dependent on the extractive linear economy. Informal economies in the Global South emerge as adaptive responses to systemic neglect and exploitation, where labor and resources are undervalued, and institutional support remains absent (Roy, 2005). When Global North countries adapt to the threats of a climate breakdown they themselves have created, it has the potential to economically and socially devastate those places still exploited for their resources and labor forces under the neocolonial system. *Global Environmental and Socio-Economic Impacts of a Transition to a Circular Economy in Metal and Electrical Products: A Dutch Case Study* underscores the uneven socio-economic effects of this transition. While the Netherlands benefits from economic gains and environmentally successful policies, these gains come at the expense of job losses and reduced economic output in resource-dependent regions of the Rest of the World (RoW). The Dutch model highlights an uncomfortable truth: circular transitions, while reducing global environmental impacts, can exacerbate socio-economic disparities, displacing job and value losses onto resource-dependent economies in low-income regions. In the context of circular transitions, innovation often bypasses marginalized populations, treating them as suppliers of raw materials or secondary markets for waste management solutions.

The Dutch circular economy plan demonstrates an extraordinary blueprint for reducing environmental pressures and realigning economic activity within planetary boundaries. However, its uneven socio-economic impacts call attention to the need for equity and justice in global transitions. For circular models to truly succeed, they must dismantle neo-colonial legacies and ensure that resource-dependent economies are included in the process of transformation, rather than excluded or displaced. A just circular economy must center on climate justice innovation that uplifts marginalized regions and integrates solutions that balance environmental sustainability with global economic equity. Only then can the spider web of systems that sustain humanity become regenerative and truly transformative.

Part V: NYC Zero Waste Plan

The NYC Zero Waste Plan (ZWP), adopted in 2015, reflects a technocratic and incremental approach to planning, aligning with Charles Lindblom’s “muddling through” framework (Lindblom, 1959). By prioritizing downstream solutions—such as recycling, diversion, and improvements to waste management infrastructure—the plan relies on small, measurable adjustments to address the city’s immense waste challenges. This incrementalism offers short-term solutions that align with the constraints of political, economic, and social systems but avoids the radical systemic changes needed to confront upstream consumption patterns and systemic overproduction. NYC’s ZWP operates within the logic of the Climate Leviathan. It delivers incremental progress while sidestepping the transformative cultural and economic shifts required to address the root causes of the waste crisis. Focusing on downstream

interventions rather than upstream prevention, the plan fails to challenge the broader socio-economic structures driving overconsumption and ecological degradation.

Recognizing the significant environmental impact of the construction sector, the City also created Executive Order 23, passed by Mayor Eric Adams in 2022. The order mandates a comprehensive approach to sustainable building practices within New York City's capital projects. Recognizing that construction and demolition (C&D) waste accounts for a significant portion of NYC's overall waste stream, the order mandates a more holistic, lifecycle-based approach to construction projects initiated by city agencies. In this instance, the program focuses on the sources and upstream contributions to the C&D economy. The order requires lifecycle assessments (LCAs), embodied carbon accounting, and adherence to green building standards, ensuring that projects account for environmental impacts from material extraction to demolition.

By aligning with the global C40 Clean Construction Coalition, NYC joins other cities in committing to reduce construction waste, lower emissions, and advance circular building practices, such as modular design, material reuse, and sustainable procurement (*C40 Cities, 2023*). These measures aim to divert significant volumes of construction and demolition (C&D) waste from landfills while addressing carbon emissions embedded in traditional construction methods. The plan also focuses on Schools and other city agencies, programs for special waste streams, and advocates for extended producer responsibility to shift the financial burden of waste management onto producers of waste.

The Zero Waste NYC plan stands at the forefront of innovation when it comes to waste management in most of the United States, but it fails to engage more honestly with the sources of the crisis, or the cultural revolution that will be required to free its residents from the weight of a system that devalues humanity and exploits nature at all costs.

Part VI: ZWP Results

In 2024, marginal progress has been made, but significant change remains out of reach, revealing the structural and political barriers that must be addressed to truly tackle the waste crisis. Despite years of targeted interventions and investments, diversion rates fall far short of the ambitious targets set in 2015. The curbside and containerized diversion rate stands at 17.5%, while the overall Department of Sanitation (DSNY)-managed diversion rate—including organics, electronics, and textiles—reaches only 20.6%, well below the national average (DSNY, *Zero Waste Report*, 2024). These figures underscore the inadequacy of downstream solutions and highlight the urgent need for transformative, upstream strategies to reduce waste generation across all sectors.

The ZWP programs are ambitious but have had mixed results in implementation. Residential and commercial waste diversion, with organics diversion, has emerged as a persistent challenge. Food scraps alone account for 36% of NYC’s residential waste stream (DSNY, *Waste Characterization Report*), yet citywide diversion rates for organics remain stagnant at 4.1% (DSNY, *Zero Waste Report*, 2024). While the Smart Compost Bins program and expanded curbside composting have increased accessibility, participation remains inconsistent across boroughs. Non-curbside initiatives demonstrate slightly better success, achieving a 9.9% capture rate, but systemic gaps in infrastructure and outreach persist. The lack of participatory planning and transformative ideological shifts has perhaps led to these low results.

The 2019 Commercial Waste Zone (CWZ) program requires businesses to separate organics and recyclables, aiming to shift waste diversion accountability onto commercial

producers, this policy shift represents a move in the right direction by beginning to focus on upstream contributors to waste. However, weak enforcement and uneven implementation have limited its impact. To address these shortcomings, DSNY is rolling out mandatory organics separation citywide, with enforcement mechanisms slated for 2025. Success, however, hinges on robust infrastructure investment, equitable access to programs, and sustained public education efforts to ensure participation and compliance (DSNY, *Zero Waste Report*, 2024).

Material-specific recycling programs present similarly uneven results. Electronics recycling has performed well, achieving a 38% capture rate, yet textiles—despite their significant potential—lag far behind at only 4% (DSNY, *Recycling Diversion and Capture Rates*, 2024). Textiles still constitute 5% of the city’s residential waste stream, illustrating a persistent challenge. Additionally, mixed-material and non-recyclable plastics pose significant obstacles to achieving zero waste, underscoring the need for stronger upstream interventions, such as producer accountability for non-recyclables and resource regulation.

What is more, borough-level disparities, and the underlying histories of environmental and economic injustice, exacerbate implementation challenges. In The Bronx the diversion rate is reported as only 14.1% compared to Manhattan’s 19.6%, reflecting inequities in outreach, infrastructure investment, and participation opportunities (DSNY, *Waste Composition Breakdown*, 2023). Addressing these disparities is not only required to ensure equitable progress towards Zero Waste, but also represents the uneven realities of a linear and extractive economy.

That said, policy shifts are on the horizon. The expanded implementation of the Commercial Waste Zone (CWZ) program seeks to address the commercial sector’s disproportionate contribution to NYC’s waste stream. By mandating private haulers to offer competitive organics and recycling services, the program creates incentives for businesses to

adopt sustainable practices (CWZ Implementation Plan, 2023). Additionally, initiatives like Extended Producer Responsibility (EPR) for packaging and e-waste aim to shift accountability upstream, requiring manufacturers to design products with recyclability and minimal waste generation in mind (DSNY, *Zero Waste Report*, 2024).

Despite these steps, the ZWP remains reactive rather than transformative, addressing the symptoms of the waste crisis without confronting its root causes. It operates within the logic of the Climate Leviathan, failing to challenge the neoliberal imperative of constant economic growth. While incremental improvements are necessary, the plan's focus on convenience and downstream fixes neglects the deeper cultural and systemic shifts required to reimagine consumption and production.

By prioritizing diversion over prevention, NYC misses the opportunity to redefine its residents as ecological citizens and reframe their role within an interconnected system of survival and sustainability. Without a more revolutionary approach, the city risks perpetuating the very crisis it seeks to solve. Using economic incentives for better behavior may succeed to an extent, but consumers need also change their habits and free themselves from the cave of consumerism currently enveloping them. The Zero Waste plan, while it has made marginal progress, falls short of the required transformation (*Recycling Diversion and Capture Rates*, 2024).

Part VII: Regeneration as Revolution

Waste management may very well hold one of the crucial keys to fighting climate change. Not only in its reduction extraction, nor its reinvention of old goods but in the

re-imagination of what it means to be human. The human mind, robbed of its hard-won citizenry, scrubbed of its slowly developed intellect, and denied the opportunity for life beyond endless growth, has become stuck within the heart of a spider's web of self-destruction. A situation that leaves no ability to even fathom a system that does not rely on extraction and exploitation, but instead focuses on the relationships that give us life and make us human.

Rethinking the product life cycle, where things come from, who brings them to the earth's surface, who farms them, the soil that grows them, or the geology that made them, may hold the future of not only life on earth but also human freedom. Undoing the damage of generations of exploitative models may require re-mining the mountains of waste we have already created and re-using what was once regarded as worthless. It most definitely will require the destruction of the climate leviathan and the stretching of the current human imagination. The Dutch model represents the possibility of shifting into a new phase of economics, one that considers the nested system it exists within and frees itself from the violent and thoughtless consumerist cave, reweaving a web with balance and equality in mind.

Sources:

- Brown, W. (2015). *Undoing the Demos: Neoliberalism's Stealth Revolution*. MIT Press.
- C40 Cities. (2023). *Clean Construction Coalition Report*. Retrieved from:
<https://climate.cityofnewyork.us/ht/subtopics/clean-construction/>
- Davidoff, P. (1965). *Advocacy and Pluralism in Planning*. Journal of the American Institute of Planners, 31(4), 331–338.
- Davis, M. (2004). *Planet of Slums*. Verso.
- de Boer, B. F., et al. (2021). *Global Environmental and Socio-Economic Impacts of a Transition to a Circular Economy in Metal and Electrical Products: A Dutch Case Study*. Environmental Science and Technology.
- Dutch Government. (2016). *National Circular Economy Plan*. Ministry of Infrastructure and Water Management.
- Friedmann, J. (1987). *Planning in the Public Domain: From Knowledge to Action*. Princeton University Press.
- MacKinnon, J. B. (2021). *The Day the World Stopped Shopping: How Ending Consumerism Saves the Environment and Ourselves*. Ecco.
- Plato. (2008). *The Republic* (B. Jowett, Trans.). Dover Publications.
- Rockström, J., et al. (2009). *A Safe Operating Space for Humanity*. *Nature*, 461, 472–475.

- Roy, A. (2005). *Urban Informality: Toward an Epistemology of Planning*. Journal of the American Planning Association, 71(2), 147–158.
- Skene, K. R., & Oarga-Mulec, A. (2019). *Planetary Health and the Limits to Growth: A Systems Perspective*. Sustainability, 11(10), 2761.
- Wainwright, J., & Mann, G. (2018). *Climate Leviathan: A Political Theory of Our Planetary Future*. Verso.
- Zero Waste Report. (2024). *DSNY Recycling Diversion and Capture Rates*. New York City Department of Sanita