



For a Zero Carbon Globalization: A Typology of Emissions

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Abstract: Globalization so far has been, roughly speaking, utopian for the rich and dystopian for the poor. Given the role of rich and poor in the climate emergency, this essay presents an emissions typology and analysis, building on Henry Shue's work on subsistence and luxury emissions, and adding and analyzing four more major types of emissions: junk emissions, waste emissions, violence emissions, and worldview emissions.

Key Words: energy transition, climate justice, subsistence emissions, luxury emissions, structural violence, worldview shift.

Introduction

Globalization can be as utopian or dystopian as we can make it. So far it has been both wonderful and catastrophic, one might say utopian for the rich and dystopian for the poor. But the climate crisis is a true dystopia for all¹. Clearly, the path to a better globalization is exiting the fossil economy.

This essay focuses on a crucial aspect of transforming globalization: a typology of six major categories of greenhouse gas emissions and related ways to think through rapid emissions reduction. First, I describe Henry Shue's influential definition of luxury emissions and subsistence emissions, and I add new definitions to these pivotal terms (SHUE 1993). Second, I introduce a typology to expand on Shue's distinction with four more emissions types: junk emissions, waste emissions, violence emissions, and worldview emissions. Throughout the essay for greenhouse gas emissions I just say emissions.

This typology is part of a larger aim of shifting to a much safer, wiser worldview, and with that, to vastly better ways to organize society. To see how the modern worldview has been a root cause of emissions helps to get a sense of the rest of the emissions typology.

Modernity and globalization brought amazing benefits and progress, but also devastating social harms and environmental crises. Ironically, modernity gave us the scientific methods

¹ See for instance the work of Kevin Anderson, James Hansen, Naomi Klein, Andreas Malm, and the International Panel on Climate Change.



now used for climate science able to reflect on how other dimensions of modern thinking, science, technology, narratives and economics, were the root causes of today's climate crisis. Modernity has come full circle, smashing the Progress Myth while revealing its role in today's crises. The modern worldview birthed a set of simplifications—nature as a mechanistic machine, determinist, atomist, and reductionist—also used as rationalizations for the inevitability of exploiting people and places. Though we since have debunked the strong versions of those underlying precepts, subtler versions of them still infuse mainstream economics, politics, values and institutions. The extant mistakes of the modern worldview still drive global apartheid, authoritarianism, and the strange ideas of endless growth and luxury on a finite planet. Meanwhile, that flawed vision robs us of wiser, safer, better worlds. Exiting the fossil economy requires exiting the diffuse errors of thinking and social organization that got us into this crisis.

Climate science shows that a rapid energy transition is in the best interests even of the rich. Scientific consensus calls for a zero new carbon budget (MUTITT 2016), and a net global greenhouse gas (GHG) emissions reduction of 12% per year, every year, to reach a 50% net reduction by 2030 (IPCC 2018). Utopianism is fantasy we have long heard. Strikingly, we have reached the point when scientists themselves tell us that fantasy is realism. 12% per year is not idealistic or wishful, but the law of physics bearing down on us. Now even many governments, finance and corporate leaders call for emissions drawdown. Yet, after decades of failed climate policy we now have more consensus about the need for swifter, greater emissions reductions, as well as rapid regeneration of the planet's natural "carbon sinks". Challenging indeed. The question is not whether we will make it or can we make it. The question is what is the best way to try.

It's not a question of being naïve or not, but of choosing a chance at survival over extinction. Utopian scholars see what most are still too modern to see: that if human survival seems idealistic, then the task, as scientists now say, is to make idealism realistic.



What Lit this Fire

«The general driver of climate change is... the fossil economy» – Andreas Malm (MALM 2016)

What lit this fire? What caused the climate crisis? What we urgently need are insights into the full web of root causes: what actors, ideas, activities and institutions are causing this and interrelated crises. Natural scientists coined the “Anthropocene” (CRUTZEN 2002) claiming to describe a full cause and effect bundle to describe the global crisis. But the natural scientists’ view of the Anthropocene focused on the effects, while omitting and obscuring the core societal causes. They blamed an undifferentiated mass of humanity for the climate crisis, and they focused on the results or markers in earth systems (LEWIS and MASLIN 2015). In so doing, they omitted any of the myriad specific actors, ideas, powers, and institutions that are the fundamental causes of the Anthropocene. The modern two cultures gap between the natural and human sciences still is wreaking havoc, distorting and delaying clear vision and action.

Meanwhile, for decades, social sciences and humanities scholars have given poignant and powerful definitions and explanations of the major causes². In the article “Who Lit This Fire?” human ecologist Andreas Malm blames the heads of colonial powers and capitalist corporations who started and most profited from the fossil economy. Of all global emissions, some 3,800 entities directly cause over 80% of emissions (SANDERS and BOXER 2013), of which 92 entities directly cause 66% of emissions (MALM 2016). These entities include oil corporations, states, and militaries, and corporate sectors like industrial agriculture, pharmaceuticals, cement manufacturing, refrigeration, and transport (HAWKEN 2017).

The emissions typology I propose further probes some of the main complex and networked causes and dynamics driving greenhouse gas emissions. What ways of thinking and organizing society are most driving emissions?

Henry Shue’s work on subsistence and luxury emissions helped in the framing of global climate justice policy. Since the 1980s, climate conferences have shown the centrality of the

² See for instance Hannah Arendt, Rachel Carson, Ivan Illich, Andre Gorz, Nicholas Georgescu-Roegen, Carolyn Merchant, Joel Kovel, David Harvey.



luxury versus subsistence axis in terms of global historical and current emissions inequality, carbon debt and reparations, and a shift towards global carbon cooperation. In academia and policy circles, people have focused on Shue's distinction as central to climate justice, and Shue's influence on the Climate Equity Reference Project (SCHLOSBERG 2019). I have great admiration for Shue's crucial work, even if I differ on some points such as market-based solutions.

Consensus has only grown around his main point: the centrality of justice to climate policy. Typologizing the most important categories of emissions, and expanding on Shue's crucial distinction, clarifies transition and climate policy. We can look more specifically at what causes emissions, and so at what must change and how.

Context: From Bitter Money to Ecocide

The Kenyan Luo say that when money is exchanged, the more distant from the family or community the more the money becomes "evil" or "bitter" (SHIPTON 1989). In close-knit societies around the world this kind of communal norm serves to reduce conflict or injustice and ensure local care, reciprocity, and thriving. "Bitter money" evokes the way that capitalism drives generalized overshoot, sacrifice zones, extreme poverty, and extreme wealth and luxury.

A major exception to this typology is the often orthogonal experience of many indigenous peoples, which have had ecological, reverential, enduring societies for millennia. In stark contrast, today's globalization grew out of the whole ensemble of ideas and praxes that arrived on American shores in the forms of settler colonialism, capitalism, white supremacy, genocide, slavery, and super-exploitation. It is this whole nexus that has grown into the main driver of today's global social, ecological, and climatic crisis. Of course, idealizing often oppressed and marginalized groups can create distorting generalizations and mask, as I will explore, how processes of expropriation and impoverishment in fact create poverty and drive the poor also into vicious cycles of emissions for survival, such as cutting down biodiverse forests to plant cash crops.



Yet we might generalize enough to say that many indigenous groups continue to cultivate their ideas and models of society, lacking many of the errors of the mainstream modern worldview. They offer role models for aspects of transitioning wealthy industrialized nations towards better social organization based on justice, strong ethos, ecological abundance, and low emissions. Indigenous groups also are standing up to state and corporate violence to build some of the most powerful social movements for climate action (DERANGER 2015, ESTES 2019).

Today's indigenous peoples show us other models of society that belie modern myths such as: the possibility of continuous economic growth, the overemphasis on scarcity and competition as predominating traits and processes, the dismantling and devaluation of strong communal norms and bonds, and the neoliberal myth "there are no alternatives".

Subsistence and Luxury Emissions

I give Shue's original definitions of "subsistence and luxury emissions" and then I propose a second set of definitions. Together, subsistence and luxury are keys to a better globalization. The diametrical roles of the rich and poor in historical and present emissions is at the crux of climate policy. And it is central to the whole web of related social and economic drivers of global crisis that require transformation.

Henry Shue introduced the terms subsistence emissions and luxury emissions in a 1993 article:

Fundamentally, then, the challenge of preventing additional avoidable global warming takes this shape: how does one reduce emissions for the world as a whole while accommodating increased emissions by some (poorer, still developing) parts of the world? The only possible answer is by reducing the emissions by one part of the world (rich) by an amount greater than the increase by the other parts (poor) that are increasing their emissions. (SHUE 1993: 43)

Shue argued that the battle to reduce total emissions should be twofold. First, the increasing emissions by poor nations should be held to the minimum necessary for the economic



development to which they are ethically entitled. Second, in the language Shue used in 1992, «the rich nations must reduce their own emissions somewhat (more), however small the increase in emission by the poor, if the global total of emissions is to come down while the contribution of the poor nations to that total is rising». And «the smaller the increase in emissions necessary for the poor nations to rise out of poverty, the smaller the reduction in emissions necessary for the rich nations».

But in the three decades since Shue's article things have changed. In 1993 climate scientists thought we had hundreds or thousands of years to work with. Now they call to reduce emissions 12% per year every year, to achieve 50% net reductions by 2030. In three decades emissions soared higher and any global carbon budget has shrunk. In fact, if we consider the fossil energy needs to make a feasible energy transition then the world's carbon budget already is nil (MUTITT 2016). It would be nice to consider the fossil fuel needs of future generations, such as for coping with the remains of industrial infrastructure. By now, the climate crisis has passed such major tipping points that the energy transition must be focused on leapfrogging over the disasters of the main patterns of hyper-energy, growth-based capitalist globalization to a vastly more effective way to organize societies.

I consider Shue's 1993 definitions of both subsistence emissions and even most luxury emissions as what we can call "positive emissions". Shue's view of subsistence emissions is that of emissions used for constructive aims of alleviating poverty and advancing healthcare, education, housing, infrastructure, and culture. Shue's 1993 definition of luxury emissions was very broad—most of the emissions fueling growth for the many benefits of the largest economies. Under modern myths about inevitably beneficial techno-industrial progress the concept of development and its web of luxury emissions long have been rationalized and normalized as entirely and inherently constructive. An urgent project is to critique both middle class and rich emissions in much greater detail and depth than I can do here. Suffice to say that when it comes to rapid emissions reductions there is a lot of low hanging fruit.

I add definitions of subsistence and luxury emissions that can be seen as "negative emissions" or unwanted, unproductive, wasted emissions, in very different ways by both poor and rich. Negative subsistence emissions refer to way the poor are forced to emit, not for social wellbeing or cultural advancement, but rather in often unwanted activities just for survival.



For instance, poor in many nations are forced into long, gas-guzzling commutes for low-wage work. And the poorest are forced into further depleting their own lands for survival. Throughout the global South, many poor deplete their own forests for necessary cooking fuel or food for short-term food survival. Corporations operating in Borneo wiped out most pristine forest habitats to monocrop palm oil. Bornean peoples who had lived in relative abundance not to mention beauty and ecological thriving, now are forced to chip away at the scant remaining forest for cooking fuel or take the remaining wild animals for food.

Negative luxury emissions refer to the way that middle and rich classes are involved in emissions that, even when aimed at the best goods, services or activities, have negative consequences. They fail to produce much or lasting satisfaction, or they contribute to unsatisfying, unpleasant or unethical activities. For instance, some negative luxury emissions go into poor design in many areas of society, like building insulation, industrial agriculture, refrigeration, or overbuilt cities. Generally, my whole emissions typology falls under ‘negative emissions’ that support the rich, while harming the majority world’s communities and commons.

The concept of negative emissions problematizes, enriches and expands on Shue’s view. In highlighting positive emissions, Shue refers to the side of capitalism most touted as beneficial, the way that both subsistence and luxury emissions are construed as promoting development, advancement and the public good. Negative emissions reveal the shadow side of capitalism, the way that the erroneous and perverse aspects of our worldview and design tend to lock all classes into negative emissions in different ways, including the destructive emissions types in the typology. Elites focus on narratives about positive emissions, such as lifting the poor out of poverty. But they tend to avoid talking about negative emissions, especially the ways that much economic activity pushes people into poverty in the first place. And they avoid talking about true costs like climate breakdown.

These subsistence and luxury emissions are entangled in the general problems of a problematic worldview and problematic societal design or organization. At this late stage, adequate climate policy must be systemic and sophisticated enough both to avoid all types of negative emissions and to transform positive emissions with renewable and energy-free alternatives. Energy-free alternatives tend to call for beyond modern thinking and tend to



require creative thinking to reorganize societies to achieve multiple synergistic improvements. Shue's basic underlying principle rests the same: luxury emissions need to be reduced enough to permit the meager subsistence emissions necessary to stave off the worst suffering for the global majority, particularly in the poorest places.

In three decades our thinking has evolved so much that we can greatly advance how we define and parse subsistence and luxury. If our carbon budget is at or near zero then we need to do much more to expand, analyze, and typologize the vast category of inadmissible luxury emissions. We need much more parsing about what emissions are truly necessary or unnecessary in the shorter and longer terms with respect to a feasibly least harmful energy and economic transition. Given the severe consequences of the climate and ecological crisis, many or all unnecessary luxury emissions should now be evaluated according to the emerging legal definitions of ecocide (SIDDIQUE 2021). To define and parse luxury emissions is central to the aims 50% emissions reductions by 2030, a top priority for all public and private policies and aims. It is easiest to define the extreme ends of the spectrum. Clearly, we cannot afford rich emissions for mega-yachts and space travel. «A yacht is a very inefficient way to have fun», according to Rupert Connor of Luxury Yacht Group, «It's an incomprehensible amount of money to most of us, but thankfully there are people in the world who do it, and it supports this fabulous industry». Just the direct fuel bill for one trip in a large yacht from the Caribbean to France is about \$70,000 (HARDINGHAM-GILL 2021).

The common way of thinking supported by centuries of capitalist globalization is that at least positive luxury emissions are a good and that everyone should strive for them. This of course obscures the many ways that precolonial societies had wiser, more satisfying societies. Studies have shown that even more common luxury emissions do not provide deep or lasting satisfaction. Moreover, organizing society around luxury emissions tends to create and worsen vicious cycles of inequality, suppress care for social well-being and the commons, and fuel authoritarian politics.



Waste Emissions

Waste emissions refer to the many social, material, and financial processes that convert goods directly into wastes or that convert natural materials into short-term goods that become long-term wastes. Their production not only does not enhance the common good, but mostly undermines it by the sheer waste of valuable materials and resources. Under financial capitalist globalization, waste emissions are an inherent byproduct of short-term profit-seeking, creating long-term ecological and climate breakdown.

An example of waste emissions is the Deepwater Horizon oil rig disaster. On April 20, 2010, the world watched in horror as the rig exploded and oil began spouting from an ocean pipe. Watching grainy underwater news videos of the gushing oil, we imagined it's massive force. It continued for six full months, releasing 4.9 million barrels of oil before it was finally capped (FEDERAL ON SCENE COORDINATORS 2011).

But oil spills are just blips in the oil sector's overall business model. More striking yet, is Shell Oil's gas flaring from oil wells in the Niger Delta that has been ongoing for sixty years. The oil giant is accused of dumping more than 200,000 barrels of crude on the Niger Delta's environment annually. According to Eferiekose Ukala, «Gas-flaring emissions, which contribute significantly to global warming, are produced when extra gases are burned off during the oil-drilling process. Gas flares are composed of toxic gases such as sulfur dioxide, nitrogen dioxides, benzapryene, methane, and CO₂». (UKALA 2011: 101) Though gas flaring in Nigeria was banned in 1969, though a Lagos court repeatedly ordered Shell to stop, and though Shell was fined \$1.5 billion it refused to pay, it has continued burning hundreds of millions of cubic feet per day (MONBIOT 2006). From 2015-2020, Shell produced on average some 176,000 barrels of oil equivalent per day (ASU 2020). In fact, Nigeria's gas flaring produces almost 25% of Africa's total GHG emissions (UKALA 2011: 103)

Such waste is the staggering heartbeat of fossil economics. We see the significance of Shue's luxury-subsistence distinction when we consider that gas flaring in the Niger Delta alone contributes more carbon emissions than the emissions of all sub-Saharan Africans combined (MONBIOT 2017).



Waste emissions comprise a global web that is more than the sum of its parts, as each way that our fossil economics creates waste tends to be exacerbated by the others. In the Niger Delta, for instance, gas-flaring is only the most obvious form of waste. In fact, if less directly or visibly, oil spills also drive emissions and wipe out carbon sinks, kill plants, animals and whole ecosystems. Oil spills have wiped out much of Nigeria's mangroves, destroying ecosystems that are also vast carbon sinks, and driving the climate crisis. The rich-poor axis is reflected in media control, such that oil spills in the Niger Delta tend to be less reported, more frequent, less remediated, and more damaging than oil spills in richer nations. Similar examples are abundant in wealthy nations. In the USA, consider the industrial monocropping of agriculture and its ripple effects. Monocropping vast swaths of land profits agriculture corporations at the cost of creating ocean dead zones in the Gulf of Mexico, wiping out climate regulating carbon sinks of soils, forests, mangroves, wetlands, and tall grass prairies, and eradicating “beneficial species”, like bees, bats, songbirds, and butterflies.

There are even more absurd, visceral examples to reveal the logic of entitlement and authoritarianism surrounding extreme wealth, such as the wastes of the 1%. A Russian oligarch, for instance, arrived by private jet on the Mediterranean to discover the family had left a small child sleep monitoring system in Moscow. Instead of ordering another one locally or online, they sent the jet back to fetch the system and return (MONBIOT 2006). Consider that the private jet, yacht or mansion are filled with goods and services with high true energy costs. Consider that luxury goods and services both are produced by and reproduce highly energy inefficient and intensive multinational production and supply chains.

Ironically, there is likely more solidarity within the 1% than in any other class. Though Bill Gates wants to fight climate change, he says that Charles Koch (the man who spent decades profiting from big oil, funding climate denial, and fighting to reduce environmental regulations) is «a very nice person», with an «incredible business track record». Gates loves private jets, his «guilty pleasure» (BROCKES 2021) and admits that his carbon footprint is «absurdly high» (CAMPBELL and BROCKES 2021).



Junk Emissions

Junk emissions are the fossil fuels used to make cheap disposable goods in order to increase consumption and profits. It is a major set of processes enabling capitalist growth. Junk emissions started less noticeably when the global population was under one billion, and there were not yet cars or planes. But in recent years it has become more and more apparent, with scenes like that of the Ocean's five great garbage patches, glossy exposés on South Asian children fingering their way through mountains of toxic e-waste, or film scenes like Pixar's Wall-E robot compressing piles of trash.

Junk emissions are an output not only of the production, but also of whole webs of processes. Capitalism grows by lowering or cheapening input costs and maximizing output profits and externalities. It creates the fuel-churning processes like junk creation, disposal, dumping, and to a very limited degree, recycling. These processes turn otherwise inherently valuable raw materials into consumer products of poor quality and short lifespan while wealthy corporations push products, costs and wastes onto the poorest peoples. These processes push high consumption, high energy inputs, high waste, and high social and ecological harms.

A prime example of junk emissions is «planned obsolescence», a wide set of strategies corporations use to make a product undesirable, useless, and unwanted, so as to sell more, more quickly, for more profit. There are many ways in which a business can do this, seen as basic means of profits. Planned obsolescence began with a positive connotation and was indeed planned. It was introduced as a response to the Great Depression to boost corporations by selling lower quality goods at lesser costs, in greater quantities. Banker and real estate broker Bernard London put it like this in 1932:

In the present inadequate economic organization of society, far too much is staked on the unpredictable whims and caprices of the consumer... In a word, people...are using everything that they own longer than was their custom before the depression... People everywhere are today disobeying the law of obsolescence. They are using their old cars, their old tires, their old radios and their old clothing much longer than statisticians had expected on the basis of earlier experience. The question before the American people is whether they want to risk their future on such continued planless, haphazard, fickle attitudes... My proposal would put the entire country on the road to recovery, and eventually restore normal employment conditions and sound prosperity...



Briefly stated, the essence of my plan... is to chart the obsolescence of capital and consumption goods at the time of their production. (LONDON 1932: 1)

During the Great Acceleration, the growing junk was mostly hidden from view. Now we see it more. We glimpse it, if we know what we are looking at, when we walk into big box stores. We glimpse it in images of plastics filling the rivers and hills of poor nations. We see it in the satellite and aerial images of hundreds of sites dotting the planet, such as aerial photos of the seven million tires filling a one million square meter Al Sulabiya tire junkyard in Kuwait. We see it in scenes like the clothes iron factory in China in the film *Manufactured Landscapes*, a factory building over one kilometer in length employing 23,000 workers, to produce a tool that is not necessary. We glimpse it via the world's vast webs of highest emissions activities: refrigeration, cement manufacturing, overbuilding cities, deforestation and more.

The human dimensions of junk emissions are vast, directly and indirectly. In a leaked 1991 World Bank Memo, Lawrence Summers revealed the logic most opposed to Shue's subsistence versus luxury emissions, writing, «[T]he economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable...» (SUMMERS 1991). This of course produces vicious cycles of both ongoing social impoverishment and ecological degradation. Junk emissions seem as stoppable as the earth's orbit. But as Ursula LeGuin put it, «We live in capitalism. Its power seems inescapable. So did the divine right of kings. Any human power can be resisted and changed by human beings» (LEGUIN 2014). The ideas and institutions that fill our world with waste, junk and their sprawling impacts are immutable pillars of our current system. But they cannot go on for long.

Violence Emissions

The world's single largest carbon footprint is the US Pentagon. In 2017, the last year for which there's data, the Department of Defense emitted 58.4 million metric tons of CO2 equivalent, more than the total emitted by the nations of Sweden or Denmark. This includes



energy to power more than 560,000 buildings in over 500 sites worldwide, and massive fleets of ships, planes, and vehicles (CRAWFORD 2019).

One obvious type of violence emissions is direct warfare. The Iraq War killed one million Iraqis, cost American taxpayers about 3 trillion dollars, and excluding the direct emissions from explosions, emitted ~250-600 million tons of CO₂. That's about what it would take to fly 63 million people back and forth from the UK to Hong Kong 1-3 times. A striking vicious cycle is that a large percentage of the US military's fossil fuel emissions goes towards ensuring the stable supply of more fossil fuels (BERNERS-LEE, CLARK 2010).

But direct warfare is the tip of the iceberg. Perhaps more costly are the networks of less evident, more pervasive indirect and structural forms of violence. Structural violence spurs vicious cycles of negative emissions, undermines democracy and stymies better climate action. Philosopher Iris Marion Young typologized structural violence, including social injustice that «exists when social processes put large categories of persons under a systematic threat of domination or deprivation of the means to develop and exercise their capacities, at the same time as these processes enable others to dominate or have a wide range of opportunities for developing and exercising their capacities» (YOUNG 2011, p.52). And Rob Nixon defined slow violence, as «the violence wrought by climate change, toxic drift, deforestation, oil spills, and the environmental aftermath of war that takes place gradually and often invisibly» (NIXON 2013). Empire and its luxury emissions requires the internal and external control of police and prisons with their own carbon footprints. For instance, Shell operates in the Niger Delta with its own armed security together with special units of the Nigerian military. Ironically again, a great deal of fossil fuel emissions goes to protecting further fossil fuel production.

Focusing on the emissions it produces, we might see globalization itself as a meta form of structural violence. To protect and grow profits, neoliberal globalization requires fundamentally inefficient and poorly organized energy use. Globalization is based on a race to the bottom, in the sense of the drive to lowest labor costs and environmental protections. Supply chains are dispersed to increase corporate control. If one union strikes it no longer shuts down a whole production or supply chain, executives simply shift part of the work elsewhere. And dispersing production creates wildly energy-intensive patterns of shipping



and flying. A single nation imports and exports the same goods, at absurd cost in emissions. In 2019 the UK exported 84,789 tons of beef, mostly to the EU. The same year the UK imported 160,289 tons of beef (BARRIE 2020).

The logic of this background everyday violence is increasingly at odds with the growing climate challenge around which we need to cooperate and mobilize as a species for our survival. The perverse logic of structural violence flies in the face of the clear logic of the climate emergency: it is in everyone's interest now or in the very short-term future to forego unnecessary emissions today to stop the escalating crisis. Violence emissions create a double blindness. Not only is the violence itself masked in many ways, but also the violence traumatizes us in ways that blocks better thinking and blinds us to alternative ways to organize the world community that would promote social, ecological and cultural flourishing. The many-faceted structural violence of fossil economics is at the expense of the alternatives: renewably energized, humane, convivial, culturally rich, socially uplifting ways to organize societies. A better globalization requires moving money and resources from militarism into the energy and economic transition.

Worldview Emissions

All of these above emissions types arise from deeper layers of trouble, errors in the modern worldview itself. From the start the western worldview held within it the seeds of both its greatest benefits and its greatest harms. Fully developing this argument would take much more space. But it's vital to look at the roots of climate policy solutions. In this emissions typology all these emissions types have deeper roots.

From the start, the modern worldview brought a wide array of benefits such as extraordinary medical advances, labor-saving machines, inventions like bicycles and trains, telegraphs and telephones, computers, and a great proliferation of scientific insights, arts and cultural expressions. From the start, the modern worldview also co-evolved with and co-produced harms—the Columbian exchange, capitalism, white supremacy, genocide, slavery, and settler colonialism. From the start capitalist growth needed a thought system to rationalize



and legitimize exploitation. The fact that injustice undermines the climate today is just the logical extension of a modern worldview built to undermine new peoples and places. In the 20th century modern thinking became a motor of the global and disastrously designed Great Acceleration. In the late 20th and early 21st centuries it has become a motor of climate and ecological breakdown.

To grasp transition today is to grasp the errors underlying the whole edifice of modernity. From the start the modern worldview was replete with great insights, but also with errors that produce distortional views and myriad harms. The foundations of the modern worldview included false, very strong views of reality as mechanized, atomized, reductionist, determinist, and objectifiable. Thinking is systemically compartmentalized and disjunctive, such that it fails to integrate the parts and the big picture, or to look at how all the sectors and processes interact on the global scale and over the longer term. In other words, from the start, the whole era of globalization lacked a way to conceptualize an effective globalization. From the start, modernity failed to conceptualize modernity, or to wisely organize societies over space and time. From the dawn of modernity to today, these errors continue to infuse the major realms of societal ideas and institutions—science, religion, economics, politics, and more.

Scientism, or the belief that science can do more than it actually can (DUPRE 2001) included the idea that science is neutral, so that even though it is always incomplete, it is inherently harmless. Whatever flaws or omissions there may be necessarily will be worked out later. If we don't know how to dispatch with radioactive waste, or what to do after topsoil and aquifers are fully depleted, or how future generations will cope as massive petro-industrial infrastructure is swamped by sea level rise, not to worry, we will figure it out later. Such a view is only possible within a worldview that operates as if science were somehow separate and perfect. Rather, it was flaws in the early modern scientific worldview that enabled the foundations and spread of social injustices and ecological harms.

The errors at the heart of the modern worldview included the two cultures gap that split sciences from humanities and wealth from wisdom. The two cultures gap has been particularly harmful in creating a strangely dualistic worldview, as if wealth existed on one planet and poverty and climate breakdown on another. Notably and not coincidentally, the



modern worldview has been particularly harmful in devaluing the very dimensions of knowledge – social sciences and humanities, alternative economics and politics, and indigenous and spiritual traditions – most necessary for critiquing the main drivers of the current global crises. For five centuries this worldview has been wedded to a totalizing supremacy that has blocked alternative, better worlds.

Beneath all the emissions types, beneath the culprits like the actors and institutions of fossil economics, the errors in worldview impacts our design, lifestyles and how we organize society. If some 92 entities are responsible for over 66% of net global emissions, then addressing not only those powerful actors and institutions, but also the web of logic and theory that produces them and their power over people and our thinking is not the afterthought but the logical starting point. We need to see and transform the full direct and indirect networked causalities.

The highest emitters are responsible not just for direct emissions, but also for playing a major role in determining all the other processes of global emissions. The highest emitters also often contribute to locking the majority of the world's people of all classes into webs of high carbon emissions. The rich organize the lives of the middle and poorer classes. Their ideas and institutions lock poor and middle classes into jobs requiring long commutes, lock them into housing with inefficient heating and cooling, lock them into high emitting careers, and lock them into media and advertising that shapes their views and values.

Wealth and poverty are two sides of the same coin: creating extreme wealth creates both poverty and also a whole societal design locked into high emissions. Over time, the whole edifice drives impoverishment and ecocide.

Conclusion: Why Peddle Fantasies?

Bill Gates said of the Green New Deal bill to reach scientific emissions reductions of 50% by 2030, «Carbon neutrality in a decade is a fairytale. Why peddle fantasies?» (CAMPBELL and BROCKES 2021). That is perfectly consistent with his views, with



modern society's general worship of riches and the rich, with common authoritarian leanings, and with a worldview that supports super-exploitation.

If a highly enlightened alien species were to visit Earth, they would say that humanity has suffered not just from structural and violent inequality, but also from a worldview riddled with errors that support a largely absurd and increasingly disastrous way of using energy and resources and organizing societies.

Better alternatives always have been possible. Today, we have most of the ideas, insights and tools we need for a great transition and better globalization³. Decades of leading work in many fields have honed and advanced a wide range of better ways to organize everything from technologies, agriculture, and economics, to politics⁴. As the Covid 19 pandemic shutdowns have shown, even the rich can reduce emissions quickly, we can reorganize foods and goods production largely locally, we can transform globalization.

Looking straight into the unfolding disaster most of today's emissions, including the most desirable luxury emissions, are not worth the coming true costs. As climate thresholds interact, globalize, and quicken, modernity's last rationalizations for fossil fuels and economic growth fail. As the future shrinks, even the intergenerational arguments fail.

The world's dominating worldview was based on atomism, separation and conquering, but our world is quickly converging. The two planets—luxury and subsistence, rich and poor, sciences and humanities, climate safety and climate disaster—are merging. Elite ideas of transcending climate breakdown in posh bunkers or spaceships are fantasies. For now, Malibu stars may escape Californian megafires in their yachts or jets. Still today, the gas flaring, oil spills and pipeline battles churn on. But physics trumps politics, not the other way round. The laws of bio-geophysics and climate science will trump human fantasies and dictate human futures. Strong and swift climate policy is the last remaining realism.

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³ See for instance interdisciplinary scholarly fields on climate policy e.g.: climate justice, political ecology, ecological economics, degrowth economics, deep democracy, environmental philosophy, transition studies, environmental humanities, complex thought, social imaginaries, flourishing studies, etc.

⁴ See for instance work on climate solutions such as work in areas like climate justice, ecology, earth systems, permaculture, agro-ecology, agro-forestry, climate policy, and more.



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