

CO₂

Arbeta med den miljö som jag andas i.

Reducing carbon in life opens up multidimensional portals, connecting you with all your lost worlds.

It is often questioned that climate-justice is about more than CO₂. It's about land theft and human right etc too. I mean, it is. But I didn't always understand that critique because to me CO₂ is also about land theft and human rights etc. The choice for me to use CO₂ as starting point was not clear to myself. It was an intuitive motivation emerging from an embodied longing, from the uncomfortable tension when sitting in a CO₂ emitting vehicle or walking by idling cars at the traffic lights.

If there is an intuitive artistic motivation to do a thing, the following process will always reveal that the underlying reasons are more shifting than what they appeared in the beginning. The strong desire to refuse, to cut out fossil fuel from my life marked the start of these PhD studies. The initial reasons were straight forward and obvious. The slow distributed violence of CO₂ is today widely understood and acknowledged. But still our emissions keep increasing. Our digital technologies abstracts the tiniest components of everyday life. Simple chores are embedded in complex processes. Automation of one step create chains of further steps, though we only see the front-end input and final output in our interfaces. What lies between the origin and the outcome grows wider and harder to see. Buying food in the store or entering a question in a search engine becomes increasingly uncomfortable. The simplest things in life, such as eating, sleeping, breathing was becoming the hardest. The sense of being completely tied up in processes that blurs CO₂ was becoming suffocating and paralyzing.

During the course of the project, I came to understand deeper layer of the motivations for refusing CO₂. The removal of CO₂ also becomes an undoing of the abstractions of daily life that CO₂ fuel. And how that affected my body, thinking and being was monumental.

Initial reasons for cutting out carbon

The obvious reason for reducing carbon use is that it is slowly killing the world. All parts of (my) western, global north life are entangled in colonial oppression channelled by fossil fuels. The tiniest ordinary daily acts of eating, driving, buying, sleeping, working, are entangled in a long arc of extractive colonialism. (M.Murphy, 2017). Tom Goldtooth's persistent arguing for the importance of cutting CO₂ emissions in global climate negotiations due to how it is affecting indigenous traditions, for example through the severe drought conditions in Minnesota, has contributed to this understanding. Stefan Mikaelsson's (Sami parliament) sharing of how global warming causes weather conditions that prevent reindeers from living of the land and causing them to starve, reveals how CO₂ undermine entire indigenous existences in Sweden. And of course, how the island nation of Tuvalu is forced to evacuate as rising seas from global warming make its land uninhabitable.

In “När kapitalet tar till vapen. Om imperialism i vår tid, 2024”, Andreas Malm describes oil as capitalism’s primary source of energy and the foundational industry for the imperialist United States’ ability to secure its hegemony by exercising global violence. When the Arab states that possess oil have sought to pursue other priorities, their sovereignty has become an obstacle that the oil industry cannot overcome. To guarantee free access to oil, Israel was needed as a counterweight to the Arab states. It is in the interest of the empire’s war economy and the oil industry that the exclusion of the Palestinians is allowed to continue.

So, if oil is imperialism’s and capitalism’s energy source, it is obvious that places outside of the western world could be freer by the removal of fossils.

At Glastonbury the summer 2025 Seun Kuti called out: *“I know you want to free Palestine, free Congo, free Sudan, free Iran. It’s a new one every week.... Free Europe! Free Europe from right-wing extremism, from fascism, from racism. Free Europe from imperialism.”*

What would such a Europe, free from imperialism look like? And what aspects could fossil refusal free Europe from within through?

So complicated to avoid fossil fuels

The outsourcing of physical labour to fossil fuels is encouraged by global subsidies amounting to \$7 trillion each yearⁱ. So it is obvious that fossil use is encouraged by powerful interests. It is obvious that I fuel powerful systems by using CO₂. This explains why it is integrated, shoehorned into ever growing details of our lives. It explains why it is so hard to exclude it.

Cutting carbon emissions seemed so difficult and complicated that I had to make it into a project. To again make visible what modern abstractions has hidden, I collaborated with sustainability engineers to assess the carbon footprint of my practice’s lifecycles (diva ref).

Copy from
as a way to interrupt destructive patterns had was guided by the growing
understanding of how
Hidden.
Lundin oil
And what would happen if I stop using it?

Deeper motivations emerging through practice

In the early days of industrialisation, carbon dioxide emissions suddenly rose with the introduction of fossil fuels. Carbon-energy disconnected time and place. It enabled the distancing from nature. Factories could move away from flow-energy like rivers and winds, and the sources of raw materials and natural resources. It could be placed where there was labour and transportation. Workers could leave their circadian rhythm and work both day and night under electric lights. Carbon created distance and detached all kinds of relations.

But reducing my Co2 emissions caused a shift in my practice. Seemingly mundane everyday routines such as walking and biking to work, cooking or mending things, carrying water, shifting latrin compost, became a bigger part of life as I could no longer effectivise my routines with co2 heavy solutions such as replacing broken things with new or taking a car to get home faster. It made me reflect on how the removal and returning of such time-consuming daily activities affected my thinking and being.

SENSORIMOTOR copy/paste

Carbon is enslaved by colonialism, whiteness, modernity, all that seeks to extract, displace, disconnect for profit. As all labour in our society animation practices are gradually outsourced to carbon in the form of AI generated or automated technologies. When I started setting this slave free, it started setting me free.

~~The learning journey throughout these studies emmanate from reflecting on the multitude of those experiences. As I have deepened my investigation in these topics they begun to connect and intertwine, gradually developing bigger pictures.~~

Kuti free europe , co2, malm palestine.

Connection between co2 & sensorimotor. Co2 is slave, that works for us for “free”.

Making it seem efficient to

The access to practically free fossil fuels Make it seem efficient to

– unknown unknowns.

To do ...what?

1. Reducing co2 connected me with my senses,
2. connecting with my senses taught me things about myself
3. -these things connected me with new communities.

Inner refusal

Sensing Co2

Paris agreement

The phrase "Fossil is a slave to colonialism CO2 emissions" reflects a perspective that connects the historical and ongoing impacts of colonialism to the reliance on fossil fuels and the resulting carbon dioxide emissions. It suggests that the global system built on colonialism has created a dependence on fossil fuels, leading to disproportionate environmental damage in formerly colonized regions. This perspective argues that the pursuit of economic growth and development, often linked to colonial expansion, has resulted in the current climate crisis, which disproportionately affects those same regions.

Here's a breakdown of the key points:

Colonialism and Fossil Fuels: Colonialism, with its history of resource extraction and exploitation, laid the foundation for the modern reliance on fossil fuels for energy and economic development.

☐ ☐ **Unequal Distribution of Impacts:**

The consequences of climate change, including rising sea levels, extreme weather events, and resource scarcity, are often felt most acutely in regions that were previously colonized.

☐ ☐ **Historical Responsibility:**

The argument suggests that the historical actions of colonizing nations, who benefited from the industrial revolution fueled by fossil fuels, have created a situation where other nations are now facing the brunt of climate change impacts, even if they did not historically contribute as much to the problem.

☐ ☐ **Intersectional Approach:**

This perspective highlights how systems of oppression, like colonialism, intersect with economic and environmental issues. It calls for a critical analysis of how these systems are interconnected and how they contribute to climate change. * In essence, the phrase emphasizes that the legacy of colonialism is deeply intertwined with the current climate crisis, creating a situation where the pursuit of economic development, often at the expense of environmental sustainability, has disproportionately impacted formerly colonized regions

I never push the button at the traffic lights. I can't stand the idling cars, on hold, emitting gases in vain, just so that I can pass. Det bygger upp en stress inom mig. Instead, I wait until there is a big enough gap for me to run across between cars.

I kept quirks like these to myself for most of my life. But when I got involved in the environmental movement others were telling me that they also had this resistance to turning on the lights when going to the bathroom in the middle of the night, or

Känslan att det kostar avgaser bara för att jag skall kunna fortsätta min gångrörelse framåt. att världen jag rör mig i är utformad så. Så att fundamentala rörelser så som att äta, gå, klä mig är tied up to emissions elsewhere.

I never generated an image with the help of AI. It feels like threading on thin ice, like waving insensitively with a stick outside my knowledgehorizon. I simply do not know from where the energy is drawn to power that image generation, it could be drawn from something vital, that is much more important than this potential image. (hito)

Pda/ocd/ see

In 2017 I created a research project centred around reducing the co2 footprint of my practice and my living. It was a desperate response to an acute situation.

The law that regulates idling of vehicles was introduced in 1999 at the same time as I got my driving license. I minute was the limit. But already before that my aversion towards idling vehicles was huge.

Except the time when I was living in Germany where it would provoke people to yell “rotgänger”! In the queue waiting for the ferry crossing I had to get in and turn off a stranger’s car that was left with the motor running. I just couldn’t stand it. I did not think much about my strong feelings about CO₂ emissions when I started lea

CO₂ is invisible to the human eye, but this all pervasive hyper-object, is pushing us further into the new ecological age with its new alter-life realities.

In today’s society, even cause and effect have been disjointed and replaced by opaque correlations, due to the saturation of fossil-capital.

Because the energy this takes, is not tangible to us. Fossil fuel is treated as externality, it is practically free, therefore labour outsourced to fossil fuel becomes invisible. To again make visible what relations has been disconnected by fossil I needed

Hasselberg h

1. senses:

new ways to make sense of it. So, I backtracked and began with personal experimentation with the hyper-object carbon dioxide. In sensory explorations, such as holding my breath, I physically connected with the concept of CO₂

2: measuring:

The next step was to assess the CO₂ footprint of my everyday actions, since high CO₂ footprint was a sign of many relations being obscured through its abstraction.

3: reducing

This outcome dictated what would

guide what steps would be prioritised to reduce the most CO₂ emission. And through that also make those dependencies and relations visible again.

For example I started walking and biking everywhere, getting physical feedback on what distances really cost. The walking and biking became a way to process ideas and thoughts that coupled my research with my environments.

I stopped buying new materials...

When we reduce CO₂ in our industries and transportation our ecological dependencies again become tangible in society. When holding your breath, from

emitting carbon dioxide, every molecule of your body awakens. The cry of your molecules drowns out everything else. Your core becomes center, and all new relations will connect from this root.

Reducing carbon emissions in artistic practice has for me included the whole range between bodily and systemic materialities, enabling me to create from a greater sense of connection.

These insights led me to pin point further this specific embodied way of processing and cocreating with my environment in a dialogue between something inner and outer. I explored how this could be applied in more direct ways than in producing animated artworks. I wanted to apply this way of interacting also in social everyday life and work. I hoped that this approach would reveal overlooked [\[LK1\]](#) ways of responding to other aspects of my life and work that I wished to change, for example its carbon footprint. In other words, extracting this way of finding new possible continuations through entangled relationships with the environment, from animated storytelling onto direct shared life.

Climate Just Worldings research project - extrapolating the animation practice

This wish was the starting point and aim for the research project “Climate-Just Worldings”^[1] where I was searching for ways to act on the climate crisis within my workplace. The most obvious response to the fact that our co2 emissions [\[LK2\]](#) [\[LP3\]](#) [\[LK4\]](#) are catastrophically heating our world was for me to stop emitting co2.

But for some reason every attempt at this in my workplace was met with sceptical reactions about its impossible nature and its unrealistic naivety. I felt increasingly paralyzed and unable to act on this obvious problem.

Co2 is invisible to the human eye, but this all pervasive hyper-object, is pushing us into this new ecological age with its new alter-life realities. I needed new ways to make sense of it.

So, I backtracked and began that project by personal experimentation with the hyper-object carbon dioxide. I began with sensory explorations, such as holding my breath to physically connect with the concept of co2.

In collaboration with a sustainability engineer, we logged, measured and analysed the carbon footprint of all different aspects of my practices. Over time, the examining

of how carbon dioxide was entangled with every action and artistic decision, gradually expanded.

By repeatedly measuring the CO₂ levels of my actions and practices and adjusting these actions to reduce my carbon footprint, I created a feedback loop that integrated daily experiences with reduced CO₂ emissions. This process affected me physically—altering how I ate, breathed, slept, and worked.

In other words, CO₂ level data was translated into motor actions, which then changed my sensory input of daily routines and artistic practices in a sensorimotor interplay.

Together with students and staff I continued to include the filmmaking across the entire film department at Stockholm Uniarts in the assessments. These iterations of assessments culminated in the creation of ELSA, a carbon calculator for film students. With ELSA, the environmental cost of film came into focus, counterbalancing the usual emphasis on economic costs.

It is the priority of economic efficiency that has driven the outsourcing and streamlining of animation processes, moving away from manual techniques. To the market capitalism of the Film industry things like environmental impacts are “externalities” and have not been part of its equations. However, when we included environmental costs in our calculations, the “real costs” of animation, reveal manual animation as one of the most eco-friendly, low-carbon approaches to animation. (ref: the footprint of CJW diva)

During this research project this method of oscillating between the inner and outer crystallized further. I called it Transtopian worldbuilding, a method that generates an iterative process where an inner story-world and an outer shared reality perpetually transform each other. A looping swirling movement, where overlaps and possible contaminations could be detected. Moving situations and dilemmas from shared realities through the story-world pushed the imagination and expanded what seemed possible. It enabled transformations or “worldings” (Taylor & Iverson, 2013) in the shared reality, challenging narrow definitions of the present.

At this point I stumbled upon research in the field of neuroscience, which offered further explanation to the underlying causes to, and meaning of, this specific way of thinking and working

Animation practicing as a neurodivergent

carbon as enabler of the disconnect between human & nature

Excessive fossil use as colonization

Yes — Tom Goldtooth, the Indigenous environmental leader and executive director of the Indigenous Environmental Network (IEN), was present at the COP21 climate talks in Paris in 2015.

While **he wasn't a formal negotiator** at the table for any national delegation (those spots are reserved for country-appointed diplomats), Goldtooth was a **prominent voice in civil society** and part of the **Indigenous caucus and activist groups** pushing hard to ensure Indigenous rights and environmental justice were addressed in the Paris Agreement.

In fact, Goldtooth was a key critic of the final agreement, especially because the language protecting **Indigenous rights** was **weakened** during negotiations. Early drafts had strong references to Indigenous rights, but in the final version, the commitment was shifted to the non-binding preamble rather than the legally binding articles. Goldtooth and the IEN called this a serious failure, emphasizing that market-based solutions and carbon trading mechanisms threatened Indigenous lands and sovereignty.

So, while he wasn't a negotiator in the strictest sense, he was absolutely part of the global movement shaping the conversation and holding governments accountable during and after COP21.

If you want, I can help you find a quote or statement he made from that time — would that be useful?

Copy från animation, sustainability, neurodivergence

The climate crisis is defined by hyper objectsⁱⁱ such as radioactivity and carbon dioxide. They are difficult to grasp with our human senses and images such as the photograph of the trinity detonation doesn't seem to assist in making sense of them.

Michelle Murphy's term "alter life" acknowledges the impossibility of trying to make sense of anything (especially in the current antropocene era) as an isolated thing, independet from our ongoing sense-making. Homo sapiens are a self-creating and world-creating species.ⁱⁱⁱ We as both research subjects and the world we study are results of human-induced materials,^{iv} and AI and robotics researcher Jitendra Malik believes that it is our "making", our body's movements, that shapes the the brain and our cognition more than the other way around^v.

This condition compels us to carefully consider what methods for sense making we are using because *how* we make sense, affects how we act, and this enacts the world further.



Image: *Simpsons The Movie* (2007)

In *Simpsons - The Movie* (2007), Homer becomes disappointed with how Alaska turns out to be an oil field. He replaces the view with an idyllic advertising poster. The obscured visibility causes them to run off the road and they end up in a landscape that looks exactly like the poster. The image somehow transformed the actual reality! Image making is an important part of human sense making. Let's continue with looking at what roles our images play in how our new realities take shape and in what sense our climate crisis is also a crisis of imagination.

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Climate-Just Worldings - expanding the animation practice

This desire became the starting point and aim of the research project *Climate-Just Worldings*,^{vi} where I sought ways to address the climate crisis through my work.

The most obvious response to the catastrophic heating of our planet due to CO² emissions was, for me, to stop emitting CO². However, every attempt I made in my workplace to achieve this was met with skeptical reactions, dismissed as impossible or naively unrealistic. I increasingly felt paralyzed and unable to appropriately respond to this problem.

Carbon facilitated the disconnect between humans and nature. It allowed factories to move away from flow-energy sources like rivers and winds, as well as from the raw materials and natural resources they depended on. Instead, production could be situated near labor and transportation. Workers were disconnected from their circadian rhythms, able to work day and night under electric lights.

Fossil fuels are treated as an externality because they work for free, enslaved by us. Labor outsourced to fossil fuels becomes invisible and intangible. An absent referent (*Carol Adams*) that makes it possible to deny aspects of the reality in order to maintain power structures. CO², itself also invisible to the human eye, is an all-pervasive hyperobject, pushing us further into a new age of alter-life realities. I realized I needed better ways to make sense of this.

den frånvarande referenten ett koncept som hjälper oss att förstå hur vissa aspekter av verkligheten kan förnekas eller osynliggöras för att upprätthålla maktstrukturer och privilegier.

I turned to the iterative dialogue between inner and outer realities from my animation practice. But instead of animating films, I animated my social reality. I brought my inner vision of a climate-just world, *New Reactive Earth* (2011) into dialogue with my workplace environment. I called this process *Transtopian Worldbuilding*, a method that generates a looping interaction between an inner story-world and an outer shared reality. This process revealed overlaps and possible contaminations, allowing them to perpetually transform one another. It enabled transformations, or “worldings”,^{vii} in the shared reality, challenging narrow definitions of the present.

I started with sensory explorations, such as holding my breath to physically connect with the concept of CO². In collaboration with Anna Björklund, Professor in *Environmental Strategic Research*, I logged, measured, and analyzed the carbon footprint of various aspects of my work. These outcomes continually prompted me to

shift my practices to reduce my CO² emissions. In other words, CO² data was translated into motor actions, which in turn altered my sensory input and daily routines. This interplay of sensorimotor (A word I will come back to in the section below) feedback gradually expanded to include students, staff, and the incorporation of filmmaking across the entire Film Department at Stockholm Uniarts in our assessments. This culminated in the creation of ELSA,^{viii} a carbon calculator for film students. With ELSA, the environmental cost of film production was brought into the calculations, counterbalancing the usual emphasis on economic costs.

The prioritization of economic efficiency has driven the outsourcing and streamlining of animation processes, moving away from manual techniques. In the market capitalism of the film industry, environmental impacts are seen as “externalities” and excluded from its equations. However, when we included environmental costs in our calculations, the “real costs” of animation became clear. Manual animation emerged as one of the most eco-friendly, low-carbon approaches to animation.^{ix} Moreover, the more we reduced the CO² footprint of our productions, the more the environmental dependencies and relationships inherent in the process became visible and tangible.

At this point, I came across research in the field of neuroscience, which offered further insights into the underlying causes and meaning of this specific way of thinking and working—through iterative dialogue between inner and outer realities.

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This essay has explored the intricate correlations between animation practices, sustainability and neurodivergent cognition. By recognizing and analyzing animation as a practice of sensorimotor cognition, I have argued that its processes afford an embodied and relational form of sense-making that renders the self as an intrinsic part of the world. This quality allows animation to challenge capitalist modes of thinking about the environment. It also helps us to grapple with the overwealming hyperobjects of climate change, revealing sensorial ways of responding, acting and engaging in accordance with them, by removing the distances created by for example fossil fuels.

Andreas Malm (2004): När kapitalet tar till vapen. Om imperialism i vår tid.

Andreas Malm beskriver oljan som kapitalismens främsta energikälla och basnäringen för det imperialistiska USA:s förmåga att säkerställa sin hegemoni genom att utöva globalt våld. När de arabstater som har oljan har velat och göra andra prioriteringar har deras suveränitet blivit ett hinder som oljeindustrin inte kan lösa. För att säkra den fria tillgången till oljan behövdes Israel som motvikt till arabstaterna. Det är i imperiets stridsmedels- och oljeindustrins intresse som utestängningen av palestinier får fortsätta.

working with Waheeda Baloch in Karachi on how climate change kills indigenous bee species there, which in its turn undermines the entire ecosystem.

ⁱ <https://ourworldindata.org/how-much-subsidies-fossil-fuels>

ⁱⁱ Morton T. *Hyperobjects: philosophy and ecology after the end of the world*. Minneapolis, MN: University of Minnesota Press; 2013. p. 57.

ⁱⁱⁱ Murphy M. Alterlife and decolonial chemical relations. *Cult Anthropol*. 2017;32(4):494-503. doi:10.14506/ca32.4.02.

^{iv} Murphy M. Alterlife and decolonial chemical relations. *Cult Anthropol*. 2017;32(4):35. doi:10.14506/ca32.4.02.

^v Malik J. Building AI from the ground-up, sensorimotor before language. *The Robot Brain Podcast*. 2023 Aug 17.

^{vi} Persson L. *Research poster Climate-Just Worldings*. Stockholm: Stockholms konstnärliga högskola; 2023. 1 p. Available from: urn:nbn:se:uniarts:diva-1560

^{vii} Taylor CA, Iverson G. Material feminisms: new directions for education. *Gender Educ*. 2013;25(6):665-675. doi:10.1080/09540253.2013.834617.

^{viii} ELSA. [Internet]. Available from: <https://www.elsa.film/>. Accessed 2024 Nov 27

^{ix} Persson L, Lagercrantz K, Björklund A. *Klimatavtrycket för projektet Klimaträttvist Världande: Rapport av livscykelanalysen av forskningsprojektet Klimaträttvist Världande*. Stockholm: Stockholms konstnärliga högskola, Institutionen för film och media; 2021. 26 p.