

# ReFuturing Studio: Designing long-term sustainability for the biosphere

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**The trajectories of the Earth’s climate and ecosystem services are unravelling, pushing the life sustaining biosphere on the path towards “biological annihilation”. As the worst climate predictions come to pass, it has become urgent to introspect on the predictable consequences of our global economic system designed for extractivism. Attempting to address and understand these issues seems to create a sense of foreboding and anxiety about our climate futures. This paper will discuss this in relation to the tendencies of defuturing in design, that is, the negation and erasure of our better futures and possibilities when trying to imagine a long-term sustainable future for human and non-human others. The discussions here are based on observations and discussions with design students in a workshop called “ReFuturing Studio” which attempts to engage young designers to confront the urgency of climate breakdown and long-term sustainability beyond “business as usual” (BAU).**

**This paper argues for a “refuturing”— to reclaim that which is defutured and dehumanized, beyond the homogenizing and hegemonic futurism of BAU by re-imagining, rethinking and ‘re-humanizing’ through a ‘designerly knowing’ of the yet unknown long-term sustainable futures. Refuturing thus critically proposes alternative perspectives, solution spaces where designers and design educators can begin to understand and reconcile design practice with climate action by “designing for the biosphere” by imagining possibilities for co-regenerative practices as a means for human well-being and ecological flourishing.**

## **PARADIGM SHIFT: RADICAL CHANGE AND/OR RADICAL COLLAPSE?**

The trajectories of the Earth’s climate and ecosystem services are unravelling (Steffen et al. 2018). The life sustaining biosphere is seemingly on the path to “biological annihilation”, the urgency of which cannot be understated (Ceballos, Ehrlich, and Dirzo 2017; Díaz et al. 2019). As the worst climate predictions come to pass, it is clear now more than ever, it is brought on by the predictable consequences of a global economic system designed for extractivism and affluent consumption which have also obscured the interdependence of

our socio-techno-economic and political assemblages (Tsing 2015). With the rapidly declining social, political and ecological conditions we see around us, formalized knowledge systems seem to be failing humanity (Fazey et al. 2020; Folke et al. 2021). While design today still seems to function on certain assumptions handed down by the nineteenth century reductionism (Dorst 2019), there have been consistent attempts across the design disciplines to formulate articulate responses to the climate crises beyond Business as Usual (BAU).

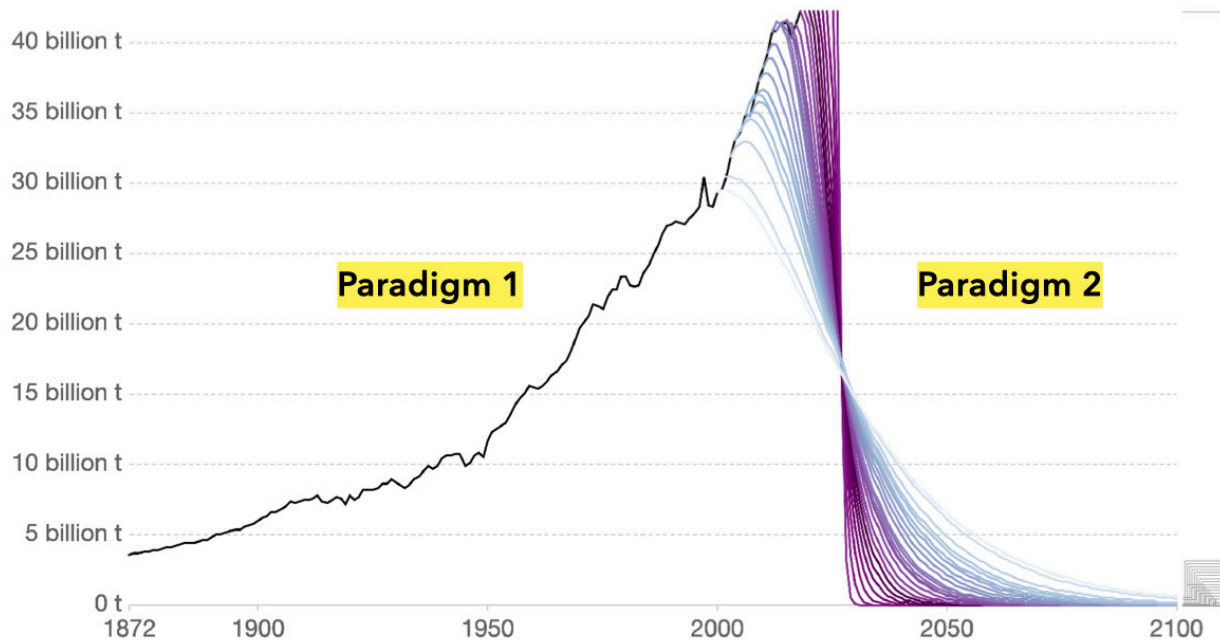
Despite the vast scholarship and knowledge being generated, it seems that a more profound understanding of climate action still evades us. Thus, as more carbon was emitted into the atmosphere *knowingly* than was ever done in ignorance (Wallace-Wells 2019), baselines for climate action were continuously being shifted (Jackson, Alexander, and Sala 2011). It would seem then that knowing alone “is not the road that leads to understanding, because the port of understanding is on another shore”, requiring a different navigation (Max-Neef 2009). The research group ReFuturing Studio at AHO has been focused on attempting such a ‘different navigation’. It is precisely the possibilities and challenges of this new navigation that informs our questions of designerly agency facing the climate and ecological crises to act beyond climate despair by instead trying to envision a long-term sustainable paradigm, by design.

The propositions discussed in the following sections are based on observations and reflections from a series of two-week workshops titled ReFuturing Studio with a focus on industrial design facilitated together with Prof. Håkan Edeholt (AHO), carried out in three countries of both the Global South and the Global North (China, India and Norway). This paper acknowledges that the provocations that follow have been based on reflections together with the participants and also within the research group ReFuturing Studio. Over the first week of the workshop, the students/participants were given inputs on the urgency of the climate crises and tasked to speculate on long-term sustainable future scenarios in the form of a design fiction. The second week required of them to express the “diegesis” of their fictional futures with tangible, “diegetic” artefacts (Kirby 2010; Candy 2013). To confront the challenges of the climate crises, the workshop made explicit early on the designer’s task was to both discover and understand

## CO<sub>2</sub> reductions needed to keep global temperature rise below 1.5°C

Annual emissions of carbon dioxide under various mitigation scenarios to keep global average temperature rise below 1.5°C. Scenarios are based on the CO<sub>2</sub> reductions necessary if mitigation had started – with global emissions peaking and quickly reducing – in the given year.

Our World  
in Data



Source: Robbie Andrews (2019); based on Global Carbon Project & IPCC SR15

Note: Carbon budgets are based on a >66% chance of staying below 1.5°C from the IPCC's SR15 Report.

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

Figure 1. To stay below 1.5°C requires a different imagination, a deep paradigm shift. Image credit: Our World in Data

the “logic or intelligence” of our unsustainable paradigm. To make the speculative practice more enjoyable, we began from a premise assuming that this paradigm shift towards negative carbon emissions had already occurred (figure 1). The diegetic artefacts then, were based on this shift and were to address the *essential* human needs that would be fulfilled by designers in this context, given that human society had now prefigured itself towards long-term sustainability. Given the limits of this paper, it seems more appropriate to frame these discussions to the general tendencies within our social imaginaries which may provide better insight and facilitate a more relevant reflection on the issues raised rather than the individual outcomes of the workshop.

### CLIMATE DESPAIR AND TECHNOLOGICAL SALVATION

“We never realized how bad things are” is a common refrain we hear early on in these sessions as being confronted with the facts of the climate emergency easily overwhelms many of us given the profoundly wicked nature of the ecological crises. It is peculiar how designers express this sentiment within their fictional scenarios where narratives might imagine with a ‘world’ being destroyed given the issues of climate change in order to build better alternatives. Furthermore, these may even be expressed in future worlds where overpopulation, resource wars, scarcity, rogue artificial intelligence, climate

refugees, mass extinction are to be ‘solved’ through near universal technocratic solutions to preserve future progress, development and avoid climate disaster. This despite recent scholarship suggesting that a 1.5°C world with guaranteed good quality of life to every human being is achievable today without the need for relying on mythical technological fixes (Keyßer and Lenzen 2021).

Techno-optimism though, is not an anomaly in design practice, given that designers, being practitioners of the artificial, are trained to create new desires for modernity, regardless of their rational and constructivist positions (Dorst and Dijkhuis 1995; Escobar 2018). With climate breakdown, however, the failure of technological redemptions to address these issues, when other strategies would do, transforms into a deep sense of technological disappointment similar to those observed in post-apocalyptic science fiction tropes. In this context however, what these tendencies reveal is not an individual’s capacity for imagining futures, but a ‘feedback loop’ of the social imaginary which seem to have normalised certain dystopian science-fiction tropes in our popular culture. More often than not these tropes are based on projecting technological development as a supernatural agent of redemptive change. The historical legacy of technology itself is not indifferent to certain deeply religious motivations, which to this

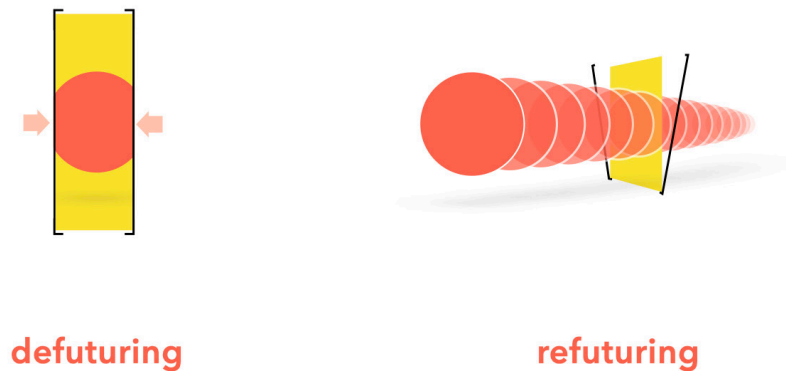


Figure 2. Differentiating the narrow frames of Defuturing and the pluriversal framing of Refuturing. Image credit. Jomy Joseph

day, seem to be reflected in pursuits of ‘technological salvation’ (Noble 1997).

Over time, it would seem that such technological salvations have been realized today into ‘bureaucratic’ technologies rather than ‘poetic’ ones (Graeber 2018). Thus promises of ‘ubiquitous computing’ (Weiser 1991) over time devolved into surveillance infrastructures, to further enable capacities for extraction, accumulation and consumption (Zuboff 2019). These tendencies may be further reflected in the discourse around “productive nature” which require a sanitized vision of the natural world, stripped of its indigenous people, displaced from their ancestral lands where technological prowess may enable further modes of consumption of resources be it for preservation or sustainable consumption (Thekaekara 2019; Patel and Moore 2017).

Curiously enough, barring a few exceptions, even in the most dystopian visions with their technological disappointments, the social and economic inequalities that exist today may remain unchanged or are exacerbated in some form or the other. It is quite well known that extreme carbon inequality today extracts a heavy cost from those at the “bottom” even as the lifestyle emissions of those at the “top” being responsible for most of the emissions (Althor, Watson, and Fuller 2016; Chancel and Piketty 2015). Even the language of overpopulation for example, has been criticized for obscuring the patriarchal and colonial relations that see women’s bodies as a means for a demographic end (Dyett and Thomas 2019). Thus, as we race to curb emissions, the logic of pursuing ‘behavioral change’ towards “sustainable consumption” seems to be directed at those least responsible, as elaborate forms of “climate apartheid” are imagined (Hickel 2016; Carrington 2019; Chancel and Piketty 2015). Moreover, such mythologizing may have also obscure the regimes of care and social reproduction which go into sustaining these systems which continue to remain fundamentally unacknowledged (Cowan 2008).

### DEFUTURING: AN ALIENATING SPECTACLE

Whether it be a grand escape to Mars or total planetary control through geo-engineering projects, such futurisms seem to point to particular social imaginaries of dehumanizing, technological spectacles. It might not be accidental then that many tensions found within apocalyptic imaginaries share certain colonial frames (Nenquimo 2020; Hickel 2018). In essence, these visions speak of human species which, by either total domination of the planet or total alienation from it, would remain disconnected from its own life-giving ecosystem as it is now (Nenquimo 2020). Such futures only further narrow the opportunities available (figure 2) and lead to ever more homogenous forms of climate dystopias. These alienating spectacles of futurism (Bookchin 2019; Debord 2010), only serve to narrow the possibilities of the designerly imagination further feeding into cycles of climate anxiety and climate despair, eventually leading to the position where it might just be far easier to imagine the end of the world than to question such frames, lest they be considered impossible or naive and unrealistic.

What these tendencies effectively describe is defuturing, which “effectively exposes the negation of world futures for us, and many of our unknown non-human others” (Fry 1999). These take the present form of BAU as it exists today and make it smaller, bigger, more extreme, more digital, more biological yet ultimately projected uncritically into the future. These may be considered a peculiar manifestation of what Freire has termed “false generosity” (Freire 2014), where say a technoutopian aesthetic obscures the oppressive nature of these defutured climate imaginaries that are never fundamentally challenged, given the fact that they ultimately deprive us of alternative visions for climate action.

### REFUTURING: A RENEWED IMAGINATION

Refuturing is a designerly re-imagining, rethinking and ‘re-humanizing’ of futures, breaking the narrow frames of the homogenizing, reductive and hegemonic defuturing of BAU and open up towards ‘pluriversal’ futures (figure 2). To

“refuture” what’s already been defutured, is to reclaim the dehumanized futures by regaining our humanity, what Freire has called rehumanization (Freire 2014). Arguably then, design may need to speculate on a “new logic” of long-term sustainability beyond the prevailing logic of BAU which only narrows the most imaginative speculative futures. Therefore, refuturing begins with the assertion that we perhaps need to change the present as we know it such that the future is profoundly different when we arrive in it. When designing for long-term sustainable futures that do not yet exist, implies rethinking the agency of design to move beyond the choices that lie between making or not-making, say, sustainable choices (Findeli 2001).

Refuturing can be understood in terms of a missing dimension to the dichotomies of making and not-making, as a means to “design beyond design” (Dorst 2019), that is, to imagine and make *differently*—by rethinking in action. When refuturing pursues “solution spaces” as scenarios/futures, it does so specifically to creatively imagine different paradigms (Kuhn 1970), that emerge in the tacit dimension (Polanyi 2009). It seems plausible that with the tools available to designers, the discipline might already be well equipped with the “designerly ways of knowing” (Cross 2007) these long-term sustainable paradigms that can be profoundly understood, complementing our realms of knowledge (Max-Neef 2009). The workshop, thus named ‘Refuturing Studio’, attempts to establish a deeper connection to such *designerly* ways of making and sensing divergent ‘pluriversal’ futures in the here and now, which involve a constant negotiation between the ‘rational and speculative reflection in action’.

### **DECOLONIZING FUTURES: CLIMATE ACTION REPARATIONS AND TECHNOLOGIES OF CARE**

The pluriversality of futures is deeply rooted in decoloniality in order to imagine ‘a world where many worlds fit’ (Escobar 2018). Global climate action and climate justice are furthermore integral to deeper questions of climate reparations and decolonization, given that the legacies of colonial relations are still ongoing and are reflected in the global economic inequalities we see today (Schultz et al. 2018). While the debate on the question of decolonization is still ongoing (Schultz et al. 2018). Climate reparation calls for transformative forms of climate action that acknowledge the deep harm that certain colonial legacies have inflicted on ecological systems and to transform systems that ensure such tendencies do not repeat themselves (Táiwò and Cibralic 2020). Refuturing attempts to mediate these decolonized relations that arguably need to be considered to go beyond the metaphorical, as complementary themes and not merely buzzwords (Tuck and Yang 2012).

Refuturing is also about acknowledging the colonizing role of design futurisms and understanding the task which lies ahead of us beyond climate despair. To attempt such a task, one may first attempt to rethink the worldviews that led to our current predicament. Today, the worldview underlining

the assumptions of BAU seems to be based on the primacy of the so-called ‘laws of economics’, leading us into ecological and social collapse (Temesgen, Storsletten, and Jakobsen 2019). Understanding ecological boundaries, that is, the ‘laws of nature’ reminds us that human society is a subset of the biosphere and the economy subservient to human needs (Temesgen, Storsletten, and Jakobsen 2019). Thinking as such in terms of ecology and ecosystems warrants a reasonable approach to long-term sustainability which may be more compatible with the ecological boundaries of long-term sustainability (Klein 2014).

For example, long-term sustainability may necessitate a decoupling of civilization’s material footprint in order to stay within planetary boundaries, where degrowth might help fulfil essential human needs, while also reducing consumer desires within a fairer society. Furthermore, reduced capacities for extraction and affluent consumption might further help decolonize indigenous land, expanding indigenous forms of land management/care which offer possibilities of addressing global food security and sovereignty through agroecological means (Díaz et al. 2019). Renewing social contracts may even lead to better social outcomes even as drastically reduced work hours complement regenerating the commons, acknowledging human and non-humans that have been othered in our deliberations.

Serious deliberations of such a kind may need to acknowledge the interdependency of fulfilling essential human needs with the expansion of so called ‘wild nature’ by regenerating biosphere ecosystem services that are in a critical state today than ever before. These goals might even imply reimagined archetypes and typologies of technological artefacts that enable and sustain the material prospects towards fulfilling essential human and ecological needs by engaging both ‘rational and speculative’ frames (Joseph 2019). Such refutured technological possibilities might aid in expanding human, social and ecological possibilities more “appropriate” to the task of climate reparations and socially useful production (Cooley 1987). These would work in localized scales of socially useful production and consumption applying benign, ecologically regenerative fabrication processes within carbon negative cascades (Bates and Draper 2019).

Designing *for* the biosphere, therefore, calls for similar mutually regenerative propositions for social and ecological flourishing where we design, fabricate, care for, nurture, sustain and socially reproduce these ecologically regenerative pluriversalities. However, such seemingly rational choices for a long-term sustainable paradigm tend to be deemed irrational, or ‘politically impossible’ within BAU. On the other hand, what seems rational within an unsustainable paradigm further narrow our choices which in turn only further entrench our climate denialism and inaction as we head towards the precipice of climate tipping points (Steffen et al. 2018). Arguably then, the task of

“refuturing” is to acknowledge the complexity of the challenge, not to predict or prove the future, for that remain out of scope of design agency, but to suggest propositions for alternative possibilities that can be tangibly realized today (Joseph 2019). However, recent scholarship suggests that it might already be possible to bring about these changes easily enough today by rethinking these assumptions. That is to say, a 1.5°C world with good quality of life for both humans and non-human others is *realistically* possible (Keyßer and Lenzen 2021; Folke et al. 2021; Kuhnhehn et al. 2020).

### RECLAIMING UTOPIAS TODAY

Refuturing thus, is about reclaiming utopias in the here and the now, by rehumanizing futures even as the planet becomes increasingly uninhabitable for the human species (Wallace-Wells 2019). It is about building radical hope when none may seem forthcoming, approaching more *human* futures that we can consciously consent to, keeping room for dancing, laughter, play, fun, leisure, creativity, even boredom—which seems impossible to imagine today. However, it must be noted that rehumanizing utopias is not to imply that alternative futures will be bereft of any conflict. In pluriversal spaces, many worlds may deliberate on such concerns through practises of conviviality and autonomy (Escobar 2018).

It may be urgent to do so, given that the climate and ecological breakdown is not a usual design problem that can be ‘solutioned’ away as such, and there may be certain cognitive limits for designers alone to addressing such wickedly complex problems (Dorst 2019). Between the systemic constraints of designerly practice and the wickedness of climate and ecological crises, to comprehend the choices at hand becomes an incredibly overwhelming task. Understandably enough, it is not long before many of us might end up questioning the design discipline itself where doing the *right* thing seems to present a professional dilemma. When internalized enough, designers may tend to see themselves as the ‘most dangerous profession in the world’ and may choose rather not to design at all or continue with BAU (Papanek 1985). Furthermore, Speculative and Critical Design (SCD) rejects commercial, consumerist solutionism in an intriguing practice with fantastical alternative futures within similar climate themes but have largely gravitated towards a “warning of things to come”, of futures few may want to inhabit (Tonkinwise 2014). In either case, one is left with few choices of action, while we remain in ‘the trouble’ and without the tools for addressing climate action, further entrench climate inaction/despair as BAU continues (Joseph 2019).

Even though refuturing offers remarkably creative possibilities for designerly agency, many possibilities lie beyond the realms of design itself, and may need disciplinary cooperation and synergies. However, it is also entirely possible that the inputs given to the students may be inadequate for such a task and this will be continually improved upon. For these reasons, this

paper takes the form that it does to rather discuss the seemingly universal yet deeply entrenched social imaginaries instead of showing successful student projects from the workshops. It might be that the climate dystopias reflected upon have been a ‘hyper-normalized’, manifestation of a zeitgeist losing its ability to imagine alternatives (Yurchak 2006). What this paper should make abundantly clear is that these defutured tendencies might not be the students’ own but perhaps a reflection of the elaborate expressions of climate denialism that have already been deeply internalized in our social imagination (Klein 2014).

Even though refuturing might create uncomfortable and unsettling encounters that challenge many of our deeply held assumptions, many of the opportunities that lie ahead may only be revealed and understood when externalizing these tacit assumptions and engaging with them by practicing reflective thinking in action. Ultimately, the goal of such frameworks is to create respectful dialogue about hopeful futures of expanded humanized possibilities that may become tangible, thinkable and doable today, opening up deeper realms of understanding towards long-term sustainable futures.

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