

# Sustainability is a Quicksand Problem

by

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*The exquisite dilemma of quicksand is that you must escape as quickly as possible but anything you do to escape only drags you further down. Our ecological crisis is a quicksand problem, but our disconnected economic system conceals the fact.*

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## UNEARTHING A PARADOX

A profound flaw is becoming apparent in the ESG community's strategy to protect the environment by diverting financial flows in more sustainable directions.

The strategy has always tacitly assumed that there is a more reliable transmission mechanism than really exists between directing capital to greener projects and achieving a smaller human 'footprint'. Instead, we are starting to recognize there is only a loose correspondence between redirecting financial flows and altering the matter and energy flows that define our ecological problems. Consequently, efforts we are recording as 'more sustainable' may or may not be 'more sustainable' in the thermodynamic terms that count.

To use a car metaphor, the ESG community has reached for the steering wheel of the global economy to turn it in a greener direction, only to find that the steering wheel is poorly connected to the main wheels and that inputs on the steering wheel may or may not be turning the vehicle in the desired direction.

The core problem is that, as a market-based movement, the ESG strategy has been grafted onto the broader market system. But the market system rests on half an accounting framework that disconnects it from physical reality. The market records our physical 'ordering' transformations of the world we deem beneficial but excludes the complementary entropic 'disorder' that must accompany any transformation of matter and energy. We 'value' the sheltering log cabin, but not the corresponding damage to the forest. In aggregate, the market registers a psychologically appealing 'Great Enrichment' of monetary wealth but ignores its psychologically burdensome, yet thermodynamically necessary, counterpart – the 'Great Acceleration' of waste flows.<sup>1</sup>

Grafted atop the market system, ESG's core strategy can only be as effective as the market's connection to physical reality is secure. Which, currently, is 'not very'.

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## A Transformation Paradox

Financial accounting owes its integrity to ‘double entry’ bookkeeping, but underneath our financial accounts, we practice only ‘single-entry’ thermodynamic bookkeeping. We record new assets of physical order but make no matching entry for new liabilities of physical disorder. Hence, to analyse – or to plan with – a financial statement is unavoidably to think with this bias, and so reinforce it.

How the half-accounting really harms us is as follows: we are responding to our new awareness of ecological challenge with a well-intended urgency to develop a greener economy, but we are failing to recognize that each transformation – *including those of green intention* – induces new entropic disorder in the ecosystem, destabilizing it further.

Even if the aim of each ‘green’ transformation is to contribute to a future ‘lower footprint’ economy, the entropy each transformation induces today engenders more near-term disorder that brings us closer to hazardous breaches of natural thresholds and raises doubts about our ability to reach the eventual ‘low footprint’ destination.

The electric car epitomises the problem. Its promise as a future climate solution is premised on much immediate matter- and energy-intensive retrieval of nickel, lithium and more. The justification is that this initial environmental damage will be more than offset over the vehicle’s lifetime. However, this pattern of ‘deferred green gain’ played out across countless sustainable projects underway merely ensures the immediate accumulation of more entropic disorder bringing us closer to ecological limits.

Life-cycle analyses have glimpsed this difficult reality, in identifying that certain ‘green’ solutions exhibit ‘rebound’ or even ‘backfire’ effects, where the headline sustainability gain is either offset or completely overturned by upstream or downstream environmental consequences. However, LCA analyses can only reach so far. At some point, one must examine the aggregate picture to comprehend the overall impact of our transformative efforts.

In that picture, our most holistic measure of matter-energy disturbance – global material footprint – remains in lockstep with our most comprehensive indicator of human transformative activity – gross domestic product – despite a 50 year global environmental movement and 20 years of ESG-style effort.<sup>2</sup>

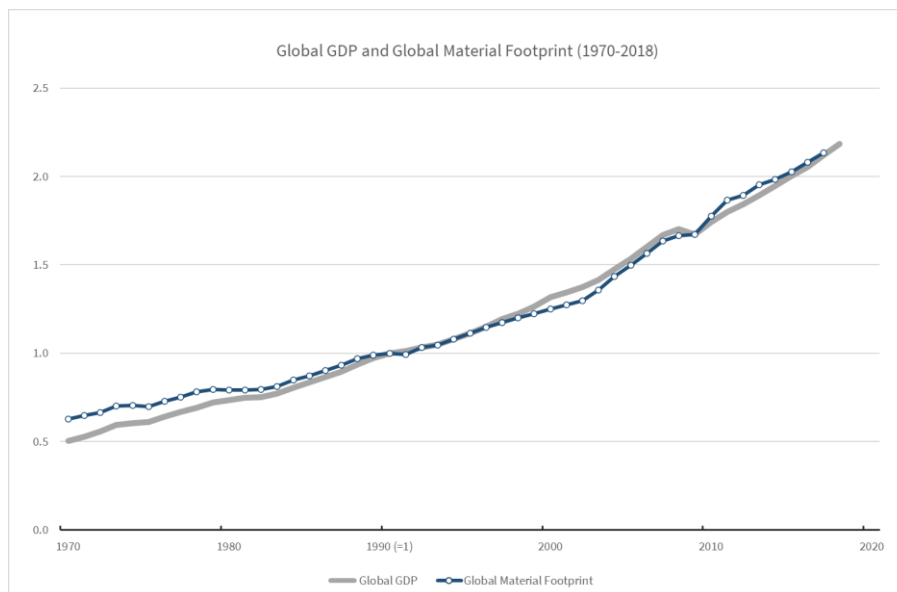


Figure 1: Wiedmann et al., *Nature Communications*, June 2020

Effectively, while our ecological concern has prompted us to pursue greener products and processes, what the Earth registers is simply more human-induced disordering of matter and energy, with no inkling that we describe a growing share of this latest activity as ‘more sustainable’. We say ‘greener’, the Earth says ‘more’. Perversely, ‘sustainability’ has become the new banner under which our physical transformation of the world continues virtually unabated.

Given the entropic toll of every transformation, it is our underexamined urge to keep transforming – even with good intention – that is the core driver of our ecological crisis. Pasi Heikkurinen helpfully labels the problem as the ‘transformation paradox’:<sup>3</sup>

*‘The observation that humans experience an urgency to transform the world, while this transformation is at the same time a root cause of the ecospherical crisis, is referred to as the transformation paradox.’*

What makes the transformation paradox hard to acknowledge is that our economic accounting blinds us to it. Consequently, in urgently trying to solve the problem without changing our economic system, what we are mostly doing is urgently making things worse.

## **A Quicksand Problem**

Paradoxes like this – ‘the solution is the problem’ – tend to be resisted by the human psyche. A metaphor might help. Our sustainability problem resembles the quicksand dilemma of old adventure movies. The hero falls into quicksand and must quickly escape or else drown, but every move he makes to escape only drags him further down.

Ecological sustainability is a quicksand problem.

Such ‘double bind’ problems repeat throughout the natural and social world. Within the private sector, they may be most familiar to those who have managed debt relationships near covenant thresholds. In such circumstances, the lender may fall into the trap that they can only avoid breaching covenants by taking on more debt, typically at worse terms. But this ‘solution’ only worsens the problem, bringing the lender ever closer to an irrecoverable debt spiral.

In a way, it is a small pity that the ESG movement originated as an equity movement, because it is debt investors and their counterparties who likely have the better intuition for our predicament. For example, corporate treasurers who, in real time, manage cash liquidity levels and debt coverage ratios against pre-established covenants, will have an instinctive feel for our ecological problem of fundamentally the same form.

The debt investor’s and treasurer’s concerns are not whether the corporate borrower has a profitable future ahead – as the CEO reassures – but rather whether the company can cross the valley of debt to get there. Similarly, the larger question is not whether the human future is bright, but whether we can make it across the Valley of Ecological Debt without irreparably breaching natural thresholds and triggering runaway cascades. Already, the Stockholm Resilience Centre reports we are in breach of four of nine ‘natural covenants’. We are already waist-deep in quicksand.<sup>4</sup>

The ESG community has not yet organized itself in recognition of this basic shape of the ecological problem. It still implicitly leans on a dated Kuznets-curve notion that improved technology from increased wealth is the key to fixing our problems, supported by anecdotal evidence that wealth and technology have indeed solved some of our environmental problems to date. Yet this perspective neglects the biological thresholds in Nature and so ignores the fact that today’s wealth generation

may trigger global-scale ecological breaches and cascades along the way that render our hypothetical ability to fix problems subsequently a moot point.

## STRATEGIES FOR QUICKSAND

*'How wonderful that we have met with a paradox. Now we have some hope of making progress.'* (Niels Bohr)

So, what to do? Rather than pursuing current strategies with more urgency, we must urgently identify new strategies. A quicksand analogy suggests three interlinked remedies: stop, reconnect, and rebalance.

### 1. Stop

When you are in quicksand, the first thing to 'do' is stop!

The appeal of quicksand as a dramatic device is that it poses a captivating dilemma: can the all-action hero do inaction? Is it part of his repertoire?

Modern culture venerates 'doing' and celebrates 'productivity', which is why most of our current sustainability initiatives are, by default, so many manifestations of more doing. 'Build back better' is just the latest incarnation of the instinct.

Stopping – or, more feasibly, just slowing – is the conscious decision to recruit Time as a strategy. Somehow, we need to buy Time in which our natural systems can begin to regenerate after our abrupt advance of the last 200 years. As the saying goes, 'sometimes you must slow down to let the wind catch up'. 'Time' might be the ultimate green consumer product.

This suggests that the ESG community review their direct actions – and the indirect actions they facilitate – and contemplate whether those actions fall foul of the transformation paradox, in perpetuating current rates of matter-energetic disorder. As the electric vehicle example hints, this raises the bar considerably for what constitutes 'sustainable'.

For example, Vaclav Smil, the renowned energy expert, has argued that keeping an old car going as efficiently as possible for as long as possible is a better thermodynamic solution than repeatedly upgrading to the latest, greenest, new model.<sup>5</sup> Its only weakness – which is the crux of the matter – is that it is not as good for sales.

A suggestion to stop would have been risible a year ago, but the COVID-19 pandemic has forced the intuition upon us. As many have noted, the shape of the pandemic is a small-scale version of the larger ecological problem in the offing. Lockdowns epitomize the strategy of buying Time until we have a better plan for how to safely proceed. Difficult as it is, it has forced us to recognize that solving our biggest natural challenges may not be consistent with economic growth – to put it mildly. Which is only to say that the economic growth we have organized around embodies a fragile conception of human wellbeing.

COVID-19 caught us by surprise and our slowing has been abrupt and chaotic. A more considered and equitable slowing of matter-energy transformation is possible to initiate, but the steps towards that goal must start immediately.

## 2. Reconnect

If we can slow for a moment, we can then work out how to reconnect. In the movies, the sinking hero or heroine is saved by a fellow explorer who, from solid ground, can extend a rope or branch and pull them to safety. But, alone on a finite planet, nobody is coming to our aid. So, we must search for a metaphorical solid ground to which we can reconnect our thinking and pull ourselves back to physical reality. We can certainly do this, but it will require throwing a grappling hook of new thoughts well beyond the boundaries of our current ones.

The principal dynamic by which contemporary human behaviour has disconnected from its earlier attunement to Nature is through our increasing self-organization around market forces, which is what has enabled more of our transformative activity to proceed without regard for thermodynamic consequences.

Over the last 200 years, and with particular enthusiasm over the last 40 years, we have passed control of our behaviour to the market. However, in identifying a Great Acceleration and the Anthropocene, we are slowly comprehending just how little markets grasp of physical reality, but how much we have nonetheless been shaping physical reality by following market signals.

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The clue to markets' critical role in severing our behaviour from natural processes can be found in key assumptions of the 'science of markets' – economics. The arguments for the superiority of market outcomes stem from appealing properties of economic theory, but these in turn rely on assumptions that detach economic thought from thermodynamic truths. These include: a belief in the unlimited substitutability of inputs, a practical downplaying of the significance of pollution flows or externalities, and hence a belief that real world markets are 'complete enough' that the attractive policy prescriptions from hypothetical 'complete markets' theory can safely be transplanted into real life. These enabling assumptions make no sense to physicists and ecologists who prioritize describing the real world over constructing an amenable narrative.

Yet, the assumptions have withstood scrutiny *because we have enjoyed the amenable narrative!* The practical benefits of accepting the economic vision have been considerable – not simply better medicines and cheap TVs, but also freer choices. Yet the question the Anthropocene raises is whether the whole model is sustainable or whether it has simply succeeded for a while because we started the experiment with high stocks of 'natural capital' that are only now revealing signs of depletion and chronic underinvestment.

Increasingly, the market apparatus presents as a single, large-scale mechanism for cost-denial. In our accounting system's choice of what to count and what to ignore, we have formalized an instinctive bias to focus on the 'order' that benefits us and to neglect the 'disorder' we impose on the world.

But we can only safely neglect that disorder that does not come back to undermine us. If disorder loops back to adversely affect us – the critical insight of the Anthropocene – then we cannot afford to ignore it anymore. As Gregory Bateson expressed:

*The unit of survival is the organism plus environment. We are learning by bitter experience that the organism which destroys its environment destroys itself.'*

So, culturally, we need to recognize and give explicit ‘value’ to newly perceived harmful feedback loops. We need to reconnect our behavioural guidance systems – markets, norms and laws – to our new comprehension of reality. It is a species-scale exercise in learning – adapting our behaviour for the millionth time to new feedback from the physical world. Learning is about internalizing the ‘loops that matter’.<sup>6</sup>

Counter-intuitively, adaptation might benefit from both *more markets* and *less market primacy*.

### **More markets...**

With the Invisible Hand, markets possess formidable powers to autonomously manage scarcity, but markets can only manage the scarcity of entities they have been made aware of. Despite widespread reverence for the market’s intelligence – ‘the market is smarter than you are’ – the market doesn’t know what the market doesn’t know!

The main shortcoming of Mr Market is not that he is moody, as Benjamin Graham imagined him, but that he is alarmingly uninformed. He has no inkling of the finite capacity of the global ecosystem to store CO<sub>2</sub> or of many other limited capacities of the environment. If we are serious about market-based solutions for ecological sustainability, we must notify Mr Market of considerably more of the physical world than he yet perceives. For all his vaunted intelligence, Mr Market is not a self-learner. To know more of the world, humans will have to inform him of it, by commodifying and assigning property rights to currently uncommodified natural entities, whereupon – the good news – Mr Market will eagerly – indeed, unflaggingly – lend his remarkable Invisible Hand to help drag us out of the quicksand.

### **...and less market primacy**

Yet, even as new markets can help many environmental issues, not everything of environmental significance lends itself to exchange, which is the only handhold markets can have on the world. Hence, to protect certain critical parts and capacities of the world, we will also need to resort to old-fashioned non-market institutions of setting certain areas or behaviours off-limits, almost certainly upsetting those who sniff (unsustainable) profit from those quarters.

The tools are the long-established ones of taboos, norms, customs and codified laws and rules. Some people may resist new constraints, but the reason these tools are part of our cultural repertoire is because our long history has been full of learning about things it is best not to do once the consequences became clear. ‘Property’ for example is the hard-won lesson that we do better when we *constrain* ourselves from simply taking things from others as we wish.

What makes coherent the seemingly oxymoronic mix of *more markets* and *less market primacy* is that both are consistent with a measured retreat from a market-led culture to a culture that more consciously uses markets as just one tool. But because such a retreat is likely to be resisted by those well-served by the status quo, any reconnection will also require underlying rebalancing.

### 3. Rebalance

Through history, humans have self-organized in a succession of socio-economic forms – from nomadic tribes to agrarian societies to city states to feudal systems to today’s near-global neoliberalism.

In all this, the foremost tension has been between the interest of the individual and the interest of the group. Today, the main manifestation of this tension occurs in scaled-up form in the confrontation between the corporation – a super-empowered legal ‘person’ mandated to pursue self-interest – and government. While the pendulum continually oscillates between individual and group interest, over the last forty years it has swung markedly in favour of the corporation – and, hence, market primacy – at just the moment we have identified global public goods problems of unprecedented scale and beyond the capacity of corporations to solve.

Healthy systems rest on healthy relationships, yet this critical relationship has been unbalanced by a powerful and self-fulfilling ‘markets-are-the-solution/government-is-the-problem’ narrative. A mainstay of that narrative has been that government ‘solutions’ can lead to unintended adverse consequences. Hence, to try and pre-empt fallible government solutions, modern culture has chosen to favour market outcomes over government intervention in principle, only to find that the meta-adverse consequences of that meta-decision are an increasingly unequal society and a seemingly unstoppable advance into a new geological era.

In essence, we have sought to remedy government’s susceptibility to make errors of *commission* by favouring a market mechanism that, in its incomplete accounting, makes errors of *omission*. Errors of omission are, of course, much harder to spot so markets have the easier PR ride.

Fortunately, the institutional deficiencies are complementary, indicating there is scope for governments and markets to act as correctives for each other. Yet, balance is paramount. Having denigrated government for four decades, we should not be surprised that the problems which have mounted lean towards those requiring public sector coordination.

To be clear, the general case I wish to advance is for *balanced* self-organization. From where we are today, in 2020, the argument for balance happens to take the form of arguing against markets and for the public sector, but at other points in time, the opposite would be – and has been – true, namely to make the case for markets against an overpowering government. The pendulum keeps overshooting because the ‘winners’ from imbalance in either direction secure the political power to thwart any re-balancing and so can ride their self-empowering logic all the way home to its typically chaotic conclusion. Tocqueville wrote about the pattern 200 years ago; Tacitus, 2000 years ago.<sup>7</sup>

If it seems downright lunacy to advocate for government in the age of Trump, consider that it is precisely because so many good people were led to believe that government was dispensable and could be made minimal – and hence that it was safe just to mind one’s own ‘business’ – which created the vacuum into which he stole. Alas for those who wish otherwise, government cannot be made to disappear – if only because of the market’s requirements for enforceable private property – so government simply ends up being restaffed, generally for the worse. Tocqueville in 1835:

*‘A nation that demands from its government nothing but the maintenance of order is already a slave in the bottom of its heart... and the man who is to chain it can arrive on the scene.’<sup>8</sup>*

And so, here we are. Again. But now with global public goods problems beyond Tocqueville’s wildest imagination.

Notwithstanding the considerable difficulties, only governments have the power to commodify and assign new property rights and protections to our natural ecosystem and so reconnect our behaviours to thermodynamic reality. The repair job facing us is, of course, enormous.

## The Implications for ESG

All this has profound implications for the ESG community. The ESG concept was founded roughly two decades ago at a time when the sustainability challenge was largely viewed as requiring technological advance and business change. It is becoming apparent that sustainability raises far more profound questions about our entire socio-economic form.

If sustainability resembles a quicksand problem requiring slowing, reconnecting, and rebalancing, the ESG community must consider whether the strategy of its first twenty years is still fit for purpose. Unfortunately, the surface-level search for greener profits is only weakly transmitting into a lower matter-energy 'footprint' because the dynamic is frustrated by the profound disconnection of our economic system from matter-energy reality. That suggests that the ESG community will need to become more pro-active in reaching down into the system to fix the transmission problem, by helping to reconstitute the entire shape of the market and the broader cultural context.

Though I have proceeded with an environmental argument, the same broad pattern applies to many social issues too. The market is as blind to certain social dynamics as it is to thermodynamics, and so in steering by market signals, parts of the social fabric have frayed in ways that are now looping back to harm us.

Bluntly, we need fewer green profits and more green policies. The original spirit of the ESG community might usefully be bottled and redirected at policy and cultural change.

Intriguingly, leading US corporations of the Business Roundtable may just have arrived at the same conclusion with their statement of September 16<sup>th</sup> articulating support for government-led action on climate.<sup>9</sup> Indeed, something strange may be occurring. Just as the New York Times reported that the US government has now rolled back 100 federal environmental policies, 200 leading US CEOs raised their hand to request government leadership on carbon prices.<sup>10</sup> While the current administration seems to be faithfully executing the corporate game plan of the last 25 years, the coin may just have dropped in CEOs' minds that corporate action is insufficient for public goods problems of global scale. It is as if the free market secured the government it wanted, only to now be having second thoughts.

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While the Roundtable statement is not perfect, its recognition of the need for policy solutions ought to be an opening for the ESG community to reach out to those corporations and take forward the idea of such prices as quickly as possible.

The very real challenge this raises for corporate leaders is whether their personal sense of leadership extends beyond the narrow frame of shareholder value maximization to which they have been tightly bound these last few decades. They are highly incentivized *not* to provide leadership beyond shareholder value maximization, so it will be a matter for their personal values.



## We Make the World

In all this, it comes back to what individuals think is possible, whether they be investors, CEOs or members of Extinction Rebellion. David Graeber, the late anthropologist-cum-activist, said:

*'The ultimate, hidden truth of the world, is that it is something that we make, and could just as easily make differently.'*

People have become pessimistic about the ecological crisis because they believe it beyond our ability to solve, but such thoughts only indicate the boundaries of our current thinking. Our capacity for pessimism is an underappreciated feature of our naturally selected emotional range. Its message is that something is wrong and must be changed. Some respond to pessimism by denouncing the signal and denying the problem, which may work temporarily. But for our evidently stubborn ecological crisis, the real fix for pessimism is not to deny the problem, but rather to take it much more seriously than we have been and to think about what we could just as easily do but are not yet doing.

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