

Carbon is not a 'thing'

The coins in a jar problem in carbon accounting

Imagine a glass jar filled with coins, casino chips, reward points, foreign currencies and gift vouchers. Each item has value but combining them into a single total, and treating them as interchangeable, would produce a deeply misleading picture of wealth.

A pound is not a euro. A euro is not a loyalty point. A loyalty point is not a casino chip. The problem is not that any one of them is worthless or 'less valuable'. The problem is **false equivalence**.

Much of modern carbon accounting risks making a similar mistake.

Across construction, manufacturing, infrastructure and corporate sustainability reporting, fundamentally different forms of carbon value are often aggregated into a single headline number as though they represent the same atmospheric phenomenon.



Worse still, systems are sometimes presented in ways that imply a benefit in one place or timeframe can justify harm elsewhere, as being an acceptable balance.

Each mechanism may have legitimacy within its own context, but they are not identical forms of atmospheric value. **Carbon is not one thing.**



This distinction matters because atmospheric behaviour is governed by physics, chemistry and time — not by accounting convenience.

An **emitted** tonne of **fossil carbon** represents a direct addition to atmospheric concentrations of greenhouse gases.

A tonne of **stored biogenic carbon** represents atmospheric carbon temporarily retained within a biological material system.

Avoided emissions are not removals at all. They are comparative reductions relative to a hypothetical alternative scenario.

Offsets may represent a wide range of mechanisms, each with different levels of permanence, verification confidence and temporal certainty.

Sequestration involves net atmospheric removal, but the permanence and timing of that removal matter enormously.

These mechanisms are related, but they are not interchangeable.

The danger is not necessarily fraudulent arithmetic. The danger is **conceptual compression**. Once multiple carbon mechanisms are reduced into a single metric without clear differentiation, category errors begin to emerge. A system can appear numerically coherent while masking fundamentally different physical realities.

This creates the risk of false confidence.

An organisation may report a strong carbon outcome while relying heavily on assumptions about future forest growth, avoided future emissions, temporary storage duration, or offset permanence — all of which carry very different levels of certainty and atmospheric significance.

The headline figure may appear precise, but the underlying mechanisms may be profoundly asymmetrical.

Why timing matters

Time is one of the most underappreciated dimensions in carbon accounting. Many systems focus almost exclusively on quantity: How much carbon?

But the atmosphere also responds to timing: When was it emitted? When might it be removed? How long will it remain stored? What is the probability of reversal? These questions are not secondary details; they are central to atmospheric impact.

An immediate fossil emission today is not necessarily equivalent to a theoretical avoided emission distributed over future decades. Similarly, temporary carbon storage cannot automatically be treated as equivalent to permanent atmospheric removal. The duration, stability and reversibility of carbon storage all matter.

Yet accounting frameworks often compress these temporal distinctions into simplified, aggregated totals that imply a level of equivalence which may not physically exist.

This does not mean current carbon accounting systems are meaningless nor does it imply that stored carbon, avoided emissions or offsets have no value. **Quite the opposite.**

Each may play an important role within the broader transition to lower atmospheric impact systems. The challenge is that different mechanisms answer different questions.

Stored carbon may provide delay.

Avoided emissions may reduce future accumulation.

Sequestration may contribute to atmospheric drawdown.

Offsets may support external mitigation activity.

These are all meaningful contributions but meaningful is not the same as interchangeable.

Seeking simplification

The commercial world understandably seeks simplification. Investors, clients, policymakers and supply chains often require comparable metrics to support decision-making. But simplification becomes dangerous when it obscures the underlying system behaviour.

A single carbon figure can create the illusion of clarity while concealing major differences in permanence, certainty, timing and physical atmospheric effect. This is particularly important as sustainability

claims become increasingly integrated into procurement, finance, planning policy and corporate strategy.

Treating unlike mechanisms as fully interchangeable may lead the market to reward accounting neatness over real atmospheric outcomes.

What to take away?

Instead of compressing all carbon-related mechanisms into a single implied currency, reporting frameworks may need to become more explicit about:

- what is being measured,
- what is physically occurring,
- over what timeframe,
- with what permanence,
- and with what degree of uncertainty.

That does not make reporting weaker. It arguably makes it more credible. The long-term credibility of decarbonisation strategies may depend less on increasingly sophisticated headline numbers and more on honest differentiation between fundamentally different atmospheric mechanisms.

Because **carbon is not one thing**, and trading systems become fragile when unlike phenomena are treated as though they are the same.

About the author

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