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Living in a material world: Why commodities like salt and sand matter more than ever

Lucia Gibbard, Investment Manager
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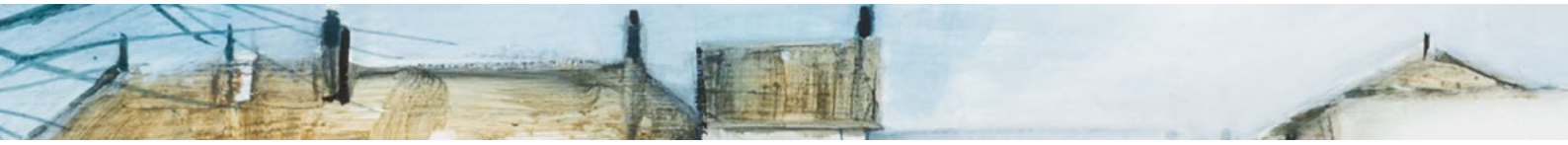
Key takeaways

- Sand, salt, iron, copper, oil and lithium form the building blocks of the modern world
- The importance of these key ingredients to modern life, and the fragility of their supply chains, are often forgotten
- The world should pay more attention to the origins and methods of sourcing these materials

Ed Conway stands at the lip of the Chuquicamata mine in Chile's remote Atacama Desert and stares into the deepest man-made crater on the planet. Far below him, trucks look like bugs as they crawl along the floor of the gigantic open-pit mine.

Conway is dazzled by the size of the pit, an abyss so vast that it could easily swallow the world's tallest building. What strikes him with equal force is the anonymity of what he is seeing. Few people have heard of Chuquicamata – or of any copper mine, for that matter – despite our utter dependence on what such mines produce.

Author and journalist Ed Conway
Photograph © Urszula Sołtys



Without copper, our lights wouldn't turn on, our mobile phones wouldn't work, our cars wouldn't run. Yet most of us have only the haziest notion of where copper originates.

To Conway, the economics editor at Sky News, our ignorance of such matters amounts to wilful blindness. "We've encouraged ourselves not to think about where things come from," Conway says. That lack of thought makes us reckless about the risks that are building up around us.

Conway explored the risks in his brilliant 2023 book Material World, which is a fascinating look at how six commodities form the building blocks of the modern world.

I've recommended Conway's book to many colleagues because it illuminates an awkward truth: physical stuff still matters. In fact, it matters more than ever. We live in an era of artificial intelligence, virtual reality and solar energy, but all those ethereal miracles ultimately depend on the easy availability of a handful of nitty-gritty materials.

Consider sand, the grittiest, most humdrum material of them all. Most of us don't give it a moment's thought. Yet sand provides the foundation for both ancient and modern civilisation.

This is literally true, because sand is a key component of concrete. It is sand, combined with cement and other materials, that allows us to build modern skyscrapers, highways and ports.

And that is just the beginning. Sand is also the essential raw material for glass. Transformed by chemistry, sand gives us windows, spectacles, camera lenses, lasers, fibre-optic cables and solar panels. Sand's precursor quartz also gives us computers, since it provides the silicon in computer chips.

Small wonder then that the European Union deems the purest, most elemental forms of sand to be a critical raw material. Sand is the key to unlocking enormous economic benefits.

The catch is that those benefits come at a cost. Concrete, for example, turns out to be a major contributor to global warming. "For all the attention lavished on other sources of greenhouse gases such as aviation or deforestation, the production of cement generates more CO2 than both of those sectors combined," Conway writes in his book.

Such tradeoffs are the norm when it comes to any of the key physical commodities on Conway's list. You can't make heavy use of sand, salt, iron, copper, oil or lithium without inflicting some degree of environmental damage.

This creates inevitable tensions. "Without fossil fuels, roughly half of us would not be alive," Conway observes. "From fuel to pesticides to fertilisers, the foundation of modern society has hinged on carbon in various forms. Yet now, the carbon emissions from those fossil fuels threaten us all."

A shift to renewable energy like wind doesn't erase the need for raw materials. Building a single wind turbine requires tonnes of concrete and steel, not to mention plastics, fibreglass and carbon.

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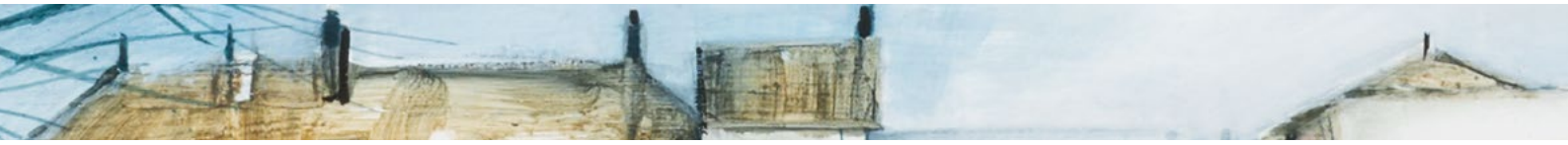


To make matters more complicated, no country can go it alone. Converting commodities into useful products requires the expertise of international networks of suppliers, refiners and manufacturers. As Conway suggests, "autarky, or economic self-sufficiency, is theoretically possible, but I think it would be incredibly expensive and disruptive to achieve".

The supply chains that hold these networks together are surprisingly long and intricate. They are also surprisingly vulnerable.

One striking example of that vulnerability is Spruce Pine, a small town on the Blue Ridge Escarpment in North Carolina. It produces the purest quartz in the world. Without its quartz, engineers would not be able to make the crucibles needed to produce the hyper-pure silicon wafers used to make silicon chips.

People who understand the importance of Spruce Pine's output regard this tiny speck on the map as a major economic choke point: if something were to happen to the single road that links its mines to the outside world, the entire global chip industry – and, by extension, much of global industry – would come shuddering to a halt.

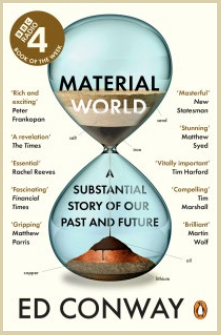
This precarious situation is not as unusual as you may think. Whether it's a tiny quartz producer such as Spruce Pine or a huge copper mine such as Chuquicamata, the global economy has come to depend upon a handful of suppliers for many of its crucial needs. Our industries operate on the assumption that nothing will disrupt these key providers. "We forget the complexity of the modern world," Conway tells me. "We've almost encouraged ourselves not to think about where things come from, what happens to them in order to turn them into the products that we use, and what their journey has been along the way. We just assume stuff will turn up."

Is that still a wise assumption? Maybe not. As Conway says, "We've been seeing a shift in tectonic plates away from untrammelled globalisation to greater economic nationalism for quite some time." Politics and the physical world are colliding as the rivalry between the US and China picks up pace. The contest for physical resources is intense as the superpowers race to secure sources of supply and keep them from rivals.

Meanwhile, countries that once welcomed mines are growing wary of the social and environmental costs that accompany the industry. By some estimates, the world will need to build three mines the size of Chuquicamata each and every year just to keep up with soaring demand for copper. Yet Panama has just halted an enormous copper mine because of concerns about the environment. Other countries, including Chile and Peru, are mulling their own limits on copper extraction.

Investors are just beginning to come to grips with the implications. For now, most are simply ignoring the growing uncertainties involved in producing key materials. "We've shifted a lot of this stuff to the other side of the world," Conway says. "We've outsourced it all. And when something is out of sight, it's out of mind."

This is a subject that cannot be ignored. Its ever-greater importance is what prompted Conway to write his book. An alarm bell for all of us. It's an issue that Walter Scott has been digging into. Last year, we conducted a supply chain mapping exercise and attended an OECD conference on conflict minerals to better understand our portfolios' exposure to these risks. Our research into these dwindling material reserves and their importance in complex supply chains will certainly continue. ■



Material World: A Substantial Story of Our Past and Future is published by WH Allen (paperback: £10.99)

Lucia Gibbard

Lucia is an investment manager at Walter Scott. She joined the firm in 2023. Prior to joining Walter Scott, she spent five years at M&G Investments, as an Investment Analyst within Private Equity and Real Assets, and latterly within Sustainable and Impact Investing. She previously interned at both Wellington Management and Walter Scott, as part of our investment intern programme in 2016 and 2017. She holds a BA in Government & Legal Studies, with a focus on International Relations, from Bowdoin College, Maine.

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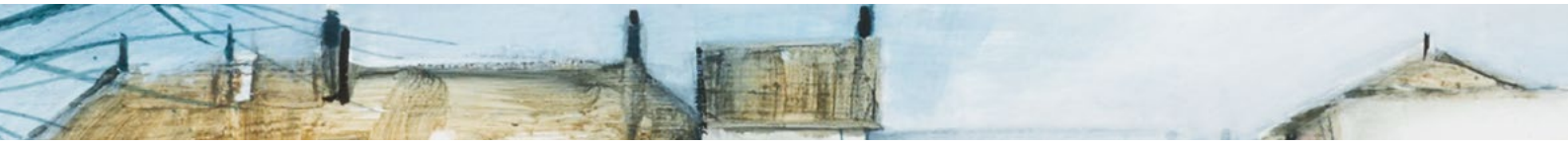

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WALTER SCOTT & PARTNERS LIMITED, ONE CHARLOTTE SQUARE, EDINBURGH EH2 4DR
TEL: +44 (0)131 225 1357 · FAX: +44 (0)131 225 7997
WWW.WALTERSCOTT.COM

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