



Floating houses in the Netherlands remain a small experiment as scaling requires regulations and improvements to business models.

CLIMATE ECONOMICS

Corporate greening falls short

Gail Whiteman is unconvinced by an argument that naked greed and market forces will drive businesses to cut their emissions.

Sustainability is no longer a fringe topic. Corporations are routinely taking steps to reduce their carbon footprints and investing in green business measures. Yet important ecological thresholds are still being breached. Companies are the main engines of socioeconomic change, and many are actively creating market advantages from sustainability. Why then are emission cuts still so abysmally small?

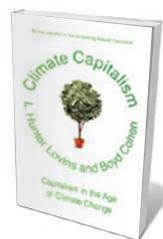
Instead of sorting through this dilemma, *Climate Capitalism* is filled with positive stories of how profit-seeking firms are helping save the planet. Through engaging examples, the book seeks to demonstrate that capitalism and “naked greed” are “powerful motivations for solving the problem of climate change”. Both authors have first-hand experience of helping organizations to improve their green credentials: Hunter Lovins’ consultancy

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A review of Nicholas Stern’s *A Blueprint for a Safer Planet*.
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advises the United Nations and the US retail giant Walmart on sustainability, and Boyd Cohen, a former professor of sustainable

entrepreneurship is chief executive of a carbon-management company. But their book is not a critical analysis.

Many business leaders recognize that economic forces are insufficient for resolving the complex challenges that face Earth systems. Chief executive of the global transportation and logistics company TNT, Peter Bakker, has told me: “As a company we can reduce our carbon footprint dramatically. But the world’s still driving off a cliff. We need a system change.” Senior business consultants say that they need more than good examples. They want to know how they can overcome barriers to change inside and outside a firm and how to let companies know if what they are doing is having a significant



Climate Capitalism: Capitalism in the Age of Climate Change

L. HUNTER LOVINS AND BOYD COHEN
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effect on the world’s resources. How should companies judge their impacts on ocean acidity, for example? Or on atmospheric pollutants other than carbon dioxide?

Science can help. Cutting emissions is essential, but Earth’s natural processes are multi-dimensional and interlinked, making it difficult to measure the specific effect of emissions cuts. A useful tool is the ‘planetary boundary’ concept of Swedish environmental scientist Johan Rockström and his colleagues. In 2009, they derived limits to seven key Earth systems — such as climate change, ocean acidity, stratospheric ozone levels — that, if breached, would be detrimental to human survival (J. Rockström *et al. Nature* 461, 472–475; 2009). Lovins and Cohen nod to this work, but don’t discuss how to bring it into the boardroom.

The case studies in *Climate Capitalism* are appealing, but the descriptions are based more on media reports than on research, so some projects are exaggerated. For example, the book describes the ‘floating houses’ piloted by the Dutch company Dura Vermeer as “popular with locals in the

Netherlands and foreigners, alike". In fact, they remain a small-scale experiment mainly in one city, Maasbommel. Scaling them up to floating communities has proved difficult owing to a lack of regulations and good business models, problems not discussed in the book.

The most regrettable dearth of analysis is in the chapter on carbon markets. The authors argue that the market will work wonders, if we let it. They acknowledge that some carbon-offset schemes are scams and that the European Union's Emission Trading System (EU ETS) had problems at the beginning, then quickly go on to call for carbon markets to be rolled out widely. There is no alternative, Lovins and Cohen say, because a carbon tax is not appealing to US politicians.

Not so. Economic studies suggest that a carbon tax may be more cost-efficient than a cap-and-trade system (B. B. F. Wittneben *Energy Policy* 37, 2462–2464; 2009). It provides a clear price signal, requires less bureaucracy, which reduces costs, and accrues revenue straight to the government that collects it. Most importantly with such an approach, there is no upper limit on emissions reduction. So why rule out a carbon tax as one of the tools of climate capitalism? Carbon taxes have indeed been successful elsewhere, for example, in British Columbia, Canada.

Nor are the market-based solutions as great as *Climate Capitalism* makes out. As a result of intense lobbying, some big polluters, particularly in the utilities sector, made windfall profits from the EU ETS without reducing emissions. Carbon-market fraud is also on the rise. One estimate suggests that such crime has cost the EU at least €5 billion (US\$7.3 billion) since 2007 (M. K. Dorsey and J. Whittington *Carbon Market Europe* 9, 7; 2010). In January, the Commission suspended EU ETS transactions for a week after a series of frauds.

Naked greed is not a motivating force for sustainability; it is a disruptive one. Although the positive examples that Lovins and Cohen present are inspiring, they are not enough. Binding international agreements and new governance mechanisms that address our integrated environmental issues — including, but not restricted to, emissions cuts — will compel businesses to engage more deeply with science. ■

Gail Whiteman is a professor in the Department of Business Society Management, Rotterdam School of Management, Erasmus University, Rotterdam, the Netherlands. e-mail: gwhiteman@rsm.nl



Sigourney Weaver (front right) in *Avatar*: director James Cameron sought scientific advice over her lines.

COMMUNICATION

Popcorn and Petri dishes

Cinemas are today's scientific lecture halls, finds **Kevin Hand** in a book probing how research enriches film.

In the autumn of 2007 I was at the American Geophysical Union conference in San Francisco, California, when my mobile phone rang. The number was blocked; as a recently minted PhD with credit-card debt, I assumed it was a company trying to track me down. Nevertheless, I answered.

To my surprise, the voice at the other end asked, "Dr Hand? I've got James Cameron on the line from New Zealand. Do you have a few minutes to help him?" I had worked with the director before and knew he was working on his next film. Cameron got on the line and described to me life on his distant planet. He needed to feed Sigourney Weaver a few lines of science jargon. Within 20 minutes we had it figured out. I put my mobile away and went on with the meeting.

Later that week I would give my talk about Jupiter's moon Europa to some 200 attendees. Two years later, Cameron's film *Avatar* reached many tens of millions of viewers.

Granted, should we some day discover life on Europa, it will dwarf the impact of any Hollywood movie. But we won't get a chance to search for that life unless the tax-paying millions that watch films care enough about our potential discoveries to invest their dollars in them. From supercolliders to NASA missions, big science is going extinct, in part because politicians and public are missing the relevance; the story isn't there. Science stands to benefit from a symbiotic relationship with those who know how to tell stories, notably film-makers.

In *Lab Coats in Hollywood*, scholar of science communication David Kirby analyses the interplay between science consultants and Hollywood film-makers. His approach is academic, but numerous examples and interesting historical details make for an enjoyable read. The book is in part a handbook for those who might try to influence the way in which science and technology are portrayed on the big screen.



Lab Coats in Hollywood: Science, Scientists, and Cinema
DAVID A. KIRBY
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Kirby notes that science advisers often labour under the misconception that there is a tension between accuracy and entertainment in film-making. On the contrary: for film-makers, he says, "there is only entertainment". The best approach for a scientist is thus to focus on how accurate science can make the story better. Rare directors such as Stanley Kubrick and Cameron are obsessed with scientific integrity, but the majority of them use it as ornament.

Although some of Kirby's conclusions are obvious, I found two concepts particularly intriguing. He argues that films are a powerful "virtual witnessing technology", in that they provide the mechanism for people to gain