



## **The Multi-Decade Marathon: Reducing Greenhouse Gases**

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Twenty years ago, I participated in a pan-European project sponsored by the European Commission (EC) to evaluate the lowest-cost methods of reducing greenhouse gas emissions. The project built on earlier work on the cost-effective reduction of sulphur dioxide (SO<sub>2</sub>) and nitrogen oxide (NO<sub>x</sub>) emissions and involved the collection of data on the energy costs and carbon dioxide (CO<sub>2</sub>) emissions of both conventional and alternative energy-producing technologies, and the costs of implementing various energy-efficiency technologies. The data was fed into a vast linear program that determined the most cost-effective way to reduce CO<sub>2</sub> emissions given forecasted energy needs.

The project was ambitiously broad in scope, but nevertheless suffered deficiencies in its design. The costs of alternative and renewable energy technologies were known with even less certainty than they are now; just as with portfolio optimizers today, garbage in meant garbage out. Further, the project focused solely on the costs of production, ignoring the even less certain, but potentially much higher costs of the environmental damage caused by high emissions. Unlike SO<sub>2</sub> and NO<sub>x</sub> emissions, the damage from CO<sub>2</sub> was not quickly visible in scarred buildings, poisoned children, and dying forests. Nevertheless, the project clearly showed that the most cost-effective action was to reduce energy demand rather than increase alternative supply.

Several examples of energy-saving technologies were highlighted that could be implemented at negative cost. It was a mystery to us then, as it may still be to efficient markets proponents today, that supposedly rational, profit-maximizing consumers would refuse to invest in positive net-present-value projects. With the benefit of hindsight, and the lessons of behavioural economics, we might rationalize that homeowners would be reluctant to invest in efficiency technologies if the value of the investment wouldn't be reflected in the future selling price of their homes. To overcome this, some form of "nudge" would be required, for example the UK homesellers' mandatory Home Information Packs, which summarize homes' energy efficiency, and which now must be obtained by all house sellers in the UK. In the 1990s, the EC decided to focus on a corporate nudge and moved to create an emissions trading scheme. The great advantage of a permit-based scheme was that the cost-benefit trade-off could be left to the emitters to calculate, not to a central body of researchers. And, as a consequence, the price set for the emissions permits could adapt in line with evolving policy goals.

Two decades later, it seems the world has not moved on; a global concord to limit emissions remains elusive. The great sense of excitement we felt as scientists at the time has been replaced with a pervasive sense of fatigue. There is fatigue amongst politicians who, worn down by late nights at Copenhagen, see no votes in advocating policies with uncertain and long-term payoffs. There is fatigue amongst voters who believe that big government is obsessed with creating more regulation and is incapable of making good decisions. There is fatigue amongst consumers who feel hectorred about making changes to their lifestyles when their immediate concern is for their jobs. And there is fatigue amongst our scientific successors who, surprised at finding themselves at the focus of a global debate, have discovered that the press would rather give undue attention to a rare, but sloppy, factual error in a report and a naive email exchange, instead of the great factual body of work that underpins the essential argument.

To this agglomeration of climate change fatigue, we might add a similar level of financial system fatigue. The world has just gone through one of the greatest financial busts of all time in which an artificially low interest rate environment promoted a leverage-induced boom in asset prices. Whilst the music kept playing, everyone enjoyed the party, but then the dancing emperors were found to have no clothes and leverage rapidly left the building.

Once leverage vanished, smart investors—those still standing—recognized that asset prices had become sufficiently depressed to make it a good time to go “risk-on.” Those who did reaped handsome returns, but now, those still in the trade must worry what the future holds as budget deficits start to translate into higher taxes and yields, and central banks debate the appropriate moment to turn off the liquidity taps.

Where does this leave the future of environmental investing? Those who may once have hoped for a new environmentally themed boom, similar to those for railways in the nineteenth century and the internet in the twentieth, are likely to be disappointed. Similarly, those hoping that a global agreement to tax emissions will yet emerge in Mexico with the potential to suddenly transform unprofitable environmental technologies into profitable propositions likely will also be disappointed.

Instead, investors must do what they, as distinct from traders, should always have been doing: focus on the long term. This means all investors, large or small, should form their own view on the probability and consequences of climate change, and adapt their investment stance accordingly. Institutional investors, particularly those with long horizons, should engage with companies that are vulnerable to climate change, perhaps because their operations will suffer as the environment changes. Investors should equally engage with companies with potential technology solutions, keeping them grounded and not reliant on a putative global commandment that will limit emissions and so make their technology profitable. Investors without the requisite size to engage with public companies may wish to avoid the lottery of the public equity markets and instead engage with earlier-stage companies that are developing energy-efficiency technologies.

And all investors may wish to look in the mirror before complaining too much about the disappointments of Copenhagen. As we showed 20 years ago, the biggest impact can come

from the mass adoption of small actions: more cycling and walking, less car use; more home insulation and biomass-fired boilers, less oil-fired heating; more domestic solar, wind, and water electricity generation, and less reliance on central generators adopting these technologies. Installing smart meters and paying attention to energy ratings when replacing appliances will be a part of reducing our profligate consumption. Consumers may be hesitant working out the return on these investments, but there is no reason for professional investors to be the same. In the absence of global political leadership, this is one global problem that needs to start with local solutions.

## **Biography**

Chris Woods is an independent investment consultant, currently retained by FTSE Group where he sits on a number of FTSE Committees and advises on new product developments.

Prior to becoming a consultant, Chris held a number of senior positions in the asset management industry including Chief Investment Officer of Man Global Strategies, a division of Man Group plc, and Chief Investment Officer, SSgA London and Chief Investment Officer, SSgA Capital Management LLC at State Street Global Advisors.

Before moving into finance, Chris was a scientist at the UK Atomic Energy Authority's Harwell Research Laboratory. Here he conducted pure research into atomic collision physics and applied research into ion-surface interactions. After a stint in the Laboratory's commercial department, Chris joined the UK Government's Energy Technology Support Unit where he collaborated on the European Commission project referred to in his article.

Chris has an MA from Cambridge University and a D.Phil from Oxford University. The transition to finance was made with the help of an MBA degree from London Business School.