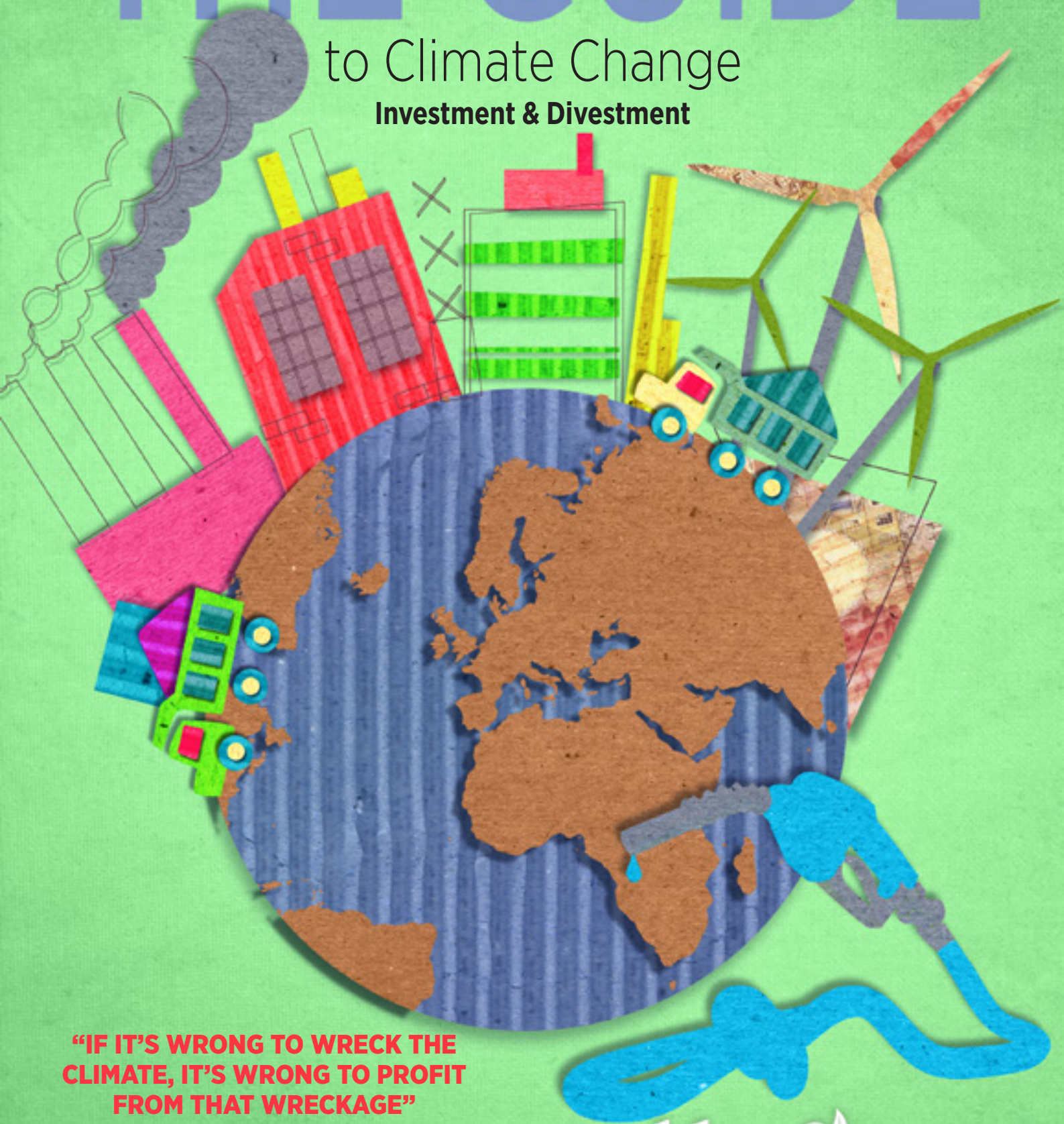


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THE GUIDE

to Climate Change

Investment & Divestment



- ENVIRONMENTALIST AND FOUNDER OF 350.ORG BILL MCKIBBEN

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tomorrow

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➔ **Essential intelligence on sustainable investing and living**

Blue & Green Tomorrow wants to support innovative businesses that balance the needs of the planet, its people and our prosperity.

➔ We aim to provide our readers with the knowledge they need to make informed choices without prejudice, scaremongering or greenwash.

➔ **We want the world to be as blue and green tomorrow as it was yesterday.**

➔ We believe that everyone can play a part and anyone can make a difference. Not by going back through misplaced nostalgia to some bygone age, but by striding out to a bright new future in which we take advantage of the new approaches that can improve our quality of life, the food we eat, the air we breathe, the water we drink and the land we live on.



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IS FOR LIVING
WITHOUT
COSTING
THE EARTH.
THERE IS NO
PLAN (ET) B.

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FOREWORD

Welcome to Blue & Green Tomorrow's Guide to Climate Change 2013. As one of the defining issues not just of our generation, but of recent human history, man-made climate change represents a major threat to our way of life. Sitting down to plan the report, we didn't want to simply look at the science behind it. There are plenty of excellent publications, such as The Rough Guide to Climate Change, that outline the fundamentals.

Furthermore, the scientific consensus that humans contribute to global warming – over 97% agree, since you ask – means arguing over the science is pointless. We may as well do a Guide to Tobacco with the subheading, 'Does it really cause cancer?' The scientific consensus among scientists exploring each issue is almost identical.

No, we wanted to go a step further and practical action. And that's why we're focusing on investment and divestment. The all-powerful investment world can and must be used as a force that benefits society and the environment upon which we all depend. We could be investing in technologies that help mitigate the worst effects of climate change: from cleantech to bluetech; sustainable transport to responsible agriculture. Similarly, we should put pressure on investors to ditch their fossil fuel stocks. Bill McKibben and 350.org's fossil fuel divestment campaign is at the centre of this current wave of pressure, which has its roots in universities across the US. Meanwhile Carbon Tracker's latest 'Unburnable Carbon' report makes for harrowing reading as to the scale of the task

at hand. Put simply, we cannot use the vast majority of fossil fuel reserves if we want to limit global warming to 2C.

We are grateful for contributions from Clare Brook and Seb Beloe at WHEB Asset Management; John David and Chris Bullock at Rathbone Greenbank Investments; and Sam Gill at the Environmental Investment Organisation. This is on top of articles by Daisy Moore at EIRIS and Gyorgy Dallos at Greenpeace International.

Nick Slawicz's opening piece on page six outlines the problem succinctly, while Ben Willers' infographic on page 24 looks at the current and future consequences of climate change. We also look at the comparisons that can be drawn between the apartheid and fossil fuel divestment campaigns, as well as slavery apologists and climate sceptics. And look out for a brilliant mock movie poster from our favourite cartoonist Polyp.

Ultimately, we don't want this to be a guide simply on how to divest from fossil fuels. We want to present you with replacement stocks – and long-term, sustainable ones at that. As McKibben said in 350.org's Do the Math documentary film, "If it's wrong to wreck the climate, it's wrong to profit from that wreckage." There are countless ways you can help heal the climate, and profit from that healing process. You'd have to question the morality, ethics and financial nous of the investor who chooses to wreck our climate instead.

Alex Blackburne

EDITOR, BLUE & GREEN TOMORROW

Is the climate changing?



83%

The climate is changing
as a result of human
activity



9%

The climate is changing,
but not as a result of
human activity



5%

The climate
is not changing



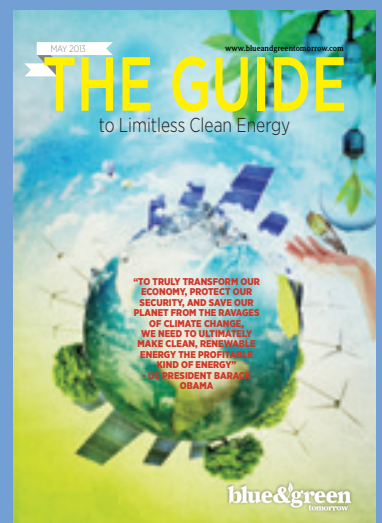
3%

I'm not sure

Source: Blue & Green Tomorrow

2013

reports



The Guide to Climate Change is Blue & Green Tomorrow's ninth report of 2013. Read them all at blueandgreentomorrow.com/reports.

CLIMATE CHANGE: WHAT YOU NEED TO KNOW

BY NICK SLAWICZ

Understanding climate change: the threat

In a 2000 interview, then-president Bill Clinton made the following statement about the importance of preventing the oncoming storm that was the global warming crisis:

The climate is changing and the globe is warming at an unsustainable rate. And if it is not slowed and ultimately reversed, what will happen is the polar ice caps will melt more rapidly; sea levels will rise; you will have the danger of flooding in places like the precious Florida Everglades, or the sugarcane fields of Louisiana; island nations could literally be buried; the whole climate of the United States, for example, could be changed where you would have more flooding, more heat waves, more storms, more extreme weather events generally. And then you'll have some public health consequences. For example, we're already seeing in Africa, for example, malaria being found at higher and higher altitudes where it used to be too cool for the mosquitoes. So there will be a lot of very bad, more dramatic weather events. There will be a shift in the patterns of agricultural production. There will be flooding that will be quite bad, and there will be more public health crises.

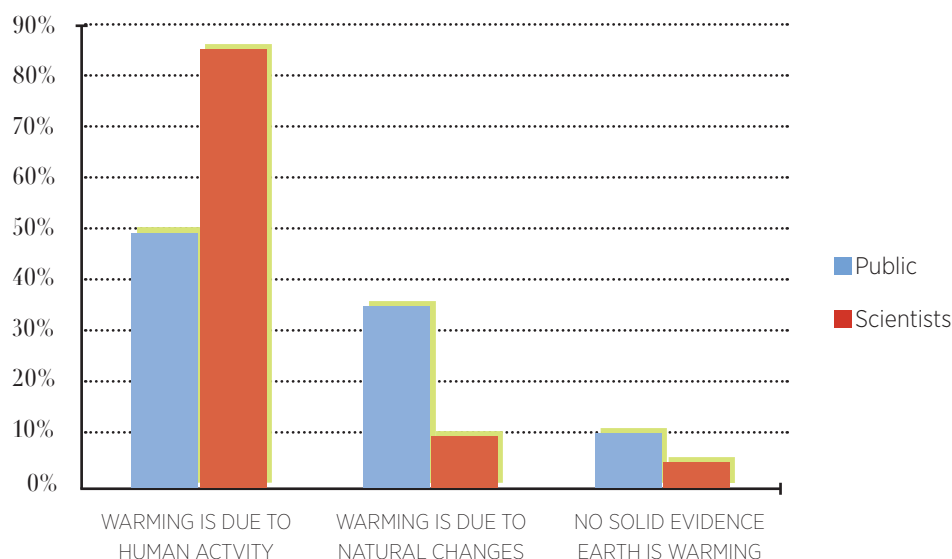
Former US president Bill Clinton

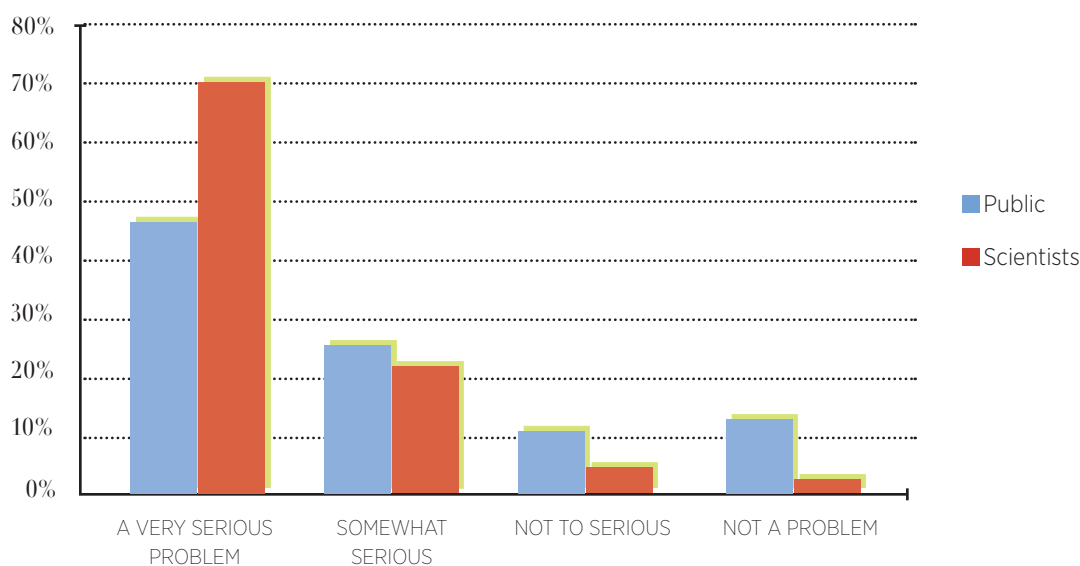
As far as warnings went, it was by no means new: the scientific community had long been concerned about the dangers of anthropogenic (human-caused) climate change, and the potential disastrous effects it could have in the long run. Even before the popularity of the documentary film *An Inconvenient Truth* – produced by Clinton's vice-president Al Gore – global warming was one of the major talking points of the last two decades.

However, public opinion has largely been in a state of flux with regards to belief in exactly what global

warming would involve, and whether or not it even exists. A Pew Research Centre poll in 2013 found that 69% of respondents believe that there is solid evidence that the Earth is warming, with 42% believing this is mostly due to human activity.

The scientific consensus, on the other hand, seems to be relatively solid. A 2009 survey compared the responses of scientists and lay members of the population on two questions: what they perceived to be the cause of global warming, and how serious a problem it was going to be.





From this, the facts are clear: while a significant percentage of the population both believe in and are concerned by the existence of anthropogenic climate change, the wider population is both less convinced and less worried by the idea than the scientific community. Although it is often seen as an immutable fact of modern living, a great deal of effort is still needed to convince the public that global warming is a viable threat to our way of life both now and in the future.

The scientific background

The science behind the greenhouse effect is relatively straightforward. Gases such as carbon dioxide (CO₂), water vapour (H₂O), methane (CH₄), dinitrogen oxide (N₂O, but better known as laughing gas), ozone and CFCs trap heat in the planet's atmosphere. Where it would normally be allowed to redisperse into the void of space, these gases provide a 'blanket', insulating the planet and keeping this heat trapped.

By and large, this is a fortunate occurrence: without it, the average temperature on Earth would be approximately 33C colder – a temperate difference large enough to ensure that life as we know it would not be able to exist.

Unfortunately, the composition of the atmosphere has changed significantly over the past 200 years, largely due to the impact of human

industry. The carbon cycle – a natural process by which the carbon in living organisms is 'trapped' underground in the form of coal, oil and natural gas, before being burnt to return it to the atmosphere where it can be reabsorbed into plant matter during photosynthesis – has been put under significant pressure by human demand for fossil fuels. The continued burning of these fuels to drive industry has resulted in much of this carbon being stuck in the atmospheric phase, where it is capable of acting as a greenhouse gas – and, as a result, driving global climate change.

The amount of fuel being used by the world is staggering. The US alone consumes over 19.1m barrels of oil per day; the European Union, by comparison, uses almost 13.7m, and China (in third place) uses 9.4m, with consumption increasing yearly. Rather than slowing down, however, production is being ramped up across the globe. Demand for oil by China may make up 90% of the demand for Middle Eastern oil (traditionally the world's largest supplier of crude oil), while the US could become the world's biggest oil producer with the decade. Despite the traditional position of the Democrats being staunchly in favour of provisions that ensure environmental security, the recent economic downturn has resulted in an increased push towards industry and financial stability. Fatih Birol, chief economist at the International Energy Agency and one

of the world's foremost authorities on energy and emissions, said the outlook for action on climate change was bleak unless the US changed direction rapidly. "Climate change has been slipping down the agenda", he said. "It is not having a significant impact on energy investors."

It is, however, important to note the distinction between two commonly conflated ideas: 'climate change' and 'global warming'. Though they are often used interchangeably, and with equal sense of threat, 'climate change' is in itself nothing to be afraid of. The climate changes constantly due to thousands of individual factors – everything from solar activity to Arctic storm patterns to natural variations in the Earth's atmospheric composition cause shifts in the planet's climate. What scientists are concerned about is global warming (or, more accurately, anthropogenic global warming) – that is, the impact of human society on the ecosystem. It is these impacts that science hopes to mitigate in order to ensure a stable global future.

History of the climate change movement

The idea of climate change is nothing new. Even as far back as 1827, it was suggested that the Earth's atmosphere would trap heat, resulting in it being warmer than it would be otherwise. By 1896, it was hypothesised that carbon dioxide emissions – specifically from the burning of coal – would increase the ability of the atmosphere



to trap heat, and thus would warm the Earth more quickly than otherwise. By the 1960s, the first computer simulations suggested a 4C rise in temperature when the atmospheric carbon dioxide level reached double that of pre-industrial times. Greater evidence for the notion of global warming as a modern phenomenon was found in the 1980s and 1990s, when data from freeze-thaw patterns in ice bores demonstrated a significant upturn in temperature since the 1850s – data known as the ‘hockey stick graph’.

Although criticised at the time for statistical errors, many analyses since its original publication have suggested that its findings were broadly accurate: the last century was the warmest in a millennium, and the increase in temperature was extremely sudden.

The shock and awe effect of the hockey stick graph pushed the question of global warming into the forefront of public consciousness. Unlike the problem of the hole in the ozone layer, which had a relatively simple solution – the banning of CFCs and enough time to allow it to take effect – the global warming crisis was huge, and required massive investment in time and public policy to even begin to make a dent in it. While the green movement advocated for individual restraint and cutbacks on the amount of energy individuals used, governments the world over planned legislation to persuade industry to scale back. This resulted in the Kyoto Protocol of 2005, which was ratified by all members of the UN except for Andorra and the United States. This has been heavily criticised by global spectators, who have stated

that the US should be leading the way in reducing industrial output of carbon dioxide.

Summary

Unlike most problems facing the planet, the future of the issue of climate change is a hard one to pin down. What can be said with relative certainty is that – unless significant steps are made to reduce dependence

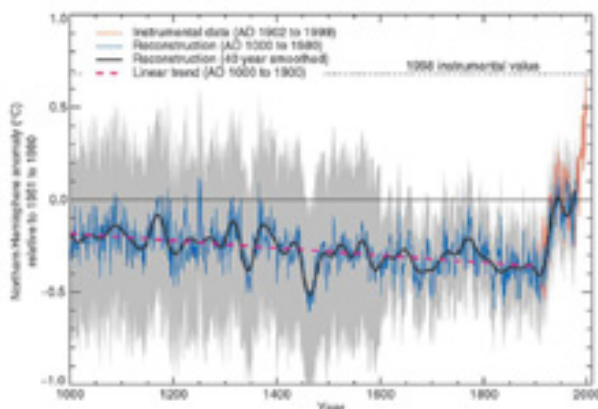
on fossil fuels – the amount of carbon dioxide in the atmosphere will continue to rise. Should that happen, anthropogenic climate change will continue, and the temperature can be expected to rise more than would be due to natural fluctuations in the Earth’s ecosystem beyond the presence of man. That must be a relatively uncontroversial statement.

The question is just how much of an effect this global warming will have. Intergovernmental Panel on Climate Change reports, while stating a high degree of certainty that change will occur, put the figure at anywhere between a 1.1C rise and a 6.4C by the end of the 21st century – a huge margin that depends on a number of factors playing into a range of different models. By comparison, the temperature between 1906 and 2005 was recorded as having increased by around 0.74 and 0.18C.

With such a wide spread of possibilities, there is obviously some doubt about the impact that global warming will have, even amongst those scientists (the vast majority of the community) who believe in anthropogenic global warming. Bjorn Lomborg, in a criticism of the treatment of scientific data in the climate change debate, stated, “Global warming will not decrease food production, it will probably not increase storminess or the frequency of hurricanes, it will not increase the impact of malaria or indeed cause more deaths.”

However, one thing we can say for certain is that the changes brought about by manmade emissions of carbon dioxide are not likely to be easy to reverse. Whether they are catastrophic or relatively minor in comparison to the dire warnings we have been given, it is crucial to ensure that we tackle the problem head on, by continuing funding into scientific research into the issues raised by climate change (and to alternative fuel sources) as well as attempting to reduce greenhouse gas emissions wherever possible.

With current atmospheric carbon dioxide levels resting at 400 parts per million (ppm) – and with the safe upper bound being cited as 350ppm – precautionary steps must be taken, and soon.



SKEPTICAL SCIENCE'S TOP 10 CLIMATE MYTHS

1. WHAT DOES PAST CLIMATE CHANGE TELL US ABOUT GLOBAL WARMING?

The sceptic argument

Climate is always changing. We have had ice ages and warmer periods when alligators were found in Spitzbergen. Ice ages have occurred in a 100,000 year cycle for the last 700,000 years, and there have been previous periods that appear to have been warmer than the present despite CO2 levels being lower than they are now. More recently, we have had the medieval warm period and the little ice age. (Richard Lindzen)

What the science says

Natural climate change in the past proves that climate is

sensitive to an energy imbalance. If the planet accumulates heat, global temperatures will go up. Currently, CO2 is imposing an energy imbalance due to the enhanced greenhouse effect. Past climate change actually provides evidence for our climate's sensitivity to CO2.

SOURCE: <http://bit.ly/11UpbmV>

2. SOLAR ACTIVITY AND CLIMATE: IS THE SUN CAUSING GLOBAL WARMING?

The sceptic argument

Over the past few hundred years, there has been a steady increase in the numbers of sunspots, at the time when the Earth has been getting warmer. The data suggests solar activity is influencing the

global climate causing the world to get warmer. (BBC)

What the science says

In the last 35 years of global warming, the sun has shown a slight cooling trend. Sun and climate have been going in opposite directions.

SOURCE: <http://bit.ly/17vfpLq>

3. POSITIVES AND NEGATIVES OF GLOBAL WARMING

The sceptic argument

Two thousand years of published human histories say that warm periods were good for people. It was the harsh, unstable Dark Ages and Little Ice Age that brought bigger storms, untimely frost, widespread famine and plagues of disease. (Dennis Avery)

What the science says

The negative impacts of global warming on agriculture, health, economy and environment far outweigh any positives.

SOURCE: [HTTP://BIT.LY/YJKS7V](http://bit.ly/YJKS7V)

4. IS THERE A SCIENTIFIC CONSENSUS ON GLOBAL WARMING?

The sceptic argument

The Petition Project features over 31,000 scientists signing the petition stating "There is no convincing scientific evidence that human release of carbon dioxide will, in the foreseeable future, cause catastrophic heating of the Earth's atmosphere...". (Petition Project)

What the science says

That humans are causing global warming is the position of the Academies of Science from 19 countries plus many scientific organisations that study climate science. More specifically, around 95% of active climate researchers actively publishing climate papers endorse the consensus position.

SOURCE: <http://bit.ly/14NOtIT>

5. GLOBAL COOLING: IS GLOBAL WARMING STILL HAPPENING?

The sceptic argument

In fact global warming has stopped and a cooling is beginning. No climate model has predicted a cooling of the Earth – quite the contrary. And this means that the projections of future climate are unreliable. (Henrik Svensmark)

What the science says

Empirical measurements of the Earth's heat content show the planet is still accumulating heat and global warming is still happening. Surface temperatures can show short-term cooling when heat is exchanged between the atmosphere and the ocean, which has a much greater heat capacity than the air.

SOURCE: <http://bit.ly/11z14K9>

6. HOW RELIABLE ARE CLIMATE MODELS?

The sceptic argument

[Models] are full of fudge factors that are fitted to the existing climate, so the models more or less agree with the observed data. But there is no reason to believe that the same fudge factors would give the right behaviour in a world with different chemistry, for example in a world with increased CO2 in the atmosphere. (Freeman Dyson)

What the science says

While there are uncertainties with climate models, they successfully reproduce the past and have made predictions that have been subsequently confirmed by observations.

SOURCE: <http://bit.ly/14NODjF>

7. ARE SURFACE TEMPERATURE RECORDS RELIABLE?

The sceptic argument

We found [US weather] stations located next to the exhaust fans of air conditioning units, surrounded by asphalt parking lots and roads, on blistering-hot rooftops, and near sidewalks and buildings that absorb and radiate heat. We found 68 stations located at wastewater treatment plants, where the process of waste digestion causes temperatures to be higher than in surrounding areas.

In fact, we found that 89% of the stations – nearly 9 of every 10 – fail to meet the National Weather Service's own siting requirements that stations must be 30 metres (about 100 feet) or more away from an artificial heating or radiating/reflecting heat source. (Watts)

What the science says

Numerous studies into the effect of urban heat island effect and microsite influences find they have negligible effect on long-term trends, particularly when averaged over large regions.

SOURCE: <http://bit.ly/ZPHah4>

8. CAN ANIMALS AND PLANTS ADAPT TO GLOBAL WARMING?

The sceptic argument

[C]orals, trees, birds, mammals, and butterflies are adapting well to the routine reality of changing climate. (Hudson Institute)

What the science says

A large number of ancient mass extinction events have been strongly linked to global climate change. Because current climate change is so rapid, the way species typically adapt (e.g., migration) is, in most cases, simply not be possible. Global change is simply too pervasive and occurring too rapidly.

SOURCE: <http://bit.ly/12gRSsS>

9. WHAT HAS GLOBAL WARMING DONE SINCE 1998?

The sceptic argument

For the years 1998-2005, temperature did not increase. This period coincides with society's continued pumping of more CO2 into the atmosphere. (Bob Carter)

What the science says

The planet has continued to accumulate heat since 1998 - global warming is still happening. Nevertheless, surface temperatures show much internal variability due to heat exchange between the ocean and atmosphere. 1998 was an unusually hot year due to a strong El Nino.

SOURCE: <http://bit.ly/16hCraF>

10. IS ANTARCTICA LOSING OR GAINING ICE?

The sceptic argument

[Ice] is expanding in much of Antarctica, contrary to the widespread public belief that global warming is melting the continental ice cap. (Greg Roberts, The Australian)

What the science says

While the interior of East Antarctica is gaining land ice, overall Antarctica is losing land ice at an accelerating rate. Antarctic sea ice is growing despite a strongly warming Southern Ocean.

SOURCE: <http://bit.ly/ZPHht1>





WHAT IS INVESTMENT?

INVESTOPEDIA DEFINITION

An asset or item that is purchased with the hope that it will generate income or appreciate in the future. In an economic sense, an investment is the purchase of goods that are not consumed today but are used in the future to create wealth. In finance, an investment is a monetary asset purchased with the idea that the asset will provide income in the future or appreciate and be sold at a higher price.

www.investopedia.com/terms/i/investment

WHAT IS DIVESTMENT?

INVESTOPEDIA DEFINITION

The process of selling an asset. Also known as divestiture, it is made for either financial or social goals. Divestment is the opposite of investment.

www.investopedia.com/terms/d/divestment

MISPRICING RISK: RAIDERS OF THE LOST ARK AND THE DANGERS OF A CARBON BUBBLE

BY SEB BELOE, WHEB ASSET MANAGEMENT

RAIDERS OF THE LOST ARK, THE 1981 FANTASY ADVENTURE FILM STARRING HARRISON FORD, IS ONE OF THE HIGHEST-GROSSING FILMS EVER MADE AND WON FOUR ACADEMY AWARDS. THE CLIMAX OF THE FILM COMES WHEN A GROUP OF NAZI SOLDIERS OPEN THE ARK OF THE COVENANT, BELIEVING IT WILL MAKE THEM INVINCIBLE. BUT INSTEAD, A SCREAMING CLOUD OF OLD TESTAMENT SERAPHIM EMERGE FROM THE ARK, TRANSFORM THEMSELVES INTO ANGELS OF DEATH AND ANNIHILATE ANYONE FOOLISH ENOUGH TO LOOK UPON THEM. RARELY CAN A PRIZED ASSET HAVE SO SWIFTLY TURNED ITSELF INTO SUCH A CATASTROPHIC AND DEADLY LIABILITY.

While the captains of the fossil fuel industry are unlikely to experience the 'face-melting' fate of Dr René Belloq, Major Arnold Ernst Toht and their cronies, the currently prized assets of coal, oil and gas reserves may prove just as illusory.

Mispricing risk

In recent years, global capital markets have swung violently from boom to bust. Overheated internet stocks created the dot-com bubble which burst in 2000/01. More recently, the financial crisis in 2007/08 was caused in large part by the bursting of the US housing bubble. That economic bubbles exist is incontrovertible after the fact, but spotting them beforehand is much more difficult.

As its name suggests, the Carbon Tracker Initiative is focused on the issue of carbon dioxide, its role in climate change and the contention that businesses focused on



developing and selling fossil carbon-based fuels, notably coal, oil and gas, are overvalued. The existence of this so-called ‘carbon bubble’ is the principal conclusion of their latest report, ‘Unburnable Carbon 2013’, which has been produced in partnership with the Grantham Research Institute on Climate Change and the Environment.

Recapping the science

Fundamentally, the report is based on the premise that climatic change is caused by human activity. It is worth briefly examining the scientific evidence for this. In mid May 2013, the proportion of carbon dioxide (CO₂) in the atmosphere passed 400 parts per million (ppm). The last time atmospheric CO₂ reached this level was approximately three million years ago. Four hundred and fifth parts per million is widely regarded as the level beyond which the probability of dangerous climate change becomes

uncomfortably high. At the current rate of increase, this level is likely to be reached in 25 years’ time.

The role of CO₂ as a greenhouse gas is well understood (having first been documented in 1859) and, according to a recent study, over 97% of nearly 12,000 peer-reviewed papers published in scientific journals have found that climate change is caused by human activity. A previous study using a slightly different methodology found that out of 13,950 papers, only 24 papers reject climate change. You are less likely to pull 10 of these studies randomly from the complete set of 13,950 studies than you are to be hit first by lightning and then by an asteroid.

While monitoring of the vast majority of physical data (such as melting ice sheets, increasing annual land and sea temperatures, global mean sea-level, and changing patterns of precipitation) indicates significant warming, the main concern for investors is the

economic impacts of climate change.

Several studies have attempted to put a price on the impacts of climate change, including most notably the Stern Review on the Economics of Climate Change in 2006.

While these estimates are contentious, recent experience of the direct and indirect economic impacts of extreme weather suggests that costs associated with climate change will be significant. A 2011 study by the National Centre for Atmospheric Research in the US, for example, estimated that extreme weather is costing the \$485 billion a year, equivalent to 3.4% of US GDP. In the UK, the Association of British Insurers has estimated that 4C of warming could be expected to result in average annual insured flood losses increasing by 14% to £633m as a consequence of increased inland flooding, and this component of insurance premiums increasing by 21%.

Sizing the carbon bubble

Four hundred and fifty parts per million of CO₂ is believed to equate to approximately 2C of warming globally. If warming is to be kept to below this level, the amount of carbon dioxide that can be put into the atmosphere between now and 2050 must be limited to approximately 900 gigatonnes of CO₂ (GTCO₂). The problem is that total proven reserves of fossil carbon energy resources represent about 2,860 GTCO₂ or slightly more than three times what can be safely used during that period. Most of these reserves are owned by governments and could be left in the ground, but 762 GTCO₂ are owned by listed companies that are valued by investors on the basis that these resources will be exploited, with a further 1,541 GTCO₂ listed in potential reserves.

If listed fossil fuel companies have a pro rata portion of the 900 GTCO₂ carbon 'budget', this would amount to 125-275 GTCO₂ or 20-40% of the reserves already booked by these companies. In other words, if CO₂ levels are to be kept at levels that the scientific community considers to be safe, then between 60-80% of

the existing booked reserves of listed fossil fuel companies should not be exploited during that period.

Implications for investors

How the world's governments are likely to respond is uncertain. Currently it seems that fossil fuel companies and their financial backers are "betting that government climate policies will fail [and that] they will be able to burn all their reserves, including new ones, after all" (as the Economist put it). This may prove to be right, at least in the short to medium-term while the impacts of climate change remain manageable, but is little consolation when the longer term impacts undermine returns across other sectors and asset classes.

It is also a big bet for investors to take. HSBC estimates that the market capitalisation of some European oil and gas companies could be reduced by as much as 16% (with Statoil the most at risk) if climate change policies are implemented, and UK mining stocks could lose up to 15% of their value.

Of course, most investors won't hold large active positions in single

stocks, but, for certain markets, the risks associated with exposure to carbon assets are significant. Citi estimates that the Australian index (the ASX200) is over 14% related to fossil fuels. The FTSE100 is the third most carbon-intense index globally (behind Moscow and Athens). Average unit holders of a FTSE100 tracker fund have approximately 18% of their holdings in oil and gas companies and a further 11% in mining, of which a significant portion is coal.

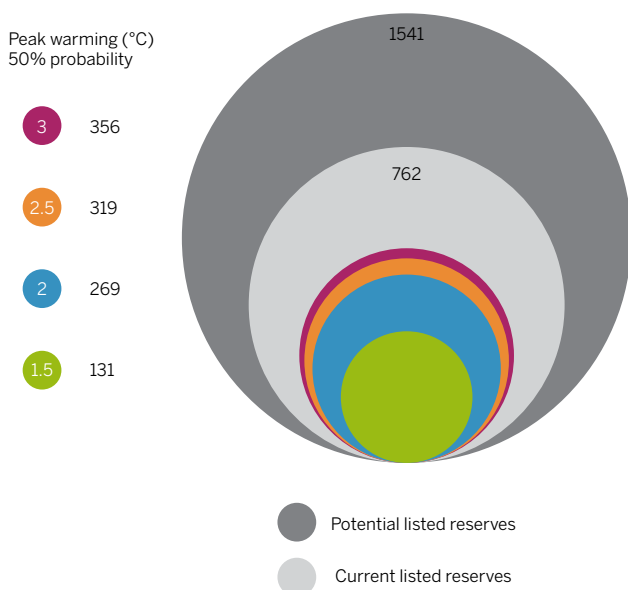
Investment strategies

So what can investors do?

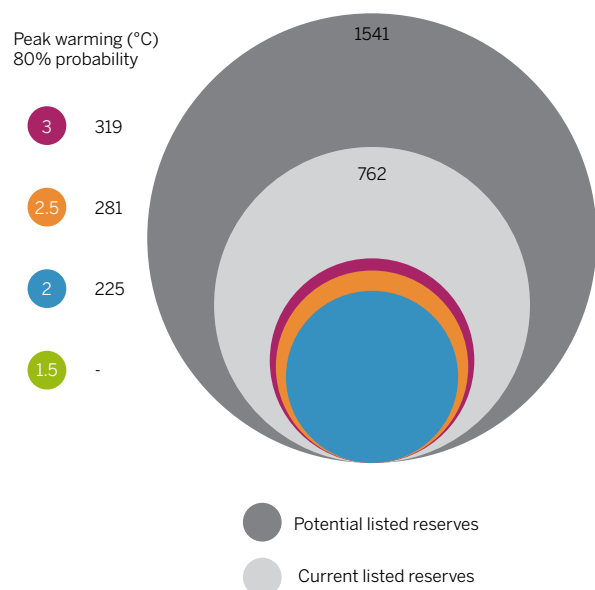
Governments around the world are still implementing policies to progressively 'decarbonise' their economies. Even the most ardent climate change sceptic will have to admit that, at the very least, there is a non-negligible risk that governments will implement climate change policies that in turn shift market demand from high to low-carbon fuels. Prudent investors might want to take account of this risk in their investment strategies.

With this in mind, one area investors might wish to reconsider is the nearly \$700 billion that is spent annually on

Comparison of listed reserves to 50% probability pro-rata carbon budget



Comparison of listed reserves to 80% probability pro-rata carbon budget



Source: <http://carbontracker.live.kiln.it/Unburnable-Carbon-2-Web-Version.pdf>

finding new sources of fossil fuels. Often expensive and in extreme environments, these resources, where they are found, are arguably unlikely ever to be exploited. Better perhaps to return this money in dividends to shareholders who, in an environment of low interest rates and bond yields, are increasingly desperate for income.

Another approach is to avoid fossil fuels that carry a particularly heavy carbon burden per unit of energy, such as coal or 'unconventionals' such as oil sands. As Citi's Australian division put it, "Investors (including asset owners) who strongly believe in 'unburnable carbon' [might] find it more productive to actively tilt their portfolios [away from high-carbon assets]".

The International Energy Agency predicts that in order to stay with the safe threshold of 450ppm of CO₂ in the atmosphere, coal consumption will have to fall 30% from 2010-2035 and oil by 12%. In perhaps a foretaste of things to come, the market capitalisation of US coal has already fallen approximately 75% in the last two years, caused in large part by the emergence of cheaper – and lower carbon – shale gas.

Finally, the investment consultants Mercer go further in their report on the implications of climate change for strategic asset allocators. Their view

is that "mitigating climate change risks will require a new approach for investors... [involving] increased asset allocations to climate-sensitive assets as a climate 'hedge'". In other words, hedge the carbon-heavy investments with investments in clean energy and sustainability themed funds, by ensuring that climate risk is integrated into fund manager analysis, and through engagement with policy-makers.

Reputational risks of carbon investments

Some institutional investors are coming under pressure from activists and end beneficiaries to alter their approach to carbon risks. Groups such as 350.org have been encouraging US institutional investors – particularly educational endowments and foundations – to divest from fossil fuel companies.

Their request is that these groups should freeze any new investments in fossil fuel companies, and divest from fossil fuel public equities and corporate bonds. The campaign has spread to Australia and is due to come to the UK in October, with some campaigners already taking the charge to religious and environmental foundations in the UK.

It isn't clear how far such a campaign can go. The 350.org campaign can

point to some small communities as well as university endowments and city pension funds that have already divested or are in the process of doing so.

Surveys of SRI (sustainable and responsible investment) investors have confirmed that over two-thirds of them are keen to move away from traditional energy companies. There are also signs that non-SRI investors are also waking up to the issue. In Australia, a survey of pension fund members found that 25% would switch providers to avoid coal and coal seam gas investments. In the USA nearly 20% of investors in Consol Energy asked for the company to produce a report detailing how it was planning to respond to the risks of unburnable carbon.

Where next?

It is still early days in understanding how investors are likely to respond to the risks posed by climate change. The work of the Carbon Tracker Initiative and others demonstrates the size of the carbon bubble and the potential for fossil fuel assets to be impaired as the world seeks alternative low-carbon energy sources. From an investment perspective, knowing whether this is likely or not is in many ways less important than recognising that it is possible, and reflecting this possibility in investment decisions.

Shutting their eyes was the unlikely but successful strategy employed by Dr Jones and his heroine Marion Ravenwood to avoid the fate of their captors in *Raiders of the Lost Ark*. Such a strategy is unlikely to prove effective for institutional investors keen to avoid the risks associated with carbon finance.

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Seb Beloe is head of sustainability research at WHEB Asset Management. For a fully referenced version of this article, see the latest edition of the WHEB magazine, WHEB Quarterly: whebgroupp.com



WHEB 
Asset Management

AN EXTRACT FROM MARGARET THATCHER'S

1990 SPEECH AT THE WORLD
CLIMATE CONFERENCE

JUST AS **PHILOSOPHIES**, RELIGIONS AND IDEALS
KNOW NO BOUNDARIES, SO THE PROTECTION OF **OUR**
PLANET ITSELF INVOLVES **RICH AND POOR**,
NORTH AND SOUTH, EAST AND WEST. ALL OF US HAVE
TO PLAY OUR PART IF WE ARE **TO SUCCEED**. AND
SUCCEED WE MUST FOR THE SAKE OF THIS AND FUTURE
GENERATIONS.

ONE OF OUR GREAT POETS, GEORGE HERBERT, IN HIS POEM ON 'MAN'
WROTE THIS:

*“Man is all
symmetry,”*

, FULL OF
PROPORTIONS, ONE
LIMB TO ANOTHER,
AND ALL TO ALL THE
WORLD BESIDES;

**EACH PART MAY CALL THE FARTHEST, BROTHER;
FOR HEAD WITH FOOT HATH PRIVATE AMITY,
AND BOTH WITH MOONS AND TIDES.”**

WE ARE, AS THE POET SAID, IN SYMMETRY WITH NATURE.
TO KEEP THAT PRECIOUS BALANCE, WE NEED TO WORK
TOGETHER FOR OUR ENVIRONMENT. THE UNITED
KINGDOM WILL WORK WITH ALL OF YOU AND ALL THE
WORLD BESIDES IN THIS CAUSE — TO SAVE OUR COMMON
INHERITANCE FOR GENERATIONS YET TO COME.

ENVIRONMENTAL TRACKING: A PRACTICAL FINANCIAL SOLUTION TO CLIMATE CHANGE?

BILL MCKIBBEN AND HIS TEAM AT 350.ORG HAVE DONE SOMETHING THAT AT ONE POINT IT SEEMED INCONCEIVABLE THE ENVIRONMENTAL MOVEMENT WOULD EVER DO AGAIN. HE HAS REVIVED AND REFRAMED THE CLIMATE CHANGE CONVERSATION INTO SOMETHING CLEAR, TANGIBLE AND UNAVOIDABLY URGENT. HOW? BY TELLING US TO DO SOME SIMPLE MATHS.

BY SAM GILL, ENVIRONMENTAL INVESTMENT ORGANISATION

McKibben's message first gained real prominence after an explosive article in Rolling Stone magazine. Since then it has led him on a world tour to convince university endowment funds and other asset owners around the world to divest from fossil fuel companies.

So let's take a look at the maths for ourselves and explore whether or not a campaign for fossil fuel divestment could actually work.

First, the widely discussed 2C of global warming. This is the politically agreed point - but not necessarily a scientifically safe one – beyond which we should not go in order to limit the chances of 'dangerous' climate change. Dangerous climate change consisting of triggering feedback loops which would accelerate and reinforce global warming beyond our control.

Next, 565 gigatonnes. This is the amount of CO₂ humans can put into the atmosphere with approximately 80% chance of avoiding 2C of global warming.

Finally, 2,795 gigatonnes. A conservative estimate of the amount of carbon contained in the proven coal, oil and gas reserves of the world's fossil fuel companies. Conservative because amongst other things, it doesn't include shale gas. The key point here is that these reserves are currently factored into our valuations of these companies.



“GIVEN EVERY COMPANY’S RAISON D’ETRE IS TO GENERATE VALUE FOR SHAREHOLDERS, IT WOULD BE DEMONSTRABLY AGAINST THE INTERESTS OF COMPANIES TO POLLUTE IF IT WEAKENS THE SHARE PRICE

Conclusion: if fossil fuel companies burn all the reserves on their books science tells us we are on course for at least a 4-6C rise in temperatures or higher. If these fossil fuels are left in the ground, trillions of dollars are going to be written off existing company valuations. Enter the carbon bubble as neatly described by UK-based Carbon Tracker initiative.

Of course, it may not be a bubble; they may still burn all of the fossil fuels on their books. As the current dash for gas shows, there’s certainly no sign of any deviation from business as usual. Whether or not stock market valuations will have any relevance in a world which will undoubtedly struggle to cope with a 4-6C rise in temperature within a century is a completely different question.

As Kevin Anderson of the Tyndall Centre for Climate Change Research points out in a truly sobering 2012 lecture, “There is a widespread view that a 4C future is incompatible with an organized global community, is likely to be beyond

‘adaptation’, is devastating to the majority of ecosystems and has a high probability of not being stable. [i.e. 4C would be an interim temperature on the way to a much higher equilibrium level].”

The maths, therefore, is quite clear. If fossil fuel companies enact their business plans we may trigger a collapse in our society and the ecosystems that support it.

Enter the call for divestment

Divestment as a concept appears to make a lot of sense. After all, why support companies presenting a business model that is likely to cause irreversible damage to the planet by buying or continuing to own their shares?

Theoretically, if every investor currently owning shares in fossil fuel companies were to divest demand for these companies’ shares would fall and so would the price. If shareholders were wise to the motivations of such a divestment, they may even call for the removal of

the board in favour of one that was more likely to pursue a business model that was less harmful to their share price.

The first question, therefore, is whether sufficient scale can be achieved. Time will tell, but the answer is much more of a maybe than a resounding yes.

According to a recent report by the Global Sustainable Investment Alliance, \$13.6 trillion of equity (21.6% of the global total) is managed by investors looking at various environmental, social and governance (ESG) factors. However, a recent paper published by the Network for Sustainable Financial Markets, suggests that of the \$13.6 trillion only around \$1.5 trillion is in fact managed specifically with sustainability in mind.

The gap between these two figures represents the multitude of pension funds and large asset owners who either purely engage with companies on sustainability issues or who apply a single sector screen, excluding tobacco companies for example. The good news is that the latter group of single-screening investors may be keen to join the divestment movement by adding fossil fuel companies to the black list. Interestingly, after an extensive piece of research, the Norwegian Government Pension Fund Global (rebranded in 2006 from the Oil Fund of Norway) began excluding tobacco companies on the grounds that their product, when used as intended, was deliberately harmful. A case could well be made about the products of fossil fuel companies also being harmful

when used as intended.

In any case, there is clearly much ambiguity as to what constitutes 'sustainable investing', never mind specific climate-related strategies.

The second question, however, is somewhat more complicated. What happens if we do get every investor, or at least every investor concerned with sustainability, to divest? Yes, we would have applied pressure to the largest fossil fuel companies and potentially also got them to re-think their business models. No mean feat indeed.

But crucially, would that be enough to realign the global economy on a carbon-free trajectory? It would certainly set us along our way; that much is for sure. But it would stop short of creating the apparatus necessary to make sure that every company in the world moved towards a carbon-free business model. After all, this is not just a supply-side problem.

The true nature of problem is captured neatly in the title of a recent book on the subject: 'The Burning Question'. Indeed, whilst fossil fuel companies may be extracting and selling the fossil fuels that are causing climate change, it is the global economy and the various agents within it that are doing the burning.

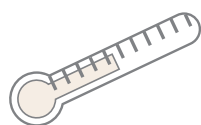
Weaning the global economy off fossil fuels is a systemic challenge that will require pressure and incentives across the board. The only guaranteed route to ending fossil fuels is to end the market for

them. In that case a divestment campaign would be the least of their worries. There is one additional point to consider when looking at divestment as a strategy to tackle climate change. In essence, it divides the progressive sustainable investment community into two camps: those who 'engage' and those who 'divest'. Should the divestment camp succeed in ebbing out those who engage, there may be no-one left on the inside to influence corporate behaviour. Ownership, at least, offers the ability to influence. The question, therefore, is whether or not we can combine the strong message of divestment with the opportunity to engage and change behaviour, which is after all what we are trying to achieve as effectively and speedily as possible.

Moving beyond divestment: what would a mechanism to internalise the externality of carbon look like?

Enter environmental tracking.

Environmental tracking is a market mechanism designed to pick up where divestment signs off. It is predicated on the same set of ideas. Firstly, harnessing the power of the financial system is where the greatest power to affect change lies. Secondly, influencing company share price in line with emissions is something no company would be able to ignore. The difference, however, is that



2°C

The point at which global warming becomes dangerous, and the level politicians have agreed not to exceed

565 gigatonnes

The amount of CO₂ humans can put into the atmosphere with approximately 80% chance of avoiding 2°C of global warming

2,795 gigatonnes

A conservative estimate of the amount of carbon contained in the proven coal, oil and gas reserves of the world's fossil fuel companies



Source: 350.org's Do the Math campaign



**“ WEANING THE GLOBAL ECONOMY OFF
FOSSIL FUELS IS A SYSTEMIC CHALLENGE THAT
WILL REQUIRE PRESSURE AND INCENTIVES
ACROSS THE BOARD**

environmental tracking is designed to incentivise the world's largest companies, regardless of sector, to lower their emissions and improve their transparency. Furthermore, it seeks to do this in a way that is sufficiently mainstream that it might just reach the critical mass required to bring about real change.

How? First, by creating a dynamic and public carbon ranking system of the world's largest companies. The ranking system is designed to drive greater transparency and lower greenhouse gas emissions, giving each company a constant incentive to improve relative to its peers. Furthermore, by including Scope 3 (supply and value chain) emissions, that is emissions over which the company has influence but not direct control, the ranking system has the ability to exert influence across all sectors and all geographies.

Second, by translating the carbon rankings into a series of investable indexes, just like the stock market indexes that currently attract approximately one third of global equity investment. The difference, though,

between these indexes and the existing indexes we have all heard of, like the FTSE 100 or S&P 500, is that companies are weighted according to their position in the carbon rankings. Once supported by investors, this mechanism offers the ability to apply pressure to companies at the share price level by shifting demand for company shares in line with emissions.

Given every company's *raison d'être* is to generate value for shareholders, it would be demonstrably against the interests of companies to pollute if it weakens the share price. Suddenly the rules of the game would have changed and we would have finally internalised the externality of carbon.

The logic behind this approach is that it isn't really asking investors to do anything radically different from what they are doing already. Most pensions funds and large institutional investors invest some of their money passively (typically a third for UK pension funds) through indexes – the two main attractions being low management fees and the ability to track the market, as opposed to the inherently difficult task of

trying to beat it.

Environmental tracking indexes have been designed to closely track their non-weight adjusted counterparts meaning there's no real risk involved. In fact, investors are given the opportunity to realign the global economy on a zero-carbon trajectory, thus mitigating the fundamental risk of climate change. Could environmental tracking offer an effective and practical compromise that captures the benefits of both engagement and divestment strategies?

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*Sam Gill is chief executive of
the Environmental Investment
Organisation*
www.eio.org.uk



TIME TO OFFLOAD THE HIGH-RISK, LOW-RETURN CARBON ASSETS

SHAREHOLDERS ARE INCREASINGLY FEELING DISGRUNTLED, AND RIGHTLY, BY THE RISKS FOSSIL FUEL COMPANIES ARE TAKING WITH THEIR MONEY. GYORGY DALLOS OF GREENPEACE INTERNATIONAL WRITES HOW INVESTORS OF OIL AND COAL ASSETS FACE A SWIFTLY DETERIORATING DEAL.

In a landscape of increasing operative and regulatory risks and low interest rates, it is time for shareholders to start demanding more. Low bond yields, poor share price performance and lousy dividend payments do not justify the risks.

Bondholders of oil majors, for example, may get only 0.5% higher yields than holders of similar maturity US treasury bonds. Oil companies also retain a vast amount of profit, maintaining a 20-30% dividend payout ratio, compared with other companies such as pharmaceutical giant GlaxoSmithKline's 82% or UK retailer Sainsbury's 51%. Coal dividend yields are often even lower than those of the oil giants.

Up until the end of February, Shell shares fell 5%, Total by 9% and BP by 11%, underperforming rising market indices. The S&P 500, for example, rose by 10%. In the US, Arch Coal shares fell by 62%, Alpha Natural Resources 56% and Peabody by 37%. In Europe coal-heavy utilities like Italy's Enel or Poland's PGE suffered substantial share price losses.

And the risks are increasing as the economics of coal deteriorates in the US,



“ THE LARGEST OIL AND COAL COMPANIES COULD BECOME EXPOSED TO THE ISSUE OF CARBON LIABILITY AS DISASTROUS CLIMATE EVENTS ARE INCREASINGLY BEING LINKED BY SCIENCE TO CARBON EMISSIONS

India and China.

Shale gas is booming in the US and pushing out coal, while renewable energy is pushing both coal and gas out of the European market, depressing market prices. In China, air pollution has sparked public concern and government action.

Deutsche Bank has estimated that global shipments of thermal coal could be 18% lower than forecasted by 2015 should China, the biggest importer, further toughen measures to curb air pollution.

In the US, the Mercury Air Toxics Standard aimed at reducing emissions of mercury and other pollutants will lead to the shutdown of numerous coal power plants. In Europe, the Industrial Emissions Directive is expected to have similar impacts. Many oil companies are also pushing into the deepest waters, the tar

sands and other highly sensitive environments. Shell has so far invested almost \$5 billion to tap offshore Arctic oil in what has only proven to be a fiasco.

These types of projects face huge liabilities if anything goes wrong, such as Chevron's recent Brazil oil spill. BP's Deepwater Horizon oil spill have cost shareholders (such as Yorkshire public pension funds) at least \$40 billion so far and the total bill might be double.

The near future brings new and bigger risks. Today's oil and coal assets would likely lose value or be written off if the world adopts stringent emissions reduction targets to limit global warming. HSBC has also calculated that if constraints on carbon emissions were imposed after 2020, they could reduce coal asset valuations by as much as 44%.

Perhaps more significantly, the largest oil and coal companies could become exposed to the issue of carbon liability as disastrous climate events are increasingly being linked by science to carbon emissions. The world's largest historic greenhouse gas emitters could soon become vulnerable to demands for compensation.

And yet, in a low interest rate environment when pension funds are struggling to balance their books, investors remain overly exposed to these types of assets.

The world's largest sovereign fund, the Norwegian Government Pension Fund, has Shell, ExxonMobil, BG Group and BP among its top 10 equity holdings, while other pension and insurance funds are often loaded with oil and coal bonds. Anyone buying into the FTSE 100 and other popular indices are exposed to many of the same companies.

And oil companies want to increase that exposure, planning to invest \$1.2 trillion in 2013 – half of the UK's GDP. While a large part of this is expected to be financed from retained profits (limiting dividends to shareholders), a significant share will come through debt and equity issues. Coal companies will also seek hundreds of billions of dollars for projects in Australia's Galilee Basin or in China.

As shareholders increasingly file sustainability-related resolutions at company AGMs, it's high time for pension funds and other shareholders to demand higher dividend payouts. More cash back to the shareholders and less investments into the most risky unconventional oil fields seems like a win-win scenario. Increasing oil and coal risks must also be priced into the bonds these companies offer.

Investors must urgently rethink if they really want to maintain such a large, and potentially costly, exposure to these high-risk and low-return oil and coal assets.

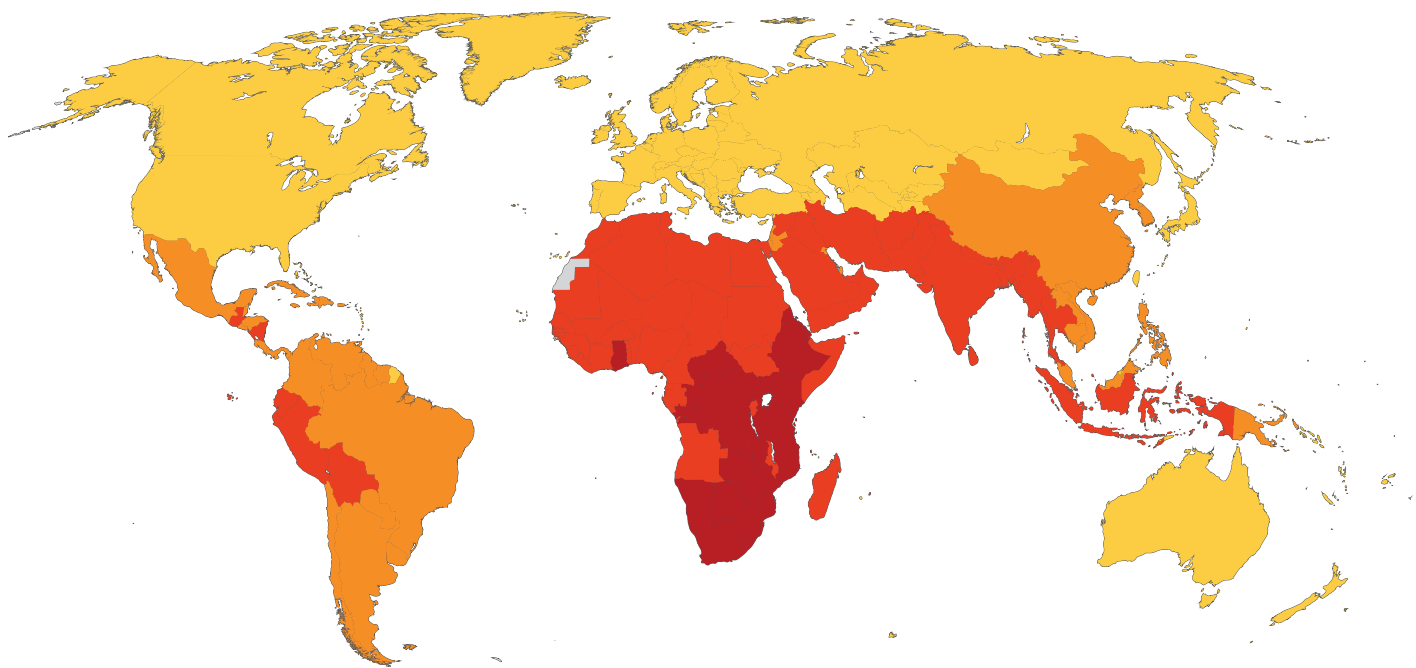
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*Gyorgy Dallos is a senior advisor
at Greenpeace International.*
www.greenpeace.org

GREENPEACE

CLIMATE CHAGE CONSEQUENCES

BY BEN WILLERS

Estimated Deaths Attributed to Climate Change in 2000



Source: epianalysis.wordpress.com/2011/12/01/climateandfood/

Mortality per Million Population

● No data

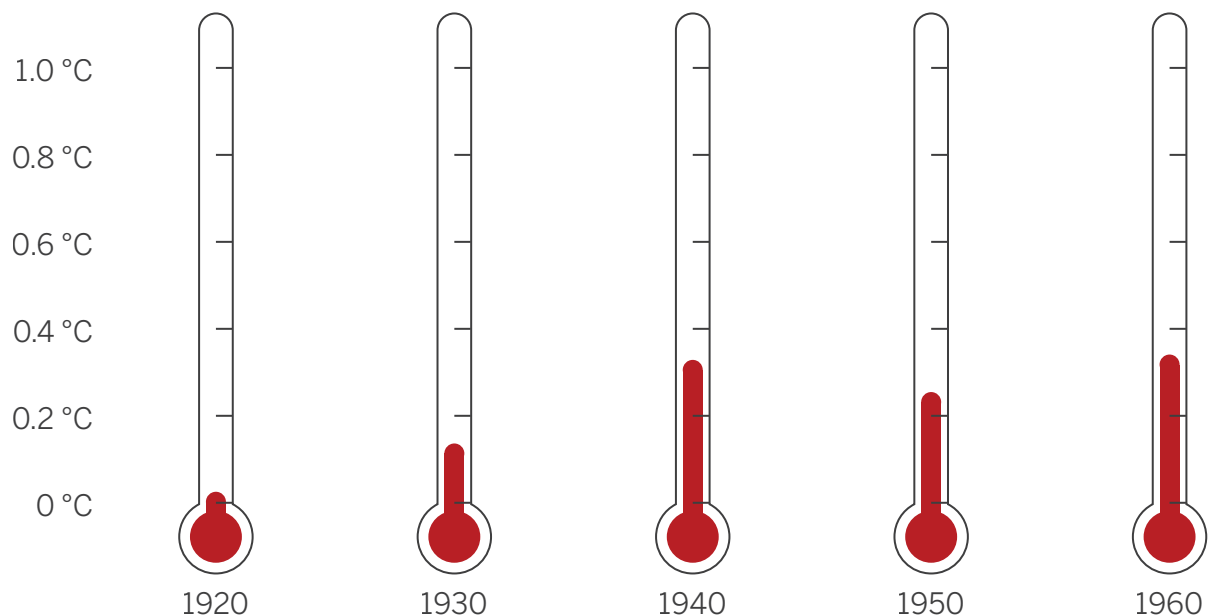
● 0-2

● 2-4

● 4-70

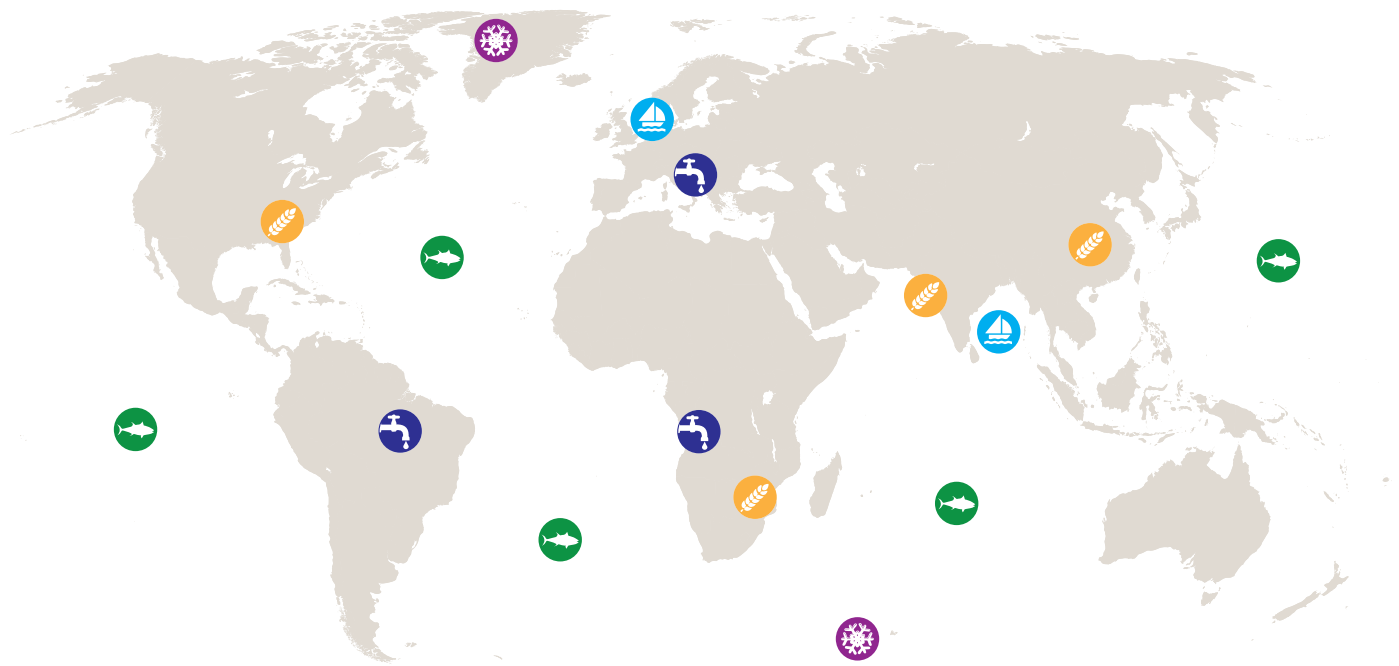
● 70-120

Average Global Temperature Anomaly Since 1920

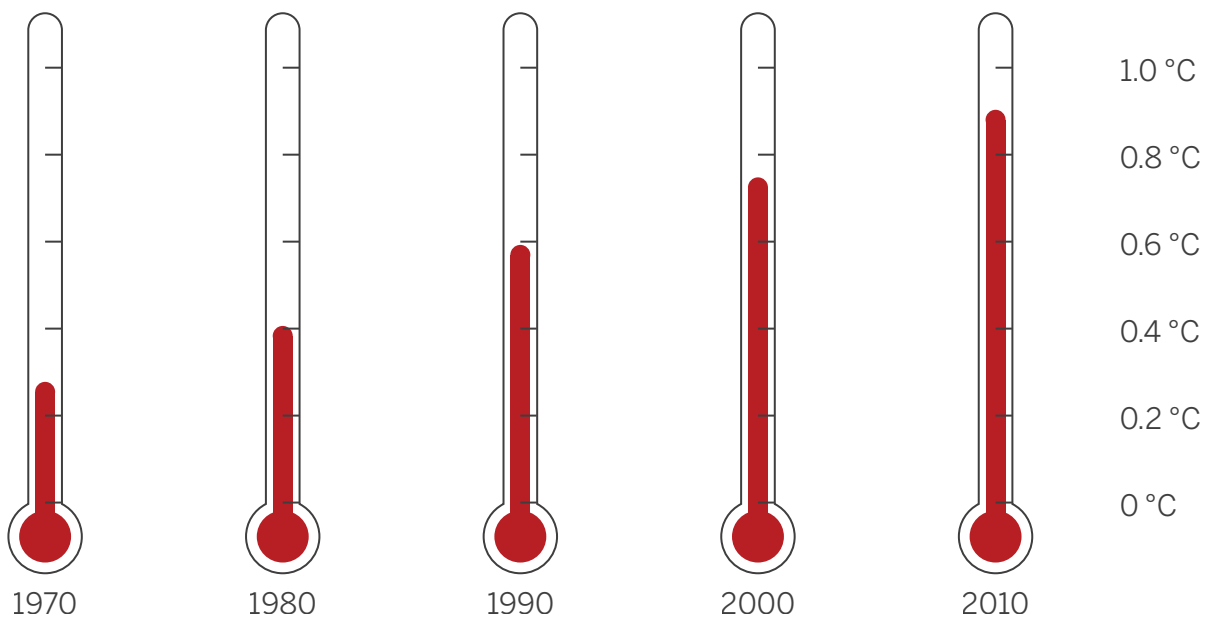
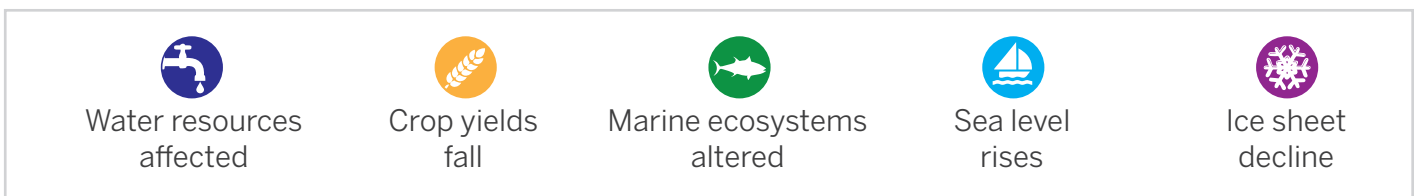


Source: en.wikipedia.org/wiki/Effects_of_global_warming

Impacts of Global Warming



Source: treehugger.com/corporate-responsibility/climate-change-impact-world-map-unveiled.html



HOW TO INVEST IN ENERGY ONCE YOU'VE DITCHED FOSSIL FUELS

SO YOU'VE MADE THE DECISION TO DIVEST FROM FOSSIL FUELS. BUT WHAT NOW? IN CONVERSATION WITH BLUE & GREEN TOMORROW, JOHN DAVID (JD) AND CHRIS BULLOCK (CB) FROM RATHBONE GREENBANK INVESTMENTS PROVIDE THE LOWDOWN ON INVESTING IN ALTERNATIVE ENERGY TO COMBAT CLIMATE CHANGE.

The background

JD: Climate change science shows that we shouldn't be burning fossil fuels. Some environmental investors argue that a major incentive to the traditional energy industry to change and to invest in alternative technologies is to cut off investment to them.

We do, however, have to be realistic as to how quickly that can happen. A pathway to a low-carbon society is not something that's going to happen overnight. That's not a realistic approach.

We may have to promote natural gas,

which is less polluting than oil or coal, as well as renewable energy technologies and energy efficiency.

If you pull out of traditional energy stocks, you've naturally got quite a big hole in your portfolio because the oil and gas industry is a large component of most global indices, particularly in the UK.

Everything one says about investing in renewables, energy efficiency and energy infrastructure has to be seen in the context of sensible risk management within a portfolio. These aren't necessarily an alternative to traditional energy stocks as



“FINANCIAL MARKETS TEND TO BE QUITE SHORT-TERM, WHICH IS A CHALLENGE WHEN CONSIDERING A LONG-TERM ISSUE LIKE CLIMATE CHANGE

a whole because they can't really be looked at on the same page. If you look at their performance, they certainly aren't correlated, and most of the stocks represent a greater risk – certainly in the short-term – than traditional energy stocks. Many are overseas companies, too, so apart from anything else, you're adding potential currency risk into the equation. Having said that, we're very keen on these stocks as alternatives over the longer term.

How to approach fossil fuels

JD: In terms of our clients, it's fair to say the majority would support a best-in-sector approach when it comes to oil and gas, supporting those companies operating more towards

the natural gas end of the spectrum and the ones with very strong environmental, social and governance (ESG) records.

But equally, we do have a significant number of clients who would favour a complete divestment approach. The nature of bespoke investment management is that you cater to your clients' needs and wishes. Our role as investment managers is to make the client aware of the potential financial impact of his or her ethical or environmental criteria, and to manage any additional risks represented by these choices.

Domestic alternative energy investment

CB: A good place to start is at more generalist funds such as

WHEB Sustainability and Impax Environmental Markets plc, which have well-resourced teams in London. The thing we like about these funds is that they have the flexibility to invest in a variety of themes. So, although they have exposure to renewable energy, admittedly wind and solar developers rather than the actual manufacturers, they also have exposure to energy efficiency, water and waste, and recycling.

It's not a direct switch from oil and gas to funds like these, but it does mean that the risks and volatility apparent in the renewable energy companies is mitigated by the water and some energy efficiency holdings. It gives investors the flexibility to have some exposure without risking too much. We also invest in some more focused funds. European fund managers are quite strong in this area and the likes of Pictet, RobecoSAM and KBI are some of our favourites.

Infrastructure investment

CB: We're also seeing quite a lot

of developments in the renewable infrastructure space, especially this year with the listing of the Greencoat UK Wind Fund, which was the vehicle that brought wind farms from Scottish and Southern Energy (SSE) and RWE. This is quite an interesting fund for us. It provides a pretty sustainable dividend yield and, while not a direct replacement for oil and gas, it gives clients a stable income stream with a good asset backing.

Direct investment

CB: In terms of direct investment, some of our clients have direct holdings in renewables stocks, but again a word of caution: these can be quite volatile, especially towards the smaller end of the market capitalisation range.

Renewable Energy Generation is an interesting company that has been around for a while. It is a developer, owner and operator of renewable projects in the UK. Its main focus is wind farms but also has a small used cooking oil facility, which it uses for short-term energy requirements for the grid. We've met the management numerous times: it always seemed slightly undervalued, a small company that perhaps not many people are following. But a few months ago, Blackrock bought some of its wind farms, and as a result, there was a surge in the price of its other wind farms and development sites. That led to a marked increase in the value of the company, and it seems to be trading at those levels quite sustainably.

Renewables becoming more cost-competitive

JD: Going back five or six years, the opportunities in renewable energy were very much at the technology end of the spectrum. They did well for a while, but plummeted during the financial crisis as a result of oversupply, a pullback in government policy, and falling oil prices. But over the past couple of years the technology has fallen substantially in price, so it's made it much easier to invest in renewable energy as a utility.

Overcoming the investment risk

JD: Financial markets tend to be



John David, investment director at Rathbone Greenbank Investments

quite short-term, which is a challenge when considering a long-term issue like climate change.

Even the hardest-hearted of traditional investors sees that renewable energy is going to become increasingly important. But they might argue that it may take five or ten years before it really begins to compete with traditional energy forms.

Markets don't really work on a five or 10-year basis; they are much shorter term. That's been a challenge for renewable energy.

Having said that, particularly if you look at the developing world and emerging markets, where there is huge investment in energy infrastructure, they are to some extent leapfrogging some of these more traditional energies – not least because they may have an abundance

of natural resource, in the form of sunshine, geothermal or wind, whereas they may not have access to oil or coal.

Unquoted or unregulated investment

CB: Unquoted investment is a really interesting area that has been growing rapidly over the last 10 years or so, from some of the original wind farm co-operatives to the more recent examples like Westmill Solar, a 5 megawatt (MW) wind farm in Oxfordshire that some of our clients have invested in.

It seems that communities are taking the lead here and trying to stabilise their own energy sources. That's definitely a developing theme. There seems to be a lot more support for these co-operatives, both in



Chris Bullock, investment manager at Rathbone Greenbank Investments

“ULTIMATELY, INVESTORS HAVE TO GO WITH THEIR HEART AS WELL AS THEIR HEAD. THEIR STRENGTH OF FEELING, THEIR ATTITUDE TO RISK AND THEIR INVESTMENT OBJECTIVES WILL POTENTIALLY DETERMINE WHICH FOSSIL FUELS STRATEGY THEY CHOOSE

terms of enlightened investors and organisations facilitating the process by sharing information. There are some larger-scale projects as well. One that we're familiar with is the Tidal Lagoon Swansea Bay project, which has been in the news. It could be the start of a major change to our energy policy and, if it goes ahead, it can be used as a blueprint for others. We expect other interesting opportunities in this area but, while we're always supportive, people need to be aware of the risks that go with an unquoted investment. They're very much long-term projects that support social and environmental returns, as well as financial ones.

The elephant in the room: nuclear

JD: If you look at the UK, nuclear remains a pivotal part of the energy policy for the next 10 to 20 years. It will be very interesting to see how this issue develops. Nuclear is something that our clients have very mixed views on. Many are anti; others are reluctantly supportive

because they don't see any alternative in the short term. But the nuclear industry appears to be under a certain amount of pressure. Germany has stepped away from nuclear. So has Japan, on the back of Fukushima. And it's becoming increasingly difficult to see how the nuclear industry will develop in the way it is expected to. If nuclear energy runs into further problems, this could be a boost for the renewable energy sector.

Investing in energy efficiency

CB: The combined results of people using energy-efficient technologies can be huge. This is an area where the UK is quite strong. There are a lot of small and medium-sized companies listed on our markets that are enabling businesses and individuals to operate more efficiently. For companies that have cash to spend, but aren't willing to make huge investments in major capital expenditure, adopting a relatively low-cost energy-efficient solution

can often reap dividends. There are real opportunities with efficiency companies that make products that perhaps aren't visible to us, but whose combined impacts are certainly quite considerable.

The future?

JD: Ultimately, investors have to go with their heart as well as their head. Their strength of feeling, their attitude to risk and their investment objectives will potentially determine which fossil fuels strategy they choose. In the short-term, many investors see the benefits of investing in a best-of-sector basis – not least because it gives them an engagement opportunity with some very large, global companies that have the financial strength to change our energy market over the next few decades. The opportunities in renewable energy and energy efficiency are making those sectors very attractive for all investors if used appropriately in a portfolio.

CB: The renewable energy sector as a whole has real opportunities in the coming decades. We're now at a stage where, in highly-irradiated regions of the world like California, solar is reaching grid parity. There are reports about Saudi Arabia considering the build out of massive solar farms because it's more economic for them to produce their own electricity from solar than from oil, in spite of their plentiful supplies. Consumers and investors can support this trend, either through home generation, buying energy-efficient products and appliances, investing in leading companies and supporting more local community-owned renewable projects. The opportunities are huge, and growing.

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John David is investment director and Chris Bullock is investment manager at Rathbone Greenbank Investments.

www.rathbonegreenbank.com



RATHBONE
GREENBANK
INVESTMENTS



Starring

JAMES DELINGPOLE as WAR • CHRISTOPHER MONCKTON as FAMINE
LORD LAWSON as PESTILENCE and introducing GEORGE OSBORNE as DEATH

A Global Warming Policy Foundation / Bovine Bowl Motion Picture

CLIMATE CHANGE DENIERS COME IN ALL SHAPES. FEW SEEM TO HAVE SCIENTIFIC CREDENTIALS OR THE PEER-REVIEWED LITERATURE YOU'D EXPECT CONSIDERING THEIR STRONG OPINIONS ON A COMPLEX SUBJECT.

BY SIMON LEADBETTER

'The four horsemen of the apocalypse' were Pestilence (or Conquest), War, Famine and Death, which rather sounds like some investors' portfolios. Here's a brief summary of our four horsemen of the climate apocalypse:

James Delingpole (degree in English literature, Oxford)

A friend of B> (he described our editor as an "epic wanker"), the Telegraph blogger gained fame by being one of the first to incorrectly declare that illegally hacked emails showed climate scientists were trying to mislead the public. They didn't and they weren't. Eight committees (the House of Commons Science and Technology Committee, Science Assessment Panel, Independent Climate Change Email Review, United States Environmental Protection Agency report, Inspector General of the US Department of Commerce, National Science Foundation and Pennsylvania State University twice) investigated the allegations and published reports, finding no evidence of fraud or scientific misconduct. Delingpole admits to not reading peer-reviewed scientific literature on climate (he reads what other people say, who may have read the literature), but expresses strong views on the subject.

Christopher Monckton (classics, Cambridge)

Monckton is an outspoken denier of human-caused climate change. He recently claimed to be "an appointed expert reviewer" of the forthcoming fifth Intergovernmental Panel on Climate Change (IPCC) report. In blogger Graham Redfearn's subsequent conversation with the secretariat at the IPCC, he was told, "Anyone can register as an expert reviewer on the open online registration systems set up by the working groups. There is no appointment." If you're trying to make a case about scientific corruption and conspiracy it's probably best not to make false claims to support your own credibility. Monckton's litany of false claims is long.

Nigel Lawson (philosophy, politics and economics, Oxford)

The ex-chancellor secured his place on our list by authoring *An Appeal to Reason: A Cool Look at Global Warming* and, more recently, being the founder of the Global Warming Policy Foundation (GWPF). Robert Watson, the former head of the IPCC and now director of the International Assessment of Agricultural Science and Technology for Development, accused Lawson of selective quotation in his book and "not understanding the current scientific and economic debate." The GWPF sounds innocent enough, but it refuses to reveal its funding, as all charities should. Its status as a charity is currently being challenged. The organisation was among the first to call for an independent inquiry into the aforementioned hacked e-mails. This they got eight times and all eight found no evidence of fraud or scientific misconduct.

George Osborne (modern history, Oxford)

The current chancellor has described parliamentary colleagues as an "environmental Taliban". Comparing colleagues who have a genuine, scientifically-evidenced concern for manmade climate change and the levels of pollution caused by burning fossil fuels with a group of violent, oppressive, medievalist fundamentalists seems a little harsh and unbalanced. One would genuinely hope that someone so well and expensively-educated knew something about a reasoned and polite debate. It's worrying to know that the man who holds heads the ministry with all the purse strings has such an open mind and is listening to all sides of the debate, particularly those with overwhelming scientific consensus on their side. As recent lobbying scandals have repeatedly shown, vested interests in financial services spend millions lobbying parliamentarians and funding political parties either directly or at conference. The investment industry loves the steady returns from mining, minerals and metals, and would prefer we continue with the status quo rather than a community-based and owned clean energy revolution.

CLIMATE SCEPTICS ARE OUR GENERATION'S SLAVERY APOLOGISTS

FUTURE GENERATIONS WILL SEE OUR DEBATE ABOUT THE CAUSE OF, AND RESPONSE TO, CLIMATE CHANGE IN THE SAME WAY WE VIEW HISTORIC ARGUMENTS OVER SLAVERY. THERE WAS ONLY EVER ONE VALID CONCLUSION AND ONE COURSE OF ACTION THEN – JUST AS THERE IS NOW.

BY SIMON LEADBETTER

The modern era is unusual in that it does not see slavery as tolerable. For the whole of our human history, trading people as property has been seen as an acceptable form of commerce. It predates written history and it is still with us even today. There are still 12 to 27 million people estimated to be living bondage.

Every single aspect of human progress has been fought for and hard won, and always resisted by powerful vested interests. Expanding the franchise to the poor, emancipating women, creating a framework of education, healthcare and equal rights, better working conditions, fairer pay and, of course, abolishing slavery, have all been resisted and still are to a certain extent.

There are still some today who, if they were completely honest, would say that society has deteriorated since the poor, women and minorities gained rights. Fortunately, for them, an eager media relishes demonising, sexualising and caricaturing these groups to ensure that their voices are regularly diminished. Whenever someone proposes a 'wild' progressive idea, there are always those who raise, amongst other objections,

economic concerns. It runs along the same lines every time: if we do this it will damage our economy, the downside is greater than the upside. There is a serious body of academic work on the economic reasons for and benefits of slavery. A similar body of work attacks expanding the franchise to the poor and women. Oppression of any kind is certainly profitable for the dominant group. Readers of various investment magazines would be the first to applaud and invest in anything that led to profit maximisation, and oppose anything that limited it. If slavery was reintroduced, they would pile in to reap the handsome profits on offer – despite the cost in human misery and suffering.

Slavery in the UK was effectively made illegal by a 1772 case (*R v Knowles*, ex parte *Somersett*) and by statute in 1833, when the Slavery Abolition Act was introduced. Britain used its naval strength to hunt down slave ships. The US followed in 1865 with the 13th amendment, after a four-year long and very bloody civil war. Around 625,000 people were killed and 412,000 injured: representing 3% of the US population at the time.

Visionary, courageous and determined

**“NEITHER
SLAVERY NOR
INVOLUNTARY
SERVITUDE... SHALL
EXIST” – 13TH
AMENDMENT**

individuals, for moral and religious reasons, fought and won against those that profited from slavery. The Quakers and abolitionist movement sparked the ethical investment sector.

We started our slow realisation that commerce (in this case, the burning of coal) might be damaging the environment, and us, with the Great Smog of 1952. This severe and lethal pollution event coincided with a period of cold weather, windless conditions and lasted for five days. The number of fatalities is thought to have been 20,000, while around 100,000 were made ill. It still took four years to pass The Clean Air Act, imposing smoke control and encouraging the use of smokeless fuel. Progress was slow and smog struck again in 1962. Unfortunately,



we had failed to learn the lessons of 1272, when Edward I banned the burning of sea coal in London, due to the problems of smoke.

While there had been a nascent environmental movement throughout the industrial revolution, the Great Smog really provided the impetus for modern environmentalism, seeing the movement expand from the '60s.

The recent era has been dominated by the philosophy that growth is good and profit is the only goal, regardless of the cost to society and the environment.

However, the Earth's resources and ability to regulate itself are finite and this imposes natural limits on growth. Industrialisation in the developed world gave birth to environmentalism, as people witnessed the damage being done first hand, and industrialisation in the developing world has made environmentalism an urgent necessity.

As living standards rise in the countries that have populations greater than Europe and the US combined, India and China, so the demand for energy, water, food and consumer goods rises inexorably. Unless we recognise our planet's constraints and how ignoring them is

“THE STRUGGLE OF TODAY, IS NOT ALTOGETHER FOR TODAY – IT IS FOR A VAST FUTURE ALSO” – ABRAHAM LINCOLN

having a terrible effect on our climate specifically, and environment more generally, our future will look increasingly uncertain.

But today we are faced by senior politicians, columnists, rogue scientists and celebrities who argue against human-caused climate change or assert that the costs of doing anything would be ruinous for our economy. When you scratch the surface of any of these sceptics they either have no relevant scientific training or have a vested interest in the status quo. Commerce and industry that threatens the climate is our generation's slavery, and you either fall into the camp of progress, reaction or apathy. Tragically, the latter group is often the largest on most issues of progress, but are often very happy to reap the benefits of any change. As are the reactionaries, who once defeated seek new and exciting ways to profit from progress. Slavery was abolished in the UK 180

years ago and we now recognise its abolition as a vital triumph of our nation's character. One can speculate on how dimly and angrily the people of 2193, in another 180 years' time, will view our feeble political leadership, indecision and inaction today. Abolishing slavery took vision, courage and determination and was, put simply, the right thing to do. It birthed an enlightened investment community that rejected profit at any cost. A sustainable future, one that we would want our great, great, great grandchildren to inhabit, needs people with the same vision, courage and determination to reject reckless and unethical investment and reject those rapacious companies that profit from polluting the Earth. The way we invest today is harming our planet, its people and everyone's prosperity. It's time to say that neither reckless nor unsustainable investment shall exist.

CLIMATE CHANGE WILL CREATE INVESTMENT WINNERS AND LOSERS

AROUND THE WORLD, CLIMATE CHANGE INITIATIVES CONTINUE. CHINA'S CLEAN ENERGY MARKET IS EXPANDING WITH INVESTMENT RISING TO OVER \$60 BILLION IN 2012.

BY DAISY MOORE, EIRIS

California's cap and trade scheme came into force at the beginning of this year meaning companies emitting over £25,000 tonnes CO₂e now have to purchase emissions permits. This initiative is set to encourage the power, oil and industrial sectors to reduce their emissions, as well as help raise funds for the state's budget for investing in transport, electricity and water.

A recent Ernst & Young survey of 300 spanning 16 countries and 18 industries found that 70% of respondents planned to increase their climate change areas such as energy efficiency and improved reporting.

In the US, 350.org's fossil fuel divestment campaign – spearheaded by Bill McKibben – is gathering pace with Seattle mayor Mike McGinn recently announcing that city funds will no longer be invested in fossil fuel companies. Shareholder resolutions relating to environmental and social issues are increasing year on year, including

requests for disclosure on the physical risks posed by climate change, greenhouse gas (GHG) emission reduction goals and energy efficiency strategies. Meanwhile, investor initiatives to tackle climate change are growing. The Institutional Investors Group on Climate Change (IIGCC) currently has 75 members accounting for €7.5 trillion and the UN-backed Principles for Responsible Investment (PRI) initiative now boasts over 1,000 signatories, with combined assets under management of over \$30 trillion.

However this support lacks synergy with the latest news of investment in carbon intensive industries and investment in UK offshore oil and gas is at an all-time high. According to the Asset Owners Disclosure Project, the average pension fund portfolio is estimated to have 55% of its assets invested in high-carbon sectors or sectors greatly exposed to climate change.

Whilst the projected supply and demand of fossil fuels may result in higher prices, there are doubts over the valuations of

fossil fuel companies as these valuations are based on their reserves.

Carbon Tracker's 'Unburnable Carbon' study highlights that if we are to stay within the 2C of warming limit, as agreed upon by governments at COP15, 80% of these fossil fuel reserves need to stay in the ground.

Given such constraints, some have argued that fossil fuel companies are overvalued and investors risk being left with stranded assets. For example, in the UK, recent research by HSBC Global Research concluded that current earnings expectations from coal assets of the four mining majors on the London Stock Exchange could be cut by as much as 44% if it was assumed carbon constraints would come into play from 2020. As a consequence, some investors have begun to review their exposure to carbon intensive industries.

Against a backdrop of increased regulation coming into force to encourage greener energy and promote energy efficiency, and the latest climate talks in Doha resulting in governments





“ **IN THIS ENVIRONMENT OF PENDING REGULATORY CRACK DOWN, IT MAY PROVE PRUDENT TO ASSESS INVESTMENTS IN CARBON INTENSIVE AREAS**

concluding to work toward a universal climate change agreement to be adopted by 2015, high-carbon industries may come under pressure.

Obama's State of the Union address indicated strong intent to “pursue a market-based solution to climate change” with or without the support of Congress. His leadership is being encouraged by other international figures, including the likes of Connie Hedegaard – EU commissioner for climate action – who are keen to secure greater international leadership from some of the world's biggest economies.

And whilst overall investment in clean energy fell in 2012, developments to introduce cap and trade schemes and carbon taxes, such as those being suggested in China, may see fossil fuel assets come under threat.

Congress has some of the latest of political leaders who are speaking up on progress on climate change action. In this environment of pending regulatory crack down, it may prove prudent to assess investments in carbon intensive areas.

It's clear that climate change will create clear winners and losers across the investment universe. EIRIS has developed a Climate Change Toolkit [www.eiris.org/pensions/ps_climate_toolkit] which enables investors to reduce investment risks by avoiding those companies that are failing to tackle climate change, or engaging with companies to improve their performance. Our toolkit identifies those companies which are leading in their response to climate change and also enables investors to focus on climate change solution companies which are best placed to benefit from operating in a carbon constrained world.

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Daisy Moore is client relationship executive at responsible investment research firm EIRIS.

www.eiris.org

30 years of pioneering responsible investment
EIRIS

WHAT FOSSIL FUEL DIVESTMENT CAN LEARN FROM APARTHEID

MANY THINGS CONTRIBUTED TO THE END OF THE SOUTH AFRICAN APARTHEID – THE RACIAL SEGREGATION SYSTEM THAT, AFTER DECADES OF PRESSURE, WAS EVENTUALLY ABANDONED. BUT ONE OF THE MOST IMPORTANT FACTORS WAS WESTERN DIVESTMENT FROM SOUTH AFRICAN COMPANIES THAT PROFITED FROM THE APARTHEID REGIME. THE MODERN DAY CAMPAIGN TO DIVEST FROM FOSSIL FUELS SHOULD BE ENCOURAGED BY THIS VICTORY.

BY ALEX BLACKBURNE

People power succeeded and common sense prevailed when South Africa eventually ended apartheid in the early 90s. The decision – the result of three years of negotiations and decades of intense campaigning – was made concrete when Nelson Mandela became the country's first black president in 1994. A lifelong anti-apartheid activist, Mandela had spent 27 years in prison for treason. But his rise to leader marked the beginning of a new chapter – not just for South Africa, but for racial equality across the globe. This victory owes a lot to divestment, particularly by western countries. In the 80s, many decided to boycott South African businesses in protest to the apartheid regime. Less than a decade later, Mandela was free and apartheid had ended.

Writing in the Huffington Post in 2010, eminent archbishop and Nobel peace prize winner Desmond Tutu said, "In South Africa, we could not have

achieved our freedom and just peace without the help of people around the world, who through the use of non-violent means, such as boycotts and divestment, encouraged their governments and other corporate actors to reverse decades-long support for the Apartheid regime."

The real traction in the apartheid divestment campaign came from the US, where students from universities had set up protest groups to urge institutions to invest elsewhere. Perhaps the most influential was the University of California, Berkeley, where sustained pressure led to the divestment of over \$1.5 billion in 1986.

In a blog post, Steve Masover – who as a student was part of Berkeley's divestment campaign – recalled a 1990 speech by Mandela in nearby Oakland Coliseum.

He said, "In the course of thanking solidarity organizations for working to end South African apartheid and his own 27-year imprisonment, Mandela acknowledged the Campaign Against

Apartheid by name – yes, our little homegrown campus organisation – as a notable contributor in the struggle to which he and his compatriots had dedicated their lives.

"I'll never forget the validation that brief mention conferred on our hard work and sleepless nights. Mandela – who represented the actual vanguard of anti-apartheid struggle – was telling us that what we'd done had mattered, had substantively contributed to a liberation struggle on the other side of the world."

Comparisons can be drawn between the apartheid divestment campaigns of the 80s and the fossil fuel divestment campaigns of the 21st century. Led by environmentalist Bill McKibben and his 350.org project, students from campuses across the US have clubbed together to urge their institutions to pull out of the oil, gas and coal sectors, with the climate change imperative being their number one motivation.

In 350.org's film, *Do the Math*, McKibben says, "It is inconsistent with the purposes of these institutions to



“ WRECKING THE PLANET TO SECURE A PERCENTAGE DOES NOT MAKE SENSE. WHEN THAT PERCENTAGE GAIN IS QUESTIONABLE OR NON-EXISTENT AND THE REAL COSTS SO HIGH, THE INVESTMENT BECOMES UNSUSTAINABLE

invest in something that is dedicated to the destruction of civilisation.”

The likes of Harvard, Stanford and Yale all have active divestment campaign groups. Many are urging their colleges to instead invest in energy efficiency measures, taking the view that the cheapest and cleanest energy of all is that which we don't use.

But it's not just universities that have latched on to the divestment message. Whole cities in the US are boycotting fossil fuels, including the likes of San Francisco, New York and Seattle. Mike McGinn, mayor of Seattle, whose employee pension fund is divesting, described the move as “just one of the steps we can take to address the climate crisis.” One step, maybe, but a giant leap forward in 350.org's campaign. However, the impact of divestment divides opinion. In the case of South Africa, while divestment campaigns may have worked wonders in raising public awareness and cleaning consciences, some are sceptical about whether they actually had a material impact.

A 1999 study by Siew Hong Teoh, Ivo Welch and C Paul Wazzan, which analysed the effect of divestment in South Africa, said, “Despite the prominence and publicity of the boycott and the multitude of divesting companies, the financial markets' valuations of targeted companies or even the South African financial markets themselves were not easily visibly affected.

“The sanctions may have been effective in raising the public moral standards or public awareness of South African repression, but it appears that financial markets managed to avoid the brunt of the sanctions.”

There is a distinct and important difference between the divestment campaigns of apartheid and fossil fuels, though. That is, the modern day fossil fuel divestment campaign is based primarily on a financial argument. Fossil fuels may be polluting our fragile atmosphere, but once their impact on climate change is factored in, they become an unsustainable investment.

In contrast, the apartheid campaigns were based almost exclusively on arguments around ethics, morals and equality.

The 'Unburnable Carbon' report by Carbon Tracker and the London School of Economics' Grantham Research Institute says that some 60-80% of oil, gas and coal reserves owned by fossil fuel firms listed on stock exchanges might need to be left in the ground if we want to stand a chance of tackling climate change.

Because of this fact alone, those campaigning for fossil fuel divestment argue that firms are therefore overvalued. More to the point, investors risk being left with so-called stranded assets – a term used to describe worthless stocks.

Pondering whether divestment works, Eric Hendey of the Harvard Political Review said in a 2012 article, "Divestment from select fossil fuel producers would send a powerful message to the energy industry and the nation. It would signal that America's universities take the climate-energy challenge seriously.

"Harvard has made significant strides in the area of sustainability, and our professors are also doing great work in this area. Adopting an investment strategy that encourages the development of renewable energy and lower-carbon fossil fuels could be an important piece of our university's response to the coming energy challenge."

Ultimately, investing in fossil fuels is unsustainable. The purpose of investment is to secure growth and

income for the future. Wrecking the planet to secure a percentage does not make sense. When that percentage gain is questionable or non-existent and the real costs so high, the investment becomes unsustainable. Leaving the cost of cleaning things up to future generations is morally questionable. There are commentators who argue that one person cannot make a difference – that what we do in the developed world will not make a difference due to the industrialisation taking place in

developing countries. They encourage inaction and apathy through their dismal analysis. But one person can change the world and can certainly start a movement, from William Wilberforce to Rosa Parks; Nelson Mandela to Bill McKibben.

It boils down to a choice: apartheid apologist and climate change sceptic, or apartheid boycotter and climate change investor?

Which side of history would you want to be on?

“ IN SOUTH AFRICA, WE COULD NOT HAVE ACHIEVED OUR FREEDOM AND JUST PEACE WITHOUT THE HELP OF PEOPLE AROUND THE WORLD, WHO THROUGH THE USE OF NON-VIOLENT MEANS, SUCH AS BOYCOTTS AND DIVESTMENT, ENCOURAGED THEIR GOVERNMENTS AND OTHER CORPORATE ACTORS TO REVERSE DECADES-LONG SUPPORT FOR THE APARTHEID REGIME – DESMOND TUTU



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The FTSE 100 in 2027

By 2027, China boasts the world's largest economy and is leading global technological development. Meanwhile India's GDP has surged past the likes of France and Germany.

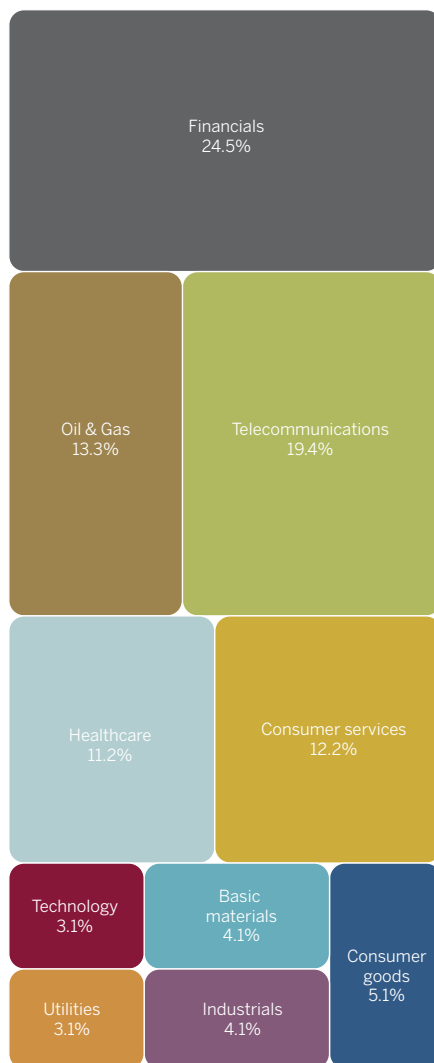
The global population is more than 8 billion and Europe, where average life expectancy is over 90, has twice as many people over 65 than it does children under 15. The UK is now home to over 70 million people.

Water has become the most sought after commodity, triggering conflict (both hot and cold) between countries that were once allies or had previously fought over oil.

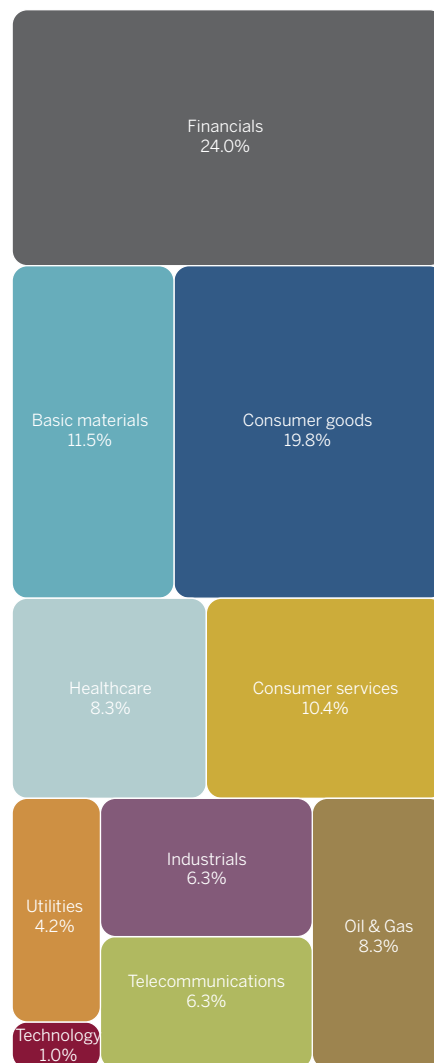
The impacts of climate change are making life in the developing world increasingly difficult, as crops are affected by droughts and floods and diseases are spread in the water.

The FTSE 100, the index that represents the performance of the 100 largest UK listed blue chip companies, also looks very different...

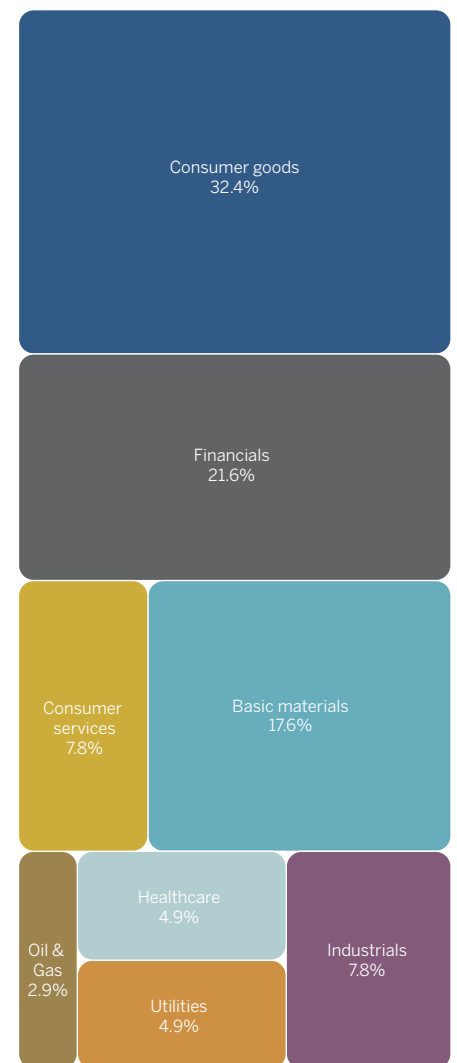
The FTSE 100 in 1999



The FTSE 100 in 2013



The FTSE 100 in 2027 (projected)



Note: the percentages are relative share of the market, so an individual sector can be larger than 2013 in absolute terms, but be smaller in relative terms.

Basic materials - Increase due to significant commodity scarcity

Consumer goods - Increase as global urban middle class continues to grow in 'emerged' economies

Industrials - Increase as they become the 'financial services' of the 2050s

Utilities - Increase due to water needs and as head to becoming the 'oil & gas' of the 2050s

Consumer services - Decrease as the market diversifies and allows smaller firms into play

Healthcare - Decrease, despite ageing population as generic drugs begin to dominate market and power of Big Pharma fragments

Telecommunications - Decrease as this sector as many pure telecoms players moving into or are acquired by consumer goods players

Technology - Decrease as Moore's law continues to drive down price of technology. Increased innovation and alternative investing models moves a lot of the technology sector out of the listed space

Financials - Decrease as other sectors become more stable and direct or alternative investment grows

CLIMATE CHANGE: WE'VE STILL GOT TIME TO SAVE THE WORLD... HAVEN'T WE?

BY CLARE BROOK, WHEB ASSET MANAGEMENT

“ WHEN THE FINANCIAL CRISIS BEGAN TO UNFOLD, PEOPLE LIKENED IT TO OTHER TIMES IN HISTORY WHEN THE HUMAN RACE HAD WALKED BLITHELY INTO SELF-INDUCED CATASTROPHE

It's a strange aspect of human nature that even though we are reasonably adept at predicting the future, time and again in history, we will drift into a crisis, semi-conscious that this is what we are doing, and yet apparently unprepared to take any action. A classic example was the financial crisis of 2008, which in fact was looming for years as governments and individuals took on more and more debt without properly calculating the consequences. As early as 2005, warning voices were sounding loudly in the US, with people like Robert Shiller talking about a housing bubble and publishing 'Irrational Exuberance' where he predicted a worldwide recession when

that bubble collapsed. Others were raising concerns about sub-prime lending practices. By 2006/07 the warnings became much clearer for anyone watching financial markets closely.

When the financial crisis began to unfold, people likened it to other times in history when the human race had walked blithely into self-induced catastrophe. Larry Elliott, the Guardian's economics editor, said, "As far as the financial markets are concerned, August 9, 2007, has all the resonance of August 4, 1914. It marks the cut-off point between 'an Edwardian summer' of prosperity and tranquility and the trench warfare of the credit crunch – the failed banks, the petrified



markets, the property markets blown to pieces by a shortage of credit.”

August 9, 2007, was the date in which BNP Paribas, France’s largest bank, admitted that it had no way of valuing its sub-prime loans.

In retrospect, it took a surprisingly long time for events to unravel from that moment. On September 14, 2007, there were panic-struck queues round Northern Rock, but it was a whole year later before Lehman’s filed for bankruptcy and HBOS was bought by Lloyds TSB. It wasn’t until mid-October 2008 that the Dow fell 30%, and a further month before the G7 gathered and Gordon Brown announced that he had saved the world.

If we were to look back on the events

that led to climate change becoming irreversible (from under tens of metres of water that had engulfed central London), it would be similarly obvious and frustrating that all the warning signs were there: the scientists had been predicting it for decades, multitudes of journalists had written about it; the Maldives had convened their parliament under water as a wake-up call to the world. Even the naysayers and more reactionary governments had come round to the view that climate change was a problem.

Yet no-one had really done anything. Rio, Copenhagen and Rio again; Earth summits had come and gone, involving a lot of handwringing, but no resolutions. Presumably the relatively

relaxed attitude of the human race is due to the fact that people think we still have time to save the world. Or because we have this habit of walking open-eyed into crises.

But as Winnie the Pooh so wisely says in *The House at Pooh Corner*, “They’re funny things, accidents. You never have them until you’re having them.”

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Clare Brook is a founding partner at WHEB Asset Management.

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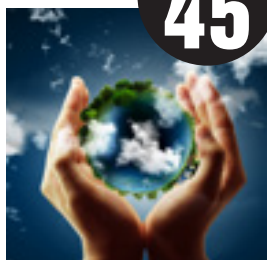
WHAT DO I DO NEXT?

Having read through the Guide to Climate Change, which we hope allows you to make informed and sustainable investment decisions in the future, you might be wondering how else you can make a difference in your life.

We encourage you to read our other in-depth reports, from both this year and last, on topics as varied as investment, tourism, energy and the media.

But above all, we encourage you to act upon what you've read.

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INVEST IN AN ETHICAL FUND THAT DEALS WITH CLIMATE CHANGE

The EIRIS initiative, YourEthicalMoney.org, lists many of the green and ethical funds in the UK. It also says which areas and issues each looks to avoid or invest in. For example, funds that look to push better human rights; funds that avoid tobacco; and funds that invest in businesses that have a positive focus.

But there are also funds that invest to tackle climate change – by funding renewable energy and clean technologies, and by not investing in fossil fuels. You can do your bit in mankind's greatest challenge by investing in one such fund.

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FIND A SPECIALIST ETHICAL FINANCIAL ADVISER NEAR YOU

Sustainable investment is what we write about day in, day out. Contrary to the early-90s Des'ree hit 'Crazy Maze', which begins, "Money don't make my world go round", money is what governs almost every decision we as consumers and businesses make.

It's important, therefore, that we use it as a force for good. All the financial advisers listed are specialists in ethical investment and will help you choose the best possible financial solutions that match your values.

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SWITCH YOUR ENERGY PROVIDER TO GOOD ENERGY

Even without the climate change imperative, there is a desperate need to reduce mankind's emissions. The problem is pollution and waste.

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BOOK A SUSTAINABLE HOLIDAY WITH COTTAGES4YOU While we wax lyrical about the wonders of doing good with your money, we're also of the mindset that consumers also want to have fun, kick back and relax. That's why we encourage sustainable tourism and responsible travel. Booking a holiday – UK or abroad – with cottages4you is the definition of luxury (and we'd be delighted to join you if invited!)

ETHICAL FUNDS THAT DEAL WITH CLIMATE CHANGE

CLIMATE CHANGE IS NOW WIDELY RECOGNISED AS ONE OF THE MOST SIGNIFICANT CHALLENGES FACING THE GLOBAL ECONOMY. ENVIRONMENTAL IMPACTS INCLUDE INCREASED FLOOD RISK, DECLINING CROP YIELDS, SPECIES EXTINCTIONS AND EXTREME WEATHER PATTERNS. THE 2007 STERN REVIEW CONCLUDED THAT UNDER A BUSINESS-AS-USUAL SCENARIO, A 2-3C RISE IN TEMPERATURE COULD REDUCE GLOBAL ECONOMIC OUTPUT (AS MEASURED BY GDP) BY 3% ANNUALLY.

The international science community has now accepted that one cause of climate change is likely to be the increase in greenhouse gas emissions, particularly carbon dioxide, which has occurred since the industrial revolution.

Under the Kyoto Protocol to the Climate Change Convention, agreed at the Rio Earth Summit in 1992, industrialised nations have now agreed to reduce their emissions of greenhouse gases by 5% on average over the next decade. Efforts are being

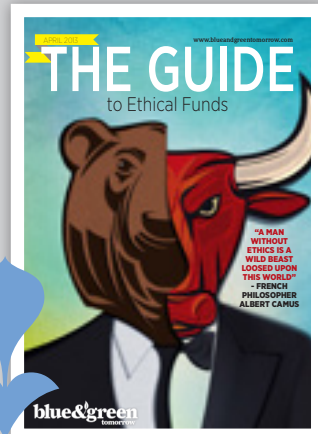
made to improve energy efficiency and develop cost-efficient renewable energy sources such as wind and solar power, which produce no carbon dioxide.

Funds can apply both positive and negative climate change screens. On the positive side they can seek to invest in companies involved in carbon offsetting and renewable or alternative energies, for example. A full list of funds that appear on YourEthicalMoney.org and deal with climate change can be found below.

- Alliance Trust Sustainable Future Absolute Growth
- Alliance Trust Sustainable Future Corporate Bond Fund
- Alliance Trust Sustainable Future European Growth Fund
- Alliance Trust Sustainable Future Global Growth Fund
- Alliance Trust Sustainable Future Managed Fund
- Alliance Trust Sustainable Future UK Growth Fund
- Alliance Trust UK Ethical Fund
- Allianz RCM Global Eco Trends
- BlackRock New Energy Investment Trust plc
- CIS Corporate Bond Income Trust
- CIS FTSE4Good Tracker Fund
- CIS Sustainable Diversified Trust
- CIS Sustainable Leaders Trust
- CIS Sustainable World Trust
- CIS UK Growth Trust
- CIS UK Income with Growth
- Climate Assets Fund
- Ecclesiastical Amity European Fund
- Ecclesiastical Amity International Fund
- Ecclesiastical Amity Sterling Bond Fund
- Ecclesiastical Amity UK Fund
- F&C Ethical Bond Fund
- F&C Stewardship Growth Fund
- F&C Stewardship Income Fund
- F&C Stewardship International Fund

- First State Asia Pacific Sustainability Fund
- FL Stewardship Income Life Fund
- FL Stewardship Income Pension Fund
- FL Stewardship International Life Fund
- FL Stewardship Life Fund
- FL Stewardship Managed Life Fund
- FL Stewardship Managed Pension Fund
- FL Stewardship Pension Fund
- FL Stewardship Safeguard Optimiser Fund
- Guinness Alternative Energy Fund
- Halifax Ethical Fund
- Henderson Global Care Growth Fund
- Henderson Global Care Managed Fund
- Henderson Global Care UK Income Fund
- IM WHEB Sustainability Fund
- Impax Environmental Markets (Ireland) Fund
- Impax Environmental Markets plc
- Kames Ethical Cautious Managed Fund
- Kames Ethical Corporate Bond Fund
- Kames Ethical Equity Fund
- Legal & General Ethical Pension Fund
- Legal & General Ethical Trust
- Premier Ethical Fund
- Rathbone Ethical Bond Fund
- Schroders Global Climate Change Fund

- Scottish Life UK Ethical Pension Fund
- Scottish Widows Environmental Investor Fund
- Standard Life Ethical Corporate Bond Fund
- Standard Life Ethical Life Fund
- Standard Life European Equity Ethical Fund
- Standard Life UK Ethical Fund
- Standard Life UK Pension Ethical Fund
- Triodos EIS Green Fund
- Virgin Climate Change Fund



For a more in-depth look into each of these funds, read Blue & Green Tomorrow's Guide to Ethical Funds 2013.

www.blueandgreentomorrow.com/reports/the-guide-to-ethical-funds-2013

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