

Fossil Fuel Divestment Brief

Edinburgh University People & Planet

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Introduction - Leading Social Change

The University of Edinburgh faces a critical opportunity to lead the way towards positive social change and display leadership in addressing one of the most urgent issues of our time. The time to act is now. Fossil fuel companies currently have five times more hydrocarbons in their reserves than is safe to burn, with current atmospheric concentrations of CO₂ already presenting a serious threat to our ecosystem and life as we know it. By directly challenging the social licence of these industries, divestment from fossil fuels targets one of the root causes of the current climate crisis. It also presents an opportunity to contribute to the swift transition to a low carbon economy which needs to be achieved in the next decade if we are to do any justice to the wealth of climate science. Furthermore, it makes financial sense, given the research into the carbon bubble and the risk this presents to shareholders.

The long term costs of burning fossil fuels are now being realised, as has been presented in repeated warnings from the scientific community. Yet the fossil fuel industry persists to pursue a business model which has been rejected by climate science. With a history of funding climate denial, lobbying against climate mitigation policy and abusing their political power, investment in these companies is highly contradictory to the university's values. The narrative is akin to divestment from tobacco, and thus fossil fuel divestment remains long overdue. This is further weighted by numerous human rights abuses involving violations in the Niger Delta, Ecuador and the Gulf coast to name but a few. To use the university's endowment fund to invest in such companies exposes flaws in their ethical investment policy. Divestment has been used before as a powerful tool for social change, demonstrated in the anti-apartheid divestment movement, and the call for divestment from tobacco industries by medical and public health institutions.

Mary Robinson, Former Irish President and former U.N. High Commissioner for Human-Rights, who was invited to give Edinburgh University's Enlightenment lecture in 2012, has come out in support of divestment stating:

*"I'm glad that young people and colleges and others are seeing the need to bring home: We can no longer invest in companies that are part of the problem of the climate shocks that we're suffering from. And so, I speak openly and encourage students and colleges to be part of that. It's, to me, a little bit like the energy that was behind the anti-apartheid movement when I was a student. We were all involved because we saw the injustice of it. There's an injustice in continuing to invest in fossil fuel companies that are part of the problem."*¹

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¹ Democracy Now!, (2015). *Former Irish President, Climate Justice Advocate Mary Robinson Urges Divestment of Fossil Fuel Firms*. [online] Available at: http://www.democracynow.org/2013/10/29/former_irish_president_climate_justice_advocate [Accessed 26 Feb. 2015].

“Carbon divestment is a shining example...The active role of young people is worth noting. As with the anti-apartheid campaign in the 1980s, students today are taking action that can determine their futures – and the futures of generations to come – for the better. They are showing the world that, once again, a transformation in how we grow our economies is essential. This is how inter-generational equity can be achieved: promoting a new investment model that responds to the risks posed by climate change. By avoiding investment in high-carbon assets that become obsolete, and by prioritising sustainable alternatives, we build capacity and resilience, particularly for more vulnerable people – while lowering carbon emissions.”²

Thus, this brief outlines the case for fossil fuel divestment for the University of Edinburgh and presents a significant opportunity for the university to respond to the rising threat of climate change.

We are calling upon the University of Edinburgh to:

1. Immediately freeze any new investment in fossil fuel companies.
2. Divest from direct ownership and any commingled funds that include fossil fuel public equities and corporate bonds within 5 years. (By fossil fuel companies we refer to the index of the top 200 fossil fuel companies:<http://gofossilfree.org/top-200/>)

² Robinson, M. (2014). *Carbon divestment is a shining example* | Mary Robinson. [online] the Guardian. Available at: <http://www.theguardian.com/commentisfree/2014/feb/17/carbon-divestment-emissions-climate-change> [Accessed 26 Feb. 2015].

Does investing in fossil fuels align with the University's investment criteria?

Criterion 1: Is it in line with the university's values?

The University of Edinburgh has a vision to be a “[truly global university, benefiting society as a whole](#)”.³ This is encompassed in its mission to “[make a significant, sustainable and socially responsible contribution to Scotland, the UK and the world](#)”.⁴ Yet the threat of climate change is one of the greatest our society faces, and though the University of Edinburgh is supposedly committed to taking leadership in “developing solutions to the world's most challenging problems”, it still has over [30 million pounds invested in fossil fuel industries](#)⁵.

In the [Principal's Introduction to the Strategic Plan for 2012-16](#),⁶ Timothy O'Shea wrote that “our priorities for delivery over the next four years [...] are shaped by our commitments to *social and environmental responsibility*, equality and inclusion, widening participation and good governance” (italics ours). It is time for the University to acknowledge its obligations to its students and to the wider public it influences as a leading educational institution and cease its contribution to the major health, environmental and social justice problem that is climate change. Divesting from fossil fuels would only bring the university into alignment with its own professed values.

Climate change is a defining example of social injury. Firms that produce fossil fuels do not bear any economic burden as a result of the many forms of harm they are imposing on other people, including agricultural impacts, sea level rise, damage to human health, and more severe extreme weather. Furthermore, those who use fossil fuels enjoy the benefits while imposing these costs on others. Divestment would be an appropriate response in order to adhere to principles of social responsibility.

The University's historical involvement in the Scottish Enlightenment is a legacy it carries to this day; now it has the opportunity to continue positively affecting the world and be part of what has been described as the “carbon free enlightenment”⁷ - one where public institutions are realising the need to stop their reliance on fossil fuels in order to provide a platform for innovation and skills for a sustainable future.

³ Edinburgh University's Vision and Mission statement.

⁴ *ibid*

⁵ Hanna, T. (2013). Investments Through Endowments And Individual Amounts Invested in Each Company. [email].

⁶ O'Shea, T. (2012). The university of Edinburgh Strategic Plan. 1st ed. [ebook] Edinburgh: The university of Edinburgh. Available at:

<http://www.docs.sasg.ed.ac.uk/gasp/strategicplanning/201216/StrategicPlan201216spreads.pdf> [Accessed 26 Feb. 2015].

⁷ Klein, N. (n.d.). This changes everything.

The University of Edinburgh has already taken many steps towards this enlightenment, being the first to launch an “[environmental initiative](#)”⁸ in 1990, which saw the installation of a [Combined Heat and Power System in 2002](#). This saved vast amounts of money in improved energy efficiency, was recognised for its commitment to the environment through a [Green Energy Award in 2004](#), and has reduced carbon emissions by [40 percent from 1990 levels](#). This outlines its impressive and long term commitment to a “greener, safer, more sustainable future”.

Furthermore, the University was the first university in Europe to sign up to the UN Principles for Responsible Investment (UNPRI). This led to [divestment from Ultra Electronics](#)⁹, a US drone component maker, in September 2013, as it did not align with UN principles. The University also affiliated to the [Worker’s rights consortium](#)¹⁰, and Electronics Watch aligning the University’s social responsibility and sustainable procurement policies with a code of conduct valuing worker’s rights and improving working conditions in garment and electronic factories. This commitment to social responsibility was reinforced when the University became one of the [first fair trade universities in the UK](#),¹¹ thus helping to stimulate a wider movement around the UK and emphasising the university’s role in leading innovation and change.

The University of Edinburgh has also divested its endowment from tobacco companies, acknowledging its responsibilities as an investor to “promote health” and recognising that tobacco conflicted with these values. Tobacco divestment was strongly advocated by medical institutions across the country, and contributed to the formulation of more robust legislation on international tobacco control in the form of the WHO’s Framework Convention on Tobacco Control. It has been argued that there needs to be a similar approach to the fossil fuel industry if we are to address the significant health impacts of climate change. In a recent [report](#),¹²

⁸Somervell, D. (2006). District Energy. 1st ed. [ebook] Internation District Energy Association, pp.11-14. Available at:

http://www.ed.ac.uk/polopoly_fs/1.134639!/fileManager/District%20Energy%20Article%20Dec06.pdf [Accessed 26 Feb. 2015].

⁹Edwards, R. (2013). Edinburgh University ends funding for US drone component maker. [online] the Guardian. Available at:

<http://www.theguardian.com/education/2013/sep/29/edinburgh-university-ends-funding-drone> [Accessed 26 Feb. 2015].

¹⁰Bowman, K. (2015). Workers Rights Consortium Affiliation. [online] Ed.ac.uk. Available at:

<http://www.ed.ac.uk/schools-departments/procurement/sustainableprocurement/sustainable-procurement/wrc-affiliation> [Accessed 26 Feb. 2015].

¹¹Bowman, K. (2015). Workers Rights Consortium Affiliation. [online] Ed.ac.uk. Available at:

<http://www.ed.ac.uk/schools-departments/procurement/sustainableprocurement/sustainable-procurement/wrc-affiliation> [Accessed 26 Feb. 2015].

¹²Wardrope, A. and Braithwaite, I. (2015). Fossil Fuel Investment and the UK Health Community. 1st ed. [ebook] Unhealthy Investments. Available at:

http://www.unhealthyinvestments.uk/uploads/1/3/1/5/13150249/unhealthy_investments_final.pdf [Accessed 26 Feb. 2015].

health organizations outline the case for divestment from fossil fuels in view of the health hazards posed by climate change and fossil fuel related air pollution. Fossil fuel combustion causes direct impacts to health through air pollution, which is the [single biggest environmental threat to health](#),¹³ causing [2000 premature deaths a year in Scotland](#)¹⁴, and [7 million deaths annually around the globe](#)¹⁵. Moreover, the continued use of fossil fuels has numerous indirect impacts on health through the ecosystem and societal consequences of climate change. A report published by The Lancet in 2009 described climate change as the [“biggest global health threat of the 21st century”](#)¹⁶, outlining the direct impacts that were already attributed to 400,000 deaths a year through climate related flooding, drought, heat waves, wildfires and severe weather. This exacerbates health threats due to [food and water security](#)¹⁷, with rising temperatures also increasing the prevalence of [vector borne disease](#)¹⁸. Furthermore, displacement and destruction of homes and livelihoods will have a significant impact on [mental health](#)¹⁹. Christiana Figueres, UNFCCC Executive Secretary described climate change as the symptom of the disease of humanity’s continued addiction to of fossil fuels. The University of Edinburgh should align with its strong medical tradition and follow in the British Medical Association’s actions who committed to divesting from fossil fuels in [June 2014](#)²⁰.

It is clear that the University’s students are already keen to fulfil commitments to sustainability and social responsibility. Students have set up societies and activities such as the Swap and Reuse Hub (SHRUB), the Sustainable Development Society and Academy, the food co-operative Hearty Squirrel, the Fairtrade café and the Allotment Society to name but a few. This is complemented by a Student Social Responsibility and Sustainability Forum, which has stimulated further engagement in how the University can fulfil its vision and mission.

¹³Vidal, J. (2014). WHO: air pollution 'is single biggest environmental health risk'. [online] the Guardian. Available at:

<http://www.theguardian.com/environment/2014/mar/25/air-pollution-single-biggest-environmental-health-risk-who> [Accessed 26 Feb. 2015].

¹⁴BBC News, (2014). Air pollution 'caused 2,000 deaths'. [online] Available at:

<http://www.bbc.co.uk/news/uk-scotland-26971182> [Accessed 26 Feb. 2015].

¹⁵Who.int, (2015). WHO | 7 million premature deaths annually linked to air pollution. [online] Available at:

<http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/> [Accessed 26 Feb. 2015].

¹⁶TheLancet.com, (2015). Managing the Health effects of Climate Change. [online] Available at:

<http://www.thelancet.com/commissions/climate-change> [Accessed 26 Feb. 2015].

¹⁷Who.int, (2015). WHO | Land degradation and desertification. [online] Available at:

<http://www.who.int/globalchange/ecosystems/desert/en/> [Accessed 26 Feb. 2015].

¹⁸Who.int, (2015). WHO | Climate change 2014: impacts, adaptation, and vulnerability. [online] Available at:

<http://www.who.int/globalchange/environment/climatechange-2014-report/en/> [Accessed 26 Feb. 2015].

¹⁹ Blogs.bmj.com, (2015). *BMJ Blogs: The BMJ » Blog Archive » Daniel Maughan: What has climate change got to do with mental health?*. [online] Available at:

<http://blogs.bmj.com/bmj/2014/09/15/daniel-maughan-what-has-climate-change-got-to-do-with-mental-health/> [Accessed 26 Feb. 2015].

²⁰Medact, (2014). [online] Available at:

<http://www.medact.org/news/uk-doctors-vote-end-investments-fossil-fuel-industry/> [Accessed 26 Feb. 2015].

The establishment of the Social Responsibility and Sustainability department at the University in 2014 further reinforces the University of Edinburgh's strong commitment to the future of its students. There are multiple academic networks, including Edinburgh Climate Network, Edinburgh Centre for Carbon Innovation and The Global Academies that are carrying out important work into the impacts of climate change on the local and global level, emphasising the damage that climate change is already having on wider society and reinforcing the evidence of the urgency with which we must act. Divestment from fossil fuels would demonstrate the university's integrity in aligning with and giving recognition to the values of its staff and students. In February of last year, 1480 students signed a petition supporting fossil fuel divestment, which added to a formal endorsement by EUSA, NUS Scotland and the UK as well as the University and College Union.

Criterion 2: How does it impact on capital, i.e. return of investment and financial risk?

There are clear ethical, social and medical benefits to fossil free divestment, but it has been mistakenly believed that fossil fuel divestment could be too financially risky to pursue. However, rather than having negative impacts on investment returns, divestment has been shown to have positive impacts, and is becoming more necessary as the risk and reality of the carbon bubble is increasingly recognised.

Just this past year, the [Fossil Free Indexes US \(FFIUS\)](#) outperformed the S&P 500 by about 1.5%²¹. The S&P 500, or the [Standard & Poor's 500](#), is an American stock market index based on the market capitalizations of 500 stocks representing all major industries. The FFIUS is practically identical to the S&P 500, except that it is rebalanced to avoid shares in [the world's largest coal, oil, and gas companies](#). These include ExxonMobil and Peabody Energy. Considering the exclusion of these companies, the 1.5% outperformance of the S&P 500 by the FFIUS is significant. It goes to show the volatility of oil and fossil fuel prices that are so sensitive on factors assessing supply and demand. This past year oil prices have been especially unreliable, leading to the University losing 4 million pounds.²²

Aside from this past year, where the financial benefits of fossil fuel divestment seem clear, historically, studies show there is no correlation between the incorporation of ESG factors (Environmental, Social and Governance factors) into investment decisions and poorer financial outcome. In 2007, the U.N. released a "review of key academic and broker research on ESG factors" called "[Demystifying Responsible Investment Performance](#)". The review analysed twenty academic studies and the effects of incorporating ESG factors in the investment management process. They found no evidence of a resulting performance penalty

²¹ Fossil Free Indexes, LLC, (2015). *Performance of the FFIUS*. [online] Available at: <http://fossilfreeindexes.com/2015/01/20/thoughts-2014-performance-ffius/> [Accessed 26 Feb. 2015].

²² The Student Newspaper, (2015). *Plunging Oil Price Costs University £4 Million*. [online] Available at: <http://www.studentnewspaper.org/plunging-oil-price-costs-university-4-million/> [Accessed 26 Feb. 2015].

²³. In fact, the two reviewed studies that focused specifically on environmental factors found a *positive relationship* between consideration of those factors and performance.

In June 2012, the Deutsche Bank and Mercer released a review called “[Sustainable Investing: Establishing Long-Term Value and performance](#),” in which major meta-studies were conducted on ESG investment performance. In the editorial letter, the Managing Director wrote:

“The evidence is compelling: Sustainable investing can be a clear win for investors and for companies. However, many SRI fund managers, who have tended to use exclusionary screens, have historically struggled to capture this. We believe that ESG analysis should be built into the investment processes of every serious investor, and into the corporate strategy of every company that cares about shareholder value. ESG best-in-class focused funds should be able to capture superior risk-adjusted returns if well executed.”

Thus, evidence substantiates the fact that responsible investment that incorporates ESG factors has no notable negative effects on investment returns. This fact is being increasingly recognised.

Thus, although the ethical, social and environmental reasons to divest from climate change are sufficient in themselves, the economic ones seem equally compelling warnings that the future looks risky for fossil fuel investments. The University of Edinburgh should be at the forefront of institutions trying to avoid the possibility of a carbon bubble blow-out, for while studies are beginning to show the dangers such a threat poses, it appears that investing with regard to ESG factors does not damage returns.

Criterion 3: Is there a mechanism available so we can actually implement the change?

Divestment from fossil fuels is well on the way to entering the [financial mainstream](#). Already BlackRock, the world’s biggest fund manager, along with FTSE and the Natural Resources Defense Council have launched a strategy for a [fossil free index](#). Recognising the risks of the carbon bubble and the long term (and short term) instability of certain investments, fund managers understand the need to implement this change if they are to safeguard making significant losses. This index is designed to be “[transparent, easy to understand, quantifiable and repeatable](#)” and it is clear the financial sector is fully engaged in the mechanism of this process.

²³ “Demystifying Responsible Investment Performance” (2007) *The Asset Management Working Group of the United Nations Environment Programme Finance Initiative and Mercer* found at: http://www.unepfi.org/fileadmin/documents/Demystifying_Responsible_Investment_Performance_01.pdf [Accessed 26/02/2015]

Criterion 4: Is it in line with the trajectory of the wider society and the world?

There are now 21 universities, 35 cities, 65 religious organisations and numerous other organisations from around the world including the Rockefeller Brother Fund, The World Council of Churches and the British Medical Association who have committed to divesting from fossil fuels. It is becoming more and more apparent that this is a wise and necessary decision, with such figures as the [UN Secretary General Ban Ki Moon](#), urging more institutions to reduce investments in the coal and fossil fuelled economy and move to renewable sources of energy. The University of Glasgow's decision to divest in October of last year, although the first university in Europe to do so, was described as a [dramatic beachhead](#), and further legitimised the fossil fuel movement within the UK. In the US, 16 universities have divested from fossil fuels, including Stanford.

Universities, which one could say have a notable responsibility to ensure a sustainable future for both their students and the values they profess, are not the only ones to take action against climate change. 35 cities have also divested in some way from fossil fuel or coal industries, including Oxford in England, which divested from any direct investments in fossil fuels in July of 2014. The full list of divested universities, cities and institutions can be found on gofossilfree.org.

In addition, there are many reasons why investing in renewable energy would be regarded as following the general trajectory. In the past year [clean energy investments rose](#) by 16%, at the same time that oil prices lagged. In part this is due to China's commitment to renewables expanding by 32 percent. China is not the only major world player that shows an increased commitment to renewables. In the United States Barack Obama [unveiled a plan](#) that aims to cut methane emissions by as much as 45% over the next decade²⁴.

These governments join an increasing list of key world figures in denouncing the harmful effects of climate change, including the [Pope](#), who suggested that humans are to blame, saying "man has gone too far." Similarly, former University of Edinburgh rector Peter McColl spoke out on the importance of divestment in the recent edition of [The Student](#) after the financial losses due to plunging oil prices. He said: "Divesting from fossil fuels is right both morally and financially. It's time to do it now."

A [new report](#) by Scottish Environment link on the risks posed to Scotland by the 'Carbon Bubble' recommend that public sector bodies in Scotland "to divest fossil fuel investment assets to reduce or eliminate risk related to carbon."

²⁴ Goldenberg, S. (2015). *Barack Obama moves to cut US methane emissions by almost half*. [online] the Guardian. Available at: <http://www.theguardian.com/environment/2015/jan/13/obama-state-of-the-union-methane-regulation-climate-change> [Accessed 26 Feb. 2015].

Criterion 5: What is the impact of this change on other areas of the university, i.e. research funding , procurement, etc.?

Divestment of the university endowment fund from fossil fuels can be seen as a separate case than issues of research funding and procurement.

Concerns over a double standard hold no weight in the face of the university's long term goals and responsibility to shareholders. The real double standard lies between its values and mission as a sustainable and innovative institution. One of the University's [research clusters](#) is currently researching "environmental governance", investigating "how and why change takes place (or not) in response to environmental problems such as climate change". It would appear the university would do well to display this governance in responding to the growing call for change in terms of its investments.

The impact of divesting from fossil fuels is likely to have an overwhelmingly positive impact. Support for divestment is aligning the energy of student and staff, outlined in our [open letter](#), and a successful divestment campaign stands to improve the university's reputation worldwide. One of Europe's biggest Asset managers has warned that companies linked to fossil fuels are at immediate reputational risk due to the dangers of climate change. "Climate risk is becoming synonymous with reputational risk". Thus, the choice to divest from fossil fuels must be seen as also having the beneficial long-term effect.

Criterion 6: The ethical argument.

There are strong ethical and moral imperatives that guide the University's values as a public institution to avoid profiting from companies whose core business model is driving climate change. Archbishop Desmond Tutu, himself an honorary graduate of this University advocates for divestment saying:

*"Climate change is a deeply moral issue... Here in Africa, we see the dreadful suffering of people from worsening drought, from rising food prices, from floods, even though they've done nothing to cause the situation. Once again, we can join together as a world and put pressure where it counts."*²⁵

*"We need an apartheid-style boycott to save the planet[...] We must stop climate change. And we can, if we use the tactics that worked in South Africa against the worst carbon emitters. People of conscience need to break their ties with corporations financing the injustice of climate change. [...] It makes no sense to invest in companies that undermine our future. To serve as custodians of creation is not an empty title; it requires that we act, and with all the urgency this dire situation demands."*²⁶

²⁵ YouTube, (2015). *Archbishop Desmond Tutu on Divestment*. [online] Available at: <https://www.youtube.com/watch?v=SR-xBzs09D8> [Accessed 26 Feb. 2015].

²⁶ *ibid.*,

The Time to Act is Now - Scientists' increasing alarm

["This is an emergency and for emergency situations we need emergency action"](#). This extraordinary statement was uttered by Ban Ki-Moon, Secretary General of the United Nations. Yet it is perhaps even more alarming to hear similar claims from normally staid scientists, such as Prof. James Hansen (recently retired from his role as NASA's foremost climatologist and director of the Goddard Institute for Space Studies) who has said himself that ["we are in a planetary emergency"](#). We could equally well quote the similar views of other renowned scientists, such as Prof. Lonnie Thompson, director of the Byrd Polar Research Centre, who has said of climate scientists, that ["Virtually all of us are now convinced that global warming poses a clear and present danger to civilization"](#). However this view, which is common amongst scientific circles (see box 1) is rarely discussed in the public realm.

For over twenty years now scientists and world leaders demonstrated alarm about how man's activities are interfering with the Earth's climate system and how this will have profound implications for human civilisation if we fail to act. Yet we procrastinate.

Since the Rio earth summit in 1992 CO₂ emissions have continued to increase exponentially. This has caused levels of CO₂ to increase by over 40 parts per million over that time period to its present level of around [400 parts per million](#) (ppm). Levels of atmospheric CO₂ are now higher than they have been for at least three million years. With 2014 being recorded as the [warmest year on record](#), and 14 of 15 warmest years ever recorded all occurring [since 2000](#), it is clear the unprecedented threat of climate change is of immediate concern.

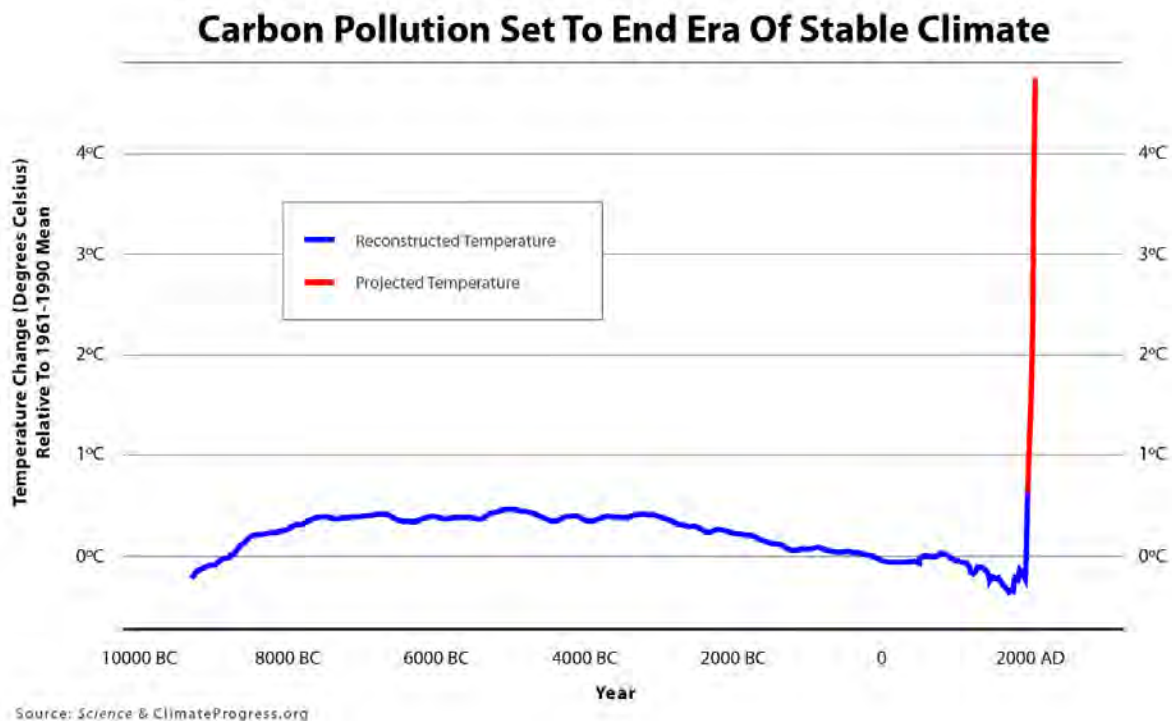
The findings of the most recent IPCC report project that if we continue to remain on our business-as-usual emissions (RCP 8.5) pathway then the world will see an average temperature increase of between 3.2°C to 5.4°C relative to preindustrial temperatures by 2100, with it being as likely as not that we will exceed 4°C (see figure 1). This amount of warming has been described by climate scientists as being a transition ["to a fundamentally different planet"](#) (a 4-5 degree °C in the planet's average temperature is equivalent to the difference between the temperature during a glacial maximum and an interglacial, only those changes took place over a much longer time scale). It's important to also note how historically unusual is the period of mild stability experienced over the last 10,000 years, the period known as the Holocene. Yet it is during this period of climatic stability that the entirety of human civilisation has developed and which set the conditions to which our agricultural systems, ports and cities are all adapted.

Such a level of warming, over such a relatively short period of time, would be catastrophic and would have devastating effects on the lives of hundreds of millions, if not billions, of people and cause the extinction of a substantial fraction of the planet's unique biodiversity. The World Bank has said that there is ["no certainty that adaptation to a 4°C world is possible"](#) and that

a “4°C world is likely to be one in which communities, cities and countries would experience severe disruptions, damage, and dislocation, with many of these risks spread unequally. It is likely that the poor will suffer most and the global community could become more fractured, and unequal than today. The projected 4°C warming simply must not be allowed to occur”²⁷. Many other experts also share this view (see box 1.)

In an attempt to avoid such disastrous consequences world leaders have agreed to limit global warming to no more than 2 degrees Celsius. Yet this is by no means a ‘safe’ level of warming. That glaciologists were surprised by reports in the last month suggesting that the current amount of warming of only 0.85°C has already destabilised part of the West Antarctic Ice Sheet, [thus making a multi-meter sea level rise an inevitability](#), means that it is more important than ever that we limit global warming to this level so as to avoid crossing any more of the planets ‘tipping points’

Yet, as [Prof. James Hansen](#) said, “Decision-makers do not appreciate the gravity of the situation... continued growth of greenhouse gas emissions, for just another decade, practically eliminates the possibility of near-term return of atmospheric composition beneath the tipping level for catastrophic effects”.



²⁷ Worldbank.org, (2015). *Climate Change Report Warns of Dramatically Warmer World This Century*. [online] Available at: <http://www.worldbank.org/en/news/feature/2012/11/18/Climate-change-report-warns-dramatically-warmer-world-this-century> [Accessed 26 Feb. 2015].

Figure 1. Temperature change over past 11,300 years (in blue, via [Science, 2013](#)) plus projected warming this century on humanity's current emissions path (in red, via [recent literature](#)).

The urgency of the situation; or why long-term targets are meaningless

Many people feel that we have plenty of time to reduce carbon emissions and that the threat is a long way off – they could not be more mistaken. The most important point here is to appreciate that we are dealing with a stocks and flow problem. The best analogy is that of a bathtub. Imagine we are filling a bath. What matters to the level of the bathwater is the difference between the rate water flows in and the rate it flows out. So long as the inflow exceeds the outflow the bath will overflow – we will have exceeded our target!

Now the atmosphere is that bathtub into which we are pouring CO₂ far faster than it leaves (a molecule of CO₂ typically stays in the atmosphere for 100 years or more); as such the cumulative emissions are amassing, and the concentration in the atmosphere is steadily increasing. This is the crucial point as it is the cumulative emissions that determine the planet's final temperature, not the rate at which we are emitting greenhouse gases at any given date in the future.

Once that point is grasped we realise that, if we wish to stay below 2°C of warming, we have a fixed budget of CO₂ emissions that we can emit between now and 2050. Reducing emissions slightly won't solve the problem as global warming won't stop getting worse until we reduce CO₂ emissions to a rate which is less than CO₂ is being removed from the atmosphere. The longer we wait before the world peaks its emissions, then the faster we need to cut emissions after that peak in order to stay within our cumulative emissions budget.

Figure 2. illustrates this point, bear in mind that it is the area under each curve that matters:

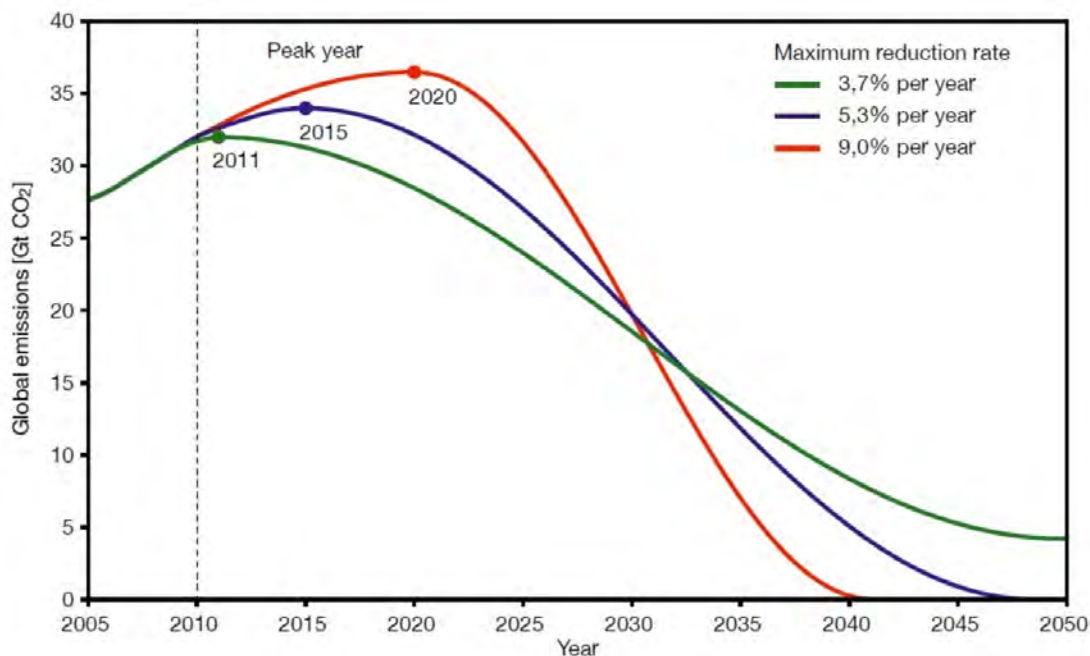


Figure 2. Three scenarios with a cumulative emissions budget for a 67% chance of staying below 2 degrees °C. The different coloured lines represent different peak emissions dates, green is 2011, blue is 2015, red is 2020. The longer we wait before reducing emissions the faster we must then reduce emissions in order to remain within the same emissions budget. The area under each curve is the same i.e. the same total amount of carbon has been emitted²⁸.

This completely changes how we must approach this problem as we can no longer think in terms of long-term targets, we must instead urgently aim to peak and then reduce emissions, as the longer we wait the harder and more costly the change will be.

Because of uncertainties in our understanding, the science can only offer *probabilistic* carbon budgets. We can make a statement such as this; to have an 80% chance of staying below 2 degrees we can only afford to emit **886 Gigatonnes**²⁹ of carbon between 2000 and 2050 (we've already burnt through 321 Gigatonnes). It strikes us as important to point out that an 80% chance is worse odds than playing Russian Roulette with a six shooter! Of course if we're prepared to accept worse odds still then this then budget gets bigger. A **1,440 Gigatonne**³⁰ budget between 2000-2050 would give a coin flips (50:50) chance of staying under 2 degrees °C.

The importance of the concepts of carbon budgets cannot be overstated. It shows us that we must adopt an urgent and radical approach to dealing with Climate Change, we cannot delay action any further. It also makes plain that the idea of long-term reduction targets is shown to

²⁸ "The Copenhagen Diagnosis" (2009) found at http://www.ccrcc.unsw.edu.au/Copenhagen/Copenhagen_Diagnosis_LOW.pdf [accessed 26/02/2016]

²⁹ <http://www.carbontracker.org/wp-content/uploads/downloads/2012/08/Unburnable-Carbon-Full1.pdf>

³⁰ "Greenhouse-gas emission targets for limiting global warming to 2 °C" (2009) found at

be scientifically meaningless.

“Thinking through the implications of 4 degrees °C of warming shows that the impacts are so significant that the only real adaptation strategy is to avoid that at all cost because of the pain and suffering that is going to cost.”

[Prof. Neil Adger, University of Exeter.](#)

“There is a widespread view that a 4°C future is incompatible with any reasonable characterisation of an organised, equitable and civilised global community. A 4°C future is also beyond what many people think we can reasonably adapt to. Besides the global society, such a future will also be devastating for many if not the majority of ecosystems. Beyond this, and perhaps even more alarmingly, there is a possibility that a 4°C world would not be stable, and that it might lead to a range of ‘natural’ feedbacks, pushing the temperatures still higher”

[Prof. Kevin Anderson, Former Director of the Tyndall Center for Climate Change Research](#)

“With current policies in place, global temperatures are set to increase 6 degrees Celsius, which has catastrophic implications”

[Dr. Fatih Birol, Chief Economist of the International Energy Agency](#)

“The current burden of greenhouse gas in the atmosphere is in fact more than sufficient to cause catastrophic climate change”

[Prof. Tim Flannery, Former Chief Commissioner of the Climate Commission](#)

“...the failure of our generation will haunt humanity until the end of time”

[Prof. Ross Garnaut, Author of the Australian Government’s Climate Change review.](#)

“Avoiding dangerous anthropogenic interference in the climate – is in fact unattainable, because today we are already experiencing dangerous anthropogenic interference. The real question now is whether we can still avoid catastrophic anthropogenic interference in climate.”

[Prof. John Holdren, US Presidential Science Advisor, Former President of the AAAS](#)

“Climate change is accelerating more rapidly and dangerously than most of us in the scientific community had expected or that the IPCC 2007 Report presented”

[Prof. Sir. John Houghton, Former co-chair of the IPCC.](#)

“We have reasons to believe that if the world doesn’t do anything about mitigating the emissions of greenhouse gases and the extent of climate change continues to increase, then the very social stability of human systems could be at stake”

[Prof. Rajendra Pachauri, chair of the IPCC.](#)

“The two degree guardrail is somewhere around or above the tipping point. So two degrees is not a good compromise! It is the dividing line between dangerous and catastrophic climate change”

Prof. Hans Schellenhuber Director of the Potsdam Institute for Climate Impact Research

“There is a growing sense of panic in those who really understand what a 4°C world might be like”

Prof. Will Steffan, Director of the Australian National University Climate Change Insitute.

“Looking back, I underestimated the risks.”

Lord Nicholas Stern, author of the Stern Review on the Economics of Climate Change

“We have already observed impacts of climate change on agriculture. We have assessed the amount of climate change we can adapt to. There’s a lot we can’t adapt to even at 2C. At 4C the impacts are very high and we cannot adapt to them.”

Dr. Rachel Warren, University of East Anglia

(Quotes from eminent climate scientists and economists on the urgency and scale of the threat from climate change.)

The Carbon Bubble

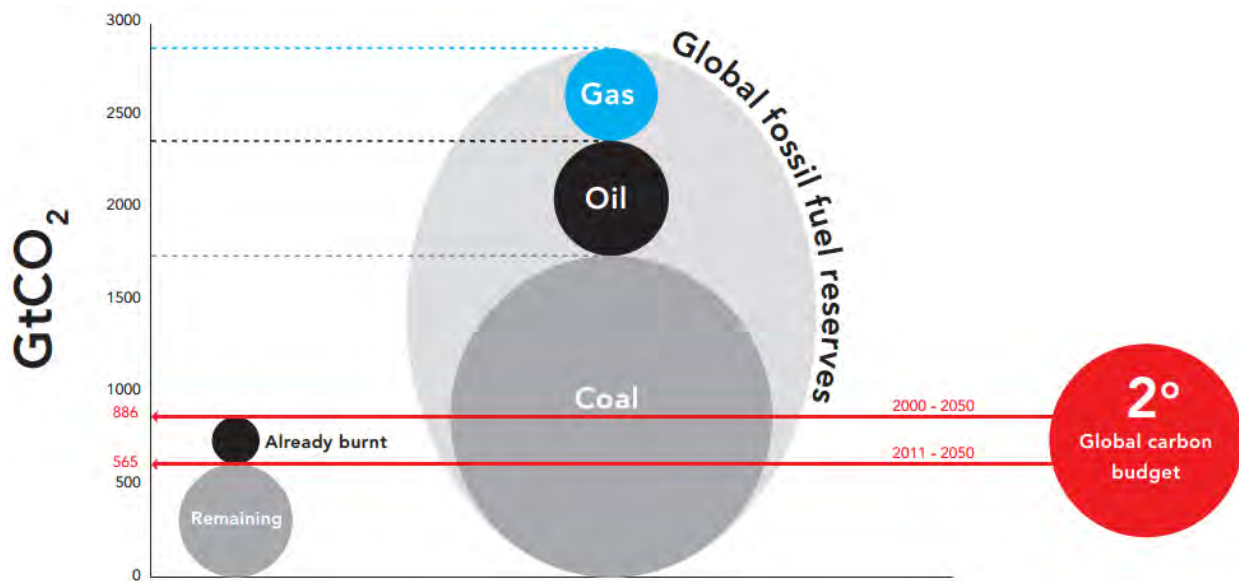


Figure 3: Comparison of the global 2°C carbon budget with fossil fuel reserves CO₂ emissions potenti³¹al.

In the wake of the 2008 financial crash a financial think tank known as the Carbon Tracker Initiative systematically undertook a comparison of the size of the budget and the size of our known fossil fuel reserves. It concluded that if we want an 80% chance of staying below 2 degrees Celsius of warming, then we have five times the necessary fossil fuel reserves. Further work by the IEA found that even if we aimed for only a 50% chance of our climate targets we would still need to leave two thirds of our available fossil fuel reserves in the ground, unburned! In short, the world already has far more fossil fuels than it can safely use.

This analysis clearly suggests that to avoid the worst effects of climate change it will soon be necessary for governments to impose severe limits on the amount of fossil fuels that can be extracted from the ground. Thus, the majority of fossil fuel reserves appear from this point of view to be overvalued and that there is a systematic failure by the financial markets to appropriately assess the risk of these reserves becoming stranded assets. This failure appears to be leading to the formation of another asset bubble which is now being referred to by investors as ‘the [Carbon Bubble](#)’.

Further work by ‘The Carbon Tracker Initiative’ in collaboration with the ‘[Grantham Research Institute on Climate Change and the Environment](#)’ has looked at the question of capital expenditure in the fossil fuel industry. They found that the top 200 oil and gas and mining companies have allocated up to [\\$674bn in 2012](#) for finding and developing more reserves and new ways of extracting them. So, not only do we have far more reserves that can be used, but these companies continue to spend investors’ money inflating the carbon bubble. The logic behind their actions lies in the fact that these extractive companies must keep their [reserves-replacement ratio](#) at a value greater than one. As [Naomi Klein](#) recently noted ‘*in order for the value of these companies to remain stable or grow, oil and gas companies must always be able to prove to their shareholders that they have fresh carbon reserves to exploit after they exhaust those currently in production*’ (p.146).

A new [study in nature by researchers at UCL](#) has gone one step further, and used information on the carbon intensity of various fuels and combined that with their cost of extraction to estimate which reserves it would be most economical to abandon. They found for example, that 90% or more of coal reserves in Australia, the USA, and Russia, over half the gas in the ex-soviet republics, the Middle East and China, and over 80% of the oil in Canada and all of the oil in the arctic would have to be forgone. One of the [authors of that study concluded](#) that “*Investors in these companies should also question spending such budgets. The greater global attention to climate policy also means that fossil fuel companies are becoming increasingly risky for investors in terms of the delivery of long-term returns. I would expect*

³¹ “Unburnable Carbon - Are the world’s financial markets carrying a carbon bubble?” (2014) *Carbon Tracker Initiative* found at <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf> [Accessed 26/02/2015]

prudent investors in energy to shift increasingly towards low-carbon energy sources". Crucially, this study along with others found that the application of carbon capture and storage technology only made a slight difference to their findings and did not change their conclusions substantially.

The dramatic financial consequences of a carbon bubble blow-out are becoming increasingly recognised by finance heads. The U.K. Parliament's environment audit committee released a [report last year](#) warning that *"The UK Government and Bank of England must not be complacent about the risks of carbon exposure in the world economy. Financial stability could be threatened if shares in fossil fuel companies turn out to be over-valued because the bulk of their oil, coal and gas reserves cannot be burnt without further destabilising the climate."* The Governor Bank of England agrees saying that ['the vast majority of reserves are unburnable'](#) and has commissioned an [inquiry](#) into the matter.

The implications could be dramatic: an [HSBC study](#) found that if the international climate goals are met, then 60% of the value could be stripped from companies such as BP, Shell and Statoil. Other Major financial institutions have also all begun to raise concerns about the risks to investors of a carbon constrained world, including [Goldman Sachs](#), [Deutsche Bank](#), [Standard and Poors](#) and [Citi bank](#) who noted that *"If the unburnable carbon scenario does occur, it is difficult to see how the value of fossil fuel reserves can be maintained"*. See also the views of leading economists and world leaders in Box 2.

Christiana Figueres, the executive secretary of the United Nations Framework Convention on Climate Change (UNFCCC), has [said on the carbon bubble](#): "A lot of the stranded assets conversations we've been having for a long time are now coming true." She also said that the "volatility in prices is one that incrementally and gradually makes investment in oil and gas more risky than investment in renewables." Messages like these are beginning to be taken seriously by certain companies, such as the German utility E.ON, which [said in November](#) that it would begin to shift its focus to more renewables.

We are constantly told that we, as consumers, have a choice over our fossil fuel use. Through behavioural change can go some way in reducing our personal carbon footprints, we as individuals are utterly constrained at industrial and societal level in reducing our collective dependence on oil. Our society was shaped more than fifty years ago by architects that structurally locked us into decades of fossil fuel dependence. We must focus our energies into stopping those companies that currently exploit this dependence, and seek to lock us into decades more of damaging energy use. A 2010 study published in *'Science'* led by a team from Stanford University calculated the expected fossil fuel emissions released over the lifespans of existing fossil fuel infrastructure and found that the emissions we were committed to were still just short of those required to commit us to global warming in excess of 2 degree Celsius. The [authors concluded](#) that *"sources of the most threatening emissions have yet to be built. However, CO₂-emitting infrastructure will expand unless extraordinary efforts are*

undertaken to develop alternatives” In light of this conclusion it is clear that the investment decisions that are presently being made bear a great moral significance.

“We should look very carefully at investing in companies that don’t recognise that the world is changing so fast...in many cases these investments will not be worth what investors think.”

[Lord Deben, chair of the committee on climate change](#)

“The continued and dangerous rise in greenhouse gases in the atmosphere is in large part the direct result of past investments in energy and mobility systems based on the use of fossil fuels... New investments must now assist in reversing this unsustainable trend, and quickly if the world is to have a chance of staying under a 2C temperature rise”

[Christina Figueres, Executive Secretary of the United Nations Framework Convention on Climate Change](#)

“I have been urging companies like pension funds or insurance companies to reduce their investments in a fossil-fuel based economy [and shift] to renewable sources of energy”

[Ban Ki Moon, Secretary General of the United Nations](#)

“We really can invest in new energy sources, divest from old sources, and actually make the economy stronger. So let’s do it.”

[Paul Krugman, Nobel Prize winning Economist.](#)

“Despite its devastating scale, the banking crisis was at its heart an avoidable crisis: the threat of significant carbon write down has the unmistakable characteristics of the same endemic problems.”

[Lord McFall, Former Chair of the Commons Treasury Committee](#)

“Be the first mover. Use smart due diligence. Rethink what fiduciary responsibility means in this changing world. It’s simple self-interest. Every company, investor, and bank that screens new and existing investments for climate risk is simply being pragmatic.”

[Dr. Jim Yong Kim, President of the World Bank](#)

“Climate change will be recognized soon as the real threat that it represents not only to nature as we know it on earth, but also to humanity. Funds have yet to recognize that a tipping point has been reached.”

[Bob Litterman, former head of risk at Goldman Sachs](#)

“...people are recognising that over the next two years, they will need to come up with investment plans about how they’re going to be part of a 2-degree world, rather than the 4- to 6-degree world which they’re on at the moment.”

[Nick Robins, head of the climate change centre at HSBC](#)

“Smart investors can see that investing in companies that rely solely or heavily on constantly replenishing reserves of fossil fuels is becoming a very risky decision. The report raises serious questions as to the ability of the financial system to act on industry-wide long term risk, since currently the only measure of risk is performance against industry benchmarks.”

[Prof. Lord Stern, author of the Stern Review on the Economics of Climate Change](#)

[On divestment] *“the most important action that ever happened on climate change”*

[Hans Joachim Schellnhuber, founding director of the Potsdam Institute for Climate Impact Research in Germany](#)

(Quotes about the risk of the ‘carbon bubble’ and the need for alternative investment.)

The Case Against Fossil Fuel Companies

Lobbying

One of the most influential US lobbying front groups on issues of climate change, the Global Climate Coalition (GCC), consists of board members from 230, 000 of the biggest oil, coal and gas companies. Along with the American Petroleum Institute (API), the major petroleum industry trade association, there has been a strong lobby strategy to [prevent mandatory climate policy](#), such as the EU proposal for a carbon tax and the kyoto protocol, resulting in a failure to produce a binding treaty to reduce global greenhouse gas emissions. Their strategy was based upon flawed economic models, which failed to include the negative impacts of climate change and the co-benefits of climate policy to health, the environment, technological development and improved energy efficiency. [Rafe Pomerance, former Deputy Assistant Secretary for Environment and Development at the US State Department](#) said “The API and GCC were very hostile to action on climate change...They were key to defeating President Clinton’s 1993 BTU tax proposal, through lobbying the congress...”. This is reinforced by more than \$122 million in political donations from 1990 to 2000, with recent donations amounting to [\\$70 million](#) to federal candidates from companies with interests in oil and gas in the 2012 US election cycle alone. [This was double that of 2010](#). Thus, it is more important than ever that this social license is challenged now in the run up to important UN climate negotiations in Paris this December.

Funding denial

Despite most fossil fuel companies now acknowledging climate change, they are still involved with spreading doubt over its anthropogenic causes which have been emphasised in all of the IPCC reports since 1990. This has come in the form of funding think tanks such as the Heartland Institute, self described as “the world’s most prominent think tank promoting skepticism about man-made climate change”. ExxonMobil has spent [\\$27.4 million](#) on

funding the [Heartland Institute](#), which has conferences, ran advertising campaigns and published reports that [spread doubt](#) about the science of climate change. The success of these campaigns is reflected in studies which reveal only 52% of the US public believe climate change is occurring. This has a profound effect on climate policy, and the recent COP19 in Warsaw, saw a civil society walk out due to explicit sponsorship and funding by some of the biggest carbon polluters. This amount of power in such critical stages of climate policy decision making is unacceptable and needs to be abated if we are to move forward in safeguarding our future from catastrophic climate change.

Exxon slowly scaled back its funding to the denial machine from a peak of \$3.5 million in 2005 down to \$766,000 in 2012. Nonetheless, ExxonMobil continues to fund at least 12 groups campaigning against climate science, according to its own tax documents and corporate reports. It should be noted that, due to the anonymity of [Donors Trust](#), the decline in Exxon's direct funding of the denial machine doesn't necessarily mean there is not additional funding provided by the company's employees that is not transparently reported. Indeed, a 2013 Guardian article revealed that by 2010 US\$118m had been routed through [Donors Trust](#) and Doners Capital Fund to 102 think-tanks or action groups which have a record of denying the existence of a human factor in climate change, or opposing environmental regulations.

Obstructing transition to renewables

In 2008, British Petroleum (BP) launched a rebranding effort in which it claimed that its initials now meant 'Beyond Petroleum'. This is now widely seen as an example of 'greenwashing' — devoting extensive resources to advertising how environmentally-friendly an organization claims to be, while not actually adopting sustainable practices. BP has since abandoned its foray into solar power generation and put its U.S. wind-farm business up for sale. This behaviour is typical of the fossil fuel industry, which has spent vast sums of money touting its environmental credentials, while its business plans — which depend on burning all of their fossil fuel reserves — are fundamentally at odds with environmental sustainability. As BP's chief executive, John Browne spent \$200 million advertising the 'Beyond Petroleum' slogan, under his tenure, BP was marred by a succession of devastating accidents... [including] an explosion at BP's Texas City refinery in 2005 that killed 15 workers and injured 170 others, and an oil spill a year later that dumped 4,800 barrels of oil at Prudhoe Bay, on the coast of Alaska || . In April 2010, BP's Deepwater Horizon oil platform in the Gulf of Mexico exploded, causing over \$40 billion in damage, alongside massive ecological harm.⁷³⁹ All told, BP may end up paying over US\$90 billion in fines and compensation for causing the disaster. At its peak, BP was directing 6 percent of overall investment toward renewables. This compares with 2.5 percent at Chevron and Shell, with no other major oil company investing more than 1 percent. The sums fossil fuel companies are investing in renewable energy are dwarfed by the investments they are making in unconventional sources of coal, oil, and gas. For example, BP has announced its intention to increase spending on arctic drilling by \$1 billion over five years, increasing its fleet of oil rigs from seven to nine by 2016. In 2003, BP invested \$6.75 billion in Russia's Tyumen Oil Company, which is involved with the massive

Sakhalin offshore project. The 200 fossil fuel companies with the largest reserves spent \$674 billion in 2012 identifying and developing new fossil fuel reserves, as well as researching ways to extract fossil fuels from proven reserves.

Conventional fossil fuel sources are more than sufficiently abundant to allow humanity to far exceed the 2 °C safe limit⁶ for climate change. The costly pursuit of exotic new reserves shows how fossil fuel companies have failed to internalize the reality of climate change and are continuing to implement investment plans that are sharply at odds with planetary safety. Also, based on various credible estimates of the social cost of carbon, the total damage being done to society by fossil fuel burning substantially exceeds the scale of the investments the industry is making in renewables.

Renewable technology is viable and ready to receive investment. As ZeroCarbonBritain (zerocarbonbritain.com) has demonstrated, a transition towards a zero carbon economy is achievable and has been found to be economically viable. If fossil fuel companies acknowledged this, they would be focusing on a rapid investment to renewable energy. However, companies like Shell remain members of the ALEC (the American Legislative Exchange Council). From this position they help draft “model” bills and legislation to repeal state renewable energy standards and roll-back regional climate initiatives.³²

British Petroleum has even sold off its entire US\$3.1 billion wind energy business as “part of a continuing effort to become a more focused oil and gas company”, according to a company spokesperson. Despite advertising campaigns extolling their renewable virtues, investments by oil companies in renewables have been described as a “drop in the bucket” while they have continued drilling for oil in hazardous environments. Indeed, at its peak in 2007, Shell was spending just 2.5 percent of its total capital expenditures on alternatives. Today it is down to 1.5 percent.³³ The disparity between advertising and action is also noticeable in Chevron.

Conclusion

In conclusion, there are clear and compelling reasons for the University of Edinburgh to remove its current investments in fossil fuel extraction and production companies. This is integral to its values in sustainability and social responsibility, and its long term mandate to its shareholders. To meet national and local carbon reduction targets it is clear that there needs to be a swift transition towards investing in clean renewable energy. This is significantly inhibited by continued investment in fossil fuels. We recommend that the University support

³²Elgin, B. (2014). *Shell Pressured to Sever Ties With ALEC*. [online] Businessweek.com. Available at: <http://www.bloomberg.com/bw/articles/2014-11-04/shell-oil-pressured-to-sever-ties-with-alec-over-climate-change-positions> [Accessed 26 Feb. 2015].

³³ Rolling Stone, (2013). *Big Oil's Big Lies About Alternative Energy*. [online] Available at: <http://www.rollingstone.com/politics/news/big-oils-big-lies-about-alternative-energy-20130625> [Accessed 26 Feb. 2015].

its students and staff in creating a low carbon economy. Divestment has been recognised as a significant step towards this goal. Furthermore, it provides the university with an opportunity to fulfil its mission statement and “display its leadership and commitment to Scotland, the UK and the world”.