The Case for Fossil Fuel Divestment at Stanford University

A Report by Fossil Free Stanford

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Introduction

Students at Stanford and young people around the world recognize that climate change poses an unprecedented threat to our future. Our global society has failed thus far to take meaningful action to address this challenge and continued inaction will have egregious consequences for all of humanity, particularly those in developing countries and marginalized communities.

The scientific consensus is not only that "warming of the climate system is unequivocal," but also that the vast majority of proven fossil fuel reserves must stay in the ground in order to avoid catastrophic climate change.[1] In response to this frightening reality, a global movement has risen to confront the challenge by calling for divestment from the fossil fuel industry. It is unacceptable to profit from the destruction of our planet, and divestment, as a strategy, can have a powerful social and political impact.

Already, the fossil free movement has spread to over 400 colleges, cities, and religious institutions around the world. Thus far, eleven colleges and over 20 cities have committed to divestment, and the movement is gaining increasingly widespread national and international attention.[2]

Stanford University was founded to "promote the public welfare by exercising an influence on behalf of humanity and civilization."[3] Stanford considers environmental sustainability to be a core value.[4] Hundreds of our engineers, scientists, policy experts, and economists are working to better understand and combat climate change. However, at the same time, our endowment is invested in the very fuels causing this crisis. We are tacitly supporting companies that use their enormous wealth and power to perpetuate climate change denial and inaction.

With the vast financial and social capital we leverage, Stanford has a unique opportunity to drive real action on climate change by divesting from the fossil fuel industry. Doing so will not only be a sound financial decision for our institution's portfolio, it will promote the wellbeing of current and future graduating classes, who deserve a future that is not defined by climate chaos.

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[1] Alexander, et al. *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis - Summary for Policymakers*.
[2] "Fossil Free Commitments."
[3] Hennessy, "An Influence on Behalf of Humanity."
[4] "About."

Our Moral Imperative: The Terrifying Consequences of Climate Change

"Climate change is the problem of our time." – John Hennessy

Recently, the math of climate change has come into stark relief. In order to avoid global calamity, the international community must keep warming below 2°C. There are few areas of international agreement on climate change, but the 2°C limit is one of them. Nearly all countries, including the largest emitters, the US and China, have recognized that warming beyond this limit would represent "dangerous anthropogenic interference with the climate system."[5] We can only afford to produce 565 more gigatons of carbon dioxide if we wish to avoid exceeding the 2°C limit.*[,6] Yet current global proven reserves of fossil fuels amount to a massive 2,795 gigatons.[7] This means we must keep four fifths of the proven reserves in the ground. Our ability to meet this challenge will impact the lives of hundreds of millions of people, define the future of entire species and ecosystems, determine the survival of small island nations and vulnerable communities around the world, and dictate the burden that must be borne not only by our generation, but by all those that follow.

We are already seeing the impacts of climate change in the form of increasingly severe extreme weather events, melting glaciers, acidifying oceans, species extinction, and spreading tropical disease. However, these impacts pale in comparison to those we can expect if all 2,795 gigatons are released. A business as usual scenario would lead to as much as 6°C of warming by the end of this century.[8] With these levels of warming, ten or hundreds of millions of people will be displaced by rising sea levels and many more by increased flooding and storm surges; extreme heat waves and droughts will decimate crop yields leading to famine and starvation; critical ecosystems such as the world's coral reefs and the Amazon rainforest may be destroyed, and perhaps most frighteningly, positive feedbacks may be set in motion that will perpetuate the warming and make it irreversible.[9,10]

The world's most impoverished communities, who have done the least to cause climate change, will bear the brunt of its impacts. In the last 25 years, 95% of deaths that

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[5] *Copenhagen Accord.*

* This estimate refers to the amount of CO_2 the can be emitted prior to 2050 to maintain an 80% chance of avoiding 2ºC of warming. The IEA and the IPCC present slightly different carbon budgets based on different timeframes and levels of certainly. However, all estimates suggest that a significant fraction of fossil reserves must be left in the ground.

[6] *Unburnable Carbon – Are the World's Financial Markets Carrying a Carbon Bubble?.*

[7] Ibid.

[8] Jeremy Lovell, "Clean Energy Lags Put World on Pace for 6 Degrees Celsius of Global Warming."

[9] Potsdam Institute for Climate Impact Research and Climate Analytics, *Turn Down the Heat - Why a 4C Warmer World Must Be Avoided.*

[10] Church et al., *Ice and Sea-level Change.*

resulted from natural disasters occurred in developing nations.[11] As sea levels rise, low-lying countries like Bangladesh will experience extreme flooding. Coastal communities in the United States, particularly in the southeast, will face the same threat; however, the US may have the resources to build seawalls or flood warning systems that mitigate the damage. Similarly, while a major drought in the US can lead to higher food prices, a major drought in a country like Sierra Leone that relies heavily on subsistence agriculture can trigger mass starvation. For these reasons, Bangladesh and Sierra Leone are among the countries most likely to be ravaged by climate change.[12]

Warming and increased flooding also lead to increased spread of disease, particularly in countries with poor sanitation. In 2003, The World Health Organization estimated that between extreme weather and disease, climate change already caused more than 150,000 deaths per year.[13] More recent estimates have put the number at 300,000 deaths and suggest that an additional 325 million people are seriously (though non-fatally) affected by climate change.[14] Developed and developing countries alike will be hit by the impacts of climate change, but those who are already most vulnerable will face the highest cost in terms of population displacement and loss of human life. As UN Secretary-General Ban Ki Moon has said, "climate change is the single greatest threat to sustainable development."[15]

Our understanding of these devastating consequences of climate change is shaped largely by the rigorous work of Stanford scientists. And while these consequences might seem far away, the vast majority of them are projected to occur during the lifetimes of current Stanford students. Stanford, as an enduring educational institution, must be concerned with the world in which its current and future students will employ the skills and talents that Stanford nurtures.

Our Ask

Given the escalating impacts of climate change, it is clear that we must not exceed 2°C of warming. Thus our demands of the fossil fuel companies are simple. In order to show that they are committed to a livable future, they must:

- **Stop seeking new fossil reserves**
- **Stop promoting climate change denial and lobbying against climate policy**
- **Commit to keeping 80% of their proven reserves in the ground**

As long as fossil fuel companies continue with business as usual, they must be thought of as an unethical industry, recklessly pushing us toward global catastrophe. The stranglehold that

[11] Hoppe, *Proposal – Developing Countries Are Most Affected by Climate Change and Need the Support of Industrialized Countries to Adapt to the Unavoidable Risks*.
[12] Gates, "These Countries Face The Biggest Threats From Climate Change."
[13] "WHO | Climate Change."
[14] *No Place Like Home Where Next for Climate Refugees?*.
[15] Section, "UN News - Greater Financial Investment Needed to Combat Climate Change – UN Chief."

these companies maintain on our government and our society makes it difficult to completely stop using fossil fuels. However, we can stop investing in them. Investments, by definition, are made with an eye to the future, and we should not be investing in an industry whose actions will compromise the future of our entire planet and all of its inhabitants. We therefore call on Stanford University to **freeze all new investment in the 200 largest publically traded fossil fuel companies, and to divest fully from any direct ownership of these companies and any commingled funds that include fossil fuel public equities and corporate bonds within 5 years.** [†]

Fossil Fuel Divestment as a Tool for Driving Large Scale Change

"To refuse to use every tool at our disposal in this fight -- to embrace inaction -- is to endorse a trajectory that will lead to suffering, privation, and calamity. We owe it to those who our institutions and investments serve and will serve in the future to do everything we can to prevent this crisis."
- Seattle Mayor Mike McGinn in a letter to the President of Harvard

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We applaud Stanford's campus sustainability programs, particularly the ambitious Stanford Energy Systems Innovation project. Stanford has repeatedly shown itself to be a leader in implementing new and innovative energy technologies. However, climate change is more than just a technological challenge, it is a social, moral, and political issue.

Fossil fuel divestment and campus sustainability are complementary strategies. Stanford must be a moral leader in addition to being a technological leader. It is inconsistent and ineffective for Stanford to green our own campus while investing heavily in the very industry that is disrupting our climate. By focusing solely on our campus, we miss the bigger picture and fail to leverage our prominence as an institution. Reducing our own greenhouse gas emissions is the right thing to do, but it is only a drop in the proverbial bucket. If the rest of the US and the world continue with business as usual, Stanford's campus sustainability will not prevent catastrophic consequences for hundreds of millions of people. By leading a national movement to address fossil fuels head-on, Stanford can reshape the public discourse and make a powerful statement that the status quo is unacceptable.

To fully grasp the potential of the fossil fuel divestment movement, it is helpful to consider the precedents set by previous divestment campaigns. A study by researchers at Oxford University and Bloomberg New Energy Finance found that "In almost every

[†] The top 200 largest punlically traded fossil fuel companies are determined based on size of carbon reserves. A list of these companies is provided in the appendix.

divestment campaign … from adult services to Darfur, from tobacco to South Africa, divestment campaigns were successful in lobbying for restrictive legislation."[16]

A particularly instructive example is that of Apartheid South Africa. The apartheid divestment campaign began at Stanford and Michigan State in 1977 and eventually led over 150 universities to divest from companies involved with South Africa's oppressive regime.[17] Studies suggest that the direct economic impact of this large-scale divestment was minimal.[18] However, by demonstrating that participation in apartheid South Africa was unacceptable, these universities sparked a national movement. The US government soon followed suit, passing sanctions against South Africa.[19] When Nelson Mandela was released from prison, one of his first stops was in Oakland where he thanked the University of California system for divesting, an action that he saw as a turning point for the anti-apartheid movement.[20, 21] There is no Nelson Mandela for climate change, but when the history books are written, we would like Stanford to be recognized as a leader of the movement to preserve our climate.

As with the apartheid campaign, the fossil free movement is about more than responsible investment. Divestment is a tactic for achieving the larger goal of a livable planet. Though many of us seek to minimize our own personal environmental impact, we recognize that in an energy dependent society, we need systemic change. The entrenched interests and political power of the fossil fuel industry have thus far thwarted all attempts at effective national climate policy. The closest we have come was in 2009, when a comprehensive climate bill called The American Clean Energy and Security Act was passed by the House of Representatives. However, Capitol Hill was overrun with more than 800 lobbyists and $175 million from the fossil fuel industry, and the bill eventually died in the Senate.[22]

Since this failure, many members of Congress have been hesitant to address climate change, and some of those who have tried have been unseated by well-financed climate change deniers.[23] By divesting from fossil fuel companies, Stanford can help to remove their veneer of respectability and create the political space for meaningful legislation.

Such a strategy has proven effective before, perhaps most notably in the case of divestment from the tobacco industry. As noted by John Dunham, a fiscal manager for the tobacco conglomerate Philip Morris, divesting from a company "Labels the company as being different from others — a rogue."[24] Much like the fossil fuel industry, the tobacco industry fought successfully for decades to obscure the scientific consensus that its products were

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[16] Tilbury, Caldecott, and Ansar, *Stranded Assets and the Fossil Fuel Divestment Campaign: What Does Divestment Mean for the Valuation of Fossil Fuel Assets?*.
[17] Knight, "Sanctions, Disinvestment, and U.S. Corporations in South Africa."
[18] "Does Divestment Work?".
[19] *Sanctioning Apartheid*.
[20] Masover, "Nelson Mandela and the Death of UC Berkeley's Eshleman Hall."
[21] Kifner, "Mandela Ends Tour of U.S. With Oakland Appearance."
[22] Merkelson, "How the Influence Industry Killed Climate Change Legislation | Money & Politics, What Matters Today."
[23] "Hot In My Backyard."
[24] Wander, "Fiscal Versus Social Responsibility."

detrimental to human health. However, the stigmatization of the industry brought by divestment made it easier for policymakers to regulate and tax tobacco.

In the case of fossil fuels, divestment can create a political opportunity to regulate or tax carbon. By making clear that fossil fuels must be phased out, and by putting our money where our mouth is, or rather, putting our investments where the science is, we will make clear that the debate is over. Neglecting to take action to address climate change is irresponsible. The time for action is now, and Stanford has an opportunity to lead the way.

Divestment is the Right Approach

There are many ways for Stanford to align its investments with its values. However, in the case of fossil fuels, divestment is the only viable approach. Strategies like proxy voting and shareholder resolutions are important tools when seeking to improve the operating practices of a company, but are of little use when the underlying business model is itself the problem.

The Securities and Exchange Commission (SEC) allows corporations to disregard resolutions that relate to "ordinary business operations."[25] This rule would invalidate most resolutions that demand fundamental changes to a company's business model. Furthermore, no group of shareholders would willingly vote for a resolution requiring that 80% of fossil fuel reserves remain in the ground, as such a resolution would undermine their investments. Concerns about giving up our seat at the table are irrelevant when our seat at the table has not and will not allow us to address the challenge at hand.

Another advantage of fossil fuel divestment is that, by driving policy change, it will impact the entire fossil fuel industry. The 200 largest publically traded fossil fuel companies hold proven reserves that are more than sufficient to surpass the 2°C limit. However, these companies account for only about one fourth of global proven reserves.[26] The majority of the world's reserves are owned by governments and national energy companies that Stanford cannot hope to directly affect. However, by reshaping the political debate and in turn influencing US and global energy policy, we can help keep these reserves in the ground as well.

Divestment from fossil fuels is not a disavowal of responsibility; it is a statement of values - an embrace of our responsibility to future generations. Given Stanford's prominence as an institution and level of scientific expertise, a decision to divest would spark discussion and deal a powerful blow to the credibility of the fossil fuel industry. Rather than focusing on impractical shareholder resolutions, Stanford should engage the issue directly and fulfill its ethical obligation to its current and future students by divesting fully from the fossil fuel industry.

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[25] Yu, Rambo, and LEWIS, Correspondences Relating To Proposal submitted to ExxonMobil by Green Century Capital Management; Trillium Asset Management Corporation... (n.d.).
[26] *Unburnable Carbon – Are the World's Financial Markets Carrying a Carbon Bubble?*.

The Carbon Bubble and the Economic Case for Divestment

In addition to strong moral arguments for divestment, there are also compelling financial reasons to transition a portfolio away from fossil fuels. As previously discussed, the international community has agreed upon a limit of 2°C of warming. To avoid surpassing this limit, we must keep four-fifths of proven fossil fuel reserves in the ground.[27] The implication of these numbers is that our financial markets are carrying a massive "carbon bubble."[28] We are pricing fossil fuel companies based on unburnable reserves, and are "fail[ing] to properly account for the risks inherent in owning carbon-intensive assets."[29] For instance, an HSBC analysis of six major oil and gas companies estimates that "the value at risk from unburnable reserves would be equivalent to [as much as] 40-60% of the market capitalization."[30] Given the carbon intensity of coal, the risk associated with coal holdings is likely even higher. The phenomenon of overvalued fossil fuel stocks was first observed by the Carbon Tracker Institute, which recommended that "investors need to respond to this systemic risk to their portfolios and the threat it poses of a carbon bubble bursting." While this idea is fairly new, it has quickly gained traction in the financial industry. Major financial institutions such as Goldman Sachs, Citibank, and Deutsche Bank are recognizing the risk of fossil fuel investments and some, including the Norwegian financial services group Storebrand, and Dutch bank Rabobank have already begun divesting fossil assets.[31,32]

As the consequences of unchecked climate change worsen and countries take action to curb carbon emissions, Stanford's fossil fuel investments are at risk of becoming stranded assets. As Stanford Trustee Tom Steyer puts it, "At the moment, other investors have not fully realized the risk that carbon reserves will become a stranded asset; if you acknowledge what your own science departments are telling you, this gives you an edge relative to those investors."[33] Our economic system is resting on top of a huge carbon bubble, and fossil fuel divestment offers a tremendous opportunity for Stanford's endowment to come out ahead of the curve.

Even without considering the carbon bubble, divesting from fossil fuels is unlikely to harm our endowment. A study by the Aperio Group estimated a trivial 0.0034% theoretical return penalty from full divestment and found that a "full carbon divestment" portfolio outperformed the Russell 3000 benchmark in 73% of ten-year periods over a 22-year historical analysis.[34] Another 22 year analysis by Advisor Partners found that the "simulated performance of [a] full divestment portfolio was virtually indistinguishable from that of the S&P 500 index."[35] A shorter-term analysis by MSCI found that the portfolio formed by removing fossil fuels from the MSCI All Country World Index Investible Market Index

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[27] Ibid.
[28] Ibid.
[29] *Stranded Carbon Assets - Why and How Carbon Risks Should Be Incorporated in Investment Analysis.*
[30] Robins, Mehta, and Spedding, *Oil & Carbon Revisited: Value at Risk from Unburnable Reserves.*
[31] "Beyond Fossil Fuels."
[32] "Two More Finance Institutions Divest from Fossil Fuels | EAEM."
[33] Steyer, "Statement of Tom Steyer to the Middlebury College Board of Trustees."
[34] Geddes, *Do the Investment Math: Building a Carbon-Free Portfolio.*
[35] Cronin, Blachman, and Kern, *Fossil Fuel Divestment: Risks and Opportunities.*

(ACWI IMI) closely tracked the MCSI ACWI IMI, but that the active return differential over the entire time series was 1.2 percent in favor of the fossil free portfolio.[36]

Other studies by S&P Capital IQ and Impax Asset Management have found even more positive results. S&P Capital IQ found that over the past ten years, a $1 billion endowment with no fossil fuel investments would have yielded $119 million more than an endowment with typical fossil investments.[37] Impax found that portfolios containing significant investment in renewables and efficiency and no investment in fossil fuels tend to perform better than a typical portfolio.[38] All of these studies viewed in concert suggest that there is little risk to excluding fossil fuels from a well-managed portfolio.

Fund managers considering divestment often fear that investments must be withdrawn from the best-managed comingled funds. However, this is a backward looking and unfounded assumption. At least five mutual funds already offer fossil free options,[39] and as the demand becomes apparent, other funds will begin to offer these options as well. In considering the financial impacts of divesting, we encourage Stanford not to be limited by the rigid thinking that has prevented some schools from taking advantage of this opportunity. Stanford can collaborate with other major universities and with fund managers to create fossil free options that continue to bring exceptionally high returns.

Supporting a Renewable Future

> *"[Transforming the energy system] is not just a once-in-a-civilization business opportunity. It is one of the greatest transformations in the history of our species. Humans are inventing a new fire, not dug from below but flowing from above. Not scarce, but bountiful. Not local, but everywhere. Not costly, but free. It is making energy do our work, without working our undoing."- Amory Lovins*

A clean energy future that ensures the safety of our climate cannot include significant utilization of hydrocarbons. While we recognize that there may be a short-term role for natural gas, this role must be kept short-term if we wish to stabilize the climate.[40] Business as usual natural gas development will result in a dangerous 60% increase in gas consumption by 2035.[41] Even the International Energy Agency's GAS scenario, which focuses on replacing coal and oil with natural gas, puts us on a path toward at least 3.5 ºC of warming.[42] Natural gas is not a solution to our climate crisis. In cases with significant methane leaks, natural gas can be even worse than coal or oil and recent research indicates that the scale of these leaks in

[36] *Responding to the Call for Fossil-fuel Free Portfolios.*
[37] Dreier, "Obama Embraces the Divestment Movement."
[38] *Beyond Fossil Fuels: The Investment Case for Fossil Fuel Divestment.*
[39] "Green America."
[40] Levi, "Climate Consequences of Natural Gas as a Bridge Fuel."
[41] "World Energy Outlook - Quotes."
[42] *World Energy Outlook 2011 Special Report Factsheet - Are We Entering a Golden Age of Gas?.*

the US is much more significant than previously recognized.[43, 44] Increased investment in natural gas has also diverted funds away from renewable energy projects and is locking us into an unsustainable generation mix for the next several decades.[45]

Because natural gas has a lower carbon content than other fossil fuels, it is not the primary target of our campaign. In fact, on a carbon basis, only 5 of the top 200 publicly traded fossil fuel companies hold primarily natural gas reserves. This contrasts with 95 holding primarily oil reserves and 100 holding primarily coal reserves.[46] Nonetheless, natural gas is a significant contributor to climate change and cannot be ignored.

In order to secure a clean and prosperous future, we must rapidly shift our energy system toward renewable resources. While fossil fuel companies often tout their investment in renewable energy, they have done everything in their power to prevent this shift. The $9 billion that US oil companies have invested in renewables over the past decade is just a tiny fraction of total US renewables investment, which exceeded $250 billion over the same time frame.[47, 48] This $9 billion appears even more miniscule when compared with the annual profits of these companies. ExxonMobil made $44.9 billion in 2012 alone.[49] The five largest oil and gas companies have recorded more than $1 trillion in profits over the past decade.[50]

Beyond the sheer scale of the financial resources of these companies, the more relevant comparison lies in their active investments in new fossil fuel reserves. Any renewable investments by fossil fuel companies are dwarfed by expenditure on exploration for new fossil fuel reserves. The oil industry has poured $341 billion into the development of new tar sands resources.[51] ExxonMobil alone plans to invest $190 billion in the exploration and development of new oil and gas resources over the next five years.[52] Though the world's current fossil fuel reserves are already enough to cause devastating warming, these companies continue to use their vast financial capital to secure new reserves.

Fossil fuel companies are not committed to forging a renewable future; they are committed to profiting as much as possible from their existing and expanding fossil fuel reserves. Their business model is not compatible with a livable climate, and Stanford cannot continue to invest in this destruction. Our own scientists show us that a renewable energy future is technologically and economically feasible,[53] but investing in fossil fuel companies – including all of their fossil fuel exploration and lobbying – is not a viable way to get there.

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[43] Howarth, Santoro, and Ingraffea, "Methane and the Greenhouse-gas Footprint of Natural Gas from Shale Formations."
[44] Miller et al., "Anthropogenic Emissions of Methane in the United States."
[45] *Global Trends in Renewable Energy Investment 2011*.
[46] *Unburnable Carbon – Are the World's Financial Markets Carrying a Carbon Bubble?*.
[47] Wells, "Big Oil's Big in Biofuels."
[48] *Global Trends in Renewable Energy Investment 2013*.
[49] Wells, "Big Oil's Big in Biofuels."
[50] "Big Oil, Big Profits."
[51] Wells, "Big Oil's Big in Biofuels."
[52] Warner, "Exxon to Invest $190B Over Next 5 Years on New Resource Opportunities."
[53] Bergeron, "The World Can Be Powered by Alternative Energy, Using Today's Technology, in 20-40 Years, Says Stanford Researcher Mark Z. Jacobson."

A Crossroads: Stanford's Legacy in the Fight Against Climate Change

With respect to climate change, there are two possible trajectories that our global society can choose to take. We can continue with business as usual, a path that will lead to extreme weather, drought, and famine; extinction for thousands of species; and disease and dislocation for hundreds of millions of people. Alternately, we can choose to shift toward a clean energy economy that can continue to meet our energy needs for generations to come. Under the latter scenario, Stanford's decision to divest will be seen as visionary. Looking back, it will not only have been the right ethical decision, but also the right financial decision, as the carbon bubble will burst. Under the former scenario, the minimal increase in risk that Stanford may assume by divesting from fossil fuels will be the least of our concerns. Under such a devastating scenario, a failure to divest would no doubt be viewed with regret as a missed opportunity and a betrayal to our university's principles.

Stanford must seize this opportunity, not only to be on the right side of history, but to create the right side of history. Stanford is a pioneer, an innovator, a leader. Now is no time shrink from the mantel of leadership. We must provide the spark that precipitates the shift to a sustainable future.

Divesting fully from the 200 largest fossil fuel companies may not be easy, but doing the right thing rarely is. Divestment can be a good financial decision, but in light of the climate crisis we face it is the *only* acceptable moral decision. For the sake of its current students, all of the graduating classes to come, and future generations around the world, Stanford has an obligation to take a stand against climate change and confront the greatest moral challenge of our time.

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Appendix: The Top 200 Fossil Fuel Companies

The following is the list of the largest 200 coal, oil and gas companies, based on the amount of carbon in their reserves.
Source: "Unburnable Carbon," The Carbon Tracker Initiative, http://www.carbontracker.org/wp-content/uploads/downloads/2012/08/Unburnable-Carbon-Full1.pdf

Company	GtCO2	Primary Fossil
Severstal JSC	141.6	Coal
Lukoil Holdings	43.56	Oil and/or Gas
Exxon Mobil Corp.	41.03	Oil and/or Gas
BP PLC	34.6	Oil and/or Gas
Gazprom OAO	28.83	Oil and/or Gas
Chevron Corp.	21.22	Oil and/or Gas
ConocoPhillips	19.14	Oil and/or Gas
Total S.A.	18.02	Oil and/or Gas
Anglo American PLC	16.75	Coal
Royal Dutch Shell PLC	16.2	Oil and/or Gas
BHP Billiton	16.07	Coal
Shanxi Coking Co. Ltd.	14.98	Coal
Exxaro Resources Ltd.	13.37	Coal
Petrobras	11.62	Oil and/or Gas
Datang International Power Generation Co. Ltd.	11.21	Coal
Xstrata PLC	11.6	Coal
Rosneft	10.78	Oil and/or Gas
Peabody Energy Corp.	10.23	Coal
Mechel OAO	8.9	Coal

ENI S.p.A.	8.04	Oil and/or Gas
Inner Mongolia Yitai Coal Co. Ltd.	7.78	Coal
Occidental Petroleum Corp.	7.58	Oil and/or Gas
Bashneft	7.26	Oil and/or Gas
China Shenhua Energy Co. Ltd.	6.91	Coal
SINOPEC Shandong Taishan Petroleum Co.Ltd.	6.83	Oil and/or Gas
Coal India Ltd.	6.69	Coal
Arch Coal Inc.	5.57	Coal
Rio Tinto	5.23	Coal
Evraz Group S.A.	4.86	Coal
Public Power Corp. S.A.	4.56	Coal
Canadian Natural Resources Ltd.	4.49	Oil and/or Gas
Yanzhou Coal Mining Co. Ltd.	4.46	Coal
Mitsubishi Corp.	4.31	Coal
Devon Energy Corp.	4.19	Oil and/or Gas
Consol Energy Inc.	4.5	Coal
Datong Coal Industry Co. Ltd.	4.3	Coal
Suncor Energy Inc.	3.81	Oil and/or Gas
Apache Corp.	3.65	Oil and/or Gas
Anadarko Petroleum Corp.	3.47	Oil and/or Gas
Bumi Resources	3.28	Coal
Hess Corp.	3.13	Oil and/or Gas
Repsol YPF S.A.	3.04	Oil and/or Gas
United Co. Rusal PLC	3.02	Coal

Vale SA	3.01	Coal
Pingdingshan Tianan Coal Mining Co. Ltd.	2.97	Coal
Tata Steel Ltd.	2.96	Coal
BG Group PLC	2.77	Oil and/or Gas
Marathon Oil Corp.	2.63	Oil and/or Gas
Banpu PCL	2.55	Coal
Inpex Corp.	2.54	Oil and/or Gas
Sasol Ltd.	2.51	Coal
United Industrial Corp. Ltd.	2.48	Coal
Statoil ASA	2.48	Oil and/or Gas
Polyus Gold OAO	2.47	Coal
Alpha Natural Resources Inc.	2.29	Coal
Teck Resources Ltd.	2.7	Coal
Magnitogorsk Iron & Steel Works	2.2	Coal
Raspadskaya OJSC	2.09	Coal
Kuzbassenergo	2.03	Coal
BHP Billiton	2.02	Oil and/or Gas
CNOOC Ltd.	1.94	Oil and/or Gas
RWE AG	1.94	Coal
Massey Energy Co.	1.93	Coal
Eurasian Natural Resources Corp. PLC	1.93	Coal
Wesfarmers Ltd.	1.86	Coal
Husky Energy Inc.	1.82	Oil and/or Gas
Churchill Mining PLC	1.74	Coal

Novatek	1.73	Oil and/or Gas
Talisman Energy Inc.	1.66	Oil and/or Gas
Pioneer Natural Resources Co.	1.61	Oil and/or Gas
Idemitsu Kosan Co. Ltd.	1.58	Coal
SK Holdings Co. Ltd.	1.56	Oil and/or Gas
Petroleum Development Corp.	1.51	Oil and/or Gas
Tata Power Co. Ltd.	1.49	Coal
Alliance Resource Partners L.P.	1.47	Coal
Cenovus Energy Inc.	1.46	Oil and/or Gas
Nexen Inc.	1.42	Oil and/or Gas
EOG Resources Inc.	1.35	Oil and/or Gas
NACCO Industries Inc. (Cl A)	1.33	Coal
TransAlta Corp.	1.23	Coal
Noble Energy Inc.	1.16	Oil and/or Gas
Sherritt International Corp.	1.15	Coal
PT Bayan Resources	1.14	Coal
YPF S.A.	1.8	Oil and/or Gas
Novolipetsk Steel OJSC	1.3	Coal
New Hope Corp. Ltd.	1.3	Coal
OMV AG	1.08	Oil and/or Gas
New World Resources N.V.	1.07	Coal
Mitsui & Co. Ltd.	1.03	Coal
Kazakhmys PLC	0.99	Coal
Chesapeake Energy Corp.	0.96	Oil and/or Gas

African Rainbow Minerals Ltd.	0.95	Coal
International Coal Group Inc.	0.95	Coal
Penn West Petroleum Ltd.	0.94	Oil and/or Gas
Patriot Coal Corp.	0.94	Coal
Aston Resources Pty Ltd.	0.93	Coal
Oil Search Ltd.	0.91	Oil and/or Gas
Tokyo Electric Power Co. Inc.	0.89	Coal
AGL Energy	0.89	Coal
Cloud Peak Energy Inc.	0.85	Coal
CLP Holdings Ltd.	0.83	Coal
Polo Resources Ltd.	0.82	Coal
Woodside Petroleum Ltd.	0.81	Oil and/or Gas
Whitehaven Coal Ltd.	0.79	Coal
Canadian Oil Sands Ltd.	0.78	Oil and/or Gas
Imperial Oil Ltd.	0.76	Oil and/or Gas
Mongolian Mining Corp.	0.75	Coal
PT Adaro Energy	0.74	Coal
Murphy Oil Corp.	0.72	Oil and/or Gas
Allete Inc.	0.72	Coal
Plains Exploration & Production Co.	0.71	Oil and/or Gas
Whiting Petroleum Corp.	0.71	Oil and/or Gas
EnCana Corp.	0.71	Oil and/or Gas
Optimum Coal Holdings Ltd.	0.67	Coal
Newfield Exploration Co.	0.64	Oil and/or Gas

ArcelorMittal	0.62	Coal
Coal of Africa Ltd.	0.59	Coal
James River Coal Co.	0.57	Coal
Continental Resources Inc. Oklahoma	0.56	Oil and/or Gas
Westmoreland Coal Co.	0.56	Coal
Macarthur Coal Pty Ltd.	0.53	Coal
Aquila Resources Ltd.	0.53	Coal
Pacific Rubiales Energy Corp.	0.52	Oil and/or Gas
Linn Energy LLC	0.52	Oil and/or Gas
Western Coal Corp.	0.49	Coal
Cliffs Natural Resources Inc.	0.47	Coal
Crescent Point Energy Corp.	0.47	Oil and/or Gas
Wescoal Holdings Ltd.	0.46	Coal
Concho Resources Inc.	0.46	Oil and/or Gas
PTT PCL	0.45	Oil and/or Gas
Walter Energy, Inc.	0.45	Coal
Quicksilver Resources Inc.	0.44	Oil and/or Gas
Berry Petroleum Co. (Cl A)	0.43	Oil and/or Gas
Huolinhe Opencut Coal Industry Corp. Ltd.	0.41	Coal
Straits Asia Resources Ltd.	0.39	Coal
Range Resources Corp.	0.38	Oil and/or Gas
Capital Power Corp.	0.38	Coal
Energen Corp.	0.38	Oil and/or Gas
Enerplus Corp.	0.37	Oil and/or Gas

Tullow Oil PLC	0.37	Oil and/or Gas
Ecopetrol S.A.	0.36	Oil and/or Gas
SandRidge Energy Inc.	0.36	Oil and/or Gas
Santos Ltd.	0.36	Oil and/or Gas
Cairn Energy PLC	0.35	Oil and/or Gas
Fushan International Energy Group Ltd.	0.34	Coal
Itochu Corp.	0.34	Coal
Noble Group Ltd	0.34	Coal
El Paso Corp.	0.33	Oil and/or Gas
Arc Resources Ltd.	0.33	Oil and/or Gas
Pengrowth Energy Corp.	0.32	Oil and/or Gas
Lundin Petroleum AB	0.31	Oil and/or Gas
Petrobank Energy & Resources Ltd.	0.31	Oil and/or Gas
Mariner Energy	0.29	Oil and/or Gas
Forest Oil Corp.	0.29	Oil and/or Gas
Northern Energy Corp. Ltd.	0.29	Coal
Fortune Minerals Ltd.	0.28	Coal
Prophecy Resource Corp.	0.28	Coal
NTPC Ltd.	0.28	Coal
Mitsui Matsushima Co. Ltd.	0.28	Coal
Black Hills Corp.	0.27	Coal
Grupo Mexico S.A.B. de C.V.	0.26	Coal
Gansu Jingyuan Coal Industry & Electricity Power	0.26	Coal
Jindal Steel & Power Ltd.	0.26	Coal

Bandanna Energy Ltd.	0.25	Coal
Bankers Petroleum Ltd.	0.25	Oil and/or Gas
Soco International PLC	0.25	Oil and/or Gas
ATP Oil & Gas Corp.	0.25	Oil and/or Gas
Questar Corp.	0.23	Oil and/or Gas
Cimarex Energy Co.	0.23	Oil and/or Gas
Irkutskenergo	0.23	Coal
Homeland Energy Group Ltd.	0.23	Coal
Zhaikmunai L.P.	0.23	Oil and/or Gas
Alcoa Inc.	0.23	Coal
GDF Suez S.A.	0.22	Oil and/or Gas
Bonavista Energy Corp	0.21	Oil and/or Gas
Swift Energy Co.	0.21	Oil and/or Gas
Compania Espanola de Petroleos S.A.	0.21	Oil and/or Gas
PetroBakken Energy Ltd.	0.21	Oil and/or Gas
Premier Oil PLC	0.21	Oil and/or Gas
Neyveli Lignite Corp. Ltd.	0.19	Coal
SM Energy Co.	0.19	Oil and/or Gas
Oil & Natural Gas Corp. Ltd.	0.18	Oil and/or Gas
EQT Corp.	0.18	Oil and/or Gas
Williams Cos.	0.18	Oil and/or Gas
INA-Industrija Nafte	0.17	Oil and/or Gas
Global Energy Development PLC	0.17	Oil and/or Gas
Venoco Inc.	0.17	Oil and/or Gas

Oil India Ltd.	0.17	Oil and/or Gas
Southwestern Energy Co.	0.16	Oil and/or Gas
PA Resources AB	0.16	Oil and/or Gas
Resolute Energy Corp.	0.16	Oil and/or Gas
Ultra Petroleum Corp.	0.16	Oil and/or Gas
Zhengzhou Coal Industry & Electric Power	0.15	Coal
Gujarat NRE Coking Coal Ltd.	0.12	Coal
Denbury Resources Inc.	0.6	Oil and/or Gas
FirstEnergy Corp.	0.5	Coal
Gujarat NRE Coke Ltd.	0.4	Coal
Jizhong Energy Resources Co. Ltd.	0.3	Coal
Baytex Energy Corp.	0.3	Oil and/or Gas
MOL Hungarian Oil and Gas Plc	0.2	Oil and/or Gas