

The Overwhelming Case for Divestment

“The University is also an important force for good in Massachusetts and is vital to its future. It shapes the Commonwealth in many ways: It produces an educated citizenry and talented workforce; it conducts important research that saves and improves lives; it fuels the state’s economy; and it provides services that enhance the state’s social well-being.” -UMass President Robert Caret, from the introduction to the new report *UMass Performance: Accountable and on the Move*

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The UMass Fossil Fuel Divestment Campaign

Establishing the Crisis

The world's climate is changing at an alarming rate. However, what is more alarming is the way that much of the general public and our political leaders seem to act as if we are not in the midst of a crisis. Scientists' concern about anthropogenic climate change (ACC) was voiced long ago, as evidenced by James Hansen, the former director of NASA's Goddard Institute for Space Studies, testifying before Congress in 1988 about the dangers of failing to address it. Between 97 and 98% of scientists have independently verified ACC since then,¹ and many established scientific bodies now use words like "unequivocal" (Intergovernmental Panel on Climate Change) and "incontrovertible" (American Physical Society) to describe the phenomenon. Despite this scientific consensus and growing concern from scientists about the dangers of unchecked ACC, national policies that reflect the urgency of climate change have been conspicuously absent. This year, James Hansen chose to retire after a 46-year career at NASA in order to take legal action against the government for failing to limit carbon emissions in the face of warnings from scientists and increasingly dire observations of the effects of current warming.

Since the beginning of the 20th century, carbon dioxide emissions from the burning of fossil fuels have caused our planet to warm 0.8°C (1.5°F), with two-thirds of that amount occurring since 1980.² It is no coincidence that 2012 was confirmed as the hottest year ever recorded in the contiguous United States since records began in 1895.³ The occurrence of numerous anomalous weather events—a scorching drought, sweeping wildfires, and the unprecedented Hurricane Sandy, just in the United States—also follow the predictions of our best climate scientists who warn that climate change is "loading the dice" for extreme weather. This May, when researchers confirmed that carbon dioxide in the atmosphere reached 400 parts per million, a concentration that hasn't occurred in at least 3 million years, it served as a stark reminder that we are moving further and further away from the world in which civilization developed.⁴ Beyond the scientific certainty that the planet is transforming before our eyes, researchers also have strong indications of where we're headed in the not-too-distant future. Climatologists' models show a 4 to 6°C (7.2 to 10.8 °F) increase in global average temperatures by the end of the century if mankind remains in a business-as-usual carbon emissions scenario.^{5,6,7,8,9,10} It is crucial to restate that this scenario

¹ William R. L. Anderegg et al., "Expert Credibility in Climate Change," *Proceedings of the National Academy of Sciences* (June 21, 2010), doi:10.1073/pnas.1003187107.

² National Research Council (U.S.). Committee on America's Climate Choices and National Academies Press (U.S.), *America's Climate Choices* (Washington, D.C.: National Academies Press, 2011).

³ Fenimore Crouch, "State of the Climate | National Overview - Annual 2012," May 16, 2012, <http://www.ncdc.noaa.gov/sotc/national/2012/13>.

⁴ Justin Gillis, "Carbon Dioxide Level Passes Long-Feared Milestone," *The New York Times*, May 10, 2013, sec. Science / Environment, <http://www.nytimes.com/2013/05/11/science/earth/carbon-dioxide-level-passes-long-feared-milestone.html>.

⁵ A. P. Sokolov et al., "Probabilistic Forecast for Twenty-First-Century Climate Based on Uncertainties in Emissions (Without Policy) and Climate Parameters," *Journal of Climate* 22, no. 19 (October 2009): 5175–5204, doi:10.1175/2009JCLI2863.1.

assumes that we maintain our current trajectory and is not the worst-case scenario—this amount of warming *is likely to occur* absent unprecedented efforts to curb carbon emissions. These predictions are so grounded in scientific data, and would be so devastating for civilization if they were to occur, that economic and financial groups are starting to become the most vocal and pragmatic heralds. The World Bank notably reaffirmed last year that we are on track for a 4°C (7.2°F) jump in global average temperatures within this century,¹¹ and other conservative economic institutions such as the International Energy Agency have also upheld this prediction.¹² Statements from peer-reviewed research and prominent scientists emphasize why a 4°C warmer world must be avoided at all costs:

- Research published in *The Philosophical Transactions of the Royal Society* states that, “in such a 4°C world, the limits for human adaptation are likely to be exceeded in many parts of the world, while the limits for adaptation for natural systems would largely be exceeded throughout the world.”¹³
- Professor Kevin Anderson, the Deputy Director of the Tyndall Centre for Climate Change Research and an adviser to the British Government on climate change, warns that “a 4°C future is incompatible with an organized global community, is likely to be beyond ‘adaptation’, is devastating to the majority of ecosystems, and has a high probability of not being stable.”¹⁴
- Professor Hans Joachim Schellnhuber, Director of the Potsdam Institute for Climate Impact Research and climate adviser to the German Chancellor and to the EU, has said that in a world that has warmed by 4°C, the population “carrying capacity estimates [are] below 1 billion people.”¹⁵

⁶ Kevin Anderson and Alice Bows, “Beyond ‘dangerous’ Climate Change: Emission Scenarios for a New World,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1934 (January 13, 2011): 20–44, doi:10.1098/rsta.2010.0290.

⁷ “Avoiding Dangerous Climate Change,” accessed May 1, 2013, <http://www.metoffice.gov.uk/media/pdf/0/m/cop14.pdf>.

⁸ “Global Carbon Project - Carbon Budget,” accessed May 1, 2013, <http://www.globalcarbonproject.org/carbonbudget/12/hl-full.htm>.

⁹ Richard A. Betts et al., “When Could Global Warming Reach 4°C?,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1934 (January 13, 2011): 67–84, doi:10.1098/rsta.2010.0292.

¹⁰ N. W. Arnell et al., “A Global Assessment of the Effects of Climate Policy on the Impacts of Climate Change,” *Nature Climate Change* 3, no. 5 (May 2013): 512–519, doi:10.1038/nclimate1793.

¹¹ “Turn Down the Heat: Why a 4°C Warmer World Must Be Avoided,” accessed May 2, 2013, http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf.

¹² “World Energy Outlook 2011: Executive Summary,” accessed May 2, 2013, http://www.worldenergyoutlook.org/media/weowebsite/2011/executive_summary.pdf.

¹³ Rachel Warren, “The Role of Interactions in a World Implementing Adaptation and Mitigation Solutions to Climate Change,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1934 (January 13, 2011): 217–241, doi:10.1098/rsta.2010.0271.

¹⁴ *Cabot Institute Annual Lecture 2012*, 2012, http://www.youtube.com/watch?v=RIInrvSjW90U&feature=youtube_gdata_player.

¹⁵ “Too Hot to Handle: Can We Afford a 4-degree Rise?,” *The Sydney Morning Herald*, accessed April 26, 2013, <http://www.smh.com.au/environment/too-hot-to-handle-can-we-afford-a-4degree-rise-20110709-1h7hh.html>.

Our planet, and the life that has adapted to the relatively stable climatic conditions of the last 10,000 years, cannot handle a 4°C rise in global average temperatures. This is best illustrated by the way that Arctic ice melt is already drastically outpacing glaciologists' models, which suggests that prior estimates of the sensitivity of our planet to a changing climate may be too conservative. On September 16, 2012, following the hottest summer on record, NASA confirmed that the extent of sea ice in the Arctic had reached an all-time low, shrinking by about 300,000 square miles—equivalent to losing an area greater than the size of Texas.¹⁶ In February of this year, however, new measurements from a European Space Agency satellite offered support for an ice-melt model built at the University of Washington which paints an even clearer, more startling picture. These satellite observations confirmed changes in sea ice volume, a measurement that had, until last February, been a mystery. With the ability to gauge how much ice is left below the surface of the ocean, we now know that four-fifths of the volume of Arctic sea ice has disappeared since 1979, when the model began.¹⁷ Many scientists now believe that an ice-free summer in the Arctic will arrive within the next decade.^{18,19} Considering that an increase in global average temperatures of 0.8°C is causing one of the major physical features on the planet to collapse, allowing temperatures to increase in line with our current trajectory of 4 to 6°C —upwards of 7 to 11°F —would invite global upheaval on an unimaginable scale. Because of the chain of events that accompany increasing global temperatures—including declining access to clean drinking water and arable land, increases in extreme weather events and days of extreme heat, inundation of coastal cities, and large-scale ecosystem devastation—life is largely incompatible with our current trajectory. Please take a moment to let that sink in. This scenario must be prevented.

So how much warming can the planet handle? An important aspect of the climate system to consider here is the existence of several positively reinforcing feedback loops which, when triggered by human-induced warming, would cause global temperatures to rise without further human intervention. An example of a positive feedback loop is the accelerating disintegration of ice in our warming world, which itself adds to warming. Ice naturally reflects back into space a portion of the heat from the Sun that enters our atmosphere, keeping it cooler. As we burn coal, oil, and gas, heat-trapping byproducts like carbon dioxide enter our atmosphere and act like a blanket that warms our planet, causing ice to melt faster. Because less energy is reflected away from our planet as it loses ice, it heats further, and more ice melts. There are several such positive feedback loops in the climate system, but it is poorly understood just how much

¹⁶ “NASA - Arctic Sea Ice Hits Smallest Extent In Satellite Era,” Feature, accessed April 28, 2013, <http://www.nasa.gov/topics/earth/features/2012-seaicemin.html>.

¹⁷ “European Satellite Confirms UW Numbers: Arctic Ocean Is on Thin Ice | UW Today,” accessed April 28, 2013, <http://www.washington.edu/news/2013/02/13/european-satellite-confirms-uw-numbers-arctic-ocean-is-on-thin-ice/>.

¹⁸ James E. Overland and Muyin Wang, “When Will the Summer Arctic Be Nearly Sea Ice Free?,” *Geophysical Research Letters* (2013): n/a–n/a, doi:10.1002/grl.50316.

¹⁹ Wieslaw Maslowski et al., “The Future of Arctic Sea Ice,” *Annual Review of Earth and Planetary Sciences* 40, no. 1 (May 30, 2012): 625–654, doi:10.1146/annurev-earth-042711-105345.

warming Earth can experience before these positive feedbacks kick in and become largely irreversible. What is clear is that we must be proactive and curb carbon emissions before we find out. To begin to address the need for a warming limit, 167 developed nations have signed the Copenhagen Accord which recognizes that carbon emissions should be limited so as to avoid a 2°C (3.6°F) rise in temperature. While no research explicitly refers to a 2°C as the threshold beyond which these positive feedbacks are triggered, it does fall within the range of critical temperatures suggested by scientists,²⁰ and the number is nevertheless important due to the fact that no other measure of warming has been prominently featured in international climate discussions. Unfortunately, the Copenhagen Accord is non-binding and does not prescribe action, thus our national and global policies do not reflect this absolute limit (which is why we're currently on track to warm the planet far more than 2°C). If 2°C of warming is sufficient to trigger these reinforcing feedbacks, and we allow Earth to warm by that amount, then the planet would be pulled towards hotter temperatures even if we stopped burning fossil fuels entirely. Current research now allows us to grasp the extent of action that must be taken to avoid reaching the 2°C limit:

- Scientists from the Potsdam Institute for Climate Impact Research determined that between now and 2050, human beings can emit 565 billion tons of carbon dioxide into the atmosphere and still retain an 80% chance of avoiding 2°C of warming.²¹
- The International Energy Agency found that global carbon dioxide emissions reached 31.6 billion tons in 2011,²² with scientists from the Global Carbon Project projecting continued growth of emissions by about 3% per year.²³
- These numbers make it clear that we will spend the 565 billion-ton carbon budget in just 16 years.

But we do not have 16 years to start to address the problem. As carbon emissions continue to increase, scientists from some of the foremost climate research institutions tell us that emissions must peak by 2016 to retain a 50% chance of avoiding a 2°C warmer world.¹⁰ In the 2011 edition of their flagship publication, the World Energy Outlook, the International Energy Agency reported that if we don't avoid building more carbon-emitting infrastructure at our current pace, we will lock ourselves into 2°C of warming by 2017.^{24,25} The urgency evident in these reports

²⁰ Timothy M. Lenton, "Beyond 2°C: Redefining Dangerous Climate Change for Physical Systems," *Wiley Interdisciplinary Reviews: Climate Change* 2, no. 3 (2011): 451–461, doi:10.1002/wcc.107.

²¹ "Unburnable Carbon," accessed April 29, 2013, <http://www.carbontracker.org/wp-content/uploads/downloads/2012/08/Unburnable-Carbon-Full1.pdf>.

²² "IEA - May: Global Carbon-dioxide Emissions Increase by 1.0 Gt in 2011 to Record High," accessed April 29, 2013, <http://www.iea.org/newsroomandevents/news/2012/may/name.27216.en.html>.

²³ Glen P. Peters et al., "The Challenge to Keep Global Warming Below 2 °C," *Nature Climate Change* 3, no. 1 (January 2013): 4–6, doi:10.1038/nclimate1783.

²⁴ IEA, *World Energy Outlook 2011* (Paris: Organisation for Economic Co-operation and Development, 2011), <http://www.oecd-ilibrary.org/content/book/weo-2011-en>.

²⁵ Fiona Harvey, "World Headed for Irreversible Climate Change in Five Years, IEA Warns," *The Guardian*, November 9, 2011, sec. Environment, <http://www.guardian.co.uk/environment/2011/nov/09/fossil-fuel-infrastructure-climate-change>.

was mirrored by a 2012 publication from the consultancy firm PricewaterhouseCoopers, adding that at our current emission rates the world will undergo "at least six degrees [Celsius] of warming" by the end of the century, and that an unprecedented 5.1% annual cut in global emissions per unit of GDP must be sustained through 2050 if the world is to limit warming to 2°C.²⁶ These articles make it evident that the climate crisis is the most significant threat that mankind has ever faced, and that we must address it immediately. This is the most important thing that anyone could know, and yet it evades serious political action.

²⁶ "PwC Low Carbon Economy Index 2012," PwC, accessed April 28, 2013, <http://www.pwc.com/gx/en/sustainability/publications/low-carbon-economy-index/index.jhtml>.

The Role of Divestment in Addressing the Climate Crisis

Having established the sobering reality that we face, it is time to turn to the solutions. There is some good news to acknowledge here: we have the technology to change our course, though the window for action is rapidly closing.

- Two studies assessing the feasibility of a world powered by wind, water, and sunlight found that the primary barriers for realizing such a world are not technological or economic, but rather social and political. These studies declared that renewables “can reliably supply all of the world's energy needs, with significant benefit to climate, air quality, water quality, ecological systems, and energy security, at reasonable cost.”^{27,28}
- A study from the University of Delaware reported that current renewable energy technologies could power a large regional electric grid 99.9% of the time in combination with storage technology.²⁹
- A study from Stanford University determined that offshore wind energy could power the entire U.S. East Coast.³⁰
- While these studies make a compelling case for beginning the massive deployment of these technologies immediately, the most promising example may come from the infrastructure that is already powering the German grid. In record-setting fashion, nearly 50% of the energy used during midday in Germany on May 26th, 2012 came from solar power.³¹

These are only a few examples to address concerns about what we can accomplish today to transition from fossil fuels to energy sources that don't affect the climate. But time is not on our side. Making this transition fast enough to avert devastating climatic changes will require a rapid shift in our economic perspective and a major dose of political will. Right now, businesses and institutions prioritize short-term profits and overlook the fact that the changes taking place are eroding any possibility of a viable future. According to scientific predictions about the risks of maintaining business as usual, adhering to the status quo is clearly not an option. Even many of the most well-intentioned organizations that exist for the betterment of society appear unaware of this reality.

²⁷ Mark Z. Jacobson and Mark A. Delucchi, “Providing All Global Energy with Wind, Water, and Solar Power, Part I: Technologies, Energy Resources, Quantities and Areas of Infrastructure, and Materials,” *Energy Policy* 39, no. 3 (March 2011): 1154–1169, doi:10.1016/j.enpol.2010.11.040.

²⁸ Mark A. Delucchi and Mark Z. Jacobson, “Providing All Global Energy with Wind, Water, and Solar Power, Part II: Reliability, System and Transmission Costs, and Policies,” *Energy Policy* 39, no. 3 (March 2011): 1170–1190, doi:10.1016/j.enpol.2010.11.045.

²⁹ Cory Budischak et al., “Cost-minimized Combinations of Wind Power, Solar Power and Electrochemical Storage, Powering the Grid up to 99.9% of the Time,” *Journal of Power Sources* 225 (March 1, 2013): 60–74, doi:10.1016/j.jpowsour.2012.09.054.

³⁰ Michael J. Dvorak et al., “US East Coast Offshore Wind Energy Resources and Their Relationship to Peak-time Electricity Demand,” *Wind Energy* (2012): n/a–n/a, doi:10.1002/we.1524.

³¹ Erik Kirschbaum, “Germany Sets New Solar Power Record, Institute Says,” *Reuters*, May 26, 2012, <http://www.reuters.com/article/2012/05/26/us-climate-germany-solar-idUSBRE84P0FI20120526>.

One might ask why, if we have known about the dire consequences of inaction on climate change for two decades, the vast majority of our society isn't conscious of the imminence and scale of this threat and why our national and global policies fail to reflect what we face. The answer here is well-documented and simple. One only has to look into the history of the tobacco industry, whose leaders recognized that creating a sense of doubt around the addictiveness of nicotine and the cancer-causing effects of tobacco would provide the public with enough misinformation to underestimate the risks of smoking and make legislative restrictions seem premature. Exploiting the same strategy, the fossil fuel industry launched a massive doubt campaign to publicize the idea that the science of climate change was unsettled.³² This initiative was successfully able to cause citizens and lawmakers to question the reality of climate change, and incited vicious attempts to discredit the scientists who were conducting legitimate research. The leaders of the fossil fuel industry recognized that climate change entailed an existential threat—either their entire industry would have to disappear to preserve a stable, livable climate and global society would necessarily switch to renewable forms of energy, or they could attempt to forestall this transition and continue to rake in unprecedented profits, even though it meant destroying our planet's ability to support life. We are in a precarious situation today because they chose the latter.

Beyond this doubt campaign, the fossil fuel industry continues to exert powerful congressional influence through lobbying³³ and pours hundreds of millions of dollars into electing politicians who will protect its interests.³⁴ The money that this industry has injected into Congress has successfully prevented any legislation from being enacted that reflects the crisis we face, and will continue to block the changes that must occur if we are to avoid irreversible climate change.

Students at universities around the nation, however, have taken notice and are starting to take action—which makes good sense. Today's young adults and children, who are looking at 60 to 70 more years of life, are poised to inherit a planet that cannot sustain them. In order to revoke the social license of the fossil fuel industry, students around the nation have begun to request that their universities divest their endowment fund from fossil fuel companies. Modeled after the divestment movement of the 1970s and 80s which targeted companies doing business with South Africa's apartheid regime, the burgeoning fossil fuel divestment movement is meant to shift what is currently politically possible in this country. The apartheid divestment movement was able to raise public consciousness of the atrocities being committed in Africa and galvanize popular support against the South African government, ultimately leading to the Comprehensive Anti-Apartheid Act which banned all new U.S. trade and investment in South Africa. The goal of the

³² "Climate of Doubt – FRONTLINE," *FRONTLINE*, accessed April 29, 2013, <http://www.pbs.org/wgbh/pages/frontline/climate-of-doubt/>.

³³ "Lobbying Spending Database Oil & Gas, 2013 | OpenSecrets," accessed May 18, 2013, <http://www.opensecrets.org/lobby/indusclient.php?id=E01&year=2013>.

³⁴ Eric Lipton and Clifford Krauss, "Fossil Fuel Industry Opens Wallet to Defeat Obama," *The New York Times*, September 13, 2012, sec. U.S. / Politics, <http://www.nytimes.com/2012/09/14/us/politics/fossil-fuel-industry-opens-wallet-to-defeat-obama.html>.

modern-day divestment movement is the same: by raising public consciousness of the urgency demanded by the climate crisis and causing ripples in the investment community, divestment can shift our political spectrum and make federal climate legislation—which is currently impossible due to powerful lobbying and congressional influence from the fossil fuel industry—politically possible. Only through policies that adhere to the dictates of science will we have a chance to avoid a disaster. As fossil fuel money is recognized for what it is—absolutely toxic to all life on Earth—the industry will begin to lose its stranglehold on Congress. Without such a major shift, the money of the wealthiest industry in the history of the world will prevent the changes that we need to make until our ability to change course is no more.

To this end, we want to encourage UMass to be the first public university to divest from fossil fuels and take a stand against the forces that prioritize their profits over human lives. We have compiled current research that describes the benefits of divestment for UMass and the implications of our investments in fossil fuel companies, to make what we feel is an overwhelming case for fossil fuel divestment.

Economic Argument

The purpose of this portion of the argument is to outline why fossil fuel companies make poor investments, question preconceptions that divestment will result in financial losses, and highlight the benefits of certain reinvestment options.

Carbon Budget

Research published in 2011 from the Carbon Tracker Initiative, an NGO staffed by UK financial analysts, provides a quantitative look at what it will take to avoid 2°C of warming. Having shown that our carbon budget (the amount of carbon that can be released before reaching 2°C of warming) is 565 billion tons, the Carbon Tracker Initiative compiled information regarding the known reserves of fossil fuels in order to compare it to our budget. Analysts found that the fossil fuel industry possesses 2,795 billion tons of carbon dioxide in its reserves—five times the amount necessary to warm our planet to 2°C.²¹ With this information, we now know that four-fifths of the reserves owned by the fossil fuel industry cannot be burned if we are to have any hope of avoiding catastrophic warming. This is the main economic reason for fossil fuel divestment—the reality of a massive carbon bubble. The International Energy Agency notably confirmed this carbon crunch in the 2012 edition of the World Energy Outlook, stating that, “no more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2°C goal.”³⁵ This estimate is obviously more conservative than what was established by the Carbon Tracker Initiative because of a crucial caveat: the idea of consuming one-third of reserves is based upon a 50% chance of avoiding warming of 2°C. Keeping four-fifths of these reserves unburned gives us an 80% chance of avoiding 2°C. How much of these reserves we burn, it appears, will be based upon our collective tolerance for the risk of triggering catastrophic climate tipping points.

With the knowledge that the large majority of fossil fuel reserves must necessarily become stranded assets in order to preserve a livable climate, investments in fossil fuel companies are clearly untenable. This information also makes it clear that fossil fuel investment are currently overvalued significantly, since the share prices of fossil fuel companies are predicated on these companies’ ability to sell reserves that are unburnable. This risk was assessed more quantitatively by the HSBC this year, in a report that stated that the entire sector stands to lose between 40% and 60% of its value if action is taken to curtail fossil fuel use in line with our carbon budget.³⁶ Based on the apparent irreconcilability of fossil fuel consumption and a stable climate, the same report suggested that it is likely that the risks to carbon-intensive investments have not begun to be priced into the market.

³⁵ IEA, *World Energy Outlook 2012* (Paris: Organisation for Economic Co-operation and Development, 2012), <http://www.oecd-ilibrary.org/content/book/weo-2012-en>.

³⁶ “Oil & Carbon revisited-Value at Risk from ‘unburnable’ Reserves,” accessed April 30, 2013, <http://gofossilfree.org/files/2013/02/HSBCOilJan13.pdf>.

The HSBC is not the only major economic institution to acknowledge the risk of investments in fossil fuel companies. A report published by the credit rating agency Standard and Poor's in partnership with the Carbon Tracker Initiative suggests that certain oil companies may already be facing a potential credit downgrade within the next three years as global policies begin to realize carbon constraints.³⁷ While smaller companies would face more risk due to less diversification of their products, such a stress scenario would also begin to affect oil majors like BP and Royal Dutch Shell. From the report: "First to be affected would be the relatively focused, higher cost producers, and then the more diversified integrated players. In both cases, according to our study, the causes would be a decline in operating cash flows, weakening free cash flow and credit measures, along with less certain returns on investment and less robust reserve replacement." The message here is that due to the aforementioned constraints, past performance of the oil sector will not be repeated.

Just how massive is the liability posed by the carbon bubble? According to John Fullerton, the president of the Capital Institute and former JP Morgan Managing Director, at current market value the fossil fuel reserves that must be stranded represent a \$20 trillion bubble.³⁸ To establish some context, the subprime mortgage bubble stranded \$2 trillion worth of assets. Confronting a bubble 10x the size of the one that shook the global economy presents an unprecedented economic challenge to accompany the unprecedented climatological one. Because the fossil fuel industry is likely to be unwilling to write off \$20 trillion in profits, investors must run fast in the other direction. Considering that the majority of current fossil fuel reserves must remain underground, this information makes it evident that any attempts by fossil fuel companies to extract new fuels for short-term profit amount to deliberately creating financial instruments that will burst. To say that the odds are against us would be an immense understatement. But by understanding these odds, the necessity of immediate action becomes apparent, and we can choose to not be a part of the problem. There is scientific certainty that a hospitable world climate is incompatible with continued use of fossil fuels—but in case this is not compelling enough to remove investments in this industry, the economic certainty that attempts to align global policies with the science will result in catastrophic financial losses to fossil fuel investors should provide the incentive to divest.

Fiduciary Responsibility

Now that the risks of investments in fossil fuel companies have been made clear, it must be acknowledged that fossil fuel investments cannot be reconciled with the Foundation's fiduciary responsibilities. A primary objective of the UMass Foundation is to "ensure a total return

³⁷ "What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness," accessed April 30, 2013, http://www.carbontracker.org/wp-content/uploads/downloads/2013/03/SnPCT-report-on-oil-sector-carbon-constraints_Mar0420133.pdf.

³⁸ Brad Johnson, "The \$20 Trillion Carbon Bubble: Interview With John Fullerton, Part One," accessed April 30, 2013, <http://thinkprogress.org/climate/2012/03/26/432617/the-20-trillion-carbon-bubble-interview-with-john-fullerton-part-one/>.

necessary to preserve and enhance the principal of [its] funds,” and adhere to “disciplined longer term investment objectives and strategies that will accommodate relevant, reasonable or probable events.” It is not in the fiduciaries’ interest to remain invested in the fossil fuel industry because we are already aware that it must be largely dismantled if we are to preserve a livable climate—in which case fossil fuel investments will necessarily fail. Retention of fossil fuel investments therefore subjects the endowment to significant, material risk. Furthermore, continued investment in this industry will indicate that despite prior knowledge to the contrary, we are choosing to subject these parts of the portfolio to certain collapse and remain complicit in the destruction of the viability of the planet. A long-term perspective on the needs of the university must necessarily acknowledge the dire risks of climate change, which pose a threat to the university’s infrastructure, its employees, and most of all, its current and future students.

The mandate of the Investment Committee is to “invest the University endowment in assets that will grow at a rate greater than inflation so that the spending power of our endowment over time continues to grow.” This mandate gets at the heart of the Foundation’s fiduciary responsibility, which is a commitment to intergenerational equity. The purpose of growing the endowment at a rate greater than inflation is to ensure that the next generation of students can benefit to the same relative extent as today’s students. However, by investing part of the endowment in fossil fuel companies, we are helping to guarantee that future students will not inherit a planet like the one we have enjoyed. Without a major push to replace fossil fuels with renewable energy over the next few years, our planet will begin to warm irrespective of our efforts to backpedal. Very soon, it will be too late. Is it meaningful to attempt to grow the endowment at a rate greater than inflation by knowingly undermining the fundamental purpose for doing so?

Flood Risks to UMass Boston

Adding a personal stake to the economic argument for divestment is the vulnerability of UMass Boston to New England’s rising sea levels. As the planet’s temperature increases, rapidly melting ice sheets around the world are causing sea levels to rise. In February of this year, the Boston Harbor Association published a report entitled “Preparing for the Rising Tide,” which highlighted the investments that UMass Boston would have to make in order to protect its infrastructure from storm surges and higher seas.³⁹ Risks posed to the primary campus entrance at Morrissey Boulevard and the secondary entrance at Mt. Vernon Street were emphasized, since flooding of these entrances would likely block access to the campus completely during extreme coastal storms with higher sea levels.

- Fortifying Morrissey Boulevard against widespread flooding from a 100-year storm surge would require a \$500,000 to \$750,000 investment with an annual \$10,000 maintenance cost, which should be undertaken before midcentury.

³⁹ “Preparing for the Rising Tide,” accessed April 30, 2013, http://www.tbha.org/sites/tbha.org/files/documents/preparing_for_the_rising_tide_final.pdf.

- Flooding of the Bayside Expo Center is already common during heavy rains, and will require a solution such as a pump-based drainage system (\$2 million in capital costs).
- The current 100-year storm surge is expected to overtop the HarborWalk and protective berm, and improving the seawall would require a \$1-1.5 million investment with an annual \$15,000 maintenance cost.
- Fortifying Mt. Vernon Street against widespread flooding from a 100-year storm surge would require a \$300,000 to \$500,000 investment with an annual \$5,000 maintenance cost.
- Ocean View Drive, where housing for UMass Boston students and local residents is located, will have to be flood-proofed against the current 100-year storm surge (as well as the annual storm surge by late-century) at a cost of \$2-2.5 million and an annual \$20,000 maintenance cost.

According to the report, under the high-end sea level rise scenarios, the 100-year storm surge will increase to “at least a 20% likelihood of occurring in a given year around 2050 and possibly as frequently as high tide around 2100.” As capital investments to protect UMass Boston from increasingly dangerous storm surges and sea level rise become more necessary and expensive, the financial logic of divestment is reaffirmed: it does not make sense to invest in the companies that are causing the seas to rise.

Exaggerated Risks of Divestment

Beyond the certainty that the fossil fuel industry’s existence is at odds with our own, and the implications this has for fossil fuel investments, statistical analysis by the investment-management firm Aperio Group should help to dispel preoccupation about potential losses from fossil fuel divestment. Using a multi-factor model which assesses statistical deviation from a benchmark index, in this case the Russell 3000, the firm measured the difference in absolute portfolio risk when excluding the entire oil, gas, and consumable fuels industry.⁴⁰ Screening the portfolio from investments in the fossil fuel industry increased absolute portfolio risk by 0.0101%, an essentially negligible difference. While skeptics of divestment emphasize the risk incurred by avoiding certain investments, they fail to acknowledge the magnitude of such risk. This analysis by the Aperio Group reframes this argument by demonstrating that the risk incurred by total divestment from fossil fuel companies is minute, and suggests that there is no real basis for exaggerated preconceptions about the financial risks of fossil fuel divestment.

Green Revolving Fund

A very useful option for reallocating investments in fossil fuel companies would be to apply these funds to energy efficiency and renewable energy projects throughout the UMass System. According to a report published by the Sustainable Endowments Institute, establishing a green

⁴⁰ “Do the Investment Math: Building a Carbon-Free Portfolio,” accessed April 30, 2013, https://www.aperiogroup.com/system/files/documents/building_a_carbon_free_portfolio_0.pdf.

revolving fund to finance projects that reduce the energy usage and generate renewable energy have a median return on investment of 28%.⁴¹ This type of investment thus significantly outperforms endowment investment returns, and by establishing the fund from former fossil fuel investments, UMass could refrain from using student fees to do so. In addition, reduced fixed costs from energy savings could be applied to decreasing student fees. With the state always striving to make sure that UMass is doing everything it can to keep its costs down, this could be a creative and effective way to demonstrate it. As such, this emphasis on cost-efficiency could help the University when it advocates for more state funding. At UMass Amherst alone, we have the potential to generate several megawatts of solar energy, according to our Climate Action Plan.⁴²

Summary

With such a clear understanding of the necessary obsolescence of the fossil fuel industry, it is financially prudent to be ahead of the curve and divest from this industry before the carbon bubble bursts. We have seen that fossil fuel investments are currently significantly overvalued given that the majority of fossil fuel reserves cannot be burned if a livable climate is to be preserved, and that major credit rating agencies like Standard and Poor's are beginning to acknowledge that credit downgrades for certain fossil fuel companies already loom on the horizon. Threats of flooding at UMass Boston, and the expenses of associated preventative measures, also suggest that we shouldn't contribute to these costs through our investments. Furthermore, the analysis by the Aperio Group debunks a common preconception that complete fossil fuel divestment significantly increases absolute portfolio risk, and the option of reallocating a portion of former fossil fuel investments in a green revolving fund offers consistent returns that make typical endowment investments appear feeble in comparison. With current and future students poised to inherit a planet ravaged by a radically altered global climate, the only way to continue to honor the UMass Foundation's fiduciary responsibility and commitment to intergenerational equity is to divest from the fossil fuel industry.

To provide a final perspective on divestment from groups who are setting the precedent within this movement, consider that municipalities around the country are beginning to scrutinize fossil fuel investments and file resolutions for divestment. In these cases, the funds in question are not endowment funds, but pension funds, which arguably deserve even more scrutiny and deliberation before investment decisions are made due to their vital importance for citizens who can no longer work. Since December, the city of Seattle has committed to fossil-fuel-free investments with its \$1.4 billion day-to-day cash balances, and is currently working to divest its \$1.9 billion city employees' pension fund from fossil fuel companies. As the city of Seattle demonstrates, fossil fuel divestment is being taken very seriously. With the logic of divestment moving from campuses to cities and states, Massachusetts is not being left behind. When the

⁴¹ "Greening the Bottom Line," accessed April 30, 2013, <http://greenbillion.org/wp-content/uploads/2012/11/Greening-the-Bottom-Line-2012.pdf>.

⁴² "Climate Action Plan" accessed April 30, 2013, <http://www.umass.edu/fp/ClimateActionPlan.pdf>.

UMass Foundation Investment Committee chose to divest the endowment from companies complicit in genocide in Sudan in 2007, legislation to remove all state funds from Sudan was pending. This year, legislation to divest state funds from fossil fuel companies was filed.⁴³ Our own legislators recognize the contradiction between trying to adapt to climate change and investing in the companies that are causing it. We hope that history repeats itself, and that UMass divests from fossil fuels before divestment legislation even comes up for a vote.

⁴³ “Bill S.1225,” accessed May 2, 2013, <http://www.malegislature.gov/Bills/188/Senate/S1225>.

Recognition Argument

The purpose of this portion of the argument is to outline the benefits that fossil fuel divestment can have for our University's reputation.

As much as climate change poses a real threat to the survival of most life on the planet, it also offers an unmatched leadership opportunity to the individuals and institutions that recognize, acknowledge, and commit to bold action on this issue. With such a short time-frame with which to change our course, the demand for leaders has never been greater. The future of today's students and children will depend more than anything on the decisions we make in addressing climate change. The fact that fossil fuel divestment campaigns have spread virally to 302 universities since last November demonstrates that students are aware of the type of planet they are bound to inherit if the threat of climate change isn't taken seriously. By aligning our University's investments with its values through fossil fuel divestment, students, universities, and governing bodies will take notice. The national divestment movement is arguably the fastest growing student movement in decades, and news about the movement has been featured in major outlets like The New York Times, Rolling Stone, Time Magazine, and The Huffington Post. While Trustees at other colleges equivocate and resist their own students' requests to remove their school's investments in companies that are destroying their future, UMass is presented with an opportunity to be recognized as a progressive institution that hasn't forgotten its commitment to the well-being of its students for the sake of short-term profit. If UMass divests, we will set a precedent by being the first public University to do so, and our example can act as a tipping point for other public and private colleges that are considering doing the right thing. As a University that prides itself on being a leader in innovation, we have the opportunity to demonstrate that an effective portfolio doesn't need to contain fossil fuel investments—and that a portfolio cannot be considered effective if its investments violate the school's commitment to the good of its students.

The reputational benefits of divestment are closely tied to the economic and values arguments, because fossil fuel divestment presents an innovative way to demonstrate our commitment to our values in a way that is economically sound, and even lucrative.

- Affirming UMass' commitment to the well-being of its students through divestment from fossil fuels will lead to greater interest from prospective students, who will see our University "walking the walk." According to a survey conducted by The Princeton Review this year, from 9,955 college applicants, 62% reported that a college's commitment to environmental issues would affect their decision to attend or apply to a school.⁴⁴ Because the student-led divestment movement is gaining prominence as the

⁴⁴ "College Hopes and Worries Survey Report 2013 - CollegeHopesandWorriesSurveyReport2013.pdf," accessed April 30, 2013, http://www.princetonreview.com/uploadedFiles/Sitemap/Home_Page/Rankings/Hopes_and_Worries/2013/CollegeHopesandWorriesSurveyReport2013.pdf.

most visible facet of the overarching movement to address climate change, adopting a leadership role within this movement will take advantage of the press and the student interest that is building rapidly.

- As a member of the Sustainability Tracking, Assessment & Rating System (STARS), a program of The Association for the Advancement of Sustainability in Higher Education (AASHE), UMass Amherst touts its position as 1 of 45 institutions (out of 234 current STARS participants) that have achieved a gold rating for sustainability (the 2nd highest possible rating). However, the most conspicuous category of the rating system is the investment category, which is the only area where UMass doesn't receive any credit towards its sustainability rating. By committing to fossil fuel divestment and reinvesting in sustainable industries, UMass could add up to 14 points to its rating (or even 16.75 points if further actions towards responsible investments are taken) and advance to within 5 points of the highest rating, platinum, which no university has yet achieved. Divestment and responsible reinvestment would bring UMass 75% of the way to this platinum rating.
- As President Caret and the advancement professionals at UMass advocate for more university funding, illustrated best by the recent push for 50% state funding, opportunities to “tell and sell” the UMass story are a top priority. In his address to the Faculty Senate last year, UMass Amherst Chancellor Kumble Subbaswamy highlighted the need for meaningful and impactful efforts to enrich the University's reputation: “In talking to our various stakeholders—alumni, donors, legislators—I have found that the pursuit of vague notions of prestige that drive up the cost of running the University are not resonating with them. It comes across as a tired, old message. On the other hand, a message of leadership via innovation, integrative education, and increased impact on society excites them.”⁴⁵ Fossil fuel divestment would add an innovative and compelling chapter to the history of UMass, at a time when students sorely need a principled institution like our own to lead the way to a viable future. And by taking action with state divestment legislation pending, UMass can lead Massachusetts on this issue and illustrate its leadership to the legislature. Finally, divestment could be a major boon for fundraising, since UMass alumni and the Commonwealth at large will see UMass taking an unequivocal stand on the greatest challenge that humanity has ever faced in climate change.

The public wants to see action taken to address the climate crisis. A survey conducted this year by the Yale Project on Climate Change Communication found that across political party, concern about the effects of climate change was high.⁴⁶ Majorities of Democrats and Independents agreed that global warming will harm future generations, and majorities of Democrats, Independents, and Republicans felt that climate change should be a priority for Congress and the President. By divesting from fossil fuel companies, UMass will show these groups that their priorities are ours,

⁴⁵ “Address by Chancellor Subbaswamy,” accessed April 30, 2013, http://www.umass.edu/senate/fs/Minutes/2012-2013/719_SUBBASWAMY.pdf.

⁴⁶ “The Political Benefits of Taking a Pro-Climate Stand in 2013,” accessed April 30, 2013, <http://environment.yale.edu/climate-communication/files/Political-Benefits-Pro-Climate-Stand-2013.pdf>.

and that UMass refuses to support the companies that are causing this crisis. Amidst a backdrop of public concern, divestment gives UMass the chance to assert its vision of a better future, to be remarkable. Parents will see that UMass recognizes the risks that climate change poses to their children and refuses to have a hand in escalating those risks. Students will see that their University strives to invest with their best interests as the top priority. Alumni will see their alma mater as a leader in a national movement to achieve a livable future for today's youth. Legislators will see the 5-campus state university system setting an example for the rest of the state's institutions in addressing climate change. As UMass searches for ways to exhibit its leadership, innovation, and commitment to social wellbeing, there is no more impactful issue to address than climate change, and no more principled stand than that offered by fossil fuel divestment.

Morality and Values Argument

The purpose of this portion of the argument is to draw attention to the ways in which fossil fuel investments are contrary to the University's professed values, are not consistent with its identity, and undermine its commitment to social good.

Agriculture

The University of Massachusetts began as the Massachusetts Agricultural College (MAC), founded under the Morrill Land-Grant Colleges Act as an institution dedicated to the advancement of mechanical skills and agricultural knowledge. Beginning in these early days, MAC, which is now UMass Amherst, reached out to educate farmers in the surrounding communities. These ties remain today, and though UMass has since expanded its campus from 310 rural acres and 56 students⁴⁷ to 1,463 acres and 27,000 students,⁴⁸ its status as a land-grant university continues to inform its mission today. But while our agricultural founding principles and research have remained strong for the past 150 years, the focus of much agricultural research now is how to preserve the discipline in a world with a rapidly changing climate. As the burning of fossil fuels accelerates the planet toward unstable levels of warming, the implications for the art of agriculture and all those whose livelihoods depend on it become increasingly dire. The assault on agriculture is already visible, best evidenced by the 2012 drought that reached 80% of all farmland in the U.S. and left 50% of the crops harvested in September in poor or very poor condition according to the United States Department of Agriculture (USDA).⁴⁹ Considering that the most severe and extensive U.S. drought in 25 years occurred after CO₂ emissions have warmed the planet by 0.8°C, and that we are on track to warm the planet by 6°C (10.8°F), farming is clearly in danger. As warming continues, stressors such as variable precipitation patterns, temperature extremes, and increased growth of weeds and insect pests will have detrimental effects on crops. A new USDA report released in February of this year stated that, "climate change poses unprecedented challenges to U.S. agriculture because of the sensitivity of agricultural productivity and costs to changing climate conditions."⁵⁰ As a University that was founded upon the study and advancement of agriculture, investments in the companies that are causing the planet to rapidly heat undermine the discipline that played a formative role in UMass' history and the collaborative academic relationship still shared with local farmers.

⁴⁷ "UMass Amherst 150 Years," accessed April 30, 2013, <http://www.umass.edu/150/our-history>.

⁴⁸ "University of Massachusetts Amherst," *Wikipedia, the Free Encyclopedia*, April 28, 2013, http://en.wikipedia.org/w/index.php?title=University_of_Massachusetts_Amherst&oldid=552581295.

⁴⁹ "USDA Economic Research Service - U.S. Drought 2012: Farm and Food Impacts," accessed April 30, 2013, http://www.ers.usda.gov/topics/in-the-news/us-drought-2012-farm-and-food-impacts.aspx#.UX9RiMp4_4Z.

⁵⁰ "Climate Change and Agriculture in the United States: Effects and Adaptation," accessed April 30, 2013, [http://www.usda.gov/oce/climate_change/effects_2012/CC%20and%20Agriculture%20Report%20\(02-04-2013\)b.pdf](http://www.usda.gov/oce/climate_change/effects_2012/CC%20and%20Agriculture%20Report%20(02-04-2013)b.pdf).

Research

At UMass, research forms a major part of the University's identity. UMass Amherst is 1 of 108 schools designated as a "research university with very high research activity" by the Carnegie Foundation for the Advancement of Teaching, and research expenditures across the UMass System have totaled over \$500 million over the past three years.⁵¹ As stated in *UMass Performance: Accountable and on the Move*, UMass' research "saves and improves lives,"⁵² and President Caret has proudly declared that, "as a world-class research university, faculty and students on all five of our campuses are engaged in scientific discovery that impacts the lives of the people in this state and around the globe." Simply put, UMass is known for its research. This is certainly the case for climate research. UMass Amherst is able to boast two major climate research centers: the Climate System Research Center (CSRC) and the Northeast Climate Science Center (NECSC). The CSRC primarily looks towards the past to learn about how the climate changed throughout history, and its researchers have produced widely cited data such as the Hockey Stick Graph, which supported the idea that average temperatures in the Northern Hemisphere had risen by the 1990s to their highest levels in 1000 years. Two years ago, UMass Amherst gained the honor of hosting the NECSC, one of eight national climate science centers around the nation, due to the University's significant research strengths. While the CSRC studies the past, the NECSC is focused on defining the climatic challenges of the future. UMass isn't just poised to inform scientific discourse about climate change—it's poised to start the conversation.

But with research comes responsibility. The Hockey Stick Graph became a lightning rod for those who sought to intimidate climate scientists, with U.S. Representative Joe Barton attempting to instigate an investigation into the data and the funding behind the graph and discredit the reputation of our own researchers in 2005. According to [opensecrets.org](http://www.opensecrets.org), a nonpartisan research group that tracks money in politics, Barton has claimed over \$1.7 million from the oil and gas industry, his largest donor.⁵³ There was no reasonable doubt about climate change back then, and now each year brings more dire predictions from scientists about the impact of continuing to burn fossil fuels. The UMass website echoes this:

"Changes [to Earth's climate system] are occurring at an unprecedented rate, with profound risks and consequences for all organisms on earth. The course of future interactions between climate and human society hinges upon policy decisions which must be based upon modern climate science. The necessity of the Northeast Climate Science Center is clear, and as its host,

⁵¹ "System Research Spending Tops \$597 Million Last Year, Reports Caret," accessed April 30, 2013, <http://www.umass.edu/loop/content/system-research-spending-tops-597-million-last-year-reports-caret>.

⁵² "Umass Performance: Accountable and on the Move," accessed April 30, 2013, http://media.umassp.edu/massedu/umassperformance/umass_performance.pdf.

⁵³ "Joe Barton: Campaign Finance/Money - Industries - Representative Career | OpenSecrets," accessed April 30, 2013, <http://www.opensecrets.org/politicians/industries.php?cid=N00005656&cycle=Career>.

UMass is going to be a significant player in investigating and potentially solving the problems of climate change before it is too late.”⁵⁴

UMass’ responsibility is clear. Research from our own campuses and from around the world tells us that we can no longer burn fossil fuels if we are to preserve a livable climate. To choose to invest in fossil fuels is to disregard the warnings of our own climate scientists, and UMass should certainly not invest in the industry that funded those attempting to discredit them. UMass knows better. And the University can show it by divesting from the companies that would destroy the planet for their own profit. That is the difference between an institution that conducts research and an institution that conducts research that “impacts the lives of the people in this state and around the globe.” What is the point of research if it doesn’t inform how we live our lives and conduct our business? Also, as an aspiring member of the Association of American Universities, an organization of pre-eminent research universities, fossil fuel divestment offers UMass an opportunity to show that it takes this research seriously enough to act upon it in a way that no member of the Association has done so far. This is a monumental opportunity for the University to demonstrate that it truly is in the upper echelon of all research universities by acknowledging what research around the world, and on our own campuses, is telling us—and taking action accordingly.

Social Good

The foundation of public universities is a commitment to social good, and UMass’ mission statement makes it clear that our University is no different:

“The University’s mission is to provide an affordable and accessible education of high quality and to conduct programs of research and public service that advance knowledge and improve the lives of the people of the Commonwealth, the nation, and the world.”

This mission is profoundly moral. It is clear that the University does not exist in isolation—as it strives to fulfill its academic charge, it takes on a larger responsibility of serving the Commonwealth and beyond. In fact, each of the five UMass campuses has earned the designation of a Community Engaged Campus by the Carnegie Foundation for the Advancement of Teaching. The new accountability report released by President Caret also highlights UMass’ rededication to reach out to surrounding communities to share knowledge and encourage education at different stages of students’ lives. While many universities do exist in isolation—offering education to and impacting the lives of only those within their walls—UMass’ mission is much broader, and much more meaningful. This is certainly a substantial commitment, and one that also helps to define UMass’ identity. As President Caret puts it in his report, “This is an enormous responsibility — one that the University embraces.”

⁵⁴ “UMass Amherst Wins Major Grant to Host \$7.5 Million Northeast Climate Science Center | UMass Amherst Campus Sustainability Initiative,” accessed April 30, 2013, <http://www.umass.edu/livesustainably/news/umass-amherst-wins-major-grant-host-75-million-northeast-climate-science-center>.

As the Commonwealth works to address the threats that climate change poses to its citizens, UMass has the opportunity to play an important role. The Massachusetts Climate Change Adaptation Report, prepared by the Secretary of Energy and Environmental Affairs (EEA) and the Massachusetts Climate Change Adaptation Advisory Committee, makes these threats clear:⁵⁵

- “By the end of the century, under the high emissions scenario of the Intergovernmental Panel on Climate Change (IPCC), Massachusetts is set to experience a 3° to 5°C (5° to 10°F) increase in average ambient temperature, with several more days of extreme heat during the summer months.”
- “While the costs of making changes and actively managing the built and natural environments to buffer the impacts of climate change may be substantial, the cost of inaction may be far higher. A sea level rise of 0.65 meters (26 inches) in Boston by 2050 could damage assets worth an estimated \$463 billion (Lenton et al., 2009).”
- “By the end of this century, under the IPCC high emissions scenario with ice melt, it has been suggested that sea level rise resulting from all these factors could reach six feet (Pfeffer et al., 2008). Since a large percentage of the state’s population, development, and infrastructure is located along the coast, the impact of this change will be significant, putting the Massachusetts economy, health, natural resources, and way of life at risk.”

These statements reflect what is at stake for the Commonwealth if climate change continues to worsen. These risks are especially real given that current emission rates are tracking or surpassing the IPCC high emissions scenario.⁵⁶ Between extreme heat, devastating flood, and the immense costs of increasingly frequent natural disasters, inaction will leave Massachusetts unrecognizable. These dire threats to our state make it clear: investments in fossil fuel companies are not consistent with UMass’ commitment to social good. By aligning a portion of the University’s financial success with that of the fossil fuel industry, which profits as the world warms, UMass profits as the risks to the Commonwealth increase. The accountability report says it best: “Our communities need us.” That is truer than ever. As Massachusetts’ communities are increasingly threatened by climate change, UMass can take action to envision a future without the industry that is causing it through divestment, and in doing so provide an example for other state institutions to follow.

As climate change accelerates from the continued use of fossil fuels, the pollution created as these fuels are refined also perpetrates grave social injustice. A report entitled the “Toxic 100,” published by UMass’ own Political Economy Research Institute, shows that minority and low-income citizens are the ones who are often most affected by the pollution from fossil fuel companies.⁵⁷ Pollution from the top five most profitable fossil fuel companies—BP, Chevron,

⁵⁵ “Massachusetts Climate Change Adaptation Report,” September 26, 2011, <http://www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html>.

⁵⁶ Charlotte Brix Andersen, “Key Messages,” March 12, 2009, http://climatecongress.ku.dk/newsroom/congress_key_messages/.

⁵⁷ “PERI: Toxic 100 Air Polluters 2012,” accessed April 30, 2013, <http://www.peri.umass.edu/toxicair2012/>.

ConocoPhillips, ExxonMobil, and Royal Dutch Shell—disproportionally affects minority communities. Though minorities make up less than 40% of the U.S. population, they bear 48.6% of the air toxics risk from BP’s facilities, 68.0% from Chevron’s facilities, 56.0% from ConocoPhillips’ facilities, 69.1% from ExxonMobil’s facilities, and 44.0% from Royal Dutch Shell’s facilities. All of these companies made the list of the top 100 most toxic polluters, and they made a combined \$137 billion in 2011, a new record, according to the Center for American Progress.⁵⁸

The injustice generated by fossil fuels also extends far beyond communities in the U.S. Worldwide, the poorest individuals from low-emission societies where fossil fuels are not often burned will endure the brunt of the consequences of climate change. Research commissioned by 20 countries that are most vulnerable to the effects of climate change and conducted by DARA International, a humanitarian organization, found that 400,000 people die each year due to effects of climate change such as hunger and communicable diseases, with over 98% of the death toll stemming from the poorest nations on Earth.⁵⁹ This report also found that a failure to address climate change would result in economic losses of 3.2% of world GDP by 2030, with 80% to 90% of all economic costs falling to the least developed countries. Though they had essentially no effect on the climate, low-emission countries will lose the most as it changes. As UMass strives to adhere to its mission to impact the lives of people throughout the world, it cannot remain invested in fossil fuel companies which disproportionately pollute minority communities and cause the climatic changes that exacerbate the suffering of the world’s poorest nations.

During times of great injustice and humanitarian crisis, UMass has affirmed its commitment to social good through divestment. In 1977, UMass decided to remove all investments in companies that were doing business with the reprehensible apartheid regime in South Africa. This was a decision that the University is still proud of today, as alluded to on the UMass website: “As one of the first American public universities to divest from companies doing business with the South African apartheid regime, the University of Massachusetts is proud of its long standing engagement with South Africa and its many universities.”⁶⁰ When genocide broke out in Sudan, UMass again exercised ethical leadership by divesting from companies doing business with the Sudanese government as recently as 2007. As humanitarian crises have arisen in history, UMass has not shied away from its responsibility to address them. In 2007, former Investment Committee Chairman Roy J. Zuckerberg affirmed the decision to divest from Sudan by declaring that, “we take seriously our fiduciary responsibilities to the University, its students, faculty and

⁵⁸ “Big Oil’s Banner Year,” accessed April 30, 2013,

<http://www.americanprogress.org/issues/green/news/2012/02/07/11145/big-oils-banner-year/>.

⁵⁹ “Climate Vulnerability Monitor: A Guide to the Cold Calculus of a Hot Planet,” accessed April 30, 2013,

<http://www.daraint.org/wp-content/uploads/2012/10/CVM2-Low.pdf>.

⁶⁰ “International Relations- South Africa,” accessed April 30, 2013,

<http://www.massachusetts.edu/international/southafrica.html>.

alumni. We are taking this action because we believe that it is the right thing to do.”⁶¹ The UMass Foundation does not take its fiduciary responsibilities any less seriously now than it did in 2007, and the climate crisis encompasses unprecedented suffering and injustice, and threatens all life on Earth. As a University that has demonstrated its commitment to social good by divesting from companies that support injustice, UMass has set its own moral precedent. Archbishop Desmond Tutu, regarded as “South Africa’s moral conscience” and noted for his leadership in the movement to end apartheid, has said that, “climate change is an even greater threat to us than apartheid was, because as temperatures rise, millions of Africans will be deprived of water and crops. This will cause enormous suffering. It is something we simply cannot allow.”⁶² Investing in fossil fuel companies undermines UMass’ mission to improve the lives of people. Our University’s commitment demanded that it take a stand against immoral forces in the past, and it demands the same of UMass now. Just as in 2007, taking action is the right thing to do.

UMass Students

Finally, we arrive at the foundation of the argument for divestment: UMass’ commitment to its students. Climate change is a matter of profound intergenerational inequity, since the decisions made in the near term by people in positions of power will determine whether or not today’s students and youth will inherit a planet that can support them. As the leaders of UMass work hard to ensure that an affordable and accessible education of high quality is available to the prospective students of the Commonwealth, the future of these students is becoming less secure. Investing in fossil fuel companies is not in the best interests of UMass students. The purpose of the endowment is to support the University’s mission to offer an education that can give a student the opportunity at a better future. But it doesn’t make sense to subsidize this education by supporting companies whose means of profit ensure that there will not be a viable planet on which to use this student’s degree. The time to address the climate crisis is running out, and science tells us where we are headed if society doesn’t wake up. For all of the University’s efforts towards innovation and excellence, these lose their meaning when the fundamental commitment to students’ well-being isn’t honored. At his final meeting as a Trustee last December, Jim Karam summed this up in one sentence:

“Students are the reason why we’re all here.”

We are the informed, engaged citizens that the University strives to cultivate, we recognize climate change as the greatest challenge of our time, and we are asking our University to take a stand once again and divest from the fossil fuel industry. At UMass, we act on our conscience.

⁶¹ “UMass Foundation Moves Forward on Sudan Divestment,” accessed April 30, 2013, http://www.massachusetts.edu/news/news.cfm?mode=detail&news_id=210.

⁶² “Desmond Tutu: Climate Change Is Worse Than Apartheid,” accessed April 30, 2013, <http://internationalpresentationassociation.org/2011/11/desmond-tutu-climate-change-is-worse-than-apartheid/>.

Conclusion

In this report, we highlighted the fact that fossil fuels make poor investments since the majority of fossil fuel reserves cannot be burned if we are to avoid established warming limits. These stranded assets form a carbon bubble that is 10x the size of the subprime mortgage bubble, and instituting policies that reflect our carbon budget will cause fossil fuel investments to lose 40% to 60% of their value. With the knowledge that these investments must necessarily fail, attempting to retain them becomes a question of the Foundation's fiduciary responsibility. Also, the flood risks posed to UMass Boston as climate change induces sea-level rise highlight the contradiction of investing in the companies causing the seas to rise. Finally, analysis by the Aperio Group debunks exaggerated preconceptions about the impact of fossil fuel divestment on absolute portfolio risk, and green revolving funds provide a unique option to reallocate fossil fuel investments.

We also highlighted the benefits that fossil fuel divestment can have for UMass' reputation. There is no more dire issue in the history of mankind than climate change, and as the fossil fuel divestment movement continues to grow, UMass is presented with an unmatched opportunity to be a leader within it. By taking advantage of the national press that the movement has received so far, the University may see increased student interest as we demonstrate our commitment to addressing the most pressing environmental and social issue ever. Divestment would also bring UMass tantalizingly close to becoming the only school to receive a platinum STARS rating in sustainability. Finally, fossil fuel divestment would give UMass a unique accomplishment to "tell and sell" as a part of a compelling story about the University and set an example for other state institutions.

Lastly, we acknowledged the many ways in which fossil fuel investments clash with UMass' values and moral standards. By threatening agriculture, climate change is taking aim at a formative discipline in UMass' history, and the University should not support the companies causing it. UMass also has a responsibility to act on the research from our own campuses that spells out why we must quickly scale back fossil fuel use, and not invest in the industry that funded attacks on our own scientists. The University is also committed to social good, thus the threats that climate change poses to the Commonwealth, the disproportionate effects of pollution on minority and low-income communities, and the devastating repercussions of climate change suffered by the world's least developed nations signal that fossil fuel investments run contrary to this commitment. During times of great injustice, the University has used divestment to address immorality. Finally, the threat that climate change poses to UMass students underscores the logic of divestment: it doesn't make sense to subsidize the education of today's students by investing in the companies that are destroying their future.

This article is intended to present what we feel is an overwhelming case for UMass to divest its endowment fund from fossil fuels. We are confronted with an emergency that mankind has never faced. With the knowledge of what is at stake absent unprecedented action to address the climate

crisis, a responsibility unlike any other falls to those who are living during this period: if civilization is to continue, then we must be the ones to save it. We cannot equivocate. Those who come after us will not have done anything to cause this catastrophe, and they will be powerless to do anything about it. We want to invoke the moral precedent established by the former leaders of our University, and we're confident that UMass will display such leadership now.