

Report of
JHU Public Interest Investment Advisory Committee
in Response to
Proposal of Refuel Our Future

September 2017



<u>Executive Summary</u>	3
<u>Background</u>	3
<u>Summary of Findings and Recommendations</u>	4
<u>Members of Public Interest Investment Advisory Committee (PIIAC)</u>	9
<u>I. Summary of Proposal from Refuel Our Future</u>	10
<u>II. The Impacts of Extraction and Burning of Fossil Fuels</u>	10
<u>Climate Change</u>	10
<u>Threats to Public Health</u>	11
<u>The Economics of Fossil Fuels and Alternative Sources of Energy</u>	12
<u>III. Johns Hopkins and Climate Change: Goals and Efforts</u>	13
<u>Policy Statements and Commitments</u>	13
<u>University Efforts to Address the Climate Challenge</u>	15
<u>IV. Fossil Fuel Divestment</u>	16
<u>History and Current Status</u>	16
<u>Considerations Regarding Divestment from Fossil Fuels</u>	17
<u>V. Johns Hopkins and Divestment</u>	19
<u>Past Actions on Divestment</u>	19
<u>Apartheid</u>	19
<u>Tobacco</u>	21
<u>Impact of Potential Divestment from Fossil Fuels</u>	22
<u>VI. Recommendations</u>	23
<u>Factors to Consider in Socially Responsible Investing</u>	23
<u>Principles to Guide Divestment Decisions</u>	24
<u>Recommendations Regarding Fossil Fuel Divestment</u>	25
<u>VII. Appendices</u>	28
<u>Appendix A. Refuel Our Future Proposal</u>	28
<u>Appendix B. Summary of University Sustainability Efforts in Carbon Reduction, Research & Education, and Community Engagement</u>	38

Executive Summary

Background

This report is in response to the student group Refuel Our Future's request that Johns Hopkins University ("the University") divest its endowment of fossil fuel holdings. In December 2015, Refuel Our Future (ROF) submitted a proposal urging the University to take steps to withdraw its investments from fossil fuel companies. Evaluation of such proposals is the responsibility of the Public Interest Investment Advisory Committee (PIIAC), which has been charged by the University's Board of Trustees to make recommendations "concerning social issues related to those corporations in which the Hopkins endowment is separately invested."¹

To better inform its deliberations, PIIAC engaged in an effort to educate itself in areas relevant to the ROF proposal related to the impacts of the extraction and burning of fossil fuels. This included climate change, threats to public health, and the economics of fossil fuels and alternative sources of energy. In addition to this background, PIIAC examined the University's general goals and efforts related to addressing the challenges presented by climate change, focusing on commitments to environmental sustainability including the JHU Task Force on Climate Change (2009) and its recommendations, the American Campuses Act on Climate Pledge (2015), and the 2017 statement by presidents of leading research universities and colleges reaffirming the 2015 commitments in the wake of the Trump administration's decision to withdraw the U.S. from the Paris Climate Accords. These statements were examined in the context of University efforts to address climate change, and whether fossil fuel divestment should become part of these efforts.

Any recommendation regarding divestment from fossil fuels must be situated in the larger context of the considerations being discussed by peer institutions. PIIAC examined the debates around divestment taking place on other university campuses and were further informed by a symposium convened by the Provost's Office on campus. The considerations the committee considered included the following questions:

- Does the climate change crisis create a moral responsibility to divest?
- How does divestment from fossil fuels relate to the intellectual and ethical mission of universities?
- What effects will divestment have in influencing fossil fuel companies?
- Is divestment from fossil fuels a meaningless or even counterproductive symbolic gesture?
- What is the financial impact of divestment on university endowments?

In addition, any current consideration of divestment from fossil fuels at Johns Hopkins must take into account the history of past actions on divestment by the University, including debate and decisions related to apartheid in South Africa and tobacco, and what can be learned from those decisions.

Finally, the committee worked to understand how divestment from fossil fuels would impact the University's endowment. While the University currently has no direct equity investments in Carbon Underground 200 (CU 200) companies,² when factoring in the commingled funds in its equity portfolio

¹ Johns Hopkins University, Office of the Provost. "Public Interest Investment Advisory Committee (PIIAC)." <https://provost.jhu.edu/about/piiac/>; Johns Hopkins University. "Procedures for Implementing the Trustee Statement on Investment Responsibility Regarding Separately Invested Endowment Funds," 1. https://provost.jhu.edu/wp-content/uploads/sites/4/2017/08/Procedures_for_Implementing_Trustee_Statement_Final.pdf.

²The CU 200 list is compiled by Fossil Free Indexes (FFI) (www.fossilfreeindexes.com) and includes the "list of the top publicly-traded coal, oil, and gas reserve owners ranked by the potential carbon emissions content of their reported reserves." Fossil Free Indexes and South Pole Group. *The Carbon Underground 2016: Managing the Climate Risks of Fossil Fuel Companies in*

(approx. \$1.8B), the University has \$76 million invested in energy companies broadly defined. Most of them are “oil and gas”, smaller investments being in “coal” and “renewables”. Within the “oil and gas” sector, some investments are in exploration and production companies, some are in transportation and storage companies. The precise exposure to CU 200 companies held indirectly within that \$76 million is unknown. Some index funds in the commingled portion of the equity portfolio are also likely to invest in companies that CU 200 lists for divestment. The hedge fund portfolio (approx. \$500M) includes \$21 million of investment in the energy sector (again, largely oil and gas). Roughly half of these are exploration and production companies. The remainder specialize in transportation and storage. Once more, these are indirect holdings and as such, the precise exposure to CU 200 companies is unknown. Finally, the University’s illiquid partnerships, which constitute roughly 28% of the total endowment (\$1.2 billion), include direct investment of \$320 million into the energy sector (again, mainly oil and gas) across private equity, venture capital, real estate, and real assets strategies. These partnerships do not invest in any of the companies on the CU 200 list. However, they do invest in smaller (private) energy companies and various oil and gas service companies. These investments are typically locked up for about 10 years.

Currently Johns Hopkins’ direct investments in the CU 200 companies amount to \$6.4 million. This exposure is solely from bonds in the operating cash accounts. The operating cash accounts are not a portion of the University’s endowment.

The University’s indirect investments in the CU 200 companies are likely greater, though no firm figures are available. Looking beyond the CU 200 companies, the University has made significant investments over the years in the energy sector as a whole, including fossil fuel companies. The current figure is about \$417 million (\$76 million + \$21 million + \$320 million, when broken down based on “liquidity” classes) or roughly 10% of the University’s endowment, as defined above. Johns Hopkins is heavily invested in commingled funds and uses over 100 managers. Given that the energy sector constitutes a significant portion of the US economy, investing in energy represents a “typical” strategy for the “typical” manager. By limiting access to certain managers and their strategies, constraining the University’s financial engagement with fossil fuel companies may affect the endowment by millions of dollars over the next decade. Nonetheless, with a total endowment of over \$4 billion, the University is expected to have the ability to evaluate fully, bear, and possibly offset the costs associated with alternative divestment options.³

Summary of Findings and Recommendations

Factors to Consider in Socially Responsible Investing

In previous decades, members of the Hopkins community tasked with reviewing the duties of socially responsible investment attempted to lay out general guidelines. The Board of Trustees designated the Public Interest Investment Advisory Committee (PIIAC) as the group responsible for evaluating such concerns and bringing recommendations for the Board’s consideration. In the 1990s, a more detailed but, as far as we know, unofficial pair of statements proposed further guidelines intended to shape PIIAC’s review process. These guidelines stressed the apolitical nature of the University, advising that it “must refrain from institutional commitment to a political position so as to preserve in full the freedom of expression and inquiry essential to its mission, character, and integrity.” However, the guidelines also acknowledged that an exception to the University’s generally neutral stance could be made “where the mission of the University calls forth a duty to respond.” The University is “a corporate citizen within

Investment Portfolios (Fossil Free Indexes, LLC, July 2016), 4. https://www.sindark.com/genre/FFI_The-Carbon-Underground-200-2016_26-July-2016.pdf.

³ These monetary figures were obtained through the JHU Office of Investment Management and were accurate as of March 2017.

society [and] as...such cannot remain wholly indifferent to the activities in whose stock the University endowment is invested, specifically as those activities might affect the value of securities...and...the academic mission of the University.”

Nevertheless, these guidelines urged caution in adopting a course of divestment. Expressing skepticism about the value and impact of divestment as a method for achieving positive change, the guidelines stated that “Divestment must be viewed as a sterile act, an act which disenfranchises the University, precluding any continuing relationship with the company and precluding the opportunity to influence the company.” Viewing this step as the “ultimate response” to an irresponsible company, the guidelines suggested that divestment be invoked only “as a last resort, and only in the most obvious cases of a company’s activities interfering with the mission of the University.” In judging whether a particular case merited such action, it would be important to weigh a number of variables: the extent to which the company’s actions violated the university’s mission; the ineffectiveness of other methods in persuading the company to alter its harmful practices; the level of consensus in the University community regarding the issue; and evidence that the issue is generating “broad-based, thoughtful and sustained interest.” With no clear provenance or official status, these guidelines nonetheless constitute an element of the University’s institutional memory.⁴

Principles to Guide Divestment Decisions

In the interest of evaluating ROF’s proposal and to help guide future discussions in response to proposals to divest, PIIAC identified a list of principles by which to evaluate any proposal for divestment, drawing on the history outlined above. In addition, as the committee learned more about the mix of investments in the University’s endowment, it determined that principles for divestment decisions should reflect the realities of the modern University endowment; namely the decline of direct University investments and the rise of third-party money managers. The endowment is largely invested through managers who actively manage large portfolios of comingled investments. Thus, the principles below are those that the committee recommends be applied to all endowment investment decisions.

1. Social harm of activity

Is there sufficient likelihood and gravity of harm to justify a decision to divest? As noted in “Summary of Peer Institution Socially Responsible Investment (‘SRI’) Policies and Advisory Committees” (JHU), “do corporate activities ‘have a direct and adverse impact on the mission of the University’ and obviously interfere with the mission of the University?”

Drawing from peer institutions’ criteria:

- Do a company’s activities or policies ‘plausibly cause substantial social injury’? (Duke)
- Do company’s activities or policies ‘cause substantial social injury’? (Stanford)
- Do corporate policies or practices cause ‘substantial social injury or substantial environmental harm’? (Penn)

The Committee finds that the business activities of CU 200 companies, and those companies that fall outside of the CU 200 but whose businesses include ownership of coal or oil and gas reserves, engage in activities that plausibly cause substantial environmental harm and, as such, conflict with the stated commitments of the University.

⁴ Anonymous. “Summary of Peer Institution Socially Responsible Investment (‘SRI’) Policies and Advisory Committees.”

2. Likelihood of effect of action

Will a decision to divest have an effect on altering the business activities deemed to be socially harmful? As noted in section V. of this report, divestment by any single institution is not likely to result in change on the part of any single company or sector of the economy.

The Committee finds that, while the individual action of the University is unlikely to result in change, it is nevertheless important to participate in and advance collective action in taking a position on climate change, not only in statements but also in actions. Moreover, the Committee finds that collective action such as that recommended by this Report, can result in positive change.

3. Moral leadership

It has long been the case that universities do and must play a role in moral leadership regarding difficult and controversial issues, including in areas related to their investments. As an institution of higher learning engaged in the confirmation of existing knowledge and the creation new knowledge, Johns Hopkins must assert its leadership on challenging policy issues, particularly when doing so follows from the knowledge it creates or to which it contributes.

The committee finds that the scientific consensus on the human-caused effects on climate change (to which Hopkins has contributed), in combination with the University's numerous statements and longstanding commitments on climate change and related areas, is effectively an announced moral position on the issue of climate change, its effects, and the actions required to address them. Actions on divestment would represent an additional step in the University's moral leadership on this issue.

4. Fiduciary responsibilities to mission, endowment, and fiscal soundness

Universities are required to be responsible stewards of the resources invested in their work. They must, furthermore, do so in ways that are both consistent with their fiduciary responsibilities and by a means that enables them to maximize their ability to carry out their institutional mission without betraying their core values. Social responsibility is among the many factors to be considered, and historically has been acted upon only sparingly and after much reflection, as in the examples of apartheid in South Africa and more recently regarding tobacco.

The Committee appreciates and emphasizes the care that must be taken in consideration of the financial responsibilities represented by the stewardship of the University's endowment, and the very important role the endowment plays in allowing the University to accomplish its mission. In reviewing the information available to us and in discussion with numerous experts both within and outside of the University, the Committee believes that the impact on the endowment's investments and returns from them can be managed such that the University's mission would not be harmed by divesting from fossil fuels, and that such divestment represents an action that is consistent with our mission.

5. Represents the values of the University community

It is important for institutional decisions to reflect the values of the community, and this is among the criteria noted in PIIAC's charge for evaluating proposals submitted to it. In the committee's estimation, a decision to divest is consistent with the values of the Johns Hopkins community as evidenced by the ROF proposal, a survey of students, interest in a public symposium on the topic, and widespread support from

the University community for public statements on the part of University leadership regarding the importance and necessity of action on climate change. It is also consistent with and complementary to the University's commitments to other actions on climate change, including reducing its carbon footprint, promoting research and education on climate sustainability, and partnering with the community on sustainability projects.

Recommendations Regarding Fossil Fuel Divestment

PIIAC arrived at its recommendations based on the analysis in the sections of this report and by applying the principles regarding questions of divestment outlined above. In response to the proposal from Refuel Our Future, the recommendations focus on divestment from the CU 200 companies and direct investments in companies and partnerships that include ownership of coal or oil and gas reserves. A focus on divestment from the CU 200 aligns with the University's longstanding stated commitments to sustainability and to addressing climate change issues. While the CU 200 represents a crucial aspect of fossil fuel investments, it is not the entire universe of companies or investments that contribute to the harmful consequences of the production and consumption of fossil fuels. The PIIAC's mission is to identify principles and guidelines consistent with our analysis, and given complicated nature of the investment environment, we expect that analysis of investment options is best carried out by professional endowment managers.

In response to the proposal by Refuel Our Future (ROF), PIIAC recommends the following actions:

1. For operating cash accounts, divest immediately from bond holdings in Carbon Underground 200 companies (CU 200).

As noted in section VI of this report, as of March 2017 some \$6.4 million of the University's operating cash accounts was invested in bonds of the CU 200. These operating funds can be easily divested from such holdings and no new such investments should be made.

2. For direct investments in companies, divest as soon as practicable (to minimize of financial impact) from Carbon Underground 200 companies, and make no new direct investments in them.

As of March 2017 there were no direct holdings in the University's equity portfolio of CU 200 companies. However, we do not have information for the period between April 2017 and the present, and so recommend that any such direct holdings be divested. In addition, we recommend that there be no new such direct investments going forward.

3. For illiquid partnerships that include direct investment in CU 200 companies or holdings in fossil fuel reserves, unwind such partnerships as they come to term or before if practicable, and make no new investments in such partnerships.

In discussions with leaders from the Office of the Chief Investment Officer, we understand that illiquid partnerships represent investments that do not as of March 2017 include CU 200 companies but do include energy-related investments, including holdings in fossil fuel reserves. The committee recommends that illiquid partnerships that take the form of direct investment in CU 200 companies or holdings in fossil fuel reserves be unwound, with timeframe determined by the type of partnership, and that there be no new investment going forward in illiquid partnerships that include direct investment in CU 200 companies or holdings in fossil fuel reserves.

4. For comingled investments in the University's equity portfolio and hedge fund portfolio:

a. Monitor investment in CU 200 companies, with minimum of annual reporting of such investments and with the goal of reducing the amount of such holdings over time.

b. Add the following criterion to the set of criteria used to evaluate investment managers: a commitment by the manager to avoid investment in CU 200 companies.

Regarding point (a): In discussions with leaders from the Office of the Chief Investment Officer, we understand that the University receives reports on a periodic basis regarding the returns and holdings in its comingled investments (with frequency dependent on the practices of individual investment managers). Our understanding is that the reports include a listing of the holdings in those accounts during the time period reported, and so investment in CU 200 companies can be monitored relatively easily. We acknowledge that hedge fund managers may not be willing to report individual holdings, but we recommend they be asked to simply report the overall percentage invested in CU 200 companies on a periodic basis.

Regarding point (b): the Office of the Chief Investment Officer employs a series of criteria to select new managers, one important criterion being profitability over a sufficiently long period of time. We recommend that the selection of new managers should also include their commitment to avoid investments in CU 200 companies among the many criteria considered. Because of their relatively shorter track record, in spite of competitive performance, some of these managers may currently not be considered.

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Full Report of the Committee

I. Summary of Proposal from Refuel Our Future

This report is in response to the student group Refuel Our Future's request that Johns Hopkins University ("the University") divest its endowment of fossil fuel holdings. In the 2015-2016 academic year, Refuel Our Future (ROF) submitted a proposal urging the University to take steps to withdraw its investments from fossil fuel companies. "We request that Johns Hopkins University terminate all direct investments it currently holds in any of the companies listed in the Carbon Underground 200™. We also request that Johns Hopkins University make a vow to not invest in any of these companies in the future. Further, we ask for the school to investigate the potential to move the University's commingled funds into more sustainable investment portfolios." In support of its proposal, ROF presented the results of a 2014 referendum among undergraduate students in which 73% of the 397 respondents agreed that the University should divest from the Carbon Underground 200 companies. In February 2017, the Senate of the Student Government Association voted in favor of "A Resolution Calling for Fossil Fuel Divestment and Increased Investment in Renewable Energy," and in April 2017, a group of guest lecturers visited campus to present arguments for and against fossil fuel divestment in the JHU Forum on Divestment from Fossil Fuels.⁵ These activities offer evidence of sustained interest and support for divestment among the campus community. The ROF proposal is attached as an appendix to this report.

Evaluation of such proposals is the responsibility of the Public Interest Investment Advisory Committee (PIIAC), which has been charged by the Johns Hopkins University Board of Trustees to make recommendations "concerning social issues related to those corporations in which the Hopkins endowment is separately invested."⁶

II. The Impacts of Extraction and Burning of Fossil Fuels

To better inform its deliberations, PIIAC engaged in an effort to educate itself in areas relevant to the ROF proposal. This section of the report summarizes those findings.

Climate Change

What is Climate Change and Why Does It Matter?

2016 was the hottest year on earth, and the third consecutive year to break the historical record. In fact, "sixteen of the seventeen warmest years in the 136-year record all have occurred since 2000, with the exception of 1998."⁷ Rising global temperatures have followed increases in the concentration of greenhouse gases, including carbon dioxide, in the earth's atmosphere. While atmospheric greenhouse gases are essential to life on our planet, beyond a certain threshold, they begin to threaten civilization, and even life, on earth. There is consensus among the climate science community that human activities are the major cause of global warming. In particular, nearly all of the increase in atmospheric greenhouse gas

⁵ Senate of the Student Government Association of The Johns Hopkins University. S. Res. 02-17. "A Resolution Calling for Fossil Fuel Divestment and Increased Investment in Renewable Energy"; JHU Forum on Divestment from Fossil Fuels. http://e2shi.jhu.edu/events/article/forum_divestment_from_fossil_fuels.

⁶ JHU, Office of the Provost. PIIAC homepage. <https://provost.jhu.edu/about/piiac/>; "Procedures for Implementing the Trustee Statement on Investment Responsibility Regarding Separately Invested Endowment Funds," 1. https://provost.jhu.edu/wp-content/uploads/sites/4/2017/08/Procedures_for_Implementing_Trustee_Statement_Final.pdf.

⁷ NASA. "Global Temperature: Facts." Global Climate Change: Vital Signs of the Planet. <https://climate.nasa.gov/vital-signs/global-temperature/>.

concentration over the past 150 years can be attributed to human activity. If current emissions rates continue, the earth is expected to warm by 6°C by 2100.⁸

Increasingly, official warnings about the dangers of climate change take the form of superlatives: climate change is “one of the greatest health threats facing humanity,” the “biggest potential threat to the global economy in 2016,” and the “greatest threat to national security.”⁹ President Barack Obama, in his 2016 State of the Union address, claimed that “no challenge—no challenge—poses a greater threat to future generations than climate change.”¹⁰

More concretely, sea level experts warn that “a rise of 15 or 20 feet has already become inevitable, though they cannot say how fast it will happen.” Absent “heroic efforts to fortify them,” sea level rise of that magnitude “would drown most of the world’s coastal cities.”¹¹ Beyond sea level rise, climate change is projected to greatly exacerbate drought and famine conditions worldwide, especially in southern and eastern Africa. Together, these and other impacts of climate change are expected to spark “a refugee crisis of ‘unimaginable scale’.”¹²

Threats to Public Health

Annually, 12.6 million lives are lost to environmental pollution alone.¹³ According to the American Public Health Association, “[c]limate change and extreme weather events are threatening our health today, and if left unchecked, will lead to increases in disease and death.”¹⁴ As the former Dean of the Bloomberg School of Public Health Al Sommer noted in 2016, “Too little attention is being paid to the impending health impact of accumulating greenhouse gases.”¹⁵

If climate change has already begun to damage health and shorten lives, how does it compare to other dangers to public health today and going forward? Consensus appears to be building among national and international public health authorities that there is no more serious threat than climate change. The World Health Organization recently declared climate change “the greatest threat to global health in the 21st

⁸ Increases in average global temperature are measured versus the pre-industrial average temperature. YaleEnvironment360. “2016 Temperatures Measure 1.2 Degrees C Above Pre-Industrial Levels.” E360 Digest (Yale School of Forestry & Environmental Studies) November 14, 2016. https://e360.yale.edu/digest/2016_hottest_year_on_record_wmo_12_degrees_c; Harvard T.H. Chan, School of Public Health, Center for Health and the Global Environment. “Climate Change and Biodiversity Loss.”

<http://www.chgearharvard.org/topic/climate-change-and-biodiversity-loss>.

⁹ Physicians for Social Responsibility (PSR). “Climate Change Is a Threat to Health.” PSR website, Environment & Health. <http://www.psr.org/environment-and-health/climate-change/>; Larry Elliott. “Climate change disaster is biggest threat to global economy in 2016, say experts.” *The Guardian*, January 14, 2016.

<https://www.theguardian.com/business/2016/jan/14/climate-change-disaster-is-biggest-threat-to-global-economy-in-2016-say-experts>; Jonathan Easley. “Sanders: Climate change still greatest threat to national security.” *The Hill*, November 14, 2015. <http://thehill.com/policy/energy-environment/260184-sanders-climate-change-still-greatest-threat-to-national-security>.

¹⁰ White House, Office of the Press Secretary. “Remarks by the President in State of the Union Address, January 20, 2015.” Obama White House Archives, Speeches & Remarks. <https://obamawhitehouse.archives.gov/the-press-office/2015/01/20/remarks-president-state-union-addressjanuary-20-2015>.

¹¹ Justin Gillis. “Earth Sets a Temperature Record for the Third Straight Year.” *The New York Times*, January 18, 2017. https://www.nytimes.com/2017/01/18/science/earth-highest-temperature-record.html?_r=0.

¹² Damian Carrington. “Climate change will stir ‘unimaginable’ refugee crisis, says military.” *The Guardian*, December 1, 2016. <https://www.theguardian.com/environment/2016/dec/01/climate-change-trigger-unimaginable-refugee-crisis-senior-military>.

¹³ World Health Organization (WHO). “Health and Environment Ministers Pledge Climate Actions to Reduce 12.6 Million Environment-related Deaths.” WHO home page, Programmes: Climate change and human health, media centre. November 15, 2016. www.who.int/globalchange/mediacentre/news/ministers-pledge-climate-actions/en/.

¹⁴ APHA. “Climate Change: Endangering Human Health and Well Being,” 1. https://www.apha.org/~media/files/pdf/factsheets/climate_change_2015.ashx.

¹⁵ Alfred Sommer. “Burning Fossil Fuels: Impact of Climate Change on Health,” *Intl J of Health Services* 46(1):48-52; December 30, 2015.

century.”¹⁶ The Medical Society Consortium on Climate and Health, representing more than half of U.S. primary care physicians, has argued that “[t]he most important action we can take to protect our health is to reduce heat-trapping pollution...”¹⁷ And a joint statement from NASA and the U.S. Centers for Disease Control claims that “From the direct effects of weather extremes on morbidity and mortality to the potential for changes in disease ecology and geography brought about by ‘state shifts’ in the earth’s biosphere, climate change will be the defining issue for public health in the 21st Century.”¹⁸

Because the harms of climate change intersect political and economic harms (e.g., poor women of color are disproportionately harmed by extreme heat and air pollution), any abstract account of these dangers to health and well-being is apt to underplay critical issues of environmental justice. However, noting the many ways in which climate change degrades human health and wellbeing underscores the responsibilities of those who are relatively privileged toward those who are at the greatest risk. Research from the Climate and Health Program at the Centers for Disease Control and Prevention outlines eight general categories of impact: *extreme heat*, which causes illness and death—e.g., from cardiovascular failure; *severe weather*, which causes injury and death and takes a heavy toll on mental health; *air pollution*, which causes asthma and compromises cardiovascular health; *changes in vector ecology*, which heighten the risk of malaria, dengue fever, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, and West Nile virus, among others; *increasing allergens*, which exacerbate allergies and increase the risk of asthma; *water quality impacts*, which make cholera, cryptosporidiosis, campylobacter, leptospirosis, and harmful algal blooms more likely; *water and food supply impacts*, which lead to malnutrition and diarrheal disease; and *environmental degradation*, which will catalyze forced migration on a scale unimaginable heretofore—with the predictable civil conflicts and mental health strains that follow.¹⁹ In sum, the growing consensus is that the public health effects of climate change are clear and approaching crisis proportions.

The Economics of Fossil Fuels and Alternative Sources of Energy

By 2040, the developing world will account for 65 percent of the world’s energy consumption, up from 54 percent in 2010.²⁰ Both China and India are building coal-fired power plants (the United States is not) and both countries are increasing their demand for petroleum. According to the Energy Information Administration (EIA), China and India are even importing oil and petroleum products from the United States.²¹ According to Bloomberg, China’s coal-fired generation capacity may increase by as much as 19 percent over the next five years. While the country has canceled some coal-fired capacity due to lack of demand growth, China still plans to increase its coal-fired power plants to almost 1,100 gigawatts, which is three times the coal-fired capacity of the United States.²²

¹⁶ “WHO calls for urgent action to protect health from climate change.” WHO home page, Programmes: Climate change and human health, Health and Climate Change: Road to COP21. www.who.int/globalchange/global-campaign/cop21/en/.

¹⁷ Medical Society Consortium on Climate and Health, “Medical Alert! Climate Change is Harming Our Health,” 2. http://medsocietiesforclimatehealth.org/wp-content/uploads/2017/03/medical_alert.pdf.

¹⁸ George Luber. “Climate change and human health: NASA and Centers for Disease Control and Prevention (CDC) collaboration,” *Geocarto International* 29.1 (2014): 17-18. https://tools.niehs.nih.gov/cchhl/index.cfm/main/detail?reference_id=9237.

¹⁹ Centers for Disease Control and Prevention. “Climate Effects on Health.” Climate and Health. ‘Impact of Climate Change on Human Health’ graphic. <https://www.cdc.gov/climateandhealth/effects/default.htm>.

²⁰ U.S. Energy Information Administration (EIA). “Future world energy demand driven by trends in developing countries.” December 3, 2013. <https://www.eia.gov/todayinenergy/detail.php?id=14011>.

²¹ EIA, “China and India drive recent changes in world coal trade.” November 20, 2015. <https://www.eia.gov/todayinenergy/detail.php?id=23852>; EIA, “U.S. Exports to China of Crude Oil and Petroleum Products.” August 31, 2017. <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mttexch1&f=m>.

²² Aibing Guo. “China Says It’s Going to Use More Coal, With Capacity Set to Grow 19%.” Bloomberg website, November 7, 2016. <https://www.bloomberg.com/news/articles/2016-11-07/china-coal-power-generation-capacity-may-rise-19-in-5-year-plan>.

While population growth in developing countries will continue to fuel demand for energy, the solution to global inequalities among developed and developing nations cannot lie in their burning of fossil fuels as has occurred in the past. This owes to the reality that the consequences of climate change will fall disproportionately on the global south. The greater the impact of climate change, the more poor countries will suffer.

III. Johns Hopkins and Climate Change: Goals and Efforts

As educational institutions, engines of knowledge production, agents of economic advancement and investment, and sources of leaderships on community, state, and national levels, universities have numerous avenues to address the challenges presented by climate change. These avenues can include:

- Conducting research to improve understanding about its causes and effects;
- Developing new and alternative technologies that can lower emissions, help lead adaptation to change, and spur investment;
- Educating and training future leaders;
- Reducing their energy use and emissions;
- Partnering with faculty, investors, and corporations to spur innovation;
- Sharing information with community groups to transfer knowledge and technologies and harness the enthusiasm of its students and employees; and
- Providing leadership by word and example to encourage society to adopt sustainable behaviors, technologies, and policies.

Divestment falls into the last category, although it can also be an opportunity for education, and a way to encourage investment in new and alternative technologies.

A strategy to implement the University's ambitious sustainability goals can choose to emphasize some of the aforementioned categories at the expense of others. However, this Committee believes that actions across these categories are complementary: effectiveness in one category increases if actions in other categories are also pursued. In particular, we believe that if the University aims to lead on the issue of climate change, it should act in a consistent and committed fashion in all these categories. For this reason, this section reviews the University's overall sustainability goals and other efforts it has made in the last decade. The review provides context for considering the question of divestment from fossil fuels.

Policy Statements and Commitments

Johns Hopkins University has committed itself to environmental sustainability in general for nearly a half-century. In the 1980s, the University's Recycling Department was launched, well before such efforts were widely adopted by companies and localities. On April 21, 2000, President William R. Brody launched the "Greening of Johns Hopkins Initiative," and framed these commitments to environmental sustainability as part of the University's core mission:

At the start of this new millennium, it is even more apparent that how we use the earth and its resources will determine the kind of earth we leave our children and our children's children... Universities can help meet these challenges by forging new knowledge and providing the students with the necessary tools to solve problems. I, therefore, declare the "Greening of Johns Hopkins

Initiative.” Through this initiative, we will bring an environmental ethic to the university’s operations. The aim will be to create a sustainable future.²³

In 2006, the University built on these efforts by creating the Johns Hopkins University Sustainability Committee within the Office of Facilities Management, which later became the Office of Sustainability. On July 23, 2007, President Brody renewed the University’s commitment to become a central actor in moving society toward environmentally sustainable future.

As of today, I am committing the Johns Hopkins University to become a driving force for developing solutions to the climate change problem. It is clear that curbing [greenhouse] emissions poses a significant challenge for future generations. It is also clear that universities must play a central role in meeting this challenge.²⁴

In March 2009, the JHU President’s Task Force on Climate Change issued its report, which recommended a focus on campus sustainability efforts, interdisciplinary research and education, and community outreach.²⁵ Incoming President Ronald Daniels enthusiastically welcomed those recommendations on March 15, 2010, emphasizing Johns Hopkins’ leadership in the “special role” and “special responsibility” that universities must play to combat climate change.

Global climate change is one of humanity’s greatest challenges. The earth’s rising temperatures will, over decades to come, affect where and how we live, the ecosystems we inhabit, our quality of life and even our health. Facing this challenge head-on is our shared responsibility as humans, and especially as residents of the developed world. But universities have a special role in our society and a special responsibility. We are institutions that discover, that educate and that, often, set an example. When it comes to global climate change, Johns Hopkins will be a leader in all three.²⁶

The University has made significant investments in response to the recommendations concerning campus sustainability, research, education, and community involvement. An overview of these efforts, along with the resulting accomplishments, as well as set-backs and remaining challenges, are summarized later in this section and detailed in Appendix B.

Since President Daniels’s endorsement of the Task Force Report, the University has made additional public commitments to lead efforts to reduce greenhouse gas emissions and climate change. On the eve of the Paris Conference of the Parties in 2015, the University was one of 218 universities and colleges that signed the American Campuses Act on Climate Pledge.²⁷ That pledge committed the University to increased energy efficiency; conservation of resources; and continued support of research in the fields of climate change, public health, energy, and sustainability. At that time, the University stated:

²³ Johns Hopkins University, Office of Sustainability. Mission and Goals.

http://sustainability.jhu.edu/office_of_sustainability/mission_and_goals/index.html.

²⁴ Bobby White. “Knowledge for a greener world.” *Johns Hopkins Magazine*. September 2007.

<http://pages.jh.edu/jhumag/0907web/wholly.html>.

²⁵ Johns Hopkins University. *President’s Task Force on Climate Change: Final Report*, March 2009.

http://sustainability.jhu.edu/sustainability_initiatives/energy_and_climate_change/Task%20Force%20Report.pdf; Appendices:

http://sustainability.jhu.edu/sustainability_initiatives/energy_and_climate_change/Task%20Force%20Report%20Appendices.pdf.

²⁶ Johns Hopkins University, Office of Communications. “JHU to halve CO2 greenhouse gas emissions in 15 years.” March 11, 2010. <http://releases.jhu.edu/2010/03/11/climate/>.

²⁷ White House, Office of the Press Secretary. “Fact Sheet: Ahead of the Conference on Climate Change, More than 200 Colleges and Universities Sign the American Campus Act on Climate Pledge to Demonstrate Support for Strong International Climate Action.” November 19, 2015. <https://obamawhitehouse.archives.gov/the-press-office/2015/11/19/fact-sheet-ahead-conference-climate-change-more-200-colleges-and>.

As institutions of higher education, we applaud the progress already made to promote clean energy and climate action. We recognize the urgent need to act now to avoid irreversible costs to our global community's economic prosperity and public health. We believe that research universities play a critical role in developing solutions to climate change and in finding new ways to meet growing energy demands while sustaining the environment. Today, the Johns Hopkins University pledges to accelerate the transition to low-carbon energy while enhancing sustainable and resilient practices across our campuses.²⁸

Subsequently, in the wake of President Trump's June 2017 decision to withdraw the United States from the Paris Agreement, President Daniels joined with presidents of 11 other leading research universities and colleges to issue the following statement reaffirming their 2015 commitments:

Today we reaffirm that commitment, which is consistent with the Paris Agreement and recognizes the concerted action that is needed at every level to slow, and ultimately prevent, the rise in the global average temperature and to facilitate the transition to a clean energy economy. Universities have a critical role to play in reducing our own greenhouse gas emissions; continuing to advance evidence-based understanding of the causes and effects of climate change on the environment, the economy, and public health; and developing solutions.

The scientific consensus is clear that the climate is changing largely due to human activity, that the consequences of climate change are accelerating, and that the imperative of a low carbon future is increasingly urgent. As institutions of higher education, we remain committed to a broad-based global agreement on climate change and will do our part to ensure the United States can meet its contribution.²⁹

From this review of public statements across more than two decades and two university presidents, it is clear that Johns Hopkins is unambiguously committed to take a leading role in addressing the effects of climate change.

University Efforts to Address the Climate Challenge

This section briefly reviews some of the progress the University has made since 2009 in acting on its commitments in the areas of university emissions; research and education initiatives; and community outreach. A more detailed discussion can be found in Appendix B.

First, the President's Task Force report focused on the principle of "reducing, with the vision of carbon neutrality, the emissions of greenhouse gases derived from university operations." The Task Force emphasized goals and actions that could be accomplished in the medium term. Taking emissions data from 2008 as its initial benchmark, the President's Task Force proposed a goal of a 51% reduction of its carbon footprint by the year 2025, based solely on the University's own actions to improve its efficiency of energy use. Efforts since 2009 to reduce energy use and utilize renewable energy have fallen well short of targets. Although the University's carbon footprint has fallen by about one-third, this reduction has been achieved primarily because of shifts from coal to gas in the regional electricity generation mix and not through conservation or other efforts.

²⁸ Johns Hopkins University HUB. "Johns Hopkins to join other universities in signing Act on Climate Pledge." November 19, 2015. <https://hub.jhu.edu/2015/11/19/hopkins-act-on-climate-pledge/>.

²⁹ Johns Hopkins University HUB. "Johns Hopkins joins 11 other universities in reaffirming commitment to tenets of Paris accord." June 5, 2017. <https://hub.jhu.edu/2017/06/05/hopkins-climate-pledge-joint-statement/>.

Second, the President's Task Force proposed the establishment of a university-wide environment institute to promote interdisciplinary sustainability and climate education and research. In response to this recommendation, in 2010 the University founded the Environment, Energy, Sustainability and Health Institute (E²SHI). One of the Institute's primary goals was to "[e]stablish Johns Hopkins University as a world leader in, and provide a single point of contact for, integrative approaches to global environmental change, sustainability, and their related health challenges." By supporting inter-departmental projects, helping Hopkins faculty secure external research funding, providing seed grants and fellowships, and sponsoring an annual symposium, the University hoped to join its peer institutions in research and education in sustainability.

Third, the President's Task Force report proposed to "develop and nurture strong relationships with State, City and community groups within the Baltimore region, and explore collaborative ways to attain our respective goals, transfer knowledge, and share successes." The Task Force recommended that there be created "a community-based learning working group to promote sustainability related projects." Although, this work group was not developed, the Office of Sustainability has provided the needed leadership, and it can be fairly stated that the University has made excellent efforts in this regard. Most of the many joint JHU-community projects now underway have a water quality emphasis rather than greenhouse gases per se, but have created important linkages that could be the basis of future energy efficiency efforts.

To summarize, although the University's public commitments to environmental sustainability and to taking a leading effort in combatting climate change are clearly articulated as part of the University's core mission, effort and investment must be renewed if it is to live up to its commitments.

In June 2017, the U.S. government's departure from the Paris Agreement galvanized the University community, as well as many city and state communities, to renew or even increase their commitment to meet voluntary sustainability goals. President Daniels spoke of "the significant threats posed by climate change" and reiterated that our institutional goal "includes not only further reducing our carbon footprint but also tapping our unique strength as a university to study and teach the impacts of climate change, and lift up innovative research into practices and technologies with the potential to slow and even reverse those impacts."³⁰ The specific question faced in this report is whether fossil fuel divestment should become part of the University's efforts to address climate change and its impacts.

IV. Fossil Fuel Divestment

History and Current Status

The current global campaign to convince institutions and individuals to divest from fossil fuel companies initially had modest beginnings. In 2010, student activists at Swarthmore College in Pennsylvania pressed, unsuccessfully, for divestment from coal as part of their broader opposition to mining in Appalachia. Several years earlier, students at Middlebury, alongside environmentalist Bill McKibben, had founded 350.org dedicated to building a more effective global social movement to demand effective action limiting climate change. Appreciating the potential of divestment to undermine the 'business as usual' normalization of fossil fuel extraction, 350.org had by 2012 become a leading advocate for a wider divestment movement. McKibben captured popular attention with the argument that, in order to prevent global carbon emissions from increasing to levels that scientists identified as catastrophic, fossil fuel companies would have to keep the majority of their known coal, gas, and oil reserves in the ground. With

³⁰ Johns Hopkins University HUB. "Johns Hopkins joins 11 other universities in reaffirming commitment to tenets of Paris accord." June 5, 2017. <https://hub.jhu.edu/2017/06/05/hopkins-climate-pledge-joint-statement/>.

this in mind, participants in the fossil fuel divestment movement often concentrated their efforts on the 100 coal companies and 100 gas and oil companies reported to hold the largest reserves awaiting extraction, which came to be known as the “Carbon Underground 200”.³¹

Divestment campaigns spread, but divestment commitments progressed more slowly. By mid-2016 in the United States, hundreds of student groups had advocated for divestment but only 36 of these campus campaigns led to policy change. High-profile schools with large endowments, Harvard University being the most prominent, debated but ultimately decided against divestment. Billionaire philanthropist Bill Gates called divestment one of the “false solutions” to the energy crisis, seemingly considering it a misleading quick-fix. Nevertheless, by mid-2016 his foundation had fully divested from both ExxonMobil and BP oil companies. As fossil fuel divestment campaigns gained wider attention and publicity, arguments for and against the policy multiplied in widely-read newspapers and periodicals, increasing public awareness and fostering a variety of perspectives.³²

In December 2015, the United Nations’ Paris Climate Conference drafted and approved an agreement for numerous nations to work together to keep the average global temperature from rising more than 2°C above pre-industrial levels, with 194 signatory countries and confederations. As of the end of 2016, in the wake of the Paris Agreement, institutions, organizations, and individuals holding an estimated \$5.4 trillion in total assets had pledged themselves to varying degrees of divestment. When calls for fossil fuel divestment began, the movement was concentrated largely in institutions of higher learning and faith-based groups. Now it spreads across multiple public and private sectors, including local governments, philanthropic foundations, pension funds, NGOs, and asset managers. The group committing to full or partial divestment includes institutions as varied as the Rockefeller Brothers Fund, the British Medical Association, the Norwegian Sovereign Wealth Fund, and Yale University.³³

Considerations Regarding Divestment from Fossil Fuels

- **Does the climate change crisis create a moral responsibility to divest?** Many advocates of divestment, and many outside the divestment movement as well, consider climate change to be the defining global challenge of our time. On this argument, the potentially catastrophic consequences of climate change, combined with the limited timeframe left to effect change and prevent irreparable and irreversible harms, elevate it to a level of importance unmatched by any other issue. However, some see climate change and fossil fuel divestment not as uniquely universal concerns, but as one moral cause among many. This viewpoint gives rise to a concern that fossil fuel divestment might lead to a ‘slippery slope’ in which various activists could place

³¹ Noel Healy and Jessica Debski, “Fossil Fuel Divestment: Implications For The Future Of Sustainability Discourse And Action Within Higher Education” December 7, 2016. *Geography Faculty Publications*, 5-6.

http://digitalcommons.salemstate.edu/geography_facpub/1; Bill McKibben, “Global Warming’s Terrifying New Math,” *Rolling Stone*, July 19, 2012. <http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719>; Fossil Free Indexes. “The Carbon Underground 200™ – 2016 Edition.” <http://fossilfreeindexes.com/research/the-carbon-underground/>.

³² Barnard College, *Presidential Task Force to Examine Divestment: Final Report to the Barnard College Board of Trustees Committee on Investments*, December 7, 2016, 17. <https://barnard.edu/sites/default/files/bc-divestmentreport2-2016dec.pdf>; Drew Faust. “Fossil Fuel Divestment Statement.” Harvard University, Office of the President. October 3, 2013.

<http://www.harvard.edu/president/news/2013/fossil-fuel-divestment-statement>; James Bennet, “‘We Need an Energy Miracle’: Bill Gates has committed his fortune to moving the world beyond fossil fuels and mitigating climate change.” *The Atlantic*, November 2015. <https://www.theatlantic.com/magazine/archive/2015/11/we-need-an-energy-miracle/407881/>; Damian Carrington, “Bill and Melinda Gates Foundation divests entire holding in BP,” *The Guardian*, May 12, 2016. <https://www.theguardian.com/environment/2016/may/12/bill-and-melinda-gates-foundation-divests-entire-holding-in-bp>.

³³ United Nations Framework Convention on Climate Change. “Paris Agreement – Status of Ratification.” (Webpage includes links to PDFs of Paris Agreement text). http://unfccc.int/paris_agreement/items/9444.php; Fossil Free. “Divestment Commitments.” <https://gofossilfree.org/commitments/>; Arabella Advisors, *The Global Fossil Fuel Divestment and Clean Energy Investment Movement*. December 2016, 5-7. https://www.arabellaadvisors.com/wp-content/uploads/2016/12/Global_Divestment_Report_2016.pdf.

increasing demands on universities and other institutions to use their endowments to declare their support for any number of projects and take sides in the social causes of the moment. Universities must articulate and apply criteria by which to determine when to use the platform of their investment portfolio to take a stand as a matter of social responsibility and/or moral leadership.³⁴ This report recommends such a process in Section VII.

- **How does divestment from fossil fuels relate to the intellectual and ethical mission of universities?** Among proponents of divestment, intellectual and ethical arguments are paramount. Seventy-three percent of divesting U.S. colleges and universities framed their decision as a fulfillment of their institutional mission and values. This framing of decisions to divest comes in the context of all such institutions continuing to use and benefit from the production of energy from burning of fossil fuels. In response to charges that divesting universities are engaging in hypocrisy, advocates of divestment counter that an equally if not more troubling hypocrisy is to profit from fossil fuel extraction while research and teaching increasingly argues that ongoing production and burning of fossil fuels are harmful and unsustainable. As it pertains to the intellectual and ethical mission of the University, this committee has identified a history of two decades during which Johns Hopkins has committed itself to environmental sustainability as part of its core intellectual and ethical mission.³⁵
- **What effects will divestment have in influencing fossil fuel companies?** Divestment advocates and critics agree that the strategy is not likely to have any direct financial impact on fossil fuel companies. When institutions or individuals divest, the stocks and bonds they sell are bought by other investors. Furthermore, much of the global fossil fuel supply is held by companies that are owned by governments that do not publicly trade their stock. Nor will divestment, in and of itself, reduce the levels of carbon emissions and greenhouse gases that cause climate change. Proponents of divestment argue that their goal is not financial, but rather a matter of social advocacy. Attempts to change the business practices of fossil fuel companies through methods such as shareholder advocacy, however, have proven largely ineffective. Such efforts intend to “revoke the social license” that enables fossil fuel companies to continue to do business as usual. In line with divestment campaigns against apartheid and tobacco, proponents believe an effective global divestment campaign can lay the groundwork for more integrated and meaningful efforts to reduce fossil fuel extraction and use. Such a campaign can educate the public on important and time-sensitive issues, and thereby create the necessary social pressure for governmental action to eliminate direct and indirect subsidies for fossil fuel extraction and use.³⁶
- **Is divestment a meaningless or even counterproductive symbolic gesture?** Some critics of divestment argue that, as a symbolic gesture, its influence will be at best negligible and at worst pernicious. Robert N. Stavins, a Harvard professor and leading scholar of climate change policy, considers divestment an easy, feel-good measure that distracts attention from the more difficult but necessary changes in public policy “at the international, national and sub-national levels.” Many of the universities and colleges in the U.S. that decided against divestment from 2011 to 2016 articulated similar arguments, suggesting that constructive engagement or renewed commitments to green energy would have better success at slowing climate change. Proponents of divestment do not deny the necessity of further work to cut carbon consumption and develop cleaner energy technologies while also considering the energy needs of developing economies.

³⁴ Arabella Advisors, *Global Fossil Fuel Divestment*, 24.

³⁵ Barnard College, *Presidential Task Force to Examine Divestment*, 20-23; Healy and Debski, “Fossil Fuel Divestment,” 9.

³⁶ Bill McKibben, “Turning Colleges’ Partners Into Pariahs,” *New York Times*, February 11, 2014.

<http://www.nytimes.com/roomfordebate/2013/01/27/is-divestment-an-effective-means-of-protest/turning-colleges-partners-into-pariahs>.

They see divestment as a stepping stone to building the kind of widespread, well-informed, and focused attention that can tackle those more difficult problems. Divestment advocates point to similar campaigns against apartheid in the 1980s and tobacco in the 1990s as evidence that taking a public position can significantly affect business practices. They see little reason to believe that such efforts have an “opportunity cost,” particularly in a context in which governmental authorities are blocking or preventing policy action. To the contrary, they believe divestment campaigns actually increase pressure for enlightened public policy by providing, as Al Gore has stated, “an opportunity for learning and the raising of awareness, for the discussion of sustainable capitalism.”³⁷

- **What are the financial impacts of divestment on university endowments?** U.S. universities and colleges that declined to divest most often cited the prospect of decreasing the financial performance and diversification of endowment portfolios as a primary concern. Trustees, fund managers, and administrators appropriately point to their duty to prioritize the protection and growth of the funds entrusted to them, and to make prudential investment decisions based on market factors rather than non-economic considerations. On the other hand, fossil fuel companies represent a relatively small percentage of most universities’ investments. Some higher-learning institutions that have chosen to divest have stated that they expect their endowments will encounter little to no loss in value, and that diversification can be served through either climate-friendly or climate-neutral alternative investments. Additionally, some investment management and consulting firms – including BlackRock – are encouraging fiduciaries to consider and disclose “climate risk” when organizing their portfolios. The European Union requires pension fund managers to inform investors of such risks. The Bank of England’s Task Force on Climate-related Financial Disclosures, which advises the G20 nations about means to promote a stable global economy, is working on a project to help companies voluntarily deliver more standardized climate risk information to their stakeholders. Some divestment proponents argue that, even apart from ethical considerations, fossil fuel stocks carry enough risk of depreciation that they do not represent good long-term investments. If governments honor the Paris Climate Agreement, they might take action to prevent fossil fuel companies from burning through their current reserves and drilling or mining for more. In that case, fossil fuel stocks could transform into unprofitable “stranded assets.”³⁸

V. Johns Hopkins and Divestment

Past Actions on Divestment

Apartheid

Johns Hopkins University began debating divestment from publicly traded companies operating in apartheid South Africa as far back as the late 1970s. For example, on March 28, 1978, the PIIAC adopted

³⁷ Ellen Dorsey and Robert Stavins. “Should Endowments Divest Their Holdings in Fossil Fuels?: Ellen Dorsey Cites Moral and Financial Reasons; Robert Stavins Argues Lack of Impact.” *Wall Street Journal*, November 23, 2014. <https://www.wsj.com/articles/should-endowments-divest-their-holdings-in-fossil-fuels-1416779351>; Fossil Free. “Al Gore Endorses Fossil Fuel Divestment at Harvard.” February 7, 2013. <https://gofossilfree.org/al-gore-endorses-fossil-fuel-divestment-at-harvard/>; Healy and Debski, “Fossil Fuel Divestment,” 10; Marc Gunther, “Why the Fossil Fuel Divestment May Ultimately Win,” *Yale Environment* 360, July 27, 2015. http://e360.yale.edu/features/why_the_fossil_fuel_divestment_movement_may_ultimately_win; Piers Telemacque, “Whether it’s apartheid or fossil fuels, divestment is on the right side of history.” *The Guardian*, April 27, 2015. <https://www.theguardian.com/commentisfree/2015/apr/27/divestment-fossil-fuels-apartheid-barclays>.

³⁸ Healy and Debski, “Fossil Fuel Divestment,” 9-10; Arabella Advisors, *Global Fossil Fuel Divestment*, 9-11.

the “South Africa Resolution,” a policy statement regarding JHU’s investments in corporations trading with or operating in South Africa, that recommended voting in favor of shareholder resolutions that (1) opposed loans to the government of South Africa; (2) opposed corporations’ sale of goods to be used for South African military or police functions; and (3) called on corporations operating in South Africa to abide by the Sullivan Principles and provide reports on how they carry out the Principles.³⁹ (These principles acted as a set of business guidelines embraced by the larger international anti-apartheid movement, and they rewarded businesses that refused to discriminate.) The South Africa Resolution also “recommend[ed] that the Trustees consider divestment or non-purchase of securities in corporations which refuse, after sufficient warning and a reasonable period of time, to abide by” the Sullivan Principles (or their equivalent).⁴⁰ Other steps by PIIAC and the Board of Trustees demonstrate active engagement with the issue in the years that followed; this includes voting in favor of shareholder resolutions placing restrictions on certain companies operating in South Africa.⁴¹

The first major student-led divestment campaign at JHU took place during the 1985-86 academic year. Beginning in early 1985, Johns Hopkins students campaigned for the University’s Board of Trustees to divest from all publicly traded corporations doing business in apartheid South Africa. By student estimates, the University had over \$70 million invested in such companies. Both undergraduates and graduate students participated in the movement, spearheaded by the Johns Hopkins University Coalition for a Free South Africa, which was in turn a member of broader regional and national student activist coalitions. These groups adopted common gestures of protest and solidarity, the central feature of which involved the construction of “shanties” on campus quadrangles to dramatize the unequal and inhumane conditions under which black South Africans struggled. The University administration, though initially resistant to considering divestment, allowed these demonstrations to continue for seven weeks.⁴²

As the campus protests continued, so did the Board of Trustees’ deliberations about divestment. In October 1986, the full Board of Trustees met to consider divestment once again and after over four hours of intense discussion, voted in favor of a partial divestment commitment that would withdraw university funds from companies that failed to implement the Sullivan Principles. It also issued a “Statement Regarding Divestment” that stated, in relevant part:

It has been and is the unanimous view of Trustees that the racial policies of the Republic of South Africa violate standards of human decency and justice and represent social evil. . . . At this time, the Board of Trustees has decided to reaffirm and strengthen the policy initiated last year of selective divestment of the stock of corporations whose South African presence in effect directly supports the maintenance of apartheid policies of the government. . . . At this time, it is the judgment of the Board of Trustees that the total and immediate divestment of the stocks of all American corporations that operate in the Republic of South Africa would not represent a responsible, prudent course of action. . . . Furthermore, there is no consensus that divestment will in fact have any positive impact on the eradication of apartheid.⁴³

³⁹ Letter from PIIAC Chairman Larry Ewing to President Steve Muller. March 28, 1978. See also Letter from President Steve Muller to PIIAC Chairman Larry Ewing. April 4, 1978.

⁴⁰ South Africa Resolution, Item 4. March 28, 1978.

⁴¹ PIIAC Meeting Minutes, 1978-1985. These minutes include examples of many individual meetings that took steps to restrict business entanglements in South Africa, particularly from 1980-1983.

⁴² United Nations Centre Against Apartheid: Notes and Documents. “United States Student Movement Against Apartheid, Hearings at United Nations Headquarters, New York, 27 June 1986.” Report published September 1986. Mr. Patrick Bond’s Statement, 15-17; “Around the Nation; Johns Hopkins Students Set Referendum Deadline,” *New York Times*, October 29, 1986.

⁴³ Board of Trustees Meeting, October 26-27, 1986. “Statement Regarding Divestment,” 15-17.

As their statement shows, many Hopkins trustees considered it questionable whether full divestment would successfully contribute to undermining apartheid. Some thought divestment might unintentionally increase hardships for some oppressed people in South Africa. Many also felt duty-bound to minimize risks to the University's financial health. Leading student activists, who had been pushing for full divestment, were dissatisfied with the trustees' decision and staged a sit-in in Garland Hall that night. However, wider campus protests dissipated and the University stood by its decision for the remainder of the decade, implementing piecemeal divestment from individual companies engaged in unacceptably racist business practices in South Africa.⁴⁴

Some administrators and trustees who were wary of setting a divestment precedent were concerned about the dangers of inappropriately politicizing the University as an institution and apprehensive that they could be opening a revolving door of social justice demands. In later years, however, the University's partial divestment from South African businesses did not translate into a 'slippery slope' toward easy acceptance of divestment in other cases. Different student campaigns came and went without engaging the serious consideration of university investment officers. In 1998 student groups asked the University to divest from Shell Oil, characterizing it as oppressive toward the Ogoni people of Nigeria. However, their petition and protests did not garner much support from other students on campus, and there is no indication that the University acted on this request. In 2007 student groups campaigned for divestment from businesses operating in Sudan during the Darfur genocide. The University administration stated that it had no investments in Sudanese businesses and therefore considered discussion of the issue moot. Some students wanted a commitment from the University not to make such investments in the future, but the administration felt that was unnecessary. The University administration generally did not allow its financial policies to be marshalled in support of social causes, except in instances where there appeared to be a direct conflict with Johns Hopkins' unique academic identity, reputation, and institutional commitments. In the early 1990s, such a conflict arose between Johns Hopkins' public health mission and the business of big tobacco.⁴⁵

Tobacco

In 1990, the PIIAC members of Johns Hopkins University urged the Board of Trustees to adopt total divestment from tobacco companies, arguing that the institution was undermining its own status as a national leader in medicine and public health research and its "mission to discover and communicate scientific evidence relevant to improving human health" by continuing financial entanglement with corporations that were in the business of causing preventable deaths. The Board of Trustees heard arguments from the deans of its schools of medicine and public health as well as from representatives of tobacco giant Philip Morris. The board unanimously voted in favor of full divestment, emphasizing the exceptional duty created by the University's public stature in the field of health. However, board members were primarily concerned with protecting the institution's integrity and hesitated to act as a figurehead to encourage other universities to adopt similar activism. Nonetheless, the University was an early leader in removing its investments from tobacco and later prohibiting the use of tobacco donations for research.⁴⁶

⁴⁴ Mike Bowler, "Schools use Sullivan code on S. Africa." *The Baltimore Sun*, October 6, 1985; "Hopkins Students Stage Sit-In As Board Votes Not to Divest." *The Washington Post*, October 28, 1986; "Johns Hopkins Students Set Referendum Deadline," *New York Times*, October 29, 1986.

⁴⁵ Dan Odenwald, "Dump investments in Shell Oil, Hopkins students urge university: They allege company is destroying habitat of Nigeria's Ogoni people." *Baltimore Sun*, April 29, 1998; "University has no plans to divest from Sudan – Administration says it has no investments in Sudan, but has not considered formally divesting." *The News-Letter*, December 5, 2007.

<http://www.jhunewsletter.com/2007/12/05/university-has-no-plans-to-divest-from-sudan-administration-says-it-has-no-investments-in-sudan-but-has-not-considered-formally-divesting-87712/>.

⁴⁶ Nathaniel Wander and Ruth E. Malone. "Selling Off or Selling Out? Medical Schools and Ethical Leadership in Tobacco Stock Divestment." *Academic Medicine*, vol. 79, no. 11 (Nov 2004), 1019-1021, 1023; Chi Dang, Vice Dean for Research. Johns Hopkins Medicine, Office of Human Subjects Research – Institutional Review Board. "ORA.3 Organization Policy on Tobacco

Impact of Potential Divestment from Fossil Fuels

As of the end of March 2017, the University's endowment pool was about \$4.3 billion dollars. This figure includes the Homewood endowment (roughly 88% of the total) and a portion of the hospital's endowment funds.

This section of the report will provide information about the University's investments in the energy sector and, more specifically, in the Carbon Underground 200 (CU 200) companies. It will list various categories of assets on the basis of their liquidity, defined here as the ability to resell quickly without generating excessive losses, from the most liquid asset to the least liquid one. The categories are: 1) cash and fixed income investments, 2) equity portfolio, 3) hedge fund investments, and 4) illiquid partnerships.

The endowment's cash and fixed income investments comprise cash-like instruments (\$327 million) as well as Treasury Notes (\$423 million). All are liquid, direct investments. Since the cash and fixed income investments include only deposits and government securities, this portion of the endowment does not comprise investments in energy companies.

The equity portfolio represents the portion of the endowment which is invested in publicly-listed stocks (about \$1.8 billion). Some of these investments are managed through individual accounts (in which the stocks are owned directly in the University's name). The majority (87%), however, is invested through commingled funds (in which the stocks are owned indirectly by the University through investments made by investment managers). Quick divestment from these funds would not carry significant transaction costs. Currently, the University has no direct equity investments in the CU 200 companies. When factoring in the commingled funds, the University has \$76 million invested in energy companies broadly defined. Most of them are "oil and gas", smaller investments being in "coal" and "renewables". Within the "oil and gas" sector, some investments are in exploration and production companies, some are in transportation and storage companies. The precise exposure to CU 200 companies held indirectly within that \$76 million is unknown. Some index funds in the commingled portion of the equity portfolio are also likely to invest in companies that CU 200 lists for divestment.

The University's investment in hedge funds amounts to about \$500 million. Hedge fund investments are a mix of equities, bonds, treasuries, derivatives and structured products, like mortgage-backed securities. All are managed through commingled funds which are typically locked up for 1 to 3 years and are less liquid than the commingled funds in the equity portfolio. The hedge fund portfolio includes \$21 million of investment in the energy sector (again, largely oil and gas). Roughly half of these are exploration and production companies. The remainder specialize in transportation and storage. Once more, these are indirect holdings and as such, the precise exposure to CU 200 companies is unknown.

Finally, the University's illiquid partnerships, which constitute roughly 28% of the total endowment (\$1.2 billion), include direct investment of \$320 million into the energy sector (again, mainly oil and gas) across private equity, venture capital, real estate, and real assets strategies. These partnerships do not invest in any of the companies on the CU 200 list. However, they do invest in smaller (private) energy companies and various oil and gas service companies. These investments are typically locked up for about 10 years.

Company Funding.”

http://www.hopkinsmedicine.org/institutional_review_board/guidelines_policies/organization_policies/ora3.html.

Currently Johns Hopkins' direct investments in the CU 200 companies amount to \$6.4 million. This exposure is solely from bonds in the operating cash accounts. The operating cash accounts are not a portion of the University's endowment.⁴⁷

Its indirect investments in the CU 200 companies are likely greater, though no firm figures are available. Looking beyond the CU 200 companies, the University has made significant investments over the years in the energy sector as a whole, including fossil fuel companies. The current figure is about \$417 million (\$76 million + \$21 million + \$320 million, when broken down based on "liquidity" classes) or roughly 10% of the University's endowment, as defined above. Johns Hopkins is heavily invested in commingled funds and uses over 100 managers. Given that the energy sector constitutes a significant portion of the US economy, investing in energy represents a "typical" strategy for the "typical" manager. By limiting access to certain managers and their strategies, constraining the University's financial engagement with fossil fuel companies may affect the endowment by millions of dollars over the next decade. Nonetheless, with a total endowment of over \$4 billion, the University is expected to have the ability to evaluate fully, bear, and possibly offset the costs associated with alternative divestment options.

VI. Recommendations

Factors to Consider in Socially Responsible Investing

In previous decades, members of the Johns Hopkins community tasked with reviewing the duties of socially responsible investment attempted to lay out general guidelines. In 1978, the Board of Trustees officially stated that its primary obligation was to protect the financial growth of the endowment, but that it would also give "independent weight" to concerns about investments in companies that might "cause substantial social impact." The Board of Trustees designated the Public Interest Investment Advisory Committee (PIIAC) as the group responsible for evaluating such concerns and bringing recommendations for the Board's consideration. In the 1990s, a more detailed but, as far as we know, unofficial pair of statements proposed further guidelines intended to shape PIIAC's review process. These guidelines stressed the apolitical nature of the University, advising that it "must refrain from institutional commitment to a political position so as to preserve in full the freedom of expression and inquiry essential to its mission, character, and integrity." However, the guidelines also acknowledged that an exception to the University's generally neutral stance could be made "where the mission of the University calls forth a duty to respond." The University is "a corporate citizen within society [and] as...such cannot remain wholly indifferent to the activities in whose stock the University endowment is invested, specifically as those activities might affect the value of securities...and...the academic mission of the University."

Nevertheless, these guidelines urged caution in adopting a course of divestment. Expressing skepticism about the value and impact of divestment as a method for achieving positive change, the guidelines stated that "Divestment must be viewed as a sterile act, an act which disenfranchises the University, precluding any continuing relationship with the company and precluding the opportunity to influence the company." Viewing this step as the "ultimate response" to an irresponsible company, the guidelines suggested that divestment be invoked only "as a last resort, and only in the most obvious cases of a company's activities interfering with the mission of the University." In judging whether a particular case merited such action, it would be important to weigh a number of variables: the extent to which the company's actions violated the University's mission; the ineffectiveness of other methods in persuading the company to alter its harmful practices; the level of consensus in the University community regarding the issue; and evidence that the issue is generating "broad-based, thoughtful and sustained interest." With no clear provenance or

⁴⁷ The monetary figures throughout this section of the report were obtained through the JHU Office of Investment Management and were accurate as of March 2017.

official status, these guidelines nonetheless constitute an element of the University's institutional memory.⁴⁸

Principles to Guide Divestment Decisions

In the interest of thoroughly evaluating ROF's proposal and to help guide future discussions in response to proposals to divest, PIIAC identified a list of principles by which to evaluate any proposal for divestment, drawing on the history outlined above. In addition, as the Committee learned more about the mix of investments in the University's endowment, it determined that principles for divestment decision should reflect the realities of the modern university endowment; namely the decline of direct university investments and the rise of third-party money managers. The endowment is largely invested through managers who actively manage large portfolios of comingled investments. Thus, the principles below are those that the committee recommends be applied to all endowment investment decisions.

1. Social harm of activity

Is there sufficient likelihood and gravity of harm to justify a decision to divest? As noted in "Summary of Peer Institution Socially Responsible Investment ('SRI') Policies and Advisory Committees" (JHU), "do corporate activities 'have a direct and adverse impact on the mission of the University' and obviously interfere with the mission of the University?"

Drawing from peer institutions' criteria:

- Do a company's activities or policies 'plausibly cause substantial social injury'? (Duke)
- Do company's activities or policies 'cause substantial social injury'? (Stanford)
- Do corporate policies or practices cause 'substantial social injury or substantial environmental harm'? (Penn)

The Committee finds that the business activities of CU 200 companies, and those companies that fall outside of the CU 200 but whose businesses include ownership of coal or oil and gas reserves, engage in activities that conflict with the stated commitments of the University and cause substantial environmental harm. Thus the decision to divest meets this principle.

2. Likelihood of effect of action

Will a decision to divest have an effect on altering the business activities deemed to be socially harmful? As noted in section V. of this report, divestment by any single institution is not likely to result in change on the part of any single company or sector of the economy. However, collective action can yield results, and requires individual institutions to participate.

The Committee finds that, while the individual action of the University is unlikely to result in change in and of itself, it is nevertheless important to participate in and advance collective action in taking a position on climate change, not only in statements but also in actions.

3. Moral leadership

⁴⁸ Anonymous, "Summary of Peer Institution Socially Responsible Investment ("SRI") Policies and Advisory Committees."

It has long been the case that universities do and must play a role in moral leadership regarding difficult and controversial issues, including in areas related to their investments. As an institution of higher learning engaged in the confirmation of existing knowledge and the creation of new knowledge, Johns Hopkins must assert its leadership on challenging policy issues, particularly when doing so follows from the knowledge it creates or to which it contributes.

The Committee finds that the scientific consensus on the human-caused effects on climate change (to which Johns Hopkins has contributed), in combination with the University's numerous statements and longstanding commitments on climate change and related areas, is effectively an announced moral position on the issue of climate change, its effects, and the actions required to address them. Actions on divestment would represent an additional step in the University's moral leadership on this issue.

4. Fiduciary responsibilities to mission, endowment, and fiscal soundness

Universities are required to be responsible stewards of the resources invested in their work. They must, furthermore, do so in ways consistent not only with fiduciary responsibilities, but that maximize their ability to carry out their institutional mission without betraying their core values. Social responsibility is among the many factors to be considered, and historically has been acted upon only sparingly and after much reflection, as in the examples of apartheid in South Africa and more recently regarding tobacco.

The Committee appreciates and emphasizes the care that must be taken in consideration of the financial responsibilities represented by the stewardship of the University's endowment, and the very important role the endowment plays in allowing the University to accomplish its mission. In reviewing the information available to us and in discussion with numerous experts both within and outside of the University, the committee believes that the impact on the endowment's investments and returns from them can be managed such that the University's mission would not be harmed by divesting from fossil fuels, and that such divestment represents an action that is consistent with our mission.

5. Represents the values of the University community

It is important for institutional decisions to reflect the values of the community, and this is among the criteria noted in PIIAC's charge for evaluating proposals submitted to it. In the committee's estimation, a decision to divest represents the values of the University community as evidenced by the ROF proposal, a survey of students and faculty, interest in a public symposium on the topic, and widespread support from the University community for public statements on the part of university leadership regarding the importance and necessity of action on climate change. It is also consistent with and complementary to the University's commitments to other actions on climate change, including reducing its carbon footprint, promoting research and education on climate sustainability, and partnering with the community on sustainability projects.

Recommendations Regarding Fossil Fuel Divestment

PIIAC arrived at its recommendations based on the analysis in the preceding sections of this report and by applying the principles regarding questions of divestment outlined above. In response to the proposal from Refuel Our Future, the recommendations focus on divestment from the CU 200 companies and direct investments in companies and partnerships that include ownership of coal or oil and gas reserves. A focus on divestment from the CU 200 aligns with the University's longstanding stated commitments to sustainability and to addressing climate change issues. While the CU 200 represents a crucial aspect of fossil fuel investments, it is not the entire universe of companies or investments that contribute to the harmful consequences of the production and consumption of fossil fuels. The PIIAC's mission is to

identify principles and guidelines consistent with our analysis, and given complicated nature of the investment environment, we expect that analysis of investment options is best carried out by professional endowment managers.

In response to the proposal by Refuel Our Future (ROF), PIIAC recommends the following actions:

1. For operating cash accounts, divest immediately from bond holdings in Carbon Underground 200 companies (CU 200).

As noted in section VI, as of March 2017 some \$6.4 million of the University's operating cash accounts was invested in bonds of the CU 200. These operating funds can be easily divested from such holdings and no new such investments should be made.

2. For direct investments in companies, divest as soon as practicable (to minimize of financial impact) from Carbon Underground 200 companies, and make no new direct investments in them.

As of March 2017 there were no direct holdings in the University's equity portfolio of CU 200 companies. However, we do not have information for the period between April 2017 and the present, and so recommend that any such direct holdings be divested. In addition, we recommend that there be no new such direct investments going forward.

3. For illiquid partnerships that include direct investment in CU 200 companies or holdings in fossil fuel reserves, unwind such partnerships as they come to term or before if practicable, and make no new investments in such partnerships.

In discussions with leaders from the Office of the Chief Investment Officer, we understand that illiquid partnerships represent investments that as of March 2017 do not include CU 200 companies but do include energy-related investments, including holdings in fossil fuel reserves. The Committee recommends that illiquid partnerships that take the form of direct investment in CU 200 companies or holdings in fossil fuel reserves be unwound, with timeframe determined by the type of partnership, and that there be no new investment going forward in illiquid partnerships that include direct investment in CU 200 companies or holdings in fossil fuel reserves.

4. For comingled investments in the University's equity portfolio and hedge fund portfolio:

- a. Monitor investment in CU 200 companies, with minimum of annual reporting of such investments and with the goal of reducing the amount of such holdings over time.

- b. Add the following criterion to the set of criteria used to evaluate investment managers: a commitment by the manager to avoid investment in CU 200 companies.

Regarding point (a): In discussions with leaders from the Office of the Chief Investment Officer, we understand that the University receives reports on a periodic basis regarding the returns and holdings in its comingled investments (with frequency dependent on the practices of individual investment managers). Our understanding is that the reports include a listing of the holdings in those accounts during the time period reported, and so investment in CU 200 companies can be monitored relatively easily. We acknowledge that hedge fund managers may not be willing to report individual holdings, but we recommend they be asked to simply report the overall percentage invested in CU 200 companies on a periodic basis.

Regarding point (b): the Office of the Chief Investment Officer employs a series of criteria to select new managers, one important criterion being profitability over a sufficiently long period of time. We

recommend that the selection of new managers should also include their commitment to avoid investments in CU 200 companies among the many criteria considered. Because of their relatively shorter track record, in spite of competitive performance, some of these managers may currently not be considered.

VII. Appendices

Appendix A

Refuel Our Future Proposal

Title:

“PIIAC Proposal: Arguing for Fossil Fuel Divestment”

Abstract:

In this proposal we argue that JHU divest its endowment from fossil fuel companies because: the current and past actions of fossil fuel companies have grave social and environmental costs, there is widespread support for fossil fuel divestment among the JHU community, divestment is an effective tactic to reduce the negative impacts of fossil fuel companies, and fossil fuel divestment is fiscally responsible for the University endowment.

Author:

Refuel Our Future (refuelourfuture@gmail.com)

Proposal:

Managed by Fossil Free Indexes LLC, the Carbon Underground 200™ identifies the top 100 public coal companies globally and the top 100 public oil and gas companies globally, ranked by the potential carbon emissions content of their reported reserves. We request that Johns Hopkins University terminate all direct investments it currently holds in any of the companies listed in the Carbon Underground 200™. We also request that Johns Hopkins University make a vow to not invest in any of these companies in the future. Further, we ask for the school to investigate the potential to move the university’s commingled funds into more sustainable investment portfolios. Though the names of the particular companies that the university is invested in have not been revealed to us, we can assume that some of the money we have invested in fossil fuels is invested in a number of these carbon-exploiting companies. Furthermore, we suggest that the divested funds be reinvested in more sustainable and socially responsible industries.

The practices and policies of fossil fuel companies in regards the acquisition, refining, transport, and use of crude oil, coal, natural gas, and heavy oils have been proven to cause substantial social and environmental impacts. According to researchers from the University of California, Berkeley and the Massachusetts Institute of Technology:

“The impacts of oil production, transport, refining, and consumption are significant and widespread. From environmental impacts on fragile ecosystems, to cultural impacts on indigenous groups, health impacts on workers and communities, global climatic impacts, and military conflicts, oil is perhaps the single most controversial and influential commodity in the world (O’Rourke & Connolly, 2003).”

The exploration, drilling, and extraction of oil sources each result in major physical alterations of the environment where they are performed. Major impacts include deforestation, ecosystem destruction, chemical contamination of land and water, long-term harm to animal populations (particularly migratory birds and marine mammals), human health and safety risks for neighboring communities and oil industry workers, and displacement of indigenous communities (National Research Council, 2003). Networks of trails used for seismic exploration have degraded the visual experience of local residents and tourists, and have also harmed vegetation and caused erosion (Effects of Oil, n.d.).

Industrial coal mining has been in practice since the 1600s and thus has been substantially studied. A typology of the known impacts arising from mine voids and wastes in coal mining districts has been developed, which recognizes known impacts under five major headings: air pollution, fire hazards, ground deformation, water pollution, and water resource depletion (Younger, 2004). Human health has been adversely affected by coals containing arsenic, fluorine, selenium, and mercury. An irreversible kidney disease of unknown origin, Balkan endemic nephropathy (BEN), has been related to the proximity of Pliocene lignite deposits. However, human disease associated with coal mining mainly results from inhalation of particulate matter during the mining process (Coal Worker's Pneumoconiosis or "black lung disease") (Finkleman, et al., n.d.)

Further, as easily accessed sources of fossil fuels become increasingly scarce, leading to a decline in fossil fuel's energy returned on energy invested (Younger, 2004), companies are utilizing more potentially risk-laden techniques to acquire their products. Some companies use hydraulic fracturing, a method of extracting oil and natural gas, without any conclusive proof of its safety. A team from the Johns Hopkins Bloomberg School of Public Health recently published a study that found an association between fracking wells and both premature births and high-risk pregnancies, concluding that "prenatal residential exposure to unconventional natural gas development activity was associated with [these] two pregnancy outcomes, adding to evidence that unconventional natural gas development may impact health" (Hub Staff Report, 2015). According to the study leader, Department of Environmental Health Science professor Brian S. Schwartz (2015), "The growth in the fracking industry has gotten way out ahead of our ability to assess what the environmental and, just as importantly, public health impacts are. Our research adds evidence to the very few studies that have been done showing adverse health outcomes associated with the fracking industry."

Concerns about hydraulic fracturing include other public health concerns, increased seismic activity, and water contamination. The United States Geological Survey's Working Group on Understanding Fluid Injection Induced Seismicity (2015) found that "To a large extent, the increasing rate of earthquakes in the mid-continent is due to fluid-injection activities used in modern energy production." They also noted that the use of supercritical carbon dioxide in some fracturing projects may pose future seismic hazards and that "the general public is the most important stakeholder because they may be exposed to potential injury and damage"(Mcgarr 2015). A joint review from Duke University, Stanford University, Dartmouth College, and the Ohio State University identified four plausible risks to water resources associated with shale gas development and hydraulic fracturing:

"The first risk is contamination of shallow aquifers in areas adjacent to shale gas development through stray gas leaking from improperly constructed or failing gas wells. Thus, evidence of stray gas contamination could be indicative of future water quality degradation, similar to that observed in some conventional oil and gas fields. The second risk is contamination of water resources in areas of shale gas development and/or waste management by spills, leaks, or disposal of hydraulic fracturing fluids and inadequately treated wastewaters. The third risk is accumulation of metals and radioactive elements on stream, river and lake sediments in wastewater disposal or spill sites, posing an additional long-term impact by slowly releasing toxic elements and radiation to the environment in the impacted areas. The fourth risk is the water footprint through withdrawals of valuable fresh water from dry areas and overexploitation of limited or diminished water resources for shale gas development"(Vengosh, 2014).

It was also found that "the public cannot ascertain the cause of most shale gas-related problems because the full datasets are often not released publicly and explained" (Llewellyn et al. 2015). After fossil fuels have been extracted, they generally have to be refined. Oil refineries have been categorized as "major polluters" by some energy specialists because they produce large quantities of wastewaters, release hazardous gases into the atmosphere, and generate solid wastes that are difficult both to treat and dispose of (Mariano,n.d.).Oil refinery effluents contain many different chemicals at different

concentrations including ammonia, sulphides, phenol and hydrocarbons (though individual refineries can vary greatly on process, output, and toxicity.) Field studies have shown that oil refinery effluents often have a negative impact on the fauna they interact with Wake, n.d.). Refineries have also been shown to disrupt the ecosystems they occupy.

Fossil fuels also have to be transported. In countries with weak governance, gas and oil transportation can be environmentally damaging, leading to water contamination and soil erosion. There is also the risk of environmental catastrophes such as oil spills. Spills in marine environments can have severe environmental impacts over wide areas (Beyer et al., 2013). An unfortunate oil spill that occurs in an ecologically sensitive location can cause devastating damage to natural environments, property, businesses, and human lives. (Etkin, 2001).

A major, overarching effect of fossil fuel companies is their greenhouse gas emissions. A large majority of the scientific community recognizes that human activities have contributed substantially to climate change by adding carbon dioxide and other heat-trapping gases to the atmosphere. These greenhouse gas emissions have increased the greenhouse effect and caused Earth's surface temperature to rise. The primary human activity that affects the amount and rate of climate change is greenhouse gas emissions from the burning of fossil fuels.[xv] Information that concisely reports the overall effects of fossil fuel use and emissions can be found in the reports from the Intergovernmental Panel on Climate Change. A brief summary is as follows:

“Fossil energy use is responsible for about 85% of the anthropogenic CO₂ emissions produced annually. Atmospheric concentrations of CO₂ (379 ppm) and CH₄ (1774 ppb) in 2005 exceed by far the natural range over the last 650,000 years. Most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic GHG concentrations. It is *likely* that there has been significant anthropogenic warming over the past 50 years averaged over each continent (except Antarctica). Human influences have *very likely* contributed to sea level rise during the latter half of the 20th century, *likely* contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns, *likely* increased temperatures of extreme hot nights, cold nights and cold days, *more likely than not* increased risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events.”

While the climate change effects strongly driven by the actions of fossil fuel companies have major global repercussions, they are also damaging to communities on a more local scale, including Johns Hopkins' beloved Baltimore.

Sea levels in the Chesapeake Bay are rising twice as fast as the global average- they are estimated to climb by as much as two feet in the next 35 years before potentially moving past a five foot increase by the end of the century. Floods in Baltimore and Annapolis have already increased by more than 900 percent since 1960. Climate Central, a nonprofit research group, has estimated that even moderate sea level rise will result in an increased risk of flooding for 41,000 local homes. If no action is taken, sea level rise will be more severe, and more than 440,000 acres of land, \$42.3 billion in property, and 94,000 homes in Maryland will be threatened by encroaching water. (Cassie, 2015). Climate Change Maryland, a public outreach program from the Maryland Department of the Environment, states that “Marylanders around the state are already noticing warmer winter days, more intense heat and humidity in the summer, and more damage due to storms.” Additionally, if climate impacts are not curtailed, Maryland's population will face a likely increase in the number of respiratory illnesses, diseases caused by bacteria and viruses, and health risks due to heat stress (Climate Change Maryland).

Even when fossil fuel companies are not neglecting regulations, their functioning results in substantial negative impacts. However, another pressing reason to divest from these companies is that they have

recurring instances of negligence that result in further damage. Historically, these incidents are often coupled with failures to heed warnings and subsequent legal ramifications. Since 2010, there have been more than 600 oil pipeline spills in the United States (including some as large as contaminating Michigan's Kalamazoo River with 840,000 gallons of crude oil.) A faulty welding technique used in the 1970s was found to cause cracks in the walls of an estimated 45,000 miles of petroleum pipelines. Fossil fuel companies, including Exxon, were warned about this problem by the United States Pipeline and Hazardous Material Safety Administration in the late 1980s.

Exxon has repeatedly neglected pipeline inspections since then. In 2010, the Transportation Department fined the company \$26,200 for not inspecting a pipeline under the Mississippi River. In 2011, another Exxon pipeline ruptured on Montana's Yellowstone River (pouring 60,000 gallons of oil into it) despite government warnings about high floodwaters. For this incident, federal pipeline officials fined Exxon \$1.7 million for the spill, saying the company had "failed to consider all relevant risk factors." A few years later, Exxon Mobil was fined \$112,300 for not performing required pressure tests on another oil pipeline in Louisiana. In 2013, a section of Exxon's Pegasus pipeline spilled 200,000 gallons of oil in Mayflower, Arkansas, filling the streets with unknown quantities of chemicals, including benzene, a known carcinogen. The spill in this occurrence was from a 22-foot gash along the spine of the pipe, which was determined to have been caused by the faulty manufacturing technique that Exxon had been warned about decades earlier (Osborne, 2013). As of October 2015, the federal Pipeline and Hazardous Materials Safety Administration found the ExxonMobil Pipeline Company liable for nine violations regarding the Mayflower spill and ordered them to pay a \$2.63 million fine. The violations included failing to follow written risk-assessment procedures, failing to obtain sufficient information about the conditions on its pipeline, and failing to reassess the seam integrity of the pipeline at least every five years (Lyon, 2015).

Coal companies have also been faulted for infractions. Recently, a statement from New York's attorney general asserted that Peabody Energy, the world's biggest private-sector coal company, has violated New York laws with misleading statements to investors and the public about the financial risks from climate change and potential regulatory responses (Krauss, 2015). The aforementioned incidents are a mere fraction of these two companies' transgressions. Considering that fact, the combined impact of total crimes of the 198 companies on the Carbon Underground 200TM list is absolutely staggering. Though given ample warnings and time, fossil fuel companies have repeatedly failed to reform their ways and it follows that further action needs to be taken to hold them accountable for the harms they cause.

A referendum open to all undergraduates on the issue of fossil fuel divestment was conducted in 2014. The poll engaged the opinions of 397 students from all classes, with 73% of students agreeing that the university should divest its endowment of the top 200 fossil fuel companies as decided by their total carbon reserves. A faculty petition being circulated among professors at Hopkins has garnered dozens of positive responses and signatures thus far. On November 19th of this year, the President of the Johns Hopkins University signed the White House Act on Climate Pledge. This pledge was supported by multiple student groups, from the Students for Environmental Action to the College Republicans. Among other positive environmental measures, this pledge includes a vow to "accelerate the transition to low-carbon energy" and "embed sustainability practices and principles into the culture of Johns Hopkins University" (White House Act on Climate Pledge, 2015). This pledge has received positive attention across campus, indicating that students and faculty alike agree on the goal of reducing Hopkins' impact on climate change; fossil fuel divestment is an effective method through which to achieve this goal.

Furthermore, the mission of JHU, as taken from its website, is "to educate its students and cultivate their capacity for lifelong learning, to foster independent and original research, and to bring the benefits of discovery to the world." As a national leader in research and education, it is important that we show our commitment to our ideals through our actions. We cannot, in good conscience, conduct research and teach

classes identifying and quantifying the risks of climate change and the health impacts of fossil fuel combustion, while simultaneously investing in the companies that contribute to these issues the most.

Johns Hopkins has over a dozen programs dedicated to understanding and resolving issues related to environmental degradation and climate change. If the education provided by the university and the research conducted by its constituents is reflective of the university's priorities, then the multitude of opportunities offered to students and faculty to work with the science behind, impacts of, and solutions to climate change suggests a strong consensus of support for the existence and mitigation of anthropogenic climate change. These programs include:

- Energy, Environment, Sustainability, and Health Institute
- Undergraduate Program in Global Environmental Change and Sustainability
- Masters Program in Environmental Sciences and Policy
- Engineering Department of Geography and Environmental Engineering
- Masters Program in Environmental Engineering, Science, and Management
- Bloomberg School of Public Health Masters in Public Health Concentration on Global Environmental Sustainability and Health
- School of Advanced International Studies Program in Energy, Resources, and Environment
- Carey Business School Global Masters in Business Administration
- The Center for a Livable Future
- Center for Environmental and Applied Fluid Mechanics
- NIEHS Center in Urban Environmental Health
- Water Institute
- Center for Global Health
- Global Assimilation of Information for Action
- Systems Institute
- Sustainability Network

The mission statements of these programs make it clear that they understand climate change to be a viable threat to the world. The Hopkins Global Environmental Change and Sustainability (GECS) program website states “the goals [of GECS] are to advance awareness of the magnitude and consequences of these issues and to train the next generation of problem-solvers to address the effects of global environmental change.” The Energy, Environment, Sustainability, and Health Institute website explains that one of its goals is to “establish Johns Hopkins University as a world leader in, and provide a single point of contact for, integrative approaches to global environmental change, sustainability, and their related health challenges.” The Center for a Livable Future website says that its mission is to “advance an ecological perspective in reducing threats to the health of the public and to promote policies that protect health, the global environment and the ability to sustain life for future generations.” The missions of Hopkins and these programs affiliated with Hopkins, among others, frequently reference the next generation of students and global citizens. Continuing to invest in fossil fuel companies that damage the future of our students and our world is contradictory to Hopkins' purported forward-thinking goals. If Hopkins wants to truly be a “world leader” in solutions to environmental challenges, we can start with the strong statement of fossil fuel divestment. Hopkins has already taken a stance against climate change through the creation and support of these organizations; divestment from fossil fuel companies would reinforce this position.

A global consensus on the need for immediate action to combat climate change was just formed at the 2015 United Nations Climate Change Conference, where 195 participating national governments agreed to reduce carbon output as soon as possible and keep global warming well below two degrees Celsius.

Fossil fuel divestment is a worldwide movement. Stanford, Syracuse, and Oxford and other universities have either fully or partially divested from fossil fuels. Organizations such as the Rockefeller Brothers Fund, the British Medical Association, and the World Council of Churches have divested, in addition to the cities of Seattle, Madison and San Francisco (Fossil Free, 2015). More than 400 organizations and 2,000 individuals across the world with \$2.6 trillion in assets have pledged to divest from fossil fuel companies, according to a new report from Arabella Advisors, a consultancy firm for philanthropies. A year ago, the total amount of assets being divested from fossil fuel companies was just \$50 billion (Luckerson, 2015). There is a consensus across organizations, politics and even countries that divesting from fossil fuels is not only reasonable but also necessary. Johns Hopkins would be an excellent addition to this global movement.

If Johns Hopkins University divests from fossil fuels, the affected companies will be dealt a massive blow to their public persona and image. Through this action, Johns Hopkins, a name synonymous with health across the world, will be effectively stating to the world that fossil fuel use as it is now is detrimental and unsustainable. We expect this action to have a massive positive impact on the corporate practices of fossil fuel companies as these institutions struggle (with increasing difficulty) to maintain a positive image in the eyes of the individuals and organizations that purchase their products. They would likely engage in a series of reforms shorter in substance than in presentation and marketing. These would be significant (but nowhere close to satisfactory) in diminishing the climate crisis.

Fortunately, JHU does not exist in a vacuum. JHU divesting is one step further for a growing movement of divestment in over 390 universities, religious congregations, pension funds, philanthropic foundations, and other institutions as described above. In addition to its global name in health, Johns Hopkins is especially important due to its status as a private, elite university with an endowment of at least \$3.4 million (National Association of College and University Business Officers and Commonfund Institute, 2015). It, in conjunction with other similar institutions like Georgetown and Stanford, will exert tremendous social pressure on other elite, private universities to divest as well. Many have called Harvard University a “hedge fund with a university attached to it.” The force of Hopkins divesting alone may not force fossil fuel companies to alter their practices. However, the critical mass of Hopkins divesting in concert with Georgetown, Syracuse, Stanford, the University of California, and other institutions such as Harvard and Princeton certainly will.

Other individuals and organizations will make a more substantial effort towards lowering their carbon footprint once Johns Hopkins University, an institution full of global thought leaders, has joined the fossil fuel divestment movement. Many people and institutions will be energized by Hopkins’ bold action, recognize that we are careening towards a catastrophic future, and have a better sense of their own agency and power in combatting climate change.

We are cognizant of the fact that fossil fuel companies are large and powerful institutions that have an incredible amount of capital devoted to the extraction and use of fossil fuels for profit. Fossil fuel divestment will not destroy these institutions outright. We do not expect Johns Hopkins University divesting from fossil fuels (on its own) to substantially affect the cost of capital or profit margin of fossil fuel companies. Since we expect Johns Hopkins on its own to have an almost negligible shareholder stock in fossil fuel companies, fossil fuel divestment is a much more effective strategy for fighting the devastating effects of climate change than some alternative “shareholder engagement strategy.” Even if Johns Hopkins or some consortium of colleges had a majority stock of one or more fossil fuel companies, the purpose of a fossil fuel company remains the same: to extract fossil fuels for profit. Some reforms might be enacted, but these will almost certainly be small and easily rescinded (with new management) because the companies are not being forced to enact them. When looking at recent and historical examples of boycotts (divestment is another form of boycott) such as the Montgomery Bus Boycott and the South African Apartheid divestment movement, the boycotters usually do not dramatically affect sales

or capital: “The real power of a boycott lies in its ability to inflict damage to corporate reputation” (King, 2008).

A report published by the United Nations Environment Programme (UNEP) Finance Initiative and Mercer, a consulting firm, reviewed twenty academic research papers examining the performance of investment portfolios adjusting for Environmental, Social, and Governance Factors (ESG). Of the twenty studies, ten found that portfolios that adjusted for ESG factors saw increased performance, three studies saw decreased performance, and seven saw neutral performance (UNEP FI & Mercer, 2007). One study of 126 conventional and socially-responsible mutual funds found that that “not a single characteristic of socially responsible mutual funds is significantly different from that of conventional funds” (Bello, 2005).

Another study analyzed the performance of firms recognized for their attention to ESG factors. They found that firms listed on the Council for Institutional Investors’s (a nonprofit association of endowments and benefit funds self-described as a “voice for corporate governance”) focus list experienced ten percent or higher growth compared to the S&P 500 after one year, and five percent or higher growth over the long term (Opler & Sobokin, 1995). One study of 450 stocks found that environmentally efficient firms (that produce a high amount of economic value relative to the waste they generate) perform 6% p.a. better than low-ranked environmental stocks. This result is statistically significant across a risk, style, and industry adjusted basis (Guenster, Derwall, Bauer & Koedijk, 2004). When given the option, investors prefer to invest in socially and environmentally responsible firms.

Of the three studies that saw decreased performance: one attributed the time period of the study (market downturn) as a contributor to the discrepancy between the “vice fund” of tobacco, weapons, gambling, and alcohol-involved firms and the Socially Responsible Investment (SRI) fund, another had a limited sample size of 34, and the validity of the third’s overall hypothesis was questioned by UNEP and Mercer (UNEP FI & Mercer, 2007). Based on the provided research, one can expect Johns Hopkins University’s endowment investment portfolio’s performance to be positively affected or unaffected by divesting from the Carbon Underground 200 index of fossil fuel companies. Risk may increase slightly, but over the long-term divestment from fossil fuel companies will have a positive fiduciary impact due to: the massive amount of stranded assets accounted for by fossil fuel companies and the negative financial impact climate change will have on the Maryland and world economy – of which Johns Hopkins is inextricably linked to.

Though we have established that fossil fuel divestment has a likely positive or neutral impact on a portfolio’s rate of return, we recognize that another large concern regarding fossil fuel divestment is increased risk to the University’s endowment portfolio. Aperio Group LLC, a portfolio manager, ran a study to determine how divesting from fossil fuels affects a portfolio’s risk. The group first measured tracking error, a measure of dispersion between a screened portfolio and a target benchmark like the Russell 2000. Using a statistical model, stock portfolios screened of fossil fuel companies were found to have a tracking error of .5978%. This value is very small, considering that the normal tracking error for active management of an institutional fund is five percent. From the .5978% measurement, the group found that stock portfolios screened for all fossil fuel companies are expected to experience an increase in risk of only .01%. They also found that a portfolio screened of the fossil fuel industry had an average annualized ten-year return .08% higher than the Russell 3000 index from 1988 to 2012 (Geddes, 2013).

What is the consequence of higher risk for portfolios screened of fossil fuels, even if the increase in risk from divesting is very small? That if fossil fuels perform better than the general economy, then the screened portfolio suffers (albeit slightly). If fossil fuels perform worse than the general economy, then the screened portfolio outperforms conventional portfolios. We have every reason to believe that the latter will be the case over the long term. If humanity wants to reach the goal of limiting the earth’s temperature rise to two degrees Celsius just agreed upon by 195 governments in the Paris Agreement, only 900

gigatonnes of carbon currently in the ground can be burned. Even in that case there is only an 80% probability that the earth's temperature will stay two degrees above pre-industrial levels. Fossil fuel companies currently list 2,860 gigatonnes of CO₂ in the ground as assets (Leaton, J., Ranger, N., Ward, B., Sussams, L., & Brown, M., 2013). Oil, gas, and mining companies spent \$674 billion in 2012 trying to find new reserves. 70-80% of fossil fuel companies' currently listed reserves are stranded assets that need to stay in the ground if the planet is to avert catastrophe.

HSBC analysis has found that equity valuations for fossil fuel companies could drop 40-60% in a low emissions scenario. As national governments start to regulate carbon emissions, renewable energies are increasingly adopted, and public opinion (hopefully) shifts away from fossil fuels, stock valuations will suffer. The top 200 fossil fuel companies currently hold \$1.5 trillion in debt. If credit rating agencies take the pledges of the world's governments seriously, then one can see credit downgrades, increases in borrowing costs, and default in the near future for several fossil fuel companies – especially if oil prices stay as low as they have since late 2014 (Leaton, J., Ranger, N., Ward, B., Sussams, L., & Brown, M., 2013). It is very likely that fossil fuel companies are seriously overvalued as an investment today. JHU should recognize this and protect the University's endowment from a much larger risk than divesting from fossil fuels: continuing to invest in them.

Continuing to invest in fossil fuels drains the University's endowment by perpetuating the economic and human losses of climate change. This limits the growth of the other firms the University is investing in. In Maryland where JHU is the state's largest employer, climate change will cost the state two percent of its total annual output through storm damage, labor losses, hurricanes, and energy demand increases. 1-2% of Maryland's property is expected to be under sea level by 2100 (Kopp, et al. 2014). Globally the story is similar, where economic losses due to climate change *already* total \$125 billion per year (Annan, et al. 2009).

In sum, we argue that Johns Hopkins University divesting from fossil fuels is fully supported by the Johns Hopkins community, an effective tactic to combat climate change, and fiscally responsible. Most importantly, it is, ethically, the correct action to take.

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Appendix B

Summary of University Sustainability Efforts in Carbon Reduction, Research & Education, and Community Engagement

As documented above, the University is committed to action on climate change. This Appendix provides background information and explanation of the conclusions presented in Section IV concerning progress since 2008 in acting on those commitments in the areas of University emissions; research and education initiatives; and community outreach.

University Greenhouse Gas Reduction Efforts

The President's Task Force report focused on the principle of "reducing, with the vision of carbon neutrality, the emissions of greenhouse gases derived from university operations." The report emphasized goals and actions that could be accomplished by the mid 2020's. The report took emissions data from 2008 as its initial benchmark, which are now estimated by the Office of Sustainability to be 422,339 metric tons CO₂ (equivalent) (MTCO₂E).¹ These included direct emissions from natural gas combustion on its campuses, emissions associated with its electricity use (based on the mix of power fuel sources used by the regional grid), fuel consumption by its transportation fleet, and emissions of methane, nitrogen dioxide, and refrigerants. Emissions from the Homewood, APL, Washington DC, East Baltimore (excluding the JH hospital), and Peabody campuses were included. The President's Task Force proposed a goal of a 51% reduction of its carbon footprint by the year 2025, based solely on the University's own actions to improve its efficiency of energy use.

In particular, this reduction, to be achieved even as the University continued to add building space, was projected to be achieved by several specific actions by the University, including:

- Implementing heat-electricity cogeneration opportunities on the Homewood and East Baltimore campuses,
- Adoption of a set of "high opportunity" energy efficiency measures,
- Implementation of renewable energy projects, and
- Greatly increasing the energy efficiency of computing operations.

No credit was given in the plan for additional possible greenhouse reductions that might occur as a result of shifts in the regional grid's generation mix to cleaner sources. Shifts away from coal generation in the regional mix were anticipated (and indeed have since occurred) due to increased natural gas use and renewable generation, which lowered the carbon "content" of electricity. Such reductions would lower the University's "carbon footprint" even further; however, the Task Force instead chose to focus on what could be accomplished just from efforts on the JHU campuses on their own, and these efforts were the basis of the 51% reduction goal.

In fact, what has happened since 2008 is that the University's calculated carbon emissions have decreased by 32.5% (to 285,077 tons),² which on the face of it sounds impressive. However, the accomplishment is less impressive than it appears, because, as the Office of Sustainability's 2016 report points out, it is

¹ Originally, the President's Task Force estimated the emissions to be equivalent to 259,000 metric tons of CO₂/year; the new number is based on corrected emissions per MWh factors for electricity consumption.

² JHU Office of Sustainability. *Johns Hopkins Sustainability Report: Fiscal Year 2016*. Reports and Publications, University and Campus Sustainability Progress Report: Fiscal Year 2016. http://sustainability.jhu.edu/office_of_sustainability/reports_and_publications/Sustainability%20Progress%20Report%202016.pdf.

mostly due to the shift in the mix of power generation in the regional grid from coal plants to natural gas-fired and renewable electricity generation, not measures that the University itself has taken.

In particular, we calculate that almost 90% of that net decrease of 137,261 tons is due to the decrease in the emissions intensity of the region's grid. Had credit not be given for changes in the regional grid, the reduction would only be 17,260 tons.³ That is only 4% of the estimated 2008 emissions. That small decrease is the net effect of the University's efforts to reduce electricity and fossil fuel use, generate renewable energy, and convert more of its heating plant to combined heat-power units, offset largely by growth in the University's physical plant.

Nonetheless, the University is doing only slightly better than holding its own in terms of the sustainability of its own physical plant and energy use. Of course, holding energy use nearly constant in the face of the growth in University facilities, enrollment, and staff is an important accomplishment that has required significant investment and effort by the Office of Sustainability and its division partners. Avoiding an increase in energy use has been an important achieve for them given resources available to them. Without that effort, the University's carbon footprint would have instead increased significantly.

However, the recommendations of the President's Task Force, which were accepted by the University administration, were not to hold energy use steady, but rather for drastic decreases in energy use and increases in renewable and combined heat-power capacity that by themselves would reduce carbon emissions by 51%. It is very unlikely that anything like the recommended 51% reduction in greenhouse gases resulting from the University's efforts will be accomplished without a renewed effort and significantly more investment. We are presently halfway to the 2025 target date, but a long way from achieving the targeted reductions in campus energy use and increases in University renewable generation.

The University's Office of Sustainability as well as its division facility partners continue to work towards accomplishing these ambitious goals. Some of the University's notable efforts to lower the consumption of electricity and generate renewable energy across its own campuses are as follows. Every new campus building project is now rated according to international Leadership in Energy and Environmental Design (LEED) standards for energy efficiency, and must attain at least Silver LEED status. Cogeneration (Combined Heating and Power) and Trigeneration (Combined Cooling, Heating and Power) equipment has enabled the University to produce 28% of its own electricity fueled by natural gas. Meanwhile, rooftop photovoltaic panels on seven buildings are generating 1.3 million kWh per year of electricity.⁴ Although this solar production is only a very small percentage of the University's use (approximately 0.3%),⁵ it still makes the University's campuses one of Baltimore's solar-energy leaders. The Office of Sustainability has also spearheaded campaigns to encourage voluntary behavioral changes among University students, staff, and faculty, and actively seeks to inculcate a campus culture of resource monitoring and conservation. All these efforts need to be greatly expanded and require increased support

³ The calculations, based on data provided by the Office of Sustainability, are as follows. In 2008 and 2016, the net electricity demands from the grid were 350,019 and 321,700 megawatts hour per year (MWh/yr), respectively. The net usage has therefore decreased by 8% over that eight year period, most of that decrease likely due to the installation of combined heat-power generation facilities on the Homewood and East Baltimore campuses. Meanwhile, renewable generation from the solar panels installed in 2012 contributed 0.3% of the power demand. The amount of emissions decrease due to changes in the mix of coal, gas, and renewable generation on the PJM grid has been estimated to be 0.373 MTCO₂E/MWh (from the 2008 value of 0.948 to the 2016 value of 0.575 tones). Multiplying 0.373 MTCO₂E/MWh by the 2016 net electricity demand of 321,700 MWh yields an emissions decrease of 120,001 MTCO₂E/yr. Subtracting this from the total CO₂ decrease of 137,261 tons yields the quoted 17,260 figure.

⁴ JHU Office of Sustainability. "Energy & Climate Change."

http://sustainability.jhu.edu/sustainability_initiatives/energy_and_climate_change/index.html

⁵ Based on Appendix C of the Task Force report, which reports that 74.9% of the 258,962 Metric tons/yr of CO₂ equivalent is due to electricity purchases, which were assumed by the report to have 0.535 metric tons/megawatt-hour. This results in an estimated annual electricity consumption of just over 350 million kWh by the University.

if the university is to come close to achieving the 51% greenhouse gas reductions that the Task Force identified as coming from the university's efficiency, renewable energy, and cogeneration efforts.

In the 2017-18 academic year, the Office of Sustainability plans to organize a university-wide effort to create an updated vision and action plan for sustainability at Hopkins.

University Research and Education Efforts

The President's Task Force also proposed the establishment of a university-wide environment institute to promote interdisciplinary sustainability and climate education and research. In particular, it recommended creation of "a university-wide umbrella research and education organization ('Institute'), with a fulltime director, administrative support, and internal oversight committee. The Institute will provide a single point of contact, increase the visibility of JHU internationally, and coordinate curricular and research activities related to climate change and sustainability."

In response to this recommendation, in 2010, the University founded the Environment, Energy, Sustainability and Health Institute (E²SHI), with strong initial support from the Provost's office and follow-on support from the Schools of Engineering, Public Health, and Arts and Sciences, as provided in the charter of the Institute.

One of the Institute's primary goals was to "[e]stablish Johns Hopkins University as a world leader in, and provide a single point of contact for, integrative approaches to global environmental change, sustainability, and their related health challenges." The Institute supported inter-departmental projects that drew together specialists with different areas of expertise to work together on a wide variety of problems related to climate change, and has helped Hopkins faculty secure approximately \$40 million in external research funding on energy technology, environmental health, and sustainability. From 2010 to 2016, the Institute provided seed grants and fellowships to fund promising research, and has funded fellowships for PhD students doing research on developing clean energy technologies, assessing the health impacts of environmental change, and analyzing public policies for incentivizing sustainable decisions in both the private and public sectors. The Institute also has sponsored an annual symposium, as well as seminars and workshops to encourage interaction across departments and schools to develop research proposals and new academic programs.⁶

In this manner, the University joined its peer institutions in establishing a pan-university institute to increase the amount, visibility and impact of the university's research and education in sustainability. Unfortunately, unlike peer institutions, the Institute has not secured an endowment to allow it to carry on its core seed grant, fellowship, and workshop programs, while financial support from the university is now provided only by the Whiting School of Engineering. Unsurprisingly then, a 2017 survey of interdisciplinary sustainability institutes at 18 major research universities found that Johns Hopkins' institute was at the very bottom of the pack in terms of Institute funding, endowment, staff, and other metrics.⁷ This is largely because little of the \$40M in funding it has helped secure finds its way back to funding the Institute's core activities. In general, it is difficult to convince individual university divisions to support activities that benefit the university as a whole, and funding arrangements based on indirect cost recovery have been made only with the School of Engineering.

⁶ The accomplishments of the Institute are described in its annual report to the President available from e2shi.jhu.edu, as well as in its Five Year Report ("E²SHI Five Year Report, 2011-2015: Research, Education, and Policy to Sustain Life on Our Earth." http://e2shi.jhu.edu/images/E%C2%B2SHI_Five_Year_Report_2011-2015.pdf).

⁷ A.J. Hoffman and J.L. Axson, *Examining Interdisciplinary Sustainability Institutes at Major Research Universities, Innovations in Cross-Campus and Cross-Disciplinary Models*, University of Michigan, June 2017. <http://graham.umich.edu/media/pubs/Mitchell%20Report%20Final.pdf>. Most institutes have full or half.

With the greatly diminished funding available, the Institute plans to pursue research and educational initiatives in sustainable energy and the intersection of food, energy, and water needs in developing countries. However, because of the Institute's reduced funding and scope, it will be unable to fulfill the role envisioned of a cross-university institute that involves investigators, students, and educators from all branches of the university in building new research and teaching programs. In this respect, the university is lagging its peer institutions, rather than being the leader envisioned in the statements by Presidents Brody and Daniels.

University Community Outreach Efforts

The President's Task Force report had as one goal to "develop and nurture strong relationships with State, City and community groups within the Baltimore region, and explore collaborative ways to attain our respective goals, transfer knowledge, and share successes." In pursuit of this goal, the Task Force recommended that there be created "a community-based learning working group to promote sustainability related projects. The group will (1) work with departments to identify faculty interested in community projects, (2) develop a clearinghouse of projects working with the City and community groups, (3) set up a directory of environmental groups for students to access for internships and other opportunities and (4) work with development offices to network with interested alumni in this arena."

Although this work group was not developed, the Office of Sustainability has provided the needed leadership stepped up and it can be fairly stated that the University has made excellent efforts in this regard. As an example, through the Climate Showcase Program which was funded from 2010 to 2012, Johns Hopkins students advised local non-profit agencies on means to reduce carbon emissions and cut utility costs. "Through the program, students worked with nearly 80 non-profits and identified low- or no-cost changes that would have the collective impact of reducing more than 600,000 pounds of CO₂ per year, while creating \$65,000 in annual savings."⁸ The many joint JHU-community projects now underway have a water quality emphasis rather than greenhouse gases per se, but have created important linkages that could be the basis of future energy efficiency efforts. Examples include the inner harbor Oyster Gardening partnership between the Carey Business School and Legg Mason; the Move-Out Recycling Program in which students donate their unneeded household goods, clothing, food and toiletries to community organizations at the end of the school year; floating wetlands partnership with the Baltimore Community Toolbank; and a local carbon offset program under development with Blue Water Baltimore.

⁸ JHU Office of Sustainability. *Johns Hopkins University Climate Action Plan – Five Year Progress Review*, March 2014, http://sustainability.jhu.edu/office_of_sustainability/reports_and_publications/Five%20Year%20Review%20Report.pdf.