Cornell Investment and Divestment Strategies for a Sustainable Future

Appendix

Definitions

For the purposes of this resolution,

"…those companies holding the largest fossil fuel reserves": The list of "Top 200 listed companies by estimated carbon reserves" provided by the Carbon Tracker Initiative (1) and the list as modified in future updates. The current list is provided in the Attachment. We refer to these as the "200 LCR."

"…a more aggressive reduction … that will achieve carbon neutrality by 2035": A stepwise introduction of carbon-reducing technologies and offsets of the same type planned under the existing 2050 goal.

"…investments in companies… be reduced consistent with Cornell's progress towards carbon neutrality": The target schedule will be linear, beginning three months after passage of the resolution. Deviations from the schedule that are noted in the President's annual report to the Faculty will be compensated for in the following year.

"…a schedule that prioritizes divestment from those companies holding the largest fossil fuel reserves": With flexibility provided for logistical issues associated with pre-existing fixed-term investments, divestment will be ordered according the annually updated 200LCR list. Reinvestment in companies that leave or significantly move down the list due to altered practices is encouraged as a means of recognizing their beneficial efforts.

Motivation

Fossil fuel reserves pose a huge threat to global warming.

- Proven fossil fuel reserves owned by companies and governments in 2012 were equivalent to 2,860 gigatons (Gt) CO_2 (2, 3).
- The 2009 and 2010 United Nations Climate Change conferences concluded that it was necessary to hold the increase in global average temperature below 2°C above pre-industrial levels (4, 5). The United States concurred. This conclusion was recently reinforced by the UN's Intergovernmental Panel on climate Change (6, 7).
- Additional CO_2 release from 2013-2050 must be limited to 565 (900) gigatons (Gt) for an 80% probability of keeping temperature rise to 2°C. It must be limited to 886 (1075) Gt for a 50% probability. [The smaller numbers are from Ref. (8); the larger from Ref. (2), which incorporates some different assumptions.]
- In either case, no more than approximately one-fifth to one-third of proven reserves can be used prior to 2050 if the world is to remain below a 2°C rise. [Even assuming optimistic projections by the International Energy Agency of carbon capture and storage deployment (3) only increases these numbers by 12-14% (2).]
- Fossil fuel-extracting companies continue to explore to increase reserves further. The top 200 oil and gas extracting companies (1) spent $674 billion in 2012 for such exploration. "[This] shows the intentions of the extractive sector if there are no emission limits in place." (2)
- "The fossil fuel industry faces a climate change Catch-22. Either it burns its existing reserves of oil, gas and coal and faces *physical risks* from climate change…or, when rising

temperatures compel international governments to limit carbon emissions…[it faces] *financial risks* that will cost its stockholders billions in shareholder value." (9)

- Without implementation of concrete policies to dramatically curtail fossil fuel use, median warming at the end of the twenty-first century is projected to be 4.1-5.1°C (10) and sea level rise is projected to be about 1-1.7 meters (7, 11). Even a 1 meter rise would place 91% of New Orleans, 18% of Miami, and 7% of New York City underwater, even without storm surge (12, 13). The impacts on ecosystems, health, freshwater resources, and food production would also be extreme (11, 14).
- To summarize: "If we burn all current reserves of fossil fuels, we will emit enough CO_2 to create a prehistoric climate, with Earth's temperature elevated to levels not experienced for millions of years. Such a world would be radically different from today, with changes in the intensity and frequency of extreme events, such as floods and droughts, higher sea levels re-drawing the coastlines of the world, and desertification re-defining where people can live. These impacts could lead to mass migrations, with the potential for widespread conflict, threatening global growth and stability—Professor Lord Stern, IG Patel Professor of Economics and Government, London School of Economics (2).

It is the responsibility of universities in general, and Cornell in particular, to take a leadership role in alerting society to knowledge-based issues. University divestment from companies holding large fossil fuel reserves is part of a national movement to draw attention to this issue.

- "If their college's endowment portfolio has fossil-fuel stock, then their educations are being subsidized by investments that guarantee they won't have much of a planet on which to make use of their degree" ---Bill McKibben, Schumann Distinguished Scholar, Middlebury College.
- Divestment campaigns initiated to successfully combat South African Apartheid caused students on college campuses across the country to revise the way they thought about their endowment and how it is used. The success of these campaigns spurred a global paradigm shift in the ethics of investing. Cornell was one of over 150 colleges and universities to divest from South Africa and has also pledged to divest from conflict minerals.
- Cornell can become a leader of the climate justice movement by divesting from fossil fuel reserve-holding companies and supporting the paradigm shift that focuses on the need for a sustainable future. Coal, oil, and natural gas will not only contribute to the global climate crisis, but are also non-renewable and thus projected to become more costly and much more difficult to extract in the near future.
- "In 2011, the University conducted a screen of its portfolio to determine its exposure to seven companies involved in producing oil in Sudan as part of an ongoing divestment program. The University subsequently sent letters to the relevant investment managers notifying them of the University's Sudan divestment policy. For managers with investments that Cornell controls directly, the University requested that the appropriate securities be divested." (15, 16)
- Cornell is a member of the Ivy Plus Sustainability Working Group, which can provide a means of cooperatively leveraging our efforts with Ivy League and other universities (17).
- Cornell's overall self-reported progress to the Sustainability Tracking, Assessment & Rating System of the Association for the Advancement of Sustainability in Higher Education is high– 70.7/100 (15, 18). However, its investment score in "Positive Sustainability Investments" is low– 0.41/9.00 (15, 18).

Carbon-neutrality and divestment are feasible.

- A concrete plan demonstrating the feasibility of converting New York State's energy infrastructure to a fossil fuel-free basis has been developed (19).
- The historical (1997-2011) effect of divestment on return of investment (ROI) for the Russell 3000 Index, a representative whole-market index, over a 10-year rolling period has been ~ ± 0.2%, depending on the time period analyzed (20). Consider that only half of the endowment is invested in equities (21), the estimated effect of divestment, if it were instituted in full immediately, would be reduced to ~ ± 0.1%. This is much smaller than the annualized standard deviation of the Cornell Long Term Investment Pool, which was about 10% for the 5-year period ending June, 30, 2012 (21). Whatever the full annual effect, because of the linear schedule of divestment, the annualized effect over the 22 year divestment period would only be half that. Moreover, recent annual financial statements show that endowment income is only ~10% of Cornell's operating revenues (22). The financial effect of divestment will be "in the noise."
  Divestment will generate a strong symbolic statement for the welfare of society at little or no cost.
- Other large institutions such as the cities of San Francisco and Seattle have already recognized the stability of carbon-free investment portfolios and financial feasibility of divestment. For example, the San Francisco Board of Supervisors unanimously voted to divest the $583 million that was invested in fossil fuel companies from its $16 billion pension fund (23).
- Even excluding environmental considerations, the competitiveness of renewable energy sources is rapidly improving. "By the end of 2012, an estimated 3.2 gigawatts of solar power will have been installed—an increase of 70% over last year." (24) Solar costs decreased by 27% in 2012 alone and solar power generated "nearly half of all new electric generating capacity in the beginning of 2013." (25)
- The International Energy Agency recently urged four measures to "keep the 2°C climate goal alive" that can be enacted quickly and a no net economic cost: targeted energy efficiency measures, limiting the use of inefficient coal-fired power plants, minimize methane emissions from oil and gas production, and accelerate the removal of fossil fuel subsidies. (26)
- The value of companies holding fossil-fuel reserves will drop significantly once the market recognizes that a large fraction of these reserves are unburnable. "Put bluntly, either we're heading for a climate catastrophe, or the carbon asset bubble will go the way of sub-prime mortgage stock. … If [the crucial 2015 UN climate negotiations are] successful, they will put a price on carbon, driving down returns on fossil-fuel investments by capping carbon emissions." (12) "An estimated 50-80 percent of the current market value of oil, gas and coal companies is based on *unburned* reserves; that is resources that are still in the ground but which, if burned, would lead to catastrophic climate change and economic disaster." (27) Such concerns recently prompted a group of 70 global investors (including the New York State and New York City Comptrollers) managing more than $3 trillion of assets to request from the world's top fossil fuel companies detailed responses to these issues (28). Divestment from coal companies is a good place to start to avoid the risks of investment in this environmentally-challenged sector (27, 29, 30).
- Cornell is committed to being carbon neutral by 2050 and we cannot claim to be successful if we continue to support the fossil fuel industry with our institution's endowment (31).

- A recent National Research Council report concluded that the US could halve by 2030 the oil used in cars and trucks compared with 2005 by improving efficiency and using alternative energy sources (32).
- A carbon tax or other federal legislation that tilts market forces towards the reduction of fossil fuel use can drive very large reductions in fossil fuel use (33, 34). What is lacking is adequate political support that can be encouraged by university actions
- Other countries are making committed progress: For example, the German government vowed in 2011 to reduce greenhouse-gas emission by 40% by 2020 and 80% by 2050 (35). The Danish government has set the target of "weaning Denmark off fossil fuels by 2050" (36). In May, 2013, China announced a new pilot carbon-trading program that will cover seven cities and provinces including Beijing (37). In 2012 China was the world leader for investment in renewable energy (38).
- Divestment will not, and is not intended to, have a direct financial impact on the fossil fuel industry. But the indirect impacts of symbolic actions such as this can have a large effect on public awareness of the issues involved. This resolution, in concert with those of other universities and groups, can tip the political balance towards real progress towards averting the climate change crisis (39, 40).

An excellent, expanded review of the ethical, practical, and financial motivations for university divestment from companies holding large fossil fuel reserves is in Ref. (41).

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Attachment: Top 200 listed companies by estimated carbon reserves

Rank	Coal Companies	COAL (GtCO2)	Oil & Gas Companies	OIL (GtCO2)	GAs (GtCO2)
1	Severstal JSC	141.60	Lukoil Holdings	42.59	0.97
2	Anglo American PLC	16.75	Exxon Mobil Corp.	38.14	2.89
3	BHP Billiton	16.07	BP PLC	32.68	1.92
4	Shanxi Coking Co. Ltd.	14.98	Gazprom OAO	14.87	13.96
5	Exxaro Resources Ltd.	13.37	Chevron Corp.	20.11	1.11
6	Xstrata PLC	11.60	ConocoPhillips	18.11	1.03
7	Datang International Power Generation Co. Ltd.	11.21	Total S.A.	16.90	1.12
8	Peabody Energy Corp.	10.23	Royal Dutch Shell PLC	14.11	2.09
9	Mechel OAO	8.90	Petrobras	11.45	0.17
10	Inner Mongolia Yitai Coal Co. Ltd.	7.78	Rosneft	10.70	0.08
11	China Shenhua Energy Co. Ltd.	6.91	ENI S.p.A.	7.51	0.53
12	Coal India Ltd.	6.69	Occidental Petroleum Corp.	7.36	0.22
13	Arch Coal Inc.	5.57	Bashneft	7.25	0.01
14	Rio Tinto	5.23	SINOPEC Shandong Taishan Petroleum Co. Ltd.	6.61	0.22
15	Evraz Group S.A.	4.86	Canadian Natural Resources Ltd.	4.35	0.14
16	Public Power Corp. S.A.	4.56	Devon Energy Corp.	3.77	0.42
17	Consol Energy Inc.	4.50	Suncor Energy Inc.	3.74	0.07
18	Yanzhou Coal Mining Co. Ltd.	4.46	Apache Corp.	3.32	0.33
19	Mitsubishi Corp.	4.31	Anadarko Petroleum Corp.	3.14	0.33
20	Datong Coal Industry Co. Ltd.	4.30	Hess Corp.	3.01	0.12
21	Bumi Resources	3.28	Repsol YPF S.A.	2.75	0.29
22	United Co. Rusal PLC	3.02	BG Group PLC	2.29	0.48
23	Vale SA	3.01	Marathon Oil Corp.	2.51	0.12
24	Pingdingshan Tianan Coal Mining Co. Ltd.	2.97	Inpex Corp.	2.44	0.10
25	Tata Steel Ltd.	2.96	Statoil ASA	2.23	0.25
26	Teck Resources Ltd.	2.70	BHP Billiton	1.82	0.20
27	Banpu PCL	2.55	CNOOC Ltd.	1.85	0.09
28	Sasol Ltd.	2.51	Husky Energy Inc.	1.76	0.06
29	United Industrial Corp. Ltd.	2.48	YPF S.A.	1.68	0.12
30	Polyus Gold OAO	2.47	Novatek	-	1.73
31	Alpha Natural Resources Inc.	2.29	Talisman Energy Inc.	1.47	0.19
32	Magnitogorsk Iron & Steel Works	2.20	Pioneer Natural Resources Co.	1.50	0.11
33	Raspadskaya OJSC	2.09	SK Holdings Co. Ltd.	1.56	-
34	Kuzbassenergo	2.03	Petroleum Development Corp.	-	1.51
35	RWE AG	1.94	Cenovus Energy Inc.	1.40	0.06
36	Massey Energy Co.	1.93	Nexen Inc.	1.40	0.02
37	Eurasian Natural Resources Corp. PLC	1.93	EOG Resources Inc.	0.97	0.38
38	Wesfarmers Ltd.	1.86	Noble Energy Inc.	1.04	0.12
39	Churchill Mining PLC	1.74	OMV AG	1.02	0.06
40	Idemitsu Kosan Co. Ltd.	1.58	Chesapeake Energy Corp.	0.39	0.57
41	Tata Power Co. Ltd.	1.49	Penn West Petroleum Ltd.	0.91	0.03
42	Alliance Resource Partners L.P.	1.47	Oil Search Ltd.	0.91	-
43	NACCO Industries Inc. (Cl A)	1.33	Woodside Petroleum Ltd.	0.54	0.27
44	Novolipetsk Steel OJSC	1.30	Canadian Oil Sands Ltd.	0.78	-
45	New Hope Corp. Ltd.	1.30	Imperial Oil Ltd.	0.75	0.01
46	TransAlta Corp.	1.23	Murphy Oil Corp.	0.69	0.03
47	Sherritt International Corp.	1.15	Whiting Petroleum Corp.	0.70	0.01
48	PT Bayan Resources	1.14	EnCana Corp.	0.24	0.47
49	New World Resources N.V.	1.07	Plains Exploration & Production Co.	0.67	0.04
50	Mitsui & Co. Ltd.	1.03	Newfield Exploration Co.	0.53	0.11

Rank	Coal Companies	COAL (GtCO2)	Oil & Gas Companies	OIL (GtCO2)	GAs (GtCO2)
51	Kazakhmys PLC	0.99	Denbury Resources Inc.	0.60	0.00
52	African Rainbow Minerals Ltd.	0.95	Continental Resources Inc. Oklahoma	0.54	0.02
53	International Coal Group Inc.	0.95	Linn Energy LLC	0.49	0.03
54	Patriot Coal Corp.	0.94	Pacific Rubiales Energy Corp.	0.50	0.02
55	Aston Resources Pty Ltd.	0.93	Crescent Point Energy Corp.	0.47	0.00
56	AGL Energy	0.89	Concho Resources Inc.	0.44	0.02
57	Tokyo Electric Power Co. Inc.	0.89	Quicksilver Resources Inc.	0.36	0.08
58	Cloud Peak Energy Inc.	0.85	PTT PCL	0.33	0.12
59	CLP Holdings Ltd.	0.83	Berry Petroleum Co. (Cl A)	0.40	0.03
60	Polo Resources Ltd.	0.82	Range Resources Corp.	0.27	0.11
61	Whitehaven Coal Ltd.	0.79	Energen Corp.	0.34	0.04
62	Mongolian Mining Corp.	0.75	Enerplus Corp.	0.34	0.03
63	PT Adaro Energy	0.74	Tullow Oil PLC	0.36	0.01
64	Allete Inc.	0.72	Ecopetrol S.A.	0.35	0.01
65	Optimum Coal Holdings Ltd.	0.67	Santos Ltd.	0.19	0.17
66	ArcelorMittal	0.62	SandRidge Energy Inc.	0.33	0.03
67	Coal of Africa Ltd.	0.59	Cairn Energy PLC	0.35	0.00
68	James River Coal Co.	0.57	Arc Resources Ltd.	0.30	0.03
69	Westmoreland Coal Co.	0.56	El Paso Corp.	0.23	0.10
70	Aquila Resources Ltd.	0.53	Pengrowth Energy Corp.	0.30	0.02
71	Macarthur Coal Pty Ltd.	0.53	Lundin Petroleum AB	0.31	0.00
72	FirstEnergy Corp.	0.50	Petrobank Energy & Resources Ltd.	0.31	0.00
73	Western Coal Corp.	0.49	Baytex Energy Corp.	0.30	0.00
74	Cliffs Natural Resources Inc.	0.47	Forest Oil Corp.	0.22	0.07
75	Wescoal Holdings Ltd.	0.46	Mariner Energy	0.27	0.02
76	Walter Energy, Inc.	0.45	ATP Oil & Gas Corp.	0.24	0.01
77	Huolinhe Opencut Coal Industry Corp. Ltd.	0.41	Bankers Petroleum Ltd.	0.25	-
78	Gujarat NRE Coke Ltd.	0.40	Soco International PLC	0.25	-
79	Straits Asia Resources Ltd.	0.39	Zhaikmunai L.P.	0.22	0.01
80	Capital Power Corp.	0.38	Cimarex Energy Co.	0.18	0.05
81	Fushan International Energy Group Ltd.	0.34	Questar Corp.	0.12	0.11
82	Noble Group Ltd	0.34	GDF Suez S.A.	0.17	0.05
83	Itochu Corp.	0.34	Swift Energy Co.	0.20	0.01
84	Jizhong Energy Resources Co. Ltd.	0.30	Compania Espanola de Petroleos S.A.	0.21	-
85	Northern Energy Corp. Ltd.	0.29	PetroBakken Energy Ltd.	0.21	0.00
86	NTPC Ltd.	0.28	Premier Oil PLC	0.18	0.03
87	Prophecy Resource Corp.	0.28	Bonavista Energy Corp	0.18	0.03
88	Mitsui Matsushima Co. Ltd.	0.28	MOL Hungarian Oil and Gas Plc	0.19	0.01
89	Fortune Minerals Ltd.	0.28	SM Energy Co.	0.17	0.02
90	Black Hills Corp.	0.27	Williams Cos.	-	0.18
91	Jindal Steel & Power Ltd.	0.26	EQT Corp.	0.01	0.17
92	Grupo Mexico S.A.B. de C.V.	0.26	Oil & Natural Gas Corp. Ltd.	-	0.18
93	Gansu Jingyuan Coal Industry & Electricity Power	0.26	Global Energy Development PLC	0.17	0.00
94	Bandanna Energy Ltd.	0.25	Oil India Ltd.	0.16	0.01
95	Irkutskenergo	0.23	Venoco Inc.	0.16	0.01
96	Alcoa Inc.	0.23	INA-Industrija Nafte	0.17	-
97	Homeland Energy Group Ltd.	0.23	PA Resources AB	0.16	-
98	Neyveli Lignite Corp. Ltd.	0.19	Ultra Petroleum Corp.	-	0.16
99	Zhengzhou Coal Industry & Electric Power Co. Ltd.	0.15	Resolute Energy Corp.	0.16	0.00
100	Gujarat NRE Coking Coal Ltd.	0.12	Southwestern Energy Co.	0.00	0.16
Grand Total		389.19	Grand Total	319.13	37.34