

Academic Council Resolution on Greenhouse Gas Emissions & Climate Change
(Approved February 10, 2016 by Academic Council)

Wellesley College recognizes that climate change is an urgent issue. As President Bottomly has stated, “climate change is a formidable problem — one of the most serious problems in the history of humankind — and one that demands an immediate and broadly multifaceted worldwide response.” Addressing climate change is a social and moral imperative.

Wellesley College has and will contribute to efforts to address climate change through its activities as an educational institution: the courses and programs we offer, our faculty’s research, and the work of our students and alumnae will be our most important contributions to addressing climate change. The college also aims to align its institutional practices with these efforts.

Considerations:

- It is consistent with the college’s values, mission, and economic interests to reduce campus greenhouse gas emissions and its contributions to climate change.
- The college should pursue a range of options to increase energy efficiency at the college, ranging from encouraging behavioral change to making infrastructure improvements.
- The college should address climate change through on-campus activities first (off-setting college activities through the purchase of renewable energy credits should be a secondary consideration).
- The on-campus power plant’s generating equipment is nearing its end-of-life and will require significant (multi-million dollar) expenditure irrespective of this commitment. This provides an opportunity to further improve energy efficiency.
- The college should adopt an adaptive approach to greenhouse gas emissions, setting 10- and 20-year goals, which are revisited regularly.

Commitment: Building on Wellesley College’s long-standing commitment to global leadership, energy efficiency, environmental responsibility, and financial stewardship, we recommend that the college adopt goals to reduce greenhouse gas emissions by 37% by 2026 and 44% by 2036 from a 2010 baseline. These targets will be re-assessed at least every five years.¹ We also recommend that the college work to create longterm plans for achieving carbon neutrality.

This resolution was discussed at Academic Council on December 9, 2015 and approved at the February 10, 2016 meeting (97% voted in favor; 3% abstained; 0% voted against). Most of the discussion focused on whether such a commitment should include language with respect to carbon neutrality.

¹ Note, this goal applies to greenhouse gas emissions resulting from on-campus activities (scope 1) and electricity purchases (scope 2) — it excludes emissions related to employee commuting, student and faculty travel, and other purchased goods and services (scope 3).

Background Information on Energy, Greenhouse Gas Emissions, and Wellesley College

Wellesley College has a history of taking substantive steps to promote energy efficiency and reduce environmental impacts. The college has reduced energy consumption by 19% since 1999, purchased 5% green electricity from the municipal light district, adopted green building standards for new and renovated buildings, and piloted a Green Revolving Fund for energy efficiency improvements.

But the college's most significant effort to advance energy efficiency and environmental stewardship occurred in 1994, when the college built a \$7.5 million on-campus co-generation facility. Compared to a traditional power plant, which operated at 30% efficiency, the co-generation facility was designed to operate at 85+% efficiency, by generating electricity and capturing waste heat for heating, cooling, and other uses. For more than 20 years, the co-generation facility has performed at or near expectations. Between 1994 and 2014, it is estimated that the co-generation facility has resulted in a total savings of \$37.2 million in utility costs (compared to a \$7.5 million initial investment) and reduced annual GHG emissions by approximately 25% (compared to purchasing electricity from the grid), while providing the college with reliable electricity, heating, and cooling generation.

The most substantive discussions around the issue of climate change came in 2013-14, after students petitioned the Board of Trustees to divest the endowment of direct investments in fossil-fuel related companies. After campus discussions, meetings with students, and trustee deliberation, the trustees chose not to divest, instead highlighting [steps the college could take](#) to address this issue through education and on-campus efforts. At that time, no long-term goals for greenhouse gas emissions were proposed.

There are several reasons why a commitment to reducing greenhouse gas emissions is appropriate at this time:

- Climate change demands immediate and concerted action at the local, national, and global level, as urged by organizations including the National Academy of Sciences, the American Association for the Advancement of Science, and the Intergovernmental Panel on Climate Change.
- Since Wellesley College owns and operates a power plant, it is likely that the college will have to reduce emissions to meet state or federal regulations. The state and federal government have recently begun requiring the college to report greenhouse gas emissions annually, the state has adopted long-term greenhouse gas reduction goals (2008), and the federal government has finalized the Clean Power Plan (2015). Depending upon how these regulations are implemented, they may require college action.
- Many of our peer institutions have adopted formal commitments to reduce greenhouse gas emissions in the past decade. These are substantial, long-term commitments to conservation, energy efficiency improvements, and greenhouse gas reductions. In many cases, these commitments have been made in conjunction with the American College & University Presidents' Climate Commitment, which requires a long-term goal of achieving climate neutrality.

While an investment in energy efficiency and infrastructure improvements on a large scale is not currently included in the college's capital budget, such investments could be financed through reductions in operating costs, cost avoidance, and additional revenue streams (in the case of the central energy plant) and generate long-term financial savings for the college.

What options are there to improve energy efficiency and reduce emissions at Wellesley?

Based on the assessments of two external consultants*, we recommend the college take a portfolio approach to reducing greenhouse gas emissions and managing energy costs. Below are a range of strategies, with first order approximations of cost, which could each be partially or fully implemented.

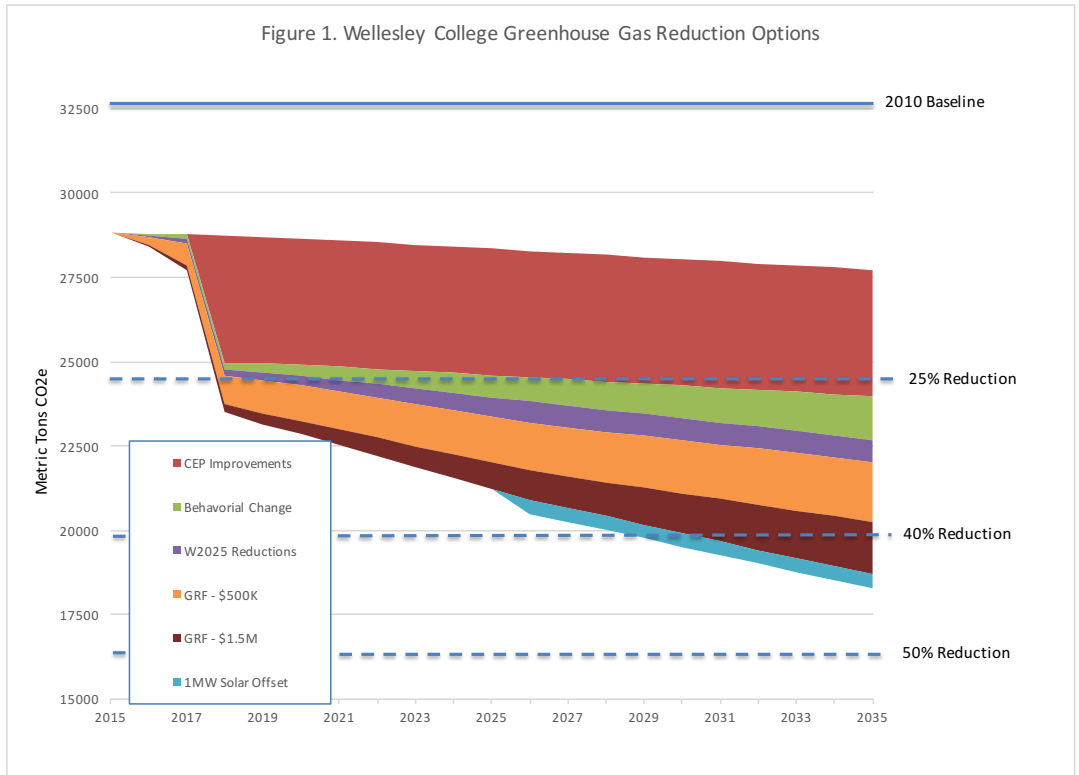
Potential Strategies*	Description	Capital Expense (\$ million)	Annual Savings (\$ million / year)**	Payback (years)
CEP Improvements	Replacing generators in the Central Energy Plant (CEP) with new, higher efficiency units would result in a 15-20% reduction in annual fuel purchases and greenhouse gas emissions; in addition, substantial revenue from state clean-energy subsidies and incentives could support this project.	\$10.0 to \$20.0	Low: \$1.0 High: \$3.0***	5-12 estimated
Behavioral Change	Behavioral change, such as conservation, establishing building temperature set points, and scheduling building use are projected to lower emissions by 0.5% per year.	—	In 2026: \$0.21 In 2036: \$0.49	—
Campus Renewal	Green building standards for the 20% of campus to be renovated will lower energy consumption of those buildings by ~15%. Such improvements are factored into plans and budgets for Campus Renewal.	—	In 2026: \$0.19 In 2036: \$0.24	—
GRF — Tier 1	A \$500,000 Green Revolving Fund (GRF) would provide capital to undertake energy efficiency projects, focused primarily on lighting and electrical projects beyond campus renewal.	\$0.5	In 2026: \$0.45 In 2036: \$0.74	< 7 years
GRF — Tier 2	An additional \$1,500,000 GRF would expand the scope of energy efficiency projects to include more insulation and building envelope projects with longer paybacks.	\$1.5	In 2026: \$0.24 In 2036: \$0.50	< 10 years
Solar Panels	1 megawatt of solar on campus rooftops would meet ~ 4% of campus energy demand. A leased system would incur no capital costs nor changes to the operating budget, however, the college only gets to count GHG reductions after the 10 th year.	—	In 2026: — In 2036: —	—
Carbon Offsets	Carbon credits can be purchased to off-set campus emissions. The current price of such credits ranges from \$5 to \$250 per metric ton of CO ₂ e annually. These credits support off-site clean energy projects.		Proposal assumes no use of carbon off sets or RECs.	

* These strategies are based on analyses undertaken by Competitive Energy Services (Portland, Maine) and Energy General (Norfolk, CT). The first-order financial analysis ignores factors such as the cost of borrowing money, alternative returns on investment, and potential regulatory actions (such as a carbon tax).

** Annual savings is estimated and includes reductions in operating costs, cost avoidance, and additional revenue streams (in the case of the central energy plant).

*** The higher estimate reflects savings relative to purchasing all electricity (necessary if the existing CEP fails) and factoring in other savings, such as potential reductions in maintenance and service for a re-commissioned CEP.

If all strategies are implemented fully, the college’s greenhouse emissions are estimated to drop by 37% by 2026 and 44% by 2036 below the 2010 baseline of 32,564 metric tons of CO2. The college would also be projected to realize cumulative operating costs savings of \$16-\$34 million between 2016 and 2026 and a cumulative \$37-\$73 million between 2016 and 2036. This suggests that the college should be able to finance these improvements through savings in operating costs over this period.



Estimated GHG reductions from each strategy (metric tons CO2e)

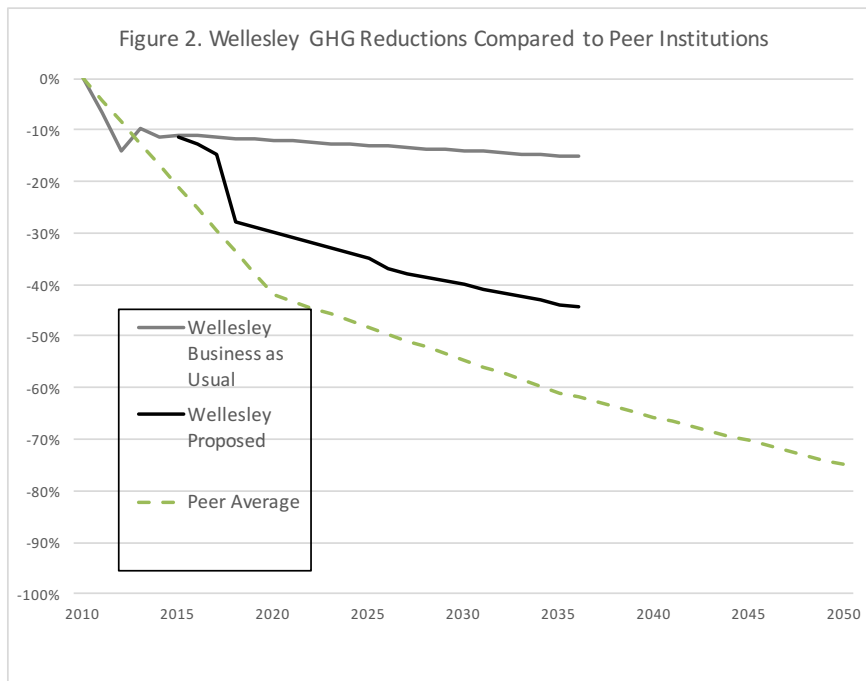
Strategies	2010 Baseline	2026	2031	2036
CEP Improvements*	0	3750	3750	3750
Behavioral Change	0	707	1029	1350
Campus Renewal	0	654	654	654
GRF — Tier 1	0	1400	1616	1832
GRF — Tier 2	0	861	1253	1644
Solar Panels	0	420	410	399
Net Emissions	32564	20490	19262	18096
Reduction from 2010	—	37%	41%	44%
Projected Reductions in Annual Operating Expenses (million \$)				
Low	0	\$2.1	\$2.3	\$2.5
High	0	\$4.1	\$4.3	\$4.5

How does this compare to the commitments peer institutions have made?

Many of our peers have made long-term commitments to reducing greenhouse gas emissions and addressing climate change. Based on analysis by Competitive Energy Services, 17 peer institutions have committed to a 61% reduction by 2035 and a 75% reduction by 2050. For instance, Williams College has committed to a 35% reduction by 2020 and Wesleyan has committed to a 51% reduction by 2035.

During the past decade, over 650 institutions have committed to the American College & University Presidents' Climate Commitment. This commitment requires each signatory to develop a plan, which includes a commitment to achieve carbon neutrality. Peer institutions, such as Bowdoin, Smith, Swarthmore, and Wesleyan have committed to the Presidents' Climate Commitment, with Bowdoin aiming for climate neutrality in 2020 and Wesleyan by 2050.

Although there are concerns that some colleges are not following through on their commitments, schools such as Williams, Bowdoin, and MIT have recently announced specific investments and strategies to achieve their goals.



This chart compares Wellesley's projected business-as-usual emissions, proposed Wellesley reductions of 37% by 2026 and 44% by 2036, and the projected emissions of 17 peer institutions (based on their current GHG reduction commitments).

What if we want to do more?

If the college wished to explore more aggressive options for addressing greenhouse gases emissions, it could consider additional investments in energy efficiency on campus. But since most low-hanging fruit will have been picked, the cost and return on such projects could be considerably higher. Opportunities for renewable energy installations could be expanded. Many schools have considered meeting more aggressive GHG reduction targets by purchasing renewable energy credits (RECs) to off-set campus emissions. Essentially, purchasing REC supports clean-energy investment and generation elsewhere. Based on present-day pricing, off-setting all college remaining emissions (to achieve carbon neutrality)

would cost approximately \$100,000 per year in 2036 with low-quality RECs and \$5 million with high-quality New England wind energy RECs.

Who has been involved in developing this proposal and supporting materials?

This proposal has been developed as a part of the broader sustainability plan currently under development by the Advisory Committee for Environmental Sustainability. The specific materials included in this proposal on greenhouse gas reductions are the product of work by the Advisory Committee on Environmental Sustainability, the Office of Facilities Management and Planning, and the Office of Finance and Administration undertaken since the spring of 2015. The estimates of greenhouse gas reductions and first-order economic costs and savings are based upon the work of two external consulting firms: Energy General based in Norwalk, CT and Competitive Energy Services based in Portland, ME.