

2011

# COLGATE UNIVERSITY'S



## SUSTAINABILITY AND CLIMATE ACTION PLAN

**Colgate University**  
**13 Oak Drive**  
**Hamilton, NY 13346**

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# EXECUTIVE SUMMARY

## SUSTAINABILITY AND CLIMATE ACTION PLAN

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Modern society's consumptive patterns and the design of our manufacturing and industrial systems consume natural resources, energy, and minerals at ever-increasing rates. Our current cultural, economic, and political systems encourage intensive and extensive use of natural resources that, through their extraction and consumption, create pollution, waste, and social and environmental inequities. The evidence is compelling that these patterns of production and consumption are negatively impacting ecosystems and biodiversity, and are making humans more vulnerable to environmental hazards. Further, this evidence also points to considerable and increased risks—especially through, but not limited to, climate change—in the coming century if we continue our current practices. Simply put, our current way of living is unsustainable, and overcoming this presents a great challenge in our time.

Colgate University continues to be a leader in higher education by advancing the practice and teaching of sustainability. In 2005, Colgate's Sustainability Council was formally charged by Colgate's president to develop a coordinated environmental vision to ensure a safe, healthy, and sustainable environment. Ultimately, the Council seeks to advise and guide the university on ways to integrate teaching, research, operations, and community engagement to address current and future sustainability challenges. In January of 2009, Colgate became a signatory of the American College and University Presidents' Climate Commitment (ACUPCC), challenging Colgate to develop and implement actions to achieve climate neutrality by eliminating or offsetting 100 percent of the university's greenhouse gas emissions. Signing the ACUPCC is Colgate's most significant commitment to sustainability and further demonstrates leadership by example as Colgate strives to meet our academic mission to *"produce ethical and moral leaders who inspire others."* By striving for and achieving climate neutrality, Colgate is helping to educate and prepare the next generation of community, corporate, non-profit, and public leaders.

Colgate has already demonstrated leadership in sustainability and made important progress in advancing sustainability on campus. In 2010, for example, we reduced our greenhouse gas emissions by 17 percent (from 17,323 MTeCO<sub>2</sub> in 2009 to 14,451 MTeCO<sub>2</sub> in 2010). This reduction is mainly the result of conservation and efficiency projects through:

- a 24 percent decrease in fuel oil consumption (nearly 88,000 gallons less in 2010 compared to 2009)
- a 4 percent decrease in electricity consumption (1.3 million kWh less in 2010 compared to 2009)
- a 33 percent decrease in paper use (43,000 lbs less in 2010 compared to 2009)
- a 4 percent decrease in landfill waste (34 tons less in 2010 compared to 2009)

Conservation and efficiency saved the university nearly \$300,000 in operating costs while enhancing our liberal arts education as student participation was integral to these results through academic research, governance, and co-curricular club activities.

Additionally, Colgate's wood-fired boiler uses over 20,000 tons of locally grown wood chips to provide heat and hot water to campus. In 2010, our wood-fired boiler displaced over one million gallons of fuel oil, avoided

over 13,000 metric tons of emissions, and saved the university over \$2 million in energy costs. We are also experimenting with cropped biomass in the form of an eight-acre willow plot in the hopes of cultivating some of our own energy.

Colgate's electronic waste recycling program includes 18 stations located throughout campus; we also recently implemented a new composting program, and broke ground on a new half-acre community vegetable garden. Vegetables and herbs from the garden are sold back to the university and served in our dining halls. Each program was funded, in part, by the Class Gift of 2010 and students are helping to manage each of these initiatives. Colgate's administration leads by creating opportunities and opening pathways for student research and innovation.

Regarding transportation, in 2010, we expanded our Green Bikes program by purchasing an additional 12 bikes and introduced a new online rideshare program in order to help reduce employee-commuting emissions.

Colgate's Green Office Program is indicative of our participatory and inclusive approach. In 2010, eight teams representing 65 employees registered for and are actively pursuing official Green Office Certification.

In April of 2010, Colgate's faculty officially approved the goals of a Colgate education. Among them, they specified that a Colgate education should enable students to *"recognize their individual and collective responsibilities for the stewardship of the earth's resources and the natural environment"* and graduate as *"engaged citizens who strive for a just society."* To meet these ends, Colgate offers numerous courses focused on sustainability and climate change.

As a result of these efforts, Second Nature recognized Colgate as a 2011 Climate Leadership Award recipient during its annual Climate Leadership Summit in Washington, D.C. With our wood-fired boiler, low-carbon electricity grid, sustainability-focused academic programming, and a campus culture conducive to sustainability, Colgate is well-positioned to continue as a leader in sustainability in the 21st century. With the completion of this Sustainability and Climate Action Plan, Colgate now has a comprehensive set of specific, measurable, and tangible goals for sustainability to guide our progress and set our direction. With this plan, Colgate will build on recent accomplishments and intensify our efforts to advance sustainability.

Colgate has set an ambitious target date of 2019—to coincide with our bicentennial celebration—for achieving climate neutrality. Meeting this goal will require the purchase of a substantial number of carbon offsets. As a result, our climate action planning efforts will continue well beyond our climate neutrality date as we continue to implement projects and policies that will reduce our campus's gross emissions and, therefore, our dependency on carbon offsets. In light of this, the university established complementary goals to reduce our gross emissions in the coming years:

- By 2015, reduce gross greenhouse gas emissions to 11,249 MTeCO<sub>2</sub> or 35% below the 2009 baseline.
- By 2020, reduce gross greenhouse gas emissions to 10,412 MTeCO<sub>2</sub> or 40% below the 2009 baseline.

The Sustainability and Climate Action Plan is a year-by-year road map to advance sustainability and achieve climate neutrality by 2019. Throughout the planning process, the Climate Action Plan Steering Committee

worked to identify specific projects that could be implemented within the next four years. In the end, we agreed on 27 individual projects that will advance sustainability on campus while reducing our greenhouse gas emissions. The Climate Action Plan table below lists each of the projects and ranks them according to the amount of metric tons of carbon dioxide equivalent (MTeCO<sub>2</sub>) reduced. The first 11 projects on the list will reduce Colgate's greenhouse gas emissions by over 3,500 MTeCO<sub>2</sub> or 95% of all greenhouse gas reductions identified in this plan.

**Climate Action Plan: on-campus project ranking by total greenhouse gases (MTeCO<sub>2</sub>) reduced.**

RANK	MITIGATION PROJECT	FIRST COST	ANNUAL OPERATING COST	ANNUAL SAVINGS	SIMPLE PAYBACK (YRS)	MTeCO <sub>2</sub> REDUCED	FIVE YEAR \$/MTeCO <sub>2</sub>
1	Fuel switching: eliminate fuel oil #6	\$ 7,300,000	\$ -	\$ (366,000)	19.9	1,258	\$ 4,348
2	Forest sequestration (carbon accounting project)	\$ 30,000	\$ -	\$ -	N/A	1,239	\$ 24
3	Green Living Program	\$ 38,300	\$ 45,500	\$ (104,700)	0.8	276	\$ (934)
4	Green Office Program (40 new offices; 240 employees)	\$ -	\$ 2,000	\$ (109,900)	0.0	188	\$ (2,870)
5	Videoconferencing	\$ 35,200	\$ -	\$ (19,000)	1.9	100	\$ (598)
6	Olin Hall (energy conservation measures)	\$ 148,300	\$ -	\$ (34,700)	4.3	92	\$ (274)
7	Low-flow showerheads	\$ 9,800	\$ -	\$ (51,900)	0.2	90	\$ (2,774)
8	Reforestation of open spaces (8 acres)	\$ 5,400	\$ -	\$ -	N/A	80	\$ 68
9	Carpooling (48 carpools)	\$ -	\$ 500	\$ -	N/A	72	\$ 35
10	Geothermal heat exchange	\$ 125,000	\$ -	\$ (15,000)	8.3	72	\$ 697
11	McGregory Hall (energy conservation measures)	\$ 96,900	\$ -	\$ (21,500)	4.5	60	\$ (175)
12	Sanford Field House (energy conservation measures)	\$ 64,500	\$ -	\$ (25,600)	2.5	35	\$ (1,804)
13	Adaptive computer power management	\$ 14,400	\$ 2,700	\$ (17,000)	1.0	23	\$ (2,531)
14	On-site composting (pre- and post-consumer)	\$ 7,000	\$ 4,100	\$ (8,100)	1.4	21	\$ (619)
15	Encourage flexible work schedules	\$ -	\$ -	\$ -	N/A	21	\$ -
16	Implement 'no-idling' policy	\$ 1,000	\$ -	\$ (5,200)	0.2	13	\$ (1,996)
17	Employee bicycle commuting (30 bikes & 10 bike racks)	\$ 8,500	\$ 5,100	\$ -	N/A	12	\$ 2,931
18	Purchase electric vehicles (6)	\$ 9,000	\$ -	\$ (6,600)	1.4	11	\$ (2,176)
19	Biodiesel (B20 blend)	\$ -	\$ -	\$ (500)	0.0	11	\$ (227)
20	Purchase hybrid-electric vehicles (3)	\$ 6,000	\$ -	\$ (3,000)	2.0	8	\$ (1,076)
21	Establish 'reduced mow' areas (30 acres)	\$ 1,800	\$ -	\$ (1,800)	1.0	6	\$ (1,200)
22	Solar thermal energy	\$ 27,500	\$ -	\$ (1,300)	21.2	6	\$ 3,573
23	Paper purchasing policy (eliminate non-recycled paper)	\$ -	\$ -	\$ (3,800)	0.0	3	\$ (6,333)
24	Green events: waste minimization and recycling	\$ -	\$ -	\$ (600)	0.0	2	\$ (1,500)
25	Trayless dining operations (Frank Dining Hall)	\$ 90,000	\$ -	\$ (100,700)	0.9	2	\$ (206,750)
26	Wind energy	\$ 86,000	\$ -	\$ (2,400)	35.8	2	\$ 43,529
27	\$50 minimum purchasing order	\$ -	\$ -	\$ (500)	0.0	1	\$ (2,500)
<b>CLIMATE ACTION PLAN TOTAL</b>		<b>\$ 8,105,000</b>	<b>\$ 60,000</b>	<b>\$ 914,000</b>	<b>9.1</b>	<b>3,700</b>	<b>\$ 1,055</b>

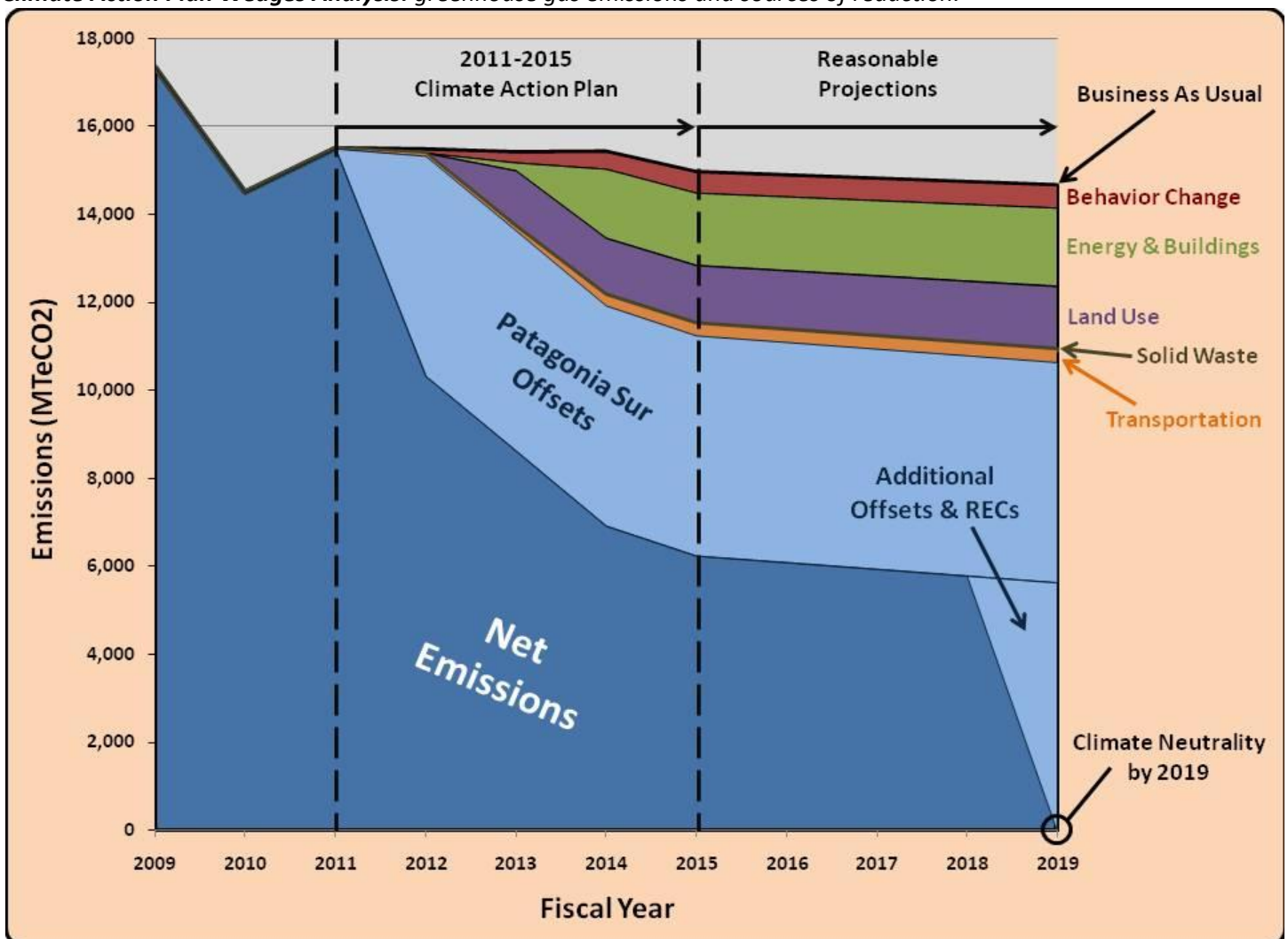
Projects range from low-cost, high-impact behavior-change strategies such as the Green Office and Green Living Programs, to capital-intensive and technologically complex engineering projects such as the heating plant upgrade (fuel switching from #6 oil to natural gas). By 2015, the goal will be to implement these proposed projects and in the process:

- eliminate fuel oil #6 consumption on campus by replacing it with natural gas (depending on its future availability Hamilton, N.Y.)
- reduce electricity consumption by nearly 5,000,000 kWh
- reduce fuel oil #2 consumption by over 10,000 gallons
- reduce gasoline consumption by over 3,000 gallons
- reduce diesel consumption by 800 gallons

- reduce water consumption by nearly 6,000,000 gallons
- reduce landfill waste by over 300 tons
- reduce paper consumption by over 10,000 pounds
- reduce food purchasing expenditures by over \$100,000
- reduce air travel expenditures by nearly \$20,000

Cumulatively, these projects are expected to eliminate approximately 3,700 tons of greenhouse gas emissions (see the Climate Action Plan Wedges Analysis graph below). Each wedge in the graph contains projects that will reduce emissions within that category: behavior change, energy and green building, land use and grounds maintenance, solid waste and recycling, transportation, and offset projects. The black line at the top of the graph—delineating the business-as-usual scenario—represents Colgate's estimated emissions if the university took no specific actions to reduce greenhouse gas emissions.

**Climate Action Plan Wedges Analysis: greenhouse gas emissions and sources of reduction.**



The Sustainability and Climate Action Plan is fiscally responsible. The one-time implementation cost (first cost) will be approximately \$8.1 million; however, \$7.3 million of that includes the heating plant upgrade project that needs to occur regardless of our sustainability and climate action planning efforts. We anticipate that by

implementing the cumulative suite of projects, we will reduce our annual operating budget by over \$750,000 (see Climate Action Plan Financial Analysis table below).

**Climate Action Plan Financial Analysis: first cost, annual operating cost/savings, and net cost/savings by fiscal year.**

FIRST COST	2012	2013	2014	2015	TOTAL
ALL PROJECTS (except Heating Plant)	\$ 15,000	\$ 380,000	\$ 191,000	\$ 219,000	\$ 805,000
HEATING PLANT	\$ -	\$ -	\$ 7,300,000	\$ -	\$ 7,300,000
<b>TOTAL</b>	<b>\$ 15,000</b>	<b>\$ 380,000</b>	<b>\$ 7,491,000</b>	<b>\$ 219,000</b>	<b>\$ 8,105,000</b>

PROJECTED OPERATING COST (Cumulative)	2012	2013	2014	2015
ALL PROJECTS (except Heating Plant)	\$ 11,000	\$ 35,000	\$ 48,000	\$ 60,000
HEATING PLANT	\$ -	\$ -	\$ -	\$ -
CARBON OFFSET PURCHASES	\$ 50,000	\$ 50,000	\$ 50,000	\$ 98,000
<b>TOTAL</b>	<b>\$ 61,000</b>	<b>\$ 85,000</b>	<b>\$ 98,000</b>	<b>\$ 158,000</b>

PROJECTED SAVINGS (Cumulative)	2012	2013	2014	2015
ALL PROJECTS (except Heating Plant)	\$ (76,000)	\$ (334,000)	\$ (469,000)	\$ (548,000)
HEATING PLANT	\$ -	\$ -	\$ (366,000)	\$ (366,000)
<b>TOTAL</b>	<b>\$ (76,000)</b>	<b>\$ (334,000)</b>	<b>\$ (835,000)</b>	<b>\$ (914,000)</b>

NET OPERATING COST/(SAVINGS)	2012	2013	2014	2015
ALL PROJECTS (except Heating Plant)	\$ (65,000)	\$ (299,000)	\$ (421,000)	\$ (488,000)
HEATING PLANT	\$ -	\$ -	\$ (366,000)	\$ (366,000)
CARBON OFFSET PURCHASES	\$ 50,000	\$ 50,000	\$ 50,000	\$ 98,000
<b>TOTAL</b>	<b>\$ (15,000)</b>	<b>\$ (249,000)</b>	<b>\$ (737,000)</b>	<b>\$ (756,000)</b>

Finally, it is important to emphasize that the Sustainability and Climate Action Plan is a living document. Surely, new research, policies, incentives, partnerships, organizational structures, and technologies will create opportunities not available today. For this reason, we must remain vigilant and open to reevaluating and revising our strategies when better ones emerge.

To meet this end, the process of revising and enhancing our Sustainability and Climate Action Plan in the months and years ahead was not an afterthought, but built directly into our ongoing effort. We have devoted a section of our sustainability and climate action planning website to encourage feedback, new ideas, and participation from the Colgate community and all interested stakeholders. We will incorporate feedback, new research, and emerging technologies into the updated version of our Sustainability and Climate Action Plan due on January 15, 2013. Moreover, we will further communicate Colgate's ongoing progress through the publication of our annual Greenhouse Gas Inventory and through the publication of the Sustainability Office's Annual Sustainability Review. We anticipate that our interactive website and these updated publications will significantly enhance our sustainability program by helping to capture the collective knowledge and insights from our diverse, scholarly, and multidisciplinary community.