
DEERFIELD ACADEMY
SUSTAINABILITY ACTION PLAN

APRIL 2013

LEAD AUTHORS:

JEFF JEWETT

DAVID PURINGTON

April 15, 2013

Dear Students, Faculty, Staff, Alumni, Trustees, and friends of Deerfield Academy,

I am delighted to introduce a major new sustainability plan that has arisen from *Imagine Deerfield*, which recognized that we must prepare students “for leadership in a rapidly changing world that requires global understanding, environmental stewardship, and dedication to service.” This Sustainability Action Plan reflects our work over the past year since we adopted a Sustainability Mission Statement for the school to bring this vision to life. Such work it has been – reflecting hours of effort by staff, faculty, and students to understand where our community has opportunities for improvement, and presenting thoughtful strategies for further inquiry and change.

There is wide recognition that human behavior is affecting the health of our planet – and we as a community must lead in working to find solutions and put those solutions into practice. This action plan puts into motion a timely, necessary, and more deliberate process for Deerfield Academy to demonstrate and educate for sustainability, graduating students ready to make lasting and positive change in the world.

The plan contains many insightful observations about current practices and many ideas about our future – but I leave off with two of the most compelling:

“There has not yet been a sustained and intentional institutional effort to green the campus”; and, “There are choices to be made. From the food we serve, to the care of our athletic fields, to how we heat our buildings in the winter, our decisions matter.”

I encourage you to read this plan with an open mind and to ready yourself for an exciting dialogue in the coming years as we execute its sometimes humble and sometimes bold suggestions.

Sincerely,

Margarita Curtis

Head of School

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Jeff Jewett, Sustainability Coordinator, Science Teacher
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James Kjørlien, 2015
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Michael McCarthy, Food Services Director
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James (Huck) Laughner, Science Teacher
Thomas Hagamen, Director of Medical Services
Timothy Trelease, Visual & Performing Arts Teacher
Mandy Irwin, Science Teacher
Nolan Bishop, 2013
Juliette Lee, 2014
Sydney O'Connor, 2014
William (Tripp) Kaelin, 2014

The ***Sustainability Action Planning Committees*** that worked together to research these issues and develop this document:

Finance & Operations

Julie Collins, Director of Business Services
Keith Finan, Assoc. Head of School for Operations, Chief Financial Officer
Suzanne Manory, Associate Director of Athletics
David Miller, Director of Global Studies, History Teacher
Jade Moon, 2013
Jeff Swetland, Manager, Endowment & Infrastructure Accounting
Annika Trapness, 2013

Buildings & Construction Practices

Charlotte Allen, 2014
Asu Bilirgen, 2014
Sheila Fritz-Ellis, Counselor
Jeffrey Galli, Sr. Manager, Construction Projects & Planning
Mark Teutsch, Science Teacher
David Purington, Environmental Management Coordinator
Sydney O'Connor, 2014
Thomas Sharpe, Project Manager, Plant Construction & Maintenance

Energy & Climate

Nolan Bishop, 2013
Mariah Kennedy Cuomo, 2013
Jacquelyn Dowling, 2014
Gary Grybko, HVAC/Plumbing Supervisor
Jeff Jewett, Sustainability Coordinator, Science Teacher
David Thiel, Dir. of Communications, Visual & Performing Arts Teacher
Joel Thomas-Adams, English Teacher
Chuck Williams, Director of Facilities

Dining & Custodial Practices

Richard Avery, Custodial Supervisor
Beth Bishop, College Advisor & Self-Study Coordinator
Kate French, 2015
Qui (Helen) Jin, 2013
David Keith, 2013
James (Huck) Laughner, Science Teacher
Michael McCarthy, Food Services Director
Bradley Woodward, Assistant Director of Food Services

Water Resources & Grounds Management

Caroline Baldwin, 2014
Brett Gewanter, Manager, Grounds & Infrastructure Construction
Denise Dwelley, Grounds Crew
Jason Han, 2015
Andrew Harcourt, Science Teacher
Juliette Lee, 2014
Kristen Loftus, Health Issues & Science Teacher
Timothy McVaugh, History Teacher

Waste Management

Timothy Bishop, P13, P14
Sally Cai, 2014
Jessica Day, Associate Director of Communications
Thomas Hagamen, Director of Medical Services
Alexia Hernandez, 2015
Lila King, 2013
Julia Rivello-Lyons, History Teacher
Gregory Shearer, IT Systems Administrator
Jodi Tanguay, Grounds Crew

Curricular Education

David Irwin, Assistant Director of Admission
Chunbin (Andrea) Leng, 2015
Camille Moeckel, 2016
Annie Skoczylas, 2014
Timothy Trelease, Visual & Performing Arts Teacher
Timm Zolkus, Director of Capital Giving

Co- and Extra-Curricular Education

Bernard Baker, Director of Community Service, History Teacher
Robert Graves, Athletic Trainer
Brooke Horowitch, 2016
Mandy Irwin, Science Teacher
Janice Kari, Director of Human Resources
Nathanael Lane, 2014
John Ling, 2013

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SECTION 1 INTRODUCTION

Deerfield Academy's Sustainability Action Plan marks a major step forward in our long process of thoughtful change to ensure that we teach and model responsible environmental stewardship.

In 2008, Deerfield Academy concluded the *Imagine Deerfield* planning process by adopting a Mission Statement, which recognized that we must prepare students "for leadership in a rapidly changing world that requires global understanding, environmental stewardship, and dedication to service." The resulting implementation plan called for the creation of the Environmental Stewardship Advisory Committee (ESAC) and to expand environmental sustainability staffing to cover both compliance and programmatic initiatives. Both items were swiftly acted upon; early ESAC efforts included developing our e-proctors program, reducing bottled water usage on campus, going trayless in the dining hall, and removing individual refrigerators from dorm rooms. On a larger scale, ESAC was a driving force in launching the Energy Dashboard system.

In 2011, responsibility for sustainability efforts was divided into two positions. David Purington was hired into the Facilities Department as the Environmental Management Coordinator to deal with regulatory and compliance needs. Jeff Jewett was hired into the Science Department in a dual role of teacher and Sustainability Coordinator to address programming initiatives. Purington and Jewett now co-chair ESAC.

Under the guidance of Purington and Jewett, ESAC wrote and the Board of Trustees adopted a *Sustainability Mission Statement* in 2012, which expresses the school's commitment to environmental sustainability and the need to respond to a changing world. It states:

Deerfield Academy seeks to preserve our heritage by operating in a manner that sustains our natural and human resources for future generations. Through an intentional program both in and outside of the classroom, Deerfield Academy will educate all its members on local and global impacts of personal and institutional choices, encouraging long-term thinking and modeling environmental best practices.

Deerfield Academy has supported the economic and ecological health of the Pioneer Valley for over two centuries while creating a world-class educational community. We have been good stewards of our land, our community, and our history, while training generations of students to become local, national, and international leaders. Over time, however, changes in both technology and human population have created the necessity to adjust both the way we think and the way we operate. There are choices to be made. From the food we serve, to the care of our athletic fields, to how we heat our buildings in the winter, our decisions matter. Some choices will sustain our communities, while other options could degrade ecological, societal, and physical health, both at Deerfield and around the globe. In order for our graduates to be equipped to evaluate such options we must model exemplary environmental stewardship and educate our students to do the same....

The sustainability mission statement continues with 11 specific commitments – generally grouped by themes of reducing our consumption of resources, safeguarding the health of our community, and educating our students. The full text of these 11 commitments can be found in Appendix A.

In order to advance these commitments from principles to practices, ESAC was charged to develop a Sustainability Action Plan (SAP). In the spring of 2012, faculty and students completed surveys from ESAC about environmental actions and attitudes. In order to streamline the Sustainability Action Plan process, over the summer Purington and Jewett gathered and summarized information about current sustainability-related conditions and practices for later use by sustainability committee members. In the fall of 2012, more than 60 faculty, students and staff were empanelled on committees to investigate sustainability issues at Deerfield Academy and suggest opportunities for change. The eight sustainability action committees were:

- Finance & Operations
- Building & Construction Practices
- Energy & Climate
- Dining and Custodial Practices
- Water Resources & Grounds Management
- Waste Management
- Curricular Education
- Co- and Extra-Curricular

Each committee was charged with addressing 3 to 6 key questions, resulting in specific recommendations for improving DA's environmental sustainability. Recommendations from these committees were culled, reviewed and refined by ESAC to create the list included in this document. Due to the brief time allotted for committee investigation and discussion, many SAP recommendations reflect the need for further study of a particular topic.

SECTION 2 SUMMARY OF FINDINGS AND RECOMMENDATIONS

2.1 SUMMARY OF CURRENT SITUATION

As expressed in the Sustainability Mission Statement, Deerfield Academy has generally been a good steward of its resources and community. Times and expectations change, however, and we must both respond and be proactive to ensure we maintain our standing. Through the investigation and discussion of our SAP committees, we confirmed what we expected: even without a formal mandate for change, many environmentally responsible choices have been made at DA, largely (but not exclusively) because they also made financial sense. Below, the plan highlights some sustainability successes that are especially noteworthy, and many of the subsequent chapters prepared by the individual committees identify a few more.

However, our investigation and discussion also revealed a theme - that there has not yet been a sustained and intentional *institutional* effort to green the campus. The culture of the institution has not yet broadly embraced that sustainability *in and of itself* is a goal. Section 2.2 below introduces some of the broad programmatic changes that are recommended by this SAP and briefly discuss the findings and back-stories that led to some of the more interesting recommendations presented in Table 2-3.

The process of developing this Sustainability Action Plan required our community to look closely at our current practices as a means to identify room for improvement. It is important to recognize and take credit for the many decisions, changes, and current practices that have already moved Deerfield Academy to a higher degree of sustainability. This listing is not meant to be comprehensive – but merely eye-opening; there is broad praise to go around beyond what might be gleaned from this list alone.

- The Koch Center for Science & Technology was certified LEED Gold for its sustainable design and construction, including a living roof and photovoltaic panels.
- The New Dorm has solar panels covering its south-facing roof, super-efficient LED lighting on the inside, and its furniture is built from Forest Stewardship Council-certified wood.
- We have upgraded over 1000 windows on campus in recent years to high-efficiency double-paned windows.
- We have reduced campus electricity consumption an impressive 20% since 2006-2007, even while adding ~100,000 sq ft of conditioned space. The replacement of the lights and chillers in the hockey rink is an example of a project that resulted in major electrical savings.
- Food waste and paper napkins are composted in the dining hall, all café to-go materials are compostable, and we serve 100% certified organic and grass-fed ground beef.
- Most irrigation water comes from the Deerfield River, saving up to 3 million gallons of potable water annually.
- Almost half of faculty report having taught a course in the previous four years that sometimes or frequently dealt with issues of sustainability.

- Enrollment in sustainability-focused courses is increasing: AP Environmental Science has expanded to three sections and the College Board/Cambridge pilot course Global H2O will expand to two sections in 2013-2014. An environmental science research summer field course in Costa Rica will debut in August 2013.
- DA was one of the first schools to join the now-nationwide Green Cup Challenge, where schools compete to reduce electricity usage. In 2012 we saved 8% of electricity in dorms compared to non-competition periods.
- Our Sustainability Coordinator mentors a group of 35 e-proctors, who have leadership roles in dormitory recycling efforts, and are spearheading this year's renewed focus on Take Back the Tap.
- Several recent campus speakers have dealt with issues of sustainability, including climatologist Kerry Emanuel, glaciologist Paul Mayewski, poet W.S. Merwin, documentarian Ken Burns, and environmental lawyer Robert F. Kennedy Jr.

2.2 SUMMARY OF GOALS AND RECOMMENDATIONS

Deerfield Academy's Sustainability Mission Statement made three overarching commitments to sustainability: (1) Use resources responsibly, (2) Preserve the health of our community, and (3) Teach and model environmental best practices and long-term thinking. Each of these commitments is refined into three or four more specific pledges (eleven total), as found in Appendix A. In addition to these three categories, we have added a fourth category, administrative, for the purposes of this report.

We found that there is a need for greater intentionality with our sustainability efforts. Worthy initiatives have been introduced and are currently under way, but they were often *ad hoc* and at the discretion of individual decision makers. We felt many topics need further research, advice from outside experts, and/or an official plan created. Deerfield Academy clearly needs to become more knowledgeable and conversant as an institution about particular sustainability issues. These topics include green construction and renovation practices, green cleaning, non-traditional investment strategies, renewable energy purchasing, and organic groundskeeping. Consulting outside expertise was suggested in the case of conducting a water conservation audit, a renewable energy generation study, an energy management audit, and in planning menu changes to sit-down meals. Major efforts such as developing a Climate Action Plan lay alongside simple goals to reduce paper consumption and disposable water bottles. A few recommendations involve review of topics that could result in needing to rearrange institutional priorities.

While we understand that there will never be enough time or enough money at any school to do all the things desired, this report calls for moving sustainability issues such as organic and local food purchasing, sustainable construction practices, and fuel/energy efficiency higher up the institutional prioritization ladder.

And of course, there are the students. From our keen recognition that we need to teach by modeling appropriate behavior to more intentional changes to the curriculum, the recommendations repeatedly circle back to the students. Their involvement in creating this plan

helped spread awareness of our sustainability needs and goals throughout the student body, and students will be vital in implementing this vision as well. Students will investigate many areas needing further study, from biodiesel use to the carbon and community impacts of our student travel. Other action items such as eliminating bottled water and reducing paper use will rely heavily on students to plan, motivate, communicate and execute the necessary changes. From providing healthier food choices to offering a course that links a hands-on community garden with studies of agricultural issues in the classroom, we anticipate deep life-lessons to result.

ADMINISTRATIVE

As with any strategic plan, there are administrative pieces that are required to wrap around and support the stated mission. Deerfield must be aware of what it is doing well, where it needs to improve, and how it can get there. Scorekeeping, communications, planning, and funding form the invisible backbone of this effort. As a member of the Eight Schools Association, Deerfield Academy has made a commitment to track our sustainability efforts rate using the Sustainability Tracking and Rating System (STARS) method. STARS allows a point-based comparison of sustainability efforts as varied as purchasing organic food and installing solar panels. This system was designed for use at the collegiate level and is not fully applicable at the secondary school level; nonetheless it has been adopted as the best-available option and we have included an action item that expresses a target STARS score and timeframe. Having said this, we insist that our sustainability success can never be fully measured by a single scoring system, and that our efforts must continue to always be driven first and foremost by our own mission statement.

Using a sustainability tracking system like STARS will help us make decisions and also let us see how we are doing in relation to peer institutions. We must use our communications resources not only to trumpet our successes, but also to quietly reinforce that sustainability is an important part of our everyday lives. We envision more intentional discussion of our sustainable practices and campus features during tours and more prominent information on our web-page. Together, these communications will build support within both the school and donor communities for greater endeavors.

As an institution with a large operating budget and an ample endowment, how we choose to spend and invest our money can have a great influence on the local economy and the health of both the local and global communities. We could use our purchasing budget on more sustainable products, from organic food to recycled paper, and we should consider developing a campus-wide purchasing policy that would provide guidance for buying sustainable products. One of the larger philosophical questions our committee raised was whether our endowment could serve the school's mission in additional ways beyond providing financial stability. We suggest further investigation into alternative investment strategies that could better align our investments with our broader educational mission, including green revolving loan funds and local farm partnerships. Finally, our two centuries of Academy history is a reminder of the importance of planning for the longer term; we should be mindful of the changing climate when making infrastructure investments that we hope to last across generations.

RESOURCE USE

Many of the recommendations focused on minimizing use of non-renewable resources and using renewable resources sustainably. The Building & Construction Practices committee found that we have made “prudent but not aggressive upgrades with respect to energy and sustainability.” The same can be said of many other types of resource use. We are not profligate with consumption, as this would waste money as well as natural resources, but we have also generally not tried to aggressively limit resource use when a financial payoff was distant. Getting more information about how we use resources and making that information as public and as real-time as possible (such as via our Energy Dashboard) was a recurring theme of the committees. We must eliminate inefficiencies (through better planning and better technology), but we must also philosophically consider what activities are core to our program. We would use many fewer resources if we had no school at all, but that is not the point. Performing a cost-benefit analysis of changes to such things as student/employee travel and sit-down meal practices might yield different results than traditional reviews if we begin to take environmental impacts into consideration. Are there current practices that we will choose to abandon because they can no longer be environmentally justified? We hope so. Conversely, are there current practices with substantial environmental impacts that will persist because they are essential to who we are as an institution? Undoubtedly.

Even without re-evaluating our current programming, there is still much to be done to improve our resource use. We can expand campus compost collection and continue to improve recycling as part of the Think 80|20 campaign. We are exploring a program that will send gently-loved surplus goods to developing countries instead of into landfills. We can shift to 100% recycled paper at our printers and copiers, while working to reduce overall printing needs through efforts like more double-siding and more reliance on electronic resources.

COMMUNITY HEALTH

“Preserving the health of our community” is certainly about protecting the physical health of the people in our local community, but it also necessitates protecting the ecological health of our area, supporting the local economy, and working to minimize our contribution to global climate change. Many actions recommended on our list will address community health on multiple fronts. Prioritizing fuel efficiency when purchasing vehicles, for instance, preserves local air quality (and public health) while minimizing climate impacts, all while saving money too. Because indoor air quality is even more important than outdoor (as we spend most of our hours indoors), we must emphasize the importance of green-cleaning programs and construction practices that use low-and no- VOC materials. A Climate Action Plan will also surely yield changes that will positively impact air quality and resource use.

Several of our recommendations center on the theme of food by encouraging us to buy locally grown products and deeply explore how we can do a better job of modelling healthy and sustainable eating. Our recommendations suggest that we serve more organic food in the dining hall, and that we reduce impacts in the air and water by exploring how to use fewer pesticides to maintain our grounds. We suggest exploring the possibilities of investing in local farming partnerships and we suggest beginning to more formally pursue water conservation efforts, which will lighten the burden on our community water supply and wastewater systems.

EDUCATION

As a school, our sustainability efforts must embrace opportunities to educate employees, students, and the broader community. We have recognized that our faculty and staff are responsible for shaping much of the culture of the school, and accordingly suggest that a more intentional effort is needed to raise our collective understanding of sustainable practices among our employee community. We anticipate this will result in widespread improvement in modeling best practices. From making recycling and composting commonplace, to making energy conservation a priority during the Green Cup Challenge, to generating clean renewable electricity on campus, we work to model environmental best practices in many ways and aim to greatly expand this in the future.

While almost half of the faculty is currently teaching some sustainability content in their current courses, we can build on that success with professional development workshops for teachers to help them enhance sustainability content or develop new courses. As we do a better job tracking our resource use (water, energy, food) and waste production, this information can be used in the classroom to teach topics already in the curriculum, as the physics and environmental science course do currently with the energy data. Similarly, we have been fortunate to have many high-caliber guest speakers that dealt with environmental topics, but we can do better about coordinating these efforts to ensure a regular schedule and avoid duplication of themes. More intentional use of public art as a teaching tool can also help weave themes of sustainability into the fabric of the school. We aim to do a better job making the campus and our lands themselves the classroom for sustainability.

Deerfield Academy is situated in one of finest agricultural areas in the region, and we feel the Academy can be intentional about educating students about agriculture and food systems. The study of agriculture is one that allows the integration of diverse topics including art, literature, history, economics, and the science of agronomy. Students can read classics about the farming experience such as the *Grapes of Wrath*, learn about the economics and politics of crop subsidies, discuss the relative merits of conventional versus organic farming, capture the beauty of the growing season in a photograph, or measure soil carbon and water retention. There is a long history of Deerfield students working the land, as photographs from the Boyden days show with students helping local farmers pick potatoes. We suggest that Deerfield Academy return toward its roots and integrate academic departments with the co-curricular space to create a uniquely immersive and expansive food and farming course. Students would learn about farming from different perspectives in the classroom, and then practice farming at a campus organic garden in their co-curricular activity. This program would help the Academy instill a *sense of place* in students, which is great educational practice and also helps tie alumni to the Rock, the River and the fields in between, strengthening their long-term connection to the Academy.

2.3 SUMMARY OF RECOMMENDATIONS

After thoughtful investigation by the sustainability committees, ESAC deliberated and winnowed the list down to 44 recommendations. Some of these are near-term and fairly simple, while others call for further study of an important but complex topic. Tangible student involvement can be found within nearly all – from a seat at the table in a large study committee,

to opportunities to lead the changes which are suggested, to wider exposure to better practices, more sustainable food choices, and more robust programming, students are the heart of this plan. The full list of recommendations is summarized below in Table 2-3. Each item in the table is supported by action item memoranda in Appendix B. The action item memoranda more fully describe the recommendation, its benefits, its challenges, and its level of priority.

RESOURCE REDUCTION THEMES					Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities
R-1	ESAC should supervise the creation of a Climate Action Plan (CAP) that lays out a path to rapidly reduce Academy greenhouse gas emissions.	Essential roadmap to reduce our contributions to harmful climate change.	Highest Priority -but deferred pending R-2 and R-3	1 year	Sustainability Coordinator
R-2	Conduct a targeted energy management audit.	Helps identify, quantify, and prioritize energy savings opportunities.	High Priority - prerequisite for Climate Action Plan	9 months	Director of Facilities
R-3	Assess the potential for generating renewable energy on and near campus, including solar, wind, hydro, biomass, geothermal, and waste digesters.	Understand viable options to reduce our greenhouse gas emissions through local renewable energy generation.	High Priority - prerequisite for Climate Action Plan	1 year	Sustainability Coordinator
R-4	Engage water conservation expert, conduct water consumption analysis, and set water-use goals.	Helps identify, quantify, and prioritize water saving opportunities while educating about global water crisis.	High Priority	6 months	Environmental Management Coordinator
R-5	Increase automation for lights across campus. More and smarter automation for lights should be pursued (light sensors, motion sensors, timers, vacancy sensors, etc.)	Modest energy, pollution, and cost savings. Increased occupant satisfaction.	High Priority	3 years (ongoing)	HVAC/Plumbing Supervisor
R-6	Eliminate disposable bottled water use on campus. Avoid providing disposable bottles at events, and actively encourage the use of reusable cups and bottles.	Educate campus about wasteful resource use. Student leadership opportunity.	High Priority	Ongoing effort	e-proctors under leadership of Sustainability Coordinator

RESOURCE REDUCTION THEMES					Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities
R-7	Prioritize fuel efficiency when purchasing new vehicles, and actively pursue the purchase of hybrids and electric vehicles.	Preserve resources and reduce pollution while demonstrating long-term thinking.	High Priority	Ongoing effort	Director of Facilities
R-8	Deerfield Academy should develop a guidance manual to guide our decisions during renovation projects relative to energy efficiency and sustainability.	Streamlines renovation planning to avoid <i>ad hoc</i> decision making. Ensures buildings are energy efficient and high-performing.	Moderate-to-High Priority	12 months	Environmental Management Coordinator
R-9	Investigate and pursue options for a more robust composting program at Deerfield, including wider capture of materials and possibly bringing composting activities back on campus.	Daily education about greenhouse gas emissions and resource reuse. Campus-Classroom connection opportunity.	Moderate to High Priority	18 months	Environmental Management Coordinator
R-10	Reduce total use of paper in academic settings; increase use of sustainable paper.	Preserves resources and creates visible sustainability success.	Moderate to High Priority	18 months	Sustainability Coordinator
R-11	Reduce landfill waste and resource use resulting from athletic travel.	Preserves resources and educates students on responsible environmental stewardship.	Moderate Priority	6 months	Athletic Director
R-12	Evaluate Academy student travel and transportation relative to: a) Athletics; b) Community Service; c) International Travel; and d) Academic calendar (student vacations)	Resource preservation & reduction of greenhouse gas emissions.	Moderate Priority	18 months	Global Studies Director

RESOURCE REDUCTION THEMES					Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities
R-13	Evaluate Academy employee travel and transportation and determine specific achievable recommendations for a) International Travel; b) Professional development; c) Commuting	Resource preservation, cost savings & reduction of greenhouse gas emissions.	Moderate Priority	18 months	Global Studies Director
R-14	Explore the feasibility/value of developing a campus-wide purchasing policy that includes commitments to sustainable products.	Supports healthy and sustainable economy, makes sustainable purchasing decisions easier.	Moderate Priority	6 to 12 months	Environmental Management Coordinator
R-15	Building use should be consolidated when possible to allow automated building shutdown for energy savings.	Energy, pollution, and cost savings; cultural shift raises awareness of conservation.	Moderate Priority	6 months	Sustainability Coordinator
R-16	Deerfield Academy should develop a construction practices guidance manual to apply during development of capital construction projects.	Streamlines construction planning to avoid <i>ad hoc</i> decision making around energy and sustainability. Ensures buildings are energy efficient and high-performing.	Moderate Priority	12 months	Environmental Management Coordinator
R-17	Investigate the use of biodiesel in vehicles and boiler plants.	Opportunity for student research on real-world problem; preserve resources, reduce greenhouse gas emissions; stimulate local economy.	Low Priority (exploratory pilot)	6 months	Sustainability Coordinator
R-18	Review Sit-down meal practices to reduce waste.	Preserve resources.	Low Priority	Ongoing effort	Dining Services

RESOURCE REDUCTION THEMES						Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities	
R-19	Investigate large-scale heating systems upgrades.	Save energy, pollution, and money (long-term), greenhouse gas reductions.	Low - Defer until energy audit complete (and, ideally Campus Master Plan too)	Several years	Director of Facilities	
R-20	Deerfield Academy should continue pursuit of aggressive reductions in the amount of solid waste sent for landfill disposal.	Build sustainable life habits for students; Success here is highly visible and tangible to the campus community.	Existing commitment	Ongoing effort	Environmental Management Coordinator	
R-21	Continue/extend our adoption of new and emerging IT services that foster more efficient communication and more effective delivery of education.	Preserve resources by replacing some need for in-person travel, paper, or other resource use.	Existing commitment	Ongoing effort	IT Services Department	

COMMUNITY HEALTH THEMES						Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities	
C-1	Develop and implement a Sit-down Meal Initiative to teach about and model healthy and sustainable eating.	Build healthy & sustainable life habits for students.	High Priority	2 to 3 years	Health Center and Dining Services	
C-2	Evaluate the feasibility of creating and maintaining an organic school garden in order to grow produce for the dining hall.	Students gain connection to land and learn life skills while providing local organic food to campus.	High Priority	3 months	To be assigned	

COMMUNITY HEALTH THEMES					Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities
C-3	Serve more organic food in the dining hall.	Reduced pesticide residue in food, environmental and worker health benefits where food is grown.	Moderate Priority	3 years	Dining Services
C-4	Serve more locally-sourced food in the dining hall.	Improves local agricultural economy and preserves local ag land. Reduces food miles.	Moderate Priority	One year	Dining Services
C-5	Deerfield Academy should formally review its custodial and housekeeping operations with respect to Green Cleaning practices	Reduced community exposure to hazardous chemicals.	Moderate Priority	6 to 12 months	Environmental Management Coordinator
C-6	Investigate community expectations for grounds maintenance as they pertain to appearance and functionality, in order to provide formal guidance to grounds crew on aspects of appearance, playability, and chemical usage.	Allow Grounds Dept. to better satisfy stakeholders while maintaining community and ecological health.	Moderate Priority	12 months	Sustainability Coordinator
C-7	Deerfield Academy should develop guidance manuals that address materials of construction and/or furnishings, carefully weighing the environmental and economic benefits of the materials.	Ensures best practices: healthier indoor environments and reduced resource use.	Moderate Priority	12 months	Environmental Management Coordinator
C-8	Find areas to designate experimental "low-mow zones".	Improved ecological health: better animal habitat, reduced fertilizer/pesticide use. Highly visible change.	Low Priority	Indefinite	Grounds Department

COMMUNITY HEALTH THEMES						Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities	
C-9	Evaluate the water distribution system (i.e. piping network) on campus from the perspective of whether the system ensures the delivery of high quality drinking water.	Ensure highest quality drinking water for community health.	Low Priority	6 months	Environmental Management Coordinator	
C-10	Continue our ongoing efforts to minimize fertilizer and pesticide application.	Minimize risks to environment and human health from grounds management chemicals.	Existing commitment	Ongoing effort, long term time frame.	Grounds Department	

EDUCATION AND CURRICULAR THEMES						Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities	
E-1	Develop a voluntary professional development program for faculty to increase sustainability content in the curriculum.	Encourages professional growth of faculty. Helps faculty integrate sustainability themes and content into courses.	High Priority	3 months to plan Ongoing to incorporate themes	Sustainability Coordinator	
E-2	Deerfield Academy should better educate our faculty/staff/employees on the principles and practices of sustainability.	Improve employee sustainability-related decision making and modeling of best practices.	High Priority	12 months to define framework	Environmental Management Coordinator	
E-3	Increase the opportunities for student engagement and leadership in sustainability initiatives.	Helps create students dedicated to environmental stewardship, with leadership skills to succeed in many endeavors. Increases likelihood of creating the cultural change required to achieve sustainability mission.	High Priority	Ongoing	Sustainability Coordinator	

EDUCATION AND CURRICULAR THEMES					Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities
E-4	Develop a multi-disciplinary farming-themed course.	Develops student leadership skills. Provides source of labor for sustainability projects. Provides sustainability education to broader student audience. Encourages student participation and motivation around sustainability plan.	High Priority	One year plus	Academic Dean
E-5	Increase visibility of Lucid Dashboard data and increase the resources monitored by our Dashboard.	Expands the use of the campus as a teaching tool. Increase ability to spot resource waste in real-time and better target efficiency upgrades.	Moderate-to-High Priority	1 year	Director of Facilities and Sustainability Coordinator
E-6	Coordinate all-school speakers to ensure that at least one per year deals with themes of sustainability, and at least every other year one speaker should be focused on sustainability.	Weaves sustainability across student experience. Notable speakers raise profile of sustainability and increase opportunity for discussion of topical issues.	Low-to-Moderate Priority	3 months to plan Ongoing to implement	Chair of the Time & Space Committee
E-7	Actively seek out works of art for our art exhibitions and public art installations that deal with themes of sustainability.	Educate community and provoke discussion about sustainability. Visible sustainability practice.	Low-to-Moderate Priority	3 months to plan Ongoing to implement	Director of Russell Gallery and Art Department Chair
E-8	Establish a program to stipend and/or offset costs for participants that engage in environmental research, activism, and/or reporting while on study abroad or other school-sponsored travel.	Integrate global and sustainability initiatives. Broaden student experience while traveling.	Low Priority	3 months to plan Ongoing to implement	Global Studies Coordinator

ADMINISTRATIVE THEMES						Table 2-3
Action Item	Recommendation	Why Action is Important	Priority to Initiate	Estimated Time to Complete	Primary Responsibilities	
A-1	Create a committee to investigate the feasibility, scope and timing of a master plan that envisions the future of the physical space and infrastructure of the campus.	Helps assure that major energy and infrastructure upgrades will serve the campus for decades. Maintains open space and habitat.	Very High Priority - Defer until key personnel available	6 months to define whether/how to proceed, then 18 months to execute	Chief Financial Officer	
A-2	Deerfield Academy should ensure that we efficiently communicate our broad practice of sustainability on an ongoing and consistent basis.	Build community support for sustainability initiatives, including recruiting “green”-minded students and faculty, and enticing potential donors.	High Priority	Ongoing effort	Director of Communications	
A-3	Deerfield Academy should consider non-traditional investment strategies to support our sustainability efforts.	Increase sustainability while maintaining the long-term growth of the endowment. Improve connections to and support of local economy.	Moderate Priority	12 months	Finance Office	
A-4	Deerfield Academy should continue to use the STARS scoring tool to record our progress relative to sustainability and should strive to steadily increase our STARS score.	Scorecard to regularly track internal progress and compare to peers.	Existing commitment	Ongoing effort	Sustainability Coordinator	
A-5	Deerfield Academy should continuously solicit new ideas to supplement this existing plan. At a minimum, formally gather ideas annually.	Ensures continuous improvement in sustainability.	Existing Commitment	Ongoing effort	Sustainability Coordinator	

SECTION 3 FINANCE & OPERATIONS COMMITTEE

3.1 CHARGE & PRIMARY QUESTIONS

The Finance & Operations Committee was made up of seven individuals, including two faculty, two students, and three staff. The committee was charged as follows:

1. Examine the impacts of current practices concerning the Academy's endowment management, and whether a portion of these investments could help serve our mission directly as well as providing funds to run the Academy.
2. Consider the environmental costs and benefits associated with Academy travel.

The committee was given the following key questions:

1. Should the Academy establish a revolving green loan fund?
2. Should we consider local investing, farm partnerships and other non-traditional investment strategies? How much would it cost? What are the risks and the benefits?
3. How can Academy travel policies limit the impact on the environment:
 - a) Student/employee commuting
 - b) Athletics and other co-curriculars
 - c) Study abroad programs/international travel
 - d) Professional development
 - e) Administrative travel (Alumni & Admissions)

3.2 CURRENT STATE OF AFFAIRS

ENDOWMENT

The Endowment Committee of the Board of Trustees has oversight of the Academy's endowment investments. The Endowment Committee members are appointed and each trustee brings significant knowledge, experience and insight to the role. The Committee meets periodically, at least quarterly, and is responsible for the endowment allocation to various asset classes as well as monitoring investment performance. Endowment performance has been strong, with the goal to provide stable support for the current operating budget while protecting the real value of the endowment over time.

The sustainability committee is not aware of any current investment strategy for Deerfield that is clearly linked to broad social or environmental goals. Similarly, the sustainability committee is not aware of any historic investing practice that would establish a precedent for future mission-oriented (social and/or environmental) investing practices.¹

¹ During the 1980s, many colleges and universities divested from companies doing business in South Africa in order to put pressure on its apartheid-era government. Some teacher pension funds have divested from tobacco and/or firearm manufacturers, and there is a movement today at over 200 universities to encourage divestment from fossil fuel companies.

We are aware of some grass roots initiatives (especially at the collegiate level) to encourage endowment investment strategies that would divest from certain firms or industries judged to be detrimental to the environment. Divestment is a complex issue that raises many philosophical questions that the committee has not had time to appropriately explore. We are not suggesting that Deerfield Academy pursue divestment at this time, but this may be a topic to revisit at a later date once our formal pursuit of sustainable initiatives has had time to mature and we better understand tradeoffs that might be contemplated in such a discussion.

ACADEMY TRAVEL

Deerfield Academy has significant activities involving domestic and international travel.

1. Students and employees commute to Deerfield daily. Public transportation is limited. There are no programs to encourage car-pooling as employees and students come from a wide range of towns and daily schedules vary considerably.
2. Co-curricular travel includes twice-weekly team travel where Academy teams travel to away games and/or opposing teams travel to Deerfield, often in excess of two hours travel each way. In addition, certain groups (ie, Ski teams, crew teams, community service, etc.) travel off campus daily. The Athletic Office works with Physical Plant to use campus vehicles, or rental vehicles, with the least environmental impact.
3. Students and faculty participate in international travel throughout the year with annual trips to Round Square in the fall, Oxford in March, and summer travel to China, France, Spain, Italy, Costa Rica and the Dominican Republic. These trips cannot always be scheduled to leave directly from school, creating additional travel from school to home.
4. The Development Office, Admission Office and Head of School travel domestically and internationally throughout the year.
5. Employees travel off campus on a regular basis and greater effort is needed to ensure that the most energy-efficient vehicle is utilized.

3.3 GOALS FOR PROGRESS

The Endowment Committee should consider investment strategies that can support and advance the Academy's sustainability efforts, including local investing, farm partnerships, and Green Revolving Loan Funds (GRFs). The Sustainable Endowments Institute 2012 report "Greening the Bottom Line" showed that a wide variety of educational institutions with varying sizes, diverse geographic locations and spanning the spectrum of endowment wealth have adopted GRFs. The operation of the GRFs vary, but they generally invest in the campus infrastructure, providing capital to decrease operational expenses. The investments are paid back through savings on energy or other operational expenses. The established GRFs report a median annual return on investment of 28%. Given these impressive results, we suggest that the Academy consider dedicating a small portion of the endowment towards a GRF, as it would increase campus sustainability and may have substantial financial benefits. Projects could be evaluated based on their ability to contribute to one or more of the following areas: greenhouse gas reductions, energy conservation, water conservation, sewage and stormwater output reductions, all types of pollution reduction, environmental leadership development within the Academy or reputation building with the surrounding community.

Given the wide range of travel to and from the Academy, there is a significant opportunity to reduce our impact on our environment. While we currently have some data regarding Academy travel, we recommend involving students in further research and analysis which will enable us to expand our efforts to save energy and prevent pollution. The committee recommends considering acquiring fuel-efficient and/or alternative energy vehicles, evaluation of the Academy calendar and Athletic schedules, and increased videoconferencing in place of administrative travel. Additionally, where possible, the Academy could modify schedules for international travel and these trips could include research, activism and reporting on sustainability issues. Through these efforts we can reduce our consumption of resources and model environmental best practices and long-term thinking.

SECTION 4 BUILDING & CONSTRUCTION PRACTICES COMMITTEE

4.1 CHARGE & PRIMARY QUESTIONS

The Buildings & Construction Practices Committee was made up of eight individuals, including one faculty, three students, and four staff. The committee was charged as follows:

Examine those issues associated with building construction and renovation projects, including in particular whether and when to pursue LEED, Energy Star or other 3rd party certifications, what materials should be used in construction, and the goals to be achieved through renovations.

The committee was given the following key questions:

1. Should we create a policy that directs us when and how to pursue certification, such as LEED, Energy Star, or Passive House for both new buildings and renovation projects? If so, can we start that discussion?
2. Should we create a policy/policies that direct(s) us when and how to use certain building materials – low/no-VOC paints, certified wood products, Green Seal certified products, etc?
3. In respect to the above, are there studies, changes, or projects that we should undertake on either a short-term or long-term schedule?

4.2 CURRENT STATE OF AFFAIRS

Deerfield Academy maintains more than 80 buildings on its school campus and in the surrounding neighborhood, including nearly 45 single- or two-family houses and approximately 40 academic/athletic/office and/or dormitory buildings.

Decisions of whether and when to renovate houses are driven by three primary factors, including condition of the house, finances, and access to the house (major renovations are disruptive and are often timed to coincide with faculty moves). A fourth consideration of “how” to renovate is the historical character of many of the houses. Decisions of whether and when to renovate campus buildings are driven by similar factors as the houses, but the larger sizes of the building can translate into a more complicated project planning and implementation.

There is no formal written facilities master plan that describes which houses or campus buildings are priorities for renovations. As the opportunities permit, Physical Plant is deliberately working its way through the inventory of housing to complete energy upgrades, with a focus on insulation, windows and heating systems. Over the past 10 years, major renovations and/or new construction of larger campus buildings have included work at the Greer Store and Fitness Center, new Squash Courts, Koch SMT, Dining Hall, and the New Dorm (2012), as well as hundreds of new windows in the dorms. In addition to the basic priorities used for residential properties (i.e, insulation, etc.), Physical Plant has also concentrated on upgrades to lighting and building automation and control systems in these larger buildings.

There is not a formal written plan or policy that describes specific sustainability parameters or energy goals to be achieved during construction or renovations. We do not routinely prepare any pre-renovation or post-renovation scoring against any metrics (such as Energy Star) and we do not have a formal charge to pursue LEED certifications. Generally, the committee observes that the school makes prudent but not aggressive upgrades with respect to energy and sustainability; typically our methods are “proven” rather than innovative or cutting edge. Recently the town of Deerfield adopted the Massachusetts “stretch energy code” which is a stringent and aggressive regulation that ensures simply building to code will result in a highly energy-efficient structure. We achieved LEED Gold certification at the SMT building; we elected to construct an efficient New Dorm without pursuing certification; and we will pursue LEED certification on the upcoming Memorial Arts Building renovation. We routinely engage architectural services from firms that are familiar with sustainable design, but this is more the result of the evolution of the architectural industry than deliberate pursuit of architects that claim legitimate specialties in green design practices. We currently do not have any employees on-staff that are certified through any of the major recognized sustainability programs (such as LEED Green Associate).

4.3 GOALS FOR PROGRESS

Based upon our knowledge, research, inquiries, and practical considerations, the Building & Construction Practices Committee recognizes that there are opportunities for Deerfield Academy to change its current approaches to building construction that will move our campus operations toward more sustainable practices. In light of this, we have established a series of broad goals for Deerfield Academy. These are discussed below in the context of short-term goals and long-term goals. Specific action items initiated in this committee are incorporated into Table 2.3, and discussed at more length in Appendix B.

It is the hope of this committee, that over the short time horizon of the next few years, we can pursue the following broad goals:

- As an organization, become more knowledgeable and conversant in sustainable construction and renovation.
- Deerfield Academy should employ construction practices that reflect aggressive pursuit of energy efficiency, minimize consumption of natural resources, and are respectful of the health and well-being of its occupants.
- Deerfield Academy should explore how a formal long-term planning process could assist in long-term sustainability gains.

Over the longer time horizon, it is the hope of this committee that we can achieve the following:

- As an organization, know that sustainable building practices have become ingrained in our planning and building culture; and
- As an organization, know that our construction practices have resulted in healthier working and living spaces for our community and are an integral piece of our overall reduced demand on natural resources.

SECTION 5 ENERGY & CLIMATE COMMITTEE

5.1 CHARGE & PRIMARY QUESTIONS

The Energy & Climate Committee was made up of seven people, including two faculty, three students, and two staff. The committee was charged as follows:

Examine the environmental impacts of energy consumption for such things as heating, electricity, and transportation, and will specifically consider climate impacts of that consumption. Energy conservation methods, alternative fuels, and renewable energy production (both on-campus and off) should be examined.

The committee was given the following key questions:

1. Should we set a specific greenhouse gas emission reduction goal? If so, should it be carbon neutrality? When?
2. Should we get a professional energy audit? If so, what type? How much would it cost? Benefits?
3. Are there other studies (besides the audit) that would help guide this process? Student-led or professional?

5.2 CURRENT STATE OF AFFAIRS

Deerfield Academy has invested in many upgrades to the physical plant that save energy and reduce our carbon footprint. In the hockey rink, new lights reduced electrical consumption by 50%, and a new ice-making system cut 42% off their electrical demand while providing waste heat to melt ice off nearby sidewalks. Across campus we have been aggressively upgrading light bulbs to efficient CFLs and LEDs. Motion sensors were added to vending machines, which are estimated to save 30% of the energy normally used. We were one of the first schools to compete in the Green Cup Challenge, which is now the largest K-12 electricity conservation competition in the world. In 2012 students saved 8% of electricity in dorms during Green Cup compared to non-competition periods. Refrigerators were banned from student dorm rooms, saving an estimated \$11,000 worth of electricity a year. Through these measures and more, we have reduced overall campus electricity consumption an impressive 20% since 2006-2007, even while adding ~100,000 ft² of conditioned space.

Deerfield Academy has looked for energy upgrades that make good financial sense. We have installed over 1,000 energy efficient double-paned windows on campus, including in all the dormitories. We have moved towards fueling our boilers with natural gas instead of fuel oil when the gas is available, saving carbon dioxide emissions, money, and preventing air pollution; we expect to be using 100% natural gas in the winter of 2013-14. We have solar photovoltaic panels on the Koch Center and the New Dorm, totaling ~ 38 kW, and also have a solar hot water system on the New Dorm. We have an Energy Dashboard that allows user-friendly web-access to real-time energy data for all of our dormitories (electricity) and the Koch Center (electricity, heating, and solar production). This data is used for the Green Cup energy challenge and in classes such as Physics and AP Environmental Science. A building management system allows

for the electronic control of essential heating and cooling systems across campus, which saves energy by allowing for automated building shutdowns in periods of vacancy. During 2013, upgrades will add electric submeters to all core campus buildings (including breaking up the athletic complex into five zones), and steam condensate submeters in most core campus buildings; all of this data will be available in real-time on the Energy Dashboard. Finally, in a demonstration project with educational and publicity possibilities, we even installed solar panels on two golf carts.

In fiscal year 2011, Deerfield Academy had greenhouse gas emissions equivalent to 6,766 metric tons of carbon dioxide. This figure includes all fuel burned on campus and in Academy vehicles, fertilizers used, refrigerants used, and electricity purchased (EPA Scopes 1 and 2). When evaluated per square foot of campus building space, these emissions put us as the worst among seven peer boarding schools. When evaluated on a per student basis, we were in the middle of the pack. Recently some peer schools have undertaken major projects to address their carbon footprints, including installation of 2 MW and 6 MW solar photovoltaic arrays at Berkshire and Lawrenceville, and a woodchip-burning biomass heating plant at Hotchkiss, which has pledged to be carbon neutral by 2020.

5.3 GOALS FOR PROGRESS

Deerfield Academy should continue and expand our efforts to upgrade the physical plant to save energy and prevent pollution, including obtaining more efficient vehicles. We should continue and expand our efforts (such as the Green Cup) to save energy via behavioral and cultural changes. We should look to greatly expand our capacity to generate our own renewable energy, through technologies such as solar, wind, hydro, biomass, geothermal, and waste digesters.

Climate change will be a central problem of the 21st century, and Deerfield Academy must lead by example in finding solutions. Deerfield Academy should create a Climate Action Plan (CAP) that lays out a path to rapidly reduce its greenhouse emissions. An energy efficiency and conservation audit and an assessment of our renewable energy generation options should inform the creation of the CAP. The CAP should include a clear greenhouse gas emissions target for net Scope 1 and Scope 2 emissions, including a target date and a plausible path to achieve this goal. The CAP should include plans to reduce Scope 3 emissions *as much as possible while maintaining our excellent educational program*. The CAP should aim to meet these goals through conservation, local renewable energy generation, and/or biofuels, not distant offsets and emissions trading schemes. While it is premature to set CAP goals at this time, we aim to ultimately establish CAP goals to bring Scope 1 and 2 emissions *near zero* in an aggressive time frame, similar to commitments that peer schools have already made.

The committee felt that greenhouse gas emissions reductions were necessary but that it would be best to wait and set reduction targets until after the possible options of achieving this were more fully explored. We felt that an energy efficiency and conservation audit would be most useful in creating the CAP if it were limited in scope to a few representative buildings, and especially focused on buildings that were likely to be renovated in the next few years. An assessment of the potential for generating renewable energy on and near campus would also be essential in determining the feasibility of large-scale greenhouse gas emission reductions.

Finally, climate change is predicted to increase both the likelihood and severity of future severe weather and extreme temperatures. Because of this, Deerfield Academy should consider future climate projections when making infrastructure investments, to ensure resiliency and minimize property damages.

Greenhouse Gas Emissions Definitions (Source: <http://www.epa.gov/oaintrnt/ghg/index.htm>):
Scope 1 emissions are *direct* emissions from DA-owned sources, such as boilers, campus vehicles, fertilizers, and refrigerants. Scope 2 emissions are *indirect* emissions resulting from purchased electricity or steam. Scope 3 emissions are other *indirect* emissions, such as those resulting from employee/student flights, employee/student commuting, purchasing of food and supplies, and waste disposal

SECTION 6 DINING & CUSTODIAL PRACTICES

6.1 CHARGE & PRIMARY QUESTIONS

The Dining & Custodial Practices Committee was made up of eight individuals, including two faculty, three students, and three staff. The committee was charged as follows:

Examine the environmental impact of our food production and preparation. The committee should examine the costs and benefits of increased local and organic food suppliers (including from Community Supported Agriculture farms), as well as addressing waste. The committee should consider how a change in menus (such as reducing meat) could also have environmental and health impacts. The informal educational opportunities potentially afforded by our dining services should be considered. The environmental and health benefits of implementing a “green cleaning” program should be investigated and judged against the costs. This committee should also evaluate the impacts of laundry programs (on-campus and with E & R) and determine if they could be improved.

The committee was given the following key questions:

1. Are we doing a good job with our menu planning and food supply – considering the wide range of concerns of menu variety, cost, manpower, locally-grown, organically-grown, and environmental impact of what we consume?
2. Look at both ends of our food chain – are there things we could/should do on-campus with respect to growing our own food, or composting our wastes?
3. Are there any available big-ticket upgrades to the dining/kitchen facilities that would improve campus sustainability (ovens, refrigerators, washers, etc.)?
4. Understand how we keep our facilities clean, and assess whether changes are appropriate with respect to cleaning methods, cleaning products, on-campus laundry, off-campus laundry, etc.
5. Do we need a campus “green cleaning” policy, and if so, what would it look like? Consider housekeeping/custodial cleaning products/methods, on/off campus laundry, etc. Is it appropriate to adopt a formal green-cleaning policy, and if so what does it mean?
6. In respect to the above, are there studies, changes, or projects that we should undertake on either a short-term or long-term schedule?

6.2 CURRENT STATE OF AFFAIRS

Deerfield Academy supplies food not only for its students but also for staff, faculty, and visitors. Both walk-through and sit-down meals are a part of the Deerfield Academy tradition. The dining experience may be rooted in tradition, but the food selection is varied and changing. The current Dining Services leadership and staff have already made major changes that increased campus sustainability, including food offerings (for example, introducing a salad bar at nearly all lunches and testing both no-meat and soup-and-salad meals), equipment (from eliminating

trays to purchasing more efficient preparation equipment) and practices (including recycling and composting).

After considering constraints of the budget, food offerings are driven by three primary factors, including what will be accepted, what is more sustainable, and what is healthier. There is no formal order of importance given to these factors (which are not always compatible) and accordingly no formal process for making decisions. However, measurement of returned food, solicitation of student ideas, and analysis of supplier practices is already in place (one student and two staff on the committee are very involved in this currently, so we were fully informed of the current, impressive state of practice at Deerfield Academy).

Like our dining services, our custodial and housekeeping duties are fulfilled by employees of Deerfield Academy, rather than outsourced to specialty vendors. This results in staff with a long tenure and significant understanding and caring about the buildings they maintain. Over the years, there has been a steady pattern of adopting new cleaning products and methods that are viewed as more environmentally friendly. However, there is not a formal written plan or policy that describes specific sustainability parameters or energy goals to be achieved in custodial practices. We are aware that comprehensive custodial strategies can be developed which incorporate policies, products, and practices, but to-date Deerfield has not pursued such a formal system. One member on our committee has prior experience working with one such system.

6.3 GOALS FOR PROGRESS

Based upon our knowledge, research, inquiries, and practical considerations, the Dining and Custodial Practices Committee recognizes that there are opportunities for Deerfield Academy to change its current approaches that will move our campus operations toward more sustainable practices. In light of this, we have established a series of broad goals for Deerfield Academy. Specific action items initiated in this committee are incorporated into Table 2.3, and discussed at more length in Appendix B. It is the hope of this committee, that over the short time horizon of the next few years, we can pursue the following broad goals:

- As an organization, become more knowledgeable and conversant in sustainability and healthfulness issues with respect to food purchases, preparation, and presentation on campus and with respect to custodial practices at Deerfield Academy.
- Continue--and expand--the impressive efforts in place to find and serve more organic, local, and/or sustainably produced foods at Deerfield Academy.
- Develop food purchasing criteria that prioritize conflicting sustainability expectations, such as whether to purchase local conventionally-grown or imported organic produce.

Over the longer time horizon, it is the hope of this committee that we can achieve the following:

- As an organization, know that our food is selected based on a consistent set of criteria promoting local, organic, and sustainably produced foods.
- As an organization, know that our custodial practices have resulted in a healthier work environment and living space for our community and are an integral piece of our overall reduced demand on natural resources.

SECTION 7 WATER RESOURCES & GROUNDS MANAGEMENT COMMITTEE

7.1 CHARGE & PRIMARY QUESTIONS

The Water Resources & Grounds Management Committee was made up of eight individuals, including three faculty members, three students, and two staff from the Physical Plant. The committee was charged as follows:

Examine those issues associated with the amount of water we use (both potable and landscaping), the amount/purity of wastewater we generate (both stormwater runoff and sanitary sewer), and our grounds keeping practices. The committee should consider the impact on human health, the local community, and wildlife.

The committee was given the following key questions:

1. Are we doing a good job conserving our community's potable water resources? Do we have adequate data to make this conclusion? If not, what additional data do we need?
2. What measures should we take to maintain (improve) the health of our local aquatic ecosystems?
3. Where can we reduce our water consumption?
4. Consider lawn/athletic field care and maintenance including mowing, fertilizer and pesticide usage. What if anything should we do differently?
5. With respect to lawn care, are there studies or projects that we should undertake on either a short-term or long-term schedule?

7.2 CURRENT STATE OF AFFAIRS

WATER RESOURCES

Deerfield Academy obtains 100% of its potable water supply from the Deerfield Fire District, the local municipal water supplier. We also draw water from the Deerfield River for irrigation of our lawns and athletic fields. Historically, the main campus used well water, but this practice was discontinued many years ago. The water district routinely tests its water quality to meet obligations imposed by the US Environmental Protection Agency and the State of Massachusetts, and reports these test results to customers annually. Based on these reports, the water District's water quality is within drinking water standards. In 2009, a campus water taste-test revealed that tap water (straight from the tap) scored favorably in comparison to various purchased bottled waters, and formed the basis for a movement to eliminate bottled water from campus.

Deerfield Academy maintains a water pumping station that draws water from the Deerfield River to support irrigation. The pumping station is a permanent installation; the pump itself is portable and is deployed for use only during irrigation season.

Our water consumption is measured by the Fire District using meters installed at numerous locations around campus. Over 80 individual water meters record flow to individual houses, dormitories, academic buildings, facilities buildings, athletic buildings and fields, and even a few fire hydrants. These meters are read every 3 months for billing purposes. Currently we have no real-time monitoring of water use and we have no water use data readily accessible through our energy management dashboard system.

Deerfield Academy has a fairly typical and straightforward storm water management system. Many areas of campus do not have storm drains and precipitation and snowmelt are allowed to run off by sheet flow or to infiltrate into the ground. In other areas, storm drains collect the water and direct it to surface water bodies, including wetlands and streams, all of which are tributary to the Deerfield River. Overall, it should be noted that Deerfield Academy has aggressively worked to limit the amount of paved surfaces, and, aside from the town road and access road, has few large paved surfaces.

Deerfield Academy has two means of disposal of its sanitary/domestic wastewater flow. The predominant portion of the flow discharges to the Old Deerfield Wastewater Treatment Plant. The treatment plant is an extended air activated sludge treatment facility which accomplishes secondary treatment. A few of the school-owned houses discharge to on-site septic systems. Wastewater flows are not measured on a building-by-building basis.

GROUNDS MAINTENANCE

Deerfield Academy owns 325 acres of land and maintains 185 acres of the land including 155 acres around the campus and 30 acres around houses. Lawns are mowed frequently: at houses typically once per week, around campus twice per week, and athletic fields typically 2 to 3 times per week. Most campus lawn areas and turf fields are aerated at least annually to reduce compaction and before fertilization and irrigation. Deerfield Academy attempts to minimize irrigation; when we do irrigate we use river water from the Deerfield River for a majority of the campus (west of Old Main Street).

Fertilizer applications are typically made 3 times per year, including early June, late August, and November. Most fertilizer application rates are determined based on testing results. A variety of fertilizers are used and fertilizer amounts and types vary somewhat by season, and by field/lawn. It is broadly stated that we do not purchase organic fertilizers for the turf applications, but instead use carefully blended commercial mixtures. There would be an added cost to use organic fertilizer and different results from using organic versus using commercial blends.

We attempt to maintain healthy grass/turf through aeration, over seeding, use of quality seed, a good fertilization program, and irrigation as necessary. In addition, we use foliar phosphites to help grow strong vegetation that is less susceptible to damage by pests. We attempt to maintain healthy plantings by cultural methods, including proper spacing of plants to allow air circulation and removal of dead matter. Fertilizer is used in landscaped beds to provide vital nutrients for plants and shrubs to promote growth and resistance to weeds and diseases

Deerfield Academy is obligated under law to prepare an Integrated Pest Management Plan. For the daycare, outside, we use no chemical pesticides. Inside we limit our chemical pesticides to bait cups for ants. For the campus indoor plan, routine pest control practices include monthly visits by our pest contractor at the dining services locations and annual inspection of as many as 40 buildings a year for termites. On-campus pest control practices are limited to non-chemical products and ant bait cups. Any additional pesticide use will be overseen by the pest contractor in accordance with laws requiring advance notifications. Our outdoor on-campus plan expresses the types of pests we typically expect to encounter, the non-chemical strategies we employ, and also requires us to identify the chemical pesticides we expect to use during those times when the non-chemical strategies are not sufficient. Outdoor use of chemical pesticides are subject to student absences and/or advance notifications.

When weather conditions promote the growth of disease, we use fungicides to control the fungus and promote healthy turf. Grubs are an annual concern. We apply a grub control product over a wide area of turf in late June to anticipate the August hatching - by eliminating the majority of the grubs early, we can avoid the need to spray later with a more harsh product at a time when school is back in session. We have used limited applications of growth inhibitors to combat annual bluegrass; timely application prevents seed head production. This promotes a greater turf density that in turn reduces other weed issues. In the spring, we sometimes apply a pre-emergent herbicide in some landscaped areas that are most prone to crab grass. For cracks in sidewalks and brick-paved areas, we use occasional treatments of a post-emergent herbicide (Roundup); these treatments are limited to the middle of the sidewalks to avoid affecting the vegetation along the edges of the sidewalks

7.3 GOALS FOR PROGRESS

Based upon our knowledge, research, inquiries, and practical considerations, the Water Resources and Grounds Management Committee recognizes that there are opportunities for Deerfield Academy to change its current approaches to water use and care of the grounds that will move our campus operations toward more sustainable practices. In light of this, we have established a series of broad goals for Deerfield Academy. These are discussed below in the context of short-term goals and long-term goals.

It is the hope of this committee, that over the next few years, we can pursue the following broad goals:

- As a community, become more knowledgeable and conversant about water use on campus, using this knowledge to set water conservation goals and develop strategies to meet these goals.
- Deerfield Academy should continue to employ grounds maintenance practices that reflect a commitment to sustainability, are mindful of stewardship, and are respectful of the health and well-being of its occupants.
- We must investigate community expectations for grounds maintenance as they pertain to appearance and functionality. From this conversation, we can then ensure that we achieve the right balance between function/aesthetics and sustainable pest control practices.

Over the longer time horizon, it is the hope of this committee that we can achieve the following:

- Become a leader in sustainable grounds management and water conservation, modeling best practices to students and the broader community.

SECTION 8 WASTE MANAGEMENT (REDUCE, REUSE, RECYCLE & ROT) COMMITTEE

8.1 CHARGE & PRIMARY QUESTIONS

The Waste Management (Reduce, Reuse, Recycle, & Rot) Committee was made up of nine individuals, including two faculty, three students, three staff, and a faculty spouse. The Committee was charged as follows:

Look at our waste generation and management, starting from the beginning of what we buy (purchasing policy), what we sell at our stores, and what we send out as trash versus recycling/compost. The emphasis should be on how to reduce our waste disposal in general, and trash disposal in particular. How can the campus do a better job with waste reduction, recycling, reuse, and rotting (compost)? This committee also should look at the environmental impacts of information technology on campus, both through electronic waste and possibilities such as paperless offices/classrooms.

The committee was given the following key questions:

1. Are we doing a good job reducing our consumption of goods – across the wide arena that is Deerfield Academy? Physical plant and dining services may be the obvious choices, but also look at athletics, academic (text books), and paper consumption. How do we improve this?
2. What are our priorities for improving our reuse, recycling, and composting?
3. Where are there opportunities for upgrades or changes in IT services to reduce our on-campus energy/carbon footprint?
4. Are there ITS changes that would reduce our consumption of other materials, such as paper? Are there ITS changes that would reduce our production of electronic waste?
5. In respect to the above ITS and 4R questions, are there studies, changes, or projects that we should undertake on either a short-term or long-term schedule?

8.2 CURRENT STATE OF AFFAIRS

Deerfield Academy generates a lot of waste and does an excellent job at understanding and managing its waste stream. We have made a major effort to divert recyclables and compostables from the landfill. We have set an ambitious goal of reducing, reusing or recycling 80% of our waste stream, leaving only 20% to be transported to the landfill. The “Think 80|20” campaign has been a success at educating the community about recycling and reducing waste as well as marketing these strategies to students, faculty and staff alike.

Until recently we collected and transported our recycling and landfill-bound waste with in-house equipment and personnel. We now have a hybrid system that outsources a substantial part of that work to a local small business. Recyclables consisting of waste paper, cardboard and mixed cans, plastic and glass are currently picked up by the ground department from academic buildings using a 2-bay recycling truck and transported to the Greenfield transfer station. Recyclables are picked from dorms and faculty housing by an outside vendor, Amherst

Trucking. Trash is currently picked up from campus buildings and all on- and off-campus faculty houses by Amherst Trucking twice weekly and transported to the Northampton landfill.

There is a solid waste dumpster for bulky waste. This is currently hauled by another vendor, Waste Management Incorporated (WMI), to a sorting facility in Springfield. WMI pulls out and captures for recycling any errant metal and cardboard; wood is also sorted out and is typically shredded to be used for daily cover at landfills.

Food waste and other compostables from the Dining Hall are transported to Martin's Farm, a commercial composting facility in Greenfield. Organic material collected by the grounds department including leaves, brush, lawn clippings and trees and branches are composted on campus, reused by local farms as animal bedding or repurposed as fire wood.

Electronic waste including computers, printers, monitors, televisions and other electronic equipment is collected at the Physical Plant and periodically shipped to Metech Recycling in Worcester where the materials they capture from recycling are returned to a manufacturing-ready raw material for resale. Metech also accepts our styrofoam packaging and plastic bags for recycling.

We have a comprehensive hazardous waste management program that tracks and manages the disposal or recycling of those many items that need special handling (e.g., batteries, fluorescent bulbs, toner and printer cartridges, biomedical waste, waste oil, paint and other fluids from the Physical Plant, mercury, asbestos, chemistry lab materials, etc.).

Ongoing efforts within ITS to conserve paper and energy are part of their normal operating procedures. The recent conversion to an off-site hosted phone system has resulted in newer more energy efficient equipment. Consolidation of printers and conversion to MFDs (multifunctional devices) capable of high volume printing, copying, scanning, emailing and faxing has already reduced energy and paper consumption. Very recently, ITS has directed that the thermostats be set at higher temperatures in their many server rooms, resulting a lesser cooling demands.

8.3 GOALS FOR PROGRESS

As an educational institution, we have an opportunity to involve students in our efforts and to model how a thoughtful community can change its behavior in sustainable way. The committee believes involving students is critical to maximizing both benefit and impact. Deerfield students are developing perspectives for understanding their world and developing habits of behaving in their world. We can help students develop perspectives and habits with respect to sustainability they will carry for the rest of their lives.

How we manage our waste stream is one our most visible commitments to sustainability. Anaerobic degradation of organic material by microorganisms in landfills is a major source of atmospheric methane gas, a potent greenhouse gas. Paper, cardboard and food waste contribute up to 75% of the methane production from US landfills. The Committee believes it is important that Deerfield continue to improve recycling as part of the "Think 80|20" campaign and accomplish the ambitious goal of diverting 80% of waste from the landfill. Additionally, we

should investigate ways to expand campus compost collection and ways to reduce academic consumption of paper.

Equally important to avoiding waste, is making prudent purchases in the first place that reflect a commitment to sustainability. While recognizing the complexity of implementing it, we have suggested that a purchasing policy be explored.

In ITS we believe we should continue to pursue technologies and adopt best practices that decrease consumption of energy and reduce waste. We believe we should make a campus-wide effort to use products and consumables that are manufactured or grown sustainably. We should help students appreciate the wisdom and health benefits of food choices that contribute to sustainability.

SECTION 9 CURRICULAR EDUCATION COMMITTEE

9.1 CHARGE & PRIMARY QUESTIONS

The Curricular Education Committee was made up of seven individuals including two faculty, three students, and two staff members. The committee was charged as follows:

Examine current practices regarding sustainability content throughout the curriculum at our school, comparable high schools, and universities. Develop ways to improve and encourage current practices, model successful practices from other schools, and invent new ways to include sustainability content across the curriculum.

The committee was given the following key questions:

1. Are we doing a good job integrating sustainability into our formal curriculum?
2. Where are there are opportunities to increase or improve the content?
3. Should we favor integrating sustainability issues into existing courses, or create new courses?
4. How do we currently make our sustainability education place-based and/or experiential? How could we do it better?
5. In respect to the above, are there studies, changes, or projects that we should undertake on either a short-term or long-term schedule?

9.2 CURRENT STATE OF AFFAIRS

There are currently 10 courses that focus on issues of sustainability (self-described by faculty) at Deerfield Academy. From Chemistry 1A and the City Lights course in the English Department to AP Environmental Science and the new Global H₂O integrated course, there is a good deal of substantive work being done with issues relating to sustainability. There is a course that focuses on the engineering of an electric vehicle, and significant work has been done involving solar power in several classes. The architecture courses address issues of sustainability in several projects, and a photography course culminates with a look at Edward Burtynsky and a project involving the documentation of industrial impact on the environment.

Sustainability is a topic that has launched exciting courses and large-scale projects at our peer schools and many of the colleges our students will attend. For example, when sustainability committee members visited Middlebury College, it seemed as if sustainability was an all-pervasive topic.

A team of ten Deerfield students has been working on two local farms, as part of our co-curricular community service program, for the past fifteen years. In the last five years, the relationships have deepened with the farmers and the farms have become more of an extension of the classroom. Students have learned about soil chemistry, crop rotation, animal husbandry, and many methodologies relating to agriculture.

Although there is great work being done around campus, and at local farms, there are many Deerfield teachers who would like to further integrate sustainability issues into their course offerings. Several teachers are eager to take on ambitious sustainability projects and there appears to be a passionate core of students who are ready for more work in this area, which presents an outstanding opportunity for Deerfield Academy to promote its sustainability initiatives.

9.3 GOALS FOR PROGRESS

In that our planet is at a tipping point, and our collective sustainability is more tenuous than ever before, it is essential for educators to raise awareness and help our students prepare for a better world. Sustainability is a subject that can be addressed in all disciplines and embedded in lessons and projects throughout the curriculum in meaningful ways.

Deerfield Academy should continue to support professional development projects that encourage courses to incorporate issues of sustainability. The faculty should be provided with opportunities to share the specifics of their current sustainability-related teaching, inspiring and nurturing others to follow suit. By encouraging workshops and mentoring from both internal and external sources, more teachers would include sustainability content into their courses. Issues of sustainability offer an excellent opportunity for interdisciplinary collaboration, as we have already seen with history and science in the Global H₂O course. A proposed multi-disciplinary capstone course that studies farming and food systems has the potential to integrate science, humanities, and/or arts faculty with facilities staff (grounds crew) in a unique team of teachers.

There should be a way to deepen the connection between science classes and local farms. We propose a departure from the model where academic pursuits and co-curricular activities are firmly separated. Instead, we believe the multi-disciplinary academic study of agriculture in literature, history, science, and/or art in the classroom would be complemented by a farming co-curricular where students get their hands in the dirt. Farmers could be invited to campus as guest lecturers, and an organic teaching garden could be developed on campus, perhaps with the assistance of local farmers. Connections have been made, through the co-curricular farming community service program, and some science and photography classes have visited local farms, but much more could be done to educate our students about sustainable agriculture and all that it entails.

With the addition of a new art gallery on campus, after the renovation of the Memorial Building, there will be a new opportunity for increased visibility of professional art on campus. Deerfield would be wise to tap the deep reservoir of innovative contemporary art inspired by issues of sustainability. This work, and the artists who made it, should be brought to campus to exhibit and interact with students.

Finally, we aim to raise the profile of the campus itself as a tool to teach sustainability and also to leverage the discussions and changes spawned by this sustainability plan to model and instruct about long-term thinking and leadership. From the dining hall menus, to the fuel used in our boilers to the electricity used on campus, there are ample opportunities for students to practice 21st century critical thinking skills while analyzing real-world relevant problems.

SECTION 10 CO- AND EXTRA CURRICULAR COMMITTEE

10.1 CHARGE & PRIMARY QUESTIONS

The Co- and Extra-Curricular Committee was made up of seven individuals, including two faculty members, three students, and two members of staff. The committee was charged as follows:

Analyze where we currently work topics of sustainability into our co-curricular, extra-curricular, and residential programming, and how we could improve. Experiential and place-based programs should be emphasized.

The committee was given the following key questions:

1. Are we doing a good job integrating sustainability into our co- and extra-curricular education?
2. Where are there opportunities to increase or improve the content?
3. Should we favor integrating sustainability issues into existing programs, or creating new programs?
4. How do we currently make our sustainability education place-based and/or experiential? How could we do it better?
5. In respect to the above, are there studies, changes, or projects that we should undertake on either a short-term or long-term schedule?

10.2 CURRENT STATE OF AFFAIRS

Prompted by an emphasis on sustainability and a drive to preserve our heritage, Deerfield has implemented several environmental programs in co and extra-curricular activities. The Elements group meets during the spring co-curricular season to learn outdoor skills, appreciation of the local environment, and sustainable practices for outdoor recreation. Several community service events, some available for all students and others specified for teams each season, focus on neighborhood and environmental cleanup. The community service program includes an option to work with local organic farms during the autumn. The Environmental Proctors (e-proctors) have also become a primary part of campus life, encouraging green practices among students in dorms and at school meetings. There was a recent expansion of the recycling efforts across campus and specifically in the dormitories. The “Think 80/20” campaign increased the availability of recycling receptacles on corridors and improved the labeling of the bins. The campaign reminds boarding students to recycle 80% of their waste and send only 20% of their waste to the landfill. E-Proctors have been helping to educate each resident of proper recycling protocols. Currently e-proctors are dominated by juniors and (especially) seniors, and there is no official distinction made between students that are truly engaged campus activists and those that are minimally involved.

Academy-wide speakers have also been invited to inform the student body about human impact on the planet. Two recent speakers include Professor Kerry Emanuel and Dr. Paul Andrew Mayewski, Director of the Climate Change Institute at the University of Maine. Dr. Emanuel, the 2012 Heritage Award winner, provided concrete evidence of climate change and encouraged students to be agents of change. Dr. Mayewski, the 2013 Lambert Fellow, discussed his

expeditions throughout Earth's remotest regions and investigation of past climate composition using ice cores.

10.3 GOALS FOR PROGRESS

Our co-curricular and extra-curricular activities offer important opportunities for our students to broaden their experience and explore new ideas and activities. Students find themselves paired with different instructors, travelling to different locations, and discovering many different new ways to be part of the greater community. Our committee believes that with deliberate purpose and thoughtful conversation, we can strengthen the presence of sustainability-themed content and offerings among our co- and extra-curricular programming. Our goals are as follows:

In the short term, Deerfield Academy should ensure that existing co- and extra-curricular programs are administered in a manner that consistently models sustainable practices and behavior. These away-from-the-classroom moments offer many opportunities for reinforcing behavior that will become lifelong habits. Examples include proper recycling and composting during athletic travel, guest speakers that educate and encourage discussion about sustainability issues, using public art displays to foster conversations about sustainability, and encouraging study abroad students to investigate questions of sustainability during their travels. The Connect4 residential curriculum can incorporate sustainability topics such as recycling and energy use into conversations about respecting the community. Importantly, sustainability needs to become an area of student leadership development. Younger students should be provided opportunities to engage with environmental issues in a meaningful way, and older students should be provided formal leadership opportunities in e-proctors and similar groups.

In the longer term, Deerfield Academy should bolster the number of programs (both on and off-campus) that have a more explicit sustainability theme. This could be achieved by more deliberately expressing the linkage of an existing offering with our sustainability mission statement and by selectively adding new programming. Successful implementation of several action items suggested by this plan may lead us on a natural path to fulfilling these goals. One suggested action will lead us to offering a more robust and hands-on understanding of the cycle of food. From how the methods of production affect the health of the environment and the people growing it, to how food waste is disposed of can change both the climate and soil productivity, students would learn a connection to the land and their community, appreciating that the choices they make matter.