October 5, 2007

**Grinnell College Emissions Reduction Commitment**

Grinnell College’s commitment to the environment is expressed, among other things, in its statements on Environmental Responsibility and Environmentally Responsible Building Guidelines, in the sustainable design of its newest buildings, in the construction of a 50 kilowatt wind turbine, in a long-standing policy of improving the energy efficiency of its existing facilities, in developing prairie plantings and minimizing the use of fertilizers and herbicides, in the expansion of the use of local foods in our dining hall, and in programs to minimize waste. Recently, Grinnell College received the first gold LEED certification in Iowa for an academic building and LEED certification for our new dormitories. LEED certification for two other buildings is pending. More information on Grinnell College’s commitment to environmental responsibility can be found at http://www.grinnell.edu/etal/green/.

Rather than resting on these accomplishments, we intend to take important further measures in environmental responsibility by making a commitment to reduce Grinnell College’s carbon emissions 20% below anticipated 2010 levels. Eschewing indirect reductions through the purchase of carbon offsets (“green tags”), we intend to commit ourselves to directly reducing carbon emissions through on-going renovations and retrofits of existing facilities, efforts to inculcate “green” behavior on campus, important environmental initiatives linked to new buildings, and the construction of a utility scale wind turbine project. Implementing the above items would reduce carbon emission by at least 20%. The first two actions are important aspects of environmentally responsible behavior among members of the college community. The second two actions can deliver truly significant reductions in carbon emissions.

**Carbon Emissions at Grinnell College**

The two largest sources of emissions are electricity and direct natural gas consumption. We estimate that current electricity consumption emits roughly 37 million pounds of carbon dioxide accounting for 66% of campus emissions. Natural gas contributes almost 18 million pounds of carbon dioxide accounting for 32% of campus emissions. Table 1 is a summary of our estimated emissions from FY2006. With new construction occurring through 2010, an increase of approximately 8% is anticipated.

<table>
<thead>
<tr>
<th>Table 1 Estimated CO2 Emissions for 2007/08</th>
<th>CO2(lbs.)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>58,239,383</td>
<td></td>
</tr>
<tr>
<td>Emissions from gasoline</td>
<td>584,095</td>
<td>1</td>
</tr>
<tr>
<td>Emissions from diesel</td>
<td>206,142</td>
<td>.4</td>
</tr>
<tr>
<td>Emissions from burning of natural gas</td>
<td>17,999,526</td>
<td>32</td>
</tr>
<tr>
<td>Emissions from electricity production</td>
<td>39,449,620</td>
<td>66</td>
</tr>
</tbody>
</table>
**Actions to Reduce Carbon Emissions by 20%**

**Action Item #1:** On-going renovations and retrofits

Goal: To continually increase the efficiencies of existing buildings

Practices:
- Convert existing pneumatic temperature controls to direct digital control to allow for accurate set point control in order to adhere to college temperature policy
- Upgrade lighting fixtures
- Increase control of lighting via motion sensors, daylighting control and scheduled control
- Install high reflectance membrane on flat roofs
- Convert existing chillers to variable speed compressors
- Improve efficiency of exterior lighting (pole and building mounted)
- Install vending misers on vending machines
- Window retrofits
- Improve steam line insulation
- Install photovoltaic panels on existing buildings
- Replace residential furnace and air conditioning units with high efficiency units
- Continue to evaluate emerging technologies i.e. fuel cells

Impact on emissions: As buildings age, efficiency is often reduced. At the very least, such renovations will help maintain emission levels, but improvements in technologies should lead to emission reductions.

**Action Item #2:** Efforts to inculcate green behavior on campus

Goal: To continue to educate the campus community about environmental responsibility and what individuals can do to lessen energy use (as well as lessen the production of waste and promote health).

Practices:
- Expand the Dorm Environmental Coordinator Program to provide in-house point person to provide information and feedback about recycling and waste issues
- Create a dorm by dorm study break program where the Environmental and Safety Coordinator and the Dorm Environmental Coordinators educate students about efforts to reduce environmental impacts, as well as the role students can play
- Create a “Green Grinnell” “publication” that points out environmentally friendly technologies on campus
- Pursue the possibility of expanding electricity and water sub-metering to allow for real-time data collection of consumption, especially in dorms
- Continue to explore curricular links to local and on-campus environmental issues

Recent practices have included adjusting thermostat set points where appropriate.
**Action Item #3:** Install energy efficiency measures for Athletics Phase II and demolish the Physical Education Complex

Goal: Limit increase in or reduce energy consumption due to new construction.

Practices:
- Install ground source heat pump to heat, cool, and dehumidify natatorium
- Increase insulation in building envelope
- Install high-reflectance roof
- Utilize high efficiency windows
- Utilize air-to-air heat recovery technology
- Install extensive lighting controls
- Install high efficiency light fixtures
- Demolish the PEC

Impact on Emissions: Reduction of approximately 7% of campus emissions. Geothermal will reduce emissions from Athletics Phase 2 by approximately 12%, or 2% of total campus emissions. Demolition of the PEC will reduce building footage in 2010 by 5% with a resultant reduction in emissions related to this energy-inefficient building of at least 5%.

**Action Item #4:** Construct a utility scale wind turbine project

Goal: Replace 30% of campus electricity consumption with renewable wind energy.

Practices:
- Install approximately 3 to 4 Megawatts of wind generation
- Install an electric boiler to consume excess electricity generated and offset natural gas emissions

Impact on emissions: Such an installation should reduce carbon dioxide emissions by at least 25%.