Transylvania University’s Climate Action Plan

September 2013

Prepared by the Sustainability Office on behalf of:

Professor R. Owen Williams
September 13, 2013

Transylvania University has a strong commitment to sustainability. This commitment is reflected in the following document, both in our institution’s plans for the future and in the great strides Transylvania has made to reduce our carbon footprint over the last five years. We thank Second Nature for serving as keeper of the American College and University Presidents’ Climate Commitment, which challenges institutions of higher learning to accelerate progress towards climate neutrality and sustainability by educating students, creating solutions, and providing leadership-by-example for the rest of society.

In recent years, Transylvania has deliberately worked to act as an agent of change in the area of sustainability, striving to create a positive future for the young people who live and learn on our campus while engaging with our community partners. We must continue to graduate socially responsible, lifelong learners as part of our efforts to contribute to a more sustainable world. We must also continue to embrace our institutional responsibilities, recognizing the great work that can be achieved through the collective efforts of the Transylvania community. This Climate Action Plan represents a significant piece of our way forward.

I appreciate the work of everyone who has helped Transylvania achieve the progress that has already been made, and I encourage all members of the Transylvania community to find ways to contribute to or improve the Climate Action Plan presented here.

Respectfully,

R. Owen Williams
President
Acknowledgements

Thank you to President R. Owen Williams and the President’s Cabinet for their support of campus sustainability initiatives, the many individuals and departments that assisted in the collection of the greenhouse gas emissions data, and the community partners who provided input during the plan development process. In addition, this Climate Action Plan would not have possible without the vision, hard work, and expertise of the following individuals:

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Executive Summary

Transylvania University’s last two Presidents have affirmed the institution’s commitment to sustainability and carbon neutrality by signing the American College and University Presidents’ Climate Commitment (ACUPCC). President Shearer was one of the early adopters, signing on in 2007. President Williams reaffirmed Transylvania’s commitment by adding his name to the ACUPCC in May 2011. The ACUPCC has served as a stimulus to campus efforts in conservation and, more broadly, sustainability.

The most recent greenhouse gas data for campus, from fiscal year 2011-2012 (Fy2012), shows that 78.5% of the university’s carbon footprint is associated with purchased electricity. Transylvania is primarily run, heated and cooled by electricity generated in coal-powered plants owned and operated by Kentucky Utilities (KU). These results were relatively consistent for fiscal years 2009, 2010, and 2011 with electricity representing 74.1%, 72.6% and 78.2% respectively. Natural gas came in a distant second, representing 21.0%, 20.4%, 15.4%, and 12.6% of the institution’s greenhouse gas emissions profile for fiscal years 2009, 2010, 2011, and 2012 respectively.

Transylvania University will aim for climate neutrality within the following timeline:

- 2020 – Reduction of GHG emissions by 35% from 2009 levels
- 2030 – Reduction of GHG emissions by 70% from 2009 levels
- 2040 – Climate neutrality

Given the emissions profile of the institution, mitigation efforts will focus primarily on increased efficiency of equipment and conservation policies and behaviors. These reduced use endeavors will be complimented by exploration of alternative energy options. The university has achieved a carbon footprint reduction of 23.4% over the past four years, primarily due to reduced use of electricity and natural gas resulting from increased efficiencies and conservation.

Though an additional 11.6% reduction over eight years may initially seem modest given a reduction double that in just four years, this reduction will be taking place in concurrence with a planned increase in the student population of nearly 50%. The rapid growth of the student body, coupled with the fact that much of the low hanging fruit related to GHG emission reductions has been “picked,” makes the 2020 goal a significant, though achievable, one.

With continued strong leadership and cooperation across campus, Transylvania University is capable of reaching the milestones outlined above. It is acknowledged, however, that many changes in opportunities and operations will occur over the next few decades. These changes will require a regular revisiting of the visions and strategies outlined in this document to ensure that Transylvania is living up to the spirit of the ACUPCC while fulfilling its mission as a leading liberal arts institution.
1.0 Introduction
In 2007, President Charles L. Shearer became one of the early signatories of the American College and University Presidents’ Climate Commitment (ACUPCC). This commitment stimulated efforts on campus to consider and act upon the sustainability-related impacts and opportunities faced by Transylvania University. Over the next few years, Transylvania launched a Crimson Goes Green initiative to engage the campus community in environmental conservation efforts, opened Kentucky’s first Energy Star certified residence hall, integrated sustainability into the university’s 2009-2012 strategic plan, and conducted an energy benchmark study and carbon footprint evaluation to assess the impact of Transylvania’s operations.

Shortly after the completion of the energy benchmark study and carbon footprint evaluation, President Shearer, along with four administrators and staff, attended an Energy Conservation Conference hosted by the Jesse Ball duPont Fund. This conference marked the launch of the Fund’s new initiative focusing on energy conservation programs at the colleges and universities it supported. Transylvania, with energy benchmarking data in hand, was ready to hit the ground running, and was the first institution to receive one of the energy conservation grants from the Jesse Ball duPont Fund. The grant funded:

- energy conservation policies and projects;
- sustainability outreach, including a faculty workshop and student engagement efforts; and
- a staff position to support sustainability initiatives.

The momentum behind sustainability on campus was maintained during the presidential transition from President Shearer to President R. Owen Williams in the summer of 2010. Within weeks of arriving on campus, President Williams created a council made up of faculty, students, and staff to serve as the driving force behind sustainability efforts on campus, making recommendations to the President and ensuring that adopted recommendations are carried out successfully. These recommendations are now embodied in the sustainability master plan (see Appendix 1), which was formally adopted by the President’s Cabinet in the fall of 2011. Another recommendation included reaffirming the institution’s commitment to the ACUPCC by re-signing it, which President Williams did in May 2011.

Transylvania’s sustainability efforts continue to expand. The University's Board of Trustees approved a strategic plan, Transylvania 2020 (see Appendix 2), in January 2013 that prominently features sustainability with Goal 3 focusing on civic engagement and social justice and Goal 4 emphasizing sustainable infrastructure and land management. In May 2013, Transylvania received a $75,000 grant from the Jesse Ball duPont Fund to seed a Green Revolving Loan Fund (see Appendix 3 for the fund charter). The university matched this amount with $75,000 from its unrestricted endowment funds. Writing, adopting, and implementing a Climate Action Plan is a natural next step in Transylvania’s commitment to sustainability.

1.1 Transylvania’s Commitment to Greenhouse Gas Reductions
Transylvania recognizes that, although climate change is a natural phenomenon, human activities are warming the planet at an unprecedented rate that will adversely affect the delicate balance of ecological, social, and economic systems on which all species rely. As an institution of higher learning,
we recognize not only our operational role in contributing to these effects, but also the opportunity we have - and must take - to educate students so they understand the complex issues around climate change and are equipped with the tools to address them.

Action on climate change is consistent with both Transylvania’s values of integrity, innovation, diversity, community, and perseverance, and our institutional mission to prepare students for a humane and fulfilling personal and public life by cultivating independent thinking, open-mindedness, creative expression, and commitment to lifelong learning and social responsibility in a diverse world.

1.2 Recent Greenhouse Gas Mitigation Efforts

Even without a formal climate action plan in place, Transylvania University has been working to reduce its carbon footprint. These efforts have led to a 20.2% reduction in purchased electricity and a 46% reduction in natural gas consumption in Fy2013 compared with Fy2009 (see Appendix 4 for tables and graphs with complete trend data). Overall, the university’s greenhouse gas emissions were reduced by 23.4% in Fy2012 compared to Fy2009. A complete greenhouse gas assessment has not yet been conducted for Fy2013.

These reductions were achieved through behavioral changes, an aggressive winter shutdown (see Appendix 5), an improved energy policy (see Appendix 6 for the current policy), operational changes resulting in utility conservation, and the installation of high efficiency equipment. Many of the equipment upgrades resulted from an investment grade audit conducted by Pepco Energy Services, completed in the fall of 2010 (see Appendix 7 for the Executive Summary of the investment grade audit). Transylvania opted to implement the recommended energy conservation measures (ECMs) using general capital project funds. To date, nearly $600,000 has been invested in:

- Low-flow shower heads in the residence halls
- Lighting retrofits in nine residential and academic buildings across campus, plus the campus center
- Occupancy sensors in the three largest residence halls
- A low-flow pre-rinse kitchen sprayer for the dish machine in our main dining facility
- Boilers in Poole Residence Hall
- Hot water storage tank insulation in Hazelrigg Hall, a combined residential and academic building
- A refrigeration system in the campus center, serving our main dining facility
- A cooling tower with a VDF for Poole Residence Hall

Additional investments are approved for Fy2013.
2.0 Assessment Procedures & Results

The inventories presented in this plan reflect data available for Fiscal Years (Fy) 2009-2012. Fy2009 was selected as the baseline year. The greenhouse gas (GHG) emissions inventories were conducted using the **Clean Air-Cool Planet Web-based Campus Carbon Calculator v1.0** (Calculator), as preferred by the American College & University Presidents’ Climate Commitment (ACUPCC). This calculator is a complex tool has been used by more than 90% of the ACUPCC colleges and universities since 2001. This large user group ensures a high degree of confidence in the calculator’s results and also an ability to compare Transylvania’s footprint directly with those of similar colleges and universities throughout the country.

Following recommendation, instructions, and insights offered in the carbon calculator user’s guide, the GHG emissions data collection team determined which temporal, organizational, and operational boundaries to use. The data collection tasks were divided among the collection team, and data was initially entered into the Excel version of the calculator (v6.9) that was housed on a shared drive. At the end of the collection process, this data was imported to the online calculator.

2.1 General Procedure

The Calculator includes all six greenhouse gases specified by the Kyoto Protocol (CO$_2$, CH$_4$, N$_2$O, HFC, PFC, and SF$_6$). The impact of each greenhouse gas is standardized by using Global Warming Potentials (GWP), which convert each gas’ emissions to CO$_2$ equivalents (see Table 1).

**Table 1: Global Warming Potentials**

<table>
<thead>
<tr>
<th>Greenhouse Gas Type</th>
<th>Global Warming (100 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide (CO$_2$)</td>
<td>1</td>
</tr>
<tr>
<td>Methane (CH$_4$)</td>
<td>25</td>
</tr>
<tr>
<td>Nitrous oxide (N$_2$O)</td>
<td>298</td>
</tr>
<tr>
<td>Hydrofluorocarbons (HFCs)</td>
<td>124 - 14,800</td>
</tr>
<tr>
<td>Perfluorocarbons (PFCs)</td>
<td>7,390 - 12,200</td>
</tr>
<tr>
<td>Sulphur hexafluoride (SF$_6$)</td>
<td>22,800</td>
</tr>
</tbody>
</table>


As the table above shows, different emission types can have dramatically different impacts on climate change in both the short and long-term. Though CO$_2$ accounts for the bulk of global greenhouse gas emissions, gases that have a high GWP can have a significant impact with even small emissions.

All effort was made to present an accurate picture of Transylvania’s carbon footprint within the parameters set by the Calculator. That said, it should be acknowledged that embodied energy is not accounted for in this tool. Embodied energy represents the carbon footprint related to the lifecycle of materials, products, equipment, and buildings. These lifecycle footprints can be significant, and should be considered when making decision related to climate neutrality. It is anticipated that, as climate footprint methodologies evolve, these types of emissions – which would add a whole new dimension to the university’s footprint and its ability to reduce emissions – would be accounted for. Currently, the science and information for accurately modeling these emission sources in any comprehensive way do
not exist. That said, the impacts of embodied energy should be accounted for in GHG mitigation efforts to the fullest extent possible. Many efficient building practices and standards, such as LEED, can be helpful in making decisions with lifecycle impacts in mind. Transylvania can also mitigate the impacts of lifecycle emissions by striving to close lifecycle loops related to campus operations whenever possible. Examples include providing recycling for students, faculty, and staff and properly disposing of electronics, equipment, and materials in a sustainable way whenever possible.

2.2 Scope Boundaries
Defining boundaries is an important step in calculating carbon footprints. In addition to determining the timeframe that will be considered, the Calculator requires defining organization boundaries and operational boundaries.

2.2.1 Organizational Boundaries
Organizational boundaries simply define at which organizational level are you conducting the GHG assessment. Is it one campus or a system of campuses? Within the organizational boundaries the Calculator suggests the use of a control approach or an equity share approach. The operational control approach accounts for emissions related to any operations over which the institution has practical control, including both facilities that the university owns and leases. This is the approach that made the most sense for Transylvania and was the one selected by the GHG data collection team.

2.2.2 Operational Boundaries
As is suggested in the General Procedure section, determining which GHG emissions to include can be a complicated matter. Operational boundaries define which emissions are included in the institution’s carbon footprint and which are left out. Decisions about operational boundaries have a significant impact on which emission mitigation efforts are included in the university’s climate action plan. The scopes, areas, and data collection methods are described below:

**Scope 1:** Direct emissions from sources owned and/or controlled by the institution. For Transylvania, this includes emissions from on-campus natural gas combustion, fuel used in the institution’s fleet, and fugitive emissions from refrigerants and other sources.

- **On-Campus Stationary Fuel Combustion:** Natural gas data was collected using utility bills from Columbia Gas.
- **University Fleet:** The university’s fleet data was collected using Speedway monthly reports. This data included gallons of gasoline purchased for vehicles owned by the university and managed by Athletics, the Department of Public Safety, Physical Plant, Admissions, and the Office Services Support Specialist. The data reflected in the inventory for Fy2012 reflects the most accurate data for gallons of fuel purchased, as reported to the Accounting office. Assumptions had to be made given temporal limitations of the Speedway monthly reports. Six months of Fy2011 data was available. Data from the corresponding months in Fy2012 served as a substitute for the missing months. No data was available for fiscal years 2010 or 2009, so estimates were made by using the estimated data for Fy2011.
Speedway monthly reports are now included in the university’s gasoline card statements, making relatively accurate data collection for fleet fuel consumption possible. However, given the archiving practices related to this data, it is recommended that the monthly Speedway report be shared with the Sustainability Director each month.

- **Refrigerant and Chemicals**: Refrigerant and chemical data were collected from Physical Plant. This data includes poundage of refrigerant usage for HCFC-22, HFC-134a, R-409a (blended refrigerant), and R-410a (blended refrigerant).

- **Agriculture**: Emissions from fertilizers and animals are included in Scope 1. Transylvania does not have a farm or any university-owned animals. In fact, the university is located in the middle of downtown Lexington, KY. Fertilizer is rarely used on the land we do own, and was therefore excluded on the basis that it is a de minimus source.

**Scope 2**: Indirect emissions from sources that are neither owned nor operated by Transylvania University but whose products are directly linked to on-campus energy consumption. For Transylvania, this includes emissions from the production of any electricity the institution purchases.

- **Purchased Electricity**: Electricity purchased from Kentucky Utilities (KU) is the largest source of the university’s emissions. Though the university has control over the quantity of kilowatt hours (kWhs) it consumes, it does not have control over KU’s utility grid mix, which historically ranges between 93 – 98% coal. This dependency on coal significantly increases the emissions related to the Transylvania’s purchased electricity.

**Scope 3**: Other emissions attributed to the university. Emissions that are either directly financed or otherwise linked to the campus via influence or encouragement. For Transylvania, Scope 3 emission sources include travel that is paid for by the institution (excluding fleet vehicles, which are included in Scope 1); regular commuting by faculty, staff, and students; student travel to study abroad locations; wastewater treatment; and paper purchasing. These emissions are the most difficult to control. They are the responsibility of the university, because if it did not exist, these emissions would not occur. That said, these emissions are largely associated with the personal and professional activities of staff, students, and faculty. The university administration has little to no direct control over managing these emissions. The only two options for mitigating these emissions are behavior change or offsets. Thankfully, scope 3 emissions are a relatively small part of Transylvania’s GHG profile, representing on 7.5% of total emissions in Fy2012.

- **Commuting**: Student, faculty, and staff commuting emissions were one of the more difficult areas to estimate. The university lacks any type of reporting or regular survey data related to commuting or commuter habits. Therefore, the Sustainability Office conducted an online and print survey of those identified as commuter students, faculty, and staff in the spring of 2013. The GHG collection team assumed that those
participants accurately represented their respective populations, and used their responses to determine the percentage of each type of travel for each group surveyed. These percentages were applied proportionately to population data in the inventory for the past four fiscal years. It was assumed that the populations traveled to campus for the following number of weeks: commuter students, 34; faculty, 34; and staff, 48. These assumptions were made to be reasonable while erring on the side of overestimating emissions. Given that the data and percentages used to make the estimates for all four fiscal years inventoried, no conclusions can be made about commuter trends. To improve future commuting emission data collection, a survey of faculty, staff, and commuter students should be conducted annually. The university also needs to employ a more accurate means of identifying commuter students for this purpose. The use of Datatel in better estimating the distance traveled on a one-way trip to campus for staff, faculty, and students should be explored.

- **University Funded Travel:** Mileage for the faculty and staff university funded travel was determined using itineraries collected by the Accounting Department. A departure location of Lexington, Kentucky, was assumed for all trips. The data collection team used the Ohio State University’s distance calculator to determine mileage between destinations and doubled the distance to establish figures for the inventory. When itineraries were not included, estimations of mileage were made based on other factors, primarily cost. To simplify and improve future data collection efforts, it is recommended that the Sustainability Office obtain monthly reports of university travel based car rentals and travel expenses charged to a university credit card.

- **Study Abroad:** Study abroad air travel information was not readily available. The data collection team worked with the Study Abroad Office to obtain information on where students went during the four years inventoried. The Ohio State University’s distance calculator was again employed in determining total mileage traveled for study abroad. A similar assumption of a Lexington, Kentucky departure location for mileage calculation purposes was made. To simplify and improve future data collection efforts, it is recommended that the Sustainability Office obtain information from the Study Abroad Office each term regarding where students going for university-related travel.

- **Solid Waste:** Solid waste data was not included in the inventories documented in this climate action plan. The data collection team determined that there wasn’t even sufficient information on which to base assumptions. Transylvania hopes to include solid waste in future GHG assessments by developing data collection tools and procedures that would facilitate this effort. Currently, there isn’t even reliable information on how many dumpsters are on campus, what they are for (recycling or waste), who collects them, and how frequently. Information on the number of recycling bins set out curbside needs to be collected, and an average weight needs to be determined. In addition to this basic information, the university needs to monitor the dumpsters to determine how full they are, on average, when they are emptied.
- **Wastewater:** Water and sewer data was generated using Kentucky American Water utility bills from the past four fiscal years. It was assumed that all the purchased water ends up at the wastewater treatment plant, which is an overestimation of the university’s emissions related to wastewater treatment. Water that is used in outdoor applications, like watering the athletic fields, hasn’t been subtracted from the total gallons purchased even though it doesn’t end up at a wastewater treatment plant as a result of the university’s use. Expanded metering would help Transylvania more accurately determine how much water is used for outdoor applications.

- **Office Paper:** Paper emissions were calculated using data collected from purchase orders related to office paper and other paper products, including envelopes and cardstock. The type and weight of the paper products were used to calculate total poundage. For envelopes, weights were calculated using *A Specifiers Guide to Envelope Sizes and Weights*, available online from Printing Alliance based in Cincinnati, Ohio. Though this data represents a significant portion of Transylvania’s paper use, it is an underestimate. Future inventories should try to capture paper consumption related to campus publications printed by the Public Relations Office or the student newspaper.

### 2.4 Emissions Results

Data was collected between 2009 and 2012 for the emissions footprint. The chart below shows the annual emissions for the footprint broken down by scopes.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Scope 1</th>
<th>Scope 2</th>
<th>Scope 3</th>
<th>Gross Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>2,346</td>
<td>7,884</td>
<td>403</td>
<td>10,633</td>
</tr>
<tr>
<td>2010</td>
<td>2,210</td>
<td>7,462</td>
<td>601</td>
<td>10,274</td>
</tr>
<tr>
<td>2011</td>
<td>1,565</td>
<td>7,397</td>
<td>494</td>
<td>9,456</td>
</tr>
<tr>
<td>2012</td>
<td>1,137</td>
<td>6,396</td>
<td>612</td>
<td>8,146</td>
</tr>
</tbody>
</table>

As the table above details, there was a steady decline in total emissions for the college between 2009 and 2012 (a 23.4% reduction overall). This large drop in emissions is primarily due to reduced use of electricity and natural gas resulting from increased efficiencies and conservation. This drop in emissions is further depicted in the following chart.
From this high level analysis, a more detailed analysis was conducted for 2012, breaking down emissions by scope and source.

As can be clearly seen in the pie chart above, Purchased Electricity (Scope 2) made up a vast majority of 2012’s emission footprint with 6,396 MTCO$_2$e (78.5% of total emissions). Stationary Combustion of Natural Gas (Scope 1) was the second highest emission source with 1,023 MTCO$_2$e (12.6% of total emissions). Study Abroad Air Travel (Scope 3) came in a distant third with 300 MTCO$_2$e (3.7% of total emissions), closely followed by Commuting (Scope 3) at 290 MTCO$_2$e (3.6% of total emissions). The two remaining sources combined, University Fleet/Mobile Combustion (Scope 1) and Office Paper (Scope 3), represent only 136 MTCO$_2$e (1.7% of total emissions).

The following chapter explores mitigation strategies that will continue to reduce Transylvania’s carbon footprint, even with anticipated growth in student enrollment and building square footage.
3.0 Mitigation Strategy & Reduction Goals

Transylvania University will aim for climate neutrality within the following timeline:

- 2020 – Reduction of GHG emissions by 35% from 2009 levels
- 2030 – Reduction of GHG emissions by 70% from 2009 levels
- 2040 – Climate neutrality

Given the emissions profile of the institution, mitigation efforts will focus primarily on increased efficiency of equipment and conservation policies and behaviors. These reduced use endeavors will be complimented by exploration of alternative energy options. The university has achieved a carbon footprint reduction of 23.4% over the past four years, primarily due to reduced use of electricity and natural gas resulting from conservation and increased efficiencies.

Though an additional 11.6% reduction over eight years may initially seem modest given a reduction double that in just four years, this reduction will be taking place in concurrence with a planned increase in the student population of nearly 50%. The rapid growth of the student body, coupled with the fact that much of the low hanging fruit related to GHG emission reductions has been “picked,” makes the 2020 goal a significant, though achievable, one.

One lens to view these strategies through is not gross reduction of emissions, but an improvement of the intensity or efficiency of the emissions expenditure. In other words, what is the carbon footprint per student or square foot of built space? This section implements this lens, setting intensity targets for the college utilizing historic data. These intensity targets are emissions per student served (MTCO$_2$e per student) and emissions per square foot owned by function type (MTCO$_2$e per square foot). By working with these intensity targets, the university will be able to grow to meet its strategic goals and fulfill its mission as an educational institution, while at the same time meeting its greenhouse gas emission goals, ultimately achieving climate neutrality by 2040.

3.1 Mitigation Strategies

Reduction efforts going forward will be focused in five key strategy areas: conservation efforts, efficiency measures, on-campus renewable energy generation projects, offsets, and renewable energy credits (RECs). These areas are presented in order of preference with Transylvania’s first preference being conservation. Financial implications of these options will be part of decision making process, as will the projects’ synergy with other institutional objectives.

3.1.1 Conservation Strategies

Conservation strategies are generally the most inexpensive form of emission reductions. These strategies are focused on changing campus behavior, both at the individual and operational level, to reduce or eliminate unnecessary or ineffective resource use. The strategies require the engagement of the larger campus community in changing habits to support potentially large reductions in resource usage. In isolation, none of these strategies have a large impact, but together they can have a significant impact on the university’s emissions.
Conservation strategies include: turning lights off, powering down computers, conserving water, manually adjusting thermostat set points, increasing waste reduction and diversion efforts, using windows for natural ventilation, reducing automobile commuter travel, using virtual meeting software, reducing idling of campus fleet vehicles, reducing vampire loads, evaluating building operations, and using natural light. These strategies are covered briefly in the following narratives:

**Turning Lights off:** Turning lights off when spaces and buildings are not used is a simple energy saver, but often is not practiced routinely. To be effective, this approach involves behavior change at all levels of the university with buy-in from multiple stakeholders. This behavior change can be as simple as asking individual faculty and staff to turn off their office light when leaving. Transylvania has encouraged this behavior with past campaigns, and is re-emphasizing it during the 2013-2014 academic year by handing out light switch plate stickers for individual rooms and offices and asking conservation coordinators to post them in common areas.

Lights off practices should also involve setting a policy for housekeeping to turn lights off after buildings are cleaned, and asking the Department of Public Safety (DPS) to turn lights off when they do building security checks. Housekeeping and DPS can be allies in identifying spaces where the lights are being consistently left on so that an intervention can be developed.

**Powering Down Computers:** Significant energy reductions have already been achieved by changing from desktop computers to thin clients in most computer labs. However, there are still a lot of computers on campus. Employing energy conservation settings for computers and monitors can result in significant reductions in energy use, as can shutting down computers and monitors at night. Transylvania has encouraged these behaviors in the past, but will again emphasize them during the 2013-2014 academic year with door to door visits to faculty and staff offices and outreach through the conservation coordinators in the residential areas. Neon green stickers will be given out for people to place on their monitors or computer power buttons to serve as a visual reminder to shut their computers down and, if applicable, turn their monitors off when they are done with their work for the day. There will also be power down stations where students can bring their computers to have another student help them engage the energy conservation settings.

**Conserving Water:** Water usage and the resulting emissions from sewage processing is a source largely controlled by individual choice. Water conservation can be promoted by asking that staff, faculty, and students attempt to efficiently manage their water consumption. For student residents this involves simple behaviors like taking shorter showers and shutting off the water while brushing teeth and shaving. For staff, water conservation opportunities will often be job specific, such as developing conservation-oriented lawn/field watering schedules and management techniques, utilizing optimal water saving settings on equipment, fixing leaks in a timely manner, or shutting off water while performing kitchen duties (being mindful of food safety practices). In other cases, the conservation opportunities are more general such as taking shorter showers after use of the campus recreational facilities.
**Manually Adjusting Thermostat Set Points:** Most rooms have one or more thermostats, many of which can be manually adjusted. A simple method for greatly reducing cooling and heating is encouraging occupants of these spaces to manually adjust the thermostats to minimize energy use. In many buildings, Transylvania is able to set a limited range for temperature set points, though there are many spaces where the space occupant(s) is in complete control of the temperature setting.

These adjustments can include campus wide policies to reduce the heating and cooling set points of the thermostats one or two degrees higher or lower than typical for building usage. This can make these buildings slightly warmer or colder, but occupants can be encouraged to dress for the temperature. Other less occupant impacting options are to establish building closed set points in which all thermostats are set to a low operating condition when the building is not being occupied. For larger buildings, especially ones with rarely used spaces such as auditoriums and maintenance areas, this could involve zoning and closing portions of the building and engaging the temperature setbacks.

**Increasing Waste Reduction and Diversion Efforts:** Though solid waste data is not included in the greenhouse gas emissions analyses summarized in this plan, Transylvania recognizes that the generation and disposal of waste contributes to greenhouse gas emissions. Such emissions will be included in future GHG reports. Therefore, waste reduction and diversion efforts need to be part of our climate action plan.

The most effective way to mitigate the GHG impact of waste is not to produce it in the first place. Waste reduction efforts can best be addressed institutionally through purchasing behaviors. Policies for university purchasing practices need to take waste minimization and diversion efforts into consideration. These policies will be most impactful in the Purchasing Office, though they will need to be shared with and embraced by offices across campus to have the greatest impact. It is also important that Transylvania’s students are engaged in the waste reduction efforts because what they buy has a significant impact on the university’s waste stream.

Waste diversion efforts are also important. Encouraging reuse, recycling and composting will further mitigate the GHG impacts of solid waste on campus. Reuse is already practiced in many ways at the institutional level. Transylvania salvages materials out of the buildings it demolishes. Even better, the university believes strongly in renovating buildings and often opts to do so instead of demolishing. A warehouse holding desks, filing cabinets, bookshelves, chairs, and other office furniture not currently in use is the first stop when furnishing a new space. Transylvania also buys used office furniture from the state surplus property program. There’s even an informal reuse give-a-way table located outside of the campus post office.

To engage the students in such efforts, the Office of Community Service and Civic Engagement partners with the Sustainability Office at the end of each school year to do a collection drive. The purpose of this drive is to divert usable items from the waste stream so that they can be donated to various organizations around town. Recyclables are also collected, both general...
recyclables and specialty items, such as batteries, ink cartridges, and small electronics. This effort needs to be expanded.

Recycling has largely become commonplace in American society – especially among younger adults. Though recycling is available throughout campus, improvements need to be implemented. Recycling can be increased through the placement of recycling bins next to every trash can on campus, including at outdoor locations. Each recycling location needs to have signage explaining what can and cannot be recycled in the bins to raise campus awareness and provide positive social support for recycling. Special efforts will be made to increase recycling during move-in and in food service areas.

Composting can be more challenging than recycling. The separation of material that is often necessary can be a significant barrier. The development and maintenance of a large-scale composting facility is difficult, especially on a small, urban campus. Large-scale offsite facilities are uncommon, and can be expensive. Currently, Transylvania Dining Services composes pre-consumer waste from the main dining facility through a partnership with Seedleaf, a local non-profit focused on community gardens. Lexington Fayette Urban County Government (LFUCG) has been piloting an industrial composting program that will be available to residences and business with county waste collection. Once this service is available, composting of pre- and post-consumer food waste on-campus becomes much more feasible because industrial scale composting eliminates the need to separate vegetable matter from other food waste. It will also allow the university to switch to compostable service ware in the dining facilities and at events where reusable service ware is not used.

Transylvania will also continue to grow its R4 campaign, which aims to encourage waste reduction and diversion behaviors by educating the campus community about the waste reduction hierarchy: reduce, reuse, recycle, rebuy. Not all the Rs are equal, but they are all important.

**Using Windows for Natural Ventilation:** In some buildings, the ability to open and close windows could provide another avenue for reducing cooling and heating costs – especially during Kentucky’s largely comfortable springs and falls months. It is important to allow manual window operation only in spaces where occupants have responsibility for the windows operation and accountability to make sure it is shut again. A carelessly left open window in a common area throughout a day or week could squander any other savings this strategy might create in other controlled areas of the campus. Open windows working against HVAC efforts is currently a common problem on campus.

**Reducing Automobile Commuter Travel:** Staff, faculty and commuter student travel to campus on a daily basis has a measurable and significant impact on the institution’s GHG emissions. On an individual basis, a single person driving a personal automobile a 10 or even 30 miles to get to campus does not seem like a lot. However, once a return trip is factored in and multiplied by the number of work or school days in a year’s time and then by the total number of staff, faculty, and commuter students, the number of miles driven quickly adds up. Thankfully, Transylvania is
a school with a residential rate that is over 80%, and many of the commuter students live within walking distance of campus and choose to do so. The university’s faculty and staff also tend to live near campus, especially compared to national commute averages. The high residential rate should be maintained or increased and the university should facilitate a continued proximity of faculty and staff as the university grows.

To reduce commuter mileage, the university needs to examine its parking policies, locations, and permit costs in such a way as to encourage no or low-carbon forms of transportation. Currently, there are very few inconveniences associated with campus use of a car. Parking lots are located throughout campus, so that you can park near wherever you need to go. Permits are free to faculty and staff, and only $35 per year for students. On the policy side, carpooling can be promoted as a way to save gas, reduce emissions and allow co-workers to visit. Incentives, such as prime parking or reduced cost passes, could be offered. Telecommuting is another option that should be explored. The university also needs to continue to promote biking as an alternative to cars by offering free, covered racks and other bike support services. The bike program could be expanded to include a free long-term bike loan for off-campus commuter students, faculty, and staff who forgo a parking permit. Free bus passes could also be offered to such individuals. Transylvania should also actively work with the city to continue the expansion of biking lanes and bus routes in and around downtown.

**Using Virtual Meeting Software:** Face-to-face time can be extremely important when networking and developing relationships. That said, new technologies increasingly allow this face-to-face time to be supplemented by virtual meetings. These new technologies mean that students, faculty, and staff can participate in regional, national, and international events, meetings, and other learning opportunities without needing to drive or fly to be physically present. Increasingly conferences offer a virtual option.

**Reducing Campus Fleet Idling:** Idling occurs when campus vehicles are left on while staff makes deliveries, meet to discuss issues or make inspections. Idling’s advantage is that it keeps vehicles warm and if diesel engines, they don’t have a lag being restarted. Idling should be limited where possible to reduce the loss of fuel.

**Reducing Vampire Loads:** Vampire load, also known as phantom load, is the energy consumed by electronics, even when they are turned off or in standby mode. Vampires include computers, printers, monitors, scanners, smart phones, tablets, and more. The increased use of such electronics has resulted in increased vampire loads. These loads can be combatted by unplugging electronics, strategically using smart strips, or strategic use of traditional power strips that are manually shut off at the end of the day or week.

**Evaluating Building Operations:** There are many simple operational changes that can result in reduced utility use. Adjusting operating hours for equipment, balancing systems for minimum outside air intake requirements, and maintaining a precise calibration of direct digital control systems are just a few examples of ways that Transylvania’s Physical Plant Department is working to reduce the campus’s GHG emissions.
**Using Natural Light:** People often habitually turn lights on when they enter a room. However, spaces with windows or skylights benefit from access to natural light. When natural light is sufficient to eliminate the need for artificial lighting, occupants should be encouraged to turn (or leave) the lights off. This behavior would be most effective in offices and residence hall rooms, where it isn’t cost effective to install occupancy sensors and where one or two individuals have responsibility for the space.

**Incentive Options:** To help incentivize these conservation strategies, the university can enact a number of programs. A few examples include:

- Hold an annual faculty, staff, and student feedback competitions with a cash or other type of value-oriented award to the individual or department that provides the best suggestion for reducing resource usage on campus. This strategy not only recruits and motivates individuals throughout campus to become involved in trying to spot resource inefficiencies, but also creates a pool of ideas and strategies that can be evaluated by the sustainability council for possible implementation.
- Utilize the energy meters that are set to be installed during the 2013-14 academic year for energy conservation competitions with the winning residence hall receiving a pizza party or other sort of prize. Such efforts can be expanded to water and other campus buildings as utility metering is expanded on campus.
- Offer down payment assistance for faculty and staff who choose to buy and live within a defined proximity of campus. This would have multiple benefits, including providing faculty and staff with assistance to buy a house while supporting a long-term commitment to stay at the university. Done well, this program could support the local neighborhoods near campus and help foster a good relationship between Transylvania and its community neighbors.

**4.1.2 Efficiency Strategies**

Efficiency strategies involve small to large capital investments in technologies that reduce utility usage and their associated emissions. These strategies may or may not involve the direct participation of the campus community. These types of strategies include lighting controls, water flow reduction technologies, digital thermostats, pump and fan motor variable speed drives, EnergyStar appliances, efficient equipment, a campus community bike program, a car share program, electric charging and alternative fuel pumps, automated shading, building monitoring, commissioned buildings, lighting upgrades, building envelope upgrades, strategic landscaping, LEED, HVAC upgrades and maintenance. These strategies are discussed briefly in the following narratives:

**Lighting Controls:** Lighting controls are technologies that automatically adapt the lights of a space without manual intervention. These controls include daylight sensors, motion sensors, and thermal sensors. A daylight sensor detects the amount of available natural light, and dims or turns off the artificial lights in response. Daylight sensors are ideal in spaces with large windows or skylights and in outdoor applications. Transylvania currently employs some daylight sensors on campus. Use of such sensors can be increased, and ones that are currently in place need to be set and used appropriately. A motion sensor turns a light on when motion is detected. After a pre-set amount of time has passed without motion, the sensor turns off the light. Transylvania
also employs the use of motion sensors, and would benefit from their expanded use. However, they need to be set appropriately to avoid damaging the bulbs with which they are associated. The life of a fluorescent light is reduced by constantly being turned on and off. (This is not a problem with LED lights, which should be taken into account when deciding which type of lighting to install in new buildings and renovations.) A thermal sensor is able to detect ambient temperature of spaces. If the space drops to a pre-set level, the sensor determines that people are not present, and turns of the lights. Many newer lighting control systems possess all three types of sensors combined. At a university, these sensors would have the greatest impact in shared spaces such as hallways, classrooms, recreational spaces, bathrooms, cafeterias, auditoriums, libraries stacks, and stairwells where no one person is responsible for adjusting the lighting levels. In such cases, the controls ensure the lights and their energy consumption are regulated as efficiently as the needs of the people using these spaces allow.

**Water Flow Reduction Technologies:** There is a large potential for reducing water consumption and saving money on campus by utilizing new technologies to replace sink aerators, showerheads in residence halls, and sprayers in kitchens with low-flow, high-pressure options. The utility and economic savings on each of these applications is increased by the fact that both hot and cold water flow through them. Low-flow showerheads were installed in the residence halls in 2011-2012.

Indoor applications that don’t have a hot-water component, like toilets and urinals, can also represent a significant savings. Toilets on campus are either 1.6 or 3.5gpf, and the standard for any new toilet is 1.28 gpf. Low-flow urinals are being considered. However, the payback period as projected by the investment grade audit makes that project a lower priority than other ECMs being considered.

Lawn and athletic field maintenance is another area of potential water conservation. Though the water applied to lawns and fields does not go to the wastewater treatment plan, these numbers were included in the GHG emissions report because there aren’t meters that would allow us to sort out indoor use from outdoor use. Additionally, conservation of water has benefits outside of the carbon footprint impact. Transylvania University employs many low-maintenance lawn care practices. Lawns and landscaping are rarely watered, though some water is used in the community garden. This water use is supplemented by water from five rain barrels attached to the garden shed. Athletic fields, however, may represent an area where significant water savings can be achieved without impacting the performance of the facilities.

Additionally, breakthroughs in ozone technology allow for reduced hot water consumption in industrial clothes washers by 85%. These washers should be considered for the new athletic facilities, and the payback for replacing the washers in Beck Recreation Center should be investigated. Upgrading the washers in the residence halls may also have a positive impact on water use.

**Digital Thermostats:** Like lighting controls, digital thermostats can be used to control shared spaces. Many digital thermostats can hold various set point levels for different temperature
schedules during the week, weekends and academic year. The more advanced thermostats can feed information back to central control areas for remote monitoring and control as well as advanced analysis of the different spaces throughout campus. Though Transylvania’s campus still has pneumatic controls in many of the buildings, there are also many areas where programmable thermostats are in use. In these spaces, Physical Plant can: control the range within which the temperature can be adjusted during operating hours; monitor temperature in the space; and set temperature schedules to minimize resource use during non-operating hours. Programmable thermostats will be installed in five additional buildings during the 2013-14 academic year.

**Building Air Change Controls:** For the health and safety of a building’s occupants and the proper functioning of interior equipment and material finishes, all buildings must have a constantly circulating source of outside air. This air is filter, and heated or cooled, depending on the time of year, to the desired temperature, circulated through the building, and is ultimately exhausted again. Depending on the building’s HVAC design, this air may also be humidified or dehumidified. Given the amount of heat and cooling required to condition the air for the building occupants, the energy impact of this process can be significant.

There first intervention for minimizing the energy impact of the building air changes is to ensure that the air change per minute is not too high. In other words, make sure that more air isn’t being introduced into the building than necessary. This can be adjusted without any capital investment, and would be another conservation measure to consider.

There are additional methods for minimizing the energy impact of building air changes, and Transylvania is employing or has plans to employ two of them. Transylvania has several energy recovery units (ERUs) on campus, specifically in Thomson Residence Hall, Brown Science Center, and Cowgill Center for Business, Economics, and Education. These ERUs “capture” some of the energy in the air that is being exhausted from the building and transfers it to the outside air that is being brought in. This changes the temperature of the incoming air to be closer to that of the desired building temperature, often by several degrees, greatly reducing the amount of energy needed to condition the outside air. Additional ERUs would further reduce Transylvania’s carbon footprint. The second method is one that Transylvania will implement during the 2013-14 in our main performance gym. To increase circulation in the gym, the university is going to install four Big Ass Fans. The air mixing will provide more uniform temperature control, aid in reducing the carbon dioxide levels, and will flatten the temperature distribution within the space, reducing the amount of outside air that needs to be brought into the space. This project will realize the majority of its utility savings during the heating season, though there will also be an impact during the cooling season.

**Pump and Fan Motor Variable Speed Drives:** New advances in motors and drives for pumps and fans have allowed for greater efficiency savings related to building HVAC systems. Older motor technologies, which are typical in our aging facilities, are of the constant speed design. The installation of variable frequency drives on older motors, or combined with newer motors where practical, will allow them to operate at reduced loads based on system demand. Variable speed
drive technology allows motors to throttle down or turn off when they are not needed relative to the load required. The ability of the variable speed drive to utilize less energy when less is needed can result in significant energy savings and reduce the wear and tear on the motor over its operating life. Transylvania employs the use of variable speed motors in several HVAC systems across campus, as well as in the new fume hoods in Brown Science Center. Expanded use of these technologies would further reduce the university’s utility consumption.

**EnergyStar Appliances:** The EnergyStar program has assisted both consumers and manufacturers with developing a trusted line of appliances that are more energy efficient than a conventional model. EnergyStar appliances run the gamut of appliance types and global manufacturers. Transylvania has an EnergyStar purchasing policy embedded in its energy policy. The university needs to self-audit to ensure that the EnergyStar policy is being followed. In addition to the savings inherent to EnergyStar products, incentives are available from KU for these types of purchases, which will help further reduce the initial investment.

**Efficient Equipment:** With changing technologies constantly improving the efficiency of equipment, purchasing agents should always take the time to shop around and compare the difference between initial capital outlay for equipment and the annual project utility consumption associated with its functioning. In many cases taking this lifecycle perspective on equipment purchases can greatly improve the efficiency of new equipment, saving the institution significantly in the long run. Beyond this, functionality and demand should be taken into account so that the university can get the most out of each dollar it spends. In other words, it may be more cost effective overall to purchase a more expensive piece of equipment that has additional functionalities that allow it to be used by more than one person or department.

**Campus Community Bike Program:** Many colleges, universities and cities have developed community bike programs. The bike programs focus on providing free bikes for use by campus community members. One college and university campuses, they are also often associated with a bike shop that maintains the loaner bikes but also is open to use by members of the campus community. These programs have been effective at promoting a culture of biking on campus. Transylvania has the Transy Bikes! program, which offers bikes for loan from the campus center and, starting in 2013-14, the library. Currently, loans on made on a daily basis only, though the program will be expanded to include semester long loans once the bike stock is increased. The loan program is supported by the student run Transy Bikes! Shop, which maintains the campus bike, helps campus community members maintain their own bikes, and promotes a culture of biking on campus through programming.

**Car Share Programs:** Car share programs allow individuals who don’t own a personal vehicle, or who don’t have one on campus, to sign up for a monthly membership and hourly usage rates for a community car. The most well-known example is Zip Car. To help promote the use of car sharing programs (or alternative vehicles), the university can provide preferential parking for easy access and exposure to the larger campus community.
**Electric Charging Stations & Alternative Fueling Pumps:** To assist in the promotion of alternative vehicles, the university could provide electric, natural gas or biofuel stations on or near campus. This would allow individuals wishing to explore these new forms of alternatively fueled vehicles to confidently have a place to refuel. It would also serve as a point of education for the larger community about how these fuel stations could work in a larger distribution. Transylvania could immediately offer an electric charging area, with preferential parking. Natural gas and biofuel options need to be explored.

**Automated Shading:** New technologies can be employed to automatically polarize glass windows of high solar gain at peak absorption in the summer and depolarize in the winter to maximize heat gain. Installation of polarized glass windows will have an even greater impact on utility use when they are installed to replace windows that are poorly insulated and/or have gaps that allow outside air in. Automated blinds or exterior louvers also can be employed to manage solar gain. These automated shading options eliminate the need to rely on individuals to make use of window shades in the most effective way.

**Building Monitoring:** Building monitoring technologies have improved drastically in the last two decades while their price has dropped significantly. With internet and router technologies, wireless monitoring has been an area of particularly significant growth, allowing for more systems to be monitored more easily and with simpler installation. New advances are proving that entire buildings can be fully monitored and calibrated constantly to ensure optimal performance in regards to the weather, fuel and electricity pricing, building usage requirements, and occupant comfort and needs. Transylvania has several buildings on monitoring systems already. In 2013-14, monitoring will expand to include electric meters for all residential areas on campus (except Hazelrigg, which is a mixed use building). This monitoring will be linked to a dashboard that will allow for real-time energy tracking by building residents, as well as Physical Plant staff. The information obtained using the monitors will support conservation competitions among the residence halls. Transylvania hopes to have all buildings monitored for electric and water.

**Commissioned Buildings:** Commissioning is a process in which a third party engineering vendor thoroughly checks a newly constructed or renovated building to ensure that it functions and is calibrated in accordance with the overall design. The construction of buildings is a complicated undertaking with many different contractors trying to complete their individual task on schedule and within budget. During this process, many small things can be overlooked, especially in how different types of building systems interact. Commissioning assesses the constructed building using a comprehensive, quantitative approach to ensure that the building functions properly and as efficiently as possible. Commissioning has come into mainstream practice over the last decade due primarily to the documented savings this additional verification process can contribute. Given that Transylvania plans to add significantly to its built space in the next seven years, through both new construction and major renovation, commissioning is a practice that the institution needs to seriously consider.
**Lighting Upgrades:** Replacing older lighting technologies with new technologies in fluorescent lighting and LED allows for significant savings in a building electricity usage, while greatly improving the lighting quality, bulb life, maintenance requirements, and overall performance of the lighting system. In many cases, lighting upgrades represent one of the fastest paybacks in energy efficiency strategies, as was indicated by the investment grade audit of campus. Transylvania upgraded lighting in nine campus buildings in 2011-12. Additional upgrades are planned, using both improved fluorescent and LED technologies. In the 2013-14, LED lighting will be installed in Beck’s performance and recreation gyms.

**Building Envelope Upgrades:** Infiltration of outside air into buildings is an often overlooked issue. Outside air can sneak into building through gaps in windows or doors, poorly sealed cracks, and inappropriately sealed material connections. This infiltration can have multiple impacts on the buildings operations. These impacts include the loss of conditioned air from the building, the introduction of moisture and unfiltered air into the building, and, depending on the design of the building, depressurization or pressurization of the building. Blower door tests are easy interventions that can quickly isolate the infiltration issues, which can typically by repaired inexpensively. Blower door tests and other analyses, such as thermal imaging, can assist in determining the quality and quantity of insulation in a building’s thermal envelope. Little, damaged, or no insulation can have a great impact on the ability of a building to retain heating and cooling and be comfortable for occupants.

Pepco evaluated buildings envelopes as part of their investment grade audit. As a result, several envelope improvements have been made across campus since 2010. These include replacing a set of exterior double doors at Brown Science Center. Work weather stripping, caulking joints, and sealing exterior building penetrations was conducted on a number of buildings. Another set of exterior double doors at Brown Science Center is set to be replaced later this fall.

**Strategic Landscaping:** Well-planned landscaping can have a significant impact on the energy consumption of buildings. Confer trees can act as year round wind buffers. Deciduous trees can provide some of the same benefits as automated shading by providing shade during the hot summer months and allowing for direct sunlight in the colder months, after the leaves have fallen off. Trees also improve the outdoor environment, providing environmental services related to water quality and uptake, shade for outdoor gathering spaces or learning areas, air quality improvements, and counter the urban heat island effect. All the benefits of trees, including those that would directly impact our university’s built environment, need to be considered as Transylvania considers its new campus plan.

**LEED:** Leadership in Energy & Environmental Design (LEED) is the most well-known and most commonly used green building standard in the United States. When LEED standards are considered from the beginning of the design process, LEED buildings cost the same as traditionally built buildings. In cases where the cost is slightly more upfront, the increased initial investment is quickly recovered through the efficiencies of the LEED building compared to a traditional one. The financial benefits of LEED standards have led to a growing number of states requiring that all new public buildings be built to LEED standards. This includes Kentucky.
Though the application process can be challenging, all the benefits that LEED certification bring to the building and its design – marketing, healthy internal environments, utility savings, reused materials, etc. – can be achieved without going through the formal application process. Transylvania has adopted policies that all new buildings and major renovations will be done to LEED silver standards or higher.

**HVAC Upgrades and Maintenance:** Many buildings on campus have heating and cooling equipment that is reaching the end of its lifecycle and can be upgraded to modern equivalents that are significantly more efficient. Several such projects were identified during the investment grade audit of campus. As a result, the boiler in one of the residence halls has been replaced, and replacement cooling towers are on order. Upgrades to several smaller HVAC systems around campus are planned.

Often, older duct work was not fully sealed when originally installed. New duct sealing products allows these ducts to be sealed properly, which greatly reduces the amount of lost air between the mechanical room and conditioned spaces while increasing air pressure in the system. This increased pressure allows conditioned air to better penetrate the whole system, providing more consistent temperature control within a building.

### 3.1.3 Renewables

In recent years, renewable energy has become a viable option for colleges and universities as they work to diversify their energy portfolios. Given the falling prices of renewables and the urgency to update our national grid with lower emission power options, many noted economists and energy experts believe renewables soon will be play a major role in how the United States and the rest of the world produce and consume energy. One major advantage over traditional power production is that renewables have an ability to be both centralized and decentralized in their deployment. Centralized renewable energy is similar to traditional power production, where it is created in large industrial facilities hundreds, potentially thousands, of miles away from where it is ultimately used. Decentralized renewable power is created onsite, and transmitted directly to the required energy need. There are challenges with renewables at both the centralized and decentralized level, but these are quickly being resolved. The following sections analyze renewable opportunities at both the offsite (centralized) and onsite (decentralized) levels.

**Offsite Renewables:** Offsite renewable options include creative partnerships with regional, national and international entities and organizations that can provide energy or the benefits of renewable energy to Transylvania. A few options include community solar programs, power purchase agreements, renewable energy hedges, and biofuel and biogas partnerships.

- **Community Solar Lease Program:** Solar PV has seen drastic reductions in cost in recent years. Even at these lower costs, economies of scale can be a factor. Instead of the cost of installing many separate systems on many different rooftops, new programs are being developed that support the development of a large array, allowing individual households and businesses to purchase leases on the panel system for long-term contracts. This approach shifts the initial capital outlay for the panels away from...
residents and businesses, and to the developer of the panels. Berea, in partnership with the Mountain Association for Community Economic Development (MACED), recently setup Kentucky’s first community solar lease program through Berea’s local Municipal Utility (Muni). The leases sold out in the first 24 hours and the partnership is already working to setup a second array to meet Berea customer demand. The local Muni serves as the payment agent, by way of either crediting or debiting each participant’s utility bill based on the energy produced from the system each month. In productive months the residents are saving money on their utility bills. In other months, they pay a little extra to cover the cost of the panels. Transylvania could potentially develop, or be involved with, a similar program in Lexington.

- **Power Purchase Agreement**: Power purchase agreements (PPAs) are contractual arrangements directly with the producer of centralized power. The PPA will set complex terms related to pricing, length of commitment, and amount of power supplied. Direct PPAs are not currently legal in Kentucky. Instead of directly developing a PPA with an energy producer, Transylvania is currently required to purchase power from KU which has PPAs with different generators throughout the region and therefore serves as an intermediary. Though not legal today, it is worth keeping an eye on the state policy front for potential opportunities in the future. A change in the legal framework could benefit all the ACUPCC signatories in the state, as well as other entities interested in diversifying their power portfolio to include renewables.

- **Energy Hedges**: A potential alternative to a formal PPA might be to purchase renewable energy hedges. A hedge is a financial arrangement between two parties based on an agreed upon amount for a commodity for a defined period of time. If the commodity price goes up, one of the parties compensates the other. If the commodity price goes down, the compensation flows in the other direction. Since an energy hedge would not be a purchase of power, only a hedge on the price of purchased power, it would not conflict with Kentucky’s regulatory power purchase laws. A renewable energy hedge would also let that power’s green attributes be part of the transaction cost. To date, the writers of the plan are only aware of one renewable hedge service offering available. Iberdrola Renewables, the 4th largest utility in the world and 2nd largest wind developer in the United State, has a wind hedge offering that could potentially be utilized by Transylvania to not only green a large portion of its annual consumption, but lock in a long-term fixed rate for electricity prices at near today’s rate. The Iberdrola hedges can also come with the renewable energy attributes of the regional wind farm hedged against. Recently the Ohio State University entered into a similar deal with Iberdrola representing 25% of all its annual power consumption over 20 years. The university is projecting a significant financial savings from to the deal.

- **Biofuels Partnership**: Biofuels are derived from replenishable, non-fossil fuel based sources. These fuels can be blended with traditional diesel fuel, making up anywhere
from 20 – 80% of the mix, with minor modifications to a diesel engine. Ethanol also can be used in specially designed flex fuel vehicles that are very similar to gasoline systems. Biodiesel is derived from vegetable or animal fats. Potential feedstocks include soybeans, coconut, algae, and flax. Ethanol is derived from vegetable-based sugars, sourced from a variety of plants including corn, potatoes, and sugar cane. Refined biofuels can be purchased from manufacturers or distributors. They can also be obtained locally from sources of waste food oil (fast food restaurants) or through a community oil collection and refinement co-op, similar to the one in Louisville.

- **Biogas Partnership:** Biogas is an organic methane product that can be combusted in a manner similar to that of natural gas. Biogas is a byproduct of landfills, wastewater treatment plants, and livestock farms. Until recently, this byproduct was typically emitted as methane (CH₄), or it was flared (burned) and emitted as carbon dioxide (CO₂). It is becoming increasingly common for biogas emitters to capture the gas to sell or convert to electricity. Transylvania could develop a partnership with a biogas generating entity in the development of a biogas to energy project. Such an investment could be a cost effective way for the university to help a local business reduce its emissions while greening Transylvania’s own energy portfolio.

**Onsite Renewables:** Onsite renewable options include solar PV, geothermal, solar thermal and micro wind:

- **Solar PV:** Solar Photovoltaic (PV) is quickly becoming the most dominate renewable new source of onsite renewable energy technology in the world. With the dramatic fall in prices over the last decade, solar PV is cost competitive in a number of states when compared with new centralized coal or natural gas production. Most projections suggest that solar PV will be the cheapest form of electricity available in the next five to ten years. These projections are good news for emission reductions goals, given that solar PV panels have a long operating life, upwards of 40 years, during which they passively create electricity with no greenhouse gas emissions. The current challenges with solar are the large roof area required to power a building and the limitation of power generation to daylight hours. Technology is working to address the space problem with solar paints, stacked solar cells, and new solar materials that are more efficient per square inch. The daylight generation issue is being addressed by major advances in new battery technologies, which would allow energy produced during the day to be stored for when it is needed at night. Generally, peak energy usage hours occur during the day, so this latter problem is less pressing than the former. Transylvania is currently exploring options for a solar PV pilot on campus.

- **Geothermal:** Geothermal HVAC is a method by which the latent and constant temperature of the earth is used to heat and cool buildings. This approach greatly reduces or eliminates heating and cooling and hot water energy needs. Electricity is only required to power the pumps and fans that regulated the system and for auxiliary
heating in the coldest days of winter. Geothermal technologies have been around for decades, but it is only relatively recently that this technology has been seen as a viable renewable energy source for individual buildings and clusters of buildings. Transylvania has two different geothermal systems on campus, one in Thomson Residence Hall and the other in the Glenn Building. The university’s experience with both these systems has been positive; they are low maintenance and the buildings with which they are associated have significantly lower energy demands than other comparable buildings.

- **Solar Thermal**: Like solar PV, solar thermal is well-tested technology that makes financial sense in many applications. Unlike PV, solar thermal is fairly straightforward. A series of tubes in a panel box on the roof circulates water or other fluids to collect heat from the sun. This heat is used as preheat for a conventional boiler or water heater. Solar thermal could be used on new buildings or retrofitted on existing buildings where the layout of the mechanical spaces and needs of the building are compatible with this technology.

### 3.1.4 Carbon Offsets

Climate change is a global issue in large part due to the fact that greenhouse gas emissions are rapidly dispersed and absorbed throughout the global atmosphere. So, in essence, a MTCO₂e reduced one place in the world is equivalent to one emitted anywhere else. Carbon offsets are simply a process in which one entity that is not in a position to directly reduce their emissions works with another entity to reduce emissions on their behalf.

Some offsets involve payment to the entity reducing emissions on behalf of another. This payment is one critical requirement for what is called additionality. Beyond payment for the offset, standards of additionality require that the offset reductions are not purely market driven, not business as usual, and are not mandated by a state or federal regulatory requirement. In other words, the offset must take place as a direct result of the payment. The project cannot be fully profitable without the sales of the offset. Otherwise, the buyer is not contributing to an actual reduction in emissions, and could not legitimately receive credit. For an offset, the emissions would still be taking place without the payment. Otherwise, the validity of the offset can be called into question. Additional offsets must also be verified by a developed carbon offset standard and annually verified by a third party entity.

Offsets outside of these parameters are referred to as non-additional offsets. Non-additional offsets can be claimed by an entity that is creating emission reductions not directly associated with its operations. These offsets are not legally recognized by national organizations as offsets. Below, these topics will be discussed in more depth.

**Community Offset Development (Non-additional)**: Non-additional offsets provide an opportunity for Transylvania to mitigate its GHG emissions while furthering its education, community engagement, and community service goals. Similar to the biogas partnership model in the previous section, Transylvania could form partnerships with local entities that are working to improve the efficiency of low income housing or installing renewable power options. Through benefiting local residents by providing renewable energy options or better insulated
homes, Transylvania could mitigate its GHG emissions by claiming the emission reductions generated by these projects. Since Transylvania is not under a regulated market requiring GHG emission reductions, it does not matter that these efforts would not be nationally recognized offsets. In fact, it could be argued that these locally developed offsets are as valid as any carbon offset purchased nationally or internationally, as long as the methodology used to evaluate the emission reductions was well developed. Transylvania would prioritize the use of non-additional offsets over the purchase of additional offsets given the educational and community benefits that could be achieved in concurrence with the emission reduction efforts.

**Carbon Offset Purchase (Additional):** When choosing offsets, it is important to understand the distinction between offsets and Renewable Energy Credits. They are similar, and many energy generation sources that produce RECs could also produce carbon offsets if they chose – being careful not to double count. The key is additionality. A renewable energy generator is not required to prove additionality when developing RECs. In other words, offsets are associated with emission reductions that would not happen without the investment from the offsetting entity. RECs, on the other hand, represent the renewable character of energy produced that may have been produced regardless of the purchasing entity’s investment (more on RECs below).

There are a number of basic parameters to keep in mind when purchasing offsets. The first is that offsets are only applicable to one 12 month period, which means they must be continually purchased to maintain the emission reducing benefits. Second, offsets can vary greatly in quality and degree of integrity. This overall dependency has a huge impact on the cost of offsets which can range from $0.10 to $15 a MTCO2e. The placement of an offset’s cost within this range is typically determined by whether it is developed by a standards entity operating in a regulatory or voluntary market. There are a variety of standards entities that are developing offsets around the world. The two most respected standards entities in the United States are the California Action Registry (CAR) and the Voluntary Carbon Standard (VCS).

Local offsets can provide additional investments in the local community. This is true for additional and non-additional offsets. When purchasing additional offset, they should be developed by a reputable entity using a reputable standard and verified by reputable third party from a regulatory market, such as CAR. Given that Kentucky is not in a regulatory environment, the voluntary market, such as VCS, would also be an acceptable offsetting option.

### 3.1.5 RECs

Renewable energy credits (RECs) represent the green attributes associated with the production of electricity by renewables sources of generation. These sources typically include: wind, solar, hydro, biomass and biogas. RECs can be bought from anywhere. To prevent double selling, they are assigned unique product codes. As discussed above, RECs are intended to reduce emissions associated with electricity usage. RECs are not usable for offsetting any other sources of greenhouse gas emissions due to issues of additionality. This means that RECs cannot be used to offset flights or commuter travel. RECs are a way to assign green attributes to purchased energy, thereby mitigating the purchasing entity’s carbon footprint. In other words, RECs can be used to negate the emissions associated with the
purchase of electricity produced using fossil fuels, which is the leading source of GHG emissions in Transylvania’s emissions profile. Though RECs would be an acceptable method for reducing the institutions carbon footprint, it is not a preferred one. Transylvania believes that RECs should be purchased as a last resort in our efforts to achieve carbon neutrality.

3.2 Intensity Targets

One useful lens for thinking about emission reductions is intensity of emissions as opposed to total emissions reduced. As evidenced in Chapter 2, the university is not an isolated entity with complete control of its emissions. It is a dynamic institution which is deeply dependent on factors at the state, regional, national, and global level, as well as the individual needs of its students, faculty and staff. For instance, if KU continues to drastically scale back its use of coal in favor of natural gas, Transylvania’s carbon footprint will dramatically decrease through no action of its own. At the same time, Transylvania has determined it is in the institution’s best interest to increase student enrollment by 50% by 2020. Square footage on campus will need to increase accordingly. This goal will increase revenue for the university and help further its educational mission. However, if this expansion is not strategically implemented with greenhouse gas emissions in mind, it could greatly increase Transylvania’s carbon footprint. In the context of this projected growth, considering the emissions per student or per square footage of campus space is a good method to gauge the overall success of expansion efforts in relation to the institution’s carbon neutrality goal. The following sections breakdown the historic intensity emissions of the university using these categories, and outlines intensity targets for the future based on the emission reduction goals set by Transylvania.

3.2.1 Student Population Intensity Target

In 2009, Transylvania’s student population was 1,117 with a greenhouse gas emission footprint of 10,633 MTCO$_2$e. This means that 9.5 MTCO$_2$e were generated per student. The chart on the following page shows what 2010 – 2012 historic trends were, along with future intensity targets that need to be met so that Transylvania can grow its student population while achieving its stated GHG emission goals, which include reaching carbon neutrality by 2040.
### 3.2.2 Square Footage Intensity Targets

In 2009, Transylvania’s total building square footage was 821,108. Given the 2009 greenhouse gas emission footprint of 10,633 MTCO$_2$e, 0.013 MTCO$_2$e were generated per square foot of built space on the university’s campus. The chart below shows historic trends for 2010 – 2012 along with future intensity targets that must be met for Transylvania to grow its building square footage while achieving its stated GHG emission goals, which include reaching carbon neutrality by 2040.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Students</th>
<th>MTCO$_2$e per Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1,117</td>
<td>9.5</td>
</tr>
<tr>
<td>2010</td>
<td>1,071</td>
<td>9.6</td>
</tr>
<tr>
<td>2011</td>
<td>1,065</td>
<td>8.9</td>
</tr>
<tr>
<td>2012</td>
<td>990</td>
<td>8.2</td>
</tr>
<tr>
<td>2013</td>
<td>1,029</td>
<td>8.0</td>
</tr>
<tr>
<td>2014</td>
<td>1,096</td>
<td>7.5</td>
</tr>
<tr>
<td>2015</td>
<td>1,164</td>
<td>7.1</td>
</tr>
<tr>
<td>2020</td>
<td>1,500</td>
<td>5.7</td>
</tr>
<tr>
<td>2030</td>
<td>2,000</td>
<td>1.6</td>
</tr>
<tr>
<td>2040</td>
<td>2,500</td>
<td>0</td>
</tr>
</tbody>
</table>

### 3.3 Mitigation Strategies Reduction Chart

For mitigation strategies, each category has a generally accepted rule of thumb emission reduction potential. If employed strategically and comprehensively, it is projected that the mitigation categories will have the following impact: Conservation Measures 10%, Efficiency Measures 30%, Renewable Energy 50%, Offsets 5%, and RECs 5%. These are general estimates. The university will need to quantitatively determine the potential long-term costs and savings of the specific strategies in dialogue with key stakeholders. Such analyses are beyond the scope of this climate action plan. For now, the
generalizations outlined above together with Transylvania’s emission reduction and campus growth targets, suggests the following trends.

In examining the above chart, it becomes clear that Transylvania is poised on the edge of a major change in the size of its campus related emissions. This change is due to the university’s goal of greatly increasing the size of its student population (~500 additional students per decade) and, correspondingly, its total building square footage. In the last 4 years, the university has clearly worked hard on GHG mitigation efforts in order to achieve a 23.4% reduction in emissions. Given Transylvania’s growth goals, however, this footprint size cannot remain on the same downward trajectory unless aggressive action is taken to fully integrate GHG mitigation strategies into planning tools for the campus’s growth. As the chart also demonstrates, campus growth can be compatible with carbon footprint reductions, resulting in climate neutrality by 2040. This balancing act will not be easy, but it is possible. In fact, the campus’s growth can been seen as the perfect opportunity to tackle emission reductions. The planning and design phase of renovation and construction projects is the perfect time to address emissions associated with the built environment, and the built environment is the driving force behind Transylvania’s carbon footprint. The value of conservation and energy efficiency has already been demonstrated over the last four years. The university can save money while reducing the size of its emission footprint. Now the task is to continue this work.
5. Financing the Plan

The conservation measures, efficiency projects, and alternative on-campus generation opportunities discussed in the previous section provide a method for reducing the existing costs and emissions associated with campus operations, while at the same time providing case studies and demonstration projects for renovations and future construction. When considering these strategies, it is essential to quantify not only their GHG emission impact but also their short, medium and long-term financial impacts. All of the proposed projects will require financial outlay, though the benefits of thoughtful implementation of the mitigation strategies will reap returns worthy of the initial investment.

Transylvania has ambitious plans to increase enrollment by 50% over the next seven years. This growth in the student body will require a similar growth in the campus’s building stock, which will necessitate significant capital investments in renovations and new buildings. These capital expenditures represent an opportunity to make strategic decisions that will have a deciding impact on the size and configuration of Transylvania’s carbon footprint and utility expenditures for years to come. Transylvania has already taken steps to ensure this growth takes place in a thoughtful manner, with an energy policy that states all new buildings will be constructed to LEED silver standards or higher and the university’s strategic plan stating that major renovations will be done to LEED silver standards or higher. In addition to new investments resulting from campus growth, general capital project funds will continue to be invested in energy conservation measures that were recommended as a result of the investment grade audit or that are identified by Transylvania’s Physical Plant as priorities due to equipment needs and opportunities.

Transylvania will also be able to fund its GHG reduction efforts through the Green Revolving Loan Fund, established with a $75,000 grant from the Jesse Ball duPont fund and a match of $75,000 from the university’s unrestricted endowment. Transylvania aims to raise an additional $150,000 through efforts headed up by the university’s development office. A first round of projects, totaling over $140,000 with an average anticipated payback period of 2.2 years, has already been approved by the Green Revolving Loan committee and the Buildings and Grounds Committee of the Board of Trustees.

This vision outlined in this climate action plan is greater than the current staff, students and faculty – it also involves future community members as well as past ones. Specific GHG reduction projects and initiatives, such as the Green Revolving Loan Fund, will serve as an important tool in soliciting donations from Transylvania alumni and other friends of the institution who are interested in supporting the university’s environmental and sustainability efforts. In-kind donations will also play a key role in helping the university meet its goals. The opportunities here are many, including the donation of solar panels (or other alternative energy technologies) that would allow Transylvania to produce its own energy, alternative fuel vehicles for university transportation, or forestland for carbon sequestration.

As is evidenced by the Green Revolving Loan projects, as well as many of the energy conservation measures presented by Pepco Energy Services after the investment grade audit of campus, many of the conservation and efficiency projects can have a high rate of return on investments. In fact, the return on investment may be superior to that of general investment practices undertaken by the institution. Therefore, Transylvania may consider adopting guidelines for the use of general endowment funds to finance GHG mitigation projects when the initial investment can be recouped in a relatively short period.
of time and the savings will continue for a period of several years beyond that. Such investments should be considered only when adequate safeguards can be put in place to minimize risk to general endowment funds.

Another tool under consideration is a student sustainability fee. Many of our peer institutions, including Centre College, (insert others) and our neighbor, the University of Kentucky, levy a student sustainability fee or green fee. In many cases, as at Centre, faculty and staff are also given the choice to contribute. The use of these funds varies from campus to campus, though in many cases the funds are used in whole or in part to fund GHG mitigation projects, invest in offsets, or purchase renewable energy credits (RECs).

There are a number of potential external funding sources that could be used to support GHG mitigation projects. Education and research grants are available for GHG mitigation-focused research, teaching, and internships. Federal, regional, state, and foundation-associated entities are interested in supporting community redevelopment. Transylvania is well-positioned to take the lead on such efforts, and use the opportunity to generate service-learning experiences and rigorous academic case studies. GHG mitigation that thoughtfully engages the community may also attract the interest of community partners and social impact investors. Transylvania’s academic reputation and on-campus expertise would be helpful in attracting charitable organizations interested in utilizing the university as a conduit for their work in the larger community.

Many colleges and universities employ performance contracting to fund efficiency projects. Performance contracting is an agreement with an outside party that they will front the costs for efficiency projects. This investment is paid back through the savings realized as a result of the project. Usually, companies that front the costs associated with performance contracts are also responsible for the audit that leads to the project recommendations and projected payback periods. These companies often guarantee savings over time. Transylvania considered this option when the investment grade audit of campus was conducted. However, it was determined that Transylvania would be able to implement the projects at a much lower cost than what would have been achieved through the performance contract, making it preferable to self-fund the projects upfront. Performance contracting has been a loop hole around barriers to facility improvements for some schools, but Transylvania isn’t subject to the political red tape and restrictions that often limit projects at public institutions.
6. Conclusions & Next Steps

This climate action plan outlines recent progress on campus with respect to greenhouse gas mitigation efforts and provides insight into the central issues and opportunities for Transylvania to reach carbon neutrality. In the process of striving toward the goal of carbon neutrality, Transylvania will be able to grow in its service to its students and the broader community while reinforcing its role as a leader in education and sustainability. To accomplish this, the climate plan needs to be internalized in all aspects of campus life: operations, academics and scholarship, and student life. This cannot be treated as a plan for the sustainability office or for physical plant; it is a plan for the entire campus community.

Thankfully, the campus community, in spirit and action, has embraced past efforts related to climate neutrality and sustainability. The students engage with the sustainability office not only through passive participation in events but also active volunteerism, internships, work study and other demonstrations of leadership and initiative. Over one quarter of the faculty have completed a week-long workshop on sustainability, and even more have participated in reading groups, retreats, and planned discussions and/or incorporated sustainability into their courses. Staff members contribute in a variety of ways related to their many roles across campus. Examples include:

- IT serving as a national leader in use of thin clients, reducing energy use, e-waste, and staff time required for computer lab maintenance, while increasing computer lab/classroom comfort
- Accounting leading campus efforts to reduce paper consumption in office operations by transitioning to online purchase orders, increasing the number of forms that are online and can be submitted electronically, offering senior loan counseling information exclusively online, and partnering with the Dean of Students and Admissions to significantly reduce the number of mailings sent to incoming students and their families
- The Office of Community Service and Civic Engagement partnering with organizations from throughout Lexington on innumerable events related to sustainability including winterizing homes in the community, a neighborhood cleanup, maintaining a local community garden, and planting trees
- Food service increasing their use of locally sourced foods, partnering with Seedleaf, a local non-profit focused on community gardens, to compost pre-consumer waste, and hosting no waste events like the Back to School picnic
- Health and Wellness for co-sponsoring events like Bike to Work Day, the Big Green Get Around, and the Unplugged Health and Wellness Fair

All evidence suggests that this campus-wide spirit of good will and team effort will be transferred to the climate action plan.

Next steps will include fostering community engagement specific to the plan, implementing planned conservation and efficiency projects, and pursuing options for on-campus renewables. A conservation coordinators program will be launched in fall 2013. These coordinators, one per academic or administrative building, and one per hall in residential buildings, will work closely with the sustainability office and physical plant to identify maintenance concerns, behavior-based problem areas (e.g., lights
consistently left on in a lobby, showers left running to create “steam room”), support recycling efforts, and engage their peers. These volunteers will also complete a Green Storm of their hall/building once each semester (see appendix 8). A transportation committee will be also be instituted this fall to explore how to increase access to shared modes of transportation, reduce car traffic on campus, and encourage no or low carbon forms of travel. The final climate action plan will be shared with the President’s Council on Sustainability, and work groups will be assigned for priority tasks. The conservation and efficiency projects with funding already approved from the capital projects or Green Revolving Loan funds will be executed. These projects include programmable thermostats for five buildings, lighting upgrades and fans in our athletic and recreation building, and electric meters for residential buildings. Last, Transylvania will continue to pursue options for installing a solar pilot project on campus, in hopes that the funding mechanism will serve as a successful model that will greatly impact our campus and that can be shared with other colleges and universities.

With continued strong leadership and cooperation across campus, Transylvania University is capable of reaching the milestones presented in this climate action plan. It is acknowledged, however, that many changes in operations and opportunities will occur over the next few decades. These changes will require a regular revisiting of the visions and strategies outlined in this document to ensure that Transylvania is living up to the spirit of the ACUPCC while fulfilling its mission as a leading liberal arts institution.
Appendix 1: Sustainability Master Plan
Executive Summary

Shortly after assuming the role of president, R. Owen Williams approved the creation of the President’s Council on Sustainability, made up of student, faculty, and staff representatives. This council is the driving force behind sustainability on Transylvania University’s campus, making recommendations to the president and ensuring that adopted recommendations are carried out. As directed by President Williams, fostering active, socially responsible students is central to the council’s efforts.

The first major task of the President’s Council on Sustainability was to develop and recommend a sustainability master plan. With input from the campus community, the council created a sustainability framework during the 2010-11 academic year. This framework consists of eight visions for sustainability on Transylvania’s campus, each supported by a set of three to five strategies. The strategies are presented in prioritized order, as determined by a vote of the full council and other work group participants on April 26, 2011.

The complete master plan will consist of this framework plus detailed action plans that identify step by step what needs to be done to implement the strategies. Each vision has a work group that will be responsible for writing and implementing the action plans. As action plans are written, links to them will be added to this document.
What is Sustainability?

Sustainability is often associated with environmentalism. While environmental considerations are an important component of sustainability, economic and social considerations must also be taken into account. These factors are known as the three pillars of sustainability.

Visually, sustainability is often represented as a Venn diagram, with sustainability being the area where the three pillars overlap, or as a set of nesting circles with economy within society, and both within the environment.

Though the role of the three pillars is widely acknowledged, there are many answers to the question, “What is sustainability?” Therefore, Transylvania has adopted a specific definition of the term:

At Transylvania University, sustainability refers to the capacity of society to meet its needs without degrading the interrelated environmental, social, and economic systems on which future generations of all species will rely.

Mission Statement

Transylvania University affirms sustainability as a core value and integrates it into the intellectual and social life of students, faculty, and staff by encouraging study, discussion, and participation in sustainable practices on campus and in the community.

Student volunteers wore rain drops containing answers to the rain drop scavenger hunt, part of the Town Branch Tuesdays campaign in May 2011.
**Important Terms**

**Sustainability Master Plan**—The complete sustainability master plan will include visions about sustainability at Transylvania, strategies for achieving each of these visions, and an action plan for carrying out each strategy.

**Sustainability Master Plan Framework** or **Framework**—The framework consists of the visions and their supporting strategies.

**Vision**—A vision is a broad, ambitious—but realistic—goal. When the council engaged in the visioning process, they were encouraged to think big, imagining how a sustainable Transylvania would look and what a sustainable Transylvania would do.

**Strategy**—Strategies are initiatives Transylvania must implement to reach its vision. They are time framed (two to five years) toward a specific vision, and action plans will be developed around them. Strategies will not necessarily be completed in two to five years, but the council will revisit all of them at least every five years to make sure they are still appropriate.

**Task**—Tasks are the specific activities or actions that will help Transylvania carry out a strategy. The tasks included in the master plan will be revisited every year or two.

**Action Plan**—Each strategy in the master plan will have an associated action plan that outlines in detail the tasks that need to be completed in order to successfully carry out that strategy. For each task, the action plan includes:
- A timeline for completion
- Identification of resources needed
- A person responsible for ensuring that the step is successfully carried out according to the timeline

The action plans will also include suggested metrics for evaluating the success of the tasks (when appropriate) and strategies. Work groups will be responsible for writing and implementing these action plans. As they are written, links will be added to this document.

**President’s Council on Sustainability** or **Sustainability Council** or **Council**—The council serves as the driving force behind sustainability on Transylvania University's campus, making recommendations to the president and ensuring that adopted recommendations are carried out successfully.

**Work Group**—Each vision has an associated work group that is responsible for writing and implementing the action plans, as well as conducting assessment associated with their vision. Work groups are made up of council members and non-members. People are allowed to serve on only one work group.

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The Glenn Building is heated and cooled by an efficient geothermal system.
Developing the Sustainability Master Plan Framework: A Detailed Timeline

- **August 24, 2010:** A staff workshop focuses on sustainability, with 112 participants identifying ways they would like to see Transylvania become a more sustainable institution.
- **September 6, 2010:** As part of orientation, 316 incoming students brainstorm about sustainability initiatives they would like to see in place before they graduate.
- **September 11, 2010:** President Williams approves the creation of the President’s Council on Sustainability.
- **October 6, 2010:** At a student sustainability workshop, 35 students identified ways they would like to see Transylvania become a more sustainable institution.
- **October 11-19, 2010:** In a faculty survey on sustainability, 12 faculty members identify ways they would like to see Transylvania become a more sustainable institution.
- **October 19, 2010:** The President’s Council on Sustainability convenes for the first time with 18 of the 19 members present. The meeting focuses on establishing the role of the council, discussing why sustainability is important to Transylvania, and defining sustainability.
- **November 11, 2010:** A Sustainability Council meeting focuses on identifying broad institutional goals, resulting in 11 visions.
- **November 29, 2010:** Representatives of the council meet with President Williams to discuss the sustainability visions as they had been conceived thus far. Some visions are rephrased and consolidated, resulting in an eight-vision plan.
- **January 7, 2011:** Council meeting focused on brainstorming ways to achieve the visions.
- **January and February 2011:** Visions, along with suggested methods for achieving them, are shared with the Transylvania community through Moodle and a series of open meetings. These documents include all ideas generated by the council as well as those resulting from the staff workshop, orientation sessions, student workshop, and faculty survey.
- **March 2011:** Visions are restructured and a work group is created for each vision. Work groups are tasked with suggesting a concise list of strategies for achieving their vision. All council members plus 10 other students, faculty, and staff serve on the work groups.
- **April 26, 2011:** The council meets to review and prioritize strategies suggested by the work groups. An outside consultant facilitates this process and helps the group write action plans for each strategy. All work group participants are invited to the meeting.
- **September 2011:** The Sustainability Master Plan Framework is officially rolled out.
- **December 2011:** Action plans for all strategies are due.

Students invited the campus community to sample pies they made with local ingredients.
CURRICULUM

Vision 1: Integrate sustainability across the curriculum.
It is essential that all students leave Transylvania University with a deep understanding of sustainability and the complexities of sustainability issues. To accomplish this, students need to encounter sustainability from the perspective of multiple disciplines and in an interdisciplinary way throughout their educational experience at Transylvania.

Strategy 1.1: Integrate sustainability into existing classes.
Strategy 1.2: Develop a sustainability major with a track for each pillar (environmental, social, and economic).
Strategy 1.3: Increase opportunities for experiential education around issues of sustainability.

Highlights:
• Twenty-four faculty members have participated in Transylvania’s Sustainability Across the Curriculum Workshop. This represents 25 percent of Transylvania’s faculty with participants from nearly all of the university’s departments.
• Transylvania offers an interdisciplinary environmental studies minor, and several students have created their own environmental studies major.

CULTURE

Vision 2: Instill a culture of sustainability throughout campus.
Sustainability is largely about individual choices; therefore, Transylvania University cannot be a sustainable institution without fostering a culture of sustainability among students, faculty, and staff. The hope is that this culture will extend beyond our campus.

Strategy 2.1: Encourage reduced energy consumption.
Strategy 2.2: Encourage waste reduction.
Strategy 2.3: Encourage no/low carbon forms of transportation.
Strategy 2.4: Encourage water stewardship.

Highlights:
• Transy Unplugged is held annually in October to encourage reduced energy consumption. The campaign highlights ways to reduce energy use on campus and provides practical ways these lessons can be applied to life off campus. It includes energy conservation pledges, self-audits, and events ranging from candlelight dinners to an energy expo to a film screening. “Last Out? Lights Off.” switchplate stickers were put up throughout campus as part of this campaign in 2010-11 and are available on a continual basis.
In the fall of 2010, a work-study position of waste and recycling coordinator was created through the sustainability office. This position is responsible for improving the Rosie (blue bin) recycling program and other waste diversion projects.

- Recycling bins are available in every residential room on campus, and each building has an active recycling program.
- Two outdoor recycling bins were added to campus in the 2010-11 school year.
- Battery, ink cartridge, small electronic, and TerraCycling recycling programs were made available to the campus community through the sustainability office in 2010-11.
- Transylvania has a free bike loan program open to students, faculty, and staff. These bikes are available for checkout from the Campus Center front desk.
- Two no/low carbon transportation work-study positions were created for the 2011-12 academic year. In the Campus Center, the bike program manager promotes the bike loan program and maintains the campus-owned bikes. In the sustainability office, the sustainable transportation liaison promotes walking and biking on and around campus as well as use of the LexTran system and carpooling.
- A bike repair shop will open on campus during the 2011-12 academic year. This is where bikes in the campus loan program will be maintained. Students, faculty, and staff can also use the space to repair their own bikes.
- Several guided LexTran trips are planned for 2011-12 to help people become familiar with the system.
- In response to increased demand for bike parking, an indoor bike rack and two outdoor bike shelters are being added to campus for the 2011-12 academic year.
- A Guide to Getting Around Green that provides an overview of LexTran bus stops and routes catered to the campus community, as well as information on biking and walking in the area around campus, is being developed.
- As part of a service learning project for a 2011 May term class, stickers encouraging students to fully turn off faucets and showers were placed in several of the residential halls. Due to the popularity of this campaign, the sustainability office plans to order more stickers for placement throughout campus in 2011-12.
- During May term 2011, the sustainability office held a month-long campaign on water stewardship, focusing on the Town Branch watershed. Each Tuesday an experiential learning event was held for faculty, staff, and students. The campaign included weekly Town Branch Tuesday facts, a raindrop scavenger hunt, storm drain painting, a progressive lunch garden party, and a water festival.
- Through the sustainability office, programs encouraging students to engage in the community in a sustainable manner were presented during New Student Orientation. These included a walk to the Lexington Farmers Market and a LexTran bus trip.
BUILDINGS

Vision 3: Manage, renovate, and construct buildings sustainably.

Transylvania currently has 824,108 square feet of indoor space. It is important that we manage these spaces sustainably and in a way that encourages those who live, work, and/or learn in them to make sustainable decisions. Many of the buildings and building systems are older, so investments will be made to make them more sustainable. Generally, these renovations will pay for themselves over time. New buildings will be constructed with the principles of sustainability in mind.

Strategy 3.1: Renovate existing buildings to be more sustainable.
Strategy 3.2: Manage buildings sustainably.
Strategy 3.3: Educate the Transylvania community about building sustainability.
Strategy 3.4: Construct new buildings sustainably.

Highlights:

• An in-depth energy audit conducted in 2010 led to a series of recommendations that are projected to result in a 19.7 percent reduction in annual energy consumption: 1,413,300 kilowatt hours of electricity and 22,634 therms of natural gas each year. These projects will also save millions of gallons of water each year.
• As a result of the energy audit, $500,000 worth of renovations are in store for the 2011-12 fiscal year.
  Those completed include:
  • Installation of a new water source chiller for the Campus Center general air unit.
  • Replacement of a hot water boiler in Poole Residence Hall with two new high-efficiency hot water heating boilers.
  • Conversion of all showerheads to low flow heads
  Renovations underway include:
  • Lighting retrofit in 10 academic, administrative, and residential facilities, which began on September 12, 2011. Phase 2 of the retrofit is expected to be implemented in the 2012-13 fiscal year.
  • Building envelope improvements.
• The other energy conservation recommendations resulting from the audit are included on the capital projects list and will be completed over the next several years.
• An energy policy was implemented in October 2010.
• The new energy policy includes a commitment to build to a LEED Silver Standard at minimum.
• Transylvania’s newest residence hall, Thomson Hall, was the first residence hall in Kentucky to be Energy Star certified. It hosts a geothermal heat pump system, energy-efficient lighting, motion sensors, remote monitoring technology, remote control of building HVAC systems, an energy recovery unit, and an energy meter for instantaneous information on electric utility consumption.
• There are two geothermal systems on campus, in Thomson Hall and the Glenn Building.
• Energy recovery systems are located in Thomson Hall, the Cowgill Center, and Brown Science Center.
• Sustainability tours of campus are offered at least once a year in an effort to educate the Transylvania community about what is being done in our built environments.

Thomson Hall was the first residence hall in Kentucky to earn the EPA’s ENERGY STAR certification for superior energy efficiency and environmental protection.
LAND

Vision 4: Develop and manage land sustainably.
Transylvania owns 45 acres of land, mostly in downtown Lexington. It is vital that we manage these properties in a way that supports and models responsible land use through sustainable development practices and sustainable management of our grounds.

Strategy 4.1: Adopt and implement environmentally friendly landscaping policies.
Strategy 4.2: Increase involvement with/awareness of Transylvania’s outdoor environment and its management.
Strategy 4.3: Adopt and implement sustainable development policies.

Highlights:
- Interpretation is being developed for the rain garden in Haupt. Transylvania received a grant to fund this signage.
- Several rain barrels are installed on the shed in the community garden.
- Four storm drains on campus have been painted in an effort to bring more attention to these important features: two at the intersection of Upper and Third streets, one at Third and Broadway, and one at Fourth and Broadway.
- The university’s butterfly garden at the corner of Fourth and Broadway is composed entirely of native plant species. This project is the result of a student-led effort to renovate a space on campus and was funded in part by a grant from the Lexington-Fayette Urban County Government.
FOOD

Vision 5: Serve healthy, sustainably produced food, grown locally when possible.
Transylvania will strive to increase local and healthy food through food services, vending, and catering. Sustainably grown food supports environmental health, worker welfare and wages, and farm viability, as well as taste and nutrition.

Strategy 5.1: Increase the use of local food on campus, both in dining areas and at catered events.
Strategy 5.2: Educate the campus community about sustainable and healthy food options.
Strategy 5.3: Provide healthier food options in dining halls and vending machines.

Highlights:
• Starting in 2011-12, local food products served in the dining hall will be clearly labeled.
• The start of term cookout for the 2011-12 year was primarily local produce and meat.
• The beginning of the year faculty/staff reception for 2011-12 featured several local foods.

Locally sourced food was served during the Sustainability Across the Curriculum workshop for faculty.

DINING WASTE

Vision 6: Achieve a zero landfill waste dining service.
Transylvania will strive to reduce its landfill-bound waste, with a special emphasis on waste associated with dining services. Through composting, recycling, thoughtful consumption, and a shift to durable or compostable service ware and utensils, Transylvania will significantly reduce the amount of waste going to local landfills.

Strategy 6.1: Eliminate the use of bottled water.
Strategy 6.2: Phase out landfill-bound service ware.
Strategy 6.4: Educate the campus community about dining waste reduction.

Highlights:
• A filtered adaptor for water fountains is being piloted on campus as a step toward the elimination of bottled water.
• Transylvania is actively pursuing financial support for the purchase of reusable water bottles for all first-year students as part of the campaign to discourage reliance on bottled water.
• Seedleaf, a local non-profit, is collecting pre-consumer waste from the Forrer Dining Hall kitchen.
• Trays have been removed from the service area in Forrer Dining Hall as part of the effort to cut down on food waste. This also reduces water and energy consumption.
ADMINISTRATION

Vision 7: Incorporate sustainability in all administrative and strategic decisions.
Sustainability decisions must be considered early in the strategic planning process. Specifically, renovations, new building projects, and major purchases will have policies that help guide the choices that need to be made. Since much of the work in this area is in policy development, clear communication will be needed so that the entire campus can properly implement sustainable options.

Strategy 7.1: Adopt and implement sustainable transportation policies.
Strategy 7.2: Adopt and implement sustainability-related purchasing policies.
Strategy 7.3: Ensure sustainability is addressed in all long-term/strategic planning initiatives.
Strategy 7.4: Integrate sustainability into human resource policies.
Strategy 7.5: Adopt and implement policies that minimize landfill-bound waste.

Highlights:
• The campus events coordinator is working with the sustainability office to develop a protocol and resource guide that will help people plan more sustainable meetings, receptions, and events.
• Fair trade products are sold in some of the dining areas.
• Research has been conducted on the current vehicle purchase policies for the departments that use various types of vehicles. Sustainable options are being reviewed, and policies will be developed.
• The university has established an Energy Star purchase policy. Research is being done to determine how this policy has been implemented on campus.

President Williams joined a group of students, faculty, and staff who participated in Ride to Work Day.
COMMUNITY ENGAGEMENT

Vision 8: Help advance sustainability in Lexington and beyond.

Transylvanians must realize that we are all members of a larger community. As such, we should support an ethos of sustainability in Lexington and beyond through community service, partnerships, role modeling, and other positive forms of community engagement.

Strategy 8.1: Deliberately engage all constituencies of the Transylvania community in sustainability-related service.
Strategy 8.2: Leverage Transylvania’s people and facilities to support community sustainability efforts.

Highlights:
• The Office of Community Service and Civic Engagement, in partnership with several student organizations, organizes a neighborhood clean-up or similar sustainability-related service projects at least once per term.
• During finals week May term 2011, student groups held year-end drives to collect items that normally would be thrown away and distributed the items to groups that could use them. Food was collected for the First-Year Urban Program, school supplies were collected for an Ethiopian orphanage, and CDs, DVDs, and video games were collected and resold with the proceeds donated to the Catholic Action Center.
• Alternative Spring Break provides students with a chance to engage in community service off campus. The 2012 program will attend to environmental and historic preservation projects at the Land Between the Lakes National Recreation Area.
• Several 2011 pre-orientation groups engaged in sustainability-related community service. Community Learning and Sustainable Students (CLASS) painted a storm drain near campus, conducted water testing in Town Branch followed by a cleanup of the testing area, and tended to neighborhood gardens and the campus butterfly garden. First-Year Urban Program (FUP) supported Lexington agencies that address the three pillars of sustainability, including God’s Pantry and the International Book Project.
• Service projects covering the three pillars of sustainability are promoted in Columns and in the service e-newsletter sent out by the Office of Community Service and Civic Engagement.
• Transylvania is in discussion with Seedleaf about allowing them to use vacant lots for community gardens that will benefit lower income residents of downtown neighborhoods.
• Transylvania’s sustainability coordinator serves on the Keep Lexington Beautiful Commission.

This storm drain art project was painted near campus as part of the Town Branch campaign to help raise awareness of water quality issues.
2011-12 President’s Council on Sustainability

Students
Austyn Gaffney ’12, council secretary
Maria Starck ’14, Student Government Association representative
Adrian Hosler ’12
Emily Martin ’15
Emily Novak ’14
Bobby Puckett ’13
Emily Salemi ’15
Danny Woolums ’12

Staff
Michael Cronk, career development, council chair
Ashley Hinton-Moncer, fitness, council vice-chair
Angela Dossett, sustainability coordinator
Diane Fout, student activities
Norman Mudd, physical plant
Anna Nevis, accounting
Jeff Summers, information technology

Faculty
Alan Bartley, economics
Eva Csuhai, chemistry
Scott Whiddon, writing, rhetoric, and communication

Other
Amanda Langlitz, Sodexo
Work Group Members

Work groups are composed of council members and other volunteers from across campus and beyond.

**Curriculum**
Michael Cronk, champion
George Kaufman
Iva Katzarska-Miller
Emily Novak
Bobby Puckett
Scott Whidden

**Culture**
Maria Starck, champion
Michael Covert
Farrah Dicken
Amy Jo Gabel

**Buildings**
Norman Mudd, champion
Robert Brown
Eva Csuhai
Isaac Fedyniak

**Land**
Alan Bartley, champion
Jack Ebel

**Food**
Ashley Hinton-Moncer, champion
Sharon Brown
Eryn Hornburger
Ria Keegan
Amanda Langlitz
Kelly Lavy
Erica Noe
Browning Smith
Krissy Thomas

**Dining Waste**
Diane Fout, co-champion
Danny Woolums, co-champion

**Administration**
Michael Vetter, champion
Austyn Gaffney
Marc Mathews
Anna Nevius

**Community Engagement**
Karen Anderson, champion
Adrian Hosler
Emily Martin
Jeff Summers

Transylvania students, faculty, and staff celebrated America Recycling Day at the LFUCG recycling center.
Appendix 2: Transylvania 2020
Transylvania University - a liberal arts college in Central Kentucky

About Transylvania  Admissions  Academics  Student Life  Athletics  News & Events

Search Transylvania

Introduction  Vision  Mission  Values  Goals  Key performance targets

Transylvania 2020

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Transylvania University admits students regardless of age, race, color, ethnicity, religion, gender, sexual orientation, disability, veteran status, national origin, or any other classification protected by federal or state law or local ordinance.

330 North Broadway
Lexington, KY 40508 USA
Phone: (859) 233-8300
Fax: (859) 233-8787

About Transylvania  Admissions  Academics  Campus Life  Athletics  News & Events  Contacts

Info for: Prospective Students  Families  Alumni  Friends/Donors  Visitors  Campus Community

Campus Map  Calendar  Employment @ Transylvania  Transy Mail  TNet

http://www.transy.edu/plan2020/

3/11/2013

[+] Have a question?
2020 Vision

Transylvania will be recognized as one of the nation's finest liberal arts colleges.
Mission

Through an engagement with the liberal arts, Transylvania University prepares its students for a humane and fulfilling personal and public life by cultivating independent thinking, open-mindedness, creative expression, and commitment to lifelong learning and social responsibility in a diverse world.
Values

As pioneers, our centuries-long commitment to achieving excellence in liberal arts education is guided by these values:

• Integrity
• Innovation
• Diversity
• Community
• Perseverance
Enhance Innovative Thinking

In our effort to improve our standing among America's finest liberal arts colleges, Transylvania will undertake the following important and innovative academic initiatives:

1. **Provide every Transylvania student with a personally tailored academic experience within the common university curriculum, comprising at least one of the following:**
   a. A hands-on research project or creative production;
   b. A faculty-student designed course of no more than three students;
   c. A student-designed, academically grounded, community/civic engagement project.

2. **Institute an experimental pedagogy laboratory, the Academic Innovation Laboratory, paying particular attention to technology as a catalyst for innovations in teaching and learning in the context of the liberal arts.**
   a. Foster interdisciplinary and multidisciplinary innovation and engagement.
   b. Provide an exploratory technology budget each year to facilitate the purchase and evaluation of emerging technologies.
   c. Make the pedagogy laboratory the locus of research on emerging technologies that reshape the learning environment in ways suited to the liberal arts college (e.g., dialogic settings, interactive learning, etc.).
   d. Provide course release time to faculty engaged in work in the pedagogy laboratory.
   e. Use the pedagogy laboratory as a tool for faculty development, disseminating emerging ideas, providing guidance on their effective use and further development, and exploring how they can be brought to scale across the university and beyond.

3. **Publicize and build upon the experimental August Term and First Year Seminar Program.**
   a. Showcase August term and the integrated First Year Experience (FYE) to prospective students and their families through a multi-channel communication flow.
   b. Hire sufficient faculty to make the August term program sustainable without compromising other academic programs, including First Year Seminar (FYS) and First Year Research Seminar (FYRS).
   c. Continue the spirit of experimentation in August term to deliver innovative ideas and respond to changes in the student body.
in institutional needs, the market, and contemporary cultural contexts.
d. Undertake structured research to evaluate the effectiveness of August term.
e. Present the August term and integrated FYE model at national meetings on the First Year Experience.
f. Use August term as an incubator for ideas and approaches that can be used to evaluate and improve the quality of the entire general education curriculum.

4. **Advance student and faculty excellence, in particular by increasing the university's research and scholarly output in volume and quality.**

a. Expand funding for student research and creative and scholarly work.
b. Define, encourage, and support faculty scholarship.
c. Establish the Center for Teaching and Learning Excellence (CTLE) as a faculty resource to develop new expertise in new pedagogies and scholarship of teaching and learning (SOTL).
d. Introduce pre-tenure leave for probationary faculty so they can complete scholarship and creative work prior to tenure reviews.
e. Provide faculty training and support in developing grants, both institutional and individual, with release time to focus on such time-intensive initiatives.

5. **Diversify the intellectual, cultural, and personal perspectives represented in the Transylvania community, and infuse this diversity (including international perspectives) into the curriculum.**

a. Strengthen Transylvania’s out-of-state recruitment while maintaining strong market position in Kentucky, as detailed in the Strategic Enrollment Plan.
b. Develop partnerships with schools, school districts, and community-based organizations that serve primarily students of color, and continue to expand Transylvania’s active international recruitment efforts.
c. Provide faculty development that focuses on incorporating diversity-and-inclusion-related themes into course content as well as on building inclusive practices into pedagogies.
d. Organize faculty-student May term trips and exchanges—in partnership with institutions abroad—that emphasize diversity and inclusion issues.
e. Increase institutional funding to support faculty and student participation in May term travel.
f. Increase the faculty’s awareness of and involvement in co-curricular diversity and inclusion programming, and enlist faculty support in promoting such programming to students.
g. Establish agreements with educational and cultural institutions internationally that will allow students to participate in experiences related to their specific academic fields (e.g., math and science teaching abroad; programs with the Smithsonian Tropical Research Institute, etc.) and explore possibilities to establish physical outposts in certain locations.
h. Promote ongoing research collaboration with a limited number of domestic and international sites where community-based research leads to better understanding of diverse perspectives.
i. Augment funding to support semester study abroad for students.

6. **Develop innovative and integrative means to support student scholars by expanding and coordinating academic support services through the Academic Center for Excellence (ACE).**

a. Provide space that is conducive to learning and scholarly discussion in a dynamic learning environment.
b. Staff ACE to create a single point of access for all academic support services in order to improve the student scholar experience.
c. Build and coordinate a strong academic tutoring program.
d. Support collaboration and cross-training of experts among the main providers of academic assistance.
e. Expand and strengthen the academic services already offered.

7. **Increase the number of Transylvania students awarded prestigious national and international scholarships.**

http://www.transy.edu/plan2020/goals/goal1.htm

3/11/2013
a. Establish a developmental program for Premier Scholars by providing them with the resources and support to fully realize and then advance their potential.
b. Provide information about fellowships and scholarships through a dedicated website that publicizes the success of past recipients for both internal and external audiences.
c. Develop advising, coaching, and programming that informs all high achieving students about scholarship and fellowship opportunities and guides them through the application process.
d. Further engage the faculty in the recruitment process, including faculty with national and international fellowship and scholarship experiences.

8. Expand curricular offerings, in particular interdisciplinary and multidisciplinary programs and initiatives.

a. Evaluate which majors might have room for more inter- and multidisciplinary dimensions.
b. Hire some postdoctoral teaching fellows or senior Bingham scholars who would introduce new focal areas to our curriculum, expand/support new majors and minors, and test new curricular foci.
c. Add new majors or minors such as Creative Writing, Health Studies, Asian Studies, Middle Eastern Studies, Environmental Studies, Film Studies, and other distinctive programs.

9. Enrich and expand library resources, including personnel and technology, to further information literacy.

a. Add one Reference and Instruction Librarian to the Public Services Team.
b. Acquire a Citation Tool such as RefWorks or EndNote.
c. Acquire a Discovery Tool to make the research process easier, allowing cross-searching of all databases with one search.
d. Add a Special Collections Librarian/Archivist.
e. Acquire online research resources.

10. Establish Transylvania’s Center for Liberal Education (CLE) as a nationally recognized forum for advancement of the liberal arts, with a special focus on interdisciplinary and multidisciplinary initiatives.

a. Expand current national faculty seminar to a four-day meeting.
b. Include presidents and provosts (1 seminar for each) from across the country in the Transylvania Seminar.
c. Establish a publishing program—both print and electronic—to broaden the impact and increase the visibility of the Center.
d. Establish faculty development opportunities through the Center for Liberal Education that would allow faculty to extend their reach beyond the campus (e.g., as journal editors and reviewers; using new media to communicate scholarship; etc.).
e. Develop seminar for high school counselors and teachers about the value of a liberal arts education.
## Develop the Whole Person

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**Close all tactics**

The university will provide the members of the Transylvania community with opportunities to realize their passion for all that life has to offer through these initiatives:

1. **Recruit and retain an increasingly diverse population of students, faculty, and staff to prepare the individual Transylvanian for participation in our growing global community.**
   
   a. Create relationships with other US colleges and universities where diversity and inclusion experiences have been successfully executed in order to share approaches, knowledge, and best practices.
   b. Incorporate diversity and inclusion into faculty and staff professional development programs (e.g., facilitating attendance at relevant conferences, creating new workshops and colloquia, providing networking opportunities, and creating avenues for recognition).
   c. Implement the Strategic Enrollment Plan’s strategy to recruit students from historically underrepresented groups at Transylvania.
   d. Increase the faculty’s awareness of and involvement in co-curricular diversity and inclusion programming and enlist faculty support in promoting such programming to students.
   e. Recruit faculty and staff from groups historically underrepresented at Transylvania.
   f. Strengthen existing and build new mechanisms to ensure retention of historically underrepresented students, faculty, and staff (e.g., support networks, ESL training, professional coaching and mentoring, etc.).

2. **Engage Transylvania alumni more fully in campus life to strengthen the student experience.**

   a. Deepen connections between the Career Development Center and alumni by establishing an alumni-student mentorship program that would provide guidance toward post-baccalaureate opportunities.
   b. Expand and enhance the use of social media and other online mechanisms to engage alumni with students, faculty, and staff in academic and co-curricular life.

3. **Develop a four-year comprehensive student leadership program to cultivate a strong foundation for lifelong leadership capacity and creativity.**

   a. Provide training and additional library resources for students to develop leadership skills through workshops, a lecture series, retreat, and conferences.
b. Add a professional staff member to administer the leadership program.

c. Add a faculty liaison to support academic and co-curricular leadership programming.

d. Develop a mentoring program in which alumni and community members provide ongoing support for students to develop leadership skills.

4. Integrate religious life and the liberal arts by creating a campus community that thinks critically while acting with conviction, compassion, and respect for religious diversity.

a. Promote personal exploration, a deepening knowledge of religious heritage, and appreciation of religious diversity through all-campus programming, service projects, interreligious meals, and worship experiences.

b. Create a Religious Life Leadership Council.

c. Integrate religious life more fully into intellectual life on campus through experiential courses, lectures, coffeehouse conversations, and reading groups.

d. Create co-curricular programming that fosters respect for religious diversity.

5. Encourage and support student recreation.

a. Build a competitive intramurals and club sports program.

b. Provide adequate staffing to successfully support campus recreation programs.

c. Build an outdoor recreation program.

d. Build incentive-based programs to foster participation in student recreation.

6. Sustain and augment student health and wellness.

a. Hire additional wellness staff to provide comprehensive care and prevention strategies.

b. Increase the operating costs and annual budget of Health and Wellness to support program initiatives.

7. Encourage intercultural understanding by ensuring that every Transylvania student is proficient in a second language and has the experience of living and learning in a different culture.

a. Create new language development opportunities.

b. Increase the academic rigor and expand the variety of study-abroad opportunities, and create options that make it more feasible for low-income students to afford such opportunities.

c. Design opportunities for students who are unable to spend time abroad to immerse themselves in different cultures domestically.

d. For incoming Premier Scholars, establish two- to three-week travel courses, providing real engagement in different cultures and communities, in the summer prior to or following their first year.

e. Draw upon the international perspectives of our staff, faculty and students to shape co-curricular programming.

8. Strengthen and expand the depth and breadth of intercollegiate athletic programs.

a. Promote geographic and ethnic diversity efforts at Transylvania by broadening the scope of recruiting activities and territories.
b. Increase staff in athletics to reflect increased participation in sports and expansion of facilities.

c. Partner with Development Office to foster mutually supportive community partnerships with businesses to promote Transylvania athletics through sponsorships.

d. Develop programming in which local at-risk youth groups benefit from Transylvania athletic team interactions through wellness/fitness activities and leadership development.

e. Promote professional and academic development for staff in order to facilitate collaboration between athletics and campus-wide education efforts.

9. Foster a culture of wellness among the faculty and staff with a focus on developing affordable systems to enhance quality prevention, early detection, and disease management efforts.

   a. Provide incentive based programs for the Transylvania community to participate in fitness and wellness activities.
   b. Promote disease management by focusing on the top 5 percent of employees that result in over 50 percent of total health claims.
   c. Increase staffing to reduce health care costs and implement/maintain an employee wellness program.
   d. Provide incentives to employees to promote health and reduce costs ($4.00 ROI per dollar spent).
   e. Publicize the efforts of the Wellness Committee.

10. Strengthen professional preparation and development for all Transylvania students, faculty, and staff.

   a. Establish a culture in which Transylvania employees are encouraged to develop and be viewed as national experts in their chosen fields.
   b. Support staff efforts to earn higher degrees by allowing them some release time without forfeiting salary.
   c. Better utilize resources in the greater Lexington area and elsewhere to facilitate and support additional internships and shadowships.
   d. Develop an internal training program in which faculty and staff who attend local, state, and national conferences share matters learned with other employees.
   e. Reward and promote staff members who effectively implement a strong service ethic and who integrate the objectives of this strategic plan in their work.

Close all tactics
Promote Civic Engagement and Social Justice

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Close all tactics

Everyone at Transylvania University has the responsibility to give back to our community, through initiatives such as the following:

1. **Ensure an affordable education for all students.**
   
   a. Meet the full, demonstrated financial need for the most academically talented students using a combination of scholarships, grants, work-study, and loans.
   
   b. Guarantee graduation in four years to new, full-time, first-year students.
   
   c. Offer a level tuition program that allows students to lock in a set tuition rate for four consecutive academic years.
   
   d. Offer students the option to pay their balance of tuition, fees, room, and board charges over 12 equal monthly payments.

2. **Provide students with opportunities to interact with individuals of diverse backgrounds, thus encouraging the appreciation of differences and the development of multicultural understanding.**
   
   a. As part of the Creative Intelligence Series, bring to campus individuals from the Lexington and Kentucky communities who can speak to their ideas, their work, and their life experiences related to diversity and inclusion.
   
   b. Develop a working relationship between Transylvania’s Diversity & Inclusion office and the Greek Life community to identify and implement collaborative programming and service opportunities.
   
   c. Establish new mentoring opportunities for student volunteers to participate in community-based programs such as an Educational Safe House providing homework assistance for students K-12.
   
   d. Develop additional programming such as poetry readings or open mic opportunities liaising with the series “What matters to me and why” being developed by Religious Life.
   
   e. Develop multicultural events with the Lexington community and alumni, such as musical and gastronomic festivals, with proceeds going to the Diversity Action Council.
   
   f. Create university-sponsored field trip opportunities to places such as the National Underground Freedom Center Museum.
   
   g. Support and institutionalize initiatives such as Alternative Spring Break, enabling students to have first-hand experiences in diverse environments around the world.
   
   h. As part of the Kenan Lecture Series, invite artists who can address diversity and inclusion issues in their performances.

3. **Initiate and integrate academic and co-curricular programming that promotes citizenship and service as a means for advancing social justice.**

[+] Have a question?

http://www.transy.edu/plan2020/goals/goal3.htm
a. Through civic engagement and service programming, cultivate and support diversity and inclusion initiatives on campus.

b. Create sustained, institutionalized civic engagement on campus and promote student learning by sponsoring and/or hosting local civic events, speakers, and workshops on civic leadership.

c. Develop additional courses that connect curriculum to community.

d. Encourage community-based research.

e. Provide workshops for faculty, staff, and students to learn skills related to grant-writing, participatory community action, and political action, and create possibilities for sharing these skills with local community partners.

f. Prepare students, faculty, and staff to serve on non-profit boards, write grants, run for public office, and create their own non-profit organizations.

4. Create forums and partnerships that advance civil political discourse within the state of Kentucky through the Henry Clay Center for Statesmanship (HCCS).

a. Establish an annual summer workshop for 50 rising high school seniors from the state of Kentucky.

b. Develop collaborations with other national centers/programs such as the Carter Center, Clinton Global Initiative, Heritage Foundation, Brookings Institution, Washington Center, etc.

5. Cultivate an attitude of gratitude towards Transylvania and Lexington.

a. Develop stand-alone Honor Roll of Giving shops that will recognize our donors and share stories about the importance of supporting Transylvania.

b. Create a Philanthropy Day/Tuition Day event on campus to raise awareness of the importance of private support.

c. Initiate educational interactions between our student body and local non-profit leaders to raise awareness of how private support impacts Transylvania University and the Lexington community.

d. Engage alumni in the Senior Challenge Program by inviting them back to campus to work with the senior class and inform them of the responsibility of becoming an alum.

e. Re-brand and re-purpose the Student Alumni Association (SAA) to serve as official ambassadors who provide an extra measure of hospitality and assistance to the administration, alumni, and community during functions held on and off-campus.

f. Work with the Office of Financial Aid to enable effective and appropriate stewarding of scholarship donors through increased interaction with their student recipients.

g. Promote lifelong commitment to Transylvania to new graduates by inviting 50th Reunion Class members to participate in commencement.

6. Promote the social, environmental, and financial sustainability of our campus, region, and world.

a. Leverage our intellectual capabilities to develop creative, sustainable solutions for purchasing, transportation, food, and waste.

b. Foster understanding and support for sustainability throughout the campus and local community through role modeling, partnerships, and service.

7. Integrate campus life with community neighbors in a cooperative, mutually beneficial manner.

a. Provide opportunities for civic engagement by cultivating strong and sustained ties to local civic and community service organizations.

b. Broaden Transylvania's interaction with its neighborhood by providing meeting spaces, lectures, and programming that includes community partners.
c. Expand community involvement and service activities for student athletes by partnering with student affairs in community partnerships that promote civic engagement.

d. Develop programming in which local at-risk youth groups benefit from Transylvania athletic team interactions through wellness/fitness activities and leadership development.
Enhance Campus Infrastructure Sustainably

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Close all tactics

As we plan for an increased enrollment of 1,500 students and a corresponding expansion of our academic and student affairs opportunities, Transylvania will undertake the following initiatives:

1. **Upgrade key technology systems and infrastructure to provide new features and better services.**
   - Increase campus Internet network bandwidth to accommodate increased usage and demand.
   - Expand wireless coverage to all areas of campus.
   - Update the aged campus phone system to a state-of-the-art, network-based model.
   - Upgrade aged security camera systems to state-of-the-art, network-based models.
   - Upgrade audio/video systems across campus to state-of-the-art equipment with support for streaming video, AppleTV, wireless projection, and other new features.
   - Expand thin client lab computers to replace remaining desktops in computer labs.
   - Add staff to support IT and internal communications operations.
   - Budget to support professional development, computers, and office expenses for web specialist.

2. **Increase capacity by adding academic, residential, athletics, and administrative spaces, sustainably.**
   - Construct all new buildings using integrated design practices and meeting LEED Silver standards (at minimum).
   - Construct a new athletics field complex on the recently acquired Fourth Street property. This complex will include a lighted turf field, running track, and spectator stadium. Initial funding will come from a 2012 bond issue, with ultimate funding from donors. Construction will be completed in 2013.
   - Construct a second lighted turf field. Construction of this field will allow the university to consider repurposing Thomas Field. Construction will be complete in 2014. Initial funding will come from a 2012 bond issue, with ultimate funding from donors.
   - Construct new student residence facility(ies). These 300-bed facilities will replace Clay/Davis residence halls. They will be open for the fall 2015 term. Funding will primarily be derived through room revenue from students and donor naming opportunities.
   - Construct a new academic building. This space will house IT offices and data center, faculty offices, and classrooms. Completion will occur in the fall of 2015. Funding will come largely from enrollment growth called for in the strategic plan.
   - Acquire and equip a facility to be designated as a cultural resource center to provide space to serve multicultural, women's studies, gender/sexuality studies, and other similar groups. Facility to be available in the fall of 2015. Funding source needs to be identified.
   - Construct new residence facilities for expansion. These 300-bed facilities will handle enrollment expansion. Design may reflect upper-class-style housing. Construction to be completed by the fall of 2016. Funding will come largely from enrollment growth called for in the strategic plan.
h. Construct a new combined performing arts center/academic building. Construction will take place from 2018-20. Funding will come largely from enrollment growth called for in the strategic plan.

i. Construct a remote parking facility. Construction will take place from 2018-20. Funding source needs to be identified.

j. Construct a wellness center to house student health and counseling services. Funding source needs to be identified.

k. Construct new natatorium. Funding would be through corporate sponsorship, alumni giving, community donations, and university funds.

l. Construct three additional tennis courts, bringing the total number of courts on campus to nine. Funding would be through corporate sponsorship, alumni giving, community donations, and university funds.

3. Enhance infrastructure by undertaking major renovations of existing buildings that will remain part of campus life sustainably.

   a. Conduct all major renovations to a LEED Silver standard or higher.
   b. Fully implement energy conservation recommendations from the 2010 campus-wide energy audit. Funding source needs to be identified.
   c. Complete renovation of main dining facility. Project will be completed in the summer of 2014. Funding source will need to be developed; possibly our food service provider.
   d. Complete renovation of W. T. Young Campus Center. Project will be completed in 2014. Funding source needs to be identified.
   e. Complete final phase of renovation of Brown Science Center labs. Construction will take place in 2014. Funding source needs to be identified.
   f. Complete renovation of Haupt Humanities building. Phased completion will occur in the summers of 2014-17. Funding source needs to be identified.
   g. Complete major renovation of Forrer Hall. A phased completion will occur in the summers of 2014-17. Funding source needs to be identified.
   h. Complete renovation of Mitchell Fine Arts Building. Renovation will be aimed at either retaining the facility as a performing arts center or retrofitting it for an alternative use, depending on whether or not a new performing arts center is constructed per strategy #2 above. Construction will be completed 2018-20. Funding will come from enrollment growth called for in the strategic plan.
   i. At the appropriate time and as opportunities arise, work to relocate all remaining athletics fields to the new Fourth Street athletics complex. Funding source needs to be identified.
   j. Implement the university's to-be-drafted Climate Action Plan with a goal of eventual carbon neutrality. Funding source needs to be identified.

4. Serve as a model of sustainable land management and development in an urban setting.

   a. Improve campus layout and landscaping in a way that encourages social interaction among students, faculty, and staff as well as engagement with the outdoors. A phased installation will occur from 2013-18.
   b. Adopt and implement environmentally friendly landscaping policies, including plant selection and care, chemical use, water use, and management, including smart irrigation.
   c. Develop bike paths and other infrastructure that would encourage no- or low-carbon forms of transportation in cooperation with the local neighborhoods and the Lexington-Fayette Urban County Government. Link plans with what the city has developed/plans to develop and create partnerships with LexTran, etc.
   d. Manage storm water more effectively and ensure that all campus-related increases in impervious surface are storm water neutral.

5. Enrich and expand communications resources, including personnel and equipment, to provide printed and electronic publications, multimedia communications, website, and social media that support the initiatives of this plan, the marketing plan, the Strategic Enrollment Plan, and the capital campaign plan.

   a. Hire a communications specialist to support the Office of Communications and Public Relations with news writing, social media, database management, research, archiving, and administrative tasks.
   b. Hire a director of marketing and advertising to provide overall strategic and operational direction in defining Transylvania's brand and shaping messages to internal and external audiences.

[+ Have a question?]

http://www.transy.edu/plan2020/goals/goal4.htm

3/11/2013
c. Hire a multimedia journalist to create and publish audio, video, and other multimedia web programming and to develop initiatives for social networking, video sharing, and web communities that augment the university’s communications and electronic marketing efforts.

d. Equip a video/photo studio to accommodate new multimedia initiatives by renovating Old Morrison 311 and 312.

e. Expand the web applications programmer position from part-time to full-time to provide additional technical expertise in the design, development, implementation, and maintenance of innovative web-based application systems that enhance the overall user experience and service provided by our websites.

f. Hire an assistant graphic designer to support new initiatives in print and electronic communication that will be needed to fulfill this plan.

g. Budget to support additional staff for professional development, computers, and office expenses.
Key performance targets

By 2020, Transylvania will:

- Rank among the top 50 liberal arts colleges in the nation
- Achieve a four-year graduation rate of no less than 85%
- Grow enrollment to 1,500 students (50% out-of-state, 12% persons of color, 8% international) while improving the quality of the student body
- Increase full-time faculty to 125
- Increase alumni annual giving participation to 50% and create 10 new alumni chapters
- While maintaining gender equity, increase faculty and staff salaries and TIAA-CREF contributions to match our peers
- Raise $100+ million and grow the endowment to $200 million
Appendix 3: Green Revolving Loan Fund Charter
Transylvania University Green Revolving Loan Fund: Guidance Document
May 2013

PURPOSES

In 2013 Transylvania University applied for and was awarded a seed grant from the Jesse Ball duPont Fund to launch a Green Revolving Loan Fund (GRLF). Transylvania pledged to match the $75,000 seed money with $75,000 from the university’s capital projects budget. Additionally, the University has the goal of raising an additional $150,000 through development efforts headed up by the university’s development office. The university will continue to grow the fund through savings generated by Green Revolving Loan Fund projects, donations, and potential additional contributions from the university’s capital projects budget.

The Green Revolving Loan Fund strengthens Transylvania’s institutional capacity while ensuring that the campus is more sustainable. The fund will be managed by the campus community through a Green Revolving Loan Fund Committee made up of students, faculty and staff.

The purposes of the Green Revolving Fund are:

- To provide funding for:
  1. utility conservation, waste reduction, or renewable energy projects
  2. education and behavioral change projects
  3. incremental funding to pursue a more utility efficient option or to purchase more utility efficient equipment than would be supported by the university’s normal operating or capital budget.
- To serve an educational function by providing the opportunity for students and faculty to become directly involved managing the fund and analyzing the costs and benefits of proposed projects.

GREEN REVOLVING LOAN FUND COMMITTEE COMPOSITION

Committee membership will include the Director of the Physical Plant Department, the Operations Manager from the Physical Plant Department, the Vice President for Finance and Business, the Sustainability Director, two faculty members and two students. The President will annually appoint the faculty and student members with input from the Dean of the College, the Dean of Students, and the Sustainability Director. Individual members may be re-appointed for up to three consecutive one-year terms.

The Committee will meet as often as deemed necessary, but no less than twice per year. The two required meetings should be (a) at least once per year to consider potential projects and (b) one meeting to review and approve the annual GRLF report.
PROJECT IDENTIFICATION AND SELECTION PROCESS

1. With input from the campus community, the Physical Plant Department and the Office of Sustainability will work together to create a list of potential projects with an analysis of the revolving loan fund potential for each one, including the following information:
   - estimated cost
   - payback (return on investment, which includes estimated savings)
   - urgency for the operation of the college
   - greenhouse gas (GHG) emissions impact
   - life span (potential for delivering a stream of savings over time)
   - anticipated behavioral impact (if applicable)

Secondary considerations will include:
   - potential for visibility (can be seen on campus)
   - opportunity for student assistance and involvement
   - possibility for incorporation into the classroom and/or curriculum
   - additional efficiencies
   - other positive or negative implications of the proposed project
   - ease or difficulty of project management and oversight

2. The GRLF Committee will review the list of the projects identified and consider both criteria above during their individual and committee reviews.

3. The GRLF committee will make recommendations on the project or projects to be completed with monies from this fund.

4. The Vice President for Finance and Business will make the decision on the funding and timing of all revolving fund projects. Recommended projects that meet the criteria of being consider capital projects (e.g., those with a cost of $5,000 or more or computer equipment with a cost of $500 or more), require final approval from the Building and Grounds Committee of the Board of Trustees, as the group charged with approval of all capital projects.

5. Project implementation deadlines will be set in order to estimate the return of the savings to the fund upfront. Once the project has been implemented, Transylvania will reimburse the GRLF on an annual basis. (See section on Savings Calculation/Reinvestment for details.)

6. Projects will be monitored to ensure effectiveness, not savings. Monitoring for the savings associated with a project requires a great deal of time and money in order to attribute after-the-fact savings. For example, various factors, such as changes in usage, utility rates and temperature, can make it difficult to pinpoint the exact change in consumption and utility costs.
avoided from an energy conservation project. (Again, see section on Savings Calculation/Reinvestment for details.)

7. Each year, by August 15th, the GRLF committee will create an annual report outlining the fund’s use and value for the preceding, recently complete fiscal year. This report will be shared with the campus community, donors, and other interested parties.

SAVINGS CALCULATIONS/REINVESTMENT

Transylvania University will calculate and agree to an annual utility savings amount and an estimated payback period as part of the project approval process. If a project is approved, this savings amount will be budgeted annually to be paid from the operating fund to the GRLF. In effect, this payment will serve to repay principal and interest on the loan. Annual payments to the loan fund will continue for the estimated life of the improvement, not to exceed twice the payback period (e.g., maximum 200% payback).
Appendix 4: Utility Trend Data
Appendix 5: Winter Shutdown Protocol
Winter Shutdown Protocol, 2012

Non-residential spaces:

All buildings will be shut down at 5pm on Wednesday, December 19. They will be back to full operation by 8am, Wednesday, January 2. Over break, buildings will be maintained at 55 degrees. In buildings where it is possible to do so without risk to equipment, steps will be taken to reduce the energy used to heat water. Electronics and appliances in all offices and common areas should be unplugged, with the exception of full size refrigerators that should be turned off using the internal dial. Thermostats in all offices should be turned to their lowest setting. Physical Plant will do a walk-through of the non-residential spaces, and will correct any items not conforming to shutdown protocol. They will document their efforts to provide information that can be used to improve the shutdown protocol for future years.

The Department of Public Safety will be able to maintain their work space in Forrer Hall at normal operating conditions since they will be on campus throughout break. Lois Johnson of HR is required to be on campus the morning of the 20th. Her office should not be unplugged on the 19th, but she is willing to work without heat on the 20th. On the morning of Friday, December 28th, the mailroom and accounting office will be staffed. Alumni & Development will work also be working then to process end of year gifts, but they will work out of Old Morrison. Therefore, Old Morrison will be operational: Friday, December 28 from 8:00am to noon.

Additionally, rooms 318 and 320 in BSC will be maintained at normal operating temperatures throughout break since animals are housed in those spaces. Temperature and humidity control in special collections needs to be maintained.

All faculty and staff will be asked to complete a checklist of activities to reduce the energy consumed in their space. (See checklist below.) These individual actions will be promoted through TNotes, candy cane distribution, instructions from cabinet members, and a pre-break email from the President. Housekeeping will complete the checklist for common areas, and, with help from other Physical Plant staff, will check each office to ensure that the recommended actions were taken. Physical Plant staff will document which applicable instructions were not followed in order to improve the shutdown protocol for future years. During this walkthrough, Physical Plant staff will also inventory targeted personal appliances and electronics (space heaters, personal refrigerators, coffee pots, and personal printers). This information will help the administration determine whether the energy policy is being successfully implemented, and will inform future amendments to the policy.

There are a few electronics and appliances that should NOT be unplugged. In addition to noting them here, I have instructed these people to leave a note on their door/cubicle.

- Mariana Shocat in OM 308: The two computers on the large, lighter colored desk MUST remain plugged in. The one on the smaller, darker colored desk to the right as you walk in may be unplugged - & Mariana will do so.
• Accounting: The printer in their office needs to stay plugged in since it also serves as their fax machine. Additional exceptions include all of BSC and the computer labs, digital signage, and servers. With so many plug exceptions in BSC, Jamie Day thought it would be safer to allow all the occupants of that building to take full responsibility for the plug-based shut down. They will unplug to the fullest extent possible. Devices that remain plugged in: will be accessed over break; will be actively doing work (e.g., running computations); would require significant recalibrating if unplugged; and/or would potentially be damaged if unplugged. Therefore, Physical Plant is not to unplug anything in BSC. Jason Whitaker expressed a preference for IT to take care of unplugging the computer labs and digital signage in order to ensure that wires are not jostled loose, etc. The main network and server equipment in the OM basement IT area and the Cowgill server room will remain operational over the break.

Residential spaces:

All residential buildings will be shut down starting at noon on Saturday, December 15th (temperature, but not water). Students that require housing on campus over break will stay in their rooms, with temperature control, through the weekend. Students will settle into their winter break housing on Monday, December 17th when the residence halls will be fully shut down. Residence halls will be brought back to full operation by 1pm on January 4th.

During shutdown, the residence halls will be heated to 55 degrees. In halls where it is possible to do so without risk to equipment, steps will be taken to reduce the energy used to heat water. Electronics and appliances in all rooms and common areas should be unplugged, with the exception of full size refrigerators that should be turned off using the internal dial. Thermostats in all rooms should be turned to their lowest setting. Residence Life will do a walk-through of the residential spaces, and will correct any items not conforming to shutdown protocol. They will document their efforts to provide information that can be used to improve the shutdown protocol for future years.

Spaces that will be occupied for part of winter break include: 2 Rosenthal apartments; 316 North Upper; and the CARE House. All units in Rosenthal will be fully shutdown except for the two housing female basketball players. The Rosenthal apartment that will be vacated on the 14th needs to be cleaned before December 17th.

Before leaving campus, all residents will be asked to complete a checklist of activities to reduce the energy consumed in their space. (See checklist below.) These individual actions will be promoted through TNotes, the Res Life website, and the RAs. Candy canes with the checklist attached will be handed out to all residents by the RAs during the first week of December. Special effort needs to be made in communicating about refrigerators to avoid problems with spoiled food. RAs will confirm that students have completed the checklist before the residents leave for break. Area Coordinators will do a final check of all rooms. Housekeeping will complete the checklist for common areas. The Rosenthal apartments, the CARE House, and the Upper Street house that will be occupied for part of break should adhere to the checklist during unoccupied periods.
Checklist:

Close and lock windows

Leave blinds down and closed

Defrost and unplug (mini) or turn off using internal dial (full-size) refrigerators*

Unplug **everything**:

- Appliances
- Printers
- Computers
- Digital clocks
- Coffee pots
- Other

Turn off all lights

Set thermostats on the lowest setting (in heating mode)
Appendix 6: Energy Policy
Energy Policy for Transylvania University

Policy Implementation Date: October 4, 2010

REVISION-1 - January 11, 2011

Revision 2 – October 2012

Policy Statement
Transylvania University Physical Plant Department, depending upon the time of the year, sets forth targeted interior space temperature ranges in commonly (temperature controlled) zoned areas for academic, administrative spaces and residence halls. For the purpose of this guideline, the Physical Plant Department will be referred to as the “PPD”

Reason for Policy
The policy provides the University a number of benefits. Pragmatically, the policy provides a formalized standard of indoor temperature ranges to be expected by building occupants depending upon season. It provides PPD a documented policy to stand behind in addressing indoor environmental comfort complaints with regard to temperature. These temperatures are consistent with policies of our peer institutions and with research performed by the American Society of Heating, Refrigeration and Air conditioning Engineers (ASHRAE). More importantly, enforcement of the policy will prevent inefficient and wasteful operation of centralized equipment from occurring.

The policy is a change from current practice where the temperature has been allowed to be several degrees warmer in the winter and cooler in the summer.

The policy supports the University's educational mission and commitment to sustainability. Energy reduction resulting from this measure helps curtail global social and environmental impacts including the country's dependency on foreign fossil fuels and the production of greenhouse gases that contribute to global warming.

Responsible University Office & Officer
At Transylvania University, indoor temperature control falls within the responsibilities of the Physical Plant department. The Physical Plant Director and Operations Manager are the responsible officers for this policy.

Who is Governed by This Policy
All Transylvania University Operated, Academic, Administrative, Athletic and Residential Facilities

Who Should Know This Policy
This policy should be universally known to building management, faculty, staff, contract employees and occupants governed by it, as well as the greater University community as a sustainability initiative.
POLICY TEXT

Exclusions
Computer rooms, server rooms, telephone rooms, elevator machine rooms, laboratory spaces, Athletic Facilities, Performing Arts Theaters and sensitive document areas with specific design criteria will be excluded from the parameters of this guideline.

Building Heating and Cooling Indoor Space Temperature Guidelines

Heating Season
The heating season will be defined as October 15th thru April 15th. On October 15th the 15 day weather forecast will be consulted. If predictions are for mild temperatures (55 degrees or above) the switch from air conditioning to heating will be delayed. However, the switchover will be made no later than November 1st. When high temperatures are expected to be below 55°F for two or more days prior to October 15th, the long-term forecast will be reviewed. If temperatures are expected to remain exceptionally cool, the administration MAY decide to enter the heating season early. If the decision is made to enter the heating season early, Transylvania will not return to cooling season operations until sometime between April 15th and May 1st.

Heating will be provided to maintain interior space temperatures at approximately 68°F during normal occupied hours. In implementing this policy, PPD seeks to ensure that all heated spaces are as close to 68°F as possible. In practical terms, this means temperatures may be in the 66°F-72°F range. During off-hours, temperatures may be allowed to drop to as low as 55°F.

An indoor space temperature of 68°F has been researched by ASHRAE (Standard 55 - Thermal Environmental Conditions for Human Occupancy) to be comfortable for most people (10% dissatisfaction rate) who are dressed appropriately for the season. Space temperature will be determined by temperature readings taken at the thermostat or desk level. The PPD will use their calibrated temperature and humidity measuring devices for the purpose of determining space temperature. Personal faculty, staff and student thermometers will not be used as a reference to actual space temperature. Floor level temperatures will not be used as a factor in determining actual space temperature as outlined in this policy. If the system is operating within its design parameters and the temperature in a space is within the specified range of this guideline, no action will be taken in response to a temperature complaint.

Cooling Season
The cooling season will be defined as April 15th thru October 15th. On April 15th, the 15 day weather forecast will be consulted. If predictions are for temperatures to be 55 degrees or below, the switch from heating to air conditioning will be delayed. However, the switchover will be made no later than May 1st. When high temperatures are expected to exceed 76°F for two or more days prior to April 15th, the long-term forecast will be reviewed. If temperatures are expected to remain exceptionally warm, the administration MAY decide to enter the cooling season early. If the decision is made to enter the
cooling season early, Transylvania will not return to heating season operations until sometime between October 15<sup>th</sup> and November 1<sup>st</sup>.

Cooling will be provided to maintain interior space temperatures at approximately 76° F during normal occupied hours. In implementing this policy, PPD seeks to ensure that all cooled spaces are as close to 76° F as possible. In practical terms, this means temperatures may be in the 74°F-78°F range. During off-hours, temperatures may be allowed to rise to as high as 80°F.

An indoor space temperature of 76°F has been researched by ASHRAE (Standard 55 - Thermal Environmental Conditions for Human Occupancy) to be comfortable for most people (10% dissatisfaction rate) who are dressed appropriately for the season. Space temperature will be determined by temperature readings taken at the thermostat or desk level. The PPD will use their calibrated temperature and humidity measuring devices for the purpose of determining space temperature. Personal faculty, staff and student thermometers will not be used as a reference to actual space temperature. If the system is operating within its design parameters and the temperature in a space is within the specified range of this guideline, no action will be taken in response to a temperature complaint.

**Residential Dormitories and Campus Housing**

Temperature control for the dorm rooms is determined by the occupants of each room/house, based on the thermostat setting for their specific area. This allows the occupants to operate either in the cooling mode or the heating mode at any given time, under normal operating conditions.

Though occupants in most residence halls have the full range capability of their thermostat, as stewards of Transylvania University, and participants in our economic and sustainability initiatives, they are encouraged to adhere to the heating and cooling temperature guidelines as implemented in this policy.

Residence halls in which the thermostat ranges are controlled by PPD will have their range set to the heating and cooling ranges outlined above, 66°-72°F in the heating season and 74°-78°F in the cooling season.

It is the responsibility of the occupants of the room to ensure that the return air portion of the room unit, which is at the base of the unit, does not become blocked with furniture, clothing, bedding or any other obstacle that would prevent normal operation of the unit. Continual failure to maintain this space free and clear of obstructions will be brought to the attention of the Director of Residence Life for resolution.

If occupants are leaving their room for extended periods of time, they are encouraged to turn their unit off or select a seasonally appropriate temperature setting that will utilize less energy than the standard occupied temperature.
Cowgill Business and Economics, Haupt Humanities and Lucille Little Theater
These facilities are similar to residence halls in that they are zoned heat pump systems. Each specific zone is equipped with a thermostat, which allows occupants to set their own temperature set-point.

Though occupants have the full range capability of their thermostat, as stewards of Transylvania University and participants in our economic and sustainability initiatives, they are encouraged to adhere to the temperature guidelines as related to heating and cooling as implemented in this policy, Winter 68°F and Summer 76°F. When leaving your area at the end of the work day, weekend or Holidays, occupants are encouraged to adjust their heating or cooling set-point on the thermostat to an unoccupied temperature of 55°F Winter and 80°F Summer. These units recover quickly and should be able to reach your daytime operating set-point in short order once you adjust it back when you return to the office.

Humidity Control
Though many of Transylvania University’s facilities were not designed to control humidity specifically, our typical humidity ranges fall within, or are close to, the ASHRAE standard guideline. In cases where a facility cannot achieve humidity as defined by the standard, the PPD will follow the appropriate temperature guideline.

Campus Building Academic Year Business Hours

Residence Halls and Student Housing
Residence Halls and Student Housing will operate 24 hours a day during the academic year. They will be shut down during winter break. In the summer, efforts will be made to consolidate remaining summer student helpers and summer campers into as few residence halls as possible. All remaining halls will be fully shut down.

Academic & Administrative Buildings
<table>
<thead>
<tr>
<th>Days</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Monday thru Friday</td>
<td>7:00 am – 5:30 pm</td>
</tr>
<tr>
<td>Saturday and Sunday</td>
<td>Closed</td>
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</tbody>
</table>

Campus Center
<table>
<thead>
<tr>
<th>Days</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday thru Thursday</td>
<td>8:30 am - 11:00 pm</td>
</tr>
<tr>
<td>Friday</td>
<td>8:00 am - 8:00 pm</td>
</tr>
<tr>
<td>Saturday</td>
<td>Noon - 8:00 pm</td>
</tr>
<tr>
<td>Sunday</td>
<td>1:00 pm – 11:00 pm</td>
</tr>
</tbody>
</table>
**J. Douglas Gay Jr. / Frances Carrick Thomas Library**

Monday thru Thursday  
8:00 am – Midnight  
Friday  
8:00 am – 6:00 pm  
Saturday  
10:00 am – 6:00 pm  
Sunday  
1:00 pm – 12:00 midnight

**Glenn**

Monday thru Friday  
8:00 am – 5:00 pm  
Saturday and Sunday  
Closed

**Beck Center**

Monday thru Thursday  
7:30 am – 10:30 pm  
Friday  
7:30 am – 7:00 pm  
Saturday  
12:00 Noon – 4:00 pm  
Sunday  
4:00 pm - 9:00 pm

Areas within the building that are not being used during open hours or are not part of the activity schedule will be turned off unless they are needed. The building will be opened for home sporting events and other scheduled activities outside of regular operating hours, to be arranged with the Physical Plant Department.

Beck Center will be closed on holidays and during winter break. Shorter hours will be set in the summer, and the operating schedule will reflect these shorter hours.

**Graham Cottage**

Graham Cottage is used on a scheduled basis only. HVAC will not normally be in operation. Use of this facility must be scheduled through the accounting office. PPD will be notified and heating or cooling arrangements will be made as required.

**Holiday Operations**

When the university closes for the holidays, every effort should be made to “Un-Plug Transy.” Certain appliances consume electricity at all times, such as microwaves, commercial water coolers (ones that use the 5 gallon jugs of water), personal radios with clocks, etc. Commercial coffee makers are also a large energy consumer. During extended unoccupied periods, these coffee makers continually heat the water, making it ready for the next pot. This is a waste of electricity and water, as the water that is being heated continually evaporates.

To the extent possible, “ALL” facilities will be shut down or adjusted to a night-setback temperature setting, during unoccupied hours and holidays as defined above.

**Personal Electric Space Heaters**

Personal space heaters use significant amounts of energy, and interfere with set temperatures in the
buildings. They also pose a fire hazard, and have been known to cause outages by overloading electrical circuits. This results in a loss of productivity and potentially the loss of valuable computer documents.

The use of personal space heaters in residential or office areas is prohibited unless a space cannot be maintained at the 66°F-72°F range during heating season. In such instances, Physical Plant will provide an energy-efficient, electric heater to remedy the situation. PPD will determine which heater is most appropriate based on size and use of the space. Radiant space heaters will be given preference, as they are the most energy-efficient type of electric heater. If a radiant heater is insufficient, a thermostatically-controlled, convection heater with a heat-transfer liquid and tip-over safety switch will be provided. The occupant(s) of the space with the heater is responsible for turning the heater off when s/he vacates the space – even for short periods of time. Failure to do so may result in loss of the heater. This protocol is based on information provided by the US Department of Energy (http://energy.gov/energysaver/articles/portable-heaters).

Space temperature will be determined by temperature readings taken at the thermostat or desk level. The PPD will use their calibrated temperature and humidity measuring devices for the purpose of determining space temperature. Personal faculty, staff and student thermometers will not be used as a reference to actual space temperature. If the system is operating within its design parameters and the temperature in a space is within the specified range of this guideline, no action will be taken in response to a temperature complaint.

Under no circumstance should a space heater be used during cooling season.

OTHER ENERGY POLICIES

Lighting
Halogen Torchiere-type floor lamps are not allowed in any campus buildings.

All exterior lighting will be turned off after dawn until dusk.

As part of the incandescent light-bulb phase out program, as mandated by the US Government to be effective in 2014, university funds cannot be spent on incandescent lights unless other, more energy efficient options will not work with the fixture. In such cases, the fixture should be replaced as soon as fiscally possible.

Lights out for the incandescent bulb
The Energy Independence and Security Act of 2007 provides for phasing out today’s general service incandescent light bulbs in favor of lower-wattage, energy-saving bulbs. Lighting accounts for about 15 percent of the electrical use in homes.

<table>
<thead>
<tr>
<th>Phase-out dates (effective Jan. 1)</th>
<th>2012</th>
<th>2013</th>
<th>—2014—</th>
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<tr>
<td>ENERGY USED (watts)</td>
<td>100W</td>
<td>75W</td>
<td>60W</td>
</tr>
<tr>
<td>LIGHT PRODUCED (lumens)</td>
<td>1,690</td>
<td>1,170</td>
<td>850</td>
</tr>
</tbody>
</table>

Replacement options
These bulbs use less energy to emit the **same levels of light as the incandescent bulbs**.

**CFLs**

Compact fluorescent light bulbs are expected to be the leading replacements for standard incandescent light bulbs, at least at first. In CFLs, electric current energizes argon and mercury vapor, which in turn causes a phosphor coating inside the bulb to emit light.

**Halogen**

New halogen bulbs look like the incandescent bulbs people are used to buying. Halogens are a more energy efficient form of incandescent, but they are the least efficient of the incandescent replacement technologies. The filament is encased in a bulb made of fused quartz or high silica glass containing a halogen gas.

**LEDs in light bulbs**

LEDs are the gizmos that have been around for years lighting up digital clocks and calculators. They use semiconductors that emit light when electrons move around. Recent innovation has allowed engineers to make them bright enough for light bulbs.

The University will occasionally sponsor a Compact Fluorescent Light (CFL) bulb swap, during which the less efficient incandescent bulbs may be exchanged for a CFL. CFL bulbs use roughly 1/4th the energy of incandescent bulbs.

In new construction or renovation, lighting levels recommended by the Illuminating Engineering Society Lighting Handbook shall be used as guidelines to avoid over-lit spaces. Increased use of day lighting and
day lighting controls shall be considered because use of day lit spaces decreases energy costs and may improve productivity. Additionally, reflection values of paint should be considered, as higher reflection values can reduce the amount of artificial light necessary to achieve the IESL standards. All lighting installed will be T-8, T-5 or better. Occupancy sensors are to be installed when economically feasible.

Faculty, staff, students, contract employees and all patrons of Transylvania University shall make every effort to reduce the amount of energy associated with lighting in all University facilities by:

- Turning lights off in unoccupied spaces.
- Discontinuing the use of incandescent lighting wherever more efficient lighting is possible such as when compact fluorescent or light emitting diode (LED) bulbs can be used.
- Maximizing the use of natural light and turning off all nonessential lighting whenever possible.
- Utilizing task lighting in lieu of overhead lighting when appropriate.

Office Equipment
All powered office equipment shall be turned off or placed in standby when not in use, unless it is detrimental to the operation of the equipment to do so. Items such as copiers, printers, calculators, shredders, etc., should be turned off at the end of the work day.

Office equipment quantities shall be reduced through consolidation to central locations for shared use whenever possible.

Office equipment purchased with University funds is required to be ENERGY STAR labeled unless approved by the responsible budget executive. Exceptions are authorized only if there are no Energy Star rated appliances manufactured that meet the user’s needs.

Computers
Computers purchased with University funds are required to be ENERGY STAR labeled unless approved by the responsible budget executive. Exceptions are authorized only if there are no Energy Star rated appliances manufactured that meet the user’s needs.

Faculty, staff, students, contract employees and all patrons of Transylvania University shall make every effort to reduce the amount of energy associated with computing in all University facilities by:

- Turning off computers anytime they are not in use. A computer left on all day uses nearly 1,000 kilowatt hours of electricity a year, producing more than a ton of carbon emissions.
- Activate the power saving settings on your computer, such as turning off the hard disk and putting the monitor in standby when you have not touched the PC for a few minutes. Modern operating systems have settings to do this stuff automatically and it will come back up and be ready to use within a few seconds of moving the mouse or pressing a key. See (link) for instructions.
Appliances and Other Electronics

Employees:
Non-University provided appliances (such as printers, coffee makers, refrigerators, freezers, microwaves, toasters, lamps, televisions, and scanners) may only be used if approved by the department head or supervisor in charge of the area. Most of these items should be available in a university-maintained shared space.

The quantities of University purchased appliances shall be reduced through consolidation to central locations for shared use whenever possible.

All new or replacement appliances purchased with University funds are required to be ENERGY STAR labeled unless specifically approved by the responsible budget executive. Exceptions are authorized only if there are no Energy Star rated appliances manufactured that meet the user’s needs.

All new or replacement televisions shall be LCD or LED unless there is a justifiable need for the tube based display.

All appliances, including digital displays, shall be turned off when not in use, unless it is detrimental to do so (e.g., a refrigerator or freezer).

Employees are encouraged to use surge protectors or Smart Strips to reduce the amount of energy lost through phantom load (energy used by electronics even when the device is turned off.)

Students:
All appliances shall be turned off when not in use unless it is detrimental to do so (e.g., a refrigerator or freezer).

Students are encouraged to bring to campus only appliances with the ENERGY STAR label.

Students are encouraged to turn off and unplug gaming consoles when not in use. (Some brands use almost as much energy turned off as when turned on).

Students are encouraged to use surge protectors or Smart Strips to reduce the amount of energy lost through phantom load (energy used by electronics even when the device is turned off.)

Fume Hoods
Fume hood sashes are to be closed when not being accessed to minimize energy use and provide improved lab safety.

Fume hoods that won’t be used for a long period of time should be brought to the attention of PPD for shutdown.
New Construction
When considering the design of new buildings, the University’s goal will be to meet, at a minimum, the standards of LEED Silver certification, though the actual certification may or may not be pursued. New buildings should be designed and built to minimize energy use by earning at least 40% of the available points for energy performance under the LEED Credit for Optimization Energy Performance. The design process shall include energy life cycle costing analyses. Alternative energy sources such as passive solar heating and heat recovery shall be considered, as well as day lighting and other strategies for decreasing building energy consumption. All new buildings shall include extensive utility metering (electricity, natural gas, steam, and water) and sub-metering (lighting, HVAC, lab services, other) in order to determine how much and where energy is being consumed. Buildings shall be designed to run efficiently, and allow users to live/work/learn in an energy efficient manner.
Where practical, newly constructed buildings will include a Building Energy Management System. These new systems will be incorporated into the existing Campus Building Energy Management System network and will include all points necessary to remotely Start, Stop, Monitor and Control all connected Heating, Ventilating and Air-conditioning Equipment, and Indoor and Outdoor Lighting systems, in an effort to streamline the building systems operations and ensure a more efficient and economical university environment.
Appendix 7: Investment Grade Audit Executive Summary
SECTION I: EXECUTIVE SUMMARY

Pepco Energy is pleased to submit its Investment Grade Audit (IGA) to Transylvania University. The IGA contains the scope of work proposed for implementation of the Guaranteed Energy Savings Performance Contract (ESPC) awarded to Pepco Energy by Transylvania University based on the Request for Proposal and subsequent submittals, presentations and discussions since November 30, 2009.

This IGA involved a search for the best energy savings opportunities across the campus. By the nature of this project delivery method there are direct, tangible benefits to Transy included as design engineering, acquisition of energy saving equipment and construction to implement needed capital equipment and systems paid for by energy savings. Ancillary benefits flow out of the overall project savings to allow longer payback equipment and technologies to be included in the project.

The ancillary benefits involve the strategy of implementing a truly sustainable campus energy strategy for campus infrastructure backed by proven engineering data showing savings extended to full life cycle equipment costs. Sustainable programs (already active on the campus) are included and being increased with rainwater harvesting measures, water conservation measures, chemical use reductions, and the encouragement of energy awareness via the inclusion of building dashboard technology for campus interaction.

PROJECT HIGHLIGHTS PRIOR TO ENHANCEMENTS BEFORE THE ESA

- Over $200,000 in Annual Energy Savings for Transylvania University.
- Over $2.6 M in New Campus Equipment and Technology Infrastructure.
- A 19.7% reduction in Annual Energy and Water Consumption – approximately 1,413,300 kWh and 22,634 therms of natural gas per year.
- A 45.9% reduction in Annual Water Consumption – approximately 10,030,000 gallons/year.
- Rainwater Harvesting Supplying Make-up Water to the Campus Center Pool.
- Installation of over 1300 New Water Saving Fixtures in 28 Buildings.
- New Chiller in J. Douglas Gay, Jr. Library
- Two New Boilers in Poole Hall and William T. Young Campus Center
- Building Dashboard Technology for six Dorms to Promote Energy Awareness with Students and Staff
ADDITIONAL BENEFITS WITHIN AN ESPC PROGRAM

Additional benefits to Transy within this project are improvements to student and staff comfort, health, safety and effectiveness. Some of these are represented by reducing CO₂ in classrooms and work spaces by providing more even distribution of conditioned air, by correctly sizing the output of lighting fixtures to meet lumen standards for task areas, and others that are defined in the Energy Conservation Measure (ECM) write-ups within the audit. Reduced maintenance and improved facilities staff efficiencies have been addressed in various ECMs that will allow more focused efforts on critical tasks and preventive maintenance rather than fighting fires routinely.

The scope of work for the ECMs, initially recommended for implementation and summarized in Table 1 below, was evaluated by the Pepco Energy team and is supported by the engineering calculations, information, variables, and assumptions contained in the IGA. Table 1 shows the listing of ECMs that made a priority cut within the constraints of savings generated. Each of these ECMs are detailed in Section II of this IGA.

TABLE 1 – ECM PROJECT SUMMARY [SELECTED-TO-DATE]

<table>
<thead>
<tr>
<th>ECM No.</th>
<th>ECM Description</th>
<th>Savings ($)</th>
<th>Costs ($)</th>
<th>Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Energy Efficient Lighting</td>
<td>$134,960</td>
<td>$95,485</td>
<td>8.40</td>
</tr>
<tr>
<td>2</td>
<td>Occupancy Sensors</td>
<td>$1,629</td>
<td>$45,485</td>
<td>27.92</td>
</tr>
<tr>
<td>3</td>
<td>Low Flow Toilet Fixtures</td>
<td>$35,388</td>
<td>$365,010</td>
<td>10.31</td>
</tr>
<tr>
<td>4</td>
<td>Low Flow Urinal Fixtures</td>
<td>$3,102</td>
<td>$31,995</td>
<td>10.31</td>
</tr>
<tr>
<td>5</td>
<td>Lavatory/Kitchen Faucet Retrofits</td>
<td>$1,359</td>
<td>$12,702</td>
<td>9.35</td>
</tr>
<tr>
<td>6</td>
<td>Showerhead replacements</td>
<td>$9,803</td>
<td>$9,577</td>
<td>0.98</td>
</tr>
<tr>
<td>8</td>
<td>Pre-Rinse Sprayer Replacement</td>
<td>$1,446</td>
<td>$871</td>
<td>0.60</td>
</tr>
<tr>
<td>10</td>
<td>Rainwater Harvesting</td>
<td>$5,411</td>
<td>$41,538</td>
<td>7.68</td>
</tr>
<tr>
<td>12</td>
<td>Air Cooled Compressor Installations</td>
<td>$16,958</td>
<td>$141,501</td>
<td>8.34</td>
</tr>
<tr>
<td>13</td>
<td>Chiller Replacement</td>
<td>$2,133</td>
<td>$151,622</td>
<td>71.10</td>
</tr>
<tr>
<td>14</td>
<td>Boiler Replacement</td>
<td>$5,823</td>
<td>$162,918</td>
<td>27.98</td>
</tr>
<tr>
<td>15</td>
<td>Cooling Tower Replacement</td>
<td>$191</td>
<td>$178,314</td>
<td>932.03</td>
</tr>
<tr>
<td>16</td>
<td>Packaged Roof Top Unit Replacement</td>
<td>$425</td>
<td>$44,367</td>
<td>104.34</td>
</tr>
<tr>
<td>19</td>
<td>Convert Constant Volume Unit to VAV</td>
<td>$3,139</td>
<td>$98,568</td>
<td>31.40</td>
</tr>
<tr>
<td>20</td>
<td>Convert Multi-Zone Unit to VAV</td>
<td>$4,538</td>
<td>$241,630</td>
<td>53.25</td>
</tr>
<tr>
<td>28</td>
<td>Temperature Setpoint Adjustments</td>
<td>$2,154</td>
<td>$3,348</td>
<td>1.55</td>
</tr>
<tr>
<td>29</td>
<td>Domestic Hot Water Storage Tank Insulation</td>
<td>$75</td>
<td>$2,511</td>
<td>33.43</td>
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<tr>
<td>33</td>
<td>Building Dashboard</td>
<td>$2,019</td>
<td>$46,616</td>
<td>22.59</td>
</tr>
<tr>
<td>37</td>
<td>Dolphin Cooling Tower Treatment</td>
<td>$12,000</td>
<td>$111,844</td>
<td>9.32</td>
</tr>
</tbody>
</table>

One challenge to the approach and results, in a positive way, was the level of effectiveness that the Physical Plant staff has operated equipment to save energy. Pepco Energy investigated a total of 38 ECMs during the period of the IGA. After discussions with Transy staff, several of the initial ECM concepts were reduced in priority in favor of a strategy to capture the greatest life cycle benefit. The strategy included replacing failed and worn out capital equipment to improve the campus environment, then to bring in green concepts that will demonstrate the Transy Sustainability commitment.
This type of program (ESPC) has another level of intangible benefits within the turn-key guarantee format. Equipment installed carries the guaranteed energy savings concept achieved on 100% of our projects. This is not the case when the same equipment is installed under the design, bid, build method where results (such as comfort / temperature levels) are not guaranteed.

There is an interim period now, before the Energy Services Agreement, where this IGA is evaluated to determine final selection of ECMs that will secure the best project for Transy. There are several new ideas that will certainly be part of the project and a few of the eliminated ECMs that will be evaluated and upgraded back into the final list. These now include items such as solar thermal water heating, solar trash compactors, a green wall or roof, hand blowers, server room conditioning and a few others.

**ECMS FOR FINAL EVALUATION TO INCLUDE PRIOR TO ESA**

- Solar Trash Receptacles
- Green Roof / Green Wall
- Hand Blowers
- Computer Server Room Conditioning

**TABLE 2 – COMPLETE LISTING OF ALL ECMS CONSIDERED**

The following Table 2 shows a listing of all ECMs reviewed during the IGA. Items without pricing are those that were reduced in priority and therefore not fully developed. Items highlighted are not included in the To-Date ECM List shown in Table 1.
Table 2: Complete Listing of All ECMs Considered

<table>
<thead>
<tr>
<th>ECM No.</th>
<th>ECM Description</th>
<th>Savings ($)</th>
<th>Costs ($)</th>
<th>Payback (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Energy Efficient Lighting</td>
<td>$114,960</td>
<td>$965,483</td>
<td>8.40</td>
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<td>2</td>
<td>Occupancy Sensors</td>
<td>$1,629</td>
<td>$45,485</td>
<td>27.92</td>
</tr>
<tr>
<td>3</td>
<td>Low Flow Toilet Fixtures</td>
<td>$35,388</td>
<td>$365,010</td>
<td>10.31</td>
</tr>
<tr>
<td>4</td>
<td>Low Flow Urinal Fixtures</td>
<td>$3,102</td>
<td>$31,995</td>
<td>10.31</td>
</tr>
<tr>
<td>5</td>
<td>Lavatory/Kitchen Faucet Retrosfits</td>
<td>$1,359</td>
<td>$12,702</td>
<td>9.35</td>
</tr>
<tr>
<td>6</td>
<td>Showerhead replacements</td>
<td>$9,803</td>
<td>$9,577</td>
<td>0.98</td>
</tr>
<tr>
<td>7</td>
<td>Dish Machine Replacement</td>
<td>$3,252</td>
<td>$187,312</td>
<td>57.59</td>
</tr>
<tr>
<td>8</td>
<td>Pre-Rinse Sprayer Replacement</td>
<td>$1,446</td>
<td>$871</td>
<td>0.60</td>
</tr>
<tr>
<td>9</td>
<td>Ice Machine Retrosits</td>
<td>$230</td>
<td>$4,700</td>
<td>20.47</td>
</tr>
<tr>
<td>10</td>
<td>Rainwater Harvesting</td>
<td>$5,411</td>
<td>$41,538</td>
<td>7.68</td>
</tr>
<tr>
<td>11</td>
<td>Walk-in Box Condenser Retrosits</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Air Cooled Compressor Installations</td>
<td>$16,958</td>
<td>$141,501</td>
<td>8.34</td>
</tr>
<tr>
<td>13</td>
<td>Chiller Replacement</td>
<td>$2,133</td>
<td>$151,622</td>
<td>71.10</td>
</tr>
<tr>
<td>14</td>
<td>Boiler Replacement</td>
<td>$5,823</td>
<td>$162,918</td>
<td>27.98</td>
</tr>
<tr>
<td>15</td>
<td>Cooling Tower Replacement</td>
<td>$191</td>
<td>$178,314</td>
<td>932.03</td>
</tr>
<tr>
<td>16</td>
<td>Packaged Roof Top Unit Replacement</td>
<td>$425</td>
<td>$44,367</td>
<td>104.34</td>
</tr>
<tr>
<td>17</td>
<td>Airside Economizers</td>
<td>$750</td>
<td>$80,970</td>
<td>107.90</td>
</tr>
<tr>
<td>18</td>
<td>Replace Constant Volume Units with VAV</td>
<td>$3,139</td>
<td>$308,042</td>
<td>98.12</td>
</tr>
<tr>
<td>19</td>
<td>Convert Constant Volume Unit to VAV</td>
<td>$3,139</td>
<td>$98,568</td>
<td>31.40</td>
</tr>
<tr>
<td>20</td>
<td>Convert Multi-Zone Unit to VAV</td>
<td>$4,538</td>
<td>$241,630</td>
<td>53.25</td>
</tr>
<tr>
<td>21</td>
<td>Convert Electric to Natural Gas Heating</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
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<tr>
<td>22</td>
<td>Water Source Heat Pump Installation</td>
<td>$2,786</td>
<td>$850,224</td>
<td>305.13</td>
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<tr>
<td>23</td>
<td>Cooling Tower Variable Frequency Drive</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>Cooling Tower Blowdown Meter</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>Chiller Condenser Cleaning</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>26</td>
<td>Water Cooled Compressor Retrofit</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>Kitchen Hood Controls</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>Temperature Setpoint Adjustments</td>
<td>$2,154</td>
<td>$3,348</td>
<td>1.55</td>
</tr>
<tr>
<td>29</td>
<td>Domestic Hot Water Storage Tank Insulation</td>
<td>$75</td>
<td>$2,511</td>
<td>33.43</td>
</tr>
<tr>
<td>30</td>
<td>Building Insulation</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>31</td>
<td>Internal Combustion Cogeneration System</td>
<td>$124,444</td>
<td>$1,926,754</td>
<td>15.48</td>
</tr>
<tr>
<td>32</td>
<td>Solar PV System</td>
<td>$583</td>
<td>$102,170</td>
<td>175.36</td>
</tr>
<tr>
<td>33</td>
<td>Building Dashboard</td>
<td>$2,019</td>
<td>$45,616</td>
<td>22.59</td>
</tr>
<tr>
<td>34</td>
<td>New Windows</td>
<td>$2,285</td>
<td>$518,001</td>
<td>226.66</td>
</tr>
<tr>
<td>35</td>
<td>Install Variable Refrigerant Volume System</td>
<td>$4,849</td>
<td>$869,466</td>
<td>179.29</td>
</tr>
<tr>
<td>36</td>
<td>Hydroflex Cooling Tower Treatment</td>
<td>$-</td>
<td>$-</td>
<td>-</td>
</tr>
<tr>
<td>37</td>
<td>Dolphin Cooling Tower Treatment</td>
<td>$12,000</td>
<td>$111,844</td>
<td>9.32</td>
</tr>
<tr>
<td>38</td>
<td>Air Cooled Chiller Installation</td>
<td>$1,068</td>
<td>$194,909</td>
<td>182.46</td>
</tr>
<tr>
<td>39</td>
<td>Solar Domestic Hot Water Heating System</td>
<td>$585</td>
<td>$106,784</td>
<td>182.54</td>
</tr>
</tbody>
</table>

Section III of this IGA includes a discussion of the ECMs that were not in the Table 1 Selected To-Date list.
OVERVIEW OF THE PROCESS AND THE OBJECTIVES

Transylvania University helped define the strategic needs to manage energy on the campus. The overall objective was to maximize savings that could leverage the financing for the replacement of older, inefficient equipment and add measures that would contribute to the sustainability program on the campus. The scope of this comprehensive project covers energy and water savings, maintenance improvements, new capital equipment and lower operating expenses for the campus and the advancement of Sustainable concepts. The results are dependent on the final selection of the ECMs but there will be over 20% reduction in energy & water costs along with new infrastructure for Transylvania University in excess of $2.6 million.

Pepco Energy’s role within this team concept is to bring energy expertise and ideas to the team and to function as a permanent energy partner with Transylvania University over the 12 year duration of the contract and beyond.

RENEWABLE ENERGY AND GREEN CONCEPTS

Transylvania University has determined to carry a leadership position within Kentucky and among university peers by implementing strategies beyond just energy and water savings. Sustainability concepts are included in the mix of energy strategy components in the To-date list and in the Prior to ESA Evaluation List. The environmental and public impact of these concepts will be important while the implementation costs will be evaluated against economic feasibility.

During the IGA the team evaluated numerous options including; solar photovoltaic, daylighting, destratification fan systems, solar domestic hot water (for pools and dorm water usage), LED lighting, geothermal heating and cooling, green roof, chemical water treatment reduction and the installation of a internal combustion cogeneration system). A tracking Energy Awareness Program is included as a specific ECM to measure the electrical energy consumption in each of the targeted residence buildings. A website will capture the data and allow a comparison of energy improvements on a real-time basis. This is intended to help hold the inspiration of the staff and students to maintain vigilance for energy savings practices as the project continues into the longer term.

Environmentally, the project complements sustainability efforts endorsed by Transylvania University. The chart on the following page shows the equivalent footprint impact that will result from just the electrical and gas energy savings:
ENVIRONMENTAL IMPACT ADVANTAGES – BASED ON ELECTRICAL AND NATURAL GAS SAVINGS

### Electrical Savings Environmental Impact Chart

<table>
<thead>
<tr>
<th></th>
<th>Project kWh Before</th>
<th>Project kWh After</th>
<th>Project kWh Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds of Carbon Dioxide</td>
<td>15,603,721</td>
<td>13,687,300</td>
<td>1,916,421</td>
</tr>
<tr>
<td>Pounds of Nitrogen Oxides</td>
<td>41,426</td>
<td>36,338</td>
<td>5,088</td>
</tr>
<tr>
<td>Pounds of Carbon Monoxide</td>
<td>1,151</td>
<td>1,009</td>
<td>141</td>
</tr>
<tr>
<td>Pounds of Mercury</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pounds of VOC</td>
<td>189</td>
<td>166</td>
<td>23</td>
</tr>
<tr>
<td>Barrels of Oil</td>
<td>6,674</td>
<td>5,854</td>
<td>820</td>
</tr>
<tr>
<td>Tons of Coal</td>
<td>2,037</td>
<td>1,787</td>
<td>250</td>
</tr>
<tr>
<td>Pounds of Ash and Dust</td>
<td>5,098</td>
<td>4,472</td>
<td>626</td>
</tr>
<tr>
<td>Acres of Trees</td>
<td>2,578</td>
<td>2,261</td>
<td>317</td>
</tr>
<tr>
<td>Old Cars Off the Road</td>
<td>1,887</td>
<td>1,655</td>
<td>232</td>
</tr>
<tr>
<td>Power saved for Homes</td>
<td>1,933</td>
<td>1,696</td>
<td>237</td>
</tr>
</tbody>
</table>

Estimation is calculated on EPA source data.

### Environmental Impact for Natural Gas:

<table>
<thead>
<tr>
<th></th>
<th>Project Therms Before</th>
<th>Project Therms After</th>
<th>Project Therms Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds of Carbon Dioxide</td>
<td>3,135,110</td>
<td>2,870,116</td>
<td>264,994</td>
</tr>
<tr>
<td>Pounds of Nitrogen Oxides</td>
<td>4,017</td>
<td>3,877</td>
<td>340</td>
</tr>
<tr>
<td>Pounds of Nitrous Oxides</td>
<td>59</td>
<td>54</td>
<td>5</td>
</tr>
<tr>
<td>Pounds of Sulfur Dioxide</td>
<td>16</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Particulate Matter less than 10 microns</td>
<td>50</td>
<td>46</td>
<td>4</td>
</tr>
<tr>
<td>Pounds of VOC</td>
<td>144</td>
<td>132</td>
<td>12</td>
</tr>
<tr>
<td>Pounds of Carbon Monoxide</td>
<td>643</td>
<td>588</td>
<td>54</td>
</tr>
<tr>
<td>Pounds of Mercury</td>
<td>Negligible</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Estimation is calculated on EPA source data.

CONSTRUCTION AND IMPLEMENTATION

This is a Turnkey Project. Implementation and Scope of Work for the ECMs contained in this IGA includes any final MEP design requirements and submittals, equipment and supplies, installation labor, project management, construction management, permitting, insurance, bonding, and any applicable sales tax on equipment. Pepco Energy shall serve as the general contractor for the Energy Performance Contract. Pepco Energy will be responsible for all subcontractor management and for maintaining close coordination and communication with the Transylvania University side of the team during the project.
A Construction Schedule will be defined to provide a basic timeline for durations of activities, but will also complement requirements of campus activities. A next step within the team is to integrate this schedule into University activities, then coordinate a Phasing Plan, as needed, for major elements involving ceiling removals and other large changes in equipment and finishes. A key point will be that Pepco Energy managers will be on-site whenever a subcontractor is active to assure integrity of our commitment to a safe and acceptable work site for all university stakeholders and visitors.

Implementation shall also include final commissioning of the ECMs and training of Transylvania University personnel on the ECMs.

After successful implementation, a comprehensive Measurement and Verification protocol (a project specific draft is included within this IGA) will be followed to demonstrate and verify annual savings of the Energy Performance Contract.

**NEXT STEPS**

The Overall Project Goals from the start of the IGA continue as:

- Maximize Energy Savings for the University,
- Integrate Maintenance and Operations Efficiencies and Productivity Savings Associated with Energy Savings Infrastructure Improvements,
- Enhance an On-Going Campus-wide Awareness for Saving Energy,
- Further enhance Transylvania University’s Position as a Healthy, Comfortable, Secure, Productive, Environmentally Sound, and Energy Efficient Campus.

The Pepco Energy team would like to acknowledge the time and cooperation that the Transylvania University Physical Plant team invested to tailor this project to the specific needs of their campus. The entire team understands that the goals of the project outweigh individual needs and that the advantage will be to the improvement of Transylvania University. We also recognize the level of expertise that has accomplished efficient management and control of Transy energy infrastructure. This ability exceeds what we have seen in other facilities.

Upon the approval of the contract resulting from 1) discussions on this IGA, 2) additions and changes to the ECMs, 3) University reviews and approvals, 4) Execution of the Energy Services Agreement, and 4) Closing of the Project Financing; Pepco Energy is prepared to mobilize immediately and begin implementation of the Energy Savings Performance Contract in accordance with the project schedule as developed by the team. The ECM pricing shall remain valid for a period of 120 days in order to accommodate any timing requirements for contract execution.
Appendix 8: Green Storm
Transylvania University
Building Conservation Coordinator
Job Description

- Act as the designated conservation contact person for your building/hall
- Report any conservation-related maintenance concerns that you witness or that are reported to you (without a report being submitted by the primary person)
  - Follow up on conservation-related maintenance requests; report problems with maintenance requests to Physical Plant Director and Sustainability Director
- Identify any patterns of behavior that would lead to increased utility use (e.g., lights consistently left on in a particular classroom, showers left running to create “steam room”)
  - Share this information with the Sustainability Director
  - Help the Sustainability Director develop and implement an intervention plan
- Maintain “Last Out? Lights Out.” stickers in common areas of building/hall
- Ensure that each recycling bin is paired with a current recycling poster
- Help implement winter shutdown procedures
- Be familiar with, and help implement, the energy policy
- Complete a Green Storm of your building twice a year, once during heating season and once during cooling season
Green Storm

Purpose

Green Storm is an opportunity for teams of students, faculty & staff to identify easy, inexpensive ways Transylvania can manage existing buildings more sustainably. The program is designed to identify minor problems that, over time, would result in water and/or energy waste. Green Storm also examines the recycling program. Major renovation recommendations (e.g., new lighting, windows) should not be made as part of this process. Transylvania had an engineering firm conduct an energy audit of campus last summer, and is considering major renovations based on the information the firm provided.

Instructions

1. Before beginning your walkthrough, discuss a strategy for dividing the work among your Inventory Team. For example, if you have a large group, you may want to divide the building by having a few people focus on each floor. Each group walking through the building should have a secretary who is responsible for recording the observed maintenance needs on the Maintenance Request Chart. You may also want to identify specialists whose job it is to make sure that particular items on the Inventory are considered in all appropriate areas of the building.

2. Complete the Inventory Team Questionnaire with the names of the participants who are contributing to the Maintenance Request Chart on the flip side of the sheet. If your team is splitting up, don’t put the full team’s information on the questionnaire. Only list the team members who are working on that specific Maintenance Request Chart.

3. Begin your walkthrough. Not all items on the Green Storm Inventory list will apply to all areas of the building for which you are volunteering, though please be mindful of all four sections during the course of your walkthrough.

4. When you come across a maintenance issue, fill out the Maintenance Request Chart as thoroughly as possible. To supplement the written report, you are encouraged to take photos and email them to adossett@transy.edu. Label the photo with the building name and the line on the Maintenance Request Chart to which the photo corresponds.

5. Completed inventories should be sent to Angela Dossett. They can be delivered by campus mail, or you can drop them off to her office in suite 101 Old Morrison. You may also email them to adossett@transy.edu.

Follow up

Once the maintenance requests from a Green Storm Team are compiled, they will be posted on the sustainability webpage. Progress on fulfilling these requests will be posted at regular intervals. Any maintenance request that cannot/will not be addressed will be acknowledged, and an explanation will be provided.
Green Storm Inventory

Please be mindful of all sections of the inventory as you conduct your walkthrough. When you fill out the Maintenance Request Chart, reference the inventory item using both the letter and number in the inventory code column. For example, a leaking faucet would be W1.

Water

W1. Are sink faucets leaking?
W2. Are sink faucets exceptionally hard to turn off?
W3. If the faucets are automatic, are they functioning improperly?
W4. Are shower heads leaking?
W5. Are the showers exceptionally hard to turn off?
W6. Are toilets running constantly?
W7. If the toilets have an automatic flushing sensor, are they malfunctioning?

Energy

E1. Are unnecessary building lights being left on when not needed (e.g., enough daylight, no one in space)?
E2. For lamps and other standard light fixtures: Are the lights incandescent bulbs? (i.e., regular light bulbs, not the swirly bulbs)
E3. Are windows allowing too much air flow? (Are there visible gaps?)
E4. Do outside doors have large gaps around the frames? If so, how large are the gaps?
E5. Do stairwell doors have large gaps around the frames? If so, how large are the gaps?

Solid Waste

S1. Are there garbage cans that are not paired with appropriately sized recycling bins?
   A. Halls: recycling bins should be large – at least waist height
   B. Dorm room/offices: recycling bins should be small, the same size as a standard office trash can
   C. Classrooms: recycling bins should approximately match the size of the trash can in the room
S2. Is the recycling poster missing? (All recycling bins should have a poster.)

Miscellaneous

M1. Are there any roofs, ceilings, walls, floors, or carpets with water leakage, stains or discoloration?
M2. Do you notice any other maintenance issue that should be reported?
<table>
<thead>
<tr>
<th>Sheet #</th>
<th>Inventory Code (ex. W1)</th>
<th>Important Maintenance Notes (ex. Steady stream of water running out of faucet)</th>
<th>Building</th>
<th>Floor</th>
<th>Side of Building (ex. 4th Street)</th>
<th>Room # (ex. 3rd from left)</th>
<th>Location (Be as specific as possible.)</th>
<th>Are you planning to email a photo related to this request?</th>
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