TEXAS A&M UNIVERSITY
Division of Administration
Office of Sustainability
Biennial Report

Texas A&M University defines sustainability as the efficient, deliberate and responsible preservation of environmental, social and economic resources to protect our earth for future generations of Texas Aggies, the TAMU community and beyond.

RESPECT.PROTECT.PRESERVE.

SUSTAINABILITY

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Office of Sustainability Biennial Report
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A Letter from our Leaders

In June of 2010, Texas A&M University endeavored to embrace sustainability on our campus in a new, comprehensive and meaningful way. Leading the way was Sustainability Officer, Kelly Wellman. Under her leadership, Texas A&M University developed the Sustainability Master Plan and Sustainability Marketing Plan. These documents provide the framework by which we coordinate environmental, social and financial stewardship efforts.

Now we are pleased to present this report detailing the progress made toward achieving our goals. Our successes are a combination of projects both large and small. From something as simple as the installation of solar tables that allow our students, faculty, staff and visitors to charge their computers and cell phones all within reach of wireless internet or something as complex as the $75 million overhaul of the campus utilities through the Combined Heat and Power Project. Each project has brought us closer to fulfilling the 12 Strategic Initiatives identified in the Sustainability Master Plan.

It is only through a continued commitment from our students, faculty, staff, former students, visitors and community that we can make good on these promises to deliberately and responsibly preserve the environmental, social and economic resources to protect our earth for future generations of Texas Aggies and beyond.

Please join us in celebrating our accomplishments to-date, renewing our dedication to fulfilling our land-, sea- and space grant missions and commitment to Texas.

Thanks and Gig'em,

Dr. R. Bowen Loftin '71
President

Dr. Rodney P. McClendon '07
Vice President for Administration

Sustainability at Texas A&M: Definition

At Texas A&M University (TAMU) we define "sustainability" as the efficient, deliberate and responsible preservation of environmental, social and economic resources to protect our earth for future generations of Texas Aggies, the TAMU community and beyond. TAMU defines "stewardship" as the act of conserving precious resources for a better and more sustainable future.

TAMU is concerned with meeting the needs of the present, without limiting future generations' ability to meet those same needs. Our university is committed to respecting, protecting, and preserving the precious resources the earth provides for us and we recognize the best way to do this is by placing sustainability at the forefront of our decision making processes.

Office of Sustainability: Mission

Our mission is to educate the campus and local community about the importance of sustainability in order to foster a "culture of sustainability." We will accomplish our mission by promoting sustainable practices both on and off campus in academic and non-academic settings, providing resources and support for people who wish to incorporate sustainable practices into their work and life, and advocating for sustainable programs, projects, and initiatives.

Office of Sustainability: Vision

Our vision is to be recognized as a national campus leader in sustainability, to develop long-term programs around environmental, social, and financial stewardship for our earth that have measurable results, and for every member of the Aggie family to incorporate sustainable practices into their daily lives. Ultimately, we envision creating a "culture of sustainability" at TAMU.

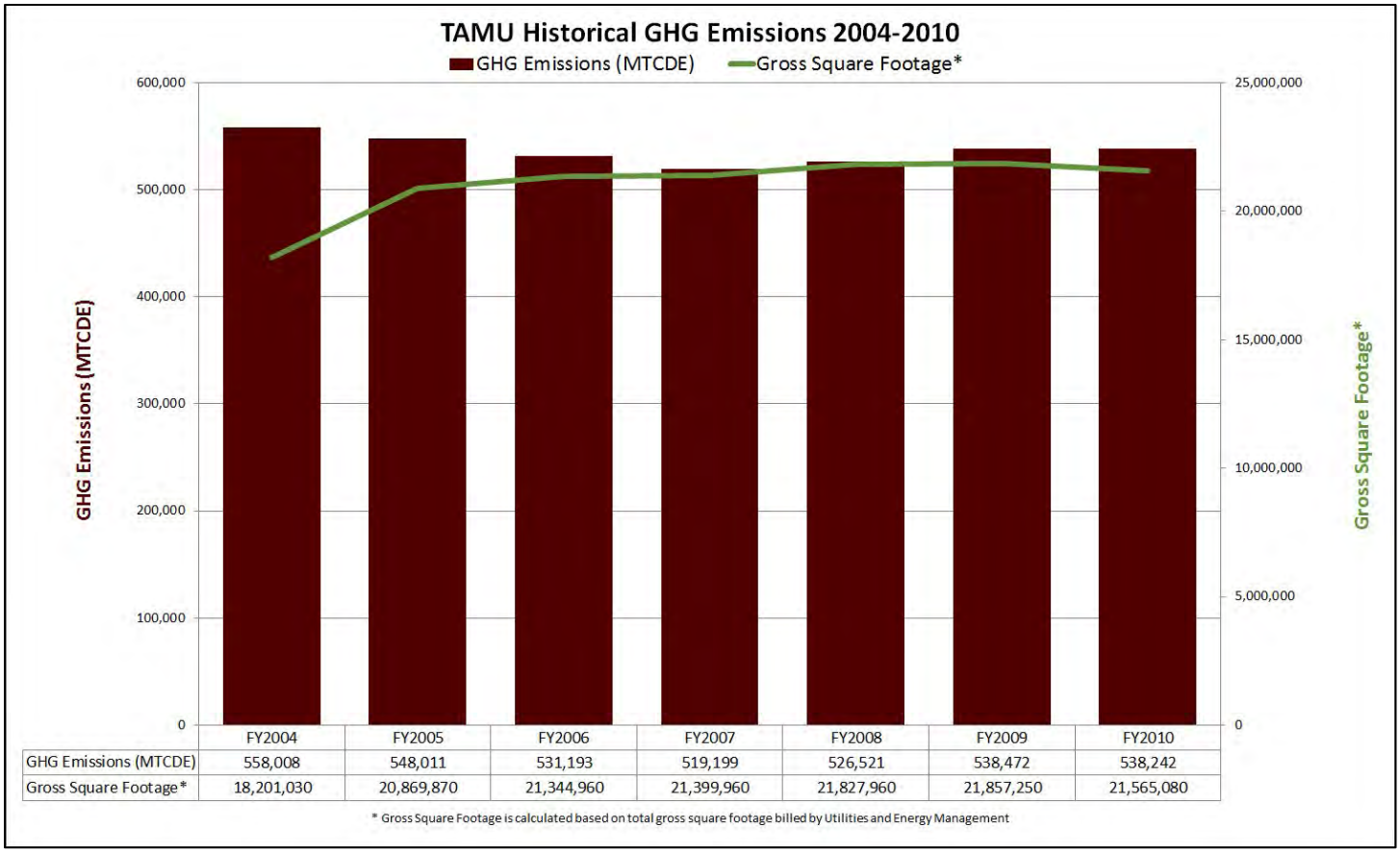
The Sustainability 12

Twelve key areas have been identified to organize sustainability efforts for TAMU. There is substantial overlap and interplay between many of the core components, but each component works to achieve an increased level of stewardship at TAMU. They are Management of Climate Change, Purchasing of Sustainable Goods and Services, Optimization of Energy Use, Sustainable Food & Dining, Management of Water Resources, Waste Management, Sustainable Land Use, Use of Green Building Practices, Utilization of Alternative Transportation and Fuels, Improving Social and Economic Factors, Education and Research, and Management and Funding Support.

1. Management of Climate Change

TAMU is an expansive campus serving over 50,000 students who are supported by more than 8,000 faculty and staff. An institution of this size produces and emits a large amount of greenhouse gas (GHG), which contributes to climate change. Because TAMU takes our commitment to stewardship seriously, we have developed Energy Action Plan 2015 to combat our GHG emissions. The first step of this plan was implemented by reviewing the existing Baseline GHG Emission Inventory and completing the Campus GHG Report for FY2010. When the Utilities & Energy Management (UEM) Master Plan is complete, GHG emission reduction goals and their supporting strategies will be officially adopted by TAMU.

Part of this process is tracking and reporting our GHG emissions. In FY2010 our University was responsible for releasing 538,241 metric tons of CO_2 into the atmosphere, which was statistically equal to the 538,472 metric tons of CO_2 we released in FY2009. When comparing the results to our 2004 baseline on a square foot basis, our carbon footprint dropped 19%. The following chart shows that even as campus size has increased since 2004, our GHG emissions have decreased. This reduction will be even greater for FY2011 due to A&M's investment in a Combined Heat and Power Plant (CHP).



	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010
GHG Emissions (MTCDE)	558,008	548,011	531,193	519,199	526,521	538,472	538,242
Gross Square Footage*	18,201,030	20,869,870	21,344,960	21,399,960	21,827,960	21,857,250	21,565,080

* Gross Square Footage is calculated based on total gross square footage billed by Utilities and Energy Management

Our carbon footprint will decrease because A&M now produces approximately 2/3 of our power requirements through the use of a highly efficient CHP system that burns natural gas. The CHP upgrade will improve plant operating efficiency by 20% and decrease energy related GHG emissions by 30%. The equipment and configuration selected for the CHP has the best return on investment, with cost avoidance projected to be between $6 million and $12 million per year. This system will reduce our dependency on the Electricity Reliability Council of Texas (ERCOT) grid that runs primarily off coal. This means that as the cost of electricity from the grid increases, the cost avoidance associated with the CHP increases because of the higher efficiency of CHP versus power purchased from the grid. For example, the record breaking temperatures and peak electrical load in August 2011 caused energy purchased from ERCOT to soar in price. Due to our switch to the CHP we were able to cost avoid $1 million in purchased utility cost in the first month of operation.

2. Purchasing of Sustainable Goods and Services

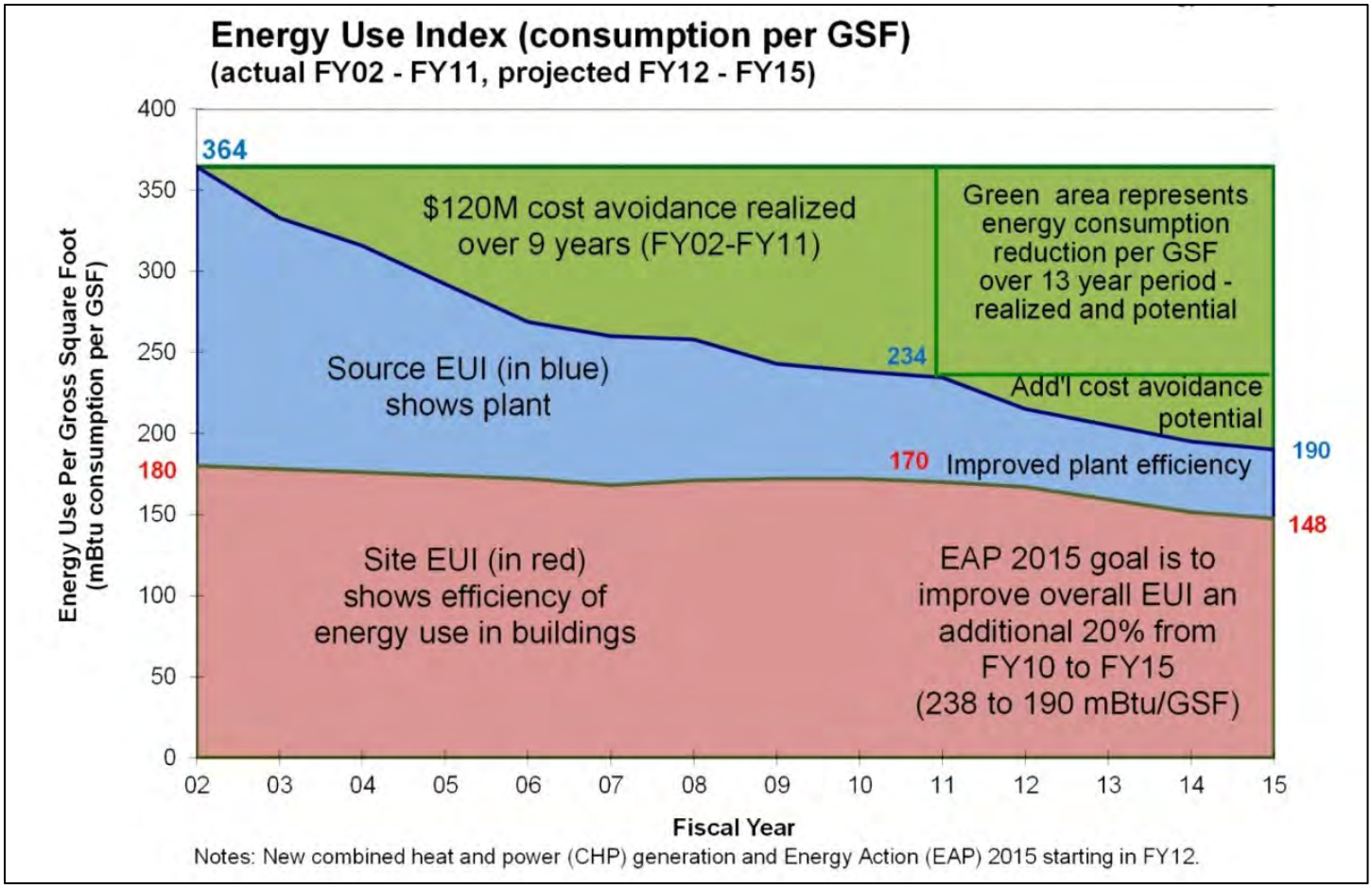
By purchasing goods and services for the 50,000+ students and 8,000+ faculty and staff members, TAMU has significant purchasing power. With this power we have the ability to affect the economy in a positive way, which is why we have committed to increasing our use of sustainably-produced materials and services. We anticipate an increase of our use of renewable, reusable, recycled, locally produced and purchased, and environmentally preferable products by December 31, 2012.

Custodial Services aids in this effort by including requirements to purchase Green Seal and EcoLogo products. Current practices include the use of Green Seal GS-41 certified[1] hand soap across campus; the use of CCD-086 certified[2] roll towels; the use of CCD-082 certified[3] coreless toilet tissue rolls; the use of durable and reusable microfiber damp mops, dry pads, wet pads, and cloths used to clean our facilities; the use of floor finish made with renewable materials; and the use of Green Seal GS-37 certified[4] cleaning products. All non-hazardous materials used by custodial services are recycled.

3. Optimization of Energy Use

In the last nine years (from FY2002 through FY2011), energy consumption at TAMU has dropped 22%, while the gross square footage served has increased by 21%. This translates into a 36% reduction in energy consumption per square foot. This significant drop in energy consumption has saved the university $120 million over the past nine years. The chart on the next page highlights these successes visually.

[1] http://www.greenseal.org/Portals/0/Documents/Standards/GS-41/GS-41_Hand_Cleaners_for_Industrial_and_Institutional_Use_Standard.pdf
[2] http://www.environmentalchoice.com/common/assets/criterias/CCD-086.pdf
[3] http://www.environmentalchoice.com/common/assets/criterias/CCD-082.pdf
[4] http://www.greenseal.org/Portals/0/Documents/Standards/GS-37/GS-37_Cleaning_Products_for_Industrial_and_Institutional_Use_Standard.pdf



Through our Sustainability Master Plan (SMP) TAMU committed to reduce our consumption of energy per gross square foot by 5% every year (until we reach the EAP 2015 goal). One avenue our University has undertaken to meet this goal is through the UEM Master Plan. This initiative will set campus goals, outline programs, establish building system design standards, and most importantly mandate participation. UEM Master Plan calls for the university to exceed the ASHRAE 90.1-2010[5] standard for energy efficiency by 15% for building renovations and by 25% for new construction. UEM collaborated with the TAMU System Facilities Planning & Construction department to establish these standards.

UEM has created a campus-wide Energy Stewardship Program (ESP) that has been approved for funding and will be expanded during FY2012. The ESP is a conservation and efficiency improvement program that started with pilot programs in June 2009. The ESP will reduce energy consumption through technical upgrades and through the employment of energy

[5] http://www.ashrae.org/technology/page/548

stewards who will educate, inform, and raise awareness about opportunities for improving energy efficiency and conservation. So far, millions of dollars have been invested in lighting retrofits and upgrading HVAC[6] units. Lighting retrofits that optimize our use of energy have been completed in 32 facilities. Aside from improvements to buildings, UEM and Transportation Services have worked closely together on lighting retrofits for all new parking lots on campus and those undergoing major repair. The existing 400 watt high pressure sodium lamps are being replaced with 325 watt metal halide lamps. On average, this switch will reduce energy use by about 21%.

Our campus uses a lot of electricity to power our server rooms, we seek to establish and implement campus data center efficiency standards. Over the past year, UEM has worked with the College of Engineering and Computer Information Services (CIS) to identify opportunities to relocate 26 server rooms to virtualized servers in the CIS server rooms. The data collected from this pilot project effort will assist UEM in creating a baseline measure to determine efficiency gains for future consolidations and virtualizations.

Fall 2011 marked the fourth ResLife Energy Challenge in which residence halls across campus competed to see who used the least amount of energy over a designated time period. UEM and Residence Life (RL) worked hand-in-hand to develop and implement this successful outreach and education campaign. Thirty-six residence halls responded to the energy challenge in 2011. To measure the impact of this program UEM tracked utilities use in comparison to the previous year's usage in each hall.

Both the 2010 and 2011 challenge expanded by allowing residents to earn points for their hall by signing a sustainability pledge, participating in a sustainability themed film series sponsored by Multicultural Services, doing service relating to recycling with the Student Government Association's Environmental Issues Committee, participating with the Howdy! Garden to learn about sustainable food sources, sponsoring an educational bulletin board, and/or selecting a student Eco-rep for the hall.

Aside from the success of the ResLife Energy Challenge in spreading the sustainability message on campus, RL applied for and received funding for an Aggie Eco-reps program to

[6] Heating, ventilation, and air conditioning

assist with sustainability outreach, education, and service across residence halls. The Aggie Eco-reps is a formal and comprehensive program that will solidify the Eco-reps implemented during the energy challenge. RL used hall improvement funds and outreach programming grants in support of sustainability initiatives that include recycling containers, bulletin boards, and other sustainability specific educational materials.

UEM completed an energy consumption reduction project in 24 facilities across campus. The $15 million implementation showcases the financial commitment TAMU is willing to make for a more sustainable future.

Our action plan targets three areas in order to increase campus energy consumption efficiency. First, UEM installed a highly efficient Combined Heat and Power Plant on September 1, 2011. Second, UEM has replaced three older inefficient chillers with high efficiency chillers. Third, UEM has improved power plant controls in order to operate more efficiently through a plant optimization program. UEM has taken this objective to another level with the establishment of Energy Action Plan (EAP) 2015. The overall goal of the EAP is reducing campus energy consumption an additional 20% over five years (from FY2010 through FY2015) while improving customer service and meeting all university energy requirements.

TAMU supports renewable energy through a commitment to increasing the usage of clean energy by 5% by 2015. We have evaluated and are currently working on the installation of a biodigester on West Campus for on-site renewable energy production. The biodigester consumes food waste and solids to produce electricity. While the CHP doesn't provide renewable electricity, the improved efficiency and energy consumption associated with the CHP actually provides greater benefit than investing the same amount of funding in renewable energy.

UEM continues to work with Smart Energy Campus Initiative (SECI) – is a collaboration of faculty and staff committed to increasing research efforts and to identifying grant funding opportunities to support development of renewable energy sources. Specifically, SECI focuses on photovoltaic system installations, electric vehicle charging station infrastructure, smart metering and monitoring, building efficiency optimization, load shedding program, and more efficient utilization of assigned building space.

4. Sustainable Food & Dining

TAMU will strengthen sustainable food systems, reduce the waste generated by University Dining (UD), and increase healthy food options. First, we will strengthen sustainable food systems by increasing the use of locally grown and third-party certified foods (such as organic, fair-trade, and marine stewardship certifications) in campus-operated cafeterias to 20% of food purchases from FY2010 to FY2015. Additionally, we will enhance and formalize the Community Garden and Student Farm on campus. Currently, a two acre plot of land is located on West Campus is home to the Community Garden and the Student Farm. The Student Farm is about 1.5 acres of this land and is tended by 60 volunteer students and one paid student. Approximately 60% of the food produced by the Student Farm is used by UD in their food program. The additional 40% of the food produced by the Student Farm goes toward Community Supported Agriculture[7], an on campus farmers' market, and regular donations to local charities. In 2010, Sbisa Dining Hall served over 1,300 pounds of Student Farm produce and in the coming years this number is expected to increase significantly. The Community Garden is tended by 40 individuals including students and community members. The food grown there is used by those who tend to the plots and stays in the community. Efforts are underway to network with off-campus gardeners in the local area to promote the use of locally grown food.

Second, we will reduce the waste our campus-operated cafeterias send to landfills by 20% by December 31, 2013. UD has focused their efforts on 1) reducing cafeteria waste from trays, plates, and utensils and 2) composting pre-consumer and post-consumer food scraps at all campus cafeterias through two programs. The first program is a partnership with Terrabon Research Company initiated in June 2010. Terrabon picks up the food scraps at regular intervals and transports them to their facility where the scraps are converted into biofuels and biochemicals through an anaerobic digestion process. Most of the food scraps are post-consumer waste and come from scrapping operations in the dish room at Sbisa.

[7] Community Supported Agriculture is a marketing system where people buy shares of the Student Farm up-front and receive produce weekly amounting to the value of their share. The Student Farm's CSA is orientated toward students and faculty.

The second program is an extensive composting and recycling program in the Sbisa Dining Center initiated by UD in February 2011. The program involves active recycling of food waste and other compostable or recyclable products from the Sbisa Kitchen and Underground Food Court (UGFC), which is located in Sbisa's basement. The composting and recycling effort involve participation by Sbisa and UGFC staff, customers (students), and Brazos Valley Recycling (BVR). UD has created less waste by switching all disposable plateware and utensils from plastic to compostable (biodegradable) materials in the UGFC. They have launched an extensive educational campaign in the UGFC to teach students how to dispose their waste properly and they have designated containers for compostable materials, recyclable materials, and waste. The kitchen staff has been trained to separate food scraps and compostable materials from recyclable materials and to deposit all materials in their proper containers outside.

Although these programs are in their beginning phases, early returns indicate significant waste minimization. For example, for the month of March total landfill waste at Sbisa fell from 42.2 tons in March 2010 to 22.4 tons in March 2011, a reduction of 46.9%. A similar composting and recycling plan is in the works for the newly renovated Memorial Student Center (MSC) that is scheduled to open in April 2012.

UD will increase the offering of diverse and healthy food options by December 31, 2012. They have started this process by providing students with access to educational materials to support their food choices. Nutritional information has been added to the University Dining nutritional analysis software database for each of the products purchased to prepare for recipes and food for the Simply Fresh line of Grab-n-Go products. This information has been used to label all the products. Aside from alerting customers to the nutritional information of products, UD will increase the amount of vegetarian options on campus by December 31, 2012. Currently, each food service area in Sbisa has vegetarian options available and all fried food is fried in vegetable, non-trans fat, omega3 oil. In the fall of 2011, Sbisa Dining Center began to offer a vegetarian line at lunch and dinner to include both vegan and vegetarian dishes. A sampling of these dishes includes beans and rice, lentil and chick pea stew, eggplant parmigiano and brown rice, as well as fresh steamed/cooked vegetables seasoned with herbs (no added salt or fat). The menu changes each day so there is variety.

5. Management of Water Resources

TAMU is concerned with preserving our available water supply so future generations of Aggies will continue to thrive in our campus community. We are committed to reducing our consumption of potable water and preventing pollution of our water resources. Over the past twenty years, TAMU has implemented a number of significant water conservation initiatives and water system improvements that have significantly reduced water consumption. From 1991 through 2009, TAMU reduced total annual water consumption by 50%. This reduction was accomplished while serving a campus that grew 43% in gross square footage (GSF). This 50% decrease in overall water consumption with a 43% increase in GSF represents a 65% reduction in consumption per GSF.

By 2015 our goal is to reduce our consumption of potable water by 15%. At present we have numerous domestic water meters in place that measure water usage, which will help our university and departments better understand how much water is used so they can reduce the amount.

We are seeking to develop and implement a water conservation plan for campus buildings focusing on cost-effective methods. If building managers learn about the savings achieved from water conservation, it is our belief they will be more motivated. TAMU's target date for the establishment of this plan is the middle of 2014.

Another way we seek to preserve our water supply is by evaluating and implementing additional landscaping water conservation practices, such as xeriscaping, rainwater harvesting, and recycling water in order to reduce the use of potable water. In the past two years, two rainwater harvesting systems have come on-line, one at the Interdisciplinary Life Sciences Building (ILSB) and one at the Mitchell Physics Building (MPHY). ILSB has a cistern that can hold up to 45,000 gallons of rainwater and condensate from the HVAC system. MPHY can hold up to 60,000 gallons of rainwater and condensate. By fall 2012, three more water harvesting systems will be in place: at the MSC by April 21, 2012, the Liberal Art, Arts, and Humanities building (LAAH) by July 2, 2012, and the Emerging Technology and Economic Development building (ETED) by August 31, 2012. ETED has also incorporated a detention pond/rain garden area to capture and reuse water runoff.

In an effort to be more efficient in the university's irrigation system, Landscape Services (LS) performs daily checks to adjust spray heads and immediately repair leaks. LS recently upgraded to a new RainMaster irrigation master controller that allows LS to program watering schedules more efficiently by regulating the watering needs of each plant species, as opposed to watering all areas (turf and plant beds) for the same length of time. LS is working on reducing turf area by substituting grass for rock or mulch which require no watering. Finally, a recent project at the Sam Houston Sanders Corps of Cadets Center has converted a traditional spray head irrigation system with a drip irrigation system and replaced existing vegetation with water wise plants that thrive on little to no water.

Proactively managing storm water in an ecologically sensitive manner and integrating storm water management in campus planning and development is another avenue TAMU is taking to properly manage our water resources. We plan on meeting this goal by updating our Storm Water Management Plan (SWMP) to continually focus on the improvement of storm water best management practices. In the coming months SWMP will be rewritten and one issue under serious consideration for inclusion in the plan is increasing the use of low-impact development (LID) methods on campus.

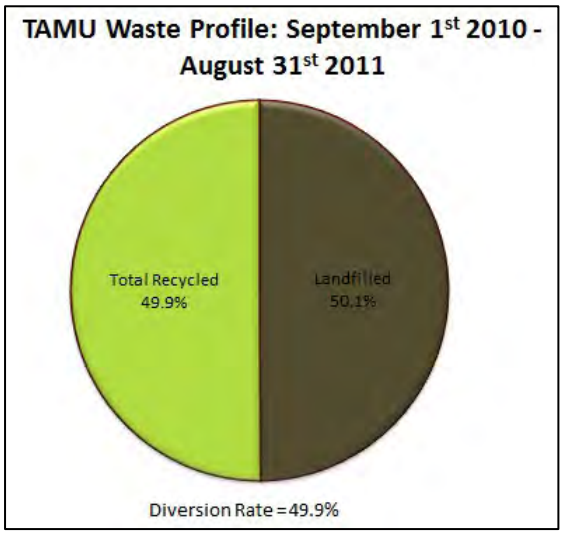
LID is an approach to land development (or re-development) that works with nature to manage storm water as close to its source as possible. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. Applied on a broad scale, LID can maintain or restore a watershed's hydrologic and ecological functions.

We will continue to push for the increased use of LID methods on campus to fortify the fourteen LID projects already implemented or underway. Aside from the previously mentioned cisterns and detention ponds at ILSB, MPHY, MSC, LAAH, and ETED, the Agriculture and Life Sciences Building and the AgriLife Center has a cistern and detention pond. The Gilchrest Building, Penberthy Intramural Sports Center, University Apartments, Texas A&M Institute for Preclinical Studies, the National Center for Therapeutics Manufacturing, and the Polo Fields all

have detention ponds. The President's House has a retention pond.[8] In addition to the cistern at MPHY, a roof garden proactively manages water.

6. Waste Management

Our large university generates a lot of waste every month. From September 2010 to August 2011, on average, TAMU generated 1,654 tons of waste each month. Therefore, waste minimization is another avenue in which TAMU seeks to make an impact. Through the Sustainability Master Plan (SMP) TAMU has committed to reducing the generation of waste and increasing our waste diversion from landfills. Specifically, our goal is to reduce the waste we send to landfills by 20% from calendar year 2010 to calendar year 2013.



First, we are developing recycling strategies and goals which include recycling services in all campus buildings that have accompanying educational materials, signage, and staffing. TAMU has come a long way with our recycling efforts in a short period of time. In June 2010, TAMU engaged in a partnership with Brazos Valley Recycling that has allowed the University to recycle more materials than ever before. For example, in September 2010 UEM had a diversion rate of 23.8%, compared to about 63% in August 2011. For FY2011, TAMU diverted 49.9% of all our waste from the landfill. UEM's recycling program continues to grow and we expect our diversion rate to continue to increase in the months and years ahead.

On April 29, 2011, UEM was awarded a $123,500 grant from the Aggie Green Fund to install 19 solar-powered, three-stream waste and recycling containers on main and west campus. These containers are used to collect waste and recycle paper, plastic, aluminum and glass. Thirteen recycling containers have been installed in high traffic areas on main campus. The final six containers were installed on west campus. This project was undertaken with the specific

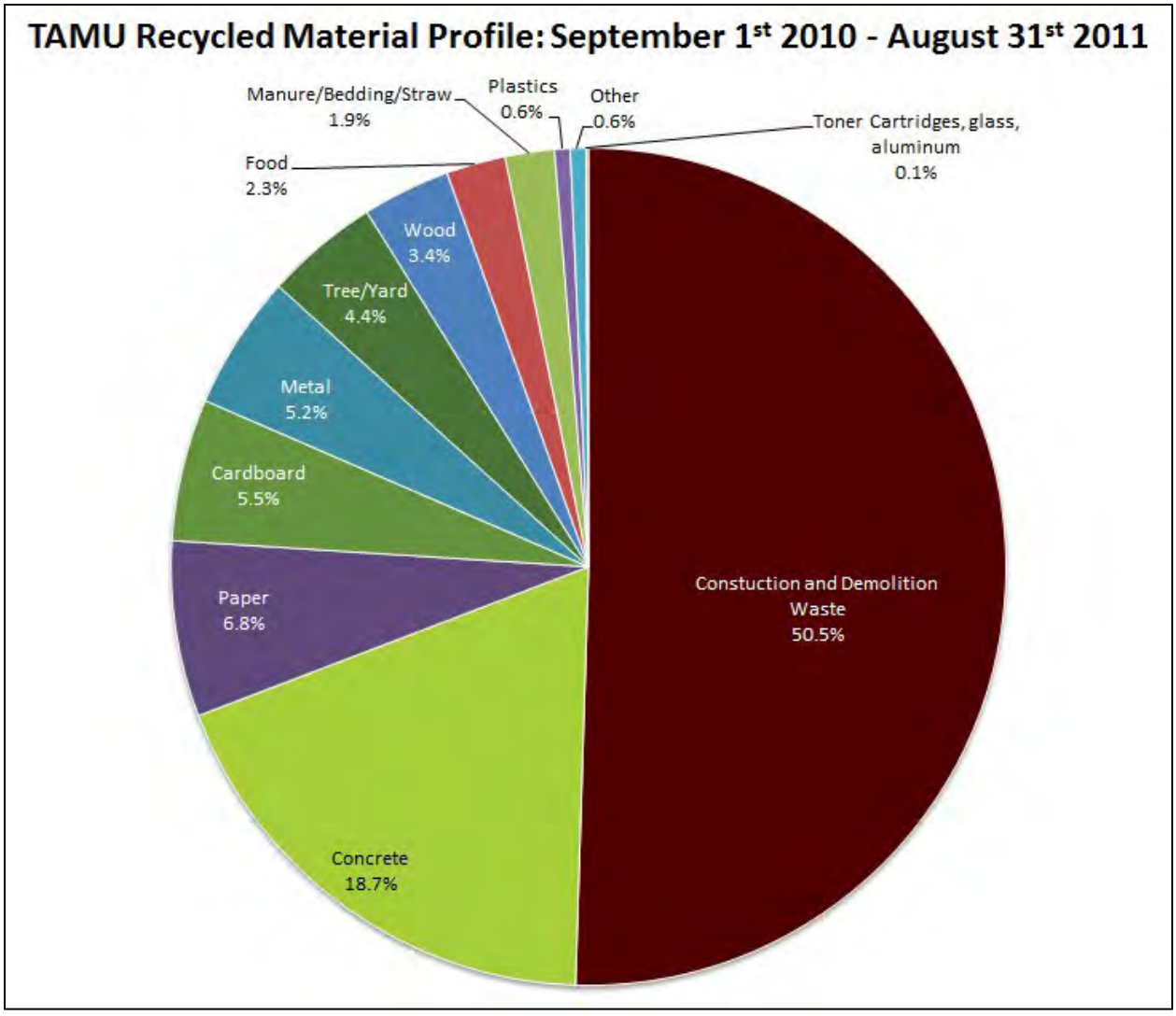
[8] A retention pond is designed to hold a specific amount of water indefinitely. A detention pond is a low lying area that is designed to temporarily hold a set amount of water while slowly draining to another location.

goal of increasing the visibility of TAMU's recycling efforts and expanding the recycling opportunities available to students, staff, faculty, and visitors on our campus.

In April 2011, UEM bolstered this effort by opening a community recycling drop-off center on Adriance Lab Road. In September 2011, an additional recycling drop-off center was added behind the Commons specifically for students living in the south side residence halls. In October 2011, a third drop-off collection center was added near Sbisa Dining Hall to serve north-side residents. The drop-off centers accept cardboard, paper, aluminum, all types of glass, and plastics 1-7. Additionally, through our partnership with PepsiCo, we have installed three indoor Pepsi Dream Machines. These machines act as reverse vending machines and reward users with coupons and points for recycling their plastic beverage containers. They have been useful in raising awareness about the importance of recycling amongst the student body.

As previously noted, UD has been working with Terrabon to recycle the pre- and post-consumer food scraps generated from Sbisa and Duncan dining facilities. The UGFC has partnered with BVR on a pilot program to collect compostable packaging and post-consumer food scraps for the compost pile at BVR. The UGFC is currently diverting 95% of their waste through recycling and composting.

UEM completes numerous reports and collects data for waste management audits that identify opportunities to reduce, reuse and recycle. UEM also collects data about waste streams generated by landscaping, construction debris, chemicals, and building and vehicle maintenance wastes. This information provides a detailed overview of the waste profile for our campus. The snap shot, on the next page, helps us celebrate our successes and identify areas that need improvement.



We are seeking a new partnership with the Salvation Army to help run the program to reduce the amount of waste generated by students during the move-in and move-out process at campus residence halls. In the future we hope to create an Aggie Swap Store as a sustainable enterprise centering on reusing and reselling items students, staff, faculty, and community members have outgrown.

Aside from traditional waste and recycling streams, TAMU has set its sights on increasing our electronic waste recycling by 25% by from FY2010 to FY2013. By targeting students through outreach and providing resources, we intend to make a significant increase in the number of students who properly recycle their electronic waste. We have identified several potential vendors that specialize in electronic waste and we are currently investigating ways to utilize

their services. Currently, students, faculty, and staff are encouraged to bring their electronic waste to the Brazos Valley Solid Waste Management Agency's Household Hazardous Waste events held in spring and fall each year.

7. Sustainable Land Use

Another area we can make a positive impact is the use of our land; therefore, we are committed to maintaining and developing land while protecting natural resources at the same time. We seek to accomplish this task by promoting sustainable land use practices through the establishment of policies by June 30, 2014. Our action plan to meet this agenda calls for three steps: first, we will identify sustainability goals to integrate into the Campus Master Plan and Vision 2020; second, we seek to establish and implement a policy and plan for sustainable land use that includes the management of green spaces, invasive species management, construction impacts, and native plants; and third, we are working on implementing a policy of Integrated Pest Management (IPM) and providing the training necessary for the grounds maintenance staff.

The Campus Master Plan calls for the retention of green space, the use of native plants, and sustainable management practices. The Design Review Sub-council, at the direction of the Council on the Built Environment, is asking that new buildings, and to the greatest possible extent, work on existing buildings, meet LEED Silver standards. While the LEED Silver metric is included in the Design Review Checklist used by the sub-council, the direction of the TAMU System Board of Regents recommended that we no longer seek formal LEED Silver certification due to the financial obligation.

Landscape Services is currently implementing IPM into their services by engaging in more environmentally safe practices and using more organic-based products. Their Turf Services group routinely addresses weed, insect, and pest control concerns through the use of IPM. They are currently aerating and composting high profile turf area in an effort to combat the overuse of chemicals and fertilizers that eradicate beneficial microbes in the soil. Instead of applying traditional insecticides that damage the ecosystem and harm beneficial insects and animals, they are exploring less harmful alternative products. An active bird abatement program is in place, which aims at displacing birds instead of killing them.

8. Use of Green Building Practices

Through our SMP, TAMU has committed to designing, constructing, and maintaining healthier and resource efficient structures. The SMP calls for the implementation of green building maintenance practices by December 31, 2013. Facilities Services (FS) is committed to the design, construction, operation, and maintenance of buildings and other facilities that employ integrated design principles, optimize energy performance, protect and conserve water, enhance indoor air quality, and reduce the environmental impact of building material.

The first guideline FS follows to ensure incorporation of sustainable design elements that are cost effective over the life cycle of the building is site design and planning. TAMU's sustainable site planning identifies ecological, infrastructural, and cultural characteristics of the site to assist designers in their efforts to integrate the building and the site. The intent is to encourage optimum use of natural/existing features in architectural and site design of campus buildings, such that the building energy and water use is diminished and the environment is enhanced.

The second guideline pertains to energy use, which FS strives to minimize during construction of the building and its ongoing operation and maintenance. By making our buildings more energy efficient, TAMU reduces its energy consumption and the financial and environmental costs associated with the burning of fossil fuels.

Third, FS is committed to reducing water consumption and protecting water quality. One way we tackle this is by using low and ultra-low water-efficient plumbing fixtures and other water saving-devices.

Fourth, FS focuses on being more sustainable in regards to materials, resources, and waste. For example, they meet this guideline by evaluating the use of materials and assemblies whose manufacture does not pollute or create toxic conditions for manufacturing workers, construction personnel or building occupants. They monitor and avoid materials and construction processes that can cause indoor air quality problems during renovation, construction, and demolition activities. Extensive recycling minimizes the waste produced from renovation projects.

The fifth guideline FS follows to promote sustainable design is indoor environmental quality. They accomplish this by ensuring an abundance of daylight and fresh air.

9. Utilization of Alternative Transportation and Fuels

At TAMU we are committed to reducing our use of fossil fuels and limiting the emissions released into the atmosphere due to motor vehicle usage. Our short-term goal is to reduce emissions and/or fossil fuel use in the campus fleet by 10% no later than December 31, 2014. Transportation Services (TS) first move to reduce the University's carbon footprint is the development and implementation of a plan aimed at replacing the outdated vehicles of our campus fleet with alternative fuel or low-emitting vehicles. They have updated the purchasing specifications departments use when replacing older vehicles by modifying the rental calculations for hybrid vehicles. This ensures departments are aware of the higher costs associated with purchasing a non-hybrid vehicle. Even if a hybrid or electric vehicle has a greater front-end cost, the long-term savings provide departments a tangible economic incentive to purchase hybrid over traditional vehicles. TS modified the Fleet Services website to promote the hybrid and electric cars that are available on state contract so departments have the information they need to make a sustainable decision. TS is improving our campus' infrastructure to support the push toward hybrid and electric vehicle purchases by providing a free charging station for electric vehicles located in the golf course parking lot on Bizzell Street. Additionally, UEM installed a free charging station at the George Bush Presidential Library.

Another way TS is reducing the fleet's carbon footprint is by regularly scheduling vehicle maintenance to maximize fuel efficiency and operating ability. In this way TAMU can amplify the life and efficiency of the vehicles already in our fleet, which is economically sustainable and promotes the quick replacement of inefficient vehicles. To support this effort TS is putting the finishing touches on a dashboard data system for the fleet to provide departments with easy access to information concerning the costs involved with maintaining and operating their vehicles. This will allow them to make informed decisions about whether or not to replace inefficient vehicles.

Perhaps the greatest sustainable success story TS celebrates is the expansive Shuttle Service system offered to students, faculty, staff, and visitors. The shuttle system is free to ride, paid for by a student transportation fee. TS operates an eighty-bus fleet that offers seven on-campus and nine off-campus routes. Our transit system is one of the largest university systems in the nation. Not only is our shuttle service expansive, it is very convenient. Buses operate at approximately 10 minute intervals from 7 a.m. to 6 p.m. After 6 p.m., when rider traffic declines significantly, the buses come once an hour until midnight. Additionally, passengers can download an application to their smartphones that tells them when the next bus will arrive at their stop. This service is supplemented by a twitter account that alerts riders to any possible delays due to traffic congestion or construction along the routes. The routes themselves are determined by gauging student requests and student density in specific areas to ensure the service is serving the most people in the most efficient manner possible. TS installed a Mentor GPS system that will help them more efficiently schedule buses to accommodate more riders per hour, which translates into less carbon emitted to get each rider from point A to point B.

Every time an Aggie utilizes the shuttle service, a potential motor vehicle is taken off the road and our carbon footprint is reduced. This reduction is impressive as nearly 8,000 student riders utilize this service every day and in total about 5,000,000 rides are provided each year. Thanks to the shuttle service, residents have the option to live on campus without needing a personal vehicle to get around our campus and the Bryan/College Station area. The on-campus routes mean off-campus riders can leave their vehicles at home with the confidence our routes will take them anywhere they need to go once they get to campus.

The reduction of TAMU's carbon footprint is even more meaningful because our transit fleet runs primarily off B-20 biodiesel[9]. In 2010, our supplier biodiesel fuel credit[10] was temporarily suspended due to high biodiesel prices. This forced us to return to regular diesel for part of the year. Despite this our campus vehicles used 119,550 gallons of biodiesel, most of

[9] Biodiesel is a clean burning alternative fuel, produced from domestic, renewable resources. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create a biodiesel blend. It can be used in compression-ignition (diesel) engines with little or no modifications. Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of sulfur and aromatics. B-20 is 20% biodiesel, 80% petroleum diesel.

[10] TAMU's purchase of biodiesel is subsidized by our fuel provider so it is similar in price to regular diesel.

which was utilized by the shuttle service. Fortunately, our supplier fuel credit was reinstated in January 2011 and biodiesel is once again available to power our campus fleet.

The next strategy TAMU has devised to make TS more sustainable is to increase the number of faculty, staff and students using alternative transportation methods. By December 31, 2015 we have set the goal of increasing alternative transportation by 25%. This includes further refining our shuttle service to increase efficiency and ridership. TS created, deployed, and completed a survey about faculty, staff, and students' transportation decisions. With this information in hand, TS is building a commuter solutions campaign to align transportation alternatives. TS is providing and promoting alternative transportation networking resources at various campus events, like Campus Sustainability Day in the fall and Earth Day in the spring. Additionally, they are setting up a listserv for bike enthusiasts on their website; the educational component of this campaign is well underway.

TS has addressed alternative solutions institutionally by hiring an Alternative Transportation Manager and creating an Alternative Transportation Unit. This unit focuses most of its efforts on improving the bicycling options available on campus by partnering with other campus stakeholders to develop a comprehensive bicycle plan. While the full bicycle plan is still in the development phases, parts have already been deployed. This includes establishing bike rules, adding more bike racks, implementing free bike registration, and launching a bike engraving program. In the future, bicycle maps will be created to encourage the increased use of bicycles on campus; bike lanes and signage will be improved in conjunction with the City of College Station. Additionally, the Alternative Transportation Unit has plans to implement a bicycle sharing program.

TS is establishing other avenues to reduce the amount of motor vehicle traffic both on and off campus. For those traveling out of town or just to campus, a carpooling rideshare website is available to connect fellow travelers and encourage a communal use of individual motor vehicles.

On April 20, 2011 at the campus Earth Day Event, TS launched a car sharing program in affiliation with Hertz Connect. The vehicles are low emitting, high-fuel mileage models. The program allows individuals to rent vehicles for anywhere from an hour to a few days. This

program will encourage people to consolidate their individual driving errands and allow students to get anywhere without having to bring their own car to campus.

Finally, in order to improve the Aggie experience and encourage walking around our beautiful campus, the Campus Master Plan seeks to eliminate traffic in the heart of campus. Transportation Services has already improved the access for pedestrians of busy Ross Street by employing gate technology that restricts motor vehicle access during the day. This gate technology will be expanded to the Houston Street and University Avenue area.

10. Improving Social and Economic Factors

At TAMU our commitment to sustainability is bigger than just respecting, protecting, and preserving the environment that sustains us. Our commitment extends to social and economic factors. Our goal is to become an invaluable asset to our community by incorporating social and economic programs into our sustainability agenda no later than December 31, 2015.

The Office of Sustainability (OS) is tackling this goal by engaging with TAMU networks to expand opportunities for students to engage in volunteerism. The first step is the creation of a sustainability volunteer program. This program is in the planning phase but has already been supported by the addition of a student intern which will became a paid position in the Fall 2011 (for more information see the Education and Research section). The second step we have undertaken was the creation of a social networking sustainability site. We launched a Facebook TAMU Sustainability page and have built a following of over 650 people to date. We use this page to communicate with our followers and alert them to the sustainable efforts our office and the University undertakes. We provide sustainability updates weekly on Facebook, often posting three or more times a week. As our volunteer program grows, we will expand our use of social networking sites and increase our updating frequency.

We are focused on economic aspects of sustainability and improving our society by providing resources about sustainability related careers in our Career Center (CC). This enables interested students the opportunity to make their mark in this burgeoning field. Over the past year CC has expanded the sustainability related resources in the Career Center Library and has added new books to their environmental/sustainability section. Additionally, CC has improved

their website, HireAggies.com, by including online resources for those interested in pursuing a green career. This includes access to job databases: ecojobs.com, Green Careers—WetFeet Insider Guide, Vault Guide to Environmental Careers, CareerShift, and Green Collar Jobs.

Aside from the resources available at CC, a commitment has been made to bring in green employers to speak with students about related careers. In Fall 2010 CC facilitated a Federal government Career Panel which hosted three employers speaking about green career opportunities. The following semester, Spring 2011, an Environmental Careers Panel was hosted by CC and featured five employers who spoke on careers in the sustainability field.

CC is committed to identifying green/sustainability careers in companies that recruit TAMU undergraduates and then adding this information to the HireAggies.com website. They are in the midst of developing a survey for Aggie recruiters in contact with CC so they can define sustainability positions/careers that are available within their organizations. Once the recruiters have completed the surveys, the CC will make the appropriate website updates to showcase these green career opportunities.

At TAMU promoting diversity is something we take seriously. To achieve this, the Office of the Vice President and Associate Provost for Diversity (OVPAPD) tailored an action plan. First, in collaboration with the Council on Climate and Diversity, they developed accountability structures and processes for monitoring and evaluating progress. Second, they established baseline comparisons in representation and climate with respect to peers and aspirant peers, and national averages. Third, baseline data for gender, race/ethnicity, and national origin for students, staff, and faculty will be compiled in collaboration with each unit head and the OVPAPD. This information will be used to target groups that need more representation at TAMU.

Our next objective for improving social factors on our campus is promoting a positive and supportive climate[11] by identifying aspects of individual units and the University which foster and/or impede a working and learning environment that fully recognizes, values, and integrates diversity. In collaboration with several divisions across campus, climate assessments were created, completed, and reported to the campus community. The assessments target

[11] In this case climate refers to attitudes and the environment of the workplace or classroom in relation to diversity.

undergraduate and graduate students, faculty, staff, and administrators to gain a better understanding of the diversity climate at TAMU. Then, data was gathered on the effectiveness of implemented climate programs and interventions. The programs were assessed, self-reported, and submitted to the Council on Climate and Diversity. From this climate data, plans were developed for each unit that address ongoing issues and concerns and offer recommendations to remedy them.

OVPAPD and their partners have made significant progress integrating diversity at TAMU. Each year, OVPAPD creates, executes, and evaluates diversity-related faculty development workshops in conjunction with the Dean of Faculties. In collaboration with the Division of Finance, a comprehensive staff diversity education program has been established, implemented, and evaluated. In collaboration with the Division of Student Affairs, a plan for student organization diversity education has been established, implemented, and evaluated for efficacy. Finally, OVPAPD offers and evaluates workshops and classroom experiences to enhance skills with conflict management and difficult dialogues.

Equity is the next objective TAMU has targeted to improve social factors on campus. We envision a University that assures students, staff, and faculty are all treated equally. To make this vision a reality, OVPAPD designed and completed a university-wide equity study to better understand the areas in which our campus needs to improve. The results of that study were then compiled in a report and recommendations were given to President R. Bowen Loftin and Provost Karan Watson. The President and Provost will use the recommendations to work toward making TAMU a more equitable campus.

11. Education and Research

As a topflight research university, TAMU has the ability to make a meaningful impact in the areas of sustainability education and research by integrating sustainability into campus life, academics, and scientific investigation. Our first objective is demonstrating leadership in University sustainability through environmentally responsible education and research by December 31, 2020.

To achieve this goal academically, TAMU has given sustainability a seat at the table in the development of the Academic Master Plan. As far back as 2002 our Academic Master Plan embraced the concepts of sustainability and this trend continues in the University's Action 2015, where sustainability is included in Goal 5, Strategy 5D.

The first step OS has taken to increase environmentally responsible education is the planning and development of a peer-to-peer volunteer sustainability outreach program. Recently, our office was granted $7,800 through the Aggie Green Fund to hire a student intern to assist in the development of programs which promote environmental awareness and establish a "culture of sustainability" at TAMU. This new position will be instrumental in developing the four core platforms of the Sustainability outreach campaign and creating a framework to make these programs a permanent part of OS's campus and community engagement. We have been fortunate enough to have a student intern to assist in the development of these programs.

The first platform the intern and volunteers will participate in is the establishment of a Sustainability Office Volunteer Program. This program will educate through workshops and a Sustainability 101 program offered to students, faculty, staff, alumni, and friends of TAMU. The remaining three platforms include a Sustainable Office Certification, a Sustainable Events Certification Program, and the Sustainability Pledge. The Sustainable Office Certification will provide education and certification for offices that wish to incorporate sustainable practices

into their work environment. A Sustainable Events Certification program will establish guidelines, offer education, certification, and recognition for faculty, staff, and students who hold an event utilizing sustainable practices. The final piece of our platform, the implementation of a Sustainability Pledge, was launched on April 20, 2011. The pledge allows individuals to commit to living more sustainably, as it provides a web-based opportunity to learn about sustainable actions one can incorporate into their life.

To complement our volunteer program, OS is in the developmental stages of crafting a sustainability speakers' series. The series will feature sustainability experts both internal and external to the university. Additionally, we are developing a comprehensive list of sustainability focused and related courses by Department to publish on our website. Once completed, this list will become an invaluable tool to students interested in pursuing a sustainable career and lifestyle. The establishment and communication of this list will identify any potential gaps in the sustainable education offered by TAMU. This endeavor has a target date for completion of December 31, 2012. By 2020 we anticipate having an official sustainability degree program for both undergraduates and graduate students.

We are invested in engaging our faculty in five research areas related to sustainability: solar generation, use of electric vehicles, use of alternative technologies for assuring continuous electric supply, optimization of energy uses in clusters of buildings, and energy efficient computational resources. Smart Energy Campus Initiative is a collaboration of faculty and staff committed to increasing research efforts in these areas.

The next objective we have targeted under education and research is raising students' participation in and levels of awareness of sustainability. To accomplish this task OS has invested in, implemented, and launched a sustainability marketing plan. We have created a brand image and give away free branded items at events to spread our sustainability message. We sponsor events in the community such as Brazos Valley Earth Day, Worldfest, Bio Blitz, and advertise through Facebook and our website. To further expand our brand identity and increase awareness, we are including sustainability education by incorporating signage and Quick Response Codes[12] into campus elements such as green buildings, community gardens, and

[12] Quick Response codes are similar to bar codes and can be scanned by smartphones and like devices and direct the user to a website.

energy projects. Currently, UGFC incorporates our brand identity into their composting and recycling program. The solar-powered Big Belly trash compactors and recycling containers that are strategically located around our campus sport the Sustainability logo. The solar-powered SolarDok picnic tables[13] feature our logo and contain a Quick Response Code that tells customers about the benefits of the table and the sustainability efforts OS has undertaken. TAMU's recycling subcommittee is recommending labeling standards for all recycling bins on campus to allow for easy identification and increased awareness. Additionally, when the newly renovated MSC opens in April 2012, the sustainability brand will be incorporated in the recycling and waste containers.

OS believes the best time to reach students is in the first days of their Aggie experience, which is why we have a strong presence at New Student Orientation and Transfer Student Orientation programs. We attend these events to distribute information about sustainability and how TAMU's new students can get involved. We are working on including sustainability education into Fish Camp. Enhancing these efforts, we seek to expand upon the existing outreach campaigns that target all students, similar to the previously discussed volunteer program and the pledge.

OS has been working diligently with student groups such as the Environmental Issues Committee and One Love to incorporate student participation in campus sustainability initiatives. These two groups in particular have played a prominent role in organizing and co-sponsoring our Earth Day and Campus Sustainability Day events. We have worked with members of these groups to identify, evaluate, engage, and expand opportunities for students to participate in sustainability as part of student clubs and organizations. OS has established a student sustainability council to create a network of sustainability-minded students and organizations that can partner with OS and each other. At a later date, we will track the effectiveness of our outreach events and programs by conducting a sustainability literacy assessment of our students.

[13] These tables offer USB and electrical plugs students can use to charge their electronic devices. They are powered completely by solar energy and are completely off the electricity grid. These tables were purchased by OS.

12. Management and Funding Support

The final piece of the SMP is ensuring the sustainability program is managed and funded to meet the goals of the University. Our first objective is developing and cultivating the sustainability program to successfully implement University priorities and establish national recognition by December 31, 2015. To accomplish this we evaluated the level of staffing required to achieve University priorities. In October 2010, OS expanded from one to two positions with the addition of a half-time graduate assistant. In May 2011, OS grew with the addition of a student intern. OS's workforce increased further when they hired a paid student intern and launched a volunteer program in Fall 2011.

We are looking to secure more sustainability funding by evaluating the potential for sustainability savings to be captured into separate funds for future initiatives. At present, we have made a great deal of progress with our "green" student fee, which has become known as the Aggie Green Fund. In the spring of 2010, a consortium of student organizations led the initiative to implement a $3.00 per semester fee or a $1.50 summer term fee to be used to fund sustainability projects on campus. The students passed the referendum with 57% supporting the effort. In total, this fee generates over $300,000 dollars every year to support sustainable projects at TAMU.

In October 2010 a nine member board, known as the Aggie Green Fund Advisory Board (AGFAB), consisting of six students and three faculty or staff members, under the supervision of OS, was formed. This inaugural board created the application and selection process for those interested in applying for green fund dollars. In six months the inaugural board created the foundation that future AGFAB's will use to select sustainability projects and run operations. The inaugural board funded nine projects in April 2011. These nine projects received more than $270,000 in funding:

- Water Bottle Filling Stations,
- Aggie E-Corps Program,
- Student Farm,
- Outdoor Recycling for Main Campus,
- Jack. E. Brown Made Green,
- Office of Sustainability Internship,

- Winnie Carter Wildlife Center,
- Bike Friendly University (Rec Center), and
- TAMU Zimride Rideshare.

Funding was awarded to OS for the purchase of filtered water bottle filling stations. Eight stations have been installed in high traffic areas such as Evans Library, Student Recreation Center, the Commons, and Koldus.

The Aggie Eco-reps Program will fund 24 students who will reach out to the residents of on-campus housing to reduce energy and resource use and thereby reduce the campus carbon footprint through the development and practice of sustainable behavior in the on-campus housing community.

Funding for the Student Farm will establish a certified organic parcel of land for food production, education and research, create a closed system of food production, reduce the campus' waste stream, and provide educational opportunities for TAMU students in sustainable agriculture through courses.

UEM was awarded money to fund outdoor recycling on campus. This project provides 19 three-stream waste and recycling containers.

Funding was provided to install a 3.2 kilowatt solar panel system to provide supplemental power to the Jack E. Brown Engineering building.

OS received funding for a student intern to assist in the development of volunteer programs which promote environmental awareness.

The Winnie Carter Wildlife Center at the College of Veterinary Medicine received funding to construct a new composting facility that is larger and more efficient than the current facility. This project will serve as an educational tool for students interested in the process and benefits of composting.

In an effort to obtain a Bike Friendly University designation, TS and Outdoor Adventures partnered and received funding to enhance bike maintenance tools.

Funding was awarded to support a TAMU Zimride Rideshare program. Zimride provides a new form of efficient transportation that integrates social networking into a customized,

private TAMU network to help users establish trust, maintain their social profiles and allow individuals to split costs by sharing seats in their car with friends, classmates and co-workers.

The Aggie Green Fund will serve as a means to acquire grant funding to support future environmental initiatives for TAMU as legislation permits. The University has received grants from both Johnson Controls and Siemens in the past year. Johnson Controls invested money and resources into the implementation of two interactive monitors that will track resource consumption by students in Hobby and Appelt Halls. By supplying marketing materials and training for Eco-reps to lead an educational sustainability outreach campaign Johnson Controls hopes the monitors will be more effective in encouraging students to live more sustainably. Siemens is helping with the Jack E. Brown Chemical Engineering Building solar project, as they are providing $5,000 to help fund the project.

The final objective of the SMP is promoting TAMU sustainability programs. OS is meeting this objective by collaborating with other universities and the Environmental Protection Agency Region 6 on sustainability programs. OS is a member of the Texas Regional Alliance for Campus Sustainability a network that brings together faculty members, students, and sustainability professionals across Texas to advance sustainability in higher education.

Next, the OS will engage and collaborate with former students on sustainability initiatives. One way the OS has targeted this group is through efforts at Kyle Field before and after football games. Tailgating is a popular pastime at Aggie football games; however the large crowds generate large amounts of waste. To counter this waste, and engage former students, TAMU has developed a recycling program for tailgaters.

The installation of the Netum Steed Solar Project will bring awareness to former students during football games, because the solar panels are highly visible from the stands of Kyle Field. This project utilizes a 27.6 kilowatt photovoltaic solar panel array. The goal of this project is to create a demonstration test site for photovoltaic (solar electricity) generation on the TAMU campus. This project was undertaken to benchmark solar photovoltaic energy's capacity for this region of Texas.

OS is a charter member of the Sustainability Tracking, Assessment, and Rating System (STARS). This sustainability recognition program is run by the Association for the Advancement

of Sustainability in Higher Education (AASHE). STARS is a self-reporting tool TAMU uses to measure our sustainability successes and opportunities for improvement compared to other higher education institutions. Key campus stakeholders are currently reporting data for their departments, and once all their data is submitted we will receive our first STARS rating. That rating will be accessible to any interested party through the AASHE website.

Finally, we have advanced the awareness of sustainability at TAMU by frequently updating our sustainability website and the publication of our first Sustainability Master Plan report. After this publication we will issue a report every other year.

Conclusion

As we have outlined here, our progress toward fulfilling the 12 Strategic Initiatives identified in the Sustainability Master Plan is well underway. With the continued support of all our constituents, we can achieve all that was imagined in the Sustainability Master Plan and create a sustainable Texas A&M University.

Appendix: Acronym Glossary with Hyperlinks

AASHE =	Association for the Advancement of Sustainability in Higher Education
AGFAB =	Aggie Green Fund Advisory Board
BVR =	Brazos Valley Recycling
CC =	Career Center
CHP =	Combined Heat & Power Plant
CIS =	Computer Information Services
EAP =	Energy Action Plan 2015
EDCS =	Engineering, Design, and Construction Services
ERCOT =	Electricity Reliability Council of Texas
ESP =	Energy Stewardship Program
ETED =	Emerging Technology and Economic Development Building
FS =	Facilities Services
GHG =	Greenhouse Gas Emissions
GSF =	Gross Square Footage
HVAC =	Heating, Ventilation, Air Conditioning
ILSB =	Interdisciplinary Life Sciences Building
IPM =	Integrated Pest Management
LAAH =	Liberal Art, Arts, and Humanities Building
LID =	Low-impact Development
LS =	Landscape Services
MPHY =	Mitchell Physics Building
MSC =	Memorial Student Center
OS =	Office of Sustainability
OVPAPD =	Office of the Vice President and Associate Provost for Diversity
RL =	Residence Life
SECI =	Smart Energy Campus Initiative
SMP =	Sustainability Master Plan
STARS =	Sustainability Tracking, Assessment, and Rating System
SWMP =	Storm Water Management Plan
TAMU =	Texas A&M University
TS =	Transportation Services
UD =	University Dining
UEM =	Utilities and Energy Management
UGFC =	Underground Food Court