

# **Kennesaw State University's Climate Action Plan**

## **Introduction**

In 2007, Kennesaw State University (KSU) signed onto the American College and University Presidents' Climate Commitment, which is now Second Nature's Carbon Commitment. In 2008 KSU created the position of Director of Sustainability and formed a Climate Commitment Council with representatives from all of the University's constituencies. This Council has evolved over the years and in 2013 became the University's Presidential Commission on Sustainability, one of six Presidential Commissions housed in the Office of Diversity and Inclusion. The Sustainability Director and the Sustainability Commission have produced Greenhouse Gas (GHG) Inventories for fiscal years 2008 (July 2007 – June 2008), 2010, 2012, and 2014, in addition to a KSU Climate Action Plan (CAP).

Universities must play a leadership role in bringing environmental concerns to the attention of the public and serve as an institutional model for developing policies and practices that promote sustainability.

The CAP provides a guide for developing priorities in the area of sustainability and to lead the way for the KSU community to address climate change by reducing GHG emissions. Several of the initiatives needed to bring about these reductions can be accomplished through low- or no-cost initiatives. Other projects have an upfront cost, but provide long-term savings. The CAP sets out proposals for promoting behavioral changes, enacting university policies, and initiating projects in the areas of transportation, energy consumption, water use, and solid waste removal.

The CAP also addresses KSU's commitment to sustainability from the perspective of our number one institutional goal: providing quality education. From an academic standpoint, KSU's Sustainability Director has developed a Sustainability Across the Curriculum Workshop to train faculty to integrate sustainability topics into their curriculum. Since 2009, seventy-seven faculty in ten colleges and over twenty departments have participated in the workshop. Additionally, the Sustainability Director teaches Sustainability at KSU, which provides students insight into operational practices, successes, and challenges relating to sustainability initiatives at KSU. For the final project, students develop project proposals to address sustainability challenges at KSU. In total, KSU offers fifteen majors, minors, and certificate programs that address sustainability issues; this list includes Architecture, Environmental Science, Biology, and a Specialty Construction Certificate.

On January 6, 2015, the Board of Regents of the University System of Georgia approved the consolidation of Kennesaw State and Southern Polytechnic State University. The new Kennesaw State University is a stronger Comprehensive University in that it houses a wider variety of academic specialties than either original institution. Kennesaw State brought strengths in the Humanities, Sciences, Social Sciences, Health Sciences, and

Arts. Southern Polytechnic brought Engineering, Architecture, and Construction Management. However, the consolidation also brings challenges in the area of sustainability. The two main campuses are in Kennesaw and Marietta, which are located about ten miles apart. In addition to transportation issues, consolidation has brought challenges in the merging of infrastructure, campus operations, and campus cultures.

KSU’s GHG inventory for fiscal year (FY) 2104 incorporated data from both campuses (although consolidation was not officially complete at that time). The Climate Action Plan (CAP) presented here uses the FY 2014 data as a baseline and describes a plan to achieve zero GHG emissions by the year 2064. The CAP uses demographic and physical plant growth projections that are being developed in KSU’s latest Master Plan, which is scheduled to be completed by the beginning of 2017.

Over the next two years, we will be gathering data and input from campus and community stakeholders with the goal of replacing this CAP document with a comprehensive Sustainability Plan for KSU by August 2018.

***Status Quo Growth Projections***

Growth projections for KSU’s GHG emissions are based on a 2.5% *per annum* growth rate in student enrollment (Table 1). This figure is consistent with the growth pattern KSU has experienced in recent decades and matches KSU’s Master Plan projections. The growth rate slowed in the 2010s but is picking up again with consolidation and as the regional economy recovers. The Master Plan projections predict a growth in enrollment to 41,000 students in the year 2024. The *status quo* GHG emissions projected for 2024 is 197,803 MTeCO<sub>2</sub> (metric ton equivalents of carbon dioxide, i.e., CO<sub>2</sub> emissions plus emissions of other GHGs, such as methane and CFCs, adjusted to reflect their warming potential relative to CO<sub>2</sub>). This emissions figure (Table 1) was generated with the assumption that increases in GHGs would parallel increases in student enrollment if no measures were taken to reduce them. The baseline for GHG projections is the figure reported in KSU’s GHG emissions inventory of Fiscal Year 2014 (July 2013 – June 2014).

Table 1: Growth projection for Student Enrollment and *Status Quo* GHG Emissions based on an assumption of a 2.5% *per annum* increase.

Year	Enrollment	MTCO <sub>2e</sub>
2015	33,252	158,386
2024	41,527	197,803

**Future Building at Kennesaw State University**

KSU’s CAP projections are based on projections of assignable building space in KSU’s 2016 planning estimates (Table 2). Note that the projection for new building space is

about 10.5% above the current amount in contrast to a projected student population increase of nearly 25%. This means that we will be developing strategies to enhance the efficiency of space utilization on our campuses as well as alternative work models such as office-sharing and teleworking. An underlying assumption is that all new KSU buildings, with the exception of on-campus residence halls completed prior to 2018, will be designed to meet “green building” certification standards, and that this will translate to a 25% per square foot reduction in GHG production relative to older, non-certified buildings. The CAP calculations assume that residence halls will also be designed to meet green building certification standards beginning in 2018.

In 2015, Georgia passed HB 255, which barred state funds from being used for LEED building projects. As a result, KSU is exploring alternatives such as ASHRAE 189.1-2014 and Green Globes.

KSU Master Plan is currently being revised with completion expected by early 2017. The plan calls for the renovation of older buildings in the historic core of the Marietta campus and only limited new construction. Plans for the Kennesaw campus focus on increasing the building density within a ten-minute walk circle.

Table 2: Assignable Building Space Projection (in square feet) based on KSU’s 2016 planning estimates.

Year	ft <sup>2</sup>
2015	5,389,946
2024	5,957,906

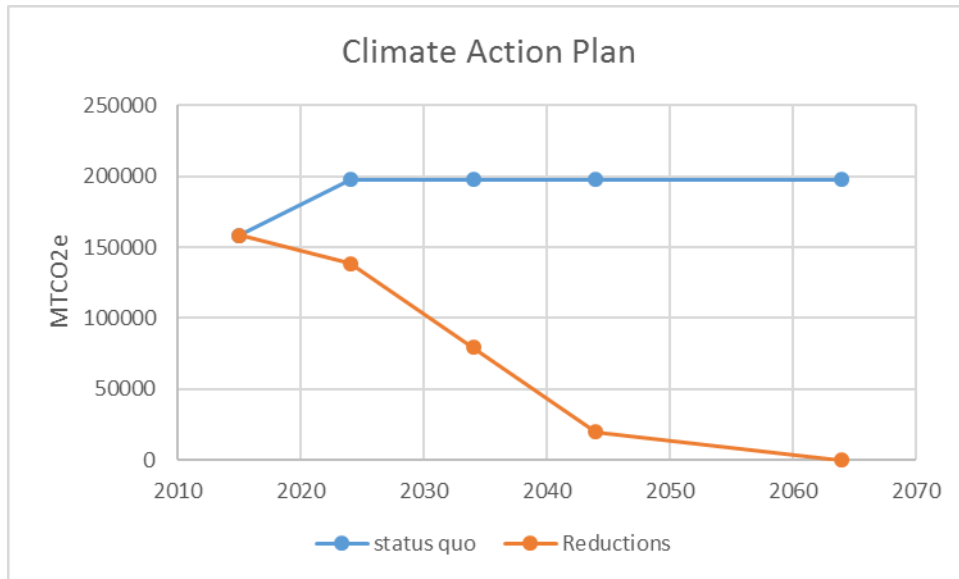
### Greenhouse Gas Reduction Targets

KSU has developed greenhouse gas reduction goals, calling for carbon-neutrality by 2064, as shown in Table 3 and in the graph below.

Table 3: Greenhouse gas reduction targets in MTCO<sub>2e</sub>, 2015 – 2064.

Year	Student Population	Target Reduction	MTCO <sub>2e</sub> Target
2015	33252		158386
2024	41527	30%	138462
2034	42000	60%	79121
2044	42000	90%	19780
2064	42000	100%	0

KSU's Climate Action Plan:  
Target GHG Reductions (in MTCO<sub>2e</sub>) for the years 2015 – 2064



### Greenhouse Gas Reduction Strategies

In order to achieve carbon neutrality, KSU has implemented multiple policies and programs across a range of impact areas, specifically: energy efficiency, water efficiency, transportation, behavioral changes, and renewable energy. The paragraphs that follow outline broad-brush descriptions of ongoing strategies for achieving greenhouse gas emission reductions over the next fifty years (Table 3). Over the next two years we plan to develop a more specific and detailed set of reduction strategies as part of comprehensive Sustainability Plan for KSU.

#### Increased Energy Efficiency

CAP projections account for GHG reductions resulting from these measures and from upgrades to more energy efficient lighting and controls that will be instituted as funds become available. Specific projects and strategies are detailed below.

- Between 2009 and 2012, KSU used federal stimulus funds to install a metering system for over 26 buildings and to implement an online dashboard providing real-time and historic utility data. This system allows us to better monitor and manage our utility consumption at the building level.
- KSU also used stimulus funds to complete energy audits and perform retro-commissioning of older buildings.
- KSU qualifies for utility rebates from Georgia Power for energy efficiency improvements. These rebates are used to provide additional building metering. KSU is also partnering with the Cobb County Water System to fund meters on 11 buildings on the Marietta campus.

- KSU completes retro-commissioning projects as funding is available.

#### Transportation Improvements

Transportation is a huge challenge to GHG reduction at KSU, a traditionally commuter institution in a region that currently has few public transportation options. Modest GHG reduction targets are based on plans to promote alternative commuting such as bicycling, carpooling, using shuttles and remote parking lots.

- KSU operates the Big Owl Bus (BOB) shuttle to provide commute alternatives to students, staff, and faculty. BOB serves multiple routes to nearby apartments and recreation destinations as well between both campuses. Since its inception, BOB has served 343,714 passengers and offset 16.5 million passenger miles travelled.
- KSU is working with Georgia Commute Options to promote teleworking, flextime, and the use of public transit.
- The Kennesaw campus connects with Noonday Creek Trail, seven-mile paved, off-street, multi-use trail connecting to Town Center mall and Kennesaw Mountain National Battlefield. KSU is working to promote this trail as a viable commute alternative for staff and faculty that live along the trail.
- KSU is exploring ways to enhance regional public transportation systems in partnerships with local and state transportation departments.
- KSU adopted a no-idle policy in 2009 to reduce tailpipe emissions. However, more needs to be done to educate on and enforce this policy. The excess amount of vehicle idling that occurs at peak times of exiting from KSU is a GHG emissions factor that has not been considered in KSU's previous GHG inventories.
- Reductions in local traffic congestion through the use of remote parking areas with shuttle bus access are probably lowering emissions but we need to explore methods of measuring their effect.

#### Behavioral Changes

KSU's CAP calls for bringing about reductions in energy use and GHG emissions by making changes in behavior, some at the individual level, some institution-wide.

- KSU is developing programs to educate staff and faculty to reduce electrical use turning off unnecessary lights and electronic devices.
- KSU sets its thermostats at season-appropriate temperatures.
- KSU is working to promote Alternative Work Schedule strategies, such as flex scheduling, teleworking, and office sharing as a way to reduce the amount of commuting.
- We plan to establish a network of "Eco-volunteers": staff and faculty with an interest in sustainability who can monitor activities and practices in their office buildings. Eco-volunteers will attend workshops on developing ways to inform co-workers about the importance of KSU's sustainability programs and encourage them to become active participants in efforts to recycle, and conserve energy and water.

#### Water Use

KSU seeks to be a good steward of its water resource.

- KSU intends to implement the WaterHub technology at both campuses as a strategy to significantly reduce water consumption through reuse of greywater in the mechanical systems.
- Additionally, KSU will develop a stormwater management plan.
- KSU measures the water consumption of many individual buildings and the main meter through the Watersignal Dashboard.

#### Renewable Energy and Carbon Credits

At present (2016) the Kennesaw campus does not utilize renewable energy; there is over 15 kW of installed solar capacity minimal solar arrays on the Marietta campus. Additionally, Marietta campus hosts the Alternative Energy Innovation Center and offers a minor in Renewable Energy Engineering Technology. KSU is exploring strategies to expand its renewable energy portfolio.

- In 2013, representatives of Georgia Power began meeting with KSU personnel and KSU student groups to find ways to make solar power a part of the University's energy supply.
- In 2016 we procured a Technical Assistance grant from the National Renewable Energy Laboratory (NREL) to analyze solar procurement opportunities for the university. As a result of this grant, we anticipate completing a solar plan for KSU by October 1, 2016.
- KSU is also looking into purchasing solar water heaters as it replaces older fossil-fuel burning models in its academic buildings.
- Ultimately, achieving Carbon Neutrality may require the purchase of carbon credits. At present KSU campuses have little forested land that can produce offsets for the GHGs produced in the institution's operations.

### **A Proposed Climate Action Plan Timeline**

#### **Ongoing**

##### **Buildings & Energy**

Ongoing plans are to add chilled water loops as new buildings are designed.

All future buildings will be designed to meet green building certification standards comparable to the LEED Silver level or above.

KSU will continue to look at ways to minimize use or shut down campus buildings (or portions of buildings) at low-use times of the year.

Energy & efficiency audits of all older buildings are carried out as the budget allows.

A regular schedule for the commissioning of older buildings is being developed.

Motion-sensors for lighting in classrooms & office areas are being phased in.

More efficient lighting systems are being phased in.

Building temperatures are set at 68<sup>0</sup> F in cold months, 78<sup>0</sup> F in warm months.

Electrical metering is being added to more campus buildings.

A utility dashboard system is monitoring electrical energy use in buildings with meters. A dashboard system monitoring water use has been installed as well. The dashboard system can add natural gas monitoring in the future.

Beginning in fiscal year 2017, KSU will earmark year-end funds for LED retrofit projects across campus. According to the U.S. Department of Energy, lighting typically accounts for 25% of a commercial building's energy consumption, making it the largest contributor to a building's energy needs

([http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/bt\\_stateindustry.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/bt_stateindustry.pdf)).

## **Campus Operations & Purchasing**

KSU's Energy Star Purchasing Policy was instituted in 2008. Mechanisms to enhance awareness of this and other sustainability-related policies are being investigated.

Accuracy of accounting of GHGs due to Air Travel has been enhanced by collecting mileage data for university-sponsored travel including study abroad.

Sustainability clauses are included in many requests for proposals sent out by KSU's Procurement Department.

## **Transportation**

KSU continues to partner with county and state agencies in Georgia and as well as local Community Improvement Districts to develop a regional comprehensive transportation plan that includes improved public transportation options.

Shuttle bus routes have been established to connect outer campus areas & athletic fields.

Additional off-campus parking has been identified to reduce congestion at peak exiting times.

Shuttle bus routes have been expanded to include shopping & nearby apartment clusters that house large numbers of students.

### **Farm-to-Campus**

KSU's Dining Services department utilizes composting, cooking oil recycling & practices that reduce KSU's food waste stream.

Farm-to-campus programs include educational opportunities for KSU students.

### **Natural Areas & Outdoor Education**

Landscaping practices de-emphasize space devoted to lawns and maximize xeriscaping using native plants to reduce need for watering.

Rainwater collection and storage has been established in the north section of the Kennesaw campus.

### **Academics**

Sustainability Across the Curriculum Workshops for faculty and "Why Recycle" courses for staff have been initiated and will continue.

Signage in the Commons and other green buildings inform students and the public of their sustainability features.

## **Climate Action Plan Timeline: Short-Term (5 – 10 years)**

### Buildings & Energy

- Develop a "no heater" policy for campus offices.
- Develop a three- or four-year Master Calendar for KSU to coordinate special events & athletic events during times when the campus is shut down.
- Develop a rotating schedule for carrying out energy and efficiency audits of all older buildings. Commission older buildings as indicated in the audits.
- Phase in motion detectors for lighting in parking decks.
- Establish a solar energy (photovoltaic and solar thermal for hot water pre-heating) demonstration site on either campus.
- Phase in electrical sub-metering for all buildings. Expand metering for campus water use.
- Replace water heaters in older classroom and office buildings with solar thermal collectors for heating or pre-heating water.
- Expand the utility dashboard systems to monitor natural gas and water use as well as electric use in campus buildings.

### Campus Operations & Purchasing



- Develop strategies to enhance awareness of energy and water use across the campus community.
- Institute education programs to encourage IT-related behavioral changes, e.g., to avoid “phantom power load”: turning off computers/monitors; avoiding use of screen-savers.
- Promote campus recycling program via campus newspaper articles. Improve signage with increased numbers & better placement of bins for recycling and landfill-bound waste.
- Encourage the purchase and use of paper with at least 30% recycled fiber content. (Aim for 25% by 2017.)
- Develop ways to track air travel mileage in order to increase the accuracy of GHG audits.
- Design contracts with vendors that call for reduced or returnable packaging.
- Develop a KSU Policy calling for a ban on styrofoam food containers, and the availability of recycling containers for plastic, aluminum, paper, and cardboard at all KSU events, including athletic events.
- Phase in the purchase of hybrid vehicles; increase the number of electric & alternate-fuel vehicles in the KSU fleet, including KSU shuttle buses.
- Purchase solar-assisted recharging stations for electric vehicles.
- Work with the KSU Foundation, Residence Life, & Resident Hall Management to develop a recycling program for residence halls that is not solely dependent on student volunteers.

#### Transportation

- Expand the campus-wide “No-Idle Policy” by encouraging faculty, staff, and students to avoid waiting for nearby parking spaces.
- Develop strategies to boost teleworking and flex scheduling to reduce the number of single-occupancy vehicles. Increase the use of work-study students and other student assistants to cover offices during low-impact times.
- Investigate ways to increase efficiency of seeking open spaces.
- Publicize incentives for faculty & staff carpooling.
- Increase participation in carpool/vanpool programs by publicizing a plan for parking fee incentives for student participation. (Current participation is at about 1%; aim for 5 % by 2017.)
- Target residence halls and students in nearby apartments in campaigns to increase bicycling & other means of non-motorized commuting.
- Identify safe routes for nearby residents using bicycles or walking. Enhance safety features of local roadways to encourage bike use (in partnership with Cobb Co., local apartment complex management).
- Provide parking incentives for alternative-fuel vehicles (all-electric, electric-gas hybrids, hydrogen fueled).
- Phase in the purchase of hybrid vehicles; increase the number of electric & alternate-fuel vehicles in the KSU fleet, including KSU shuttle buses.

### Natural Areas & Outdoor Education

- Develop policies designed to preserve natural areas: the “pink ladyslipper forest” south of the Science and Clendenin Buildings, the Arboretum, forested areas adjacent to the Jolley Lodge on the Kennesaw campus, and along Rottenwood Creek on the Marietta campus.
- Develop a campus tree plan to maximize tree plantings along roadways & in appropriate open areas.
- Expand water conservation practices: rainwater collection, storage, and reuse as well as gray water use.

### Academics

- Seek grants to fund workshops and events to promote sustainability education across the curriculum.
- Set up a program of focus groups and education for Resident Assistants & other Student Leaders to promote sustainability efforts, e.g., energy efficiency and recycling.
- Expand sustainability research & service learning opportunities associated with Climate Action Plan’s initiatives, e.g., making PV energy savings data available on-line for local school systems and KSU’s Introductory Science courses.
- Maximize the visibility of energy-saving and other sustainability features associated with new green buildings and green renovation projects.

### **Climate Action Plan Timeline: Long-Term (10 – 20 years)**

- Seek ways to enhance the visibility of KSU’s sustainability efforts on campus and in the surrounding communities.
- Reduce university-sponsored travel (other than travel to professional meetings) by using web-based conferencing, e.g., for early rounds of the interview process.
- Partner with Cobb Co. to develop a local system of collecting & processing home & restaurant vegetable oil for biodiesel production. (This also reduces the amount of lipid-based sludge and minimizes sewage backups.)
- Install solar PV electric charging stations in parking lots & on top levels of parking decks to recharge the KSU fleet’s electric vehicles & electric vehicles of commuters.
- Develop renewable energy strategies to shift away from fossil-fuel energy use in buildings and the campus fleet.

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