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OVERVIEW

New Mexico State University (NMSU) is committed to protecting and enhancing the environment. In April 2007 NMSU President Michael Martin signed the American College and University Presidents’ Climate Commitment. NMSU Interim President Waded Cruzado-Salas signed the Talloires Declaration in January of 2009. To re-affirm this commitment, 2009 was named the Year of Sustainability, whereby the university system challenged itself to become a leader in sustainability by developing educational, research, and outreach opportunities statewide.

The Presidents’ Climate Commitment pledges that NMSU will develop an action plan for becoming climate neutral. This means that NMSU must build greener, purchase responsibly, reduce energy consumption, use cleaner fuels, travel more efficiently, and offset the remaining carbon footprint if carbon neutrality is to be achieved.

The following Climate Action Plan is NMSU’s response to the American College and University Presidents’ Climate Commitment’s requirement to develop an institutional action plan to achieve climate neutrality. The plan will be updated and refined as new data become available and strategies evolve.
GREEN RENOVATION AND CONSTRUCTION

Leadership in Energy and Environmental Design (LEED)

On January 16, 2006, Bill Richardson, Governor of the State of New Mexico, signed Executive Order #2006-001 requiring all Executive Branch state agencies, including the Higher Education Department, to adopt the U.S. Green Building Council’s LEED Rating System:

http://legis.state.nm.us.

In addition to complying with the Executive Order, New Mexico State University will design and construct all new building and renovation projects to meet the U.S. Green Building Council’s (USGBC) guidelines for a minimum of LEED “Silver” certification.

New projects that are unable achieve a minimum LEED “Silver” certification and do not involve enough changes to the buildings will still be designed and constructed using the U.S. Green Building Council’s guidelines for LEED criteria as a framework for making decisions related to sustainable design. Every new construction project will be commissioned by a third party commissioning agent to ensure that the building is built as designed and operates according to the design parameters.

As of fall 2009, NMSU has three facilities under construction: Gardiner Hall, Football Coaches’ offices building, and the addition to Health and Social Services building. All three have been registered for a minimum of LEED “Silver” level certification.

The USGBC guidelines are dynamic and have changed several times within the last several years. New Mexico State University has 5 accredited LEED professionals on staff and is committed to staying current with USGBC guidelines.

Design Standards

NMSU is currently in the process of developing design standards that will incorporate sustainability, life cycle costing, and energy efficiency. These standards will be applied to all new projects. Energy conservation and sustainability will be maximized at all phases from the initial two-year design and construction process through the 40+ years that the building is occupied.
SUSTAINABLE PURCHASING

The New Mexico State University Climate Action Plan will extend to the purchase of energy consuming equipment, because these “plug loads” consume on average 30% of the power used in laboratory buildings and 20% of the electricity is administrative facilities. Evaluating equipment purchases in terms of energy efficiency will minimize the impact on NMSU electric consumption from the devices and will in many cases lower the heat load, thus reducing the energy consumption of the air conditioning systems.

NMSU Purchasing is currently in the process of developing a Sustainable Procurement policy for proposal.
ENERGY CONSERVATION

Operations and Maintenance

There have been many projects and activities undertaken at New Mexico State University that reduce energy consumption:

- A cardboard recycling program implemented for the opening week of school collected over eight tons of cardboard.
- 80% of the appliances in family housing have been replaced with Energy Star rated units.
- NMSU recently installed close to 300 energy-efficient evaporative air conditioners in student family housing and apartment communities around campus. The upgrades qualified NMSU to receive an $88,000 rebate through El Paso Electric’s Energy Saver Program.
- Inefficient interior light fixtures and lamps have been upgraded. This retrofit involves the replacement of T12 fixtures and ballasts with energy efficient T8 units that are approximately 40% more efficient than the existing T12 ballasts.
- High wattage mercury vapor exterior lamps are being replaced with low wattage, energy efficient high pressure sodium fixtures throughout the campus. This has resulted in electrical savings and the elimination of mercury that requires special handling and disposal.
- Asphalt millings from a contractor are being used for road building and resurfacing. This material that would otherwise be discarded is then used as base course material in lieu of the standard material of ¾" rock and gravel.
- NMSU has been a leader in recycling efforts and in 2009 finished 3rd in the Grand Champion category of Recyclemania.
- NMSU Recycling has developed a composting facility that turns lawn clippings and leaves into flowerbed mulch.

Additional conservation measures make sense economically and complement the Climate Action Plan. These efforts will include the following initiatives:

- Recycling efforts in residential areas will be examined and expanded.
- Strategies to reduce power consumption in residential areas during breaks will be employed.
- The use of sensors to turn off lights in laundry rooms and other public use spaces during unoccupied periods will be studied and employed if feasible.
- Older residential facilities will be upgraded with new, efficient housing as the budget allows.
- LED technology will be employed on exterior lighting (the first installation of LED poles is planned for Geothermal Drive in the spring of 2010).
- The composting program will be expanded.
- The production of biodiesel for vehicle fuel will be investigated and implemented if possible.
- Substitute equipment and methods will be identified to minimize the use of gasoline powered lawn maintenance equipment.
- Performance contracting will be investigated as a means to finance replacement of the remainder of the T-12 fluorescent bulbs and ballasts across the NMSU campus.

**Utility Master Plan**

GLHN Engineers completed a utility master plan for New Mexico State University in 2009. Replacement of equipment and infrastructure is the main focus of this study, although sustainability and energy conservation permeate every aspect of the plan to provide utilities to the NMSU Las Cruces campus over the next 20 years. Thermal storage, additional peak generation, and replacement of inefficient chillers with new, energy efficient equipment are all viable options as NMSU moves forward. A new, energy efficient satellite central plant could begin operation as early as spring of 2013.
RENEWABLE ENERGY

Geothermal Energy at NMSU

New Mexico State University has been at the forefront of the research in Sustainable Energy since the late 1980s when NMSU began a program of developing geothermal resources in the vicinity of Tortugas Mountain. The temperature gradients of the geothermal energy in this area provide a resource of approximately 140 degrees. The development consisted of extracting the water and, by use of a plate and frame heat exchanger, transferring some of the heat content to sweet water from campus wells. This then was stored and used as a source of domestic hot water for Regents Row residence halls. In addition there were some initial efforts to use the heated water at the natatorium and for the President’s residence.

However, the aggressive water conditions fouled the heat exchangers and severely damaged the pumping equipment. Because of this, the operation of the wells as a source of building heating was not economically viable. One well remains active today and provides high salinity water for turf research and heat that maintains optimum water temperature for endangered fish species near the rodeo grounds.

Present and Future Activities

Solar power is the most viable source of renewable energy in the Las Cruces area. The Las Cruces campus has employed a solar power bus stop and currently has a solar powered parking structure that provides 18 kilowatts of electrical power to the Student Health Center.

NMSU has several grant proposals related to sustainable initiatives pending at this time, including a comprehensive proposal for the development of “smart grid” technology and a 1 megawatt solar facility in cooperation with El Paso Electric.

The NMSU Las Cruces campus must embrace and employ this resource if the goal of climate neutrality is to be achieved.
Research and Leadership

NMSU has developed an international track record in the study and development of photovoltaics and other sources of alternative energy, including fuel cell design. By creating an Institute for Sustainability of Water, Energy, and Land, NMSU will ramp up its multidisciplinary energy research and technology development programs in renewable and nuclear sources of energy to serve the entire Southwest. Specifically, NMSU will carry out research on the following:

- Development, testing, and validation of photovoltaic energy including flexible solar cell systems
- Education and training of students in technologies related to sustainable energy
- Educational and outreach services to energy, telecommunications industries, and regulatory commissions across the U.S.
- Provision of an adequate and secure energy supply
- Electric delivery systems technology development and implementation
- Fuel cell design, hydrogen storage, and membrane durability
- Organic waste utilization
- Distributed energy
- Nuclear energy research and application
- Education of the public in use of alternative sources of energy
The NMSU Transportation Services Department has initiatives in progress that will directly support the Year of Sustainability and the Climate Action Plan. These initiatives will impact not only staff and faculty transportation but student transportation as well. The current actions being taken by the Transportation Services Department include the use of methanol blended gasoline and biodiesel, the purchase of alternative fuel and electric vehicles for the University fleet, and the expansion of the Aggie Shuttle routes.

**Fleet Management**

The NMSU Transportation Services Department’s fleet initiatives are driven not only by sustainability guidelines but by state mandate as well. In a 2005 executive order, the governor mandated that all institutions of higher education in New Mexico must meet a minimum of 15% of total fuel needs with alternative fuels by the year 2010 and that 75% of vehicles purchased annually must be able to operate on these fuels. Since that time the NMSU Transportation Services Department has worked diligently to meet these mandates.

According to a University press release NMSU purchased 28 alternative fuel vehicles in fiscal year 2006-2007 as well as several GEM electric cars for short-distance transportation on campus. The University is also switching to an E15 (15% ethanol) blend of gasoline and a B20 (20% biodiesel) blend of diesel for its current fleet vehicles.

**Student Transportation and the Aggie Shuttle**

The biggest and most important change to the student transportation system is the expansion of the Aggie Transit System, otherwise known as the Aggie Shuttle. The Aggie Shuttle now has three routes serving the NMSU main campus and the Doña Ana Community College main campus. This service provides two main benefits to the campus community. First, it reduces the overall emissions from commuters to the University. Second, it relieves much of the traffic congestion in the middle of campus making it safer for pedestrians. Future plans for the Aggie Transit System include collaboration with the City of Las Cruces Transit System to create NMSU specific routes within the city, thereby making public transportation a more viable option for off-campus commuters to NMSU.
Staff Transportation

Housing, Facilities and Services, and other campus departments are reducing the size of their fleets to reduce fuel consumption. Electric vehicles and golf carts are being employed where full sized vehicles were used previously. NMSU has adopted a comprehensive Vehicle Policy to more efficiently manage fleet operations; sustainability and fuel efficiency are major goals.

Campus Housing

NMSU Housing has initiated the programming process for the construction of additional campus residential facilities. The Campus Master Plan calls for a walking campus with housing on the periphery, and additional housing will need to be constructed on and adjacent to the campus if commuting travel is to be reduced in the coming years.

Bicycling

New Mexico State University and the Las Cruces community celebrated “bike to work” last May. Bicycling will continue to be encouraged through the use of bicycle lanes and secure bicycle racks.

Reducing Commuting

Commuting travel represents the most challenging component of achieving climate neutrality at NMSU. Reducing commuting will mean significant alterations to behavior with respect to mass transit and an increase in residential density in the vicinity around the campus.
CARBON OFFSETS AND CREDITS

Carbon Offsets considers investments in energy conservation and renewable energy “off campus” to offset or balance the remaining emissions from campus operations.

Appearing before the United States House Agriculture Committee, Agriculture Secretary Tom Vilsack testified that “A viable carbon offsets market -- one that rewards farmers, ranchers and forest landowners for stewardship activities -- has the potential to play a very important role in helping America address climate change while also providing a possible new source of revenue for landowners.”

Grassland reforestation, alteration of cow diets to produce less heat-trapping methane, and the use of methane digesters at dairy farms may offer unique and innovative ways of taking the final steps to reach zero net emissions. Carbon Cap and Trade legislation in the United States is yet to be formulated, but as a land grant university and major research institution, New Mexico State University will be well positioned to participate in developing creative ways to meet the challenge.
CONCLUSION AND STRATEGY

Targeting *Net Zero*

New Mexico State University committed to the development of an institutional action plan to achieve carbon neutrality by becoming a signatory to the Presidents’ Climate Commitment. Achieving “net zero” emissions is a challenging but worthwhile goal.

At the institutional level, measures that reduce emissions become particularly viable when financial incentives coexist. Not all carbon reduction measures have an attractive return on investment, however, and the task of achieving “net zero” emissions becomes complicated by competing goals. For example, earning LEED credits can stretch already limited construction funds. Sustainable purchasing occasionally conflicts with procurement laws designed to protect the institution and the New Mexico taxpayers. The cost “per kilowatt” of solar energy is not yet competitive with other renewable energy sources unless subsidized from an additional funding source.

And yet, technological developments may change the landscape overnight. Light emitting diode (LED) lighting is substantially more efficient and could represent a significant source of emission reductions. Technological breakthroughs or government incentives that improve the installation cost-per-kilowatt would result in solar power suddenly becoming a financially viable option for renewable energy.

In the stair-step progression to achieve “net zero” emissions, the last measure required will be the purchase or development of carbon offsets. NMSU holds water rights that must be used or forfeited, owns land throughout New Mexico, and has a requirement to purchase or grow feedstock. New Mexico State is well positioned to be a leader in reforestation and sequestration strategies.

Due to the large number of technological variables, and because institutional funding is largely dependent upon the financial health of the state and national economy, New Mexico State University has taken a conservative approach to the establishment of a timeline and milestones in the path to carbon neutrality. By definition, this Climate Action Plan is a living document and will be updated regularly as technology and strategies evolve. As a land grant institution, New Mexico State University was already committed to excellent stewardship of our natural resources. Our hope is that this plan will provide a blueprint for NMSU to reach climate neutrality.
Greenhouse Gas Inventory 2008 Baseline

**Scope 1 Emissions**
Onsite Combustion: 27,294 metric tons of CO2e

**Scope 2 Emissions**
Purchased Electricity: 39,902 metric tons of CO2e

**Scope 3 Emissions**
Commuting: 81,049 metric tons of CO2e
Air Travel: data was unavailable
Solid Waste: 1,943 metric tons of CO2e
Agriculture: 1,633 metric tons of CO2e

**Total = 151,821 metric tons**

1 The accounting codes necessary to track air travel information were added to NMSU Banner financial system beginning July 1, 2009. Air travel emissions will be added to the 2009 Greenhouse House Gas inventory by the end of the 2nd quarter (January 2010).
New Mexico State University
Las Cruces Campus
Climate Action Plan

Update Log

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