



# Sustainable SCU



Meagan Diss  
Natalie Nowak  
Priya Pandya  
Sarah Park

As a Jesuit and Catholic University, Santa Clara believes that not only do they have a responsibility to help develop more sustainable ways of living, but also that it furthers their mission through environmental stewardship, education and service. SCU plans to become a leader in sustainability, constantly setting goals to reduce emissions and make the University a more environmentally friendly school.

### ***Santa Clara University's Policy on Sustainability***

As a Jesuit and Catholic University, we have the responsibility to provide leadership in developing a more sustainable way of living. By embracing sustainability, the University furthers its mission to act as a voice of reason, conscience, and service to society. <sup>1</sup> Santa Clara's mission to become more sustainable is being achieved through the combination of environmental stewardship, education, and service.

Through environmental stewardship, Santa Clara seeks ways to reduce the use of non-renewable resources and to minimize pollution. SCU considers the economic, social, and environmental consequences of our actions.

Part of the Jesuit mission is to educate the whole person and through environmental education, Santa Clara is living out that goal. SCU recognizes the importance of both the individual responsibility as well as the institutional responsibility to live a more sustainable life.

Santa Clara is continuing its policy of sustainability through assisting communities, businesses, governments, and non-profit organizations to develop in more eco-friendly ways. SCU supports research that expands the understanding and practice of sustainability in order to further their policy.

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<sup>1</sup> Santa Clara University Sustainability Assessment 2006-2007  
<http://scu.edu/sustainability/newsandevents/upload/SCUSustainabilityAssessment2007-2.pdf>

### ***SCU Green Practices- Timeline***

By examining Santa Clara University's campus wide growth in terms of people and square feet over the past 10 years, we can compare that to the amount of energy use and see that overall SCU is a very energy efficient organization. Through looking at the amount of CO<sub>2</sub> emissions produced by SCU we can more closely observe the areas in which SCU excels and needs to improve upon in terms of where these emissions are coming from.

Starting at 1997, we see that the CO<sub>2</sub> emissions were at an all time low of 15,271.01 tons. However, we can account for this because of the much smaller size of the SCU campus and amount of students and faculty at that time. Since 2002 CO<sub>2</sub> emissions are currently on the decline despite our campus expansion and growing enrollment numbers. In 2002 total emissions were 18,765.08 tons of CO<sub>2</sub> as compared to 2006 total emissions of 18,552.3. However, Santa Clara University's CO<sub>2</sub> emissions topped the charts in 2003 at 19,596.73 tons of CO<sub>2</sub>. These higher numbers can be accounted for by the increase in enrollment in these years, which was much higher than prior years. Since 2000 enrollment has increased by 11%. These total emission numbers include electricity, natural gas, diesel, and gasoline consumption. Electricity is the main source of these CO<sub>2</sub> emissions, which accounted for roughly 62% of total emissions in 2006. Natural gas also accounts for a large portion of the total CO<sub>2</sub> emissions at about 37% in 2006. These percentages of total emissions are fairly consistent over the past 10 years. We are seeing a decline in the amount of CO<sub>2</sub> emissions caused by electricity and hope to see those numbers continue to fall. Electricity is a main area of concern for SCU

as it is a huge part of total emissions. This is one of the areas in which SCU must focus on reducing in order to even further lower their total CO<sub>2</sub> emissions in the future.

Since the year 2000 there has been a 27% increase in SCU's building square feet as well as an 11% increase in student enrollment as mentioned earlier. Despite these growing numbers in buildings and population, SCU's energy use has only increased by 3%. This shows how efficiently Santa Clara University is growing and how despite a major increase in campus size, buildings, and people SCU's energy used. SCU's total population and building area are up but the per area and per person energy consumption has decreased. (*Table 1*).

Through all of these figures and information pertaining to Santa Clara University's CO<sub>2</sub> emissions, we see how despite SCU's major growth over the past decade in terms of people and buildings they continue to be on the decline of energy use since 2002. With electricity still being a major contributor to these negative emissions, SCU needs to find ways to motivate their population to conserve electrical energy and continue to lower those numbers.

### ***Santa Clara's Current Projects***

Santa Clara University's sustainability goal is in 2010 to have 20% lower emissions than their 1990 level. In order to do this, they must reduce current emissions by 34%. The plan for achieving these goals has already been set into motion, and the main strategies are to reduce the demand for energy and to use green energy.

Currently, the Facilities building has solar panels on the roof, which provides the University with 50 kilowatts of power. While this is helpful, the University plans to have 1,000 kilowatts worth of solar energy on campus by 2010.

Also in the works right now is to replace old windows. Doing this will allow more sunlight into buildings, reducing the need for turning on the lights. Walsh, McLaughlin and Campisi dorms currently have these new windows, and San Filippo, Dunne and Kenna Hall are planned to receive them next. High efficiency components have also gone into the heating, ventilation and air conditioning systems in Benson, the engineering buildings, Kenna Hall, and Leavey Center.

Kennedy Commons is the first “green” building at Santa Clara. The building is 7500 square feet, and serves as a community meeting place as well as holding classrooms. The building consists of natural ventilation, a solar chimney, day lighting, a green roof that supports live planting, ground water cooling and insulating straw bale walls among many other eco-friendly aspects. Santa Clara believes that by building Kennedy Commons as a green building, it will demonstrate that sustainability responds to community, environmental and economic needs.<sup>2</sup>

The new business school that is currently under construction will not be a completely green building, but will definitely have eco-efficient aspects to it, “Heating and cooling will also be efficient in the new business school building. The air conditioner will be cooled using what is called an ice plant. Ice will be made at night during off-peak electricity hours to save money while during the day; water that is cooled by the ice will be pumped throughout the building to cool the air.”<sup>3</sup>

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<sup>2</sup> The Commons on Kennedy Mall. <http://www.scu.edu/sustainability/commons/>

<sup>3</sup> “University Puts a Focus on Environmental Issues.”  
<http://media.www.thesantaclara.com/media/storage/paper946/news/2004/11/04/News/Univ-Puts.A.Focus.On.Environmental.Issues-1628544.shtml>

## ***CO<sub>2</sub> Levels at Santa Clara***

CO<sub>2</sub> levels at Santa Clara for the fiscal year 2006 were 18,551 tons. This requires a thirty-four percent decrease of present emissions. Of that 18,551 tons, fifty-six percent was from energy, forty-three percent was from natural gas, one percent from gasoline, and less than one percent from diesel. (*Table 2*) Facilities purchases and distributes roughly 22,000 gallons of gasoline and 1,000 gallons of diesel fuels annually. <sup>4</sup>

For our studies, we have decided to focus on the CO<sub>2</sub> emissions from natural gas and electricity. While working with the sustainability interns, we focused on the CO<sub>2</sub> from the dorms on campus. Natural gas usage is measured in therms. The conversion factor from therms of natural gas to pounds of CO<sub>2</sub> is 19.43. In other words, one thousand therms equals nineteen thousand four hundred and thirty pounds of CO<sub>2</sub>.

One of Santa Clara's projects for reducing the use of natural gas in dorms is by using solar water heaters. Currently, Dunne, McLaughlin, and Walsh have water heaters that conserve almost eight hundred thousand more pounds of CO<sub>2</sub> than before. (*Table 3*)

Electricity is measured in kilowatt hours. The conversion factors from kilowatt hour to pounds of CO<sub>2</sub> is 0.75. Therefore, one thousand kilowatt hours equals seven hundred and fifty pounds of CO<sub>2</sub>. Electricity on the campus is not measured per dorms, but as a whole.

## ***Sustainability Pledge***

Part of Santa Clara's policy on becoming sustainable is educating the individual on what he or she can do to help the campus go green. One major use of electricity and therefore CO<sub>2</sub> emissions is from students living on campus. Because students never see their electricity bills, they tend to be more careless in turning off lights and leaving

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<sup>4</sup> Fossil Fuels [www.scu.edu/sustainability](http://www.scu.edu/sustainability)

electronics plugged in throughout the whole day. Televisions, cell phone chargers, and microwaves are some of the many items students never unplug. Also, leaving a computer on standby or on screen saver sucks more energy than when left in hibernate mode. When these items are plugged and not used they are called energy vampires. Forty percent of the energy used by these items is from when they are off or on standby. Santa Clara has implemented a program where students can see how much energy is being used by their dorm. In the next two quarters Santa Clara plans on placing monitors in the lobbies of dorms to raise awareness to these on campus students in order to lead a more sustainable life.

### ***U.S. Universities' Initiatives to Go Green***

While SCU is making great strides to reduce their carbon footprint, there are several schools around the nation that have already implemented the new and innovative technologies that reduce carbon dioxide emissions.

In March of this year, Colorado State University announced their partnership with Wind Holding LLC to develop a wind farm on the University's 11,000 acre ranch near the Wyoming border. Their goal is to convert the entire campus into using 100% wind power. This initiative will take at least 25 wind turbines with a potential of 200 megawatts. The power generated will generate more than the university's needs – at peak demand, they use 16 megawatts of power. The plan is to finish all the building in two years and be fully operational within eight years.<sup>5</sup> Not only will this greatly improve the sustainability of their whole campus, but improve the research facility to further their

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<sup>5</sup> "Today @ Colorado State." Today @ Colorado State. 29 Mar. 2007. Colorado State University. 20 Oct. 2007 <[http://today.colostate.edu/index.asp?url=display\\_story&story\\_id=1001660](http://today.colostate.edu/index.asp?url=display_story&story_id=1001660)>.

research on environmental and energy systems that will ultimately be a benefit to the world.

Another school actively seeking alternative energy is Duke University. Duke University has already begun their movement early on and purchased \$19,718 in September of 2005. The renewable energy certificates offset its use of electricity generated from fossil fuels. Renewable energy certificates are credits that individuals, institutions or businesses can buy to compensate for the amount of nonrenewable fuels that are burned in their facilities. The purchase was made through Gray Country Wind Farm, the largest wind farm in Kansas. By this purchase, Duke University is offsetting about 16.5 millions pounds of carbon dioxide emissions – this is equivalent to taking about 1500 fuel powered off the road for a year.<sup>6</sup>

On November 15, 2007, California State University, Fresno announced the completion of a large-scale solar power installation at Fresno Sate that will supply 20% of the university's annual power needs. This is the largest photovoltaic paneled parking installation at any U.S. university and is expect to save the university more than \$13 million in utility costs over its 30-year lifespan. The 10 parking structures provide the only shaded parking on campus and comprise of 3,872 photovoltaic panels on top of more than 700 carport stalls. This system is expected to generate more than 1.5 million kilowatt hours of power year offsetting the production of about 950 metric tons of CO2 emissions – equivalent to removing 200 cars from the road every year or planting 24,300 new trees. The initial \$11.9 million cost was reduced by \$2.8 million in rebates administered by Pacific Gas and Electric Company under the State of California's Self-

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<sup>6</sup> "Nicholas School Purchases Wind Power to Offset Fossil Fuel Use." Environmental Sustainability At Duke. 12 Sept. 2005. Duke University. 20 Oct. 2007 <<http://www.duke.edu/web/ESC/2005-09-12wind.html>>.

Generation Incentive Program. This project was financed through Power Purchase Agreement with MMA Renewable Ventures, LLC, a subsidiary of Municipal Mortgage and equity, LLC (NYSE: MMA). The project will also provide four publicly located electronic kiosks that show real-time status of photovoltaic production, conversion and electricity output as well as parking lot upgrades and 247 additional parking spots.<sup>7</sup>

While many skeptics argue that going green is expensive, these three school set examples of how anyone who uses nonrenewable energy such as electricity generated by fossil fuels, can move towards a green alternative. The long-term costs and effects have obviously proved to be the solution to our ever-growing, worldwide epidemic.

### ***Recommendations***

Because our biggest concern is electricity consumption, we would like to heavily emphasize what students who live on-campus can do to reduce their carbon footprint. Our recommendations are to do a competition among dorms with similar sizes such as Casa Italliana and Sobrato or Campisi and San Filippo. The prize for the lowest electricity usage can be to have a solar panel installed on their residence hall. Also, to track how much power is being used, TV monitors in each residence hall will give a better understanding for students in terms of seeing exactly how much energy is being used.

Along with SCU's current efforts to become a more sustainable community, SCU should continue education and awareness in sustainability. Being educated about what other companies are doing in the classroom and learning what students can do as

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<sup>7</sup> "Chevron Energy Solutions, Fresno State Complete Solar Parking Project." The California State University. 15 Nov. 2007. California State University, Fresno. 20 Oct. 2007 <[http://blogs.calstate.edu/cpdc\\_sustainability/?p=217#more-217](http://blogs.calstate.edu/cpdc_sustainability/?p=217#more-217)>.

individuals to reduce CO2 emissions will greatly increase awareness and allow students to make the right choices when it comes to things such as energy vampires.

Continual investment in new innovative technologies will be a crucial part in making SCU a campus using 100% renewable energies. Ways to reduce costs can be to have partnerships with local wind farm companies or companies that produce renewable energy products as Colorado State University and California State University, Fresno have done recently.

Table 1

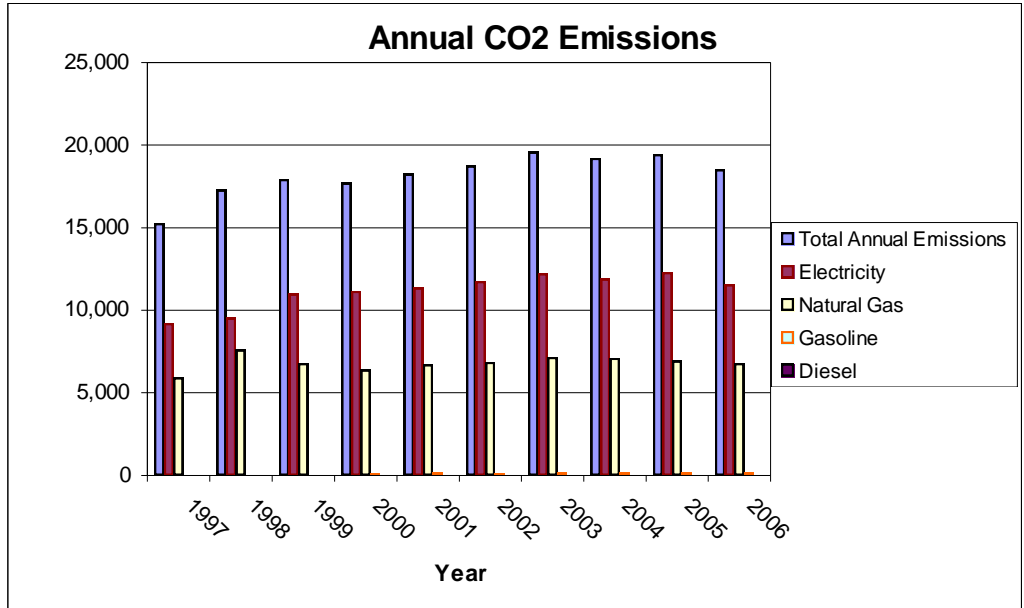


Table 2

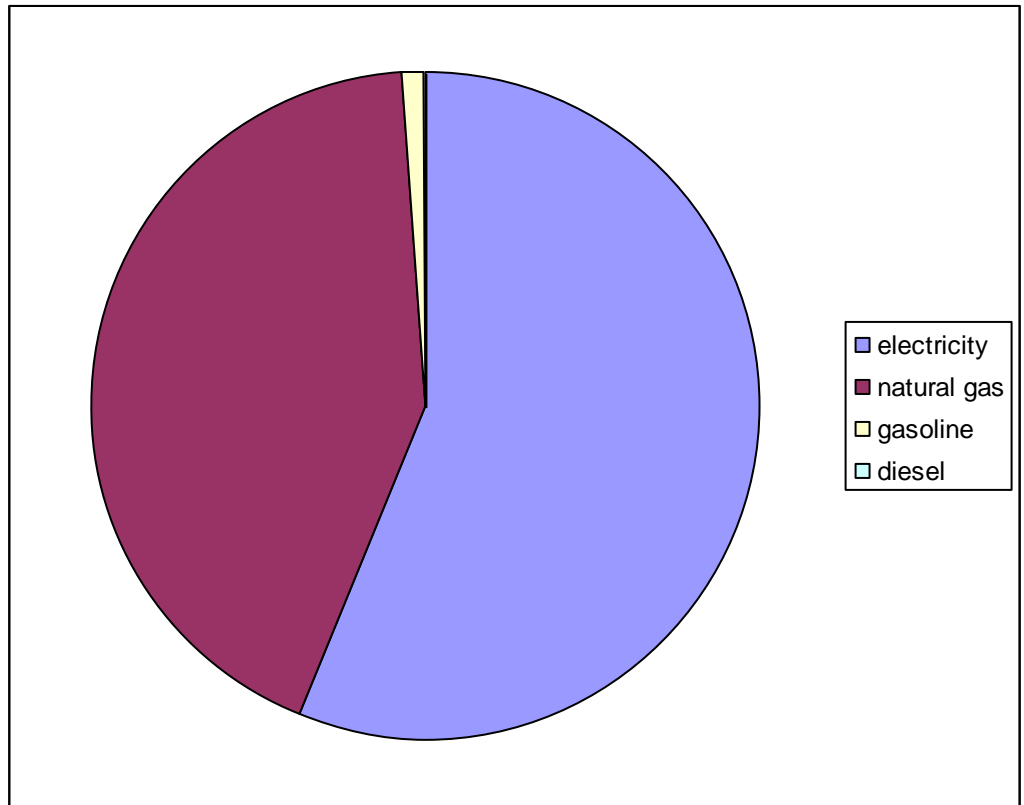


Table 3

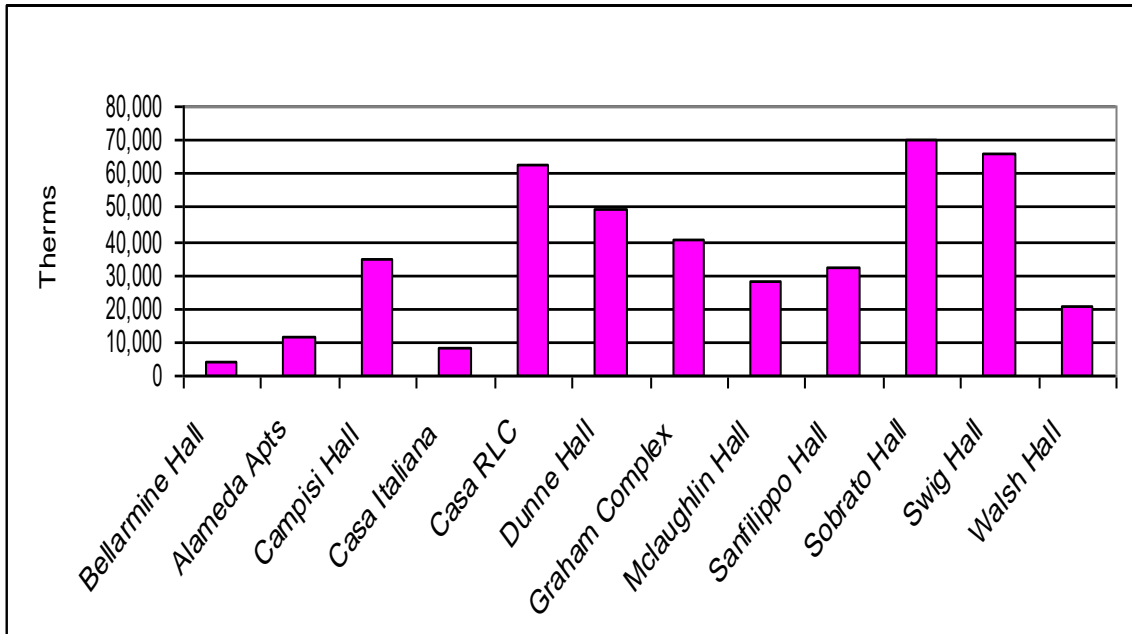


Table 4

