VALENCIA

VALENCIA COMMUNITY COLLEGE

CLIMATE ACTION PLAN

CO_2

September 27, 2010

Prepared by:

ECO2ASSET SOLUTIONS
LYKES BROS. INC.

President's Signature Page

The signature below signifies that the President of Valencia Community College hereby accepts the Climate Action Plan.

Dr. Sanford Shugart
President
Valencia Community College

2/2/2011
Date

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EXECUTIVE SUMMARY

Valencia Community College (Valencia) is located in the Orlando Metropolitan Area in Central Florida. Valencia is one of the largest community colleges in Florida, with over 63,000 students enrolled and seven campuses and centers in Orange and Osceola Counties.

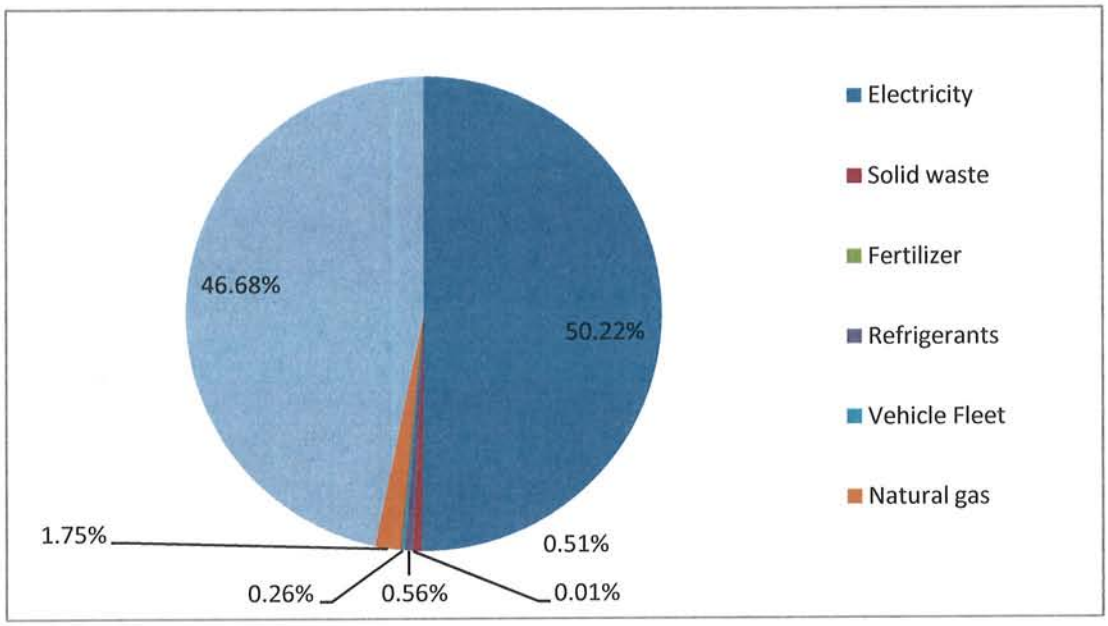
In 2009, Valencia's President Sanford Shugart became a signatory of the American College and University Presidents' Climate Commitment (ACUPCC). President Shugart's participation demonstrates the institution's dedication to environmental stewardship and sustainability and acknowledges the reality of global climate change, which is projected to increase Florida's average temperature between 4 and 10 degrees Fahrenheit over the next 100 years. Valencia joins eleven other universities and colleges in the state of Florida and over 650 across the United States in a commitment to achieve climate neutrality.

Sustainability is not a new concept for Valencia. The Facilities Department has been responsible for many sustainability initiatives on the campuses, including implementing energy efficiency and conservation projects, developing a green building policy for all new buildings and replacing 85% of traditional cleaning products with green cleaning products. The College's Sustainability Committee was established in 2005. This Climate Action Plan (CAP) will serve as a roadmap for the Sustainability Committee to further the College's efforts and begin to chart Valencia's path toward climate neutrality.

Achieving Climate Neutrality

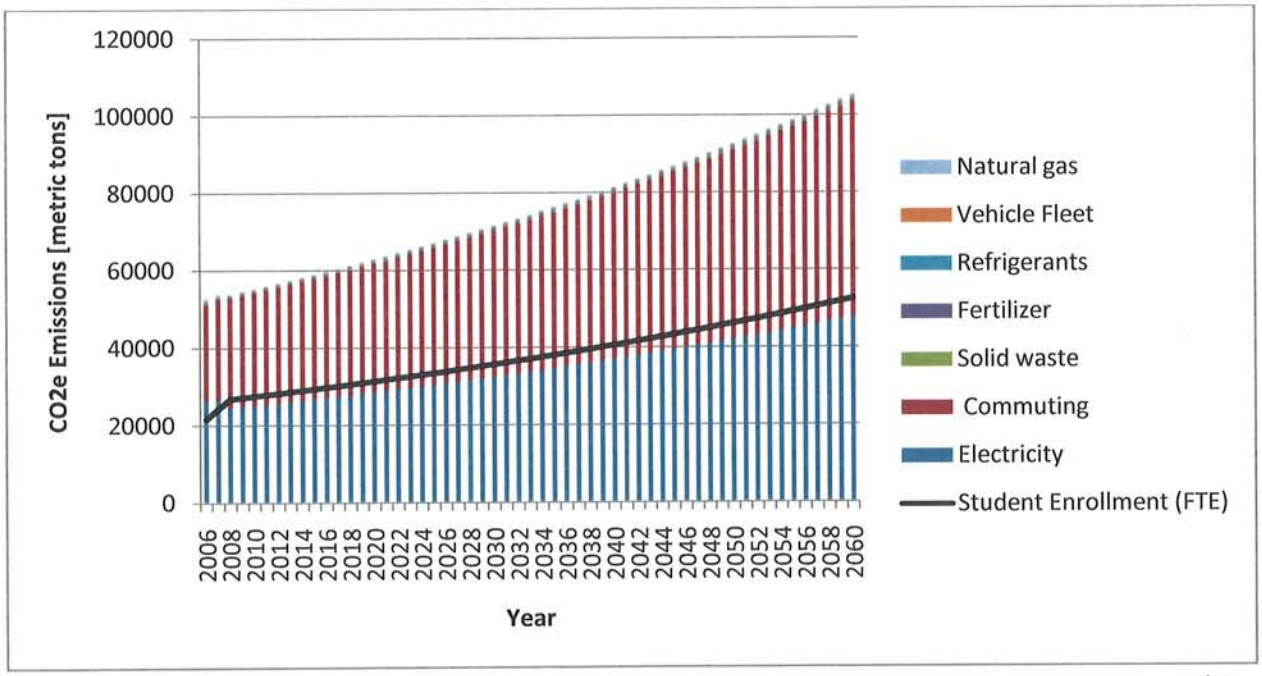
ACUPCC defines **climate neutrality** as *having no net greenhouse gas (GHG) emissions, to be achieved by minimizing GHG emissions as much as possible, and using carbon offsets or other measures to mitigate the remaining emissions if necessary*. In 2010, Valencia commissioned a baseline GHG inventory study to quantify emissions at its seven campuses and centers between 2006 and 2008. In calendar year 2006, Valencia emitted **52,785** metric tons of CO_2e across seven different sources. The largest sources were electricity, which comprised 50% of the total emissions, and commuting, which contributed 47% of total emissions. Natural gas consumption, fertilizer application and the college vehicle fleet accounted for the remaining percentage of Valencia's GHG emissions. In 2006, only 3% of the total emissions were categorized as Scope 1. The majority of emissions were classified as Scope 2 and Scope 3, which comprised 50% and 47% of the Valencia's total emissions, respectively.

Percent Total CO_2e Emissions by Source Category at Valencia (2006)



Over the last decade, Valencia has been experiencing significant growth both in student enrollment and building square footage. Given Florida's increasing population, these trends are likely to continue. In a business-as-usual (BAU) scenario, GHG emissions at Valencia are projected to rise 100% by 2060.

Business As Usual (BUA) Greenhouse Gas Emissions Forecast for Valencia (2001-2060)



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Climate Action Plan

To reverse the trend, Valencia has created a strategic plan with strategies, goals and targets to reduce its GHG emissions over time. Using the results of the GHG inventory, feedback from stakeholder engagement, and best practices, Valencia has developed this CAP. The CAP offers a comprehensive set of strategies that address transportation, energy, education and solid waste challenges at Valencia. These strategies include:

- The formation of a Transportation Task Force to educate the Valencia community on alternative forms of transportation, develop a long range transportation plan to increase public transit to the college's campuses and centers, and establish incentives to decrease commuter vehicle miles traveled (VMT)
- Initiatives to increase onsite electricity generation using low carbon and renewable fuels
- Policy initiatives aimed at conserving energy, increasing renewable energy, and reducing waste disposal and personal vehicle travel
- The establishment of an Office of Sustainability and hiring of a full time Sustainability Officer to coordinate all sustainability efforts and oversee the Sustainability Committee
- Numerous educational and outreach efforts that integrate sustainability into the everyday lives of students and employees

Carbon Offsets

Valencia will likely need to develop alternative forms of energy to meet its climate neutrality goals. There are many opportunities to sponsor carbon offset projects in the local community, especially those projects that result in additional energy savings through efficiency and conservation measures.

Financing

To support the development of more capital-intensive strategies in the CAP, Valencia will need to take advantage of a variety of financing mechanisms, which may include the following:

- Valencia's Endowment
- Cost Savings through Operations Improvements
- State and Federal Grants
- Utility Incentives and Rebates
- Property Assessed Clean Energy (PACE) Financing
- Clean Renewable Energy Bonds

Climate Neutrality Goals and Targets

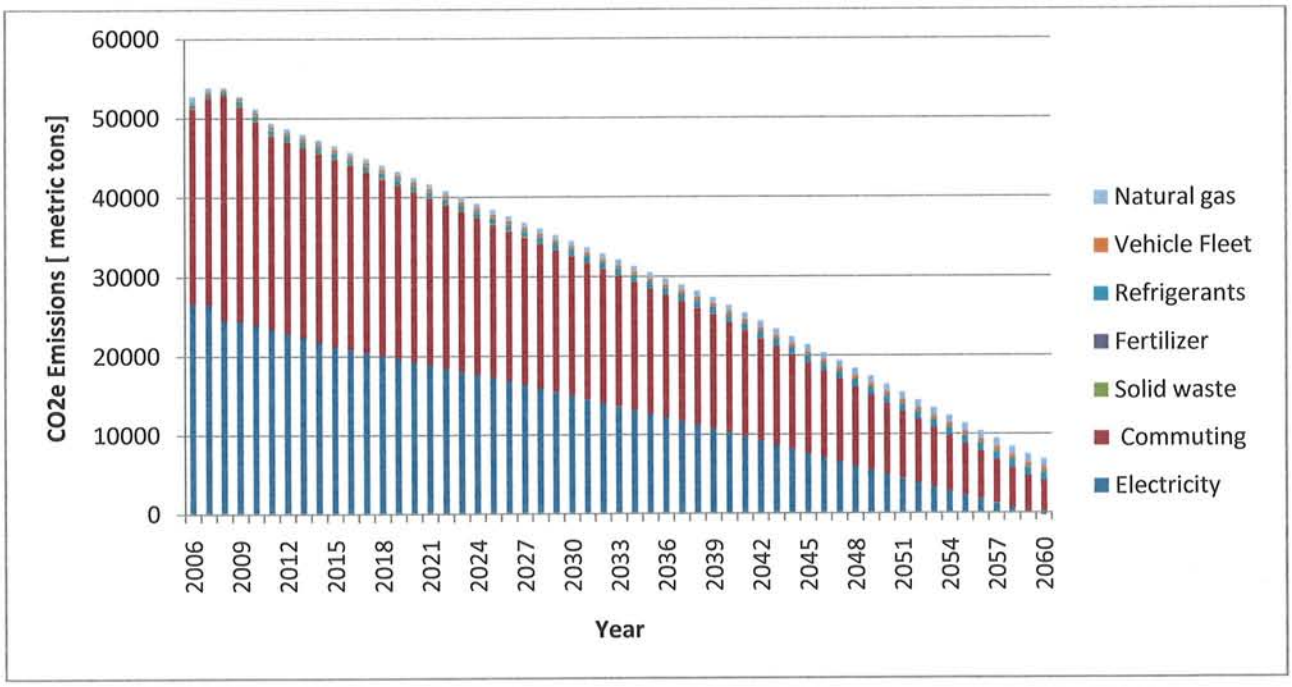
Valencia has decided to adopt the goal to become climate neutral by **2060**. To reach this goal, Valencia will aim to reduce its 2006 baseline GHG emissions along the way: 12% by 2015, 30% by 2025, and 50% by 2040.

Overall GHG Emission Reduction Goals for Valencia

Target Year	Emissions Goal [metric tons CO2e]	GHG Reduction Goal from 2006 baseline
2015	46,571	12%
2025	36,950	30%
2040	25,337	52%
2060	4,751	100%

Given that Valencia can execute the CAP successfully and in a timely manner, it can achieve climate neutrality and alter its BAU forecast to match the one below:

GHG Emission Forecast at Valencia with Climate Action Plan



Monitoring, Reporting and Refinement

The Valencia Climate Action Plan marks the beginning of strategic effort to achieve carbon neutrality. To be successful, Valencia will need to engage in an ongoing process of tracking and reporting the results of the implemented strategies, evaluating the data and any new information (i.e. technological opportunities), and refine the Climate Action Plan accordingly.

1.0 INTRODUCTION

The purpose of this report is to present the Climate Action Plan (CAP) for Valencia in Central Florida. The CAP provides a roadmap to decrease the College's greenhouse gas emissions, with the ultimate goal of achieving climate neutrality. The CAP follows the completion of Valencia's greenhouse gas (GHG) inventory, an important tool to measure and track Valencia's GHG emissions. Both the GHG inventory and CAP were commissioned by Valencia's Sustainability Committee and are necessary to complete to comply with the American College and University Presidents' Climate Commitment (ACUPCC).

This Climate Action Plan was completed by EcoAsset Solutions, LLC, a wholly owned subsidiary of Lykes Brothers Inc. based in Tampa, Florida. EcoAsset Solutions also conducted Valencia's GHG inventory.

1.1 ACUPCC

In 2009, Valencia's President Sanford Shugart became a signatory of ACUPCC, an effort by higher education institutions to eliminate their global warming contribution by a chosen target date. To date, 685 presidents have signed on, committing their institutions to a series of goals that will guide them to climate neutrality. These goals include:

- Establish an institutional structure to oversee the development and implementation of the school's program within two months
- Take some immediate steps to reduce GHG emissions
- Complete an emissions inventory within a year, and annually thereafter
- Establish a climate neutrality action plan within two years
- Integrate sustainability into the curriculum
- Make the climate action plan, inventory and progress reports publicly available

1.2 Florida and Climate Change

Through his commitment, President Shugart recognizes the seriousness of climate change and the need to lead by example in Florida, a state that is anticipated to experience significant impacts from the Earth's changing climate. Over the next 100 years, global warming is projected to increase Florida's average temperature between 4 and 10 degrees Fahrenheit and has the potential to increase sea level up to 2 feet. [1] If action is not taken, flooding and erosion from sea level rise threaten Florida's homes, businesses, and ecosystems, including the state's prized beaches that draw thousands of tourists every year. A changing climate may also impact commercial farming and forestry operations through more extreme weather systems (i.e. concentrated rains and droughts). With most of the state's population living near the coast and

[1] Natural Resource Defense Council. *Feeling the Heat in Florida: Global Warming on the Local Level.* http://www.nrdc.org/globalwarming/florida/florida.pdf

an economy highly dependent on tourism and agriculture, global warming poses a significant threat to Florida's economy and population.

Florida has been taking efforts to address climate change. In 2007, the State of Florida ranked fifth overall in the nation in total GHG emissions and fortieth overall in per capita emissions.[2] In July 2007, Florida Governor Charlie Crist declared action against climate change by signing three Executive Orders related to climate and energy policy: Executive Order 07-126 established GHG reduction goals for state government, including a 40% reduction of 2007 GHG emissions target by 2025; Executive Order 07-127 set a statewide target to reduce GHG emissions by 80% of 1990 levels by the year 2050; and Executive Order 07-128 charged the Florida Governor's Action Team on Energy and Climate Change to develop a statewide Climate Action Plan to achieve or surpass the targets established in Executive Order 07-127.

Along with the state, many Florida cities and counties have joined in to lead by example by measuring their GHG emissions, developing Climate Action Plans, and committing to take action to reduce their GHG emissions. Valencia now joins a group of 11 other Florida higher education institutions under ACUPCC to do the same.

1.3 Sustainability Efforts at Valencia

Sustainability is not a new concept for Valencia. Before signing onto ACUPCC, Valencia had already established a Sustainability Committee, developed a green building policy and implemented energy efficiency projects on campus. Below is a timeline highlighting some of the sustainability accomplishments that Valencia has achieved during the last five years (Table 1.1). Many more detailed accomplishments are described in the following sections.

[2] World Resources Institute's Climate Analysis Indicator's Tool: http://cait.wri.org/

Table 1.1
Valencia Sustainability Highlights (2005-2010)

Year	Achievements
2005	Valencia's Sustainability Committee is established.
2006	Valencia establishes a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.
2007	Valencia hires an ESCO to audit all campus facilities and implement energy efficiency projects.
2009	Valencia's President Shugart becomes a signatory of ACUPCC. Valencia adopts an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.
2010	With assistance from EcoAsset Solutions, Valencia completes a baseline greenhouse gas inventory and Climate Action Plan.

1.4 Climate Neutrality

Greenhouse gases (GHGs) are gases that encourage the trapping of heat in the atmosphere that contributes to global climate change. GHGs are typically emitted through the combustion of fossil fuels (i.e. coal, oil, natural gas, etc.), but some can be released through the handling of certain chemical substances, the decomposition of biogenic material, and the combustion of other fuels. While there are many greenhouse gases, the most commonly reported include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Under ACUPCC, Valencia has the end-goal of achieving carbon neutrality. ACUPCC defines **climate neutrality** as "having no net GHG emissions, to be achieved by minimizing GHG emissions as much as possible, and using carbon offsets or other measures to mitigate the remaining emissions if necessary." The first step towards climate neutrality was to conduct a greenhouse gas inventory to measure the net GHG emissions of Valencia. Net GHG emissions at Valencia were calculated by subtracting the total reductions in greenhouse gas emissions from the total greenhouse gas emissions generated by the college.

GHG Emissions – GHG Reductions = NET GREENHOUSE GAS EMISSIONS

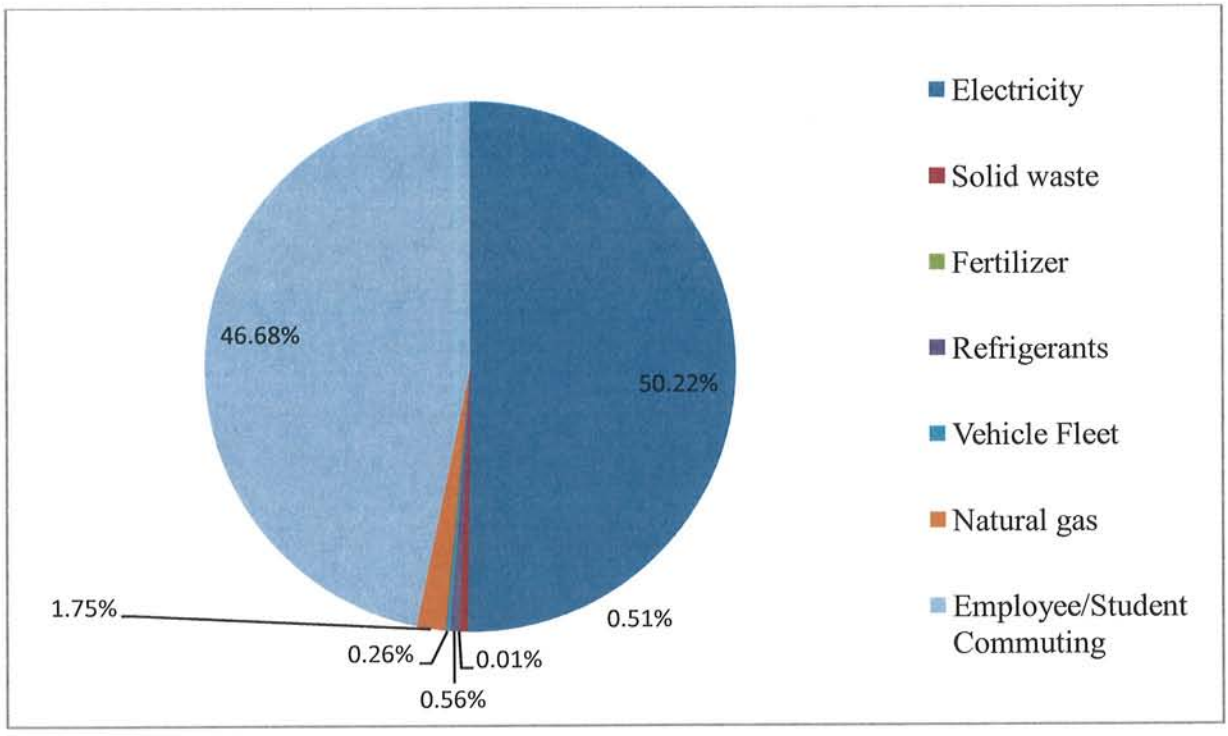
1.5 Valencia Greenhouse Gas Emissions

In 2010, Valencia conducted a baseline GHG inventory to quantify emissions at its seven campuses and centers. Although the baseline year selected was 2006, additional inventories were developed for 2007 and 2008 as a means for comparison. Scope 1 and Scope 2 emissions were measured along with GHG emissions from commuting (Scope 3); due to lack of

available data, emissions from air travel could not be calculated at the time.[3] Additionally, emissions from fertilizer application were quantified, a source not required by ACUPCC. All analysis was performed using a selection of best available scientific methodologies, including the Local Government Operations Protocol, Clean Air Cool Planet, US EPA's 2006 Solid Waste Management and Greenhouse Gases: A Life Cycle Assessment of Emissions and Sinks report, and US DOE's Voluntary Reporting of Greenhouse Gases (1605(b)) Program.

In calendar year 2006, Valencia emitted **52,785** metric tons of CO_2 emissions across seven different sources. The largest sources were electricity, which comprised 50% of the total emissions, and commuting, which contributed 47% of total emissions (Figure 1.1). Natural gas consumption, fertilizer application and the college vehicle fleet accounted for the remaining percentage of Valencia's GHG emissions. In 2006, only 3% of the total emissions were categorized as Scope 1. The majority of emissions were classified as Scope 2 and Scope 3, which comprised 50% and 47% of the Valencia's total emissions, respectively (Table 1.2).

Figure 1.1
Percent Total CO_2e Emissions by Source Category at Valencia (2006)



[3] Scope 1 emissions refer to GHG emissions from sources that are owned and managed by Valencia. Scope 2 emissions are defined as indirect emissions generated through Valencia's consumption of purchased electricity. Finally, Scope 3 emissions are indirect emissions that occur as a result of Valencia's activities, yet are not linked to GHG sources that c controls or manages.

Table 1.2
GHG Emissions Categorized by Scope at Valencia (2006)

Source	Source	GHGs	Emissions [metric tons CO_2e]
Scope 1 Emissions			
Direct Emissions from Stationary Combustion	Natural Gas Consumption	CO_2, CH_4, N_2O	924.43
Direct Emissions from Mobile Combustion	Gasoline and Diesel Fuel Use for Valencia's Vehicle Fleet	CO_2, CH_4, N_2O	138.74
Direct Emissions from Fugitive Emissions	Refrigerants Used in HVAC systems, Chillers, and Vehicle A/C units	R-12, R-22, R-134A, R-404A, R-409, R-502	295.43
Direct Emissions from Fertilizer	Fertilizer application	N_2O	2.73
		Total	1,361.33
Scope 2 Emissions			
Indirect Emissions from Purchased Electricity	Purchased electricity	CO_2, CH_4, N_2O	26,509.99
		Total	26,509.99
Scope 3 Emissions			
Indirect Emissions from Employee/Student Commuting	Fuel use from personal vehicles and buses used in commuting to and from Valencia campuses	CO_2	24,641.85
Indirect Emissions from Solid Waste	Solid waste sent to landfill	CO_2, CH_4	269.77
Indirect Emissions from Fertilizer	Fertilizer application	N_2O	2.07
		Total	24,913.69

Between 2006 and 2008, Valencia's total GHG emissions continued to rise, although at a decreasing rate (Figure 1.2). During this stretch, emissions from electricity, natural gas and solid waste dropped while emissions from commuting and the campus vehicle fleet increased (Figure 1.3).

Figure 1.2
Absolute CO_2e Emissions for Valencia (2006-2008)

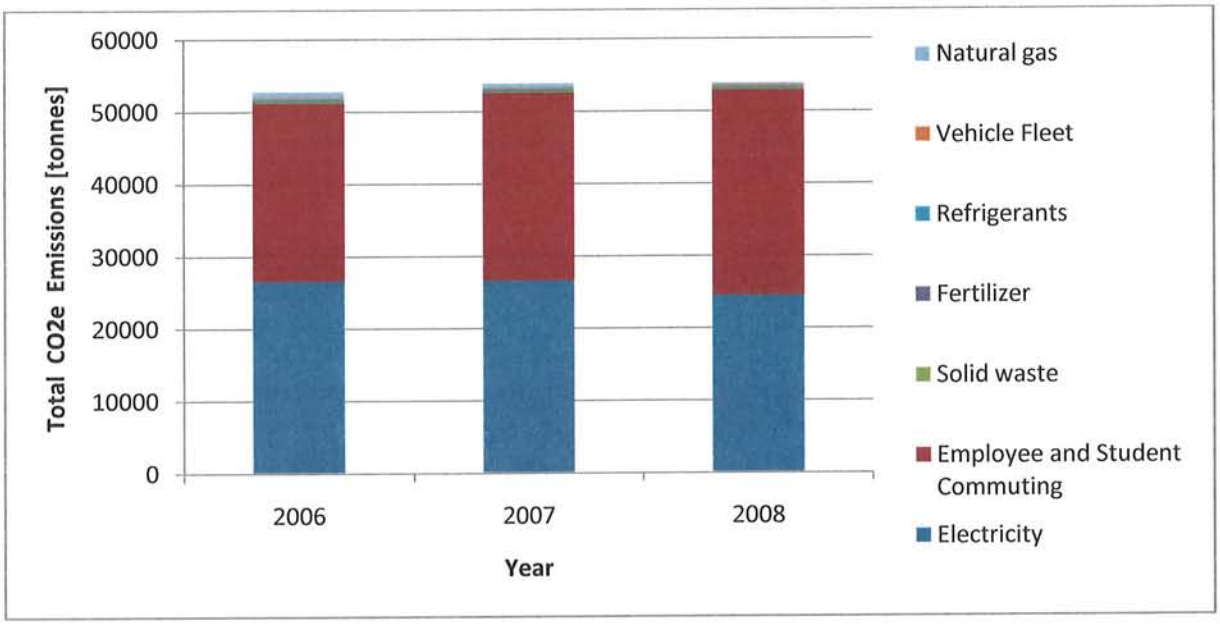
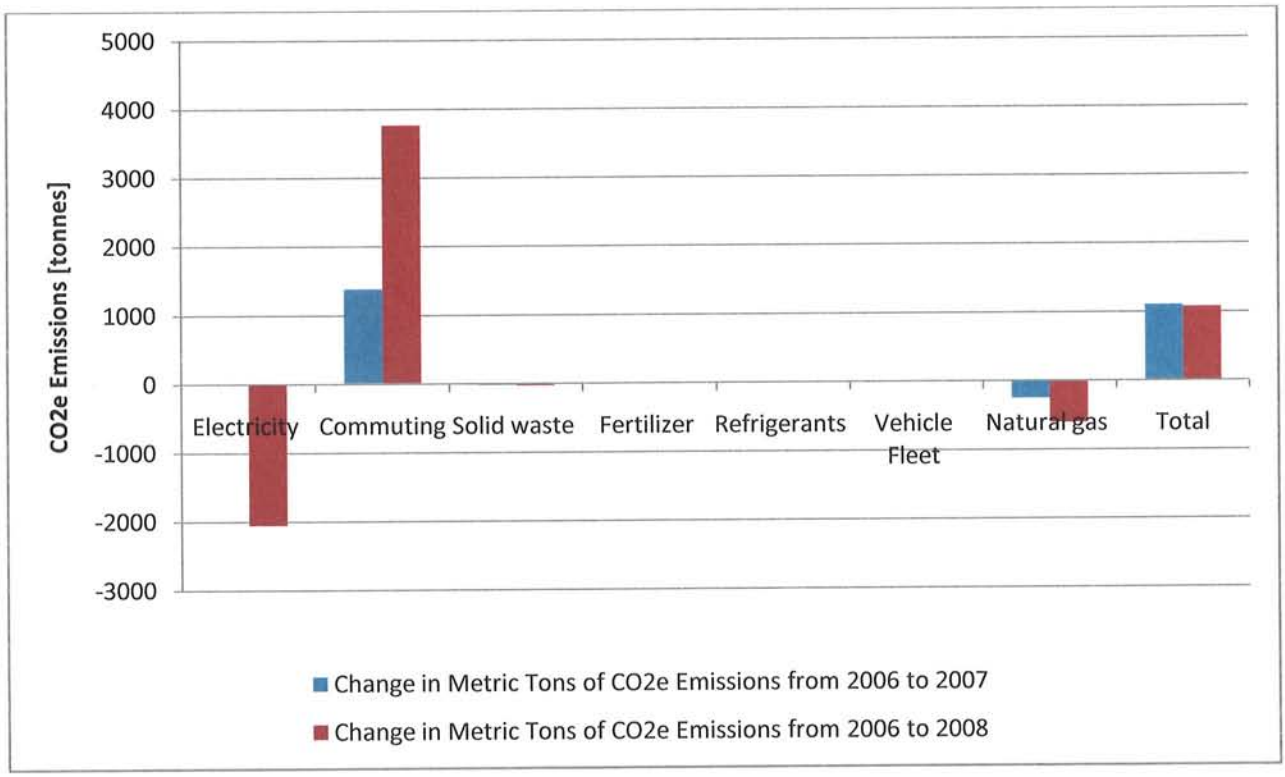


Figure 1.3
Change in CO_2e Emissions by Source Category at Valencia (2006-2008)



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1.4 Valencia GHG Forecast and Trends

Over the last decade, Valencia has been experiencing significant growth both in student enrollment and building square footage (Figure 1.4). Given Florida's increasing population, these trends are likely to continue. In the short term, Valencia is planning to expand both Osceola Campus and East Campus to meet the high demand. Although new buildings will be built to at least LEED Silver standards, the projected increase in student enrollment will result in increased energy consumption and vehicle miles traveled from commuting, two sources that are responsible for 97% of Valencia's GHG emissions.

In a business-as-usual (BAU) scenario, GHG emissions at Valencia are projected to rise 100% by 2060 (Figure 1.5). The BAU scenario assumes annual growth of 1.3%, the rate of the State of Florida's population growth determined by the University of Florida's Bureau of Economic and Business Research. Per capita emissions by source category in 2008 were calculated and used to project annual emissions out to 2060.

Figure 1.4
Growth Trends at Valencia (2001-2009)

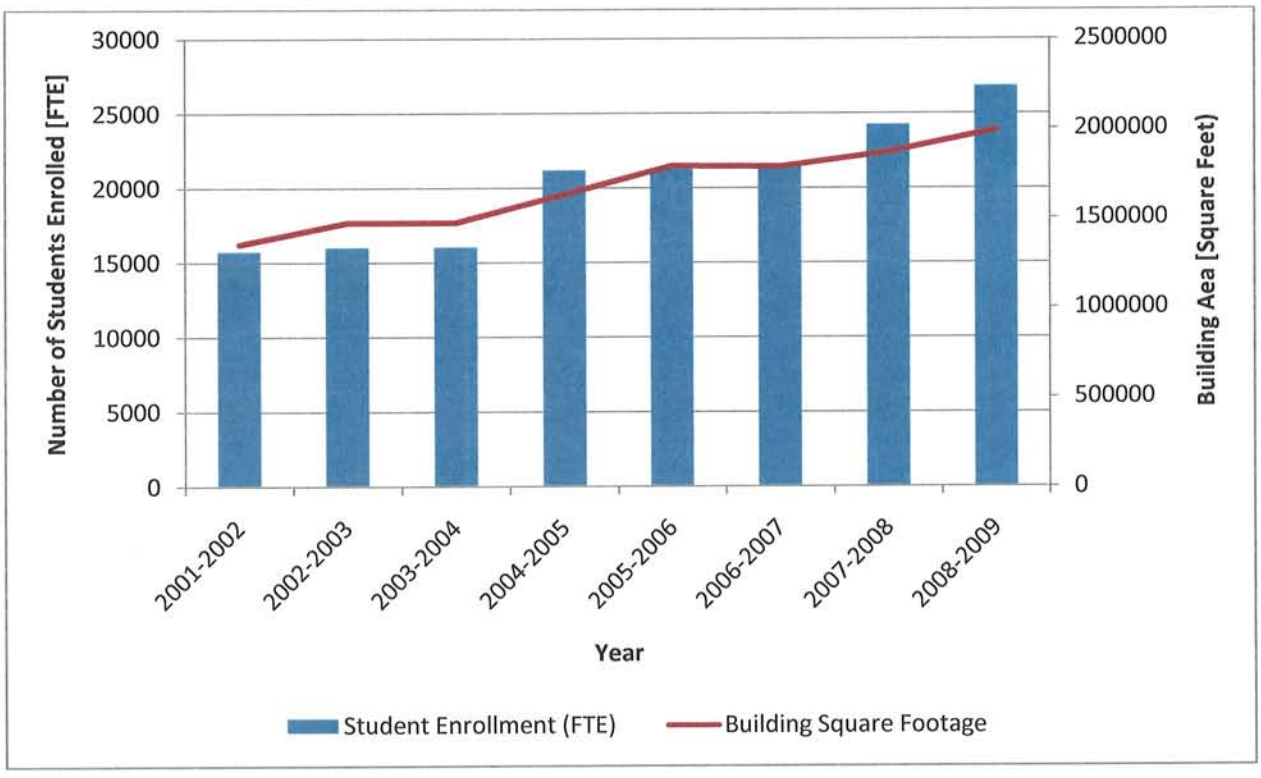

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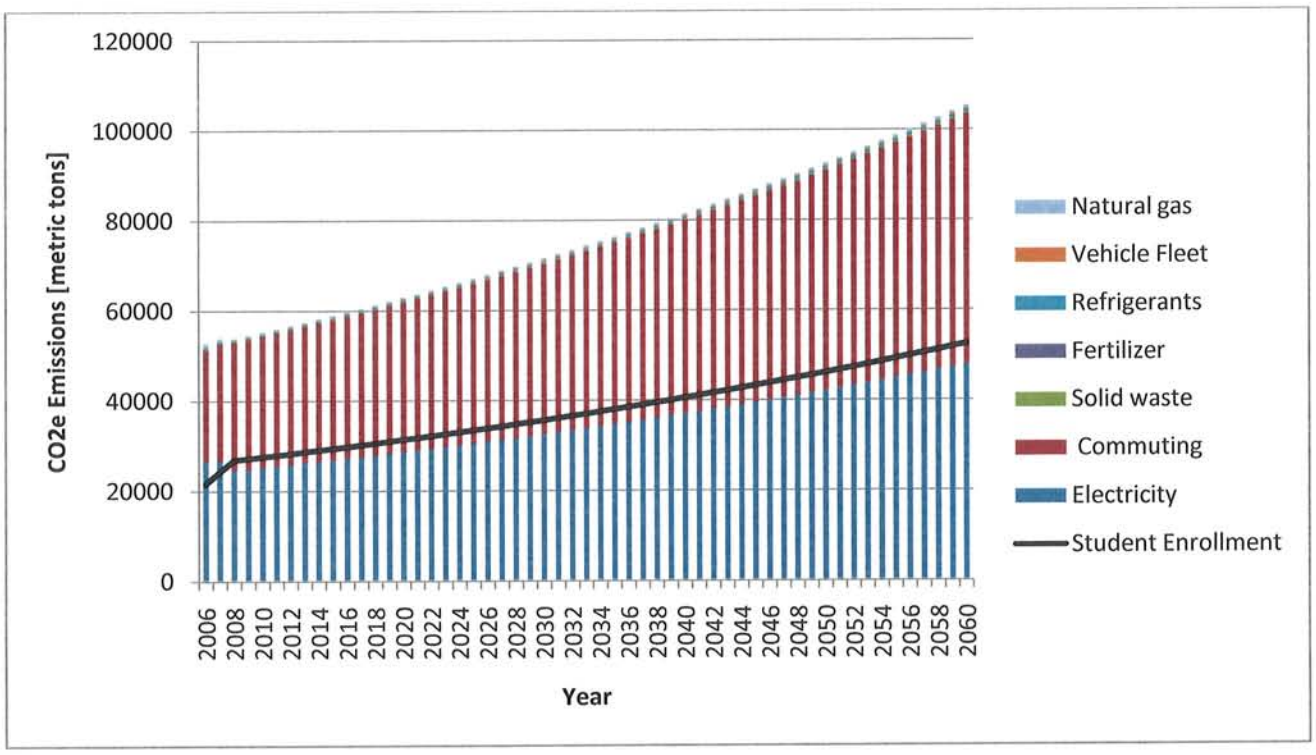
Figure 1.5
Business As Usual (BUA) Greenhouse Gas Emissions Forecast at Valencia (2001-2060)



1.5 Valencia's Climate Action Plan and Approach

Valencia's Climate Action Plan was developed using the results of the GHG inventory, feedback from stakeholder engagement, and research on best practices.

1) GHG Inventory

A GHG inventory provides valuable information on which operations and activities are the largest contributors to an entity's carbon footprint. A three-year GHG inventory was conducted to quantify emissions from all of Valencia's seven campuses and centers. The following categories were included in the analysis:

- Electricity consumption
- Natural gas consumption
- Refrigerant use
- College vehicle fleet
- Commuting
- Solid waste
- Fertilizer application

The process involved data collection from Valencia's Facilities Department and analysis using the best available scientific methodologies. The study highlighted the categories that contributed the most GHG emissions and identified trends in the college's GHG

2.0 MITIGATION STRATEGIES

2.1 TRANSPORTATION

2.1.1 Background

As a commuter school, Valencia students and employees rely heavily on personal vehicles to travel to and from campus. Overall, GHG emissions from commuting continue to rise on an annual basis more than any other category. Between 2006 and 2008, the percentage of total emissions from commuting grew from 47% to 53%.

2.1.2 Challenges

Valencia faces many challenges in reducing GHG emissions from transportation:
1) Many students have inflexible, tight schedules and depend on personal vehicles to fulfill other obligations during the day, including off-campus jobs, childcare, etc.

2) Public transportation options are limited to the bus system. Within the bus system, there are limited bus routes that serve the Valencia campuses and centers.

3) Varying class schedules make it difficult to coordinate rides between students.

4) There is little or no information on where students and staff are commuting from, making it difficult to establish programs that can increase alternative forms of transportation.

5) The vast majority of our course settings require face-to-face delivery.

6) Transportation planning depends to a large extent on the County and City Planning Department.

2.1.3 Stakeholder Feedback and Vision

VISION

Valencia would be a place with fewer cars in the parking lots and less parking lots (paved areas) in general. Valencia's campuses and centers would be integrated with the city and county's transportation plan, with bus routes, bike paths, carpooling programs and light rail stations near Valencia's campuses and centers, along with more convenient campus locations and more fully on-line or hybrid course offerings.

Across all categories, transportation was viewed as most stagnant area in Valencia's path to become a more sustainable institution. Feedback from staff and students was gathered through the online survey and two focus group meetings held at Valencia's West Campus. Many different recommendations were made by stakeholders to decrease personal vehicle travel (Table 2.1). Student survey respondents ranked carpool incentives (40%) and assistance in finding carpool partners (42.1%) as the most valuable tools to encourage alternative

forms of transportation (Figure 2.1). Although smaller, 15% of student respondents would find bus schedules and transit discounts beneficial. While 50% of employee respondents expressed that no benefits would encourage a change in behavior, 33% did check that incentives would encourage them to consider carpooling.

Table 2.1
Transportation recommendations from Valencia stakeholders

STUDENTS	EMPLOYEES
Safer bike paths to school	**Option for emergencies**
Making courses available at multiple campuses	**Provision of a college vehicle when I have to travel off site to meetings during the work day**
Park and Ride Service	**Inter-campus shuttle**
More frequent bus service	**Schedule changes every semester makes it hard to organize carpooling**
	Flex Schedule
	Alternative to hold same position at another campus closer to home

Figure 2.1
Student Commuter Survey Results for Valencia (2010)

If you DRIVE ALONE to campus, check up to THREE reasons why you drive alone (If you DON'T DRIVE ALONE, move to Question 8).

Answer Options	Response Percent	Response Count
Need car to travel between Valencia Community College and work	56.2%	168
Saves time	38.8%	116
Irregular school schedule or night classes	35.8%	107
Want car for emergencies	23.4%	70
No one to carpool with	54.2%	162
Saves money	2.3%	7
No bus where I live	15.1%	45
Buses don't run frequently enough or during the hours I commute	15.7%	47
Bus takes too long	28.8%	86
Not interested in carpooling	15.7%	47
Drive children to/from destinations	10.0%	30
Other (please specify)		29
	answered question	**299**

If you DRIVE ALONE to campus, what benefits would encourage you to try an alternative? (check up to THREE options)		
Answer Options	**Response Percent**	**Response Count**
Help finding carpool partners	42.1%	120
Incentives for carpools	40.0%	114
Discounts on Linx Bus	15.1%	43
More bike racks	5.3%	15
More information on bus schedules	15.4%	44
Reserved parking for carpools	35.4%	101
Showers for bike riders and walkers	7.4%	21
No benefits would encourage me to try an alternative	34.0%	97
Other (please specify)		24
	answered question	**285**

2.1.4 Transportation Roadmap

GOAL

Reduce transportation GHG emissions by 10% by 2015, 25% by 2025, 45% by 2040 and 85% by 2060.

There are numerous strategies that Valencia can implement to reduce commuting vehicle miles traveled (VMT) to its campuses and centers. The suite of strategies below aims to promote increased use of alternative transportation, reduce the average distance of the daily commute, and minimize the number of trips taken during the day. Most of the initial strategies focus on educating the Valencia community about alternative transportation options. To reduce VMT over the long term, Valencia will need to collaborate with local transit agencies to improve access to its campuses, establish meaningful incentives, and use internet-based tools. Each strategy is described in detail below. The milestones, goals and target dates for each strategy are listed in Table 2.2.

1) **Establish A Transportation Task Force**

The first step for Valencia is to assemble a Transportation Task Force to oversee and address transportation issues at the college. The committee will be ideally comprised of students, faculty and staff and will have the goals of 1) evaluating the current transportation-related policies and commuting behavior at Valencia of the students and staff, 2) engaging the appropriate departments on campus to develop and implement new transportation policies and programs, and 3) executing the plan set forth in this CAP.

2) **Collect and analyze commuting data**
While initial commuting data was collected for Valencia's GHG inventory, it did not capture a significant percentage of the staff and students. The Transportation Task Force along with Institutional Research and Campus Security should develop a survey to collect comprehensive data on student and staff commuting behavior. This study should investigate the trips to and from campus, trips between campuses, and trips between campus and non-campus destinations (i.e. work, child care, etc.). The survey can be administered through the online decal application process. Once the data has been collected, the committee should analyze the data to identify large-scale trends on how the Valencia community travels to and from the different campuses.

3) **Plan and launch a transportation awareness campaign**
Valencia should initiate a college-wide campaign to educate students on alternative forms of transportation available to students and staff and the relative environmental and economic impacts.

The main venues to educate the Valencia community include:

- **Internet**: A webpage should provide resources on bus routes, rideshare programs, and bike amenities at Valencia's campuses and centers. The website should also highlight housing options located near the different campuses.
- **Workshops**: A workshop with accompanying materials should be developed to educate students and staff at orientation, events, and meetings.
- **Kiosks**: Strategically placed kiosks should be placed around Valencia's campuses and centers to make the community aware of alternative transportation options.

Before launching the campaign, the Transportation Task Force should select a carpooling coordination tool. There are a range of options, some of which are free and others which require an annual subscription. The preferred tool should ideally be web-based and interface with social networking sites such as Facebook. Some potential resources include:

- Go Loco
- Pickup Pal
- ZimRide

Valencia should also consider **car slugging**, a form of casual carpooling that began in the Washington DC area.[4] There are established rules for passengers who participate and pick up and drop off areas should be designated using the commuter data that Valencia collects.

4) **Promote local housing and day care services**
Valencia should play a more active role in promoting apartment/housing options, food establishments and day care services that are within a short distance from campus. This should be accomplished through the transportation web site and materials provided to the students

[4] http://www.slug-lines.com

during orientation. If there is a lack of facilities, Valencia should encourage businesses to locate near the campuses.

5) **Promote use of e-meeting software**
On a daily basis, faculty and staff commute between campuses to conduct meetings. The Task Force should consider purchasing a subscription to a web-based e-meeting application and training appropriate staff on how to use it. If necessary, Valencia can develop a policy that mandates the use of the tool in certain situations. Some criteria may include the travel distance and time required to and from the meeting as well as the number of people in attendance.

6) **Expand on-campus food services**
Many students and staff leave campus to access off-campus food facilities. Valencia should try to work with local food vendors to bring private food services to its campuses. Although building space is limited, Valencia can offer centrally located outdoor space for vendors to set up temporary food stalls or carts. Students and staff should have the option to vote for the vendors and priorities should be given to those that are local and use eco-friendly materials and practices. Proper permitting will need be considered for each of the vendors that are invited to campus.

7) **Organize commuter challenge month event**
A commuter challenge is a fun way to bring awareness to alternative transportation and spark competition among the community to reduce their carbon footprint. Students and staff commit to travel to campus using a sustainable form of transportation. For every trip, they log the miles traveled and form of transportation used. Every week, results are announced and prizes are awarded to participants. The challenge can be based on individuals and/or departments or programs. New initiatives, ideas and programs are likely to grow out of the event that can become long term transportation solutions.

8) **Devise long-term transportation plan with transit agencies**
Representatives of the Transportation Task Force should establish relationships with LYNX, Metroplan ORLANDO, and other relevant transit agencies and groups to explore opportunities to partner on transportation initiatives serving Valencia's campuses and centers. With the support of the agencies, the Task Force should develop a long-term plan to encourage more sustainable forms of transportation. The plan should include planned bike paths, park and ride lots, potential bus and rail stops/terminals, etc.

9) **Establish telecommuting program**
Valencia should consider implementing a telecommuting program for staff members with duties that do not require them to be physically present on campus. The program should initially target employees that live beyond a certain distance threshold from campus. A number of programs already exist that Valencia can easily adopt.

10) **Establish incentive system and parking fee structure**
With free parking at all campuses, students and staff have little reason to change their commuting habits. Once the community is aware of other transportation options available to them, Valencia should consider implementing a parking fee in tandem with incentives to carpool and take alternative forms of transportation to campus. A variety of incentives, both financial and social, are available to encourage students and staff to consider sustainable transportation:

- Reserved carpool spaces
- Subsidized bus fares
- Free parking passes
- Emergency Ride Home Service

11) **Develop and fund inter-campus shuttle program**
Given the results of the commuting study, there may be sufficient demand to develop an inter-campus shuttle program that can transport students and staff between select campuses. This program will serve the purpose of cutting down on single occupancy travel during the day.

12) **Implement capital projects**
Capital projects identified in the transportation plan should be implemented when funding becomes available. These projects may include park and ride lots, installation of bike lanes, bus shelters and other forms of transportation infrastructure. Some of these projects will be funded by the transit service while certain partnerships may include a cost share between the agency and Valencia.

13) **Adding other campus locations**
By adding other localized campuses Valencia can dramatically reduce the commute distance and time frame. Also, by reducing the travel distance we invite and encourage walking and bicycling.

14) **Providing more fully and hybrid course offerings**
Fully online course offerings completely negate the need to go to and from campus. Hybrid courses have the ability to cut commuting in half by offering 50% or more of the content on-line. Expanding these types of course offerings to our students can have a significant impact.

Table 2.2

Transportation GHG Reduction Strategies, Milestones, Goals and Targets for Valencia

Strategy	Milestones	Goal	Target Date
1. Transportation Task Force Formation	Develop Task Force	Establish group with 5-8 members, comprised of representatives from Master Planning, Campus Security, Institutional Research, Student Services, Communications and the Sustainability Committee.	December 2010
2. Commuting Data Collection and Analysis	Commuting Analysis Report	Achieve > 75% Survey Response Rate.	June 2011
3. Transportation Awareness Campaign	1) Website development 2) Selection of carpool coordination software 3) Deployment of workshops and kiosks on all campuses	1) Create active website, two annual workshops per campus, and two dedicated kiosks per campus. 2) Sign up 500 carpool program participants in 2011 and increase participation by a minimum of 250 annually until 2028. 3) Maintain 15% annual student participation in carpool program until 2060	December 2011
4. Promote Local Housing and Day Care Services	Resources listed on website and incorporated in orientation materials	1) Connect students and staff with resources on nearby housing and day care facilities. Where none exist, assess demand and encourage companies and developers to fill need. 2) Aim to attract 10% of students and staff to live within a 5 mile radius to campus by 2020.	December 2011
5. E-meeting Software Procurement and Training	1) E-meeting policy 2) Software procurement and employee training workshops	1) Aim for 100 e-meetings in 2012. 2) Increase e-meetings by 100 annually through 2020.	December 2012
6. Expand On-campus Food Services	1) Approved policy authorizing private vendors to provide food on campus grounds 2) Vendor selection process	Establish 1-3 private food vendors on each campus by 2015.	December 2012

7. Commuter Challenge Month	1) List of participants and VMT reductions by department 2) Follow-up actions to establish departmental programs	Aim for 100% department participation in event.	June 2012
8. Long Term Transportation Plan	1) Draft Plan 2) List of transportation capital projects	Develop multi-modal transportation plan developed in concert with transit agencies and Valencia Master Planning Department that will decrease personal vehicle miles to Valencia campuses.	June 2013
9. Telecommuting Program	1) Approved telecommuting policy 2) Selection of participants	Aim for 5% staff participation in 2013 and increase 1% annually over next five years.	June 2013
10. Incentive System Implementation	1) Parking fee proposal 2) New permit system and enforcement policy 3) Collaborative programs developed with the local transit agency	Decrease total number of personal vehicles on campuses by 5% in 2015 and 2% annually until 2030.	June 2014
11. Inter-campus Shuttle Program	1) Feasibility Study 2) Proposed Schedule	Transport 250 individual riders daily in 2015 and increase ridership as needed.	June 2014
12. Capital Projects	List of transportation related capital projects and funding approval	Implement capital projects identified in long term transportation plan.	Ongoing through 2060
13. Adding Other Campus Locations	Map of potential locations of future campuses	Plan future campus locations within short distances of medium and high density residential areas.	Ongoing through 2060
14. Providing more fully and hybrid course offerings	List of courses that can be offered online	Design existing and future courses to be offered fully or partially online.	Ongoing through 2060

2.2 ENERGY

2.2.1 Background

In 2006, energy use was the largest contributor of CO_2e across Valencia's campuses. Electricity use alone totaled 25,028 metric tons, or 49% of Valencia's CO_2e emissions– the highest value of all seven (7) source categories. When GHG emissions from natural gas were added, the total carbon footprint attributed to energy was 25,952 metric tons, or 51% of total emissions. These numbers demonstrate the value of energy efficiency upgrades, energy conservation strategies, and renewable energy investments needed to greatly reduce Valencia's carbon footprint.

As reported in the completed Greenhouse Gas Inventory report, there was an overall increase in GHG emissions from 2006 to 2008. Despite the increase in overall emissions, electricity and natural gas emissions dropped. This drop was attributed to the removal of a large natural gas boiler on the West Campus and many energy efficiency upgrades across all of Valencia's campuses and centers. Dr. Winsome Bennett, the Energy Manager of Valencia, compiled a list of energy conservation features that have been implemented on each campus since 2007 (Table 2.3).

2.2.2 Challenges

Some of the challenges that Valencia faces in reducing GHG emissions from energy use include the following:

1) Valencia has already identified and implemented many of the quick payback energy efficiency projects ("low hanging fruit") on its campuses. Achieving additional decreases in energy consumption will become harder and more expensive to achieve.

2) The high upfront costs and long payback periods of renewable energy remain a barrier for implementation, especially without any local or state rebate programs.

3) Valencia purchases all electricity from local utilities and has no influence over the fuel mix responsible for power generation. All of these utilities rely on coal as a major source to generate electricity.

4) There are currently no mandates from the federal government or State of Florida that require electrical utility companies to reduce greenhouse gas emissions. As a result, predicting future reductions are not possible at this time.

5) There are plans for continued expansion at Valencia to meet the demand for the growing student population. Naturally, this will increase overall energy demand.

Table 2.3
Energy Improvements at Valencia

CAMPUS	ENERGY IMPROVEMENTS
East Campus	• Conversion from individual Air Cooled Chillers to a complete Water Cooled Central Energy Plant • New energy efficient Chiller Plant with two (2) 650 ton chillers • Campus wide building automation system • Extended chiller water loop to include the entire campus • Lighting retrofit projects in Buildings 1, 3, 4, 5, and 6 • Energy efficient fixtures in parking lots • Installed window tint on first floors of North and East walls in Building 5 and south wall in Building 6 • Installed Energy Recovery Ventilator (ERV) unit on the roof of Building 7 • Replaced boilers in Buildings 1A, 5, and 6 with high efficiency water heaters • Replaced 2 air handling units with high efficiency units in building 3 and the Performing Arts Center • Replaced one (1) air handling unit with a high efficiency unit in the Theater Technology Lab • Replaced moduline terminal units with high efficiency variable air volume (VAV) boxes in Buildings 3 • Preparing to replace moduline terminal units with high efficiency VAV boxes in Buildings 1B and 2 • Installed a new roof on Building E

Osceola Campus	• Some lighting control retrofits • Upgraded building automation system • Installed occupancy sensors in classrooms • Upgraded lights from magnetic ballast to electronic ballasts and from T12 lamps to T8s
West Campus	• Extended chiller water loop to serve all buildings with air conditioning • Remodeled old inefficient chiller plant and retrofit with (4) 500 ton high efficiency water cooled chillers • Installed occupancy sensors throughout • Installed reflective roofs on Buildings 3,8,10 and 11 and a partial roof on the SSB Building. • Replaced inefficient boiler with new 95% efficiency condensing boilers • Installed campus wide automation system • Installed demand ventilation • Installed variable frequency drive (VFD) on all air handler units (AHU) and pumps • Installed 103 kW solar array on Building 11. • Installed autoflow and pressurized independent characterized control (PICC) valves
Criminal Justice Institute	• Installed thermal storage units • Replaced building automation system • Installed window tint in CJI-164
Winter Park	• Installed occupancy sensors throughout • Replaced old inefficient boiler with energy efficient boiler • Some lighting upgrades • Upgraded energy management system (EMS)

2.2.3 Stakeholder Feedback and Vision

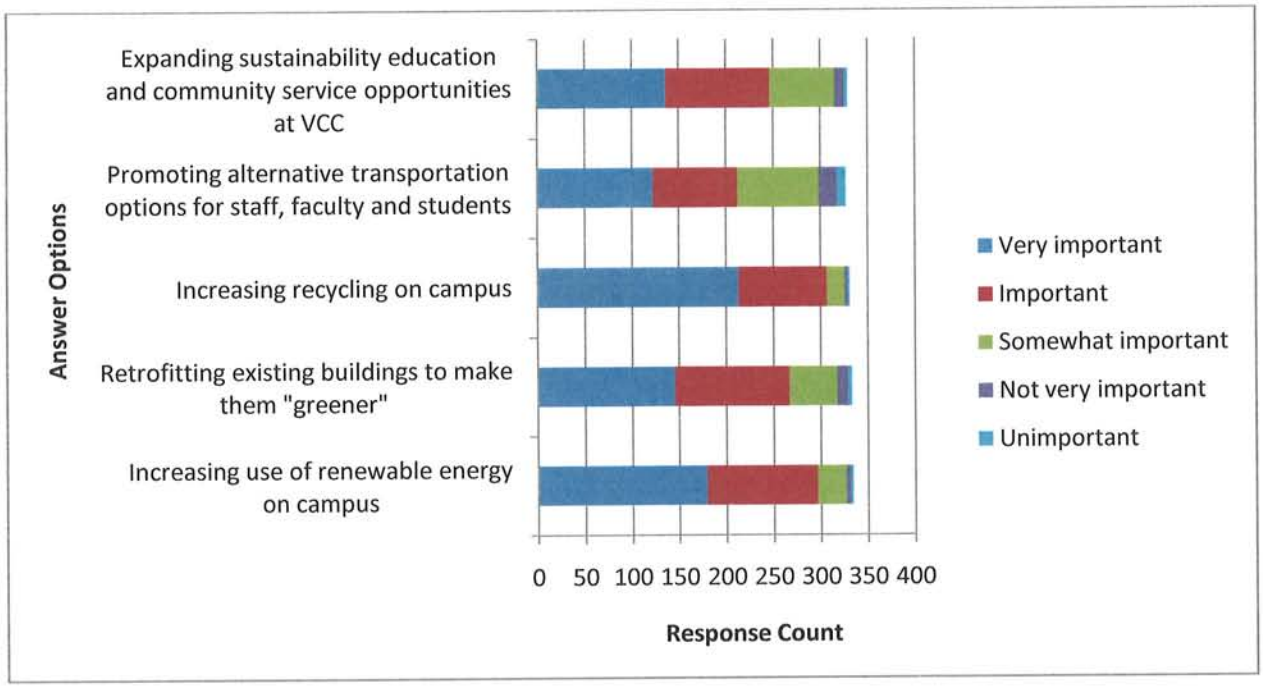
VISION

Valencia would generate some of its own power using renewable sources of energy, operate more energy efficient buildings, and would foster awareness of energy conservation among students and employees.

Stakeholder participants felt that Valencia has been moving in a sustainable direction with energy. Many projects have been completed since 2007. Efforts have been stagnating recently due to the lack of funds to finance further projects.

The online survey revealed that students consider renewable energy and green buildings as very important actions that Valencia should take to become more sustainable (Figure 2.2).

Figure 2.2
Student Survey Response on Valencia's Sustainability Priorities (2010)



2.2.4 Energy and Built Environment Roadmap

GOAL

Reduce Energy GHG Emissions by 20% by 2015, 35% by 2025, 60% by 2040 and 100% by 2060.

Valencia currently relies on purchasing close to 100% of its electricity and natural gas from utilities. The four electrical utilities that Valencia depends on are heavily reliant on coal, a high intensity GHG emissions source. While Valencia should continue to prioritize energy efficiency strategies to reduce energy demand, the college will need to gradually ramp up investment in low carbon or renewable energy technologies to generate an increasing supply of its own electricity. Each strategy is described in detail below. The milestones, goals and target dates for each energy strategy are listed in Table 2.4.

1) **Establish a green policy for retrofits/upgrades in existing buildings**
Although Valencia has a policy that requires all future new building construction to be LEED Silver certified, Valencia should also establish a policy and minimum standard to retrofit existing buildings using the most economically environmentally preferred choice or product. Examples of this may include:

- increasing the amount of thermal zones
- window upgrades (low emission factor)
- renewable energy systems
- green walls for shading
- reflective roof paint
- green roofs
- soy insulation
- occupancy sensors

2) Establish re-commissioning schedule for high energy use equipment
Valencia should continue on its current path of updating chillers, distribution systems, thermal storage and boilers across all campuses. A goal should be set to strategically upgrade all systems by 2020. A schedule should also be made for periodic re-commissioning of all existing buildings to optimize energy efficiency.

3) Evaluate and update space allocation plan
Space is an expensive commodity due to the high cost of construction, operation, maintenance, and upgrades. Reviewing and updating Valencia's space allocation plan should be a priority, especially since the college has a higher FTE to square footage ratio compared to other community colleges.

Valencia should try to organize class schedules in order to maximize energy efficiency without sacrificing the student experience. Administration should attempt, in less busy periods, to schedule classes that would normally be held at the same time in different buildings to continually be held at the same time, but in the same building. This facilitates empty buildings to be in "sleep mode", by having no lights or air conditioning running.

4) Use power management software to manage electronic equipment

Valencia owns and operates multiple computers throughout the College's computers laboratories and employee offices. While Valencia has communicated with staff to hibernate or turn off computers when not in use, this policy does not always lead to action. However, through the use of power management software, the sleep mode of computers can be programmed and managed from a central place. The software's ability to manage a large network of computers ensures that machines are automatically and consistently shut off. Valencia should explore the options available on the ENERGY STAR Power Management Website and choose a solution that makes the most sense given the number of computers it has and the effectiveness of the current policy.[5] Aside from computers, Valencia should regularly schedule audits of printers, copiers, monitors and other electronic equipment across the campuses to ensure they are configured to use the power saving mode.

While student laptops are not connected to the Valencia network, they regularly draw power through the college's outlets. Valencia should educate students on using the sleep mode of their computers to save energy.

5) Generate electricity through low carbon and renewable energy resources

While Valencia should prioritize energy conservation and efficiency strategies that reduce energy demand, it should implement a goal to increase onsite electricity generation 20% every 10 years. As discussed above, Valencia purchases electricity from four primarily coal-fired utilities. To offset this dependence, Valencia should conduct a feasibility study to identify distributed power generation projects that use low carbon sources such as natural gas and renewable energy sources such as biomass. For the projects, Valencia Facilities Department should identify important conditions and price points where it makes economic sense to invest in these technologies. While these projects require high upfront costs, there are an increasing number of available grants and low interest loans available to public institutions to fund initial research and renewable energy projects (See Section 4.0). These projects would be ideally implemented first on West and East Campus, which have the highest demand for electricity. Solar photovoltaic (PV) systems should be considered for the smaller campuses and centers, where space is limited.

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[5] General Technical Overview of Power Management: http://www.energystar.gov/index.cfm?c=power_mgt.pr_power_management

6) Set minimum renewable energy standard for new buildings

As Valencia continues to expand and construct new buildings, the college should establish a policy that each new building meets a minimum percentage (10%) of its energy demand through onsite renewable energy. This policy forces the college to budget the renewable energy system into the cost of the overall building. The policy should also specify that all new buildings should be built solar-ready. When solar technology does become less expensive, the infrastructure (i.e. wiring and roof) will be in place and will reduce the time and expense to add solar PV.

7) Purchase green power

In the short term, Valencia should consider purchasing green power from utilities to reduce the emissions generated from electricity consumption. Green power is electricity that is generated from clean, renewable resources such as solar, wind, geothermal, biomass, and low-impact hydro facilities. Although none of the local utilities that serve Valencia sell green power in Florida, there are national sellers that can be selected through EPA's Green Power Locator.[6] Valencia can also consider joining the EPA's Green Power Partnership, a voluntary program that encourages organizations to buy green power as a way to reduce the environmental impacts associated with purchased electricity use.

[6] http://www.epa.gov/grnpower/pubs/gplocator.htm

Table 2.4

Energy GHG Reduction Strategies, Milestones, Goals and Targets for Valencia

Strategy	Milestones	Goal	Target Date
1) Green Building Policy for Existing Buildings	1) List of environmentally preferred upgrades 2) Draft policy	Upgrade 25% of existing buildings every 3 years.	December 2010
2) Re-commissioning Plan	Draft plan with proposed dates of upgrades	Re-commission all buildings every 3 years.	June 2011
3) Evaluate and Update Space Allocation Plan	Plan Review and Update	Re-evaluate plan and benchmark utility savings annually.	December 2012
4) IT Power Management Solutions	1) Select IT Power Management Software 2) List of equipment and configuration status	1) Manage all computer equipment through a program by 2014. 2) Quarterly audits of equipment to ensure that they are configured for power saving mode.	December 2012
5) Increase onsite electricity generation	1) Feasibility Study 2) List of potential projects 3) Issue RFI for projects	1) Submit a minimum of 1-2 grant applications annually. 2) Increase onsite electricity generation 20% every 10 years.	June 2012
6) Renewable Energy Standard on New Buildings	Draft and approve policy	1) All new buildings must meet a minimum of 10% percentage of its energy demand through onsite renewable energy. 2) All new buildings must be built solar-ready.	June 2012
7) Green Power Purchasing	1) Locate green power vendor	Purchase a minimum of 5% green power annually beginning in 2013.	December 2014

2.3 EDUCATION AND OUTREACH

2.3.1 Background

Valencia's CAP will fail without strong education and outreach. Educating and engaging Valencia's students on sustainability and the consequences of their actions is a fundamental step in driving behavioral change, especially in those areas that the college has little control (i.e. commuting). Transforming technical information and action items into actual results is as important as the data itself.

The Facilities Department has been able to achieve significant improvements across Valencia operations, ranging from recycling and landscaping and to water conservation and cleaning products. While the committee continues to make progress, they are full time staff and ultimately limited in their time and ability to organize, prioritize, and implement needed changes. There is a wealth of information, but a lack of outreach to the Valencia community. In order to address the College's greenhouse gas reduction goals, the Committee cannot go it alone. It is the responsibility of the whole college community.

This section will act as a guide to lay a strong foundation for a robust education and outreach campaign. From there, the existing Sustainability Committee members and/or a future Sustainability Coordinator (SC) will need to adjust and add to this plan through time for optimal success.

2.3.2 Challenges

Some of the challenges that Valencia faces in implementing sustainability education and outreach:

1) The existing Sustainability Committee does not have the time or resources to conduct and coordinate sustainability education and awareness across all campuses.

2) Faculty, who have daily access to the students, need to be educated on sustainability.

3) There is no united vision across campus about what sustainability is.

4) There is little publicity and awareness about Valencia's sustainability efforts and what students and employees can do to contribute to Valencia's sustainable future.

2.3.3 Stakeholder Feedback and Vision

VISION

Valencia would be guided by a Central Sustainability Office that would implement college-wide awareness and applications of sustainable practices. Sustainable thinking would be integrated into every course and introduced to all incoming students at orientation. The environmental benefits for Valencia's Campuses will be evident to all student, staff, and faculty.

As noted in Figure 2.2 above, a majority of students claimed that sustainability education and community service opportunities were important or very important. About 48% of survey respondents replied that they would be interested in attending educational sessions regarding sustainability issues.

At the stakeholder meetings, the group agreed that sustainability education efforts were stagnating. Some faculty shared that they integrated sustainability issues into their course, but there was no formal process or procedure to make it the normal practice. There was also no current effort to introduce students to sustainability during orientation. However; it is worth mentioning that on the day of the stakeholder meetings, Valencia had organized a large Earth Day fair that brought attention to many sustainability topics, including energy and solid waste.

2.3.4 Education and Outreach Roadmap

GOAL

To increase student and employee involvement in sustainability initiatives and provide meaningful learning experiences that result in cultural and behavioral change inside and outside of Valencia.

While it is hard to quantify the impact of education on GHG emission reductions, it is well known that one of the largest barriers to behavioral change is education and awareness. While the Sustainability Committee has been hard at work changing internal efforts, Valencia requires a much broader initiative that brings climate change and sustainability into the daily lives of students and employees. The following strategies will ensure that the Valencia student community is engaged around these issues inside and outside the classroom and provide them with valuable skills that they turn into job opportunities. Each strategy is described in detail below. The milestones, goals and target dates for each energy strategy are listed in Table 2.5.

1) **Expand the Sustainability Committee to include students**

The Sustainability Committee should engage more students to participate in the Committee. The Committee can use a variety of approaches to draw in more students, including partnering with the Student Services Office, establishing an ongoing presence at Valencia events, and requesting

1-2 representatives from Student Government. Ultimately, the Committee should have equal representation of students, faculty and staff.

2) **Employ a full time sustainability officer**
Valencia should hire a full time Sustainability Coordinator (SC) and establish an Office of Sustainability. The SC's responsibility will be to coordinate all efforts related to sustainability, including the ongoing monitoring of Valencia's GHG emissions and implementation of the CAP. The SC will also be fundamental in leading education and outreach efforts at the College and ensuring that sustainability is integrated into campus operations, campus and community-wide events, and coursework. The Sustainability Coordinator will serve as a cross-cutting member of the Valencia staff that can interface with faculty, staff, students and the community. Some of these responsibilities may include:

- Training of key staff
- Organizing environmental events and fundraisers
- Incorporating sustainability theme into campus events
- Incorporating sustainability into recurrent materials
- Work with marketing department to create conservation reminder signage
- Work with academic departments and faculty to ensure sustainability topics and projects are included in coursework
- Manage feasibility study and research results and transform them into action plans
- Secure grant money and funding to support onsite sustainability initiatives
- Attend conferences, meetings, webinars, etc.
- Keep current with other schools' environmental current events
- Develop relationships with community partners, programs, and groups
- Conduct waste and energy audits
- Manage pertinent student groups
- Secure environmental speakers to visit campus
- Holding others to imposed goals and deadlines
- Implementing, maintaining, and updating this CAP

Aside from the concrete value of this position, having a staff member that solely focuses on sustainability is a clear indicator of Valencia's commitment to a sustainable campus life.

3) Establish sustainability website
Valencia has a lot to be proud of in the area of sustainability and should continue to update the College community on its ongoing efforts. This website should serve a central place where students and employees can visit to learn more about sustainability, provide ideas for discussion, and display Valencia's progress in meeting its sustainability goals.

4) **Train personnel that have a high impact on sustainability initiatives**
Valencia should select key leaders to receive training on incorporating sustainability into their department and operations. These individuals may include Vice Presidents, Assistant Vice Presidents, members of the governing councils, etc.

5) **Educate faculty and staff on the basics of sustainability**
Before faculty can teach students about sustainability, they need to receive training on sustainability and suggested learning outcomes. Valencia should organize training for faculty through workshops and/or online courses. All faculty should be required to take the course and pass a basic test on sustainability. A similar program should be developed for employees.

6) **Update Valencia's mission statement**
Valencia should update its mission statement to express a commitment to sustainability and environmental stewardship. Valencia's current mission statement reads "Valencia provides opportunities for academic, technical and life-long learning in a collaborative culture dedicated to inquiry, results and excellence."

An updated mission statement could read "Valencia provides opportunities for academic, technical and life-long learning in a collaborative culture dedicated to excellence in inquiry, results, and **sustainability**."

7) **Add a statement about sustainability on all college materials**
Valencia should create a new motto for sustainability that would appear on College materials such as the orientation package, syllabi, newsletters, website, intranet, etc. It can be based on the updated mission statement, but should be no longer than one line.

8) **Install conservation signage in appropriate areas**
Signage with reminder messages and sustainability facts need to be created and placed in key areas such as student common areas, waste receptacles, restrooms, computer laboratories, etc. This is more important for any materials that may be taken home and shared with friends and family who may not be fluent in English.

9) **Integrating sustainability topics into courses**
The Chief Learning Officer should work with the head of each department to establish guidelines in integrating sustainability topics into the curriculum. Due to the interdisciplinary nature of the sustainability, courses can easily be tied to a variety of sustainability concepts. Some example topics for departments that are not related to the environment include:

Course	Sustainability Topic
Real Estate	Green Mortgages and Green Buildings
Accounting and/or Economics	Return on Investment (ROI) study for energy efficiency upgrades and renewable energy
Chemistry	Life cycle analysis and Climate Change science
Psychology	Consumer behavior with green purchasing

Professors are important role models for the students and do have an impact on college resources. They should be encouraged to demonstrate sustainability through practices such as double sided printing, electronic submission of assignments, and turning lights off when room is not in use (if sensors have not been installed).

10) **Offer sustainability training or certificate programs**
Valencia should offer more options for student learning by offering new classes in sustainability – a strongly growing professional sector. A more immediate addition to Valencia's offerings should be certificate or training programs. An example would be to offer a LEED training course. If there are no available or qualified staff to accommodate this, partnerships should be created by reaching out to USGBC or similar groups to provide training.

11) **Create green partnerships within the community**
Valencia should reach out to the local community to build relationships with environmental groups. The College can collaborate with these groups to develop volunteer opportunities and events that expose students to conservation issues and benefit the local ecosystem.

12) **Create green campus events and challenges**
Similar to the Recyclemania competition, Valencia should involve themselves with other regional and/or national environmental competitions. The College can develop an internal student, faculty and/or staff competitions between the seven campuses and centers to reduce energy consumption, waste, increase recycling, raise money for charity, etc. For example, a fun way to promote energy conservation is to pool the annual energy savings from a building or department and use it to upgrade that building or reward the occupants with recognition and prizes.

Additionally, Valencia's faculty should seek out professional speakers for presentations to expose students to sustainability and possible opportunities.

Table 2.5

Sustainability Education and Outreach Strategies, Milestones, Goals and Targets for Valencia

Strategy	Milestones	Goal	Target Date
1. Student participation in the Sustainability Committee	Recruit 3-5 students to the Committee	Achieve equal representation of students, faculty and staff in Sustainability Committee.	December 2010
2. Hire Sustainability Coordinator	1) Job Description 2) Begin Hiring Process	By the Fall of 2011, establish a Sustainability Office staffed with at least one full time staff member dedicated to sustainability	June 2011
3. Establish Sustainability Website	1) Content creation 2) Website Launch	Develop interactive educational website updated regularly by Communications Department.	December 2011
4. Key Personnel Training and Certification	1) Identify key staff and outside training and certificate programs	Sign up staff signed up for appropriate training course(s) in 2012-2013 academic year.	December 2011
5. Basic Staff and Faculty Training	Internal training program for faculty and staff	100% of faculty and staff enroll and pass basic sustainability course during 2012-2013 academic year.	December 2011
6. Sustainability curriculum integration	1) Develop curriculum standards 2) Research topic areas per department 3) Lesson plan examples	Lesson plans submitted by 100% of departments for review and approval by Chief Learning Officer and Sustainability Committee.	June 2012
7. Update existing mission statement	Propose draft to President	Modify mission statement to include commitment to sustainability.	June 2012
8. Add a statement about sustainability on all college materials	Sustainability statement or motto	Presence of motto in orientation materials, class syllabi and signs around campus.	June 2012

9. Install Conservation Signs	1) Choose focus areas 2) Create and post signs	Three focus areas and student participation in developing the signs	December 2012
10. Sustainability training/certificate programs	Program approval	Offer 1 training/certificate program at Valencia beginning in academic year 2013-2014.	December 2012
11. Establish partnerships with local environmental organizations and government agencies	Event launch	1) Research and develop relationships with organizations for collaborative projects 2) Collaborate annually to develop 1-2 events with a local organization	Ongoing
12. Green campus awareness week or competition	1) Planning Committee 2) Event Plan	Dedicate a minimum of one week annually to raising awareness around a sustainability topic (i.e. energy, climate change, etc.)	Ongoing

2.4 SOLID WASTE

2.4.1 Background

Between 2006 and 2008, Valencia expanded its recycling program and reduced the amount of GHG emissions generated from solid waste. However, total tons of solid waste still increased, mostly due to the rise of Construction and Demolition (C&D) waste. While solid waste contributed less than 1% of Valencia's total GHG emissions, it is the topic that received the most attention from stakeholders and the most visible sustainability effort at Valencia. Moreover, there are still valuable opportunities to reduce solid waste while achieving valuable cost savings.

2.4.2 Challenges

Some of the challenges that Valencia faces in reducing solid waste GHG emissions include the following:

1) Reducing solid waste relies on the participation of all staff and students and cannot be decreased immediately through simple internal changes.

2) With regards to procurement, many products are still not designed to be recyclable and recycled products tend to cost more than conventional products.

3) There are no local or state mandates that require C&D Waste to be recycled.

2.4.3 Stakeholder Feedback and Vision

VISION

Valencia would engage in responsible product procurement, recycling bins would be located in every hallway, office and classroom, and students and employees would be well educated on what and where they could recycle.

Valencia's recycling efforts received significant praise at the stakeholder meetings and the group agreed that the college was moving toward a more sustainable direction. Faculty and staff shared numerous successful examples of efforts at the college to decrease paper use. The groups did request more bins for paper recycling in offices and classrooms. As seen in Figure 2.2, students considered increased recycling as the most important activity that Valencia could take to become more sustainable.

2.4.4 Solid Waste Roadmap

GOAL

Reduce Solid Waste by 15% by 2015, 50% by 2025, 75% by 2040 and 100% by 2060.

An effective approach to reducing solid waste GHG emissions should include strategies that increase recycling and reuse of waste, and prevent waste by altering procurement practices and changing internal practices. The following strategies target the largest sources of waste (i.e. MSW and C&D). The milestones, goals and target dates for each solid waste strategy are listed in Table 2.6.

1) **Organize textbook recycling events**
Many students discard textbooks at the end of the semester that they cannot sell back resulting in tons of waste delivered to the landfill. Valencia should organize a textbook recycling week at the end of each semester to collect textbooks that would otherwise be discarded by students. Some groups such as Book Drives, Inc. will send boxes to set up and pay the institution for each full box that is returned. This could generate extra income for Valencia, minimize waste disposal, and ultimately guarantees that all books are reused or recycled.

2) **Initiate composting program**
Valencia has begun using organic fertilizer on East Campus, resulting in a significant reduction of greenhouse gas emissions. A composting program has both the desired effect of reducing Valencia's current municipal solid waste and providing a low-cost source of organic fertilizer that groundskeepers can apply at Valencia's campuses and centers. Valencia could establish a partnership between food services and facilities to collect organic waste from vendors, students and staff for conversion into compost. Strategically placed bins could be placed around campus to collect the organic waste along with explanatory signs of materials that can be discarded. Additionally, the composting site/facility could serve as an educational tool that can be incorporated into the science curriculum.

3) **Establish construction and demolition recycling standard**
Construction and Demolition (C&D) waste represents 15-25% of Valencia's solid waste in weight annually. This C&D waste ultimately is transported to and deposited in nearby landfills. Where feasible, Valencia should establish guidelines to reuse the material on site during new building construction or require delivery of a certain percentage of the waste to C&D Recycling Centers located at a number of Orange County landfills.

4) **Adopt waste reduction policy**
Aside from the students on campus, a significant portion of the waste generated at Valencia is comprised of the products that the institution operations purchase and use. Where practical, Valencia should develop and enforce the following policy guidelines:
1) Prioritize products that are made with recycled material or are recyclable
2) Hiring preference for companies that use minimal and/or recycled packaging to deliver their products
3) Default double sided printing on all campus printers
4) Promotion of electronic submission and editing of documents for all courses

Table 2.6

Solid Waste Strategies, Milestones, Goals and Targets for Valencia

Strategy	Milestones	Goal	Target Date
1) Organize Textbook Recycling Program	Contract with textbook recycling service	1) Organize textbook recycling at the end of every semester. 2) Reduce overall tons of MSW through textbook recycling program.	December 2010
2) Composting Program	1) Education program to educate staff and students 2) Composting pilot program on West Campus	1) Compost >20% of food waste on West Campus. 2) Expand program to all campuses by 2013.	June 2011
3) Construction and Demolition Recycling Standard	Protocol for C&D waste recycling for new building construction and existing building upgrades	>15% of C&D material recycled on construction projects by 2012	June 2011
4) Waste Reduction Policy	Waste reduction policy draft for review by Valencia Board of Trustees	Reduce MSW through responsible procurement and paper use policy	June 2011

2.5 MITIGATION SUMMARY

Valencia has decided to adopt the goal to become climate neutral by **2060**. To achieve this goal, Valencia has set out a detailed roadmap with GHG reduction strategies that address transportation, energy, education and solid waste. The GHG emission targets for the transportation, energy and solid waste categories are summarized in Table 2.7. Overall, Valencia will aim to reduce its total baseline GHG emissions by 12% by 2015, 30% by 2025, 50% by 2040 and achieve 100% by 2060 (Table 2.8 and Figure 2.3). Note that carbon offsets will be critical to fully achieve climate neutrality by 2060.

Table 2.7
GHG Emission Reduction Targets for Transportation, Energy and Solid Waste at Valencia

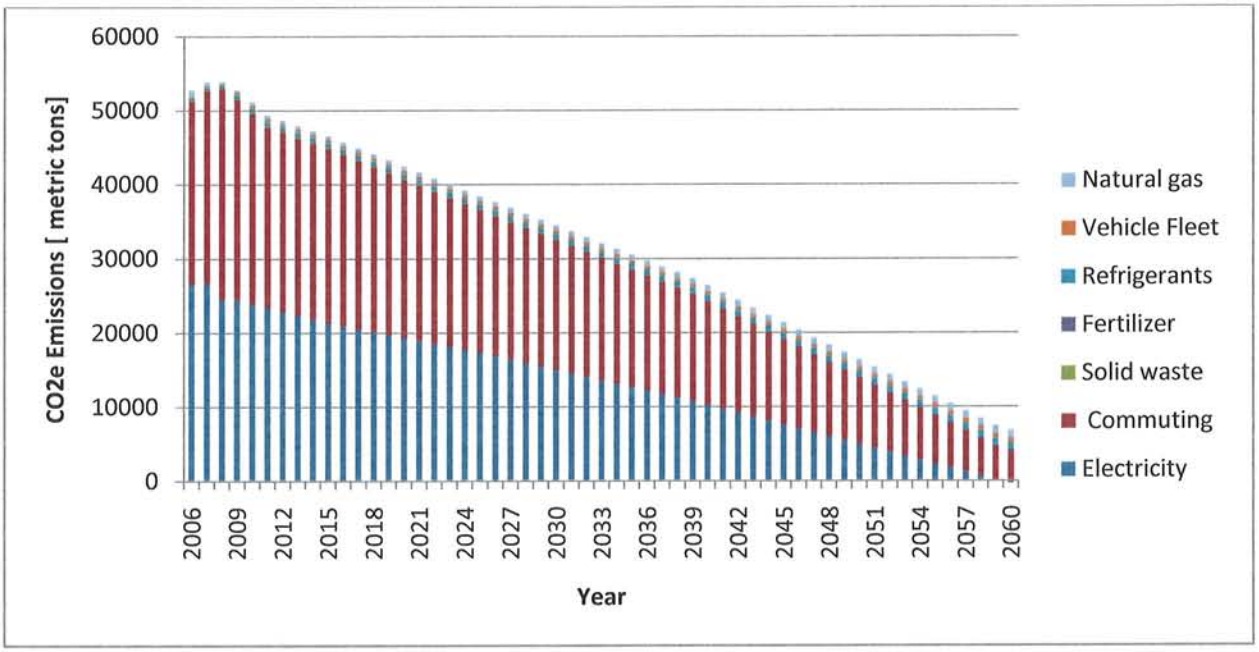
Year	Transportation Emissions Reduction Goal	Energy Emissions Reduction Goal	Solid Waste Emissions Reduction Goal
2015	10%	20%	15%
2025	25%	35%	50%
2040	45%	60%	75%
2060	85%	100%	100%

Table 2.8
Overall GHG Emission Reduction Targets at Valencia

Year	Emissions Goal [metric tons CO_2e]	GHG Reduction Goal from 2006 baseline
2015	46,571	12%
2025	36,950	30%
2040	25,337	52%
2060	4,751	100%*

*Achieved with Carbon Offsets

Figure 2.3
GHG Emission Forecast at Valencia with Climate Action Plan



3.0 CARBON OFFSETS

While Valencia will be primarily focused on reducing its greenhouse gas emissions internally, the institution will be unable to achieve carbon neutrality in the short and medium term without carbon offsets. A **carbon offset** is generated through a carbon offset project outside of the college operations that reduces, destroys, or sequesters greenhouse gases. One carbon offset is equivalent to the reduction of one metric ton of CO_2e. Carbon offsets can be produced many ways (Figure 3.1).

Figure 3.1
Carbon Offset Project Types

- **Renewable energy**: Projects that generate energy from solar, wind, biomass, geothermal and other renewable resources.
- **Energy efficiency and conservation**: Projects that decrease energy consumption without affecting overall performance.
- **Fuel Switching**: Projects that substitute fossil fuels with lower-carbon fuels.
- **Carbon sequestration**: Projects that increase the amount of carbon sequestered in biomass (i.e. reforestation)
- **Carbon capture**: Projects that capture greenhouse gases (e.g. methane) and prevent their release into the atmosphere through destruction or conversion to an energy source.

Creating Carbon Offsets

Valencia has the option to develop carbon offsets by sponsoring carbon offset projects in the local community. Valencia can partner with local groups and organizations to install renewable energy systems, improve energy efficiency, and reforest public and private lands in the area to generate carbon offsets. Overall, the college needs to ensure that the offsets generated meet the guidelines specified by ACUPCC.[7] That is, offset projects must be measurable and verifiable and demonstrate additionality, transparency, and permanence.

Conclusion

Ultimately, Valencia should base its decision on finding the most economical way to generate quality carbon offsets.

[7] http://www.presidentsclimatecommitment.org/resources/guidance-documents/offset-protocol

4.0 FINANCING

Some of the GHG reduction strategies specified in the Climate Action Plan will require upfront costs to develop and implement, especially energy and transportation initiatives. Valencia can take advantage of various sources of financing and opportunities to fund sustainability efforts.

Endowment

As of 2009, the Valencia Foundation had an endowment of $41.8 million. Valencia may choose to use a portion of the endowment to fund projects and initiatives that both decrease the college's GHG emissions while providing a return on investment (ROI). Additionally, the Foundation could initiate campaigns and fundraisers to fund efforts to achieve Valencia's sustainability goals. The fundraisers could target alumni, local businesses, and current students.

Operations

By improving the efficiency of Valencia's operations, the college can realize cost savings that can then be reinvested back into sustainability projects. Ideally, the efficiency improvements will also be tied to a reduction in GHG emissions. Improved waste management, building energy management, water conservation and space utilization can generate valuable savings in both financial and natural resources while contributing to Valencia's reduction targets.

Grants

Valencia should target grant funds that are available for sustainability-related projects. Specifically, the college can benefit from grants that will support curriculum development, the establishment of green job training programs, research, energy efficiency and renewable energy projects, and transportation initiatives.

Developing partnerships with local non-government organizations (NGO's), transit authorities, government and other higher education institutions to advance sustainability goals will also open doors to collaborative grant opportunities.

Utility Incentives and Rebates

Most utilities that serve Valencia have demand-side management programs that encourage energy conservation through incentives and rebates. For example, Orlando Utilities Commission (OUC) offers a Pilot Solar Program that purchases renewable energy credits (RECs) from customers who install photovoltaic (PV) and/or solar thermal energy systems.

Local Financing Sources

Property Assessed Clean Energy (PACE) financing is now an option in Florida. HB 7179 authorizes property owners to enter into financing agreements with local governments to finance energy efficiency improvements and small-scale renewable energy projects. In the case that the City of Orlando, Orange County or Osceola County decide to implement an energy finance program, Valencia could decide to fund energy efficiency and renewable energy projects with little to no upfront costs and pay back the loan within a 10-20 year period.

State Financing Sources

The Renewable Energy Technologies Grants Program provides renewable energy matching grants for demonstration, commercialization, research and development projects relating to renewable energy technologies. In 2008, the program was expanded to include energy efficiency technologies.

Federal Financing Sources

The American Recovery and Reinvestment Act (ARRA) of 2009 funded the Energy Efficiency and Conservation Block Grant (EECBG) Program, which allocated billons of federal dollars to local governments and public institutions to develop, promote, implement, and manage energy efficiency and conservation projects and programs. While these funds have already been allocated, future competitive grant opportunities may be available in the upcoming years.

The Clean Renewable Energy Bonds (CREBs) program finances public sector renewable energy projects and with zero percent interest bonds. The borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. As of October 2009, $2.4 billion in CREBs were allocated by the American Recovery and Reinvestment Act. Currently, the CREBs program is not accepting more applications, but the program may issue more bonds in the near future.

5.0 MONITORING, REPORTING, AND REFINEMENT

This Climate Action Plan marks the beginning of strategic effort to achieve carbon neutrality at Valencia. It is a working document that requires ongoing revision by the Sustainability Committee. A successful plan will involve a process of implementing the strategies, tracking and reporting the results, and evaluating the data and any new information (i.e. opportunities, technology, etc.). Finally, with all the new information, Valencia will need to refine the Climate Action Plan by modifying past strategies and developing new strategies (Figure 5.1). Valencia should plan to reinitiate this cycle on an annual basis.

Figure 5.1
Climate Action Plan Evaluation Process