RANCHO SANTIAGO
Community College District

Rancho Santiago Community College District Sustainability Plan

WORKING DRAFT Version 1

Produced by sustainable rsccd

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ACKNOWLEDGMENTS

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SECTION 1.

EXECUTIVE SUMMARY

As with many public sector agencies, the Rancho Santiago Community College District (RSCCD) recognizes the environmental, economic, and social benefits of resource efficiency and sustainability. The passage of the California Global Warming Solutions Act (AB-32) and the establishment of a Sustainability Policy by the California Community Colleges (CCC) Board of Governors have made it imperative for Community Colleges to develop an organized, comprehensive approach that incorporates the elements of sustainability, satisfies state regulations, takes advantage of available resources and complimentary programs, and adopts the Best Practices of others who are further along this path.

Sustainability is defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The purpose of this Sustainability Plan is to prepare the Rancho Santiago Community College District for the anticipated environmental and regulatory challenges of the 21st century, to guide the campus towards becoming a more sustainable institution, and to prepare students for the green economy.

Vision Statement

The Rancho Santiago Community College District holds sustainability to be a foundational principle in its current and future development.

As a responsible steward of natural resources and the environment, the District will endeavor to minimize its impact on the environment by implementing best practices for conserving resources, reducing waste, implementing energy reduction and alternative energy generation strategies, constructing efficient buildings, and by developing partnerships that will further these activities.

RSCCD is a two-campus District: Santa Ana College and Santiago Canyon College. The District has prepared this Plan to encompass the activities, goals, and priorities of each College. The following Sustainability Plan articulates the vision, goals, and objectives established by the District for sustainability, as well as the strategies to meet these goals. This Plan has been developed by the Sustainable RSCCD Committee (SRC). The SRC has developed this Sustainability Plan in coordination with the many different campus stakeholders, including students, faculty, and staff, to ensure that the plan meets the different needs of the campus.

SECTION 2. BACKGROUND

2.1 HISTORY OF SUSTAINABILITY EFFORTS TO DATE

Insert a summary of the work the campus has performed to date in the area of sustainability. All past sustainability projects and efforts should be fully recognized.

2.2 CREATION OF THE SUSTAINABILITY PLAN

This section describes the process for the creation of the Sustainability Plan. The flow chart to the right reflects the process flow that is used in the Sustainability Template.

To create this Sustainability Plan, RSCCD followed the process and utilized the tools provided in the California Community Colleges Sustainability Template. The process is illustrated in the flow chart at right. The implementation of the sustainability planning process and the resulting Sustainability Plan are described in the following chapters.

2.3 CAMPUS SUSTAINABILITY COMMITTEE

In order to manage the process and to develop this Sustainability Plan, the District established the Sustainable RSCCD Committee (SRC), consisting of faculty, staff, and students to provide representation from the different campus stakeholders. The Committee is responsible for developing and implementing the sustainability programs and projects described in this plan to achieve the sustainability goals.

The SRC chair is [Name], [Title], and can be reached at [email] or [phone number].

2.4 THE POLICY CONTEXT OF SUSTAINIBILITY PLANNING

Colleges may need to update this section as major legislation or regulations relating to sustainability are adopted.

Sustainability can provide environmental, economic, and social benefits to campuses. However, there are other motivations for the Rancho Santiago Community College to pursue these practices. The State of California has been on the forefront of efforts in establishing aggressive policies and standards for environmental protection and reducing greenhouse gas (GHG) emissions that contribute to global

warming. In 1970, the State adopted the California Environmental Quality Act (CEQA) with the goal to inform governments and the public about potential environmental impacts of projects. From 2005 onward, legislation has been passed to directly regulate GHG emissions by utilizing incentive mechanisms, cap-and-trade programs, and mandatory reporting while encouraging voluntary activities such as purchasing emissions offsets and offering renewable energy certificates (RECs). Compliance with state policies and regulations regarding these issues is an important factor for consideration by the Rancho Santiago Community College.

The following outlines the numerous policy and regulatory drivers that contributed to the creation of this Plan.

2.4.1 CCC BOARD OF GOVERNORS ENERGY AND SUSTAINABILITY POLICY

To encourage the CCCs to a more sustainable future, the CCC Board of Governors approved the Energy and Sustainability Policy in January 2008, which puts forth goals for each campus to reduce their energy consumption from its 2001-02 baseline by 15 percent by 2011-12. It also sets goals for minimum efficiency standards of new construction and renovation projects and provides an incentive of 2 percent of construction cost for new construction projects and 3 percent of construction cost for modernization projects. The policy also sets goals for energy independence through the purchase and generation of renewable power and energy conservation through the pursuit of energy efficiency projects, sustainable building practices, and physical plant management.

The CCC Board of Governors Energy and Sustainability Policy can be found here:
http://www.cccco.edu/Portals/4/Executive/Board/2008_agendas/january/3-1_Attachment_CCC%20Energy%20and%20Sustainability%20Policy%2011-9-07%20FINAL.pdf

2.4.2 CALIFORNIA STATE CLIMATE REGULATIONS

2.4.2.1 State of California Executive Order S-3-05

Executive Order S-3-05 was signed by the Governor of California in 2005, thereby identifying the California Environmental Protection Agency (Cal/EPA) as the primary state agency responsible for establishing climate change emission reduction targets throughout the state. The Climate Action Team, a multi-agency group comprised of various state agencies, was formed to implement the Executive Order S-3-05. Shortly thereafter in 2006, the team introduced GHG emission reduction strategies and practices to reduce global warming. These measures are aimed at meeting the Executive Order's long term goal of reducing GHG emission to 80 percent below 1990 levels by 2050.

2.4.2.2 Global Warming Solutions Act of 2006 (AB-32)

The Global Warming Solutions Act, or Assembly Bill 32 (AB-32), was adopted in 2006 by the California legislature, establishing two key requirements in regard to climate change reduction measures. The first requires that California GHG emissions be capped at 1990 levels by 2020, and the second establishes an enforcement mechanism for the GHG emissions reduction program with monitoring and reporting implemented by the California Air Resources Board (CARB).

In 2008, the Assembly Bill 32 Scoping Plan was released by CARB which describes measures to implement the requirements set by AB-32. In addition to partnering with local governments to encourage the establishment of regional emission reduction goals and community regulations, the Scoping Plan uses various mechanisms to reduce emissions state-wide, including incentives, direct regulation, and compliance mechanisms.

2.4.2.3 Assembly Bill 1493 (The Pavley Bill)

Assembly Bill 1493, widely known as "The Pavley Bill", was passed in 2002 and authorizes CARB to establish regulations to reduce the GHG emissions from passenger cars and light trucks by 18 percent by 2020 and 27 percent by 2030 from 2002 levels. This aggressive bill was temporarily blocked by the US EPA in March 2008 and later received a waiver of approval for implementation throughout California in June 2009.

2.4.2.4 Low Carbon Fuel Standard (LCFS)

The Low Carbon Fuel Standard (LCFS) was established in January 2007 by Executive Order S-01-07 and requires California fuel providers to decrease lifecycle fuel carbon intensity of transportation fuels by 10 percent from 2007 levels by 2020.

2.4.2.5 California Renewables Portfolio Standard

The California Renewables Portfolio Standard (RPS) was established in 2002 under Senate Bill 1078 and mandated that electrical corporations increase its total procurement of eligible renewable resources by at least 1 percent a year to reach a goal of 20 percent electricity generation from renewable resources. These goals were accelerated in 2006 under Senate Bill 107, which mandated that at least 20 percent of the total electricity sold be generated from renewable resources by the end of 2010. The RPS was further extended in 2008 by Executive Order S-14-08, which required that 33 percent of total electricity sales be generated from renewable resources by 2020. In April of 2011, this RPS standard of 33% renewable by 2020 was enacted into law through final passage of Senate Bill X 1-2 (Simitian) and extended to apply to both public and investor owned utilities.

2.4.2.6 Senate Bill 97

Senate Bill 97, passed in 2007, required the Governor's Office of Planning and Research (OPR) to develop and recommend amendments to CEQA Guidelines for addressing GHG emissions related to land use planning. The amendments to CEQA were approved and became effective in March 2010, thereafter requiring all CEQA documentation to include and comply with the new amendments established for addressing greenhouse gas emissions.

2.4.2.7 Senate Bill 375

Senate Bill 375 was passed in 2008 to reduce GHG emissions caused indirectly by urban sprawl throughout California. The bill offers incentives for local governments to execute planned growth and

development patterns around public transportation in addition to revitalizing existing communities. Metropolitan Planning Organizations (MPOs) work with CARB to reduce vehicle miles traveled by creating sustainable urban plans with a comprehensive focus on housing, transportation, and land use. Urban projects consistent with the MPO's Sustainable Community Strategy (SCS) can bypass the CEQA's GHG emission environmental review. This provides developers with an incentive to comply with local planning strategies which support the State's greater effort for overall emission reduction in the land use and transportation sector.

2.4.2.8 Assembly Bill 341

Starting July 1, 2012, businesses and public entities, including schools and school Districts that generate four cubic yards or more of waste per week and multifamily units of five or more will be required to recycle, if they are not already doing so. AB 341 also establishes a statewide goal of 75% diversion of solid waste to landfills. The purpose of this new law is to reduce greenhouse gas emissions by diverting commercial solid waste to recycling efforts and expand opportunities for additional recycling services and recycling manufacturing facilities in California.

2.4.2.9 Regional Air Pollution Control Districs (APCD) and Air Quality Management Districts (AQMD)

In 1947, the California Air Pollution Control Act was passed and authorized the creation of Air Pollution Control Districts (APCDs) and Air Quality Management Districts (AQMDs) in every county. APCDs and AQMDs are tasked with meeting federal and state air pollution requirements set by the Clean Air Act and can develop regulations to achieve the necessary public health standards, though these regulations need approval from CARB and the US EPA. APCDs and AQMDs have jurisdiction over businesses and stationary sources of emissions and can offer varying levels of outreach, grants, and CEQA review and technical assistance to interested public and private parties. The APCDs and AQMDs do not have the authority to regulate mobile air pollution sources, which is the responsibility of CARB, and must defer to state or federal regulations provided by the California Air Resources Board and the U.S. Environmental Protection Agency.

SECTION 3.

VISION STATEMENT, GOALS, AND PRIORITIES

The Sustainable RSCCD Committee has developed the following Vision Statement to guide the District in its Sustainability Planning efforts.

> ***The Rancho Santiago Community College District holds sustainability to be a foundational principle in its current and future development.***
>
> ***As a responsible steward of natural resources and the environment, the District will endeavor to minimize its impact on the environment by implementing best practices for conserving resources, reducing waste, implementing energy reduction and alternative energy generation strategies, constructing efficient buildings, and by developing partnerships that will further these activities.***

To realize this Vision Statement, the SRC has defined the following sustainability goals and priorities. The goals and priorities for the Sustainability Plan reflect campus needs, interests, and available resources.

Fill in the following table with the campus's goals and add or delete rows as necessary. In addition, the campus may want to include graphs of energy use, water use, or other relevant information to better illustrate the goals. It is recommended. Criteria assigned to a goal should contain both a target that can be measured and a timeframe by which to achieve the target. These are sometimes called SMART Goals (Specific, Measurable, Achievable, Relevant, Time-bound).

	Area of Sustainability	Established Goal
1	Environmental education and training	
2	Energy use	
3	Waste Management and recycling	
4	Hazardous materials management	
5	Resource conservation	
6	Facilities design and operation	
7	Grounds and landscape management	
8	Purchasing practices	
9		
10		
11		
12		

The goals and criteria established for the Sustainability Plan will be monitored during Plan implementation as described in Section 5, "Monitor and Report Performance".

SECTION 4.

PROGRAMS AND PROJECTS FOR IMPLEMENTATION

This section describes the specific programs and projects that have been selected for implementation from the menu of choices in Section 7 of the Sustainability Template. If the Implementation Programs and Plans Checklist was used, it should be attached to this Sustainability Plan document as an appendix. Campuses should not feel limited to the options here and should include any innovative program or project that was not identified in the Sustainability Template Plan under "Section 7.13: Other" below.

Based on the goals and priorities described above, the Sustainable RSCCD Committee has selected the following programs and projects to actively improve campus sustainability. These programs and projects are also reflected in the Implementation Programs and Plans Checklist, located in Appendix [number], which outlines the details of each action item, its priorities, responsibility for implementation, schedules, and estimated cost of each program or project. The Checklist will be used by the Sustainability Committee to manage the implementation process.

These key actions were selected from a menu of suggested programs and projects from Section 7 of the California Community College Sustainability Template. As a result, the following programs and projects are numbered to reflect the numbering system outlined in the Template and Implementation Programs and Plans Checklist.

7.1 MANAGEMENT AND ORGANIZATIONAL STRUCTURE

In order to implement an effective Sustainability Plan, it will be important for RSCCCD to have a policy mandate for sustainability, the institutional structure required to manage the process, and the financial and programmatic expertise to accomplish Plan goals. The District will implement the following programs to meet this requirement.

7.1.2.1 ADOPT A DISTRICT SUSTAINABILITY POLICY

The Rancho Santiago Community College Board of Trustees has adopted a District Sustainability Policy by delegating authority to the Chancellor to establish administrative regulations for sustainable practices in the following areas: environmental education and training; energy, waste management and recycling, resource conservation, facilities, grounds and landscape management; hazardous materials, transportation and air quality; and purchasing practices.

In addition, the Board of Trustees endorsed the creation of a Sustainability Plan that addresses District-wide and site-specific needs for each college.

7.1.2.2 APPOINT A SUSTAINABILITY COORDINATOR AND ESTABLISH AN OFFICE OF SUSTAINABILITY

7.1.2.3 APPOINT A CAMPUS SUSTAINABILITY COMMITTEE

The Sustainable RSCCD Committee (SRC) was established as a District-wide committee in 2011 under the leadership of Chancellor Rodriguez. The membership, which is open to all interested stakeholders of RSCCD, represents students, faculty, staff, and administration. The Committee is organized into subcommittees, each focusing on one of four areas of interest—transportation, facilities, recycling, and newsletter and communication. The SRC has also created a committee logo to represent their sustainable efforts on campus.

In addition, Santa Ana College (SAC) has established a Green Task Force, which consists of both faculty and students, and works to provide a greener SAC campus. SAC has also created an Environmental Task Force which serves as a sub-committee to the SAC Facilities Committee.

7.1.2.4 FUNDING AND RESOURCES TO SUPPORT SUSTAINABILITY ACTIVITIES

Rancho Santiago Community College District has worked hard to obtain funding for sustainable development, and to spend these funds responsibly. In 2002, voters approved Measure E, a $337 million general obligation bond to renovate existing campus buildings and construct new classrooms. These funds were used for a variety of sustainability projects on campus.

7.1.2.5 EMPLOY SUSTAINABILITY PROFESSIONALS, AS REQUIRED

7.1.2.6 CONSIDER SUSTAINABILITY IN ENDOWMENT INVESTMENTS

7.1.2.7 INTEGRATE SUSTAINABILITY PLANNING INTO CAMPUS MASTER PLAN

The District has integrated principles of sustainability into the RSCCD Master Plan, with guidance from the architects and consultants from HMC Architects. The Master Plan committee considered current offerings, potential future programs, current facility challenges, future instructional needs, and the state of infrastructure systems, while striving to incorporate sustainability into all aspects of campus life. To gain information about this topic, a District-wide survey on sustainability was conducted. The current Master Plan states that the District should update and implement facilities master plans, maximize college and community use of facilities, and incorporate green efforts into facilities development and other efforts when cost-effective.

7.2 ENERGY EFFICIENCY

Energy efficiency is one of the most cost effective ways to reduce campus energy use and its carbon footprint. When implemented properly, efficiency measures can decrease energy use without compromising comfort and can improve indoor air quality and enhance student, faculty, and staff performance. Energy efficiency will be a higher priority than renewable or other on-site energy generation due to more favorable economics and to avoid over-sizing renewable energy systems.

The following energy efficiency programs and projects will be implemented at Citrus College.

7.2.2.1 SET ENERGY EFFICIENCY GOALS

It is important to set goals for the reduction of any resource in order to define success. Planning for energy conservation is important to the District. The District has stated that it will participate in the California Community Colleges/Investor Owned Utility (CCC/IOU) Energy Efficiency Partnership in order to help further this goal and reduce energy consumption and increase energy efficiency, as well as reducing operating costs. Currently in fiscal year 2013-2014 and moving forward into 2014-2015, the Administrative Services/Facilities has set goals and measureable objectives related to sustainability efforts in the operation of our campus as well as the products we utilize for the maintenance of the campus facilities.

7.2.2.2 EVALUATE MECHANISMS FOR THE IMPLEMENTATION OF ENERGY EFFICIENCY PROJECTS

7.2.2.3 CONDUCT A FACILITY PRIORITIZATION SURVEY

7.2.2.4 CONDUCT COMPREHENSIVE FACILITY ENERGY AUDITS

The District recognizes the need for energy audits to gain information about the current state of energy use at its facilities and is currently in the process of compiling baseline documentation to complete a comprehensive audit.

7.2.2.5 IMPLEMENT NEW AND EXISTING AUDIT RECOMMENDATIONS

7.2.2.6 IMPLEMENT ONGOING ENERGY MONITORING

As part of the Year 2 Proposition 39 allocation, the District plans on implementing a Monitoring Based Commissioning (MBCx) program. The project would involve installation of whole-building energy meters to determine trends in energy use. The process will identify base-line usage data, identify changes in building and systems operations that will reduce use, and monitor the actual results of projects implemented to demonstrate increased efficiency.

7.2.2.7 PARTICIPATE IN DEMAND RESPONSE PROGRAMS

7.2.2.8 IDENTIFY AND TAKE ADVANTAGE OF GRANT AND INCENTIVE PROGRAMS

The District has demonstrated an effective use of funding to finance many sustainability projects on campus. Funds from Measure Q will be used for the construction of new utility infrastructure and to complete a Central Plant project, which is projected to significantly increase campus energy efficiency. In addition, funds from Measure E were used for to update and renovate campus buildings.

7.2.2.9 ENERGY EFFICIENT EQUIPMENT

A wide variety of energy efficient equipment had been installed on both campuses in the District. Most

notably, the Central Plant project which is underway at Santa Ana College will provide chilled water to cool most of the conditioned spaces on campus, and save money and energy by taking advantage of cooling load diversity and off-peak production. The Central Plant is estimated to reduce campus electrical consumption by 40%. This facility will include a small building, the thermal energy storage (TES) tank, the chilled water distribution pipe loop, and the adaptation of existing building mechanical equipment. The pipe loop will be built under the campus drive. The location of the building and TES tank will be determined during design. The District estimates that the Central Plant will reduce the campus electrical bill by approximately 50% for the portion of the bill that pertains to cooling only. The electrical consumption of the campus will be reduced by approximately 40% and demand will be reduced by 50%. The emissions of greenhouse gases from this project will likewise be reduced by 50

In addition to the Central Plant, various other energy reducing projects have been implemented employing the Investor Owned Utilities (IOUs) incentive programs. These projects include:

Santa Ana College:

- Buildings A, F, and R Boiler Replacements
- Central Plant and New Infrastructure
- Health Sciences Building
- Science Technology Engineering Math Building (STEM)
- Committed scheduled maintenance funds to upgrade inefficient boilers and plumbing to seek a reduction in the use of fossil fuels
- Campus-wide LED lighting upgrades committed with Prop 39 funds, for both the interior and exterior light fixtures

Santiago Canyon:

- Building D Chiller and Boiler Upgrades
- Building 'D' & 'C' HVAC Renovations
- VFD's for our pool water pumps
- Boiler replacement to meet new SCAQMD emission standard
- Planned increase in the use of the swimming pool cover by making renters responsible for putting on pool cover when finished as a condition of the rental.

7.2.2.9.1 ESTABLISH AN ENERGY EFFICIENCY PURCHASING POLICY

7.2.2.9.2 EFFICIENT LIGHTING AND LIGHTING CONTROLS

Both Santa Ana College and Stantigo Canyon College have installed LED lighting as part of LED Building and Site Lighting Replacement projects. The District has also particpated in LED Lighting Demonstrations, to educate the public about efficient lighting.

7.2.2.9.3 INSTALL ENERGY EFFICIENT HVAC SYSTEMS

With the implementation of the new centralized cooling plant at Santa Ana College, existing buildings on campus will need their HVAC systems to be modified to work with the new system. The existing systems,

with the single exception of building D, all have air-cooled DX AC units. The cooling coils and refrigeration compressors in these machines will not work with chilled water. The HVAC components in buildings A, B, C, D, E, F, M, N, P, S will require a retrofit of the mechanical cooling systems and chiller piping system be converted to chilled water operations and more efficiently service the campus and buildings.

Santiago Canyon College has planned to update the HVAC control system in their Science Building as well as implement re-commissioning for that building. They also have plans to install occupancy sensors that adjust the speed of exhaust fans based on whether or not the lab rooms there are occupied or not. In addition, they plan to revise the sequence of operations for various mechanical equipment including the air handlers, the boilers, the exhaust fans and the fume hood equipment. They also plan to adjust air handler scheduling and boiler scheduling to attain maximum energy efficiency.

In Buildings 'D' and 'C' of Santiago Canyon College the District will replace an inefficient chiller unit with a new efficient chiller and install new pumps and VFD equipment. In addition, the existing split-system units and single-packaged systems will be replaced with efficient units. The District also plans to install new VAV hot water return and supply actuators to distribute reheat water efficiently.

For both campuses, the District will install a new robust and more efficient energy management system with a versatile range of controls for the mechanical equipment and lighting systems. They will also retrofit air handlers and install new high efficient motors and fans at various buildings.

At the District office, the chiller equipment, cooling tower, and the pumps will be replaced with more efficient equipment. The equipment will be installed with VFDs to adjust the speed of fans and motors. The existing EMS will be replaced with a new robust and more efficient energy management system with a wide range of controls for the mechanical equipment. The air distribution system will be modified to efficiently distribute air in the building.

7.2.2.9.4 ENERGY EFFICIENCY MEASURING-MONITORING BASED COMMISSIONING

At both Santa Ana and Santiago Canyon College, the District will implement advanced energy data and Monitoring-Based Commissioning (MBCx) techniques to maximize long-term efficiency and lower energy costs. Energy meters will be installed to continuously track energy data from the Building Management System (BMS) to compare actual performance to baseline performance.

For Santiago Canyon's Science Building the District's consultant developed a Measurement and Verification (M&V) Plan to evaluate building and/or energy system performance after retro-commissioning the building. The M&V process will evaluate the building and/or energy systems through energy simulation or engineering analysis. The retro-commissioning contractor will install the necessary metering equipment to measure energy use. They will be able to track performance by comparing predicted performance to actual performance, broken down by component or system. Once M&V is implemented, the consultant will evaluate energy efficiency by comparing actual performance to baseline performance.

7.3 FACILITIES OPERATION

In addition to installing energy efficient equipment, RSCCD strives to operate high-performing facilities, buildings, and energy infrastructure systems that are optimized for inhabitant comfort, productivity, and energy and resource efficiency. The District plans to align all facilities improvements with the RSCCD Sustainability Initiative. Maximum effort will be made to ensure that all improvements be created and managed sustainably for reduction of fossil fuel consumption, and thus the reduction of the campus carbon footprint. Green efforts will be considered as a means of reducing utility costs and improving the campus and community environment.

Current and planned activities in this area are described below

7.3.2.1 ENCOURAGE AND SUPPORT ENERGY EFFICIENCY TRAINING OF STAFF

The Maintenance and Operations staff at both Santa Ana and Santiago Canyon Colleges have been trained to operate new Energy Management Systems (EMS). Further ongoing training programs will be developed and implemented to ensure that the staff is aware of systems updates as they are implemented.

7.3.2.2 INSTALL ENERGY MANAGEMENT SYSTEMS

A new robust and more efficient energy management system that has a more versatile range of controls for the mechanical equipment and lighting systems will be installed. Currently, Santa Ana College already utilizes an EMS system for control of much of its HVAC equipment.

At Santiago Canyon College, there are currently two EMS systems in place. The older American Automatrix system controls HVAC and lighting in some of the buildings and there is an ALC system that controls HVAC in the newest buildings. These systems are used weekly to schedule HVAC and lighting for classes and events scheduled in each of the buildings. In the pursuit of a LEED credit, the Humanities Building at SCC had all its classrooms designed with a daylight harvesting lighting system that will adjust lighting levels based on the amount of natural light entering the building, which reduced energy consumption in the building. All of the newer buildings at SCC already have motion detectors, and moving forward, SCC will be installing motion detectors in the science labs so that the ventilation system will run at a lower speed thus reducing energy usage when the labs are not in use. In addition occupancy sensors will be installed to adjust exhaust fan speed and modify the sequence of operations so the mechanical systems are operating efficiently.

At the District Office an energy study was conducted in May 2013. The energy study recommended measures to improve the overall energy efficiency, reduce the electrical energy consumption and associated carbon footprint of the building. The project was reviewed by agency partners at Southern California Edison and Southern California Gas to determine potential energy rebates the project may qualify for, which is currently estimated at $107,985. Southland Industries is currently conducting a site study to implement the projects.

7.3.2.3 ADJUST TEMPERATURE SET POINTS AND SCHEDULE OPERATING TIMES

As part of the new construction program, the District will implement a facilities wide Owner Operating Requirement specification that will be used by the commissioning agents and EMS installer to ensure the EMS systems are customized to the campus needs and the HVAC equipment scheduling and maintenance is optimized. This system is currently being implemented on the Science Center- Retro Commissioning project and the District Operation Center- HVAC Renovations. The Owner Operating Requirement form will include the following:

- Air Temperature Range
- Operating Schedule

7.3.2.4 OPTIMIZE BUILDING OCCUPANCY SCHEDULING

The above mentioned Owner Operating Requirement form which is currently being implemented on the Science Center- Retro Commissioning project will also include the following items to optimize the building occupancy scheduling:

- Normal Occupancy Schedule
- Pre-occupancy Operating Period
- Non-occupancy Schedule
- Holiday Schedule
- Cleaning Schedule

7.3.2.5 OPTIMIZE HVAC EQUIPMENT SCHEDULING

To best optimize the equipment scheduling of the HVAC systems, the District will evaluate needs related to instruction so as to utilize entire buildings and shut off HVAC and lighting in buildings that are not being utilized. Santa Ana already has regular PM schedules to ensure that the HVAC systems work, despite their age. At Santiago Canyon, most of the air handles have VFD's to reduce usage when there is a reduction in demand.

In addition, the Owner Operating Requirement specification will include the following items to optimize HVAC equipment scheduling:

- Air Temperature Range
- Humidity Range
- Relative Building Pressure
- Air Filtration
- Ventilation
- Noise Criteria
- Supply Air Temperature Reset Range
- Preferred CO2 Range
- CO Alarm

7.3.2.6 ACTIVATE ENERGY-SAVING FEATURES FOR APPLIANCES AND COMPUTERS

Santiago Canyon College has made a commitment to utilize energy-saving features by installing motion sensors on its personal computers (PC's) which shut down the PC and ancillary equipment when not needed.

7.3.2.7 PURSUE MONITORING-BASED COMMISSIONING (MBCX)/RETRO-COMMISSIONING (RCX)

AS described above, both campuses have plans to implement Monitoring Based Commissioning using Proposition 39 funds in FY 14-15. Santiago Canyon is about to begin a retro-commissioning project under Proposition 39 to reduce energy consumption by the HVAC system that services its science labs. This project is expected to be completed by the end of June 2014.

7.4 SUSTAINABLE BUILDING PRACTICES

7.4.2.1 ESTABLISH A GREEN BUILDING STANDARD

In its Comprehensive Master Plan, the District has stated that it will work to develop green building design standards. Currently the District is developing standards for efficient landscaping and plant materials, irrigation equipment, low flow plumbing fixtures, low wattage LED lighting , efficient HVAC equipment, Glazing and Fenestration, Insulation, Roofing, Low VOC Painting and Coating, Energy Management Systems, Lighting Controls, and Daylight Harvesting Options. The District has already implemented a policy to minimize exposure of buildings occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke. The District prohibits smoking in the buildings except in designated exterior parking lots. The exterior parking areas are at least 25 feet away from entries, outdoor air intakes, and operable windows.

The Sustainable RSCCD Committee has recommended the development of sustainable design standards for the renovation of existing buildings to make such buildings more efficient, cost effective, and comfortable for their occupants. Already on campus, many buildings have been built using sustainable design criteria.

The newest building at Santiago Canyon College is the 90,000 sq. ft. Humanities Building, which is a US Green Building Council LEED Gold Building. In addition to its photo-voltaic system, some of its other sustainable features include a block exterior which requires little maintenance, lighting features that coordinates day-lighting with interior lighting and drought tolerant landscaping. It was also designed with low emitting products to reduce the quantity of indoor air contaminates that are odorous, irritating, and/or harmful to the comfort and well-being of occupants. To attain an Indoor Environmental Quality LEED credit, the Humanities building was designed with the following adhesives and sealants in accordance with SCAQMD Rule # 1168, limiting the VOC limits: Adhesives and Sealants used for carpet, rubber flooring, vct, drywall, cover base, structural glazing, pvc welding, abs welding, top and trim adhesive. The following materials do not exceed Green Seal GS-11 (VOC content limit) and Green Seal Plus requirements; Painting and Coatings, Carpet Systems, and Composite Woods. Both the Humanities

building and the Gymnasium were designed and installed with a fluid-applied roof coating that contain low SRI values promoting cooler roofs to avoid heat islands effects, also in pursuit of LEED credits. The cooler roofs reduce building cooling loads.

7.4.2.2 IMPLEMENT SUSTAINABLE DESIGN PRACTICES

Both campuses have made efforts to implement sustainable design practices in various buildings, and to research the best methods for doing so. At Santa Ana College, the Facilities Committee includes a regular report from the Task Force which often discusses Environmental the implementation of sustainable buildings practices for buildings on campus. The recent renovation of the Johnson Center at SAC will provide modern and efficient infrastructure and technology to support the building use and fulfill the College's objective for sustainable and environmentally responsible operations. Service and receiving facilities will be developed to accommodate recycling, and to separate delivery vehicles from pedestrian circulation. In other buildings, hand dryers have been installed in restrooms, and the swimming pool and Building E replacement facility will utilize state of the art technology for efficient energy and water use.

Santiago Canyon's Humanities building embodies sustainable design with its outdoor teaching spaces, which were implemented in pursuit of LEED credits. The exterior teaching environments are designed such that the exterior concrete benches have the capability to provide data and power to electronic devices to facilitate teaching. This promotes a sustainable environment.

7.4.2.3 USE AN INTEGRATED SYSTEMS APPROACH IN BUILDING DESIGN

The new parking structure planned at Santa Ana College is also a potential location for a central cooling plant, which could be integrated into the design. The parking structure also provides an opportunity for integrating a large scale photovoltaic electrical power facility into the campus. The College wishes to consider the feasibility of a rainwater harvesting system, which would use the upper deck as a collection area.

7.4.2.4 HIRE SUSTAINABLE BUILDING DESIGN PROFESSIONALS

7.4.2.5 COMMISSION NEW BUILDINGS

As part of the Measure 'Q' construction program, Proposition 39 projects, and scheduled maintenance projects, facilities will require new and renovation projects to contain a comprehensive commissioning plan as part of the project specifications, to best commission new buildings. At Santiago Canyon, the last two major buildings, the Athletics and Aquatics Center completed in 2012 and Humanities Building completed in 2014, have both been through the commissioning process.

7.5 ON-SITE GENERATION AND RENEWABLE ENERGY

7.5.2.1 EVALUATE CLEAN COGENERATION AND RENEWABLE ENERGY GENERATION

The District has stated in the Master Plan that it will explore renewable energy opportunities. So far this has been manifested as several feasibility studies including a comprehensive Photovoltaic System Feasibility Study at both Santa Ana and Santiago Canyon.

In the Santiago Canyon College Facilities Master Plan, there is a plan to include an energy efficient central plant to provide air conditioning for the entire campus, which is being evaluated. Some renewable energy generation has already been installed, at the newest building on campus, the 90,000 square foot Humanities Building, which has a photovoltaic system that should provide approximately 19% of the building's electrical needs.

7.5.2.2 EVALUATE LOAD SHIFTING TECHNOLOGIES

As part of the Central Plant project at Santa Ana, the campus is implementing an ice based thermal energy storage system that will make use of load shifting technologies. The chiller will use off-peak energy for production of ice. This technology will the reduce energy costs required to produce the ice. The District will also implement load shifting technologies as part of the future central plant at the Santiago Canyon campus. The Central Plant project at SCC is included as part of the facilities master planned projects.

7.5.2.3 MINIMIZE GREENHOUSE GAS INTENSITY OF PURCHASED ELECTRICITY

7.5.2.4 EVALUATE PARTICIpATION IN COMMUNITY CHOICE AGGREGATION

7.5.2.5 IDENTIFY AND TAKE ADVANTAGE OF GRANT AND INCENTIVE PROGRAMS

The District plans to apply for various green facilities grants and incentives. The District is already collaborating with the investor-owned utilities to take advantage of various incentive programs such as the Savings by Design program.

7.6 TRANSPORTATION, COMMUTING, AND CAMPUS FLEET & TRAVEL

Ranch Santiago CCD will strive to reduce Vehicle Miles Traveled (VMT) for students, faculty, and staff commuting to the campuses in an effort to reduce greenhouse gas emissions and minimize the infrastructure costs related to parking. The following programs will be implemented.

7.6.2.1 UNDERSTAND COMMUTE AND TRAVEL PATTERNS

Santa Ana College follows annual compliance with the South Coast AQMD survey requirements in accordance with emission reduction targets, for emission from commutes to campus.

7.6.2.2 ENCOURAGE AND ENHANCE PUBLIC TRANSPORTATION AND RIDESHARING OPTIONS

7.6.2.2.1 UTILIZE THE LOCAL MTA PROGRAMS

The RSCCD Sustainability Committee is actively engaged with Santa Ana College in finding alternative commuting opportunities, including a tie to OCTA. OCTA has a bus stop in the center of the Santa Ana campus off Campus Road. The bus stop is convenient for student and staff, thereby promoting the use of public transportation.

7.6.2.2.2 INCREASE AWARENESS

The District will be partnering with the Air Quality Management District to raise community awareness about sustainable transportation options.

7.6.2.2.3 FACILITATE PUBLIC TRANSIT USE

7.6.2.2.4 INCENTIVIZE PUBLIC TRANSPORTATION AND CARPOOLING

Because Santiago Canyon College is located in the City of Orange, there are not many options to get to campus. There is one bus line that comes from the west and SCC is located at the very end of the line. The District has researched the student public bus pass program, and there are now discounted bus passes to encourage students and staff to take the bus.

7.6.2.2.5 FACILITATE RIDESHARING

7.6.2.2.6 FACILITATE CAR SHARING

7.6.2.2.7 ENCOURAGE FUEL EFFICIENT VEHICLES FOR COMMUTERS

The District is researching the feasibility of electric vehicles for RSCCD use, and plans to research the feasibility of campus electric vehicle charging stations. There are plans for electric car charging stations at Santa Ana, which include the planned installation of two electric vehicle charging stations within its Lot 11 expansion project for use by the campus community. There are also plans at Santiago Canyon for electric car charging stations.

7.6.2.3 ENCOURAGE AND ENHANCE BICYCLING OPTIONS

Santa Ana College plans to partner with the City of Santa Ana on a bike-friendly city initiative to increase the use of bicycling as a means of transportation for staff and students to get to campus. In 2013-2014 Santa Ana purchased additional bike racks to encourage alternative transportation options.

Approximately two years ago, Santiago Canyon added three bicycle racks on campus to the three existing ones. Since then, usage of the bike racks has been noted to have increased.

In 2013 the District held a Ride to Work Day contest, to promote biking throughout both campuses and the District office.

7.6.2.4 IMPROVE CAMPUS FLEET & TRAVEL

Santa Ana College has worked to improve the campus fleet by the replacement of gas powered maintenance carts for newly purchased electric powered carts. SAC also upgraded one of its security vehicles to a Prius hybrid vehicle.

7.6.2.5 ENHANCE STUDENT DISTANCE LEARNING

The Santiago Canyon Master Plan stated that a priority for the college will be the expansion and enhancement of distance education course offerings. A full-time faculty coordinator will be hired, training on effective online course design will be implemented, and an outreach and marketing plan will be developed. To support distance education and other technology advancements, funding will be needed for faculty and staff to attend conferences and workshops.

7.7 WATER, WASTEWATER, AND SUSTAINABLE LANDSCAPING

Water conservation is an important component of sustainability and is aggressively pursued by RSCCD. The District strives to reduce potable water use as well as waste water discharges to both the sewer and storm water systems. In addition, the District reduces waste water pollution by minimizing chemical fertilizers and pesticide use in association with landscaping practices.

7.7.2.1 ESTABLISH WATER CONSERVATION GOALS

The District Master Plan stresses the importance of water conservation, and will continue to develop specific goals to meet this objective.

7.7.2.2 IMPLEMENT WATER CONSERVATION STRATEGIES

Both Santa Ana and Santiago Canyon have implemented water conservation strategies through various projects on their respective campuses.

Santiago Canyon is currently working with the Irvine Ranch Water District (IRWD) to utilize reclaimed water to irrigate the athletic fields. Although the area is served by the Irvine Ranch Water District, the water is provided by the City of Orange Water Department. IRWD has already received approval from the City of Orange for this partnership. Preliminary information shows that if SCC commits to a $70,000 construction cost, IRWD will proceed with the construction. It is estimated that the cost of construction will be recovered in 5-6 years in the form of reduced water charges. On other parts of campus, the new Humanities and Gymnasium buildings were designed with low-flow flushometers with automatic operation providing reduced water usage. Some waterless and low-flush urinals were also installed and SCC would like to install more when additional funding becomes available. Synthetic turf has also been installed on the softball field to reduce the need for water.

Santa Ana has installed new efficient, low flow irrigation systems in all of its new perimeter landscape as well as efficient irrigation valves to reduce its water use on campus. A new tournament quality artificial turf soccer field was installed to reduce the use of potable water for irrigation as well as engine combustion required for maintenance.

7.7.2.3 REDUCE STORM WATER, SEWER DISCHARGES, AND WATER POLLUTION

Efforts to promote sustainable storm water management are a key part of Santa Ana College's planning for environmental stewardship. Storm water management has been a concern to the College and an environmental issue in Southern California for a long time. A long dry season followed by frequent, sometimes heavy rains contributes to the flushing of pollutants into the Santa Ana River and the Pacific Ocean. The Santa Ana Master Plan recommendations include the incorporation of best management practices which use natural processes to filter and retain or slow the flow of storm water. Opportunities for bio swales and rain gardens have been investigated. Rain gardens will be used to retain and percolate water for building roof drains. They will be incorporated in attractive outdoor seating areas near the entrances of buildings. Rain gardens will be engineered to overflow to the storm drain system if needed. Bio swales will be incorporated in large areas of impervious paving, including roads and parking lots. Currently most of these areas are drained by surface flow to the southwest, ultimately draining to the box culvert under Washington Street. The city drainage system has a finite capacity, and efforts to retain or detain storm water on the campus significantly reduce the College's environmental impact. As future campus development occurs, the College will explore the feasibility of harvesting storm water to replace potable water used for irrigation and other uses.

At the District level, erosion control systems and best management practices on the construction program have been implemented. The District hired a Storm Water Pollution Prevention Program consultant to inspect, monitor, and advise construction personnel and the District on best practices.

7.7.2.4 ADOPT SUSTAINABLE LANDSCAPING PRACTICES

Various sustainable landscaping projects have been implemented on both campuses, such as the Campus Landscape Improvement Projects at Santa Ana and the Coastkeeper Garden at Santiago Canyon. The Coastkeeper Garden is a project where SCC leases some of its property to the non-profit Orange County Coastkeepers who have built a demonstration garden open to the public. They provide a variety of drought tolerant gardens that homeowners can view and possibly install at their homes and significantly reduce water consumption. SCC has also undergone campus landscaping projects to implement sustainable landscaping. The landscape designer for the SCC projects designed native or adaptive plant materials to reduce or eliminate irrigation requirements. Where irrigation is required, the landscape designer used high-efficiency equipment.

7.8 SOLID WASTE REDUCTION AND MANAGEMENT

The goal of the Sustainability Plan is to improve and expand efforts into source-separated recycling, Construction and Demolition (C&D) recycling, and green waste compositing. If designed effectively, minimizing solid waste can save the District money and create revenue streams that can be reinvested in the campus. The District will employ the principles of Reduce, Reuse, and Recycle in its solid waste reduction program.

7.8.2.1 CREATE WASTE REDUCTION GOALS

In order to gather information to create goals for waste reduction, the District surveyed existing practices and conducted researching on best practices that could be implemented.

7.8.2.2 MAXIMIZE PROGRAMS OFFERED BY CONTRACTED WASTE HAULER

The District plans on improving waste management contracting. The current waste management contract with CR&R is effective through 2016. The contract, however, does not call for recycling efforts and it was determined that all waste is being co-mingled and put in one truck. The waste management subcommittee of the sustainability committee will conduct further research to explore the possibility of rebidding the contract to meet District's requirements for recycling. Santiago Canyon will investigate the use of other trash haulers that will provide recycling services and help promote recycling for their campus.

7.8.2.3 REDUCE THE WASTE STREAM TO THE LANDFILL

The District and colleges will act to reduce the waste stream to the landfill by making resource conservation an integral part of its waste reduction and recycling programs. They will integrate the concept of resource conservation, including waste reduction and recycling, into its environmental programs and will decrease the amount of waste of consumable materials by reduction of the consumption of consumable materials wherever possible, full utilization of all materials prior to disposal, and minimization of the use of non-biodegradable products whenever possible. Santiago Canyon has made efforts to avoid an increase in what goes to landfills despite the increase in student population and in facilities over the past few years. SCC believes it can do even better with recycling campaigns.

7.8.2.3.1 RAISE AWARENESS OF WASTE REDUCTION

Representatives of the District and colleges will actively advocate, where appropriate, for resource conservation practices to be adopted at the local, regional, and national levels. The Santiago Canyon Facilities committee has hopes to advertize recycling with promotional activities that explain the benefits of recycling.

7.8.2.3.2 MINIMIZE UNNECESSARY WASTE

7.8.2.3.3 REDUCE PAPER USE

Santiago Canyon's Facilities Committee hopes to promote the use of electronic media in place of the enormous amount of paper used for syllabi and class handouts. SCC further reduces paper use by having its copy center's standard set to make all copies double-sided. Requestors need to specify single-sided copies otherwise it defaults to double-sided. Also, any white paper tossed in the trash which is unused on one-side, is collected and used in the math tutoring center as scratch paper.

7.8.2.3.4 MINIMIZE USE OF DISPOSABLE ITEMS

7.8.2.3.5 FACILITATE SWAP SHOPS AND FLEA MARKET

7.8.2.3.6 DONATE REUSABLE GOODS

7.8.2.3.7 SUPPORT PRODUCER RESPONSIBILITY PROGRAMS

The District will purchase, where financially viable, recycled products. The District will also encourage suppliers, both private and public, to make recyclable products and unbleached paper products available for purchase.

7.8.2.4 IMPROVE EXISTING RECYCLING PROGRAMS

The District and colleges will cooperate with, and participate in, recycling efforts of service area cities and the county. As systems for the recovering of waste and recycling are developed within service area cities and the county, the District will participate by appropriately separating and allowing recovery of recyclable waste products.

In addition to administrators, students are also concerned about recycling efforts on campus. Currently community members come on campus and recycle bottles and cans from the trash receptacles for their own needs. Efforts are being made to build a more robust recycling program that would include construction debris, cardboard, mulching and green waste. A higher level of sustainability will be included when bidding waste and management services. A District wide recycling program has been discussed at the sustainability committee meetings.

At Santiago Canyon, the Humanities building was designed such that free-standing recyclable and trash receptacles are strategically placed in certain key locations of the building to promote recycling, in pursuit of a Storage and Collection of Recyclables LEED credit. Throughout campus a Paper Collection and Recycling Program has also been implemented, and there are plans to place more recycling bins around campus.

7.8.2.5 COLLECT AND SELL ALL RECYCLABLE MATERIAL

7.8.2.6 GREEN WASTE AND FOOD WASTE COMPOSITING

Santiago Canyon's current contract agreement with the landscape contractor requires that none of the green waste goes to landfill but goes toward composting, thus reducing the waste stream to the landfill.

7.8.2.7 ADOPT CONSTRUCTION AND DEMOLITION (C&D) RECYCLING

As part of the Measure 'E' and Measure 'Q' building program, the District's consultants are required to include a construction waste management specification so that contractors properly separate recyclable material from the construction waste to promote recycling on the construction program. It is required for the Contractor to separate construction and demolition waste materials generated on-site in three categories: re-use or recycle on-site, transport to approved recyclers, and transport to legally designated

landfills for the purpose of recycling, salving or reusing a minimum of 50% of construction and demolition generated. The contractor is required to provide a monthly report to verify the target amounts.

7.9 GREEN PURCHASING

Rancho Santiago CCD has adopted purchasing policies to meet the goals of environmental, economic, and social sustainability and to use its market power to influence suppliers to be more sustainable, as described below.

7.9.2.1 SUSTAINABLE FOOD PURCHASING

7.9.2.2 GREEN PURCHASING PRACTICES

7.9.2.2.1 ESTABLISH REQUIREMENTS FOR MINIMUM RECYCLED CONTENT

The Director of Purchasing for the District will work with departments to establish minimum recycled content standards for designated recycled products to maximize recycled product availability, recycled content, and competition.

7.9.2.2.2 ESTABLISH STANDARDS FOR GREEN PURCHASING

The District and colleges shall, whenever possible, use recycled products and recycled materials to meet their needs. The District and colleges promote the use of recycled products publicizing its procurement regulation whenever practicable. The District will require its contractors and consultants to use and specify recycled products in fulfilling contractual obligations whenever practicable. This regulation is enacted to demonstrate compliance with the Waste Management Reduction Act and foster market development for recycled products. The Director of Purchasing shall coordinate the implementation of this regulation. He/she will establish a list of recycled products that shall be purchased by all departments whenever practicable and will develop the mechanism for maintenance, additions, and deletions to the list of recycled products available for procurement. Maintenance of the list will include addition of new products containing recycled material as they become available and make available to departments specifications on the new product along with a list of suggested uses. Purchasing has previously established a waste management program to increase the amount of recyclables. They have made it a point to start procurement of Green Seal products for the Janitorial staff to reduce VOC emissions.

At Santiago Canyon, a majority of custodial paper products are identified as green paper products and a majority of custodial cleaning products are environmentally friendly. Purchasing has previously established a waste management program to increase the amount of recyclables. They have made it a point to start procurement of Green Seal products for the Janitorial staff to reduce VOC emissions.

7.9.2.3 SOCIALLY RESPONSIBLE PURCHASING

7.10 STUDENT AND CURRICULUM DEVELOPMENT

The mission of Rancho Santiago CCD is to deliver high quality instruction to students both within and beyond traditional geographical boundaries and to provide an open and welcoming culture that supports student completion and success. With the economics of environmental sustainability becoming increasingly important in all facets of society, the District has a responsibility to play a role in moving current and future generations toward a sustainable future.

RSCCD will strive to create learning opportunities for student involvement and encourage active sharing of current and evolving content to support implementation of the plan. Through the Sustainability Plan initiatives, faculty, staff, administrators, and students will have opportunities to collaborate, participate and serve as effective agents for positive change.

7.10.2.1 CREATE A SUB-COMMITTEE IN THE ACADEMIC SENATE DEVOTED TO SUSTAINABILITY

Santiago Canyon's Associated Student Government (ASG) has recently appointed a student to a position that looks at environmental issues including recycling in order to involve students in the promotion of sustainable practices on campus.

7.10.2.2 PROVIDE PROFESSIONAL DEVELOPMENT AND CREATE A FACULTY FORUM

7.10.2.3 UTILIZE DIFFERENT PATHWAYS TO INTEGRATE SUSTAINABILITY IN THE CURRICULUM

Both Santa Ana and Santiago Canyon have several courses that involve principles of sustainability in the curriculum offered to students:

Santa Ana College

Environmental Geology 140 - This course focuses on the study of urban geologic hazards: earthquakes, groundwater pollution, flood potential, landslides and creep, soil expansion, coastal erosion, and volcanic hazards.

Biology 200 - The Environment of Man - Sustainability is fundamental to the class, as it touches on environmental problems such as energy, resources, pollution, land use, population and food, including economic and political factors.

Engineering 201 – This course focuses on energy efficiency and building design, including thermal massing and natural ventilation as cooling methods. Students inquire and work with the SAC Facilities team on identifying potential renovation projects on campus.

Santiago Canyon College

Automotive Technology 085 – Basic Clean Air Car Course – A Bureau of Automotive Repair recognized Basic Clean Air Car Course, which prepares students for the State Smog Technician Exam.

Biology 109 – Fundamentals of Biology – Principles of biology stressing the relationship of all organisms from anatomical, physiological and ecological points of view. Includes cell machinery, genetics, reproduction, embryology, animal behavior, botany, ecology, evolution and human physiology.

Biology 111- Marine Biology – This course covers basic concepts of marine ecosystems including oceanographic principles, ecology and a survey of marine habits and diversity of marine organisms.

Biology 127 – Ecology – Introduction to the basic principles of ecology. Study of ecosystems, biomes, and the relationships of plants and animals in the natural world.

Biology 128 Natural History of the California Coast – A field study course focused on the ecological study of plant and animal life of the southern and central California coast.

Biology 128 – Ecology of Southern California – Identification and study of the plants and animals of the ocean, mountain and desert regions of Southern California with emphasis on the organisms relationship to their environment. This is a field study course and includes overnight camping.

Biology 170 – Environmental Challenge of the 21st Century – Examines the environmental impacts of increased human population on food, water and energy resources. Land use policies and environmental effects of pollution will also be analyzed.

Biology 200 - The Environment of Man - See above under Santa Ana College courses.

Biology 212 – Animal Diversity and Ecology - A study of ecological principles, and relationships between animal diversity and ecosystems. Habitat, populations, ecological interactions, and environmental influences are stressed while surveying animal diversity and addressing structure, function, behavior, and adaptation of major taxonomic groups.

Biology 214 – Evolution and Plant Diversity – Principles and processes of evolution leading to biodiversity. Survey of the organisms, viruses, prokaryotes, fungi, algae, and plants with emphasis on evolutionary adaptations of the anatomy, physiology, and life cycles of these organisms.

Biology 259 - Introduction to Environmental Biology: This course includes the study of ecosystems, population dynamics, classification, diversity of plant and animal species, effects of pollutants at both the cellular and organismal levels and principles of ecology.

Geology 140 – Environmental Geology - See above under Santa Ana College courses.

Geology 150 – Introduction to Oceanography – Introductory study of the ocean and its topography, sediments, circulation, shoreline processes, biological productivity and mineral resources.

7.10.2.3.1 ADDING A COMPONENT TO AN EXISTING COURSE OUTLINE OF RECORD

The Water Utility Science program at Santiago Canyon offers a wide range of courses that directly apply to water distribution, treatment, and wastewater management. The certificate program provides a great

opportunity for students to be trained in a growing and important field centered on environmental sustainability. With completion of the program, students are prepared for entry-level jobs in the water distribution, treatment and water reclamation industries. The associate of science degree provides coursework and internship experience designed to provide an overview of a wide range of environmental career opportunities. Santiago Canyon College hopes to consider environmental programs for future development, building on this existing Water Utility Science program.

Students have also expressed their desire for development of more environmental programs. When asked what kinds of programs and services the college should offer in the future in a survey, most participants touched on developing programs in the areas of High Technology and Green Technology . For example, participants suggested that the college should not expand upon its signature programs in Water and Surveying, but also develop green technology programs and create environmental studies and sustainable studies programs.

7.10.2.3.3 CREATE A NEW CERTIFICATE OR DEGREE PROGRAM

Energy Analysis Degree & Certificate – This degree program trains students for work in energy analysis and auditing. Students completing training will be prepared for work performing Title 24 energy calculations or for work in utility companies, or private companies that do energy analysis and auditing. Course work includes:

Engineering 165 – Introduction to Energy – Students will gain a broad understanding of energy concepts, efficiencies, conservation, distribution, careers and cost-benefit analysis of energy resource use. The study of both renewable and non-renewable energy will be included.

Engineering 175 – Introduction to Energy Analysis – This course is focused on energy analysis with respect to energy conservation, energy auditing, and CA Title 24 requirements. Calculations will be performed manually and with the assistance of software applications. Career tracks in energy analysis will be explored. Energy concepts, heat loss calculations, basic solar concepts, site selection, design improvements, appliances, and utility systems will be covered within this course.

7.10.2.4 ADVOCATE FOR CHANGE AT THE STATEWIDE LEVEL

The Sustainable RSCCD Committee hopes to advocate on a larger scale by sending representatives from both the SRC and the Facilities Committee to the annual Higher Ed Sustainability Conference.

7.10.2.5 TRAINING OPPORTUNITIES FOR STUDENTS

7.10.2.5.1 ASSIST IN GREEN INTERNSHIP AND JOB PLACEMENTS

7.10.2.5.2 FACILITATE HANDS-ON CAMPUS PROJECTS

Biology faculty at Santa Ana oversee a group called the Green Task Force, which works to identify recycling projects and puts together Earth Day events. Recently, a representative of the Associated Student Government (ASG) committed to personally getting involved with re-cycling and is attempting to generate student interest. The Administrative Services Department agreed to provide recycling bins for

cans and bottles. Students will regularly empty them along with the current containers used for paper. The students will then deliver the collections to re-cycling centers.

For the future, students have expressed interest in jointly exploring hand on projects including replacing old restroom faucets that have conventional on/off knobs with automatic shutoff valves, changing the college landscaping requiring a high amount of irrigation to drought-tolerant landscaping and looking at having water bottle filling stations so that students/staff will not discard their water bottles.

7.10.2.5.3 ENCOURAGE SOCIAL SERVICE

7.10.2.5.4 INVITE NOTABLE SPEAKERS

Santiago Canyon's Earth day event featured several exhibits including electric and hybrid vehicles as well as guest speakers who presented on a variety of sustainability topics.

7.10.2.5.5 SUPPORT STUDENT COMMITTEES & CLUBS

The District Master Plan states that the District will both engage student organizations and clusb on campus and support student recycling activities.

Clubs at Santa Ana College include the following:

> **Collegiate Alliance for Positive Enviromnetal Stewardship Engineering Club (CAPES):** Students involved in CAPES participate in activities that focus on sustainable topics such as sustainable design and building with solar.

7.11 CAMPUS AND COMMUNITY OUTREACH & AWARENESS

The sustainability of a college is highly dependent on the actions of individual students, faculty, and staff. While having energy efficient equipment, installing low flow water devices, and providing separate bins for source separation of waste can make a District more sustainable, behavioral changes can have a large impact on the effectiveness of these projects. Additionally, it is important to maintain transparency and keep the campus and local community informed of the District's progress with sustainability plan implementation. This is hard work and contributions to the District's sustainability should be recognized. RSCCD will implement the following programs related to campus and community outreach and awareness.

7.11.2.1 CREATE A WEBSITE DEDICATED TO CAMPUS SUSTAINABILITY

The sustainability committee created the RSCCD sustainability web page. They are in charge of maintaining and updating the website.

7.11.2.2 HOLD WORKSHOPS AND PRESENTATIONS

7.11.2.3 SUSTAINABILITY EVENTS

In 2013 the District worked with student clubs to hold the Earth Day events. Together they coordinated an Earth Day program and events including presentations, workshops, and more. The Transportation Subcommittee of the Sustainability Committee proposes designated a day in May as "Ride Your Bike to Work Day" for the District and developed a flyer to publicize the event and organized prizes for participants. The sustainability committee also held a contest to develop as sustainability tag line.

Santa Ana held a "Sustain-a-Palooza" event which was a success, with overflowing crowds, informational presentations, speakers and involvement by a number of the campus clubs. At Santiago Canyon there is an on-going periodic campus clean-up day which is organized by students.

7.11.2.4 CAMPUS SPECIFIC OUTREACH & AWARENESS

The Sustainability Committee publishes a Sustainable RSCCD e-newsletter to inform the campus community about sustainability news and events.

7.11.2.5 COMMUNITY SPECIFIC OUTREACH & AWARENESS

The campus master plan states that the District will work to fostering community partnerships related to sustainability.

7.12 CREATE A CLIMATE ACTION PLAN

7.12.5 MAKE A COMMITMENT TO REDUCE GREENHOUSE GAS EMISSIONS

The Sustainable RSCCD Committee has discussed the possibility of becoming a signatory to the American College and University Presidents' Climate Commitment (ACUPCC). Signatories of the ACUPCC agree to complete a greenhouse gas (GHG) inventory; create an action plan with targets and milestones for reducing emissions; integrate sustainability into curriculum; and make their plans, inventory, and progress reports publicly available.

7.12.6 PERFORM A GREENHOUSE GAS INVENTORY

7.12.7 CREATE AND EXECUTE A CLIMATE ACTION PLAN WITH PRIORITIZED GREENHOUSE GAS REDUCTION MEASURES

7.12.8 REGULARLY MONITOR AND REPORT PROGRESS TO CAMPUS

7.13 OTHER PROGRAMS AND PROJECTS

7.13.1 ANY ADDITIONAL PROGRAMS AND PROJECTS NOT COVERED ABOVE

7.13.2 ANY ADDITIONAL PROGRAMS AND PROJECTS NOT COVERED ABOVE

7.13.3 ANY ADDITIONAL PROGRAMS AND PROJECTS NOT COVERED ABOVE

7.13.4 ANY ADDITIONAL PROGRAMS AND PROJECTS NOT COVERED ABOVE

SECTION 8.

MEASURE AND REPORT PERFORMANCE

The purpose of this section is to describe the campus's plan for regular measurement and reporting of its progress towards reaching the Sustainability Plan goals.

As with any successful program, the ongoing progress and performance of sustainability plan activities should be ***monitored and compared to goals and criteria***. This will require continuous participation of the Campus Committee, college staff, and other participants in the process. To communicate results and ensure transparency and accountability, the ***results of the Sustainability Plan activities should be communicated to the larger campus community on a regular basis***.

The following section describes the planned process for measuring and reporting sustainability activities and achievements.

8.1 MEASURING PERFORMANCE

In order to monitor the Rancho Santiago Community College's progress towards its sustainability goals, the Campus Sustainability Committee plans to collect information on the following key metrics at the regular intervals described below.

Fill in the following table with the campus's customized metrics and add or delete rows as necessary. Campuses that choose to normalize metrics by number of students, building square footage, or other factors should list these metrics separately from measurement of aggregate usage. For more details on developing metrics, see Section 9 of the Sustainability Template.

Area of Sustainability	Performance Metric	Measurement Frequency
Total Energy Use	Change in total annual electricity and gas use.	Annual
Energy Use Intensity	Change in total annual electricity and gas use per student/staff/faculty and/or per conditioned square foot.	Annual
Renewable Energy Use	Change in total annual renewable energy use and/or percent of total annual energy use that is generated from renewable sources	Annual
Water Use	Change in total annual water use.	Annual
Water Use Intensity	Change in total annual water use per student/staff/faculty.	Annual
Waste Diversion and Management	Percentage of waste diverted and increase or decrease from the previous year.	Annual
Transportation Efficiency	Total VMT reduced or number of single occupancy vehicles reduced.	Bi-Annual
Greenhouse Gas	Total and change in annual campus greenhouse gas	Bi-Annual

Emissions	emissions in tonnes CO_2e.	
Area of Sustainability	**Performance Metric**	**Measurement Frequency**
Greenhouse Gas Emission Intensity	Total and change in campus greenhouse gas emissions in tonnes CO_2e per student.	Bi-Annual
Green Curriculum	Number of students enrolled in sustainability courses.	Annual
Avoided Costs	Total dollars saved as a result of sustainability actions.	Annual

8.2 REPORTING PERFORMANCE

The campus should use this section to describe how the Campus Sustainability Committee will communicate measurement of performance. This section should include any plans to report to external databases, such as the Sustainability Tracking, Assessment, and Rating System (STARS) or the American College and University Presidents' Climate Commitment (ACUPCC), and any media that will be used to regularly update the campus on activities in between formal reports, such as a website or a blog.

In order to keep the campus community informed of the progress of the Sustainability Plan activities, the Campus Sustainability Committee will create a webpage dedicated to sustainability on the Rancho Santiago Community College website at [insert web address is known]. Additionally, the Committee will summarize activities, metrics, and progress towards goals in an [annual/bi-annual] report, which will be available publicly on the sustainability website.

To increase transparency, the Rancho Santiago Community College will also participate in the Sustainability Tracking, Assessment, and Rating System (STARS) to evaluate the overall campus sustainability and submit the campus greenhouse gas inventory and Climate Action Plan to the American College and University Presidents' Climate Commitment (ACUPCC) reporting system.

On an ongoing basis, the Campus Sustainability Committee will regularly update the campus of projects and progress by maintaining a sustainability blog, which can be found through the sustainability website or at [insert web address if known]. All students, faculty, and staff are encouraged to contribute to this blog by emailing its administrator, [Blog Administrator Name], at [Blog Administrator Email] with events, projects, and any other campus sustainability news.

8.2.1 CAMPUS WORKSHOPS

The Campus Sustainability Committee will hold periodic workshops open to all campus members throughout the planning and implementation phases of the project. This will be designed to encourage a two-way dialogue where information is provided to the campus community and feedback is solicited and incorporated into the plan.