Chapter 8: Policies, Standards, and Scheduling

8.1 Introduction

Policies and standard regulations are highly beneficial. They enhance productivity, increase innovation, and provide a resource of guidelines and procedures[13]. The Association for the Advancement of Sustainability in Higher Education (AASHE) also provides a database of successful sustainable energy policies at many U.S. colleges. Furthermore, the Chapman University Code of Ethics includes ethical ideals of Respect for the Environment and Respect for University Resources, stating, “We value life in its variety and unity, and we promote a sustainable environment by responsibly using natural resources” and “We exercise due care and responsible stewardship in using university resources”[5]. This chapter of the 2015 Building Construction and Energy Use Audit addresses the establishment of a development timeline for permanent subsections within the University’s sustainability policy, consisting of an energy-use policy, building-use policy, and building construction policy for the purposes of benefitting Chapman’s stakeholders, shareholders, and energy bill. The policies will contain standards for best practices, or a method or technique that has consistently shown results superior to those achieved with other means[4], as well as energy-efficient class scheduling for the summer and fiscal school months. Lastly, the chapter includes recommendations to participate in national initiatives.

8.1.2 History of Policies, Standards, and Scheduling at Chapman University

Due to the combined efforts of Chapman’s Faculty Sustainability Committee, Facilities department, past graduating classes of Environmental Science and Policy students, and Student Affairs departments, there has been much sustainable progress at the University. Chapman’s sustainability policy, created as a result of the 2013 Environmental Audit, states “Chapman University is committed to a campus culture that promotes a sustainable future. This commitment is instrumental to Chapman’s mission to educate ethical and informed global citizens. As such, it calls upon all constituencies of the University to carefully evaluate short- and long-term social, economic, and environmental impacts of decisions before acting. The University demonstrates this commitment through sustainable practices in strategic planning and ongoing operations as well as sustainability-focused educational programs, research, and community engagement”[6].

However, the 2013 and 2014 Environmental Audits addressed the lack of building construction and procurement policies in the Building Construction, New Construction, and Curriculum chapters[1].

8.2 Current Status of Policies, Standards, and Scheduling at Chapman University

8.2.1 Overview

In addition to the creation of Chapman’s sustainability policy, the University has implemented the following sustainability programs and initiatives[6]:

- The Green Initiative Fund (TGIF)
- Green Department Certification Program
- Community Supported Agriculture (CSA)
- Community garden
- Tower gardens
- Big belly solar trash compactors
- Electric vehicle charging stations
- Water refilling stations

8.2.2 Student Status

The 2015 Student Environmental Audit Survey was launched mid-semester spring 2015. A total of 430 participants, comprised of undergraduate and graduate students, completed the survey. Questions specifically pertaining to policies included asking level of support for:

- Closing academic/auxiliary buildings during extended break periods
- Energy Use Policy at Chapman
- Implementation of New Construction Policy

The survey responses reflect where students currently stand on adding sustainable policies, standards, and class scheduling changes. **Figures 8.1, 8.2, and 8.3** display compiled survey responses. There is a majority of support amongst students for an energy use policy, new construction policy, and participation in national initiatives.

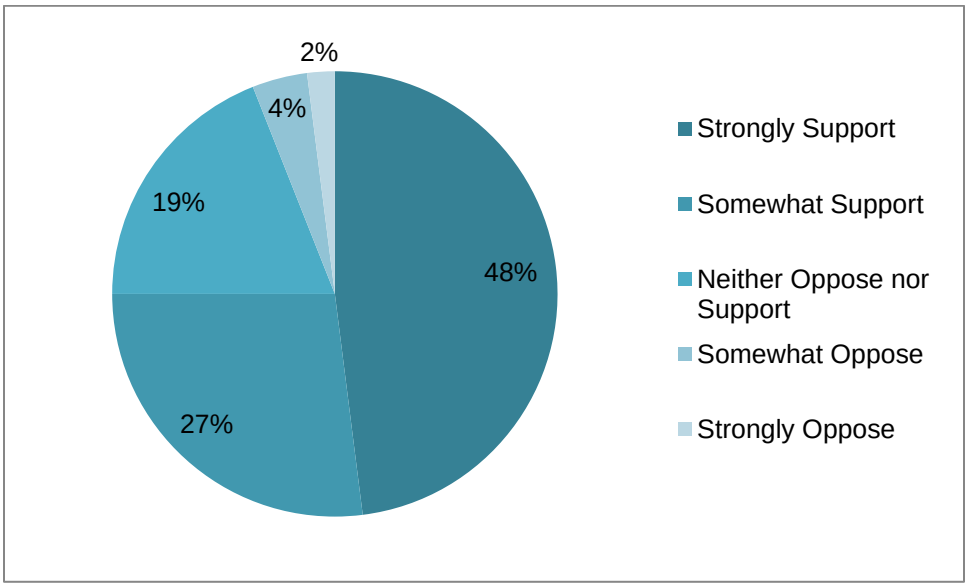

Figure 8.1. *Survey responses to the question: "Implementation of an energy use policy at Chapman"*

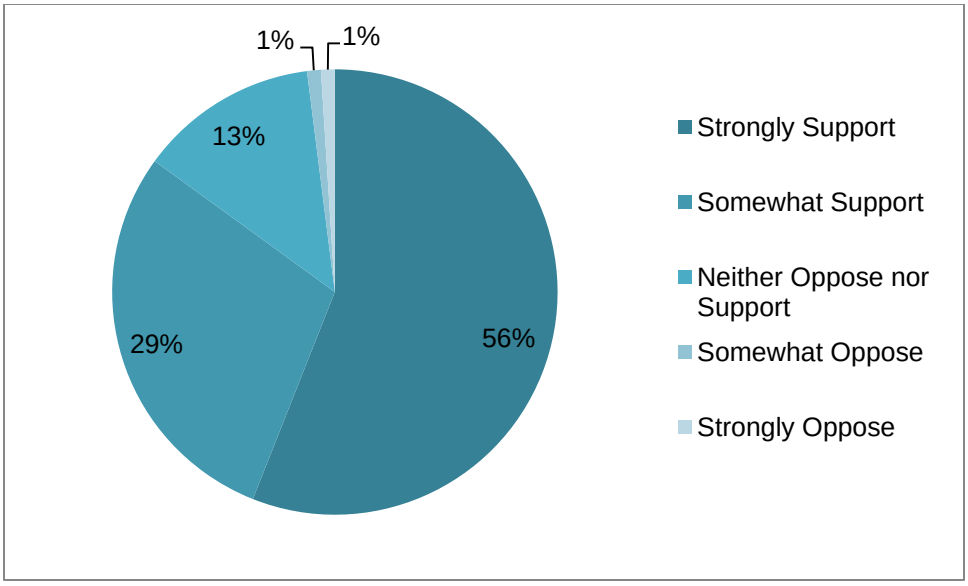

Figure 8.2. *Survey responses to the question: "Implementation of a New Construction Policy to require energy-efficient design"*

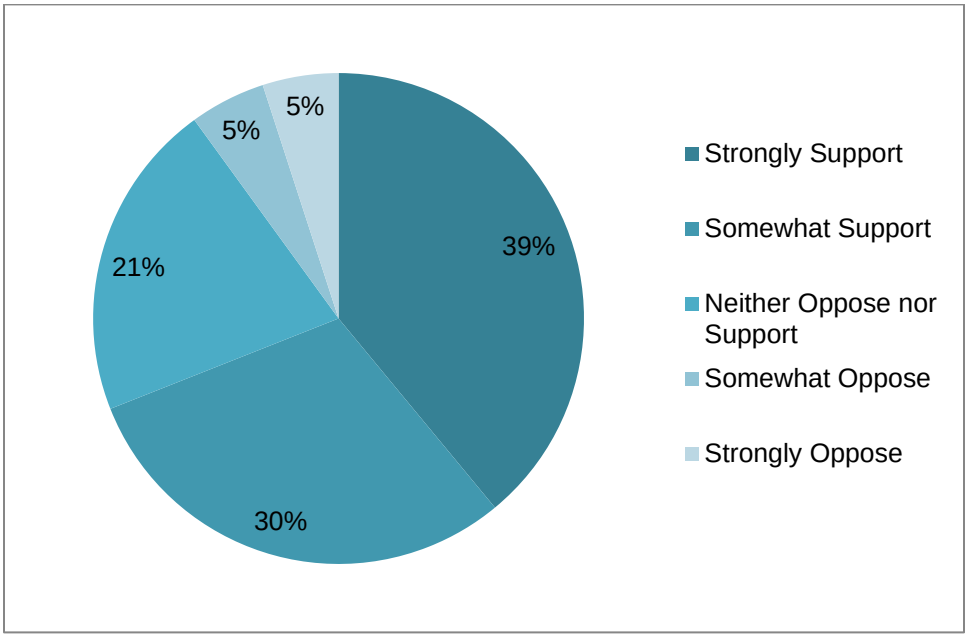

Figure 8.3. *Survey responses to the question: "I want Chapman to take part in national sustainability initiatives (President's Climate Commitment, The Billion Dollar Green Challenge, etc."*

8.2.3 Staff/Faculty Status

The 2015 Staff/Faculty Environmental Audit Survey was launched concurrently with the student survey mid-semester spring 2015. A total of 283 participants completed the survey. Questions specifically pertaining to policies included asking level of support for:

- Closing academic/auxiliary buildings during extended break periods
- Energy Use Policy at Chapman
- Implementation of New Construction Policy

- Teaching a class in a different building to reduce energy usage

The survey responses reflect where staff and faculty currently stand on adding sustainable policies, standards, and class scheduling changes. **Figures 8.4, 8.5, and 8.6** display compiled survey responses.

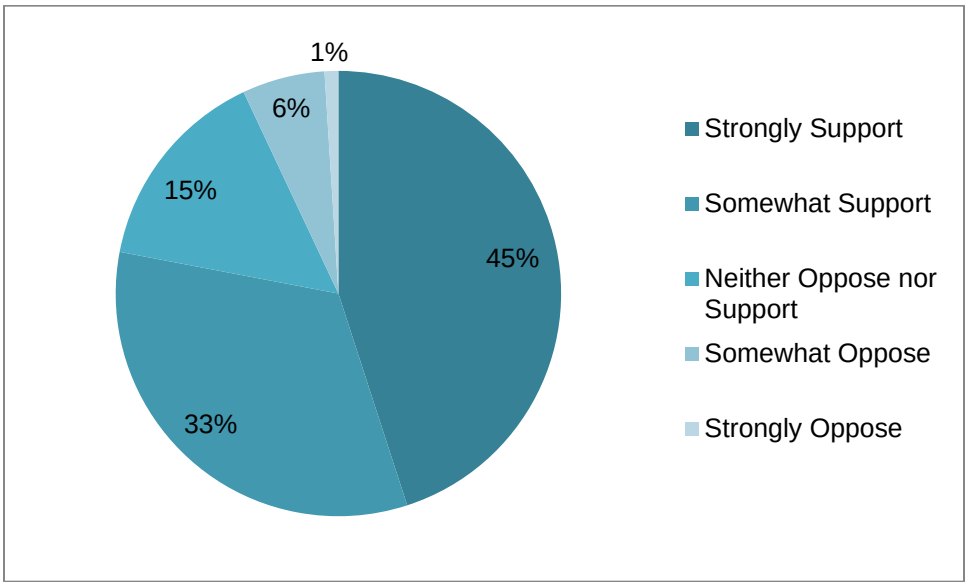

Figure 8.4. *Survey responses to the question: "Implementation of an energy use policy at Chapman"*

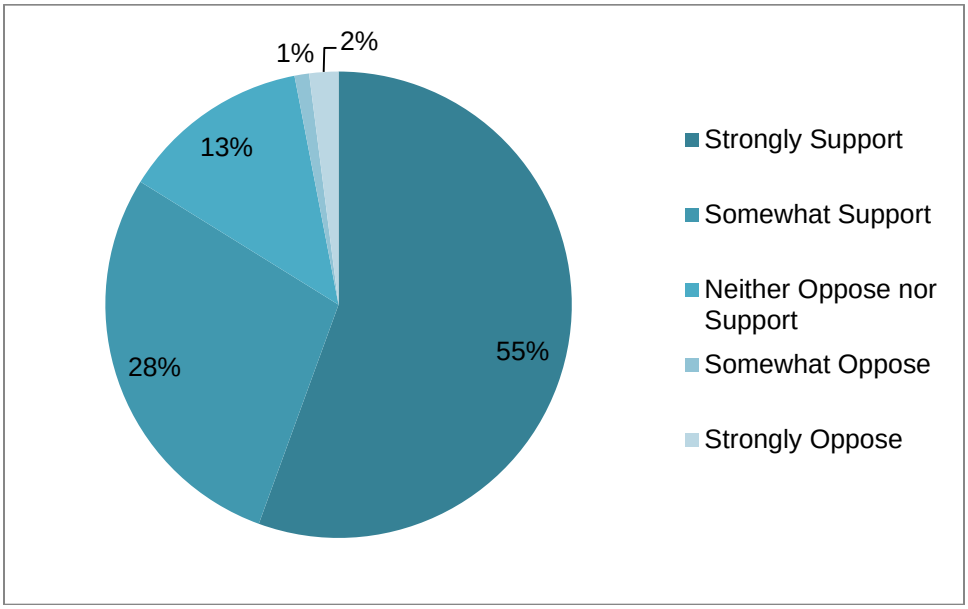

Figure 8.5. *Survey responses to the question: "Implementation of a New Construction Policy to require energy-efficient design"*

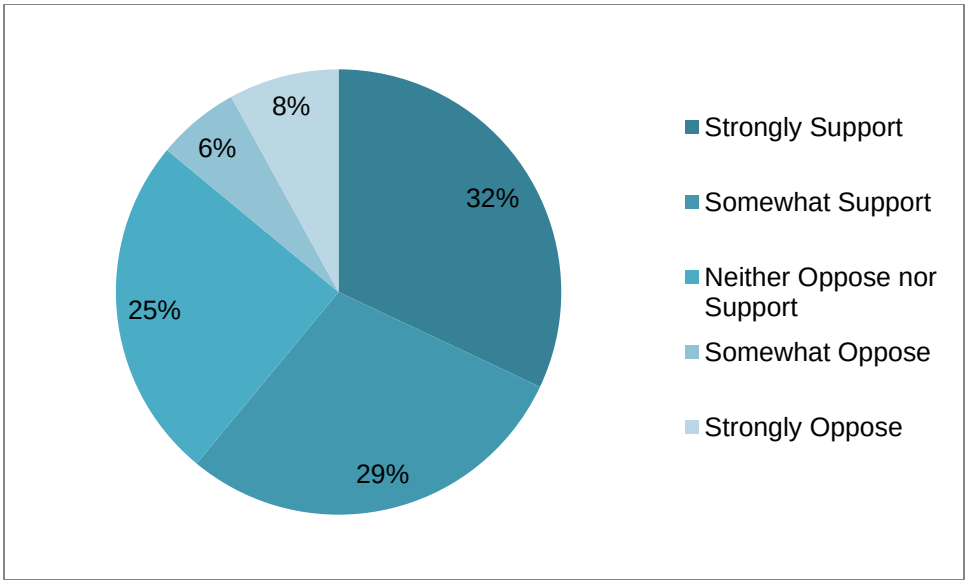

Figure 8.6. *Survey responses to the question: "I want Chapman to take part in national sustainability initiatives (President's Climate Commitment, The Billion Dollar Green Challenge, etc.)"*

8.3 Research

8.3.1 Case Study – University of La Verne

Case studies at universities similar to Chapman are useful tools in further developing sustainability policies and standards. The University of La Verne is a private, not-for-profit, research-focused university located in La Verne, California. La Verne's campus is 26 acres, compared to Chapman's 75 acres, but both are medium sized higher education institutions located in a suburban Southern California environment, with more than 4,000[14] total enrolled students[3].

In 2003, the National Wildlife Federation (NWF) conducted a sustainability assessment of the University of La Verne. The NWF found that the University's Sustainable Campus Task Force's sustainability issues fell into seven categories[17]:

- Energy efficiency
- Water efficiency
- Landscaping
- Transportation
- Recycling and waste reduction
- Reduction toxins
- Environmental lessons

The Sustainable Campus Task Force and students in environmental awareness core classes collected data for the University of La Verne's environmental audit, as well as for a baseline for project progress[17]. The Task Force successfully created a sustainable campus mission statement, collaborated with housing and orientation departments to raise energy and water-saving awareness, and added sustainable general education options in the curriculum[17]. The University also implemented an electricity use policy. In 2010, the National Wildlife Federation published a case study on the University's Greenhouse Gas Inventory. La Verne's 2005 to 2009 greenhouse gas inventory report "quantified the amount of GHG emissions produced

directly/indirectly by the University" in an effort to lower greenhouse gas emissions[18].

As of 2010, the greenhouse gas inventory displayed a decrease in the University's emissions as a result of green practice and energy expenditure changes. La Verne converted a chiller system into a green chiller plant in 2006, which has saved over 368, 141 kWh and $50,000 per year[18]. **Figure 8.11**, directly from the case study, illustrates the decrease in greenhouse gas emissions as a result of energy use reduction and the University's electricity use policy[18]. The emissions will continue to decline as more sustainable practices are implemented. In addition, the University uses this data to track progress as a signatory of the American College and University President's Climate Commitment (ACUPCC).

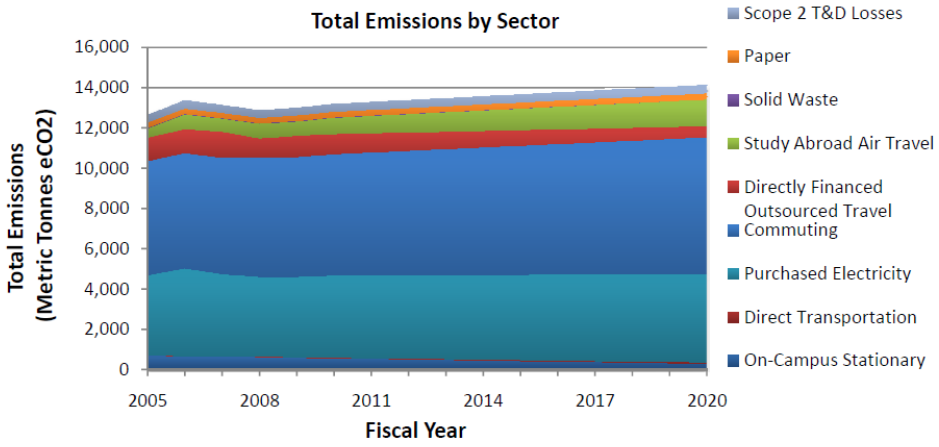

Figure 1. Sectors of emissions sources that contribute to total emissions produced by the University of La Verne. Projections reveal that emissions are expected to increase over the next 10 years if sustainable practices are not implemented.

Figure 8.7. *Directly from the case study.*

8.3.2 National Initiatives

Many U.S. higher education institutions participate in the following distinguished national environmental initiatives:

- American College and University President's Climate Commitment (ACUPCC)
- Billion Dollar Green Challenge
- The Environmental Protection Agency's (EPA) Green Power Partnership

Universities most commonly participate in the American College and University President's Climate Commitment. It aims to "address global climate reduction" by "empowering the higher education sector to educate students and create solutions"[15]. Once presidents or chancellors sign the commitment, the university subsequently consents to[12]:

- Complete an emissions inventory
- Establish milestones and a target date to become climate neutral
- Take immediate steps to reduce greenhouse gas emissions by choosing from a list of short-term actions
- Integrate sustainability into the curriculum and make it part of the educational experience

- Make the action plan, inventory and progress reports publicly available

There are 697 current signatories of the ACUPCC. Local Southern California signatories include: University of California, Irvine, University of La Verne, Loyola Marymount University, and California State University- Fullerton.

Launched in 2011, the Billion Dollar Green Challenge "encourages colleges, universities, and other nonprofit institutions to invest a combined total of one billion dollars in self-managed revolving funds that finance energy efficiency improvements"[16]. These funds invest in energy efficiency projects to reduce energy consumption and reinvest the money saved in future projects. They are called "revolving funds" because "the funds loan money to specific projects, which then repay the loan through an internal account transfer from savings achieved in the institution's utilities budget. Participating institutions will achieve reductions in operating expenses and greenhouse gas emissions, while creating regenerating funds for future projects"[16].

The EPA's Green Power Partnership is a "free, voluntary program that assists organizations with procuring electricity generated from renewable resources" in order to reduce negative environmental impact[9]. The Partnership program's initiatives include:

- College and University Green Power Challenge
- Clean Energy Collaborative Procurement Initiative
- On-site Renewables Challenge

Chapman could easily partake in any of these programs, and would serve to fuel the steady sustainability improvements on campus. The University of La Verne is a current ACUPCC signatory and Billion Dollar Green Challenge participant.

8.4 Concluding Assessment

8.4.1 Low Cost/Effort Recommendation

New Construction Policy

Relatively low cost and effort, as the University would only need to implement the policy into the design phase. Chapman will save money and energy in doing so. In addition, from referencing **Figures 8.2 and 8.5** it is apparent a majority of faculty, staff, and students support this recommendation based on the survey responses. A proposed policy would be as follows:

<u>New Construction Policy</u>

1. Proposal: Creation of a mandatory New Construction Policy in order to require energy-efficient design.

2. Proposed text, modeled after the University of Missouri[7]:

   Sustainable Design

Chapman University recognizes the value of sustainability and energy-efficiency. Chapman's sustainability policy includes accountability of all constituencies to effectively evaluate environmental impacts and commit to sustainable practices. New construction projects will always have a sustainability component. It is required to exercise best management practices at sustainable sites. This includes:

1. Design: approval of optimal energy-efficiency from facilities before beginning building project
2. Compliance: compliance with California building procedural requirements
3. Energy and atmosphere: encourage energy-efficiency and performance
4. Resources: use building-based recycling program and encourage use of locally-produced materials
5. Certification: consider applying the USGBC Leadership in Energy and Environmental Design (LEED) process in project design.

Policy Template

It is highly recommended Chapman University form subsections to the existing sustainability policy. These sections would consist of an energy-use policy, building-use policy, and sustainable purchasing policy. A proposed outline of the policy is as follows; the standards have been modeled after Loyola Marymount University[11]. They are similar to Chapman in location, temperate, size, and values:

Facilities & Building Use Policy

1. Purpose: To reduce Chapman University's energy usage and costs, and encourage a more sustainable campus climate.

2. University-Wide Temperature Policy:
   - Indoor temperature set points in all spaces during occupied periods will be: 71° F in heating mode, and 74° F in cooling mode. These temperatures will be programmed by the Facilities department.
   - More detailed information can be found in Chapter 1 of the Audit.
3. Energy-Saving During Extended Breaks:
   - Residence halls will be closed during extended breaks
4. Sustainable Purchasing:
   - Chapman must follow LEED guidelines, which requires a specific percentage of purchases should be sustainably sourced, recycled and energy efficient.
   - Creating a sustainable purchasing policy is very achievable since many contractors that the university works with, such as Sodexo and Office Solutions already makes several sustainable choices.
   - More information regarding energy and cost-savings benefits of sustainable purchasing can be found in Chapter 2 of the Audit.
5. Lighting:
   - Optimization of natural light through light harvesting in residence halls from the hours of 10am-3pm each day.
   - Two emergency lights will be located in each hallway and room.
   - Specific cost-saving amounts can be found in Chapter 5 of the Audit.

6. Occupant Accountability:
    - Report observations of excessive energy use and concerns to Facilities Management.
    - Utilize power-saving mode on personal computers
    - Exercise best practices such as turning off lights when leaving a room.
    - Remain conscious of water use.

Timeline

Chapman University should implement the policies and pilot the standards from June-August 2015, beginning with two newer, high-volume main campus buildings: Argyros Forum and Beckman Hall. If the Facilities department or University Administration has concerns or editions to make, the low-traffic summer months are a highly beneficial time to do so.

Once fully implemented during the school year (September 2015-May 2016), the electricity use will be tracked for one year through Facilities. There will be an increase in energy savings and costs. The Environmental Science and Policy 2016 graduating cohort will also be able to measure behavioral change and general campus reception as the pilot year comes to a close. Once one year has finished, the next year will include two additional buildings, and so forth.

Benefits of a permanent energy and building use policy, as well as a new construction policy, include:

- No monetary cost and low risk to implement both
- Further improve Chapman's competitive image as a sustainable campus
- Reference, enforcement, management, and organizational purposes. Much of the policy will be modeled after different universities.
- Money saved can be used toward future sustainability projects.

8.4.2 Moderate Cost/Effort Recommendation

Sustainable Class Scheduling Policy

It is strongly recommended Chapman implement sustainable class scheduling standards. To begin this suggestion, this section specifically addresses Argyros Forum, Beckman Hall, Doti Hall, and Marion Knott Studios. These four buildings all have a high volume of students attending classes. The buildings are also newer and are not as equipment-specific as others, such as Leatherby Libraries, with the exception of Marion Knott Studios. However, the building contains ample classroom space.

As addressed in previous chapters of the Audit, a class scheduling policy would decrease an impacted load on Chapman's energy supply. A decrease leads to a lower peak, and therefore less energy and lower energy cost. This decrease can be achieved by scheduling classes during less impacted times, when energy is not being used as frequently or in such high demand. A sustainable class scheduling policy would create a wider variety of class time intervals and greater energy-efficiency with low effort. The only moderate cost would be energy emissions during commute times in order for classes to be scheduled earlier and later in the day.

Figure 8.8 displays class distribution percentages over a one-week period during

the 2012-2013 academic year. Argyros Forum, one of the most populated and widely-used areas on campus, contains over 40% of classes between the hours of 10:00am and 2:00pm. Furthermore, Saturday time intervals for classes are not utilized.

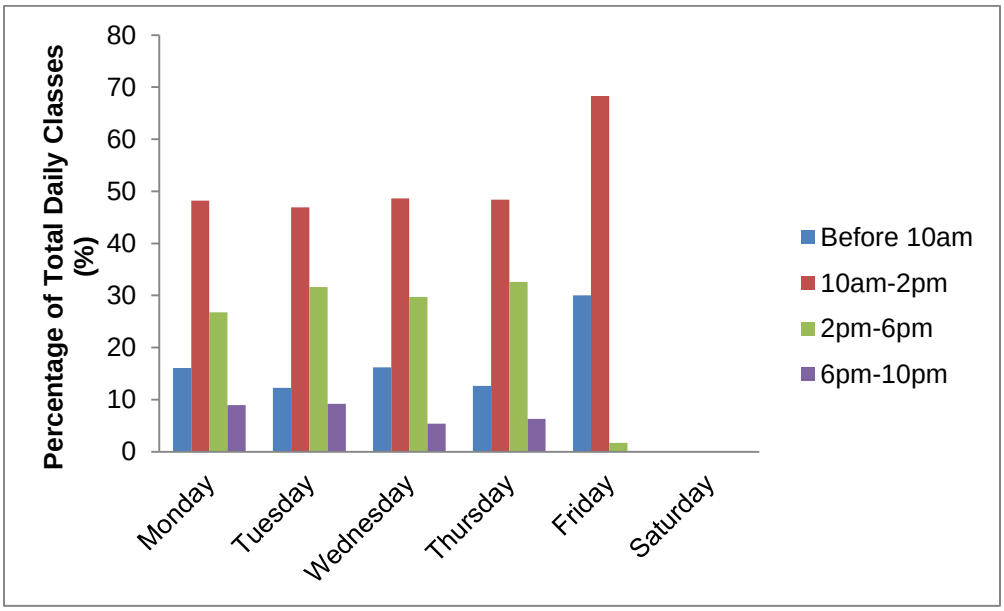

Figure 8.8. *Fall 2012-Spring 2013 Argyros Forum class time interval distribution over a one week period*

Building	Classroom Space (Sqft)
Argyros Forum	13556
Beckman Hall	23345
Marion Knott Studios	6813

Sustainable Class Scheduling Policy

1. Purpose: Reduce energy usage and costs, and promote sustainability
2. Consolidation:
   - Faculty should remain open to teaching a course in a different building in order to save energy
   - Classes which have specific requirements or equipment, such as computer labs or science labs, will be exempt from location changes, but not time changes
3. Interterm and Summer scheduling:
   - More classes should be held in the same building during Interterm and Summer, in order to reduce energy usage
   - Class time intervals will be more evenly spread throughout the week (more balanced hours and days)
   - Building consolidation means less office space for faculty
4. Prime Time[12]:
   - This is from 10:00am-2:00pm, when number of classes is the most heightened

- To address this, departments must ensure a maximum of 50% of their core courses are not scheduled during this time.
- 20% of classes should be scheduled on Fridays for greater energy-efficiency

8.4.3 High Cost/Effort

National Initiatives Participation Recommendation

As a short-term goal, Chapman should become a signatory to the American College and University President's Climate Commitment (ACUPCC). As a long-term goal, the University should focus on the Billion Dollar Green Challenge. The monetary cost and effort is higher, but it is done to place universities at a specific green standard.

The benefits of becoming a Billion Dollar Green Challenge participant[16] include:

- Calculations of GRFs (Green Revolving Funds) as investment options is based on the track records of existing GRFs
- Money saved from energy use reduction can be placed into sustainability projects
- Conservative estimates show that a GRF can earn at least a 20% annual return on investment, which yields "a median annual ROI of 32%—with no losses—for 52 existing green revolving funds"[16]
- Networking and PR benefits from the Green Revolving Investment Tracking System (GRITS), a "web-based platform providing real-time comparative data on performance of GRFs at participating institutions"[16]

8.5 Challenges

Challenges with a classroom scheduling policy include:

- Student organization usage of classes in buildings during the evening
- Commute time and emissions trade-off for adding earlier classes
- Availability; offering classes too early or late may conflict with nonnegotiable schedules
- First-year students are less adjusted to taking early-morning classes and do not perform as well
- Office space constraints
- Changing faculty and growth; keeping departments in same buildings
- Community events rent out campus buildings

8.5.1 Alternative Suggestions

Solutions to challenges include:

- Marketing incentives for people to take early-morning classes, such as parking discounts
- Proposing sharing office spaces during summer and Interterm

- Staggering work schedules

8.6 Future Areas of Research

To address limitations, future areas of research should be dedicated to the following:

- Complete analysis of class scheduling data from the Office of the Registrar
- The documents were created too early on before semesters began, therefore many classes did not yet have assigned buildings or allotted time slots
- As the case study is from recent years, more in-depth research on case studies of private universities in similar climate and model to Chapman with older sustainability policies
- Additional universities comparable to Chapman are: UC Irvine and CSU San Bernadino. They have implemented interim energy policies and class scheduling policies which can be another model for the University to follow.

8.7 Conclusion

Chapman is a small university that can quickly enact change, more so than larger colleges with more stringent requirements. Success would be defined by enforcement of sustainability policy in at least two main campus buildings, enactment of class scheduling standards during one summer session, and implementation of a new construction policy to require energy-efficient design. Lastly, the money saved from energy reduction can be used towards future sustainability projects.

8.8 Contacts

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8.9 Appendices

*Percentages derived from dividing Count by total number of participants, and multiplying the result by 100.

Figure 8.1

On a five-point scale, to what degree would you support the following sustainable measures at Chapman University? [Implementation of an energy use policy at Chapman]		
Answer	**Count**	**Percentage**
Strongly Oppose	8	1.86%
Somewhat Oppose	18	4.19%

Neither Oppose nor Support	80	18.60%
Somewhat Support	116	26.98%
Strongly Support	208	48.37%
No answer	0	0.00%
Non completed	0	0.00%

Figure 8.2

On a five-point scale, to what degree would you support the following sustainable measures at Chapman University? [Implementation of a New Construction Policy to require energy-efficient design]		
Answer	**Count**	**Percentage**
Strongly Oppose	6	1.40%
Somewhat Oppose	6	1.40%
Neither Oppose nor Support	54	12.56%
Somewhat Support	123	28.60%
Strongly Support	241	56.05%
No answer	0	0.00%
Non completed	0	0.00%

Figure 8.3

On a five-point scale, to what degree do you agree with the following? [I want Chapman to take part in national sustainability initiatives (President's Climate Commitment, The Billion Dollar Green Challenge, etc.)]		
Answer	**Count**	**Percentage**
Strongly Oppose	21	4.88%
Somewhat Oppose	20	4.65%
Neither Oppose nor Support	91	21.16%
Somewhat Support	129	30.00%
Strongly Support	169	39.30%
No answer	0	0.00%
Non completed	0	0.00%

Figure 8.4

On a five-point scale, to what degree would you support the following sustainable measures at Chapman University? [Implementation of an energy use policy at Chapman]		
Answer	**Count**	**Percentage**
Strongly Oppose	4	1.41%
Somewhat Oppose	16	5.65%
Neither Oppose nor Support	43	15.19%
Somewhat Support	93	32.86%

Strongly Support	127	44.88%
No answer	0	0.00%
Non completed	0	0.00%

Figure 8.5

On a five-point scale, to what degree would you support the following sustainable measures at Chapman University? [Implementation of a New Construction Policy to require energy-efficient design]		
Answer	**Count**	**Percentage**
Strongly Oppose	6	2.12%
Somewhat Oppose	4	1.41%
Neither Oppose nor Support	37	13.07%
Somewhat Support	80	28.27%
Strongly Support	156	55.12%
No answer	0	0.00%
Non completed	0	0.00%

Figure 8.6

Field summary for F5.2(6):		
On a five-point scale, to what degree do you agree with the following? [I want Chapman to take part in national sustainability initiatives (President's Climate Commitment, The Billion Dollar Green Challenge, etc.)]		
Answer	**Count**	**Percentage**
Strongly Oppose	23	8.13%
Somewhat Oppose	17	6.01%
Neither Oppose nor Support	70	24.73%
Somewhat Support	82	28.98%
Strongly Support	91	32.16%
No answer	0	0.00%
Non completed	0	0.00%