



## **An Analysis of the Sustainability Efforts of the Centro Cultural Costarricense-Norteamericano**

An Interactive Qualifying Project  
Submitted to the Faculty of  
WORCESTER POLYTECHNIC INSTITUTE  
in partial fulfillment of the requirements for the  
Degree of Bachelor of Science

by  
Cameron Henchy, Carina Kennedy  
Monét Norales, Timothy Ryan

Date:  
6 March 2020

Report Submitted to:

Señora Lilly Sevilla and Señor Carlos Cortés  
*Centro Cultural Costarricense-Norteamericano*

Professors James Chiarelli and Darko Volkov  
*Worcester Polytechnic Institute*

*This report represents work of WPI undergraduate students submitted to the faculty as evidence of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review. For more information about the projects program at WPI, see <https://www.wpi.edu/Academics/Projects>*

# **Abstract**

The Centro Cultural Costarricense-Norteamericano (CCCN) is working to revamp their previous Get Green Campaign to obtain a Carbon Footprint Certification. Through interviews and surveys, the opinions of the students and faculty were obtained on their campus's efforts with the Get Green Campaign. Our team then created a recommendations report to help the CCCN implement sustainable habits and broadcast the campaign throughout the campuses. These recommendations explained how to offer recycling options, informational sessions and encourage sustainable habits.

# Acknowledgements

We would like to thank the Centro Cultural Costarricense-Norteamericano for providing us the opportunity to work with them on this project. We would like to thank the following members of the Centro Cultural Costarricense-Norteamericano for their cooperation and support of our project: Señora Lilly Sevilla Gamboa, Señor Carlos Rodolfo Cortes, Señora Sonia Salas Abarca, and Señor Guillermo Madriz. Additionally, we would like to thank all other individuals that were interviewed and surveyed for their cooperation and participation with us and our project. We would also like to thank our advisors Professor James A. Chiarelli and Professor Darko Volkov for their generous guidance and assistance throughout this project. Without the aforementioned individuals' support, participation and cooperation, we would not have been able to make this possible.

# **Executive Summary**

## **Purpose**

The Centro Cultural Costarricense-Norteamericano (CCCN) implemented a Get Green Campaign in 2013. After a couple of years, this campaign gradually diminished due to the absence of a manager. As a result, the Get Green Campaign found it difficult to find motivation and new initiatives to implement. The CCCN decided to task our group with the revamping of the Get Green Campaign. This revamp consisted of finding new initiatives to implement at the CCCN that would help to reduce the greenhouse gases emitted by the center, as well as other sustainable efforts, which will ultimately help the Centro Cultural obtain a Carbon Footprint Certification.

## **Goals, Objectives, & Methodology**

The goal of this project was to create a cohesive program plan for the Get Green initiative, along with helping the CCCN attain a Carbon Footprint Certification. As our project evolved, it became clear that our main focus was the Get Green Initiative.

Our objective was to analyze the CCCN to discover what can be done to decrease its environmental impact. This includes both decreasing the waste produced by the CCCN and decreasing the carbon footprint of the CCCN.

Our methodology for discovering solutions that the CCCN could implement to decrease their environmental impact consisted largely of in-person interviews with members of different departments along with the distribution of anonymous surveys to both students and faculty. These interviews and surveys asked questions relating to the most common source of waste, what has already been done to help the CCCN become more sustainable, and what more can be done.

## **Results & Analysis**

From the surveys of the employees, 81 out of 210 (38.57%) responded. Many individuals knew of the Get Green Program and some of the initiatives in previous years. The employees are informed more about the program compared to the students. The students lacked knowledge of the Get Green Program, as 90.1% of students did not know about the Get Green Program. This observation is understandable, as there has been more emphasis on the employees to practice sustainable actions such as recycling. However, the CCCN has not expressed to the environmentally conscious.

From the surveys of the students, 668 out of 3804 (17.56%) responded and most were unaware of the Get Green Program as well as any initiatives that were done or put in place excluding the recycle bins. The students were given an opportunity in the survey to propose some ideas that the CCCN could implement to become more environmentally conscious. Most students that responded to the question had no knowledge of the proper procedures for recycling, as well. The student responses expressed a need for the CCCN to inform the student population that attends the organization about the Get Green Program and the actions and behaviors that are promoted by it.

In total, eight department interviews were conducted. Overall, each faculty member was extremely enthusiastic about the idea of participating in a committee for the Get Green Program. However, some were more interested in supporting the program than participating in a committee due to a lack of time and ability to dedicate a portion of their schedule to it. Additionally, it was expressed that paper was the biggest form of waste for each department that was interviewed. Each department has already successfully limited the use of paper and the amount of wasted paper by

converting most documents to online versions and only retaining physical copies of documents for legal purposes and requirements that are enforced by law.

## **Recommendations & Conclusions**

Based on our research, we created a recommendation report that can be seen in Appendix F. These recommendations include the continuation of initiatives such as the implementation of solar panels among all campuses and easily accessible recycling bins. Some new short-term recommendations for the CCCN include creating awareness through posters and infographics, as well as limiting paper in every department, and the creation of a Get Green committee. According to many of the employee interviews, it is very reasonable and would be effective to create a Get Green Campaign committee. This committee would consist of volunteers from varying departments across the campuses that would work together to educate the CCCN community about sustainable practices and provide information about different sustainability projects within the CCCN.

## Division of Labor:

Section	Writing
<b>Abstract</b>	Carina
<b>Acknowledgements</b>	Carina, Monét, Timothy
<b>Executive Summary</b>	All
<b>Chapter One: Introduction</b>	All
<b>Chapter Two: Background</b>	
Effects of Global Warming	Timothy
Carbon Neutrality	Carina, Monét
Carbon Footprint Certification	Timothy, Monét
Recycling: What Happens to Recycled Materials?	Monét
Why Is Recycling So Important?	Timothy
Correlation	Carina, Monét
Composting	Timothy
Current Sustainability Status of Costa Rica and the CCCN	All
<b>Chapter Three: Methodology</b>	
Goals	Monét
Objectives	Cameron, Monét
Previous Efforts	Carina, Timothy
Understanding	Monét
Initial Plans for Greenhouse Gas Emission Reduction and Sustainability	Cameron
Obtaining a Carbon Footprint Certification	Carina
<b>Chapter Four: Findings and Analysis</b>	
Survey Results	Cameron, Carina, Timothy
Findings	Cameron
Notable Data Results	Cameron, Timothy
Conclusion of Results	Timothy
Interview Results	Carina
<b>Chapter Five: Deliverables and Recommendations</b>	
Recommendations	Cameron, Monét
Short Term	Cameron
Long Term	Cameron
Deliverables	Cameron
<b>Chapter Six: Conclusion</b>	
Conclusion	Cameron
Future Projects / Goals for the CCCN	Timothy
<b>References</b>	All
<b>Appendix</b>	All

\*All editing was completed collaboratively

# Table of Contents:

<b>Abstract</b>	i
<b>Acknowledgements</b>	ii
<b>Executive Summary</b>	iii
<b>Purpose</b>	iii
<b>Goals, Objectives, &amp; Methodology</b>	iii
<b>Results &amp; Analysis</b>	iv
<b>Recommendations &amp; Conclusions</b>	v
<b>Division of Labor:</b>	vi
<b>Table of Contents:</b>	vii
<b>List of Figures:</b>	ix
<b>List of Tables:</b>	x
<b>Chapter 1: Introduction</b>	1
<b>Chapter 2: Background/Literature Review</b>	4
<b>2.1 Effects of Global Warming</b>	4
<b>2.2 Carbon Neutrality</b>	5
<b>2.3 Carbon Footprint Certification</b>	5
<b>2.4 Recycling: What Happens to Recycled Materials?</b>	8
<b>2.5 Why Is Recycling So Important?</b>	11
<b>2.5.1 Correlation</b>	11
<b>2.6 Composting</b>	12
<b>2.7 Current Sustainability Status of Costa Rica and the CCCN</b>	16
<b>Chapter 3: Methodology</b>	19
<b>3.1 Objectives</b>	19
<b>3.2 Previous Efforts</b>	21
<b>3.3 Understanding</b>	23
<b>3.4 Initial Plans for Greenhouse Gas Emission Reduction and Sustainability</b>	24
<b>3.5 Obtaining a Carbon Footprint Certification</b>	26
<b>Chapter 4: Findings and Analysis</b>	29
<b>4.1 Survey Results</b>	29
<b>4.2 Notable Data Results:</b>	30
<b>4.3 Conclusion of Results</b>	40
<b>4.4 Interview Results</b>	41



<b>Chapter 5: Deliverables and Recommendations.</b>	43
<b>5.1 Short Term Recommendations</b>	43
<b>5.2 Long Term Recommendations</b>	45
<b>5.3 Deliverables</b>	46
<b>Chapter 6: Conclusion</b>	48
<b>References</b>	52
<b>Appendix</b>	59
<b>Appendix A: Employee Interview Questions</b>	59
<b>Appendix A.1: Employee Interview Questions: English</b>	59
<b>Appendix A.2: Employee Interview Questions: Spanish</b>	60
<b>Appendix B: Transcribed Interviews</b>	61
<b>Appendix B.1: Interview 1: Academic Department</b>	61
<b>Appendix B.2: Interview 2: Executive Board</b>	64
<b>Appendix B.3: Interview 3: Finance, Accounting, General Services Departments</b>	67
<b>Appendix B.4: Interview 4: Human Resources Department</b>	72
<b>Appendix B.5: Interview 5: Cultural Department</b>	76
<b>Appendix B.6: Interview 6: Maintenance and Supplies Department</b>	78
<b>Appendix B.7: Interview 7: Marketing Department</b>	81
<b>Appendix B.8: Interview 8: Administrative Department</b>	85
<b>Appendix C: Survey Questions</b>	87
<b>Appendix C.1: Student Survey Questions: English</b>	87
<b>Appendix C.2: Student Survey Questions: Spanish</b>	89
<b>Appendix C.3: Student Survey Results</b>	92
<b>Appendix C.4: Employee Survey Questions: English</b>	101
<b>Appendix C.5: Employee Survey Questions: Spanish</b>	103
<b>Appendix C.6: Employee Survey Results</b>	106
<b>Appendix D: Sample Purchasing Policy Guidelines</b>	119
<b>Appendix E: Recycling Certification Example</b>	121
<b>Appendix F: Recommendations Deliverable</b>	122

## **List of Figures:**

<b>Figure 1: Compost Bin</b>	<b>15</b>
<b>Figure 2: Student Survey Results to the Question “How Old Are You?”</b>	<b>30</b>
<b>Figure 3: Student and Employee Survey Results to the Question “How Far is Your Commute To and From the CCCN?”</b>	<b>31</b>
<b>Figure 4: Student and Employee Survey Results to the Question “How Do You Travel To the CCCN?”</b>	<b>32</b>
<b>Figure 5: Student and Employee Survey Results to the Question “Do You Know About the CCCN’s Get Green Program?”</b>	<b>33</b>
<b>Figure 6: Student and Employee Survey Results to the Question “How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”</b>	<b>34</b>
<b>Figure 7: Recycling Bins at the CCCN San Pedro Campus</b>	<b>35</b>
<b>Figure 8: Student and Employee Survey Results to the Question “Do You Know the CCCN’s Guidelines About What Can and Cannot be Recycled?”</b>	<b>35</b>
<b>Figure 9: Student and Employee Survey Results to the Question “What Material Do You Recycle Most Often at the CCCN?”</b>	<b>36</b>
<b>Figure 10: Student and Employee Survey Results to the Question “Do You Know Where the Garbage and Recycling Go After Throwing It Away?”</b>	<b>37</b>
<b>Figure 11: Sample Posters Produced in Collaboration With CCCN Marketing Team</b>	<b>44</b>

## **List of Tables:**

<b>Table 1: Materials That Can Be Composted</b>	<b>13</b>
<b>Table 2: Materials That Cannot Be Composted</b>	<b>14</b>
<b>Table 3: WPI Sustainability Plan points applicable to CCCN</b>	<b>20</b>

## Chapter 1: Introduction

With the start of the Industrial Revolution in the late eighteenth century, it also began the ongoing trend of disrupting the natural ecosystems of the Earth on a monumental scale. However, it was not known at the time that the consumption of natural resources at this new ever-increasing rate would lead to devastating effects such as the rise of global temperatures and deforestation. It is even estimated that by 2050, there will be more plastic in the oceans than there will be fish (Jambeck et al., 2015). Fortunately, there are countries that are leading the change in environmental sustainability, showing that the modern way of living does not have to come at the cost of nature's health, beauty, and its inhabitants.

The rise of global temperatures is also known as global warming. The heat from the sun's radiation is contained in the atmosphere with the assistance of "greenhouse gases." These greenhouse gases, including carbon dioxide, as well as water vapor and methane, maintain the earth's atmospheric temperature. However, when the amount of greenhouse gases greatly increases, they can be extremely detrimental to life on Earth. These gasses eventually cause the average temperature of Earth to increase. Exposure to prolonged periods of increased temperatures have negative implications for the environment, such as the melting of the ice near the poles, as well as for the living beings in specific areas such as these that must maintain steady internal body temperatures (Anderson, 2011). Trends in the previous years can be used to analyze the effects of the rising global temperature. Scientists have also predicted the future effects of global warming, such as "...increased frequency, intensity, and duration of heatwaves in cities that currently experience them" in North America as well as a decrease in biodiversity in Latin America (USGS, n.d.).

Due to the rising concern of global warming, there has been an increased effort in many parts of the world to try to decrease the amount of carbon released into the atmosphere. In 2007, according to the Harvard University Center for the Environment, Costa Rica declared its goal to be the first carbon-neutral nation by the year 2021 (Harvard University Center for the Environment, 2008). To be carbon neutral means to emit a net value of zero carbon emissions. Methods of becoming carbon neutral include emissions reductions in various fields including energy, transportation, and tourism.

Costa Rica has been making great strides to become more sustainable. Beginning in the 1980s, Costa Rica implemented a reforestation effort that increased the country's forest cover from 21 percent to 51 percent in just twenty years (Mora, 2007). This program has made Costa Rica the only tropical country to reduce the rate of deforestation as a result of the increased rate of reforestation. This "reforestation" of the Costa Rican land essentially decreases the amount of carbon dioxide in the atmosphere. As previously mentioned, carbon dioxide is a greenhouse gas that traps heat in Earth's atmosphere. As trees grow, they absorb that carbon dioxide, removing it from the atmosphere.

Although the government plays an important role in obtaining carbon neutrality, community leaders are equally as instrumental in the effort. This is why the Centro Cultural Costarricense-Norteamericano (CCCN) wants to create a cohesive plan to achieve a Carbon Footprint Certification and reduce their environmental impact. The CCCN, established in 1945, provides educational and cultural programs to foster the relationship between the United States and Costa Rica. The CCCN strives to be one of the leaders in providing additional resources about the English language, as well as promoting intercultural experiences. The CCCN has recently switched to solar energy in an effort to reduce their carbon footprint, along with switching to highly efficient toilets and timed sinks in their bathrooms, greatly reducing their water consumption. The

CCCN has established a few other initiatives, though not as impactful as what they desire for the long-term success of the program. Their goal is to analyze these initiatives and establish "...a more cohesive plan" in an effort to decrease their negative impact on the environment.

The CCCN has tasked our team with the development of a Get Green institutional initiative that can be implemented in their San Pedro branch, and later across all of their other four campuses in San Jose. The purpose of the Get Green Program Design Project is to develop a plan for decreasing the carbon footprint in Costa Rica. The main objective is to devise a way of defining a 'social responsibility strategy' and revamp past initiatives to 'achieve a Carbon Footprint Certification'. The final goal is to be able to implement the Get Green Program across campuses to increase its effectiveness and continue the program of minimizing the environmental impacts produced by the CCCN as an organization.

To devise a well-thought-out and cohesive plan and program, we first needed to assess what the CCCN is currently doing to reduce their environmental impact. Additionally, we needed to know what the CCCN is consuming and producing to properly analyze their environmental impact. All of this information will be necessary so that we can create an effective, impactful, sustainable, and implementable plan within the time frame we are given.

The first action that must be taken is to analyze the current sustainability status of the CCCN. The most common activities which result in carbon emissions include transportation of people and goods to the organization, use of electricity for day to day processes, and the consumption of goods which have their own carbon footprint due to how they were manufactured. The main goal of the CCCN in regard to this project is to establish an outline for social responsibility in maintaining carbon neutral operation and recommend a Carbon Footprint Certification organization. The previous initiatives to become carbon neutral will be analyzed, re-introduced, and built upon.

## **Chapter 2: Background/Literature Review**

### **2.1 Effects of Global Warming**

The air above land typically heats up faster than that above the oceans. Since the Northern Hemisphere includes more than 60% of the Earth's land, it is increasing in temperature much more rapidly than the Southern Hemisphere. The melting of the Arctic ice is essentially speeding up the process of its melting, which is creating a positive feedback loop with a possibly disastrous end. The ice coverage in Earth's oceans counteracts the effect of greenhouse gases in a way. Greenhouse gases trap the heat from the Sun's radiation in the atmosphere, while the ice caps reflect some of this solar radiation into the atmosphere, with some of it being sent back to space, preventing it from being caught in the Earth's atmosphere and causing the air temperature to increase. Global warming is also expected to affect precipitation patterns. This does not necessarily translate to increased rainfall throughout the world, but rather increased rainfall in certain areas and decreased rainfall in other areas. This may lead to droughts that will be detrimental to areas that rely on farming and also overall a more intense water cycle with enhanced evaporation and precipitation. A food shortage could occur in places susceptible to droughts or flooding, having a serious negative impact on the human population (Anderson, 2011).

Major contributors to global warming are energy intensive industries, the transportation sector, but also consumers since they may push for unsustainable growth [citation needed]. This relationship leads to a disregard for their long-term impact on the environment on behalf of said industry. While many companies have implemented some forms of filtering substances that are released as a result of industrial processes, they are still contributing to the production of waste, pollution, and greenhouse gasses.

## **2.2 Carbon Neutrality**

Carbon neutrality is defined as an operation or activity that results in net zero carbon dioxide emissions. There are multiple ways this can be achieved. One method is to eliminate or reduce current carbon dioxide emissions. Another way is to offset the emissions by investing in carbon offset programs. An organization can work to eliminate their carbon emissions by becoming paperless, turn off the lights and unplug electronics and even travel in cars and airplanes less. It is very hard to immediately eliminate an organization's carbon emissions. As a result, offsetting carbon emissions is often an organizations first step to carbon neutrality. Recycling, reforestation and renewable energy sources including wind turbines and photovoltaic solar panels are all ways to offset one's carbon emissions (Schmidt, 2009). Costa Rica already practices many of these offsetting techniques. As mentioned in Chapter One, Costa Rica has previously invested in a reforestation program through which the nation increased its forest cover by approximately 30% (Mora, 2007). This reforestation has allowed for more consumption of carbon dioxide which ultimately offsets the carbon emissions. The Centro Cultural Costarricense-Norteamericano has also installed solar panels as a means of producing clean electricity. Such actions help offset and reduce an organization's carbon emissions.

## **2.3 Carbon Footprint Certification**

A carbon footprint measures and evaluates the total greenhouse gas emissions released by an institution. A Carbon Footprint Certification is an assurance that the measured carbon footprint of the institution in question is accurate. Knowing the institution's carbon footprint will be beneficial to the CCCN for multiple reasons. Firstly, it reveals their environmental impact to themselves and to the community in which they are trying to set an example. Secondly, knowing your carbon footprint is the first step in reducing a carbon footprint. Since the report will give



information on not only the amount of carbon emissions but also the processes that are producing them, specific problem areas can be identified and improved upon.

To obtain an accurate Carbon Footprint Certification, a greenhouse gas (GHG) contractor can be utilized. According to the PRNewswire on April 16<sup>th</sup>, 2013, the SCS Global Services, a GHG contractor based out of California, has been authorized by the Costa Rican government to provide Costa Rican organizations and businesses with Carbon Footprint Certifications (SCS Global Services, 2013). Through the measurement of carbon emissions, the government or organization can evaluate where the highest emissions are and how to reduce or offset such emissions. The benefit of obtaining a Carbon Footprint Certification is the ability to express to consumers that the given organization practices clean habits regarding greenhouse gases and has limited its impact on the environment. Additionally, it provides tangible evidence in support of the greater goal of attaining total carbon neutrality for the country of Costa Rica.

Various programs have been implemented to assist the Costa Rica government in achieving such an ambitious goal of becoming the first carbon neutral nation within the next century. These programs exhibit a variety of skills and assets to help different organizations. Established in 2007, the Estrategia Nacional de Cambio Climático (National Strategy for Climate Change), or the ENCC, has been the basis for creating a national strategy to decrease Costa Rica's effect on the environment (Nationally Appropriate Mitigation Actions, n.d.). The ENCC focuses on two roles: mitigation and adaptation. In addition to these two main roles, they are also involved in the "...measurement; capability development and technological transfer; public awareness, education and cultural exchange; and financing." (Nationally Appropriate Mitigation Actions, n.d.).

According to the Cambridge Dictionary, mitigation is defined as reducing the negative effect that one thing has may have on something else (Cambridge Dictionary, 2020). In the

situation defined throughout this report, Costa Rica is attempting to mitigate the effect of carbon emissions on the environment to reduce the severity of climate change. While the nation of Costa Rica cannot eliminate the threat of climate change for every other country, they can set an example for others to follow. The ultimate goal of mitigation for the ENCC is to reduce greenhouse gas emissions in a variety of ways such as switching to cleaner energy sources, creating public awareness of the threat of climate change and through the use of offsetting carbon emissions via reforestation. However, the Estrategia Nacional de Cambio Climático is not the only national program attempting to contribute to the reduction of carbon emissions.

The Programa País was established in 2012 by the Ministry of Environment and Energy (MINAE). It is a voluntary program that enables organizations such as the CCCN to obtain a Carbon Neutral Certification through the Costa Rican government. Carbon Neutral Certifications are different from Carbon Footprint Certifications, as a Carbon Neutral Certification is granted to organizations that exhibit zero net carbon emissions, while a Carbon Footprint Certification simply details and verifies the number of carbon emissions by an organization or business. Only twenty-two organizations (companies, businesses, etc.) have received such a certification. To achieve a Carbon Neutral Certification, the organization must first submit an emissions assessment based on given standards. The organization must determine its carbon footprint through a Carbon Footprint Certification, develop a plan to reduce carbon emissions, as well as offset the remaining emissions (Nationally Appropriate Mitigation Actions, n.d.). Companies such as SCS Global Services, based out of California, can provide a Carbon Footprint Certification detailing the amount of emissions and offsets, also known as its carbon footprint (SCS Global Services, 2013).

Regarding offsetting carbon emissions the Programa País allows organizations that cannot reduce specific emissions due to financial constraints to invest in other programs such as the

National Forestry Finance Fund (FONAFIFO). Most of the given standards that must be followed are based on National INTE 12-01-06:2011, which stems from ISO 14064 and ISO 14065. The International Organization for Standardization (ISO) is a worldwide organization that drafts, votes on and implements international standards through the use of various committees. The ISO 14064 is divided into three subsections: ISO 14064-1, ISO 14064-2 and ISO 14064-3. ISO 14064-1 provides guidelines for quantifying greenhouse gas emissions and offsets at the corporate level. It also outlines how these quantities should be officially reported. ISO 14064-2 is similar to ISO 14064-1, only at the project level. ISO 14064-2 outlines greenhouse gas projects such as identifying and selecting sources, as well as a guideline for reporting greenhouse gas emissions.

While ISO 14064-1 and ISO 14064-2 were based on guidelines for quantifying greenhouse gas emissions, ISO 14064-3 provides an outline for the verification process for GHG (greenhouse gas) emissions. Upon completion of a GHG emissions assessment following ISO 14064, the given organization must comply with ISO standard ISO 14065. This standard enables organizations to receive a valid assessment which can be used in the future to receive a Carbon Footprint Certification, or other certifications such as the Carbon Footprint Certification.

## **2.4 Recycling: What Happens to Recycled Materials?**

When materials are recycled, they are collected, cleaned, broken down, and made into new materials. This is done in the effort to produce new products from old ones, conserving energy and resources (PennState, 2018).

Glass materials are taken to a glass treatment plant where it is sorted by color and washed to remove residues or contaminants. It is then crushed and re-melted to be used in the production of new bottles, jars, or other objects that could be used for many purposes such as decoration or

brick manufacturing. Once reformed, it is sent back to stores to be sold and used again. Because glass does not degrade, it can be continuously recycled (GuidesNetwork, 2020a).

Paper is taken from recycling bins and is brought to a recycling plant. Within the recycling plant, the paper is separated into multiple types. Once the paper is sorted and separated, it is washed with water and a few chemicals to remove the inks, plastic films, staples, glue, and other substances that may be found in paper products. It is heated, chopped and mixed thoroughly until it is a semi liquefied and semi fibrous consistency referred to as 'pulp'. The pulp is spread into thin sheets. They are left to dry and are then rolled up. These sheets can then be made into many new and different paper products such as newspaper, cardboard, or printer paper (GuidesNetwork, 2020b).

Recycled metal has four main processing steps. First, the metal must be collected and sorted into different trucks that can transport it to be processed. Second, the metal must be crushed and shredded so that it can be put onto the conveyor belts. These conveyor belts take the metal to hammer mills which are used to break down the metal until it is in small pieces about the size of a hand. After the metal is reduced in size, it is separated into two groups, non-ferrous meaning "not containing iron" and ferrous meaning "contains iron", using magnetic drums. Then paint and other materials are removed by blowing hot air and creating a vacuum that removes all non-metallic substances. Finally, the cleaned scrap metal is melted in a furnace. "The furnaces have fuel-efficient regenerative burners to reduce the amount of energy used and the impact on the environment" (Carri, 2020). The molten metal is stirred to ensure a constant even temperature and to enable circulation within the furnace. The metal is purified using an "Eddy Current" before being cooled. After being cooled, they are sent to mills to be rolled into sheets and sold to places such as aluminum can factories or other factories creating products from metal (Carri, 2015).

Plastic is recycled in many steps. The plastic is sorted, washed, shredded, classified, and melted. Two popular ways of recycling plastic after melting it down are heat compression and monomerization. Heat compression consists of putting any uncleaned, unsorted plastics into a big churner and packing them together.

The process of monomerizing plastics is much more complicated and has the plastics sorted by type so that they can be shredded properly. They are washed to remove the adhesives and labels that may remain to improve the quality of the plastic moving forward. Once washed, the plastic is shredded into little pellets to be used in other plastic product production. The classification consists of testing the pellets to ascertain their quality and type before being melted down, treated by a reverse polymerization reaction and purified to begin the process of forming other products.

Benefits of recycling plastic include conservation of energy and natural resources, clears landfill space, and increase the production of plastic and take care of the environment. Because there are so many products that are manufactured using plastic, recycling that plastic allows for more to be produced using less raw materials which helps the manufacturing companies as well as the environment. Recycling plastic allows for less energy to be used when constructing products from raw materials. It decreases the amount of plastic that is transported to landfills and also decreases the number of toxic fumes that are released from waste that is decomposing while mixed with plastic materials. These fumes can lead to skin and lung diseases due to their level of toxicity (Compactor Management Company, 2019).

Ninety-five percent of the energy expended producing new aluminum cans can be saved through the recycling of used cans. Ultimately, the energy expended in the process of recycling metal is less than the energy expended in the production of new metal. Recycling steel and tin saves 60-74% of energy trying to form objects out of the raw materials. Recycling paper saves

approximately 60% of energy. Recycling plastic and glass saves about 33% compared to producing raw or virgin materials (Howard, 2018).

## **2.5 Why Is Recycling So Important?**

Recycling products that are organic or contain food waste such as bottles and containers reduce the amount of waste in landfills. This is significant because landfills experience a process called anaerobic decomposition. According to the United States Environmental Protection Agency (EPA), anaerobic decomposition, also known as anaerobic digestion, occurs in organic materials only. In this instance, organic refers to materials made of plants or animals, including food products. Anaerobic decomposition occurs when “...microorganisms [such as bacteria and archaea] break down organic materials” (United States Environmental Protection Agency, 2018). Anaerobic decomposition is ultimately beneficial in reducing the physical quantity of organic materials in landfills. However, anaerobic decomposition is not entirely beneficial. One of the byproducts of this process is various biogases, including carbon dioxide and methane. As previously mentioned, carbon dioxide and methane are greenhouse gases in the Earth’s atmosphere that contribute to the maintenance of our atmosphere, yet an abundance can cause global warming.

### **2.5.1 Correlation**

Recycling is vital to becoming carbon neutral. By recycling, an organization helps to offset its carbon emissions since the material they are recycling can be remade into a new and usable version of the same item. Creating an item from recycled material produces much fewer carbon emissions than creating that same item from its original raw materials. This helps to reduce greenhouse gas emissions and therefore reduce pollution in the environment. On top of that, recycling also helps to reduce the amount of waste in landfills and the number of fossil fuels used

in the production of products. Recycling is often used to engage a community and create an easy way to be involved in a common goal of becoming more sustainable and carbon neutral.

## **2.6 Composting**

Composting is the act of exposing organic materials, mostly food waste and manure, to beneficial microbes such as fungi and bacteria. The microbes break down the waste as it becomes nutrient-rich material that is often used in farming as fertilizer (United States Environmental Protection Agency, 2019). However, the use of composted material is not limited to farming. According to Ed Bernhardt of the *Tico Times* in 2014, spraying compost can be used to protect plants and trees from disease, as well as decrease the odors and flies on farms that have animals. If the Centro Cultural Costarricense-Norteamericano develops a rooftop garden, the compost could be used as fertilizer, eliminating the need for chemical fertilizers, contributing to the overall sustainability of the CCCN. Composting would be beneficial to the Centro Cultural Costarricense-Norteamericano in reducing the organic material that is deposited at landfills. This organic material could then be utilized in other ways such as food for livestock or fertilizer for plant growth (Bernhardt, 2014). However, two problems arise when composting at the CCCN: what materials can be composted and what cannot, and where can these products undergo the process of composting.

The first problem is dependent on the education of the employees and students of the CCCN. If those individuals know what materials can be composted, the operation will run smoothly. However, if materials are composted that should instead be thrown away or recycled, problems could arise. The United States Environmental Protection Agency (EPA) provides a detailed list of materials that can and cannot be composted (United States Environmental

Protection Agency, 2019). To understand the items on these lists, the complex process of composting must first be analyzed.

According to the EPA in 2019, composting requires three components: browns, greens, and water. The “browns” include dead plant life such as fallen leaves and branches. The “greens” are most of the materials that will be thrown away into the composting bin. Finally, water is introduced into the compost pile to moisturize it and break down the organic materials. The purpose of the aforementioned products are as follows: “The brown materials provide carbon for your compost, the green materials provide nitrogen, and the water provides moisture to help break down the organic matter” (United States Environmental Protection Agency, 2019). The desired ratio of brown material to green material is 1:1. It is essential that those composting understand the materials that can be composted. According to the EPA website, the following materials can be composted. The materials in red indicate their existence within the CCCN San Pedro campus:

<b>Table 1: Materials That Can Be Composted</b>	
<ul style="list-style-type: none"> <li>● Fruits and vegetables</li> <li>● Eggshells</li> <li>● Coffee grounds and filters</li> <li>● Tea bags</li> <li>● Nut shells</li> <li>● Shredded newspaper</li> <li>● Cardboard</li> <li>● Paper</li> <li>● Dryer and vacuum cleaner lint</li> <li>● Hair and fur</li> </ul>	<ul style="list-style-type: none"> <li>● Yard trimmings</li> <li>● Grass clippings</li> <li>● Houseplants</li> <li>● Hay and straw</li> <li>● Leaves</li> <li>● Sawdust</li> <li>● Wood chips</li> <li>● Cotton and Wool Rags</li> <li>● Fireplace ashes</li> </ul>

\*Red Text Indicates Existence Within the CCCN San Pedro Campus\*



In contrast to the table above, the EPA provides a list of the materials that cannot be composted due to various reasons. That list is shown in Table 2:

<b>Table 2: Materials That Cannot Be Composted</b>	
<b>Product</b>	<b>Reason</b>
Black Walnut Tree Leaves and Twigs	Potentially harmful to plants
Coal or Charcoal Ash	Potentially harmful to plants
Dairy Products	Odor produced, potential to attract unwanted pests
Diseased or Insect-Ridden Plants	Could infect other plants
Fats, Grease, Lard, Oils	Odor produced, potential to attract unwanted pests
Meat or Fish Bones or Scraps	Odor produced, potential to attract unwanted pests
Pet Wastes	Potential to contain microorganisms and diseases harmful to humans
Yard Trimmings Treated w/ Chemical Pesticides	Potential to kill composting organisms

The education of the public on these potentially hazardous materials is required to ensure successful and safe composting. This can be achieved through the implementation of infographics in the vicinity of the compost bins describing what can and cannot be composted or educational programs.

The second problem that arises when establishing a composting process at the CCCN is the location of the compost bins. Traditionally, composting on a residential scale is accomplished outdoors in a backyard. In this instance, the compost must be in a dry, shady location. Maintenance is required to ensure that the compost does not dry out, and all food products must be buried under 10 inches of compost material to prevent pests from damaging the compost. Unfortunately, located in the heart of San Jose, Costa Rica, the San Pedro campus does not have access to an outdoor area that is required for composting. However, composting bins can be purchased to continue the composting process indoors. If it is properly maintained, it “...will not attract pests or rodents and will not smell bad” (United States Environmental Protection Agency, 2019). Indoor compost

typically takes two to five weeks to process and become usable. A picture of an indoor composting bin is included below:



Figure 1: Compost Bin (SCDProbiotics, 2020)

External composting companies can also be utilized if the composting process cannot be completed at the Centro Cultural Costarricense-Norteamericano. Susteco AB is a Swedish company established in 1991 that provides simple solutions to on-site composting (Environmental Xprt, n.d.). Their Big Hanna composting machines make the composting process straightforward. There is no need to sort the organic material as compared to the indoor composting method. The Big Hanna composting machines can turn all organic materials including meats, dairy products, fats, greases, oils and many more into compost (Environmental Xprt, n.d.). In 2018, América Free Zone, a business development area in Heredia Province near San Jose, employed a Big Hanna composting machine with the assistance of waste management organizations such as Wastech Costa Rica and Berca Group (Environmental Xprt, 2018). The model that was implemented at this site, the T120\_40LS, is capable of processing 70 kilos of organic waste daily (Environmental Xprt, 2018). The Big Hanna models are capable of composting anywhere from 75 kilograms of waste to 10800 kilograms (Environmental Xprt, n.d.). While this is not the most financially efficient strategy of composting, it is the most simplistic and user-friendly method of composting. There is

no need for infographics describing those materials that can be composted and those that cannot. There would be no confusion when using such a system. As a result, organic waste will be eliminated from landfills, decreasing the amount of anaerobic decomposition, therefore decreasing the number of harmful greenhouse gases in the atmosphere that contributes to climate change.

## **2.7 Current Sustainability Status of Costa Rica and the CCCN**

Costa Rica has been striving to become more sustainable. In 2017, Costa Rica reached a record-breaking level in clean energy production. In the first six months of 2017, 99% of the nation's electricity came from renewable sources according to a study conducted by the National Energy Control Center (CENCE). The major renewable sources currently implemented in Costa Rica include geothermal, hydroelectric, solar and wind energy (AFP, 2018). For comparison, in 2018, only 17% of the electricity in the United States was produced using renewable energy sources (U.S. Energy Information Administration, 2019). Similar to the United States, according to Natural Resources Canada in 2019, Canada produced 17% of its primary energy supply through the use of renewable energy sources (Natural Resources Canada, 2019). Due to these strides, Costa Rica has made in the past few years to be sustainable, they are hoping to become the first carbon-neutral country in the world by the end of the 21<sup>st</sup> century. Over the last 5 years, Costa Rica has also been the only tropical nation not only to preserve the forest but also to increase the amount of the geographical area covered by forests.

Along with these reforestation efforts, Costa Rica has used rice mills to produce electricity to power the farms and the houses of workers (Castro, 2015). The rice mills use dried rice husks for energy production. They are usually dried in the heat of the sun. Rice husk contains about 30–50% of organic carbon and has a high heat value of 13–16 MJ per kg. It can be used to generate

fuel, heat, or electricity through thermal, chemical, or bioprocesses. The rice husks are collected after rice milling, with a moisture content of about 14–15%. (Castro, 2015).

The Coopedota coffee cooperative was another effort that aimed to develop a better and less destructive way to sustainably support the production of coffee. Instead of using firewood to dry out the coffee beans, Coopedota burns the biomass that results from each harvest to serve the same purpose. This created a new energy source instead of trees and would reduce the energy used and the amount of wastewater produced by half when coffee producers switch fertilizers to help the soil hold water for longer and use mills to allow for the cycling of water and the production of energy.

The CCCN has already taken several steps towards its Carbon Footprint reduction. One of these main steps has been switching to solar energy to help reduce CCCN's carbon footprint. They have also greatly reduced their water usage by implementing water-efficient toilets and sinks in their bathrooms.

To further develop the Get Green Program, many more aspects of Costa Rica's sustainability efforts will have to be researched. Many questions will be answered throughout the next sections of this report, such as the following:

- What is the Costa Rican community's response to these environmental changes?
- What is the exact purpose and goals of this specific Get Green Program both in the short term and long term?
- What past projects have CCCN implemented and what was the success of these projects?

From preliminary research, there are already several initiatives that the CCCN could implement to further their efforts. For any organization, transportation is a major player in

producing emissions. In fact, “for the average U.S. commercial office building, transportation energy use to and from that building actually exceeds building energy use by 30 percent” (Stringer, 2009). Creating a way for employees to work from home or developing online classes for their students could go a long way toward reducing this aspect of the CCCN’s emissions. Additionally, water conservation at the CCCN can be taken even further. Although they have made significant progress, implementing a greywater recycling system could even further reduce their water consumption. Greywater is water from sinks, laundry, or bathing, and can be used for things such as irrigation or toilet flushing (Duttle, 1990). As no one at the CCCN is doing laundry or bathing, most of the greywater at the CCCN would come from sinks, which to be used for flushing toilets.

Since the CCCN has already taken significant steps towards sustainability, site-specific initiatives are necessary to help the organization achieve its goal of carbon neutrality and sustainability. The CCCN has already implemented water-less urinals, solar panels, and energy-efficient light bulbs. Initiatives include reducing the need for private transportation to and from the CCCN through the use of public transportation or implementing a greywater recycling system. It was our task to explore and present more divergent ideas on sustainability to the administrators of the CCCN, thereby initiating an assessment of their feasibility.

## **Chapter 3: Methodology**

The main goal of this project was to assess the current status of the CCCN in terms of their environmental impact and to help the center reduce this impact. This means we had to help them determine ways of reducing their carbon footprint and overall environmental impact. It was our goal to assist in this effort and ultimately prepare the CCCN to receive a Carbon Footprint Certificate. An understanding of the community's perspective about what works, what doesn't work, and what can be improved was essential to this process. Additionally, the community's opinion on the increase of global warming, the CCCN, and the goals of the CCCN were all relevant to our project as well. Using the information that was gathered on all these topics, the CCCN will be able to adjust how their organization operates and spreads its impact and message.

### **3.1 Objectives**

Identifying what the CCCN wants to show as their ideal version of carbon neutrality and how they plan to express that idea to the public was our first step. While working with the CCCN, we identified the major greenhouse gas producers at the San Pedro center in which we worked as well as the four other campuses that the CCCN plans to integrate into the program. Once the major greenhouse gas producers within the CCCN were identified, a plan to reduce these emissions was created. Although our work mainly focused on the San Pedro campus, our plan will be replicable across all of the CCCN's campuses.

Our group was tasked with all of the aforementioned objectives, along with establishing new initiatives to implement on the campuses as well as modifying the initiatives that are already in place. Our initial sponsor meeting was instrumental in helping our team to understand this objective. In this meeting, our overall goal of the project was clarified, and some past initiatives

were explained. Many of the initiatives and strategies we plan to implement at the CCCN will be modeled after WPI’s Sustainability Program, due to its mature and comprehensive nature. Although we will not be able to directly apply everything done at WPI to the CCCN due to differences in geography, climate, and culture, we should be able to use WPI’s sustainability program as a foundation and guideline for what to do.

WPI’s sustainability program has four main areas of focus: academics; campus operations; research and scholarship; and community engagement. Due to the nature of the CCCN and what it does, the two areas that are the most relevant to our project are WPI’s efforts within campus operations and community engagement. WPI has made many efforts in both areas that were a benefit to our project. Table 1 shows just a few of those efforts that we believe could be implemented at the CCCN:

<b>Table 3: WPI Sustainability Plan points applicable to CCCN</b>	
Campus Operations	Community Engagement
<ul style="list-style-type: none"> <li>● Reduce utility consumption and waste production</li> <li>● Monitor and reduce energy usage</li> <li>● Install water bottle filling stations</li> <li>● Create purchasing guidelines for on campus products</li> </ul>	<ul style="list-style-type: none"> <li>● 50% of the campus is involved in sustainability efforts</li> <li>● Create a sustainability training program for faculty</li> <li>● Create a transportation plan to reduce the use of single occupancy vehicles</li> </ul>

Being able to use WPI’s sustainability plan greatly benefited our project because it showed us one way that an institution might approach the task of becoming more sustainable. Along with what has already been listed, less tangible efforts are also essential to the success of such a program. Some of these efforts include establishing funding for the program, appointing staff to

manage the program, and creating overall goals and milestones to be achieved. It is apparent that due to the cultural, political, and economic contexts in which the CCCN resides, we will not simply be able to mimic WPI's plan. However, combined with more research into what other organizations in Costa Rica are doing, WPI's sustainability plan was a substantial starting point for our project.

### **3.2 Previous Efforts**

The CCCN has been working to make its five campuses as carbon neutral and environmentally sustainable as possible. Their previous efforts in achieving carbon neutrality and being more environmentally conscious include installing solar panels and implementing the use of recycling bins. Both initiatives, as well as other initiatives such as reusable bags, and encouraging carpooling have allowed the CCCN to focus on the reduction of their carbon footprint. The CCCN's previous Get Green Program included several very successful initiatives that can be further improved upon to allow for more sustainable practices within the campuses.

Much of the CCCN's previous Get Green Program consisted of smaller initiatives, and with the revamp of this program, they hope for a more cohesive plan. Much of these small initiatives should remain a part of the revamp due to its ability to reduce the center's carbon footprint if conducted effectively. For example, the recycling bins allow for the CCCN to be able to reduce their carbon footprint by reducing the amount of energy needed to produce new goods from scratch (Carbon Footprint, n.d.). Many materials such as paper, plastics, and glass can all be made from recycled materials, so having these materials properly recycled at the CCCN will allow for more energy to be conserved. Other initiatives such as carpooling and reusable bags reduce the CCCN's carbon footprint correspondingly by reducing the amount of energy indirectly consumed by the CCCN's daily activities.



The CCCN installed solar panels on three of its five campuses in January of 2018. The CCCN strives for one hundred percent dependence on the solar panels for their electrical needs. This goal is achieved during Costa Rica's dry season. However, due to the cloud cover during the rainy season, the solar panels cannot provide the total power requirements during this portion of the year. To supplement the solar panels, there is a backup diesel generator for the occurrence of power outages, the rainy season, or any other time that would result in a reduction of solar power. The solar panels still generate light, just not as much as if they had direct sunlight. They can still produce around 10% to 20% of their normal output and the rain helps to increase the functionality by washing away any dust or dirt that may block the solar cells. Introducing non-refractive solar panels would also be a better option when taking into consideration the amount of cloud coverage during the rainy season. Increasing the number of solar panels would increase the amount of energy, but it would not increase the production rate of each cell (Solar Energy Industries Association, 2020). One task that our group would like to accomplish is establishing the process of installing solar panels at the final two campuses which have not done so yet.

Some smaller initiatives such as implementing the recycling bins were not as successful. According to Señora Lilly Sevilla of the CCCN, this initiative does not work properly. It is unclear if they do not work due to a lack of knowledge of the difference between recycled and landfill goods. One of our tasks is to analyze why this initiative is not effective and implement changes to improve it and make it more successful. Interviews and surveys with the employees and students of the CCCN will be crucial to achieving this. The anonymous surveys will explore the students' and employees' opinions on carbon neutrality, recycling, and the effectiveness of the Get Green Program, as well as what would make them more likely to recycle their waste.

The organization has reduced the amount of paper used by half by transitioning to online placement tests and class summaries to replace paper handouts. Some within the department ask for a copy of certain documents to have on their records even though only the accounting department needs them. The CCCN is currently working on eliminating this desire that some of the employees have to further reduce the amount of paper required by certain internal rules and regulations. They have started to only use paper for legal documents that are required to be in a physical copy. The goal of the CCCN is to have as many departments go paperless as possible.

The CCCN has also implemented initiatives that are focused on water conservation. Some of the departments have sinks while some do not; some of the departments have water fountains or dispensers for the use of refilling reusable water bottles. This is to stop the use of plastic single-use bottles. They have adapted the restrooms to have toilets that are low consumption using only 1.1 liters per flush instead of the average 6 liters per flush. In the men's restroom, they have converted to water-free urinals and they have saved an average of 151,000 liters of water per urinal per year.

### **3.3 Understanding**

Determining the CCCN stakeholders' understanding of global warming will enable our group to know where to implement changes and at what level of complexity to make recommendations. For example, for those who do not believe in or fully understand global warming, a more far-reaching or radical change may result in decreased participation or lack of support of such changes when compared to possible reactions of participants who are sympathetic to increased conservation and sustainability measures. However, those who are skeptical or ambivalent may be willing to partake in smaller acts until they learn the seriousness of the issue.

Upon learning of the issue of global warming through the CCCN's Get Green Program, people involved with the CCCN that initially understand global warming based on the survey we distributed would then be more likely to support more drastic changes. An understanding of how the campus is set up and run will also improve the success of the implementations of the newer initiatives. Possession of that knowledge will allow for better decisions on what will work upon initiation and will inform for a more successful future of the program for all the campuses. This information was obtained through the distribution of our anonymous surveys.

### **3.4 Initial Plans for Greenhouse Gas Emission Reduction and Sustainability**

To plan the revamp of the Get Green Program, the willingness of the CCCN community to become more sustainable was analyzed. To gauge their willingness of the CCCN community, an anonymous survey was distributed to both the visitors of the campuses as well as the employees. We had two separate surveys for the students and the employees. This also gave us separate data for the two groups, which allowed us to create different areas of focus for each group.

Another essential step to creating a plan of action for the CCCN was our department interviews. As the organization is relatively large, each department is different from the last. Having an understanding of what each department does, the waste it produces, and other relevant topics as seen in the survey and interview questions helped us understand the current situation that the CCCN is in from a more administrative level rather than an individual level. The department interview questions can be found in Appendix A.

To help the CCCN achieve a Carbon Footprint Certification, a thorough analysis of the campuses' carbon emissions was also conducted. To analyze the carbon emissions, data assessments of the facilities' fuel use, electricity use, as well as transportation practices are

required. This information was obtained through the distribution of our anonymous surveys, as well as interviews with our sponsor representatives and members of each department. The greenhouse gas emissions from their suppliers and consumers can also be evaluated to ensure that the CCCN is engaging with sustainable activities through other companies as well.

Attaining carbon neutrality by eliminating carbon emissions can be difficult for organizations to achieve in a short period. Therefore it is very important to offset the carbon emissions to achieve a net-zero carbon emission. These offsetting initiatives range from planting trees to implementing bicycle stands to reduce the number of commuters who drive to the campuses.

New initiatives include bicycle locks on the campuses, seminars and webinars for proper recycling, and limiting single-use plastic and cardboard. Having bike locks on campus should encourage staff and students to bike to the CCCN instead of driving, depending on the employees' proximity to the campuses. Creating informational sessions for recycling will address the issue of the recycling initiative that was not as effective as anticipated. Additionally, a plan that will discourage the utilization of single-use plastic will be implemented.

One potential way to accomplish the reduction of single-use plastics is through the installation of water bottle filling stations. This will encourage employees and students to bring their reusable water bottle to the Centro Cultural Costarricense-Norteamericano, ultimately reducing the need for plastic or paper cups on campus. However, the CCCN does provide ceramic, reusable mugs for coffee and tea in the various meeting rooms, eliminating the need for paper or plastics single-use cups. If the CCCN does not provide non-reusable utensils and other single-use products, the organization will be encouraging more sustainable habits. After arriving on the

CCCN campus, we were able to analyze what strategies should be implemented to become more environmentally friendly.

### **3.5 Obtaining a Carbon Footprint Certification**

A Carbon Footprint Certification can be achieved through a third-party consulting company. To receive this certification, we will reach out to different companies such as SCS Global, Inteco, Carbon Trust and Earth University. All these organizations provide the Carbon Footprint Certification that the CCCN desires, as well as maintaining locations in Costa Rica to allow for this certification to be granted more easily. As we are a group of students from Worcester Polytechnic Institute, we cannot provide this certification, but we helped the CCCN estimate their carbon footprint, as well as create a plan for them to receive the certification.

Estimating the CCCN's carbon footprint is important before receiving a Carbon Footprint Certification to ensure that the center is reducing its carbon emissions. To accomplish this, it is best to separate these calculations by scope. Scope 1 is defined as the direct emissions from the organization, including on-site fuel use. Scope 2 includes energy consumption from a third-party vendor. Scope 3 includes all of the other indirect consumption of energy, such as travel, waste, and water. By looking into the daily habits of the visitors and employees of the CCCN, each of these scopes can be analyzed to determine where the most carbon emissions result, and therefore where to focus the most attention for reduction of these carbon emissions

All these estimates require an "emission factor." An emission factor can be defined as the coefficient that can convert the activity of analysis into a quantity of greenhouse gas emissions (Clim'Foot, 2016). Emission factors are a coefficient of the variable that are dependent upon the specific country of the investigation, this means that the United States' emissions factors are different than Costa Rica's emission factors. Unfortunately, over the years Costa Rica has

struggled with having reliable data to be able to accurately calculate these emission factors (Madsen, 2015). Since these emission factors have been unreliable, these calculations can only be seen as an estimate until a third-party company analyzes the center’s carbon emissions in order to receive a certification. Therefore, we will be using the following emission factors throughout our calculations (Emission Factors for Greenhouse Gas Inventories, 2014).

As stated early, the CCCN is over one hundred percent reliant on solar panels during the dry season, but during the rainy season, CCCN relies upon a diesel generator. The use of diesel is under the scope 1 carbon emissions. But since the CCCN is only reliant upon solar panels and its backup diesel generator the CCCN has eliminated all scope 2 carbon emissions. These carbon emissions can be estimated by the following formula:

$$Emissions = Fuel Consumed * EF$$

(United States Environmental Protection Agency, 2016)

Where fuel consumed is defined as the total mass or volume of different fuels consumed, these fuels can be diesel or gas. EF is the fuel-specific emissions factor.

In contrast to scope 1 and scope 2 emissions, scope 3 emissions are more complicated to estimate. The emissions from business travel can be estimated in a few different ways. Since the emission factor will vary based upon how many people are carpooling and the type of vehicle and miles traveled, there are a few different approaches that can be taken.

If we wish to estimate based upon total miles traveled, the following equation can be used:

$$Emissions = Total Distance * EF$$

(United States Environmental Protection Agency, 2016)

Where total distance is the total distance traveled to and from work per employee and EF is the vehicle-specific emission factor. Since it is more difficult to collect the data for transportation type,

as it may not be the same every day, this emission calculation can also be based upon the amount of fuel consumed during one's commute. The following equation would apply:

$$\text{Emissions} = \text{Fuel Consumed} * EF$$

(United States Environmental Protection Agency, 2016)

Once again, where fuel consumed is defined as the total mass or volume of different fuels consumed, these fuels can be diesel or gas. EF is the fuel-specific emissions factor. The data for these two equations will be collected from the surveys discussed above. Lastly, the emissions from waste can be estimated in two separate categories, solid waste, and water waste:

$$\text{Emissions} = \text{Waste Generated} * EF$$

(United States Environmental Protection Agency, 2016)

Where waste generated is defined as the total mass or volume of different fuels consumed, these fuels can be diesel or gas. EF is the waste-specific emissions factor, these emission factors vary based on each product, such as paper, plastic, water, and other waste.

## **Chapter 4: Findings and Analysis**

Our initial observation of the physical CCCN San Pedro campus pointed to a lack of visuals and posters expressing the goals of the CCCN that related to sustainability. Additionally, we were provided a Microsoft PowerPoint document detailing the efforts of the Get Green Program. However, upon arrival at the San Pedro campus, the only initiative that was evident was the recycling bins. Efforts such as the stickers that were placed on the lights to remind individuals to turn off the lights when leaving a room had been removed. Upon consultation with Sr. Carlos Cortés, the Get Green Program has experienced a decrease in participation. This program ultimately ceased to exist when the individual who ran the program left the Centro Cultural approximately five years ago. Our interviews and surveys provided valuable information for the course of action for the CCCN. The following sections detail the results and conclusions of those documents, as well as a summary of our observations at the Centro Cultural Costarricense-Norteamericano.

### **4.1 Survey Results**

We sent out two different anonymous surveys to the employees and students of the CCCN. These surveys asked questions such as how often one recycles while at the CCCN and how does one commute to the CCCN. The full survey questions can be found in Appendix B. We chose to send out two different surveys to the employees and the students since both groups' responses would greatly vary due to their time spent at the CCCN, involvement level, and activities completed while at the CCCN. The student surveys were sent to all students over the age of 18. There was a total of 668 students who responded to the survey that was sent to 3804 students. There were 81 responses to the employee surveys out of 210 employees that were surveyed.



Overall, these numbers are satisfactory, and any analysis made can be representative due to the rule in statistics, called the Law of Large Numbers.

One of the most revealing questions from these two surveys is question 9, “Do you know about the CCCN’s ‘Get Green Program’?” 90.17% of the students answered this question “No,” and 35.80% of employees answered “No.” Only 1.72% of students and 24.69% of employees knew about the program. Many of the students and employees do not know about the Get Green campaign.

## 4.2 Notable Data Results:

We surveyed 3804 students and 210 employees over the course of nine days. The following is an analysis of the results.

### “How Old Are You?”

The graph below is from the student survey. It is worth noting that 52.53% of the student population is below the age of 25. This data is significant in the creation of educational programs about the Get Green Program and environmentally conscious practices.

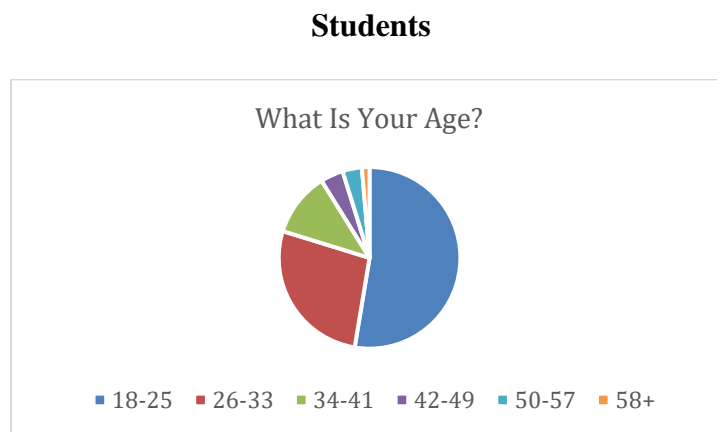


Figure 2: Student Survey Results to the Question “How Old Are You?”

### “How Far is the CCCN from Where You’re Coming From to go to English Classes?”

On average, the commute is approximately 50 minutes long, for employees as well as students. For the distanced traveled to and from the CCCN, we decided to filter the results due to a potential misinterpretation of the question. Some of the survey responses to this question did not seem accurate. For example, one student responded that it only took them 25 minutes to arrive at the CCCN by bus, but they traveled from 1500 km away, which is not accurate. Therefore, we decided to filter the distance results to only include those responses greater than 0 kilometers and less than 800 kilometers. The resulting average came out to be 14 kilometers for both students and employees.

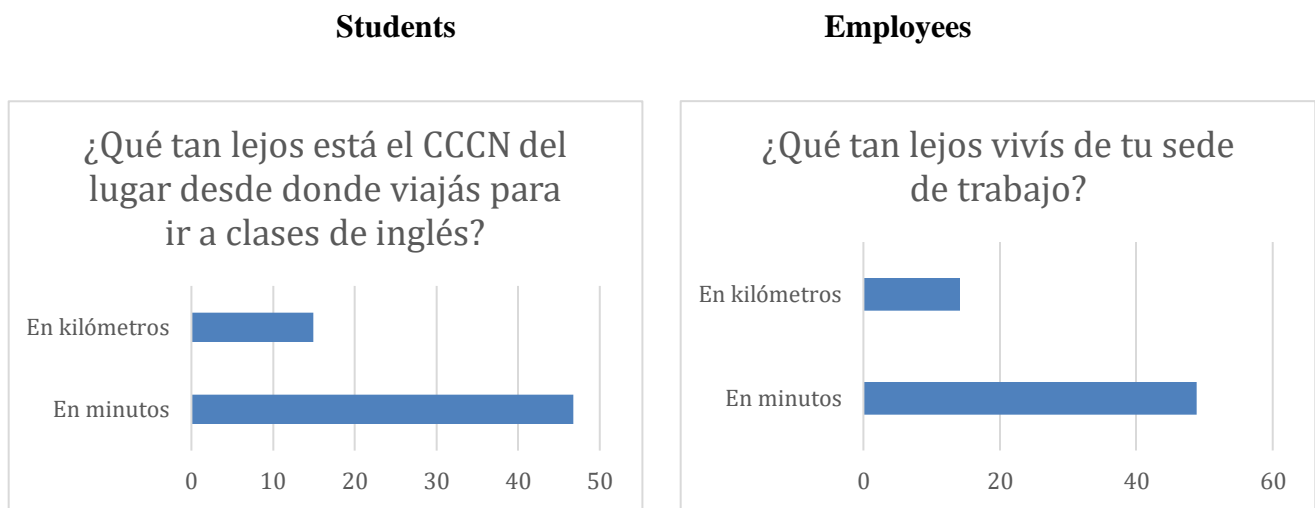


Figure 3: Student and Employee Survey Results to the Question “How Far is Your Commute to and from the CCCN?”

### “How Do You Travel from Your House to the CCCN?”

For the following question, individuals could select multiple answers, as the method of transportation may change daily. As evident from the charts above, the main method of travel to and from the CCCN is the bus system in San Jose. The trends are very similar between the two

surveys, as 43.00% of students travel by bus and 38.75% of employees use this method of public transportation. The bus system is the most popular method of transportation and bicycle is the least popular, with 1.03% and 2.50% participation by the students and employees, respectively. Only 22.50% of employees and 23.12% of students drive their own cars. This is important as one strategy to reduce the potential Scope 3 sources of greenhouse gases of the CCCN is to encourage the use of public transportation such as buses and taxis/Uber.

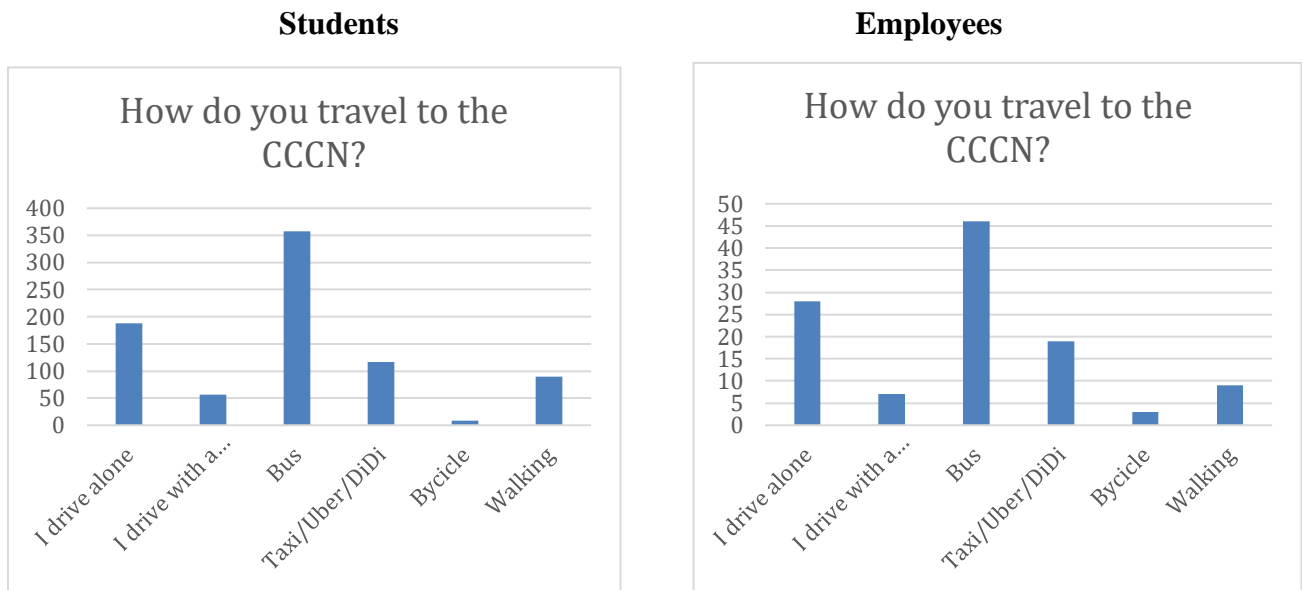


Figure 4: Student and Employee Survey Results to the Question “How Do You Travel To the CCCN?”

### “Do You Know About the CCCN’s Get Green Program?”

After conducting the employee interviews, it became evident that most CCCN employees were aware of the Get Green Program. However, a remaining few had not heard of such a program or did not know what the program did for the CCCN. In contrast to the distribution of the responses from the employee survey, 89.67% of students did not have any prior knowledge of the Get Green Program. Only a mere 1.75% of students replied that they knew of the program. We hypothesize that the students that do not know of the program are from a younger generation since the Get Green Program was disbanded approximately five years ago. For this reason, we

proposed infographics to appeal to the younger generation to spread awareness of the Get Green Program, as well as various other environmentally conscious efforts.

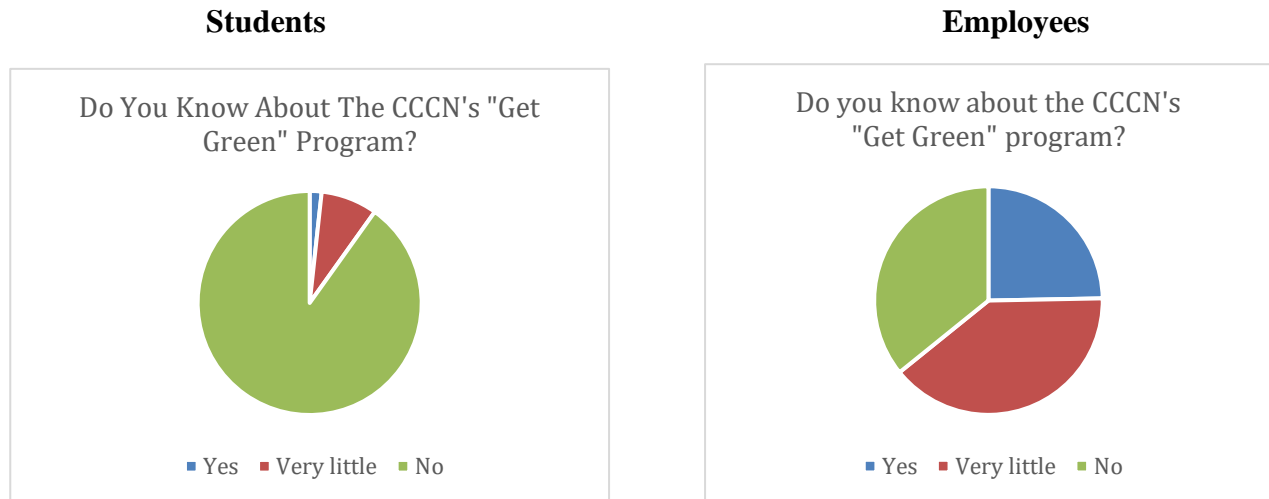


Figure 5: Student and Employee Survey Results to the Question “Do You Know About the CCCN’s Get Green Program?”

### “How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”

In line with the previous question regarding the Get Green Program, students do not have the same awareness as employees regarding environmentally beneficial efforts. When asked, “How frequently do you recycle in the CCCN using the recycling bins?”, employees were more likely to respond positively, while the student population does not recycle as often. Only 33.80% of students always recycle, while 36.36% of employees recycle using the recycling bins. However, the percentage of students who do not recycle is a notable observation from the survey. 23.47% of students responded that they do not recycle while at the CCCN. In contrast, 3.03% of employees stated that they do not recycle at the CCCN.

Students may not recycle due to the limited time that they spend at the CCCN. Additionally, they may not have materials that need to be recycled, such as paper or disposable water bottles. However, we can conclude that the source of the issue is a lack of knowledge of proper recycling habits. In the free-response section of our survey, we ask the individuals what

the CCCN can do to achieve carbon neutrality and reduce their impact on the environment. Many of the responses from the students include references to classes or informational sessions to teach the students about recycling and encourage them to do so. Our proposed poster ideas include teaching these individuals at the CCCN about recycling and that they are helping the environment and the CCCN. We hypothesized that students may not recycle because they do not know how to and do not know what happens to the recycled material once it leaves the CCCN. We believe if they had a better understanding of the recycling process, they would be more likely to recycle. Additionally, promoting environmental consciousness will encourage all students to participate in the effort of becoming carbon neutral.

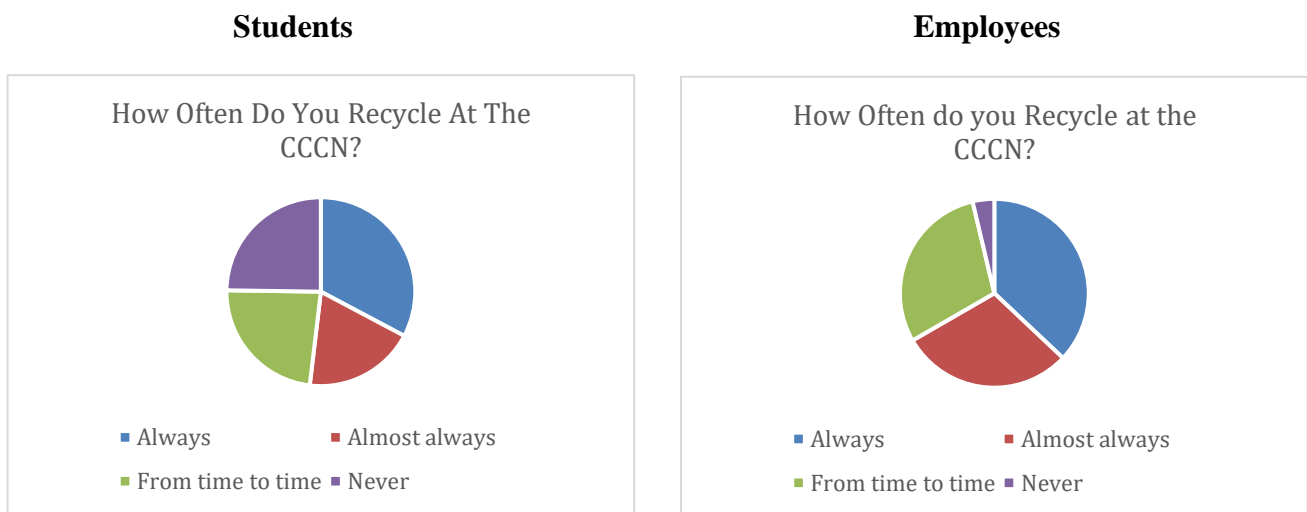


Figure 6: Student and Employee Survey Results to the Question “How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”

**“Do You Know the CCCN’s Guidelines About What Can and Cannot be Recycled?”**

Evidence of the lack of knowledge regarding proper recycling is included in the question regarding the recycling guidelines of the CCCN. The CCCN recycles paper/cardboard, plastic, aluminum, glass, and organic material. This broad range of materials may confuse students and

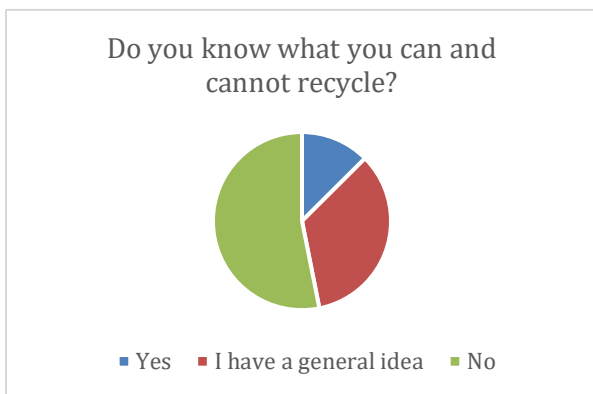
employees regarding what objects can go in each bin. A picture of the recycling bins is included in below:



Figure 7: Recycling Bins at the CCCN San Pedro Campus

According to the student survey, 52.19% of students do not have any knowledge of the recycling guidelines. In contrast, only 3.03% of employees responded “No”. At least 96.97% of employees know what they can and cannot recycle or have a general idea, while only 47.81% of students know what can and cannot be recycled in each bin.

**Students**



**Employees**

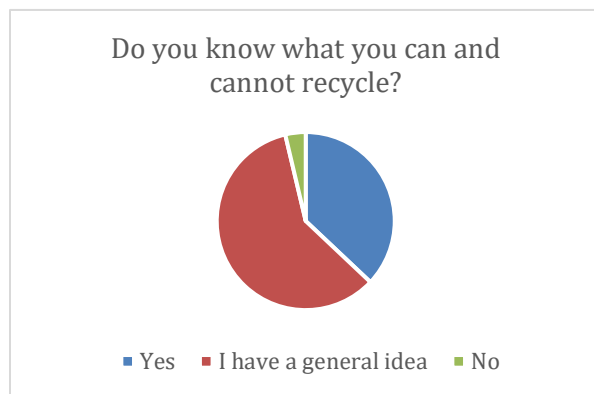


Figure 8: Student and Employee Survey Results to the Question “Do You Know the CCCN’s Guidelines About What Can and Cannot be Recycled?”

## “What Material Do You Recycle Most Often at the CCCN?”

Our interviews with members of each department at the CCCN revealed that paper is the most recycled material at the CCCN. In the interviews, every employee stated that paper is the main source of waste in their respective department. This claim is supported by the employee survey, in which 40.58% of the total material recycled was paper. Plastic was the second most common recycled material for employees, accounting for 29.71% of the total recycled material. However, the student survey was slightly different. As each department, especially the academic department, is striving to become paperless, students may not even use paper. For that reason, plastic was the most recycled material by students. Plastic accounted for 41.00% of recycled materials for the student population, while paper was the second most recycled material at 28.70% of total recycled material. We can hypothesize that the plastic use of the students is from single-use bottles or containers. However, further investigation is necessary to identify the cause of plastic use. After that conclusion is made, we can then analyze methods to eliminate the use of plastics by the students, helping the CCCN become more environmentally friendly.

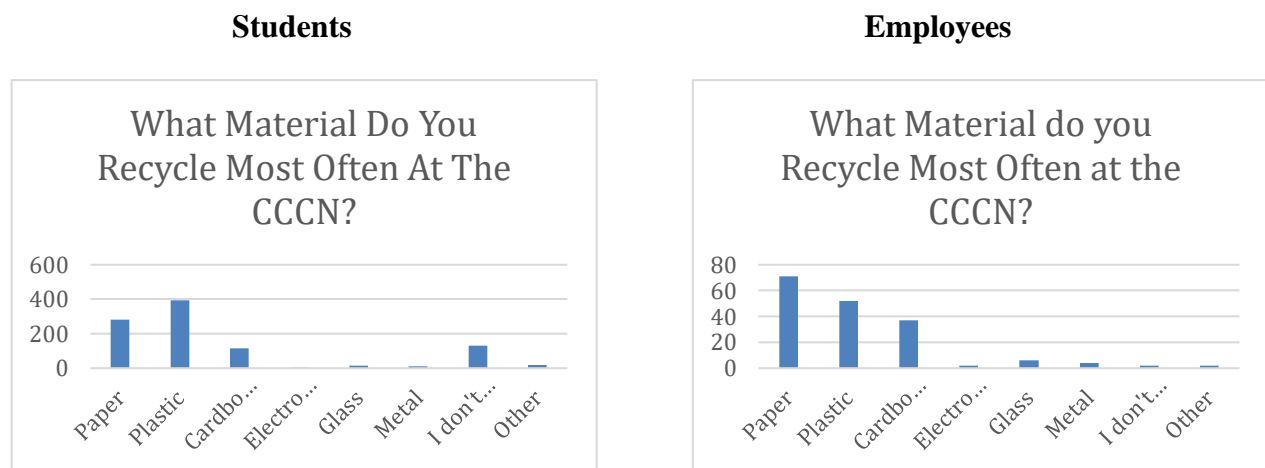


Figure 9: Student and Employee Survey Results to the Question “What Material Do You Recycle Most Often at the CCCN?”

## “Do You Know Where the Garbage and Recycling Go After Throwing It Away?”

As mentioned in the analysis of the question “How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”, knowledge of the recycling process may incentivize students and employees to engage in recycling and encourage others to participate as well. In response to the question “Do you know where the garbage and recycling go after throwing it away?”, the lack of knowledge of both student and employee populations was prevalent. We contend that these individuals are hardly to blame. Rather, this pertains to a lack of information which we hope will be resolved at the CCCN in the near future. Our proposed posters and educational sessions will promote conventional recycling practices as well as an environmental consciousness of the CCCN that will benefit the sustainable goals of the CCCN.

### Students

### Employees

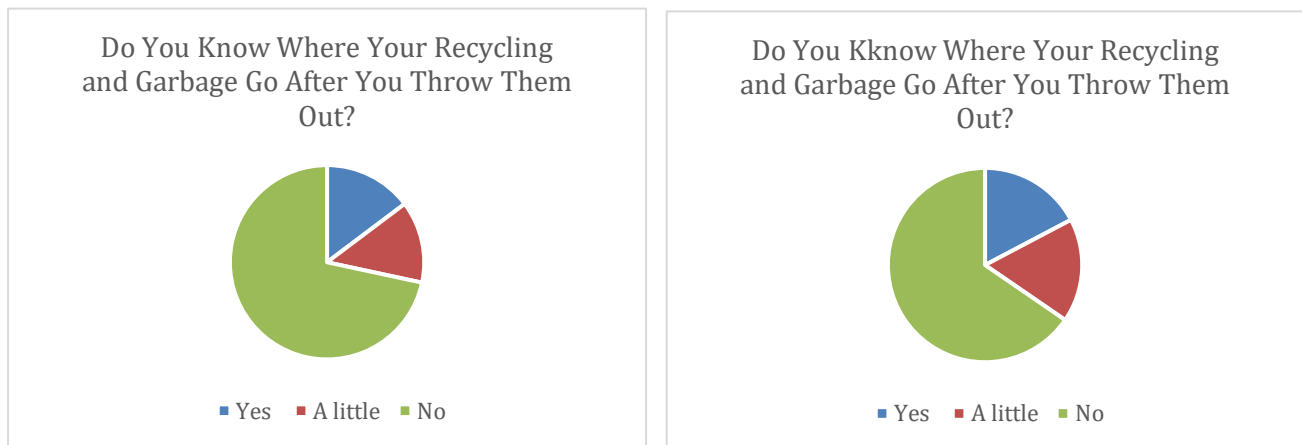


Figure 10: Student and Employee Survey Results to the Question “Do You Know Where the Garbage and Recycling Go After Throwing It Away?”

Education on the process of recycling and receiving the recycling certificate that guarantees recycled materials are properly disposed of may increase participation.



**“The CCCN wants to make efforts to reduce their carbon footprint and care for the environment. What can the CCCN do to achieve this goal?”**

The first of our free response questions was added to help us establish ideas other than what we could think of ourselves. It also reveals the types of incentives that the CCCN community is willing to participate in.

The most common idea from both the students and staff is simply to raise awareness and to educate people about proper sustainable practices. We already knew this was necessary based on our department interviews, however receiving the same feedback from both the students and staff shows there is a genuine interest throughout the entirety of the community. This means proper education is much more likely to be impactful. However, for this education effort to be successful, the CCCN must also be able to implement it and enable students and staff to put their new education to use. Both students and staff expressed a willingness to participate in sustainability efforts such as recycling, but many students stated that they do not know what to recycle or how to recycle. It will be important for the CCCN to inform the students of proper recycling habits using posters and informational sessions. It is also imperative that the CCCN introduce more recycling bins in the hallways and in the classrooms, which currently only have trash cans. This will encourage students to recycle more, as recycling bins will be more prevalent at the Centro Central, as opposed to the few main recycling bins that are in the CCCN now.

Another common answer among students and staff was to increase the use of online materials. This means both to utilize more online tests, and to use online textbooks instead of paper textbooks. The CCCN has already taken steps to reduce the amount of paper used in the test taking process, such as separating answer and question sheets so that the question sheets can be reused. Making their tests completely digital might be the next step for the CCCN in this aspect.

Although there were many similar responses between students and staff for this question, we also noted some differences. There were multiple staff who suggested teleworking or working from home. This is not possible for students, as they are not working, but several did suggest online classes, which is similar in nature. The most significant difference between students and staff was that students seemed to be more willing to take more drastic measures, such as completely banning plastic from the campus. This trend could be explained by the age difference, as 50% of the students who answered the survey are below the age of 25. This reveals a larger cultural shift towards a greater willingness to help protect our environment.

**“What are some of the practices you follow while at the CCCN to help conserve resources (e.g., conserving water, recycling paper or other materials, turning of lights when you can, etc.)?”**

Of the respondents who answered this question, many seem to already have very good habits when it comes to environmentally friendly practices, both within the students and the staff. The most common responses between both groups included turning off lights when not in use, recycling, conserving water, and bringing water bottles. Additionally, within the staff several also mentioned that they turn off the AC when they can, and they try to utilize both sides of sheets of paper. The fact that there is no mention of either of these two activities likely reflects on the students’ inability to do so rather than their lack of willingness.

At first glance, it does appear that both students and staff have already learned many good practices. However, another response found within the student answers was “nothing”. This theme of doing nothing on the part of the students is reinforced when looking at the response rate of the students to this question. Out of 668 total responses, 104 students decided to not answer this question. That means that 15.57% percent of the students who took this survey likely do not do

anything to help reduce their impact while at the CCCN, or do not know what to do to contribute. Comparing this percentage to the number of staff who chose to not answer this question, 2 out of 79 total responses were omitted. This indicates that the staff appears to be much more likely to practice environmentally friendly behavior. This reveals the importance of raising awareness within the community, and especially within the student body at the Centro-Cultural.

Additionally, earlier in the survey, the question “Do You Know What You Can and Cannot Recycle” was answered with a resounding “No” or “I have a general idea” by both students and staff. In total, 53.04% of students did not know what they can or cannot recycle in each recycling bin. 3.70% of employees did not know what can or cannot be recycled, but 59.26% only had a general idea. Only 12.48% of students and 37.04% of employees know what can be recycled. This means that although they may be making a good effort to recycle, they are likely not doing so properly.

### **4.3 Conclusion of Results**

An important conclusion to be drawn from the collected data is that education is necessary for the CCCN to become the sustainable organization that it strives to be. The CCCN has already implemented various environmentally friendly alternatives to traditional methods of operation (ex. solar panels instead of grid electricity, waterless urinals, energy-efficient LEDs). However, we have included recommendations in the section below regarding environmentally conscious practices, as well as educational techniques that can be implemented to improve the sustainable atmosphere of the CCCN.

## **4.4 Interview Results**

We interviewed several members of the following departments: Academic Department, Marketing Department, Cultural Department, Finance, Accounting, General Services, Human Resources, Maintenance and Supplies. We interviewed these employees to report back to our CCCN sponsor about how their efforts are noticed across the community. The results from these surveys also will be used to help create and create more effective plans and recommendations for the CCCN to implement a successful Get Green program as well as be able to easily achieve their goal of carbon neutrality.

Each of these eight interviews was completed within an hour and was able to help us understand what each departments' daily activities consist of and how these activities affect the Get Green program. We were also able to gauge each department's knowledge of the CCCN's current Get Green program, and it was evident that much of the employee community was not sufficiently knowledgeable of the program. One of the main findings was that newer employees were not educated about the program since it had been created over five years ago. Another common response from all employees, new and old, all stated that they have never received any training on the program, and if there was training their knowledge and ability to participate in the program more effectively would be a lot greater.

We were able to determine other common themes through these interviews. Most departments main source of waste is paper, although each department does reuse both sides of the paper and then recycle. Many departments are already working on reducing the amount of paper that they use, but some department proofs and legal documents must be printed. That being said most departments said that they believe that it is possible to go paperless, and even for those other departments to limit the use of paper and it is already a task that they are working to accomplish.

Lastly, even though many of the interviewees did not know much about the Get Green Program, they were all very enthusiastic at the idea of taking action. While many of the departments already recycle, it is believed that education on proper recycling habits would be highly beneficial to the success of the program. All of the interviewees also responded to the last question saying that they would highly enjoy working on the campaign team, but many also said if they had the time in their schedule it would make them even more willing to work on the campaign committee.

## **Chapter 5: Deliverables and Recommendations.**

The recommendations made to the CCCN include increasing the awareness of the environmental achievements that the CCCN has already accomplished in the process of becoming more environmentally friendly and carbon neutral. The entire Get Green Program appears to have a presence behind the scenes. It would be beneficial to showcase the current sustainability progress made to increase the awareness of the community at the CCCN. A sense of community will increase the number of participants in the Get Green Program that contribute to the achievement of the aforementioned goal of becoming carbon neutral. This information will be communicated through posters made in collaboration with the graphic design team at the Centro Cultural.

Through our research, interviews with the staff, and the survey results from students and staff, we have compiled a list of recommendations for the CCCN that we believe will be the most impactful on the Get Green Program. Both short-term and long-term recommendations were provided to the CCCN, resulting in immediate change as well as the implementation of these initiatives for the future.

### **5.1 Short Term Recommendations**

The most impactful and arguably the easiest change to implement at the CCCN will be to raise awareness of the Get Green Program and to educate the population on proper practices. Creating seminars to educate both students and staff will be the first step. Then, through the creation and implementation of various posters and infographics designed in collaboration with the graphic design team at the CCCN, the information learned at these seminars will be reinforced. Information about how to properly recycle, what the Centro Cultural has already done to help the environment, and other sustainable practices will be included both the aforementioned seminars

and posters. A sample of such posters produced with the graphic design team is shown below in Figure 11.



Figure 11: Sample Posters Produced in Collaboration with CCCN Marketing Team

For the seminars to be successful, the posters must be permanent fixtures around the campuses, ensuring that the information learned is not simply forgotten. Additionally, periodic newsletters through email will keep the community engaged in coming up with new ways to approach the subject of environmental consciousness.

Eliminating paper in each department is also an important step the CCCN can take. Throughout our interview process, the most prevalent source of waste was identified as paper. We believe that the amount of paper in the Centro Cultural can be greatly reduced. We acknowledge that the Centro Cultural cannot become paperless in the foreseeable future, due to legal constraints. Within the finance and accounting departments, certain documents must be printed according to Costa Rican law. Additionally, the marketing department must occasionally print proofs to verify color accuracy. However, aside from these specific examples, most of our interviewees stated that the amount of paper in their offices can be reduced.

Lastly, the creation of a dedicated committee to lead the Get Green Program will be instrumental in its continued success. This committee should oversee the planning and funding of future Get Green initiatives along with the ongoing effort of raising awareness using emails, posters, and seminars. Having a committee also allows staff members to have a more active role in the Get Green Program, and many expressed enthusiasm in participating during their interviews. Ideally, this committee would be a volunteer committee.

## **5.2 Long Term Recommendations**

The long-term goals presented in the following paragraphs are initiatives that we predict will require a greater effort to achieve, both in terms of time and expenditure. For this reason, we wanted to separate them from the short-term goals.

The first and most obvious long-term goal for the CCCN should be to finish the installation of solar panels on its two remaining campuses that have not done so. This will mean that the center is entirely run on solar energy when possible. It will also be a strong statement to their community showing their dedication to the goal of becoming as environmentally friendly as possible.

Implementing a greywater recycling system will potentially be the costliest of all our recommendations. It will require major changes to the pipes and other infrastructure within the CCCN as water will have to be routed from the sinks to the bathrooms, but it could go a long way in reducing the water used at the center. Additionally, depending on the overall costs of installation and water costs at each location, with time the greywater recycling system has the potential for a return in investment.

Lastly, creating purchasing guidelines that are adhered to throughout the entirety of the Centro-Cultural will ensure that all the products used at the CCCN were created in a sustainable manner. These guidelines should apply to all the products purchased by the CCCN, ranging from



cleaning supplies to the food used in the cafeteria to the office supplies used within each department. Appendix C shows a sample of the purchasing guidelines used by WPI, which the CCCN can use as a guide to create their own purchasing guidelines. Some examples of the types of guidelines to be followed for purchased products include;

- Durable, not single-use or disposable
- Made of recycled materials
- Produced by companies with good environmental track records
- Cause minimal environmental damage during normal use and maintenance
- Reduced packaging

### **5.3 Deliverables**

Our main deliverable is a compilation of all our recommendations with a short explanation of why we think they are important, what the specific recommendation will accomplish, and a cost estimate if it is applicable. This compilation, along with our final presentation will leave the Centro-Cultural in a position to restart their get green program and continue their efforts, either on their own or with the help of another IQP team from WPI in the future.

The recommendation report given to the CCCN includes third-party certification vendors that the center could work with in the future to receive a Carbon Footprint Certification. The biggest complication when searching for companies was finding companies that are certified to achieve these verifications in Costa Rica. Of the organizations we reached out to, the most responsive company was SCS Global. Our inquiry about the Carbon Footprint Certification was responded to within twenty-four hours and helped to explain the benefits the CCCN would gain from working with SCS Global. According to the program manager who responded to our inquiry, SCS Global would work to create a GHG Inventory Report on all three scopes of the certification

and help to set up a tool to allow for the self-calculation of this report in future years. SCS Global and the CCCN would work together to collect the necessary data so that Carbon Footprint Models, Internal Verification and Certification Packets can all be accomplished.

## Chapter 6: Conclusion

Through our work at the CCCN, we came to several conclusions to allow for the center to be able to become more environmentally sustainable. Through the collection of data from students and employees of the CCCN through surveys and interviews, we were able to create a recommendations report for the center with future goals and programs that will help to assist in their ultimate goal of achieving a Carbon Footprint Certification.

Our interviews revealed that within the departments at the Centro Cultural, paper was the most common source of waste. This is reinforced by our survey results, which show that almost 90% of all participants of the faculty survey responded that they recycle paper the most. Based on this result, one of our main recommendations for the CCCN is to create a campaign to eliminate the use of paper in all departments wherever possible. We acknowledge the fact that it is not always possible to eliminate the use of paper, for example:

- Finance departments: legal documents must be printed and
- Marketing department: Proofs of posters must be printed for color accuracy

Aside from these few exceptions, evidence shows it is feasible for all departments within the CCCN to become paperless, and many of our interviewees expressed enthusiasm for the idea. This goal can be achieved through the increased use of online tests, distributing documents to students using a file-sharing program, and other similar strategies.

Another major finding was the lack of awareness of the Get Green Program within the student body. As previously stated, over 90% of the students who responded to our survey stated they do not know about the Get Green Program. This is a stark contrast to the faculty, of which only 35% said they do not know about it. The students are the largest population within the CCCN,

numbering almost 5,000. For this reason, it is imperative for the student body to be aware of the Get Green Program and to be educated on proper recycling habits. To reach this goal, we recommend the Centro Cultural do the following:

- Create posters that detail;
  - What the CCCN has already done towards the effort of environmental sustainability
  - What can and cannot be recycled
  - Other environmentally friendly practices that students can participate in
- Invite speakers / create presentations to spread awareness of the Get Green Program and what can be done to help
- Create extracurricular programs to encourage the active participation of students in the Get Green Program. These can include but are not limited to;
  - Sorting through and separating recycling to enable single stream recycling within the Centro Cultural
  - Planting trees to offset the CCCN's Carbon Footprint

The combination of single events and long-lasting reminders such as the posters will create permanent awareness of the Get Green Program resulting in an increase in sustainable practices among the student body.

Lastly, and arguably most importantly, we recommend that the CCCN create a committee dedicated to furthering the Get Green Program. Having a specific committee, separate from the already existing social responsibility committee, will ensure the longevity of the program while also providing the CCCN staff an opportunity to participate. This committee would be in charge of;

- Creating and overseeing new initiatives for the Get Green Program
- Raising awareness through presentations, newsletters, and posters
- Creating a budget for the Get Green Program

The aforementioned recommendations will decrease the environmental impact of the CCCN, but they do not address all aspects of their overall impact. For this reason, we also recommend the following smaller, longer-term initiatives:

- Finish the installation of solar panels on the remaining two campuses
- Create purchasing guidelines to be adhered to throughout to CCCN
- Implement a greywater recycling system
- Add a timer to lights / use more natural light
- Place recycling bins in all classrooms
- Encourage opening windows in place of using AC
- Discourage the use of single-occupancy vehicles in favor of public transportation on non-vehicular modes of transport
- Compost at sites where it would be beneficial and practical

The work done by the CCCN as a community member and leader to become more environmentally friendly is only a small part of what we need to do as citizens of our planet. However, we hope that, with our recommendations, the Get Green Program will flourish for years to come. Additionally, while receiving a Carbon Footprint Certification is not a current goal of the Centro Cultural Costarricense-Norteamericano, it is worthy to note that this may establish the foundation for a future project through Worcester Polytechnic Institute.

Upon completion of a Carbon Footprint Certification, further analysis will be necessary to assess the sustainability state of the Centro Cultural Costarricense-Norteamericano. Once the

CCCN obtains a Carbon Footprint Certification that displays a net of zero carbon emissions, a Carbon Neutral Certification can be pursued. To achieve a Carbon Neutral Certification, all that is required is a Carbon Footprint Certification that displays total carbon neutrality, in accordance with ISO standards. This is a long-term goal as the CCCN must first achieve carbon neutrality. However, if the CCCN can obtain both a Carbon Footprint Certification and a Carbon Neutral Certification, along with implementing the aforementioned recommendations, the center will be a shining example of environmental consciousness that can be followed by many organizations to come.

# References

- Actions, N. A. M. (n.d.). Costa Rica's climate change strategy. Retrieved from <https://www.namacafe.org/en/costa-ricas-climate-change-strategy>
- Administration, U. S. E. I. (2019). How much of U.S. energy consumption and electricity generation comes from renewable energy sources? Retrieved from <https://www.eia.gov/tools/faqs/faq.php?id=92&t=4>
- AFP. (2018, July 12, 2018). Almost all of Costa Rica's energy has come from renewable sources since 2014. *Tico Times*. Retrieved from <https://ticotimes.net/2018/07/12/almost-all-of-costa-ricas-energy-has-come-from-renewable-sources-since-2014>
- Agency, U. S. E. P. (2018). Basic information about anaerobic digestion (AD). Retrieved from <https://www.epa.gov/anaerobic-digestion/basic-information-about-anaerobic-digestion-ad>
- Agency, U. S. E. P. (2019). Composting at home. Retrieved from <https://www.epa.gov/recycle/composting-home>
- Anderson, M. (2011). *Global Warming*. Chicago: Britannica Educational Publishing.
- Association, S. E. I. (2020). What happens to solar panels when it's cloudy or raining? Retrieved from <https://www.seia.org/initiatives/what-happens-solar-panels-when-its-cloudy-or-raining>
- Belić, D. S. (2006). Global Warming and Greenhouse Gasses. *Physics, Chemistry and Technology*, 4(1), 1-11.
- BercaGroup. (2020). Compostaje in situ con más de 900 instalaciones en todo el mundo. Retrieved from <https://www.berca.es/compostaje/bighanna/>

- Bernhardt, E. (2014). Why we compost. *Tico Times*. Retrieved from <https://ticotimes.net/2014/05/24/why-we-compost>
- Board, C. R. T. (Producer). (2017). Costa Rica Achieves Two New Records in Sustainability Effort. Retrieved from <https://www.newswire.ca/news-releases/costa-rica-achieves-two-new-records-in-sustainability-effort-636713503.html>
- Canada, N. R. (2019). Renewable energy facts. Retrieved from <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/renewable-energy-facts/20069>
- Carri. (2015). Scrap metal recycling process. Retrieved from <https://www.recyclingdepotadelaide.com.au/scrap-metal-recycling-process>
- Carri. (2020). Scrap metal recycling process. Retrieved from <https://www.recyclingdepotadelaide.com.au/scrap-metal-recycling-process>
- Castro, R. (2015). Eco-Competitiveness and Eco-Efficiency: Carbon Neutrality in Latin America. *Viewpoints*. Retrieved from [https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/151100\\_castro\\_vp.pdf](https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/151100_castro_vp.pdf)
- Clim'Foot. (2016). *What is an emission factor?* Retrieved from <http://www.climfoot-project.eu/en/what-emission-factor>
- Company, C. M. (2019). Processes, stages, and benefits of plastic recycling. Retrieved from <https://www.norcalcompactors.net/processes-stages-benefits-plastic-recycling/>
- Council, U. S. G. B. (2020). LEED v4.1. Retrieved from [https://www.usgbc.org/leed/v41?creative=340481831930&keyword=leed%20certified%20projects&matchtype=b&network=g&device=c&gclid=EAIaIQobChMI35nO392r5wIVuIVaBR2bNQLHEAAYASAAEgK-YvD\\_BwE](https://www.usgbc.org/leed/v41?creative=340481831930&keyword=leed%20certified%20projects&matchtype=b&network=g&device=c&gclid=EAIaIQobChMI35nO392r5wIVuIVaBR2bNQLHEAAYASAAEgK-YvD_BwE)



- Duttle, M. (1990). Safe Use of Household Greywater.
- Efficiencies, E. i. D. F. G. (2020). EDGE in Costa Rica. Retrieved from <https://www.edgebuildings.com/certify/costa-rica/>
- Emission Factors for Greenhouse Gas Inventories. (2014). *You Can't Change What You Can't Measure: Understanding Greenhouse Gas Emissions in Costa Rica*.
- Flagg, & A., J. (2018). Carbon Neutral by 2021: The Past and Present of Costa Rica's Unusual Political Tradition. *Sustainability*, 10(2), 296. doi:10.3390/su10020296
- Fletcher, R. (Producer). Costa Rica - a 21st Century Environmental Leader. Retrieved from <https://www.bbc.co.uk/programmes/articles/2WjxnLkpwDY9dkLLYPf7X6q/costa-rica-a-21st-century-environmental-leader>
- Footprint, C. (n.d.). Recycling. Retrieved from <https://www.carbonfootprint.com/recycling.html>
- Greenhouse Gas Inventory Guidance Direct Emissions from Mobile Combustion Sources. (2016).
- Greening Offices: 25 Tips to Get You Started. (2020). In: Cultivating Capital.
- GuidesNetwork. (2020a). How glass is recycled. Retrieved from <http://www.recycling-guide.org.uk/science-glass.html>
- GuidesNetwork. (2020b). How paper is recycled. Retrieved from <http://www.recycling-guide.org.uk/science-paper.html>
- Heng, A., Barber, D. T., Wood, K. P., & Huaman, Z. J. (2019). A Carbon Footprint Study of the Center of Science and Culture in San Jose, CR. Retrieved from <https://digitalcommons.wpi.edu/iqp-all/5310>

- Howard, B. C. (2018). 5 recycling myths busted. Retrieved from <https://www.nationalgeographic.com/environment/2018/10/5-recycling-myths-busted-plastic/>
- Irfan, U. (Producer). (2018). Costa Rica is moving toward carbon neutrality faster than any other country in the world. Retrieved from <https://www.vox.com/energy-and-environment/2018/7/17/17568190/costa-rica-renewable-energy-fossil-fuels-transportation>
- Jambeck, J. R., Geyer, R., Wilcox, C., Siegler, T. R., Perryman, M., Andrady, A., . . . Law, K. L. (2015). Plastic waste inputs from land into the ocean. *Science*, *347*(6223), 768-771. doi:10.1126/science.1260352
- Kennedy, C., & Rebecca, L. (2015). What's the difference between global warming and climate change? Retrieved from <https://www.climate.gov/news-features/climate-qa/whats-difference-between-global-warming-and-climate-change>
- Mora, R. D. (2007). Costa Rica's Commitment: On the Path to Becoming Carbon-Neutral. *UNChronicle*, *XLIV*(2). Retrieved from <https://unchronicle.un.org/article/costa-rica-s-commitment-path-becoming-carbon-neutral>
- N/A. Carbon Neutrality. Retrieved from <https://www.carbonfootprint.com/carbonneutrality.html>
- N/A. (2008). Costa Rica Takes on the "Carbon Neutrality Challenge". Retrieved from <http://environment.harvard.edu/news/huce-headlines/costa-rica-takes-carbon-neutrality-challenge>
- Ones, D. S., & Klein, R. (2015). Pro-Environmental Behavior. *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)*, 23185.
- PennState. (2018). 5.3 Recycling efficiency. Retrieved from <https://www.e-education.psu.edu/eme807/node/625>

- Press, C. U. (Ed.) (2020) Cambridge Dictionary (2020 ed.). Cambridge University Press.
- PRNewswire. (2013). Costa Rica gives SCS Global Services go-ahead to verify carbon footprints and carbon neutrality under ambitious carbon neutrality initiative. *PRNewswire*, p. 1. Retrieved from <https://www.prnewswire.com/news-releases/costa-rica-gives-scs-global-services-go-ahead-to-verify-carbon-footprints-and-carbon-neutrality-under-ambitious-carbon-neutrality-initiative-203275241.html>
- Replogle, J. (2015, May 15). Costa Rica launches new green building certification. *The Tico Times*, p. 1. Retrieved from <https://ticotimes.net/realestate/costa-rica-launches-new-green-building-certification>
- Rica, G. B. C. C. (2016). Acerca de nosotros. Retrieved from <https://www.gbccr.org/acerca-de-nosotros>
- Robertson, J. L., & Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviors. *Journal of Organizational Behavior*, 34(2), 176-194.
- SCDProbitics. (2020). All seasons indoor composter. In.
- Schmidt, C. W. (2009). Carbon Offsets: Growing Pains in a Growing Market. *Environmental Health Perspectives*, 117(2), A62-A68.
- Standardization, I. O. f. (2013). ISO 14065:2013 Greenhouse gases - requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition. In *ISO 14065:2013* (Vol. 2, pp. 27): ISO.
- Standardization, I. O. f. (2019). Climate change mitigation. In (pp. 21). Geneva, Switzerland: ISO Central Secretariat.

- Stringer, L. (2009). *The Green Workplace: Sustainable Strategies that Benefit Employees, the Environment, and the Bottom Line*: St. Martin's Press.
- thinkstep. (2020). EDGE green building certification. Retrieved from <https://www.thinkstep.com/edge>
- Times, T. T. (Producer). (2015). Costa Rica backs away from 2021 carbon neutrality goal. Retrieved from <https://ticotimes.net/2015/11/30/costa-rica-steps-away-2021-carbon-neutrality-goal>
- USGS. (n.d.). What are the long-term effects of climate change? Retrieved from [https://www.usgs.gov/faqs/what-are-long-term-effects-climate-change-1?qt-news\\_science\\_products=0#qt-news\\_science\\_products](https://www.usgs.gov/faqs/what-are-long-term-effects-climate-change-1?qt-news_science_products=0#qt-news_science_products)
- von Wahl, D. Carbon Footprint Certification. Retrieved from <https://www.tuv-sud.cn/cn-en/corporate-social-responsibility/carbon-footprint-certification>
- WastechCostaRica. (2017). Big Hanna: gestión de residuos orgánicos. Retrieved from <https://wastechcr.com/2017/06/30/big-hanna/>
- Xprt, E. (2018). America Free Zone in San Jose, Costa Rica will convert organic waste from its food court into top quality compost with the start-up of a Big Hanna T120\_40LS composting plant. Retrieved from <https://www.environmental-expert.com/news/america-free-zone-in-san-jose-costa-rica-will-convert-organic-waste-from-its-food-court-into-top-qua-749036>
- Xprt, E. (n.d.). Susteco AB. Retrieved from <https://www.environmental-expert.com/companies/susteco-ab-10384>

Zhuang, X., & Jiang, K. Z., X. (2011). Analysis of the Carbon Footprint and Its Environmental Impact Factors for Living and Travel in Shijiazhuang City. *Advances in Climate Change Research*, 2(3), 159-165. doi:10.3724/SP.J.1248.2011.00159

# Appendix

## Appendix A: Employee Interview Questions

### Appendix A.1: Employee Interview Questions: English

What language do you prefer, English or Spanish?

First, we don't speak Spanish very well. For that reason, we are going to read the questions that we wrote last week. Can we record your responses on our phones so we can write them later? If not, can you talk a little slower because we have to write the responses?

Now, the legal requirements:

Participation in this interview is voluntary. We have to obtain your permission to participate in this interview. We will honor all requests for anonymity and confidentiality. We will not disclose your identity. You will have the opportunity to approve the publication of the information from this interview.

Do you accept this interview?

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

#### Questions:

1. What department do you work in?
2. How many people are in your department, more or less?
3. What activities does everyone do on a typical day?
4. What is the main source of waste/garbage/recycling in your department?
  - a. For example, paper, plastic, etc.
5. Do you think that your department understands how to eliminate and recycle waste properly?
6. Can your department become paperless and use only computers?
7. If your department cannot eliminate paper in the office, can you limit the use of paper?
8. How do you store documents in your department and other departments?
  - a. For example, Sharepoint, MicrosoftTeams, Office 365, paper, etc.
9. Is the conservation of water a problem in this department?
  - a. For example, coffee or tea that nobody drinks.
10. What do you know about the Get Green program?
11. Do you think that it would be practical to create a group to run this program?
12. Would you be interested in participating in this program as an advisor?

## Appendix A.2: Employee Interview Questions: Spanish

¿Qué idioma prefiere, inglés o español?

En primer lugar, no hablamos español muy bien. Por eso, vamos a leer las preguntas que escribimos la semana pasada. ¿Podemos grabar sus respuestas en nuestros teléfonos celulares para escribirlas más tarde? Si no, ¿puede hablar un poco lento porque tenemos que escribir las respuestas?

Ahora, los requisitos legales:

Participación en esta entrevista es voluntario. Tenemos que obtener su permiso para participar en esta entrevista. Honraremos todas las solicitudes de anonimato y confidencialidad. No divulgaremos su identidad. Tendrá la oportunidad para aprobar la publicación de la información de esta entrevista.

¿Acepta esta entrevista?

Firma: \_\_\_\_\_

Fecha: \_\_\_\_\_

### Preguntas:

1. ¿En qué departamento trabaja?
2. ¿Cuántas personas están en su departamento, más o menos?
3. ¿Qué actividades hacen todas las personas en un día típico?
4. ¿Qué es la mejor fuente de desperdicio o basura o reciclaje en su departamento?
  - a. Por ejemplo, papel, plástico, etcétera
5. ¿Piensa que su departamento entiende cómo eliminar y reciclar desperdicios adecuadamente?
  - a. ¿Saben lo que pueden reciclar? ¿Usan las papeleras de reciclaje?
6. ¿Puede su departamento convertirse en sin papel y usa sólo computadoras?
7. Si su departamento no puede eliminar el papel en la oficina, ¿puede limitar su uso de papel?
8. ¿Cómo se comparten documentos en su departamento y otros departamentos?
  - a. Por ejemplo, Sharepoint, MicrosoftTeams, Office 365, papel, etcétera
9. ¿Es la conservación del agua un problema en este departamento?
  - a. Por ejemplo, café o té que nadie bebe
10. ¿Qué sabe sobre el programa “Get Green”?
11. ¿Piensa que sería práctico crear un grupo para ejecutar este programa?
  - a. Sabemos que hace cinco años la persona que lo estaba ejecutando dejó y nadie quería encargarse del programa.
12. ¿Le interesaría participar en este programa como consejero(a)?

## Appendix B: Transcribed Interviews

### Appendix B.1: Interview 1: Academic Department

Q: ¿En qué departamento trabaja?

A: Apartamento academico.

Q: ¿Aproximadamente cuántas personas están en su departamento?

A: Nueve cinco o cien. Contando profesores. ¿Verdad? hay un pocito mas, de existas de profesor ciento seis mas en facturas y ustedes... Ciento quince aproximadamente.

Q: ¿Qué tipo de actividades realiza su departamento en un día ordinario?

A: Muchas reuniones, conferencias, lecciones. Manejamos muchas acciones administrativas. ¿La pregunta es individual o para el grupo? Es una pregunta de grupo para todo el departamento. Ah, sí, okay... Sí, capacitaciones numerosas clases. Algunas de las celebraciones como el día de la graduación, el Día del Padre, el Día de la Madre, y algunas conferencias son despegado.

Q: ¿Cuál es la mejor fuente de desperdicio, basura o reciclaje en su departamento?

Por ejemplo, papel, plástico, etcétera

A: Papel y plástico. Tratamos de reciclaje papel.

Q: ¿En su departamento se comprende cómo eliminar y reciclar desperdicios adecuadamente?

¿Saben lo que pueden reciclar? ¿Usan las papeleras de reciclaje?

A: En todos los departamentos no, pero en este departamento tenemos contenedores donde se clasifican los residuos. En mi departamento, Recogen todos los materiales de reciclaje y no sé a qué lugar va a ir, qué pasa después, si se separan en las diferentes clasificaciones, si se limpian. ¿Necesitas que hable más despacio, repita algo o lo estás haciendo bien? Estamos bien. ¿Puede repetir la pregunta más reciente para nosotros por favor? Sí y no, sabemos cosas básicas sobre el reciclaje de papel y plástico y otros materiales, pero no sabemos si deben limpiarse para reciclarlos o si debemos hacer cosas como quitar grapas del papel antes de ponerlo en los contenedores de reciclaje. Tratamos de hacer nuestro mejor esfuerzo, pero hasta donde sabemos, no es el camino correcto. Creo que eso responde a tu pregunta, ¿verdad? Sí

Q: ¿Puede su departamento dejar de usar papel por completo usar sólo elementos digitales?

A: Sí, es difícil para ellos digitalizar los exámenes o cosas que necesitan estar en copias físicas. Ponemos una gran cantidad de material en Google Drive, pero los documentos oficiales deben estar en forma física. El año pasado redujimos la cantidad de papel que usamos en la clase digitalizando los exámenes tanto como sea posible y usando la parte posterior no utilizada del papel o imprimiendo papel de doble cara. Los estudiantes también utilizan hojas de papel



separadas para responder a los exámenes, por lo que no es necesario imprimir tantos exámenes si no se pueden hacer en línea.

Q: Si su departamento no puede eliminar el papel en la oficina, ¿puede limitar su uso de papel?

A: Sí

Q: ¿Cómo se comparten documentos en su departamento y otros departamentos?

Por ejemplo, SharePoint, Microsoft Teams, Office 365, papel, etcétera

A: En general, utilizamos Google Drive principalmente, así como el correo electrónico. Los estudiantes usan más papel, mientras que el departamento académico utiliza materiales en línea.

Q: ¿La conservación del agua es un problema en su departamento? Por ejemplo, café o té que nadie bebe

A: No tenemos vasos de plástico o papel de un solo uso. En su lugar por cada máquina de café tenemos tazas de vidrio para usar. Muchas personas usan sus propias botellas de agua personales en lugar de las de plástico.

Q: ¿Qué sabe sobre el programa “Get Green” de centre cultural?

A: Creemos que es un proyecto muy bueno, pero el interés por las tetas ha disminuido mucho. Esperamos que pueda volver a la vanguardia y esperamos que tenga éxito en iniciar su restauración. Sabemos lo básico de esto. Sólo necesitamos más información sobre el reciclaje y lo que el programa puede hacer a largo plazo. También necesitamos saber más sobre cómo reciclar correctamente, que es lo que esperamos que pueda ayudar también. No sabemos mucho sobre el programa y no hay mucha participación del centro en sí. Hemos hecho grandes avances en hacer que el consumo eléctrico, agua, papel sea más barato y estamos trabajando duro hacia nuestro objetivo de neutralidad del carbono. Debemos especificar el tipo de eliminación de residuos y los estudiantes conforman la mayoría de los residuos producidos.

Q: ¿Sería práctico crear un comité para ejecutar este programa?

A: Sí, es importante tener un grupo que pueda ejecutar el programa y enseñar a las personas que tienen la manera correcta de hacer las cosas.

Q: ¿Le interesaría participar en este comité?

A: Sí, pero necesitamos más información para que funcione y realmente no reciclamos en casa, pero aquí nos va mejor. Hacemos grandes esfuerzos, pero tiene que haber más participación. Nadie está trabajando juntos. Tiene que haber más comunicación entre los diferentes campus. Convertir los hábitos de reciclaje en una rutina hará que sea más fácil implementar todo. El proceso y el programa deben ser capaces de extenderse a otros lugares e instituciones. Necesitamos un programa para que los profesores hagan con sus estudiantes para fomentar su participación. Necesitamos establecer una responsabilidad para que los estudiantes aborden los

problemas. Con suerte, este será el comienzo de un efecto dominó y que, al introducirlo aquí, los estudiantes y el personal comenzarán a hacer más en casa también.

## Appendix B.2: Interview 2: Executive Board

Q: Estamos aprendiendo español y no lo hablamos muy bien. Por eso, vamos a leer las preguntas. ¿Podemos grabar sus respuestas en nuestros teléfonos celulares o prefiere que las escribamos?

A: Sí

Q: Su participación en esta entrevista es voluntaria, (no se hará recopilación de información personal). Nuestra investigación es confidencial y la información no se utilizará para identificarle ni contactarle. Honraremos todas las solicitudes de anonimato y confidencialidad. No divulgaremos su identidad. Además, tendrá la oportunidad de aprobar la publicación de la información de esta entrevista.

¿Acepta esta entrevista?

A: Sí

\*Interviewee proceeds to sign IRB Informed Consent form\*

Q: ¿En qué departamento trabaja?

A: Yo trabajo en el Dirección Ejecutiva.

Q: ¿Aproximadamente cuántas personas están en su departamento?

A: Somos solamente tres personas [statement removed to protect anonymity].

Q: ¿Qué tipo de actividades realiza su departamento en un día ordinario?

A: Son, son muy variadas. Sí son muchas. Ningún día es igual a otro, verdad. El encargado de coordinar todo lo que es la mensajería, tanto en la parte interna como externa, es la encargada de llevarle la agenda al director ejecutivo y coordinar estas reuniones. Todo lo que sera reuniones para dentro del hotel, coordinar. Tengo que coordinar muchas reuniones en la parte interna, tanto para los directores, con todos los directores del centro como con la junta directiva, porque yo también asisto a todos los integrantes de la junta directiva. Entonces yo trato de coordinar también las sesiones de ellos y después a todo lo que sera en la parte de asistencia administrativa, no solo al director ejecutivo, sino como muchas veces también lo es yo.

Q: ¿Cuál es la mayor fuente de desperdicio, basura o reciclaje en su departamento? Por ejemplo, papel, plástico, etcétera

A: Bueno, yo creo que papel, el papel es como lomas inmediato, ¿verdad? Sin embargo, yo siempre trato de reciclarlo, yo tengo una destructora de papel, ¿verdad? Entonces ahí eso sea, está destruido, pero se saben que reciclaje, ¿verdad? Después para las reuniones de junta directive cuando haya almuerzo siempre se les ponen gaseosas, ¿verdad? Entonces las botellas vacías igual se reciclan. Pienso que la persona que ayuda a la limpieza de la sala de reuniones y ella sabe que las botellas están vacías de gaseosas o cualquier otro material basico para reciclar.

Q: ¿En su departamento se comprende cómo eliminar y reciclar desperdicios adecuadamente?

A: Sí, y no solo en mi apartamento [unintelligible] en el Centro Cultural. [unintelligible] Tanto a nivel administrative como los estudiantes. [unintelligible].

Q: ¿Puede su departamento dejar de usar paper por complete usar solo elementos digitales?

A: Tal vez por complete no, pero sí en un mínimo nivel, ¿verdad? En un mínimo nivel. Casi siempre cuando yo utilizo papeles cuando tengo que entregar una cara y me la tienen que recibir porque se mandan, no lo mando solo internet si no en físico. Entonces, para qué era crucial y yo tengo ese comprobante en mis archivos, pero creo que es mínimo lo que se utiliza, pero no porque, por ejemplo, informes. [unintelligible].

Q: Si su departamento no puede eliminar el papel en la oficina, ¿puede limitar su uso de papel?

A: Sí, sí sí sí. [unintelligible]. Es posible no imprimir. [unintelligible]

Q: ¿Cómo se comparten documentos en su departamento y otros departamentos? Por ejemplo, Sharepoint, Microsoft Teams, Office 365, papel, etcetera

A: [unintelligible] Sharepoint después cuando son documentos muy grandes, muy pasados, se mandan por [unintelligible] Transfer porque hay documentos muy grandes y el correo no la [unintelligible], entonces se mandan por muy grande. Después la junta directiva temenos una aplicación que se llama [unintelligible]. Entonces en esa aplicación se pueden subir a este [unintelligible] por hasta entonces se sube ahí. Entonces eso nos imprimí. Ah, perdón, las actas de junta directiva [unintelligible] para mí, porque eso tiene que ir firmado y eso la auditoría. [unintelligible], pero no son altas, muy largas. Que te digo, cinco o seis páginas y [unintelligible], para aprovechar el papel.

Q: ¿La conservación del agua es un problema en su departamento? Por ejemplo, café o té que nadie bebe

A: No, no no no. No ha sido un problema. Por lo general siempre consumen [unintelligible].

Q: ¿Qué sabe sobre el programa “Get Green” de centre cultural?

A: Absolutely nothing.

Q: ¿Sería práctico crear un comité para ejecutar este programa?

A: Pues, sí, yo creo que siempre todos los tipos de actividades y todos los tipos de iniciativas de activismo sobre el medio ambiente es muy bueno. Por supuesto que sí, que sería muy interesante poder crear un [unintelligible] en el Centro para esta programa.

Q: ¿Le interesaría participar en este comité?

A: Sí, me interesaría, [unintelligible] pero no tengo el tiempo. Entonces, para mí sí es muy complicado. Sí me gustaría mucho, por supuesto, pero no tendría el tiempo para dedicarle exactamente al comité y darle todo mi apoyo en todo lo que se puede para mí es un poco complicado.

A: Pues, estamos listos y no temenos más preguntas. ¡Muchas gracias!

## ENGLISH

Q: What department do you work in?

A: I work for the Executive Board under the CEO.

Q: How many people are in your department, more or less?

A: 3 people in the department

Q: What activities does everyone do on a typical day?

A: They all work together

Q: What is the main source of waste/garbage/recycling in your department? For example, paper, plastic, etc.

A: Paper very much; gas; bottled drinks; meetings bring bottles and recycle plastics whenever possible

Q: Do you think that your department understands how to eliminate and recycle waste properly?

A: Yes; the entire center

Q: Can your department become paperless and use only computers?

A: No but they can minimize it; they need paper for letters and physical copies of things; information such as agendas and schedules

Q: If your department cannot eliminate paper in the office, can you limit the use of paper?

A: Yes, it's possible but not in the near future

Q: How do you store documents in your department and other departments? For example, SharePoint, Microsoft Teams, Office 365, paper, etc.

A: SharePoint mostly; 5 or 6 paper of paper for certain documents

Q: Is the conservation of water a problem in this department? For example, coffee or tea that nobody drinks.

A: No, it's not a problem because they consume it all

Q: What do you think about the Get Green program?

A: Absolutely nothing

Q: Do you think that it would be practical to create a group to run this program?

We know that 5 years ago the person that was running it left and nobody wanted to take over the program

A: Yes, always active its very good and interesting

Q: Would you be interested in participating in this program as an advisor?

A: Yes, but would need the time and it would be a little complicated due to scheduling issues

## **Appendix B.3: Interview 3: Finance, Accounting, General Services Departments**

Q: What department do you work in?

A: Finance Administrative Director. I am in charge of finance, accounting, IT and general services.

Q: How many people are in your department, more or less?

A: There are two in finance, seven in accounting, seven in IT and 6 in general services.

Q: What activities does everyone do on a typical day?

A: Finance takes care of everything related to the correct allocation and balance between the budget and expenses and income and revenue. They revise the budget, and also maintain relationships with banks and the institution.

The accounting department is very general, they pretty much do just accounting, all of the time. The IT department is divided into two sections. One is in charge of taking care of software and the applications and databases. The other takes care of the IT structure at all of our different sites.

General services has three major areas. So maintenance, which is taking care of the buildings and our equipment, and then cleaning which is outsourced, so we must just supervise them as well as security which is also outsourced.

Q: What is the main source of waste/garbage/recycling in your department? For example, paper, plastic, etc.

A Finance is paper it's not a lot but there is a lot of stuff done behind a computer we don't produce a lot of waste. Accounting, I would say paper also and maybe some supplies, office supplies. Which would include like toners and so on? Actually they produce a lot of paper but not to waste a store they actually print a lot of stuff because legally they have to print it and store it. In the IT department, I would say software parts, they produce like nothing but infrastructure would produce, like electronic waste, like cables and old computers, monitors, stuff like that, batteries, all sorts of electronics. Maintenance. Wow. They can produce a lot of things like debris from the fixing it all depends on what they are doing there. Again it all depends on if they are desk they would produce a lot of wood, paint, sayings and so on, they do produce a lot of waste, it is not a ton of waste, but it is an important amount. It is not all produced here but its produce where they are doing the thing, it can range from PVC pipes lights umm building stuff. Cleaning. It is Outsourced. And we provide some of the cleaning materials they use but mostly they give it to us. It's part of the contract they can bring their own cleaning material but I would say they would say they produce a lot of garbage bags. They clean that every day. Sometimes more than that I would say twice a day. I'm not sure if you can consider disinfectants as something that they can throw away since it is part of their job to do the cleaning but I don't know how to express

that, because they are not throwing it away they are just using it.. But we do tell them and um that we want everything to be biodegradable, at least everything that we buy from this company has been certified and um sometimes we do that. However plastic bags we can't just get rid of them because public safety and health issues. Umm but we do produce a lot of garbage. Garbage could be from food wrappers, and paper would mostly be that I think, cleaning utensils. I think they just get worn out, I don't know what they do with them, I have no idea. Just throw them out I guess but I don't know exactly, I have no idea.

Q: I just a quick follow-up question because I was a little unsure. Did you say you provided all of their supply or no?

A: For example, we do buy the plastic bags, we keep a control of the amount otherwise it would be complicated. For example in that trash can if there is like two or three pieces of paper that are not contaminated we will just dump it in a bigger bag and use the same bag that is there. I think it is good practice. If they see that it is contaminated they will take the whole bag. I can provide a list of what we give them I don't have it with me.

Q: Do you think that your department understands how to eliminate and recycle waste properly?

A: I don't have an idea. We started the program get green about 5 or 6 years ago. We don't have the support, we have the recycling bins everywhere and I think they know how enforced that is I am not sure I think it is a personal thing not an institute enforced thing and I know that in my house I will go to throw away something that can be recycled and my daughter will go "ahh" and put it in the right bin, so I think it is a personal thing. Not like I will send you a letter reprimanding you because you don't recycle here, that does not happen.

Q: Can your department become paperless and use only computers?

A: On what time frame? It all depends on that. In general, paperless yes. Only, if there is like a legal change that would be or will allow me not to print stuff. All of accounting needs to print invoices, I need to print balance sheets. All the accounting sheets need to be printed and then stored, and every 5 years destroyed. But for legal purposes I have to keep a legal copy like a year-and-a-half ago. We got new legislation where everybody needs to send an electronic invoice instead of printing. So what happened was that instead of me receiving printed copy of an invoice and I don't have to print. The invoice that comes in an email, which what happened was it switched who pays for [the printing] but not the amount of paper that is being produced. I think probably or eventually what will happen there will be the possibility of not printing that invoice but to do that there has to be a very strong and powerful vault of invoices somewhere that can be kept legally for at least 5 years. And everybody's working on that. I'm sure it's going to happen in the short term, submissive, and its relationship. In the accounting department? It's just legislation everywhere else we can go paperless. Everywhere else we can go paperless there is no reason why not, just like signing, like instead of signing a paper just sign digitally.

Q: If your department cannot eliminate paper in the office, can you limit the use of paper?

A: Yes, but at the same time, since I'm not only the CFO and controller the whole thing, I tend to question. Why do we print so much paper and for example I think I explained to you about 7 years ago we used to give like 15 pieces of paper for student every semester and we have 6,000 students. Do the multiplication that's a ton of paper? And most would just take it and throw it away. It was just information so we decided to put them in the student portal and we got rid of papers. What happens is people don't read it anyway. They just don't read it. They only read it when issues arise, you know how to act on the rules and regulations some people just don't read it. You will get printed the course outline I believe, that's about it everything else is not printed. However, we did do one thing. That was really interesting. Is that a we did like a bank of test? That is the same for all students, but we have like different versions of those tests. So for example for level one we would have like four or five versions of those tests for level one. So for example, we do version 1 in San Pedro and version two somewhere else and number three in some other place so at the end of each bimester, you would be like an answer sheet instead of writing on the exam to take back the exam and rotate them through all of the different sites and the has saved a ton of paper, it was very useful. it produced less paper, like one answer sheet rather than five sheets of test questions.

Q: How do you store documents in your department and other departments? For example, SharePoint, Microsoft Teams, Office 365, paper, etc.

A: We have all of those. Okay, our main application for communication, is google apps, we have the corporate one, or the application suite that we call it. So we google docs for a lot of things, google signs for a lot of things, umm many of the reports are in the SharePoint and they are classified by departments. There are being fed by, most of them by the databases of our system which is called class which is used by \\the financial accounting thing but also the academic records on this it's a one program that holds everything together so it is integrated. So it means basically all the information is in one database, information can be access through class and the reports you can find there but if you have a custom report you will look for it in our share point. if it is not like a report but basically you are like feeding in information um I comprise information of the discounts we have with companies its being shared by the woman who does that and it is in Google Do. with the permissions everyone has been given, not everyone can edit something and can just see and that's why yes. IT does use Teams but that is because IT guys are more Microsoft than most of us, still don't know why but.

Q: Is the conservation of water a problem in this department? For example, coffee or tea that nobody drinks.

A: Is that a problem? It is not a problem, it is a concern. But it is starting more as my concern because I do think we have to conserve more water, and have done everything possible to conserve water, but it's more than pushing it not because someone else has been telling me what



to do with water conservation for example you go to the men's room you got the urinals that are water free you got the push faucets and the water stations all those things are pushing for it. I think that I one from a family that do believe in that that this is okay, sometimes I haven't had opposition from anybody, so like when it came to the idea of having water bottle stations, everybody says that's okay, I say about 5 or 6 years ago someone said I want a water bottle station but from the water bottles that just you place the water bottle on and it fills, because they thought the water was not pure enough, so what I did was make sure that the tank, the water tank was refilled and resurfaced and redone into the best possible conditions and every month I have the water tested anti comes out clean. And did you know all of America, only two countries can say water is totally potable, and it is Costa Rica and Chile and that is it.

Q: What do you think about the Get Green program?

A: I think it is great. The concept is perfect. The execution started slow but good, I think it lacks a leader I think it needs more publicity, ideas of what to do next. At the end gg shouldn't be just about recycling it should be more. Like I said most of the get green initiatives have come from me, from the water conservation, the solar panels changing all of the lights to LEDs, so what is left for the rest I'm not sure, recycling and that kind of thing, what can we do more outside of our institution, volunteering outside, more community involvement and to get our students involved, I don't think we have done that. And at the end the city's most of that communication. I cannot do it. Because of the position I am, I'm more back office than front office. I think that is prob the reason it hasn't been more successful projecting it outside of the institution, including I am not sure it is something that has been said when you hire anyone and I think that it is important at the end that okay you are now part of the central cultural, remember that to turn off the lights take care of resources, conserve waters don't know, and probably it should start at the hiring process. But for that to happen everything else has to be in place. When you are hired and you are told all of this and you go outside and nothing is happening, you walk the walk but we need to talk.

Q: Do you think that it would be practical to create a group to run this program?

A: I don't think it is practical, I think it is necessary. And like I said there should be a leader behind it to make sure everything that is being done keeps running. At the end, I think they have given the get green and social responsibility team and we have a leader, which I think has his mind set on other types of social responsibility and not this is thinking out how to get low-income children to get English instruction. Which I think is great, I am not saying it is bad but I think this is on the back burner, I don't think this is on his agenda at all. I'm not sure it has to be separate from the doc responsibility I just think he has to grab it and be part of it. I think it's big but it's not that big. And I think following up on this stuff It's not that hard shouldn't take that long to be like at once a month thing. Now we're meeting, what are we doing now, how can we change it? It can't be that bad, at the beginning it is going to take a lot of time to structure procedures and policies and blah blah blah but once it is all set it shouldn't be that hard to do the follow up.

Q: Would you be interested in participating in this program as an advisor?

A: Of course! Por supuesto! I am all for it.

## Appendix B.4: Interview 4: Human Resources Department

Q: Estamos aprendiendo español y no lo hablamos muy bien. Por eso, vamos a leer las preguntas. ¿Podemos grabar sus respuestas en nuestros teléfonos celulares o prefiere que las escribamos?

A: Sí

Q: Su participación en esta entrevista es voluntaria, (no se hará recopilación de información personal). Nuestra investigación es confidencial y la información no se utilizará para identificarle ni contactarle. Honraremos todas las solicitudes de anonimato y confidencialidad. No divulgaremos su identidad. Además, tendrá la oportunidad de aprobar la publicación de la información de esta entrevista.

¿Acepta esta entrevista?

A: Sí

\*Interviewee proceeds to sign IRB Informed Consent form\*

Q: ¿En qué departamento trabaja?

A: Resources humanos

Q: ¿Aproximadamente cuántas personas están en su departamento?

A: Somos cuatro personas.

Q: ¿Qué tipo de actividades realiza su departamento en un día ordinario?

A: Muchas, hahah, okay mi departamento se encarga del pago a todos los colaboradores. Es decir [unintelligible] además nos encargamos de contratar personales de todas las áreas, todas las sedes. También ofrecemos el servicio de medicina de empresa para todos los colaboradores. Atendemos situaciones personales de los colaboradores. Que alguna persona sienta necesidad de conversar porque tiene un problema con su jefe inmediato o algunas situaciones problema y lo quieren comentar, siempre estamos dispuestos para colaborar. Trabajamos día por día para motivar al personal haciendo actividades y enviando permunicados también para que la gente esta informada sobre lo que... la institución, comunicados institucionales como feriados, una actividad importante... hacemos la fiesta de fin del año también para nuestros colaboradores. Que mas? Todo el tema de capacitación y desarrollo nos comiende a nosotros hacerlo buscar proveedores para brindar la capacitación teniendo al departamento y los temas de [unintelligible] que mas? [unintelligible] Siempre tratamos de fortalecer nuestros valores. Nosotros somos una institución que enfoca en los valores que son compromisos, integridad, la excelencia, el respeto Y colaboración. Entonces nuestro departamento, nuestras actividades, siempre tratamos de fortalecer sus valores y que la gente los tome como suyos como propios. Eso hace que las personas se identifiquen con nuestra institución. Es como resume tal vez.

Q: ¿Cuál es la mayor fuente de desperdicio, basura o reciclaje en su departamento? Por ejemplo, papel, plástico, etcétera

A: Reciclaje. Papel es lo que mas reciclamos

Q: ¿En su departamento se comprende cómo eliminar y reciclar desperdicios adecuadamente?

A: Hablando del papel? De reciclaje? Si si. Tenemos un espacio en un escritorio y allí tiramos todo el papel que reciclamos para después utilizarlo o triturarlo que no es el correcto pero a veces hay mucho papel y hay que triturarlo

Q: ¿Puede su departamento dejar de usar paper por complete usar solo elementos digitales?

A: Es muy complicado. Porque mi departamento manejamos información muy confidencial de nuestros colaboradores y necesitamos documentos impresos porque en caso que se presente una situación legal con alguna person, un quiso, nos piden documentos impresos entonces es imposible no tenerlos.

Q: Si su departamento no puede eliminar el papel en la oficina, ¿puede limitar su uso de papel?

A: Si de hecho si hemos hecho muchas incentivas para tratar de dimunirlo. Hace mas de tres anos cuando una persona un colaborador se le paga, se le entrego un comprobante que redució su pago y ese comprobante lo imprimimos y se lo entregamos a cada uno. Había mucho papel. Ahora se envía por correo electrónico. Entonces es muchísimo. Nos ahorramos por eso

Q: ¿Cómo se comparten documentos en su departamento y otros departamentos? Por ejemplo, Sharepoint, Microsoft Teams, Office 365, papel, etcetera

A: A través de share point o google drive. Es la question was utilizamos google drive.

Q: ¿La conservación del agua es un problema en su departamento? Por ejemplo, café o té que nadie bebe

A: No. Para nosotros es necesario el agua en nuestra oficina. Para beber si. Tenemos una envión y nos puede durar 15 días. Tratamos de provecharlo pero para nosotros es muy importante que tomemos líquidos.yo desayuno en i casa y no utilizo la agua de acá para [unintelligible] mis compañeras si toman pero solo cafe y dos tazas

Q: ¿Qué sabe sobre el programa “Get Green” de centre cultural?

A: El program get ring es uno incentiva institucional que pertenece al departamento financiero y tiene muchísimas incitativas para ayudar el medio ambiente y conservar también la naturaleza de una manera. Muchas de las incentivas han sido mucho por ejemplo en los escuelas [unintelligible] De San Pedro y Cartago [unintelligible] eso permite la agua energético que viene de la 90% del ahorro por el uso de esa incitativas

Q: ¿Sería práctico crear un comité para ejecutar este programa?

A: De hecho ya existe un comité de la responsabilidad social pero no solo ahora esta temo sino ahora otros temas de responsabilidad sociales. Sin embargo si cree que podemos hacer mucho mas. Podemos darles mayor seguimiento y tratar de ver las otras incentivas que hay.

Q: ¿Le interesaría participar en este comité?

A: Si.

## ENGLISH

Q: What department do you work in?

A: Human Resources.

Q: How many people are in your department, more or less?

A: There are four people.

Q: What activities does everyone do on a typical day?

A: A lot. Okay, my department is responsible for the payment of all employees. That is to say, we also take care of hiring personnel from all areas, and all locations. We also offer the company medical services for all collaborators. We attend to personal situations of the collaborators. if someone feels the need to talk because they have a problem with their immediate boss or some situations and they want to communicate, we are always willing to communicate. We work day by day to motivate staff by doing activities and sending communications also so that people are informed about the institution, institutional communications such as holidays, and important activity; we also organize the end of the year party for our employees. What else? The whole issue of capitalization and development combine us to do it to look for suppliers, to provide the recruitment, having well functioning departments... What else? ... We always try to strengthen our values. We are an institution that focuses on values that are commitments, integrity, excellence, respect and collaboration. Then our department, our activities, always try to strengthen their values and that people take them as their own as their own. That makes people identify with our institution. It's as it sums up maybe.

Q: What is the main source of waste/garbage/recycling in your department? For example, paper, plastic, etc.

A: Recycling. Paper is what we recycle the most

Q: Do you think that your department understands how to eliminate and recycle waste properly?

A: Speaking of paper? Of recycling? Yes, yes. We have a space on a desk and there we throw away all the paper that we recycle and then use it or shred it that is not correct but sometimes there is a lot of paper and we have to shred it

Q: Can your department become paperless and use only computers?

A: It's very complicated. Because my department handles very confidential information of our collaborators and we need printed documents because if a legal situation arises with any person, a warrant, they ask us for printed documents so it is impossible not to have them.

Q: If your department cannot eliminate paper in the office, can you limit the use of paper?

A:

Yes indeed we have done many incentives to try to reduce it. More than three years ago when a person is paid by a collaborator, a receipt was given that reduced their payment and we printed that receipt and handed it to each one. There was a lot of paper. Now it is sent by email. Now, we save a lot of paper because of that.

Q: How do you store documents in your department and other departments? For example, SharePoint, Microsoft Teams, Office 365, paper, etc.

A: Through share point or google drive. It is the question, we use google drive.

Q: Is the conservation of water a problem in this department? For example, coffee or tea that nobody drinks.

A: No. For us, water is needed in our office. To drink yes. We have a shipment and it can last 15 days. We try to take advantage of it but for us it is very important that we drink liquids. I have breakfast at home and I do not use the water here but for my companions they drink here but only coffee and only two cups.

Q: What do you think about the Get Green program?

A: The get green program is an institutional incentive that is a part of the financial department and has many incentives to help the environment and also preserve nature in a way. Many of the incentives have been a lot, for example, in the campuses of San Pedro and Cartago water efficient bathroom that allows the energetic water that comes from 90% of the savings from the use of these incentives.

Q: Do you think that it would be practical to create a group to run this program?

A: In fact there is already a committee of social responsibility but now it seems that they are focused on other social responsibility issues. However, if you think we can do much more, we can follow up with them and try to see the other incentives there are.

Q: Would you be interested in participating in this program as an advisor?

A: Yes.

## Appendix B.5: Interview 5: Cultural Department

Q: ¿En qué departamento trabaja?

A: Trabajo en el departamento cultural.

Q: ¿Aproximadamente cuántas personas están en su departamento?

A: Somos seis personas.

Q: ¿Qué tipo de actividades realiza su departamento en un día ordinario?

A: nosotros nos envergamos de todo lo que es la parte cultural vemos en teatro la galería tenemos cinco galerías un en qué hacer. hace que coordinando eso realizamos eventos en el teatro y trinos

Q: ¿Cuál es la mejor fuente de desperdicio, basura o reciclaje en su departamento?

Por ejemplo, papel, plástico, etcétera

A: Papel, una estructura tratando de quitarlo totalmente diferentes formas. Este ya es intentar usar papel solo para contratos o documentos legales.

Q: ¿En su departamento se comprende cómo eliminar y reciclar desperdicios adecuadamente?

¿Saben lo que pueden reciclar? ¿Usan las papeleras de reciclaje?

A: Sí, porque en el centro cultural ya tiene como estrategia. Específicamente no entendemos lo que tienes que hacer si tienes más que papel en el reciclaje.

Q: ¿Puede su departamento dejar de usar papel por completo usar sólo elementos digitales?

A: Es complicado porque los documentos formales y legales deben estar en forma física, pero tratamos de reducir el uso del papel usando las espaldas o ya usamos papel para pequeñas cosas. Hacemos todo lo que podemos digitalmente.

Q: Si su departamento no puede eliminar el papel en la oficina, ¿puede limitar su uso de papel?

A: Si

Q: ¿Cómo se comparten documentos en su departamento y otros departamentos?

Por ejemplo, Sharepoint, MicrosoftTeams, Office 365, papel, etcétera

A: Utilizamos Google drive y SharePoint principalmente

Q: ¿La conservación del agua es un problema en su departamento? Por ejemplo, café o té que nadie bebe

A: No, se utiliza más agua durante grandes eventos en el baño y la cantidad que las personas consumen agua aumenta en estos eventos, pero de lo contrario no es un gran problema.

Q: ¿Qué sabe sobre el programa “Get Green” de centre cultural?

A: No sé mucho sobre eso, excepto el reciclaje. No he sido informado de ello lo suficiente.

Q: ¿Sería práctico crear un comité para ejecutar este programa?

A: Sí

Q: ¿Le interesaría participar en este comité?

A: Sí, me gustaría ser parte de ella y saber más al respecto.



## **Appendix B.6: Interview 6: Maintenance and Supplies Department**

A: We have like ten pages, but again you know it depends on the departments. If you think about the finance department many of these important documents need to be printed. In our department, in the academic department, we try to go paperless as much as we can.

A: Yes there is something else, including the board of directors plus the heads of other departments all these people get together on a regular basis to see how we can go about working with...we are trying to have a less impact on the environment by thinking you know resources and environment itself.

A: There are different people that I guess are a part, he is part of that committee. In my department I am not a part of that committee but there are people who are always a part of that committee. Every single department has members in that committee.

A: This is interesting for example question number 9 we do have this fountain that we have in the office and obviously you can get hot water from that so I think that no coffee or tea is being wasted because if you want to drink something you go prepare it yourself so there is nothing left we have taken care of most bottles that we have used before.

A: This report that he handed out to you is [unintelligible].

A: So, if you want extra reports, he can bring them to you. He has been running around because of the many different things he has to do.

Q: There is a consent agreement we need you to sign.

A: Oh no problem.

Q: Other than that, we can read the report.

The report that the interviewee handed us was the following:

## REPORTE PROGRAMAS DE RESPONSABILIDAD SOCIAL EN EL AREA DE AMBIENTE

### **1. ¿Cuáles son los proyectos que en materia ambiental se han implementado en el CCCN para reducir el impacto ambiental?**

**R/** En los proyectos en que el Centro Cultural ha venido trabajando en materia de ambiental para reducir el impacto ambiental son los siguientes:

1. En todas las sedes se colocaron iluminarias led, lo cual produjo un ahorro enorme de consumo eléctrico.
2. Se colocaron en todos los baños grifería push para que no haya desperdicio de agua potable y así reducir el consumo de agua potable, también se colocaron en todas nuestras sedes orinales 100% libres de agua potable.
3. Estamos colocando paneles solares en nuestras sedes lo cual nos ayudan a reducir el recibo eléctrico hasta un 90%.
4. También contamos con una empresa recolectora de material de reciclaje para todas las sedes. Cada sede cuenta con basureros debidamente identificados para recolectar vidrio, plástico, aluminio, papel y cartón. Esa toma y distribución del reciclaje lo hace el personal de limpieza donde se pesa cada vez que viene el camión del reciclaje.
5. Hemos ido cambiando los aires acondicionados de R22 a AC 410 inverter los cuales no perjudican a la capa de ozono y ayudan a reducir el consumo eléctrico.
6. Les solicitamos a las sodas del Centro Cultural que utilicen gas para reducir los consumos eléctricos

### **2. ¿De qué manera se ha reducido la huella de contaminación carbono de la institución en el ambiente? ¿Se podría cuantificar?**

**R/** La gestión del carbono se va a convertir en un importante elemento de responsabilidad medioambiental.

Algunos beneficios para la institución son:

1. Ayuda a la institución a buscar la diferenciación cualitativa que supone el cálculo y la difusión de esta información entre sus estudiantes y colaboradores.
2. Es una de las herramientas de las que hacen uso las instituciones para seleccionar de una manera más inteligente, sostenible y concienciada qué productos comprar.
3. Otro de los beneficios de contar con la huella de carbono en la institución es la de analizar los puntos susceptibles de reducción de emisiones de carbono en dicho proceso.
4. La huella de carbono ayuda a mejorar la imagen de la marca y a tomar decisiones coeficientes con su entorno. En definitiva, es el indicador del grado de coeficiencia de la CCCN.
5. Actúa como elemento diferenciador cara a la competencia.
6. Otro de los beneficios de contar con la huella de carbono en la institución, es que ésta produce un diseño y un producto más sostenible con el medio ambiente.
7. También ayuda a mejorar la imagen de la empresa entre sus propios trabajadores. Una imagen mucho más eco solidaria con el entorno y el Planeta.
8. Es una tendencia al alza. Implantarla en la empresa supone pertenecer a este creciente grupo de empresas que ya adoptan medidas relacionadas.
9. Un aspecto importante para las instituciones, medir la huella de carbono no supone excesivos costes para las empresas.

**3. ¿Por qué podemos calificar los proyectos ambientales como parte del área de Responsabilidad Social del CCCN?**

**R/** Lo podemos calificar los proyectos de ambientales como parte del área de Responsabilidad Social del Centro Cultural, ya que se ha vuelto una práctica aquí en la institución a una situación actual de mayor compromiso con el medio ambiente y la sociedad en su conjunto. Ya no se busca solo como un beneficio económico sino ha venido que ceder lugar al desarrollo de nuevos objetivos en el campo de la responsabilidad social, del cuidado del medio ambiente y la preservación de los recursos naturales, pasa desde un enfoque estratégico netamente económico a uno cada vez más social y ambiental, en un alto grado de compromiso con la sostenibilidad y con los diferentes grupos de interés.

**4. ¿En qué mejora la calidad de vida de los estudiantes/personal/sociedad los proyectos ambientales?**

**R/** Mejora la calidad de vida de los estudiantes, colaboradores y sociedad en los proyectos de ambientales, como el entorno que afecta y condiciona especialmente las circunstancias de vida de las personas o la sociedad en su conjunto. Comprende el conjunto de valores naturales, sociales y culturales existentes en un lugar y un momento determinado, que influyen en la vida de las personas y en las generaciones venideras. Es decir, no se trata sólo del espacio en el que se desarrolla la vida, sino que también abarca mucho más como a los seres vivos, objetos, agua, suelo, aire, clima y las relaciones entre todas las mencionadas, así como elementos tan intangibles como la cultura.

**5. ¿Cuál es la historia que más le ha impactado como líder de este programa?**

**R/** Que pueda servir de ejemplo para futuras generaciones y puedan seguir cosechando una mejor calidad de vida en la materia de ambiente, así como de dejar un legado a esta noble causa. Además de considerar las expectativas económicas, sociales y ambientales de todos nosotros, demostrando respecto por las personas, valores, la comunidad y el medio ambiente, contribuyendo así a la construcción del bien común.

## Appendix B.7: Interview 7: Marketing Department

Q: What department do you work in?

A: Marketing department since July 2017

Q: How many people are in your department, more or less?

A: 4 mainly

Q: What activities does everyone do on a typical day?

A: We help with the cultural aspects and the communications of the center. I am not sure if you are familiar with it, but with education USA. It is a department that helps people, I say people but many of them are kids like 17-18 years old. That are interested in going to the United States to study at like a university, so we have that department here, its free service and we also help the education USA department make all the communication in social media also the theater and the gallery's and education USA have their own social media like their own profile on Facebook and on Instagram too. Then we are in charge of all the communication in social media like I said as well CCCN, the CCCN has its own profile on social media on Instagram and Facebook.

What else? Wait a minute because I am missing something.

Oh, and we're helping to in the academic department and you don't have to know that but once a year we make like, well organize a very big conference for teachers of English. This year it is going to be in May, normally it was in January or February but this year it is going to be a very big confer. So, like they delayed on till May so the NCT National Conference for teachers of English and has its own profile on Facebook to. So, as you can see there is a lot of work to do not only work with posts like study English no its a lot of work to do, we like to fragment ourselves in many fields many subjects and stuff. SO we have like an agenda that we have in google drive, I am the one that feeds the agenda, the Graphic designers have their own agenda and committee too, so like I said there is a lot of work to do so we have to organize ourselves daily. Ask me what's a normal day, we don't have a normal day. I feed out the agenda and then two minutes later I have to change it because I don't know. Or they could be like in emergencies and stuff, for example, right now we are. I don't know. How do you say matricula like in the engagement process of people outside? We are in that process right now. So, our boss is we were approved to have light up like special face-to-face for example 60% off in store in your monthly payments or something. So, he was at and so and also, we have right now in cultural in the photo department. We have this department called promising artist of the 21st century which are kids who come from university in the United States to give a concert or dance session and stuff who are musicians and they are about to graduate from the University. So, they come to CR to give like little concerts and stuff. So, as you can see there is a bit of work. I have to manage to work with all of product leaders, and then I get to work to the graphic designers so they can do the magic and stuff so that

Q: What is the main source of waste/garbage/recycling in your department? For example, paper, plastic, etc.

A: Source? Paper, of course. Well I wasn't in former workplace the amount of paper we waste here is not even comparable to my former workplace. But here the marketing department, the waste of paper is a lot. I mean I have tried to, not to, mmm be like it's not that bad right so for example if we print something that is wrong, and the other side is blank. Okay so we use it for another purpose and stuff. But yes I think that paper is the main, because we have to print like arts and for example the back part of the bus that you have publicity there so for example we do that kind of publicity of advertisement the one that are printing it have to bring us all the printing idea and stuff and we see it and okay its approved. But it is inevitable, I have to see it, I have to see how the printing is right. If the colors are right, it is inevitable, but yeah At least in my department. But again, we try to recycle for example if that piece of paper that is a proof of color (in Spanish) we call it that's like proof of color right, after I don't know 3 months that I don't need it, we recycle it we recommend to the garbage cans of recycling, right.

Q: Do you think that your department understands how to eliminate and recycle waste properly?

A: I hope so. But to be honest we haven't had any of training or to like no lecture about how to recycle I mean when you see the garbage cans. But for example, I know to recycle a bottle of yogurt, I mean plastic yogurt, you have to clean it first and then I don't know if they know that, right? Yeah, I wouldn't say they know it because I don't want to take it for granted. I hope so, but again to be honest. I mean since I have been here since 2017. We haven't had like a very good explanation of how to recycle how to clean the bottles and stuff.

Q: Can your department become paperless and use only computers?

A: It has become paperless. I mean it has. As I said that there are some printings that are inevitable. I mean we have to see the proof of a color will I mean one example is the buses, another example is. Oh, I forgot the other department. We have another department called Internationals certifications, for example for toy topple and stuff. I mean we need to be in charge of all those off certifications. I can give an example from yesterday, we received all the proofs of colors from the department of int certifications because we are going to make brochures folders, flyers that they need because the client needs it. Compared to I don't know three years ago the printing the amount of printings have been diminished but I don't know if we can if we can eliminate it completely but has I mean it has diminished a lot. But yeah again so we had we, first we have to make materials. We have to print materials. There are much less than example for four or three years ago. And then again, the proofs of color are inevitable. we have to see, feel the quality of the paper the quality of the color, we also make like folder for example, we have to see if it okay because if it's not the waste will be a lot. Not only for the paper but also for us, for our budget, right? It's not that we are doing it right now. I mean a lot of material said we're printed that we are now using it as digital ones, and we email them right, but we still are making some materials, printed materials but enough much less amount.

Q: If your department cannot eliminate paper in the office, can you limit the use of paper?

A: Of course, and we are doing and we are doing it so bad. And um yeah, the amount of printing materials is not compared to two of the ones of when I entered here. And we are doing it because some people still need the printing material still need to make notes and stuff. But actually, the people in customer service they are telling me like I emailed that and don't say anything because you have everything here, right? So, there are like not many people who are asking for the printed material, so we are trying to use actually right now. Two years three years ago we made like a brochure that had for example information like classes begin on I don't know February 27th, okay and if we had finished that date and we had a lot of printing I mean what would we do with that? It goes to the garbage. I mean it's a lot of waste, so we are trying to eliminate those materials so that we can use these materials along the year

Q: How do you store documents in your department and other departments? For example, SharePoint, Microsoft Teams, Office 365, paper, etc.

A: Storage you said? Okay most of it is in google drive because the material that we amok are sometimes very heavy because board and it is very heavy for us to have it here. But in the cloud is it okay, so but also in here in on the computer network. Yeah, I have everything, at least the screenshots of the billboard and if you are not asking that but, for printed materials we also have like a folder with all of the printed material that we've done since 2015 like for reference, please for reference like okay we used to do that in okay how do we want to improve material how can we make it better because again the printed material it is very important for us to. So how can we make it better and how we can go backwards how it's important for us to so how can I get better and how we can a backwards to how it was?

Q: Is the conservation of water a problem in this department? For example, coffee or tea that nobody drinks.

A: No, I don't know if you have seen along the campus like the water fountain I mean we use it a lot because one of the employees she drinks a lot of tea. So she doesn't have to use tap she uses the water fountain for example. So, I don't think that's a problem actually. I don't know if maintenance has the same problem, I think they have but at least in marketing no. I drink a lot of water but again I use the water fountain.

Q: What do you think about the Get Green program?

A: Okay, the get green, I'm going to be honest with you guys. I know there's a get green program, but I haven't heard about it. I mean again, I haven't heard we haven't had a lecture about it or an email about it I mean to educate ourselves I know there is a project like but I mean since 2017 I don't know if it was different in 2016 but since I have been here I haven't heard anything about it. Yeah, for example, I know that's the least a garbage cans, recycling cans are part of the get green , and like actually they removed the stickers on the lights saying to turn off the lights when you leave the room, but they were kind of ugly honestly. So actually, making myself

responsible too, I have asked about it either. Because if someone asked, I don't know first of all who is in charge of the project, but everything that has to be printed, like the stickers, email, art, has to come through marketing and I haven't received any request for the Get Green Project. That's a problem. You have to take notes about it.

Q: Do you think that it would be practical to create a group to run this program?

A: Of course, I think there is a committee, but I don't even know where it is. I don't know if there still employees but of course there has to be a committee. I mean, not only for this situation but for us to learn how to recycle how to clean the bottles how to inform us about stuff that, that could help the planet and could also help this institution to help make it greener.

Q: Would you be interested in participating in this program as an advisor?

A: Okay, I'm interested but I don't have any time and I'm sure that people that you have interviewed have told you the same thing. Yeah, the biggest problem with my position is that I have to charge of a lot of things that even though I want to, I'm not going to be able to, because of the time. But nevertheless, I am all ears, and in all this position to make department available to help, to get to know the Get green Project. I mean we can make room in the agenda; we can make it a priority. The graphic designers can make beautiful things, beautiful flyers, emails and stuff. So, all of the employees in the CCCN can get to know the Get Green Project better. That is what I am committed to, I mean to make my department 100% available.

## Appendix B.8: Interview 8: Administrative Department

Q: Su participación en esta entrevista es voluntaria, (no se hará recopilación de información personal). Nuestra investigación es confidencial y la información no se utilizará para identificarle ni contactarle. Honraremos todas las solicitudes de anonimato y confidencialidad. No divulgaremos su identidad. Además, tendrá la oportunidad de aprobar la publicación de la información de esta entrevista. ¿Acepta esta entrevista?

A: Sí, Gracias.

Q: ¿En qué departamento trabaja?

A: I am the library coordinator, we have five libraries in each site at the Centro Cultural and we have one library in each, I am the person in charge to coordinate with these sites all the process of the library

Q: ¿Aproximadamente cuántas personas están en su departamento?

A: Here we have three staff people in charge of the front desk, one is a librarian, and we have an office close to the door and in each site, we have one librarian. In the structure my boss is Lilly Sevilla she is the academic director.

Q: ¿Qué tipo de actividades realiza su departamento en un día ordinario?

A: I am like an instructive staff for example purchases of book or materials in all libraries, check the budget, we have to process the entry of all material because we have in the system we have an integrated system for the supervision of the library, for the loans, inventory, cataloging, the use of all materials, books, keyboards, laptops, multimedia projects, electronic things. Sometimes we organize or support other departments, for example the academic department, for activities with the teachers or students.

Q: ¿Cual es la mejor fuente de desperdicio, basura o reciclaje en su departamento?

A: Maybe paper, but we use a few tenemos poco desperdicia porque no implimimos mucho yo imprimo cosas de copies of invoices for the support of you a little Qe idiamos y los companeros no imprimen casi nada nos autorisous imprimen para profesores or que los profesores tampoco imprimen they have to pay for copies y we have a lot of books y ja si libros estan muy detoreal o esta con mancha o receclar. Un poco prequenta. Algen importante es el los sivils porque la casi no se usa no tiene el optic reader entonces semos tenido que motar reciclague muchos listos pero eso en la pasada ya no tenemo mas

Q: ¿En su departamento se comprende cómo eliminar y reciclar desperdicios adecuadamente?

A: Sí, el papel. Llamos tengo una epsacio estoy papel muchos companero del piesa papel y alguien trabajo in pac para manda reciclar.



Q: ¿Puede su departamento dejar de usar papel por completo usar sólo elementos digitales?

A: Sí, echo mucho tiempo del uso system no necesitamos nada. Y tenemos todo el google docs o entrillo calidarios y eso tipo de cosas no tenemos malintreso los brans del facturas y esas compras external si la guardanos pero esta todo para papel y a Partido ahora en digital porque no necesitamos.

Q: ¿Cómo se comparten documentos en su departamento y otros departamentos?

A: google drive por electronico como media oficial documentos compartidos y sharepoint

Q: ¿La conservación del agua es un problema en su departamento? Por ejemplo, café o té que nadie bebe

A: No porque la biblioteca inside no tenemos agua los pisos pero todos ellas neccesario agua botellos

Q: ¿Qué sabe sobre el programa “Get Green”?

A: Un poco hace mucho tiempo porque yo tiempo deoca anos trabaja aqui entonces recuerdo que problama fue estos boten de basura colores el hicimos un hora campana del central de unas camicertas y una charla como reciclar pero si fui hace como cinco anos puedo no tomar el tema como parar continuar novemos tomar

Q: ¿Sería práctico crear un comité para ejecutar este programa?

A: Sí porque hay que estar permenante que llamo como recordante a las personas como reciclar, que biciclen, con usan una bicicleta, botellas y papel, y Tambien estudiantes porque primero el staff pero todos estudiantes no son parte de programa no que estudiantes hay como reciclar y tienen consiensia pero no repuertos teachers no hablan tal vez sobre eso en las clases tal vez si todos y es de practicamentes te nos programa de dianto.

Q: ¿Le interesaría participar en este comité?

A: Sí, claro pero que hacer en cetnro cultural muchos cosas podia hacer un poco mas papel, Bicicleta, informacion de papel, biclete, le gente reciclar con la grafa paper clip boten y la botella lavar no clasifica si hay un comite estudiante ducharlos y este con los algo mas.

## Appendix C: Survey Questions

### Appendix C.1: Student Survey Questions: English

Dear Students:

In the Costa Rican North American Cultural Center, we have set the goal of being carbon neutral by 2023. For this purpose, it is necessary to measure our impact as an institution with the environment. All of us, professors, administrators, suppliers and students, leave a mark on this world. What we want is for that footprint to be as small as possible in order to have a better world in the future. We would appreciate if you could participate in the following survey that will not take more than 5 minutes of your time. The answers are completely anonymous, and we will use that information to generate specific actions that help you have a better experience with us. Thank you for being part of this change.

1. Which CCCN headquarters do you attend?
  - a. San Pedro
  - a. Sabana
  - b. Cartago
  - d. Alajuela
  - e. Heredia
2. At what time do you attend English classes at the Cultural Center?  
In the morning
  - b. In the afternoon
  - c. In the evening
  - d. On Saturday mornings
3. What is your gender?
  - a. Female
  - b. Male
  - c. Other
4. What is your age?
  - a. 18-21
  - b. 22-25
  - c. 26-29
  - d. 30-33
  - e. 34-37
  - f. 38-41
  - g. 42-45
  - h. 46-49
  - i. 50-53
  - j. 54-57
  - k. 58-61
  - l. 62 or older
5. Approximately how many hours do you spend at the CCCN per week?
  - a. 1-3 hours
  - b. 4-6 hours
  - c. 7-9 hours
  - d. 9+ hours

6. How long does it take you to get to and from the CCCN?
  - a. \_\_\_\_ Minutes
  - b. \_\_\_\_ Kilometers
7. How do you travel to the CCCN?
  - a. I drive alone
  - b. I drive with a friend
  - c. Public Bus
  - d. Taxi/Uber/DiDi
  - e. Bike
  - f. Walk
8. What do you eat at the CCCN?
  - a. I bring lunch to the CCCN
  - b. The café at the CCCN
  - c. I go to restaurants nearby
  - d. Sometimes I bring lunch, sometimes I go to restaurants
  - e. I never eat in the CCCN
9. Do you know about the CCCN's "Get Green" program?
  - a. Yes
  - b. A bit
  - c. No
10. How often do you recycle at the CCCN?
  - a. Always
  - b. Almost always
  - c. Sometimes
  - d. Never
11. Do you know can and cannot be recycled?
  - a. Yes
  - b. I have a general idea
  - c. No
12. What material do you recycle most at the CCCN?
  - a. Papel
  - b. Plástico
  - c. Cartón
  - d. Electrónica
  - e. Vidrio
  - f. Metal
  - g. Otro material
  - h. No reciclo
13. Do you know where your garbage and recycling go after you throw it away?
  - a. Yes
  - b. A bit
  - c. No
14. The CCCN wants to make efforts to reduce the carbon footprint and take care of the environment. What can the CCCN do to achieve this goal?
15. What are some of the practices that you follow while at the CCCN to help conserve resources? For example, conserve water, recycle paper or other materials, turn off the lights when you can.

## Appendix C.2: Student Survey Questions: Spanish

### Encuesta de Estudiantes

Estimados estudiantes:

En el Centro Cultural Costarricense Norteamericano nos hemos puesto la meta de ser carbono neutrales para el 2023. Para tal efecto, es necesario medir nuestro impacto como institución con el medio ambiente. Todos nosotros, profesores, administrativos, proveedores y estudiantes, dejamos una huella en este mundo. Lo que queremos es que esa huella sea la menor posible para poder tener un mundo mejor a futuro. Agradecemos si pudieras participar de la siguiente encuesta que no tomará más de 5 minutos de tu tiempo. Las respuestas son totalmente anónimas y utilizaremos esa información para generar acciones puntuales que ayuden que tengás una mejor experiencia con nosotros. Gracias por ser parte de este cambio.

1. ¿A cuál sede del CCCN asistís?
  - a. San Pedro
  - b. Sabana
  - c. Cartago
  - d. Alajuela
  - e. Heredia
2. ¿En qué horario asistís a clases de inglés en el Centro Cultural?
  - a. Mañanas entre semana
  - b. Tardes entre semana
  - c. Noches entre semana
  - d. Sábados mañanas
3. ¿Cuál es tu sexo?
  - a. Femenino
  - b. Masculino
  - c. Otro
4. ¿Cuál es tu edad?
  - a. Entre 18 y 21 años
  - b. Entre 22 y 25 años
  - c. Entre 26 y 29 años
  - d. Entre 30 y 33 años
  - e. Entre 34 y 37 años
  - f. Entre 38 y 41 años
  - g. Entre 42 y 45 años
  - h. Entre 46 y 49 años
  - i. Entre 50 y 53 años
  - j. Entre 54 y 57 años
  - k. Entre 58 y 61 años
  - l. 62 años o más
5. Aproximadamente, ¿cuántas horas pasás en el CCCN cada semana?
  - a. De 1 a 3 horas

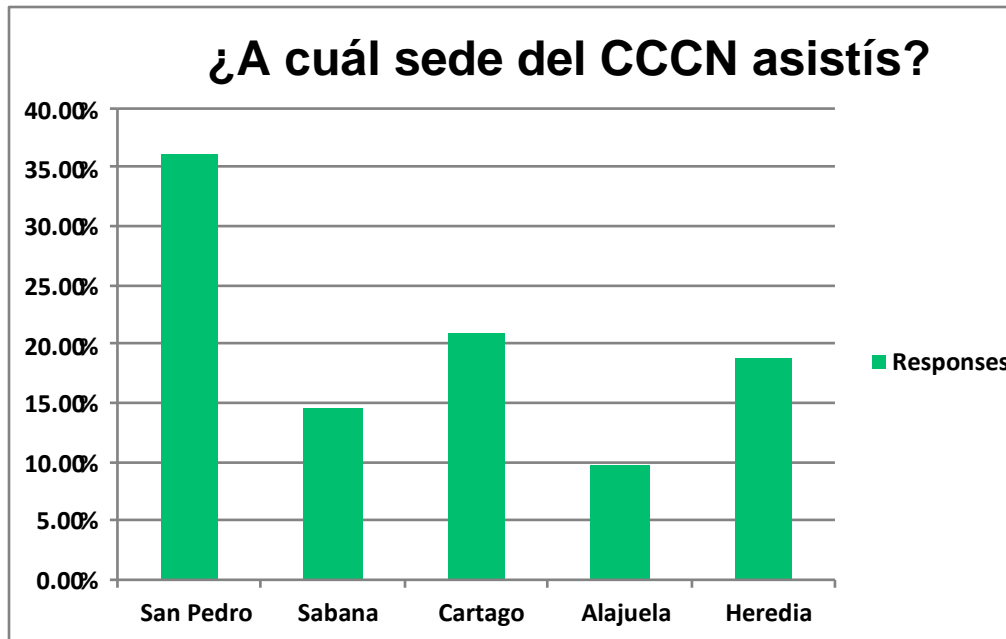
- b. De 4 a 6 horas
  - c. De 7 a 9 horas
  - d. Más de 9 horas
6. ¿Qué tan lejos está el CCCN del lugar desde donde viajas para ir a clases de inglés?
- a. \_\_\_\_ En minutos
  - b. \_\_\_\_\_ En Kilometers
7. ¿Cómo viajas de tu casa/trabajo al CCCN?
- a. Manejo solo (carro/moto)
  - b. Manejo con un(a) amigo(a) o un compañero (a)
  - c. En autobús
  - d. Taxi/Uber/DiDi (cualquier otra aplicación de transporte)
  - e. Bicicleta
  - f. Caminando
8. ¿Dónde comés cuando estás en el CCCN?
- a. Yo traigo el almuerzo al CCCN
    - b. Compro en la soda/vending machine del CCCN
    - c. Compro la comida en restaurantes/sodas/supermercados cerca del CCCN
    - d. A veces traigo el almuerzo, a veces compro en los restaurantes/sodas/su
    - e. Nunca como en el CCCN
1. ¿Conocés el programa del CCCN llamado “Get Green”?
- a. Si
  - b. Muy poco
  - c. No
2. ¿Con qué frecuencia reciclás en el CCCN usando los recipientes para tales efectos?
- a. Siempre
  - b. Casi siempre
  - c. De vez en cuando
  - d. Nunca
3. ¿Conocés los lineamientos del CCCN sobre lo que se puede o no reciclar?
- a. Si
  - b. Tengo una idea general
  - c. No
4. ¿Qué material reciclás más a menudo en el CCCN?
- a. Papel
  - b. Plástico
  - c. Cartón

- d. Electrónica
  - e. Vidrio
  - f. Metal
  - g. No reciclo
  - h. Otro (especifique)
5. ¿Sabés adónde se llevan la basura y el reciclaje después de botarlos?
- a. Si
  - b. Un poco
  - c. No
6. El CCCN quiere realizar esfuerzos para reducir la huella de carbono y cuidar el medio ambiente. ¿Qué puede hacer el CCCN para alcanzar este objetivo?
7. ¿Cuáles son algunas de las prácticas que seguís mientras estás en el CCCN para ayudar a conservar los recursos? (Por ejemplo, conservar agua, reciclar papel u otros m materiales, apagar las luces cuando se puede, etc)

### Appendix C.3: Student Survey Results

9. ¿A cuál sede del CCCN asistís?

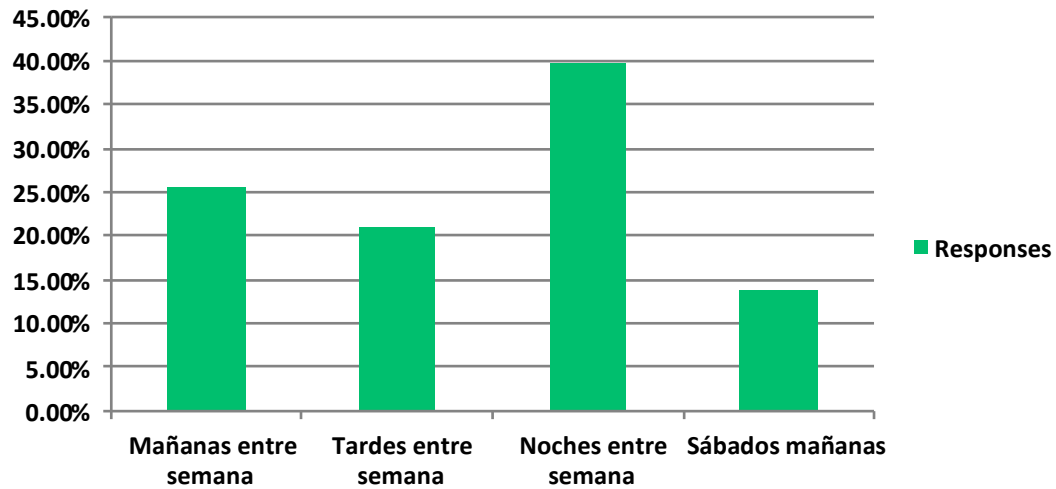
Answer Choices	Responses	
San Pedro	36.07%	242
Sabana	14.61%	98
Cartago	20.86%	140
Alajuela	9.69%	65
Heredia	18.78%	126
	<b>Answered</b>	<b>671</b>
	<b>Skipped</b>	<b>0</b>



10. ¿En qué horario asistís a clases de inglés en el Centro Cultural?

Answer Choices	Responses	
Mañanas entre semana	25.52%	171
Tardes entre semana	21.04%	141
Noches entre semana	39.55%	265
Sábados mañanas	13.88%	93
	<b>Answered</b>	<b>670</b>
	<b>Skipped</b>	<b>1</b>

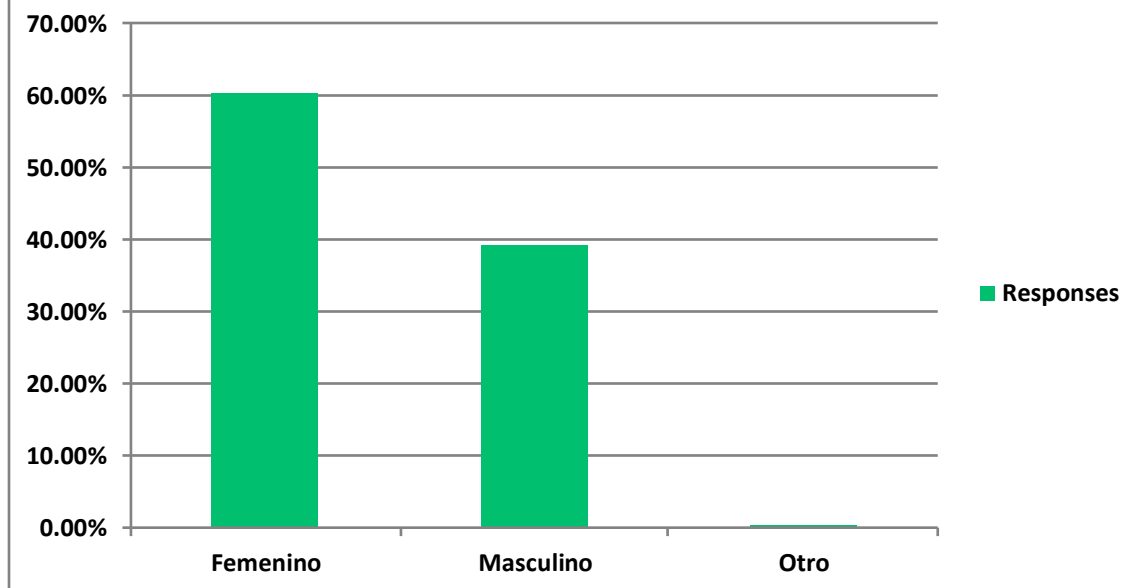
## ¿En qué horario asistís a clases de inglés en el Centro Cultural?



11. ¿Cuál es tu sexo?

Answer Choices	Responses	
Femenino	60.21%	404
Masculino	39.34%	264
Otro	0.45%	3
	<b>Answered</b>	<b>671</b>
	<b>Skipped</b>	<b>0</b>

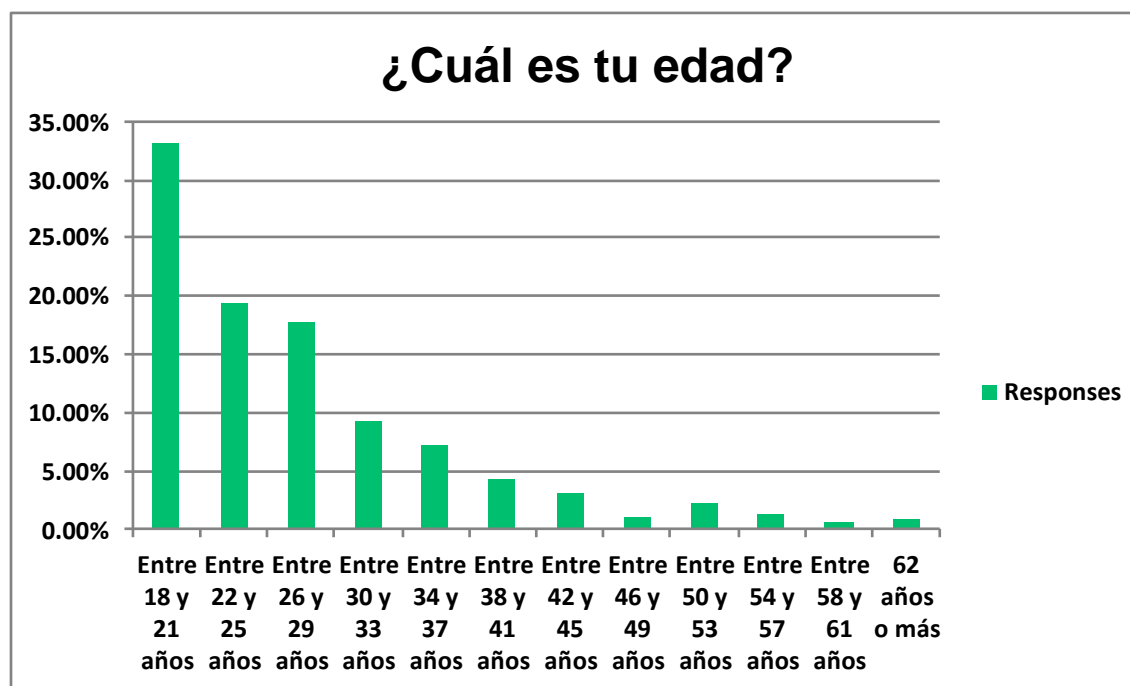
## ¿Cuál es tu sexo?





12. ¿Cuál es tu edad?

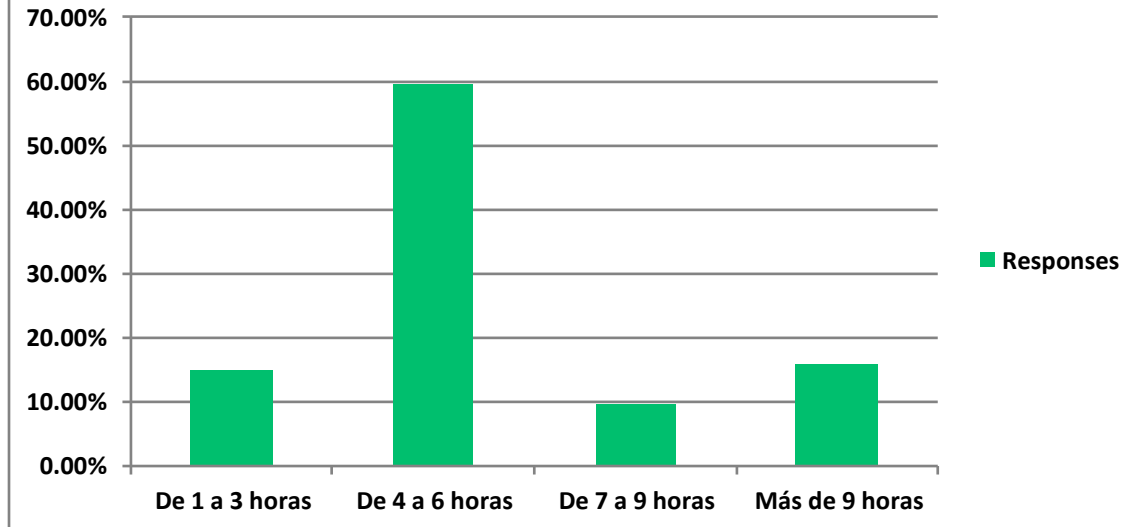
Answer Choices	Responses	
Entre 18 y 21 años	33.13%	222
Entre 22 y 25 años	19.40%	130
Entre 26 y 29 años	17.76%	119
Entre 30 y 33 años	9.25%	62
Entre 34 y 37 años	7.31%	49
Entre 38 y 41 años	4.18%	28
Entre 42 y 45 años	3.13%	21
Entre 46 y 49 años	1.04%	7
Entre 50 y 53 años	2.09%	14
Entre 54 y 57 años	1.34%	9
Entre 58 y 61 años	0.45%	3
62 años o más	0.90%	6
	<b>Answered</b>	<b>670</b>
	<b>Skipped</b>	<b>1</b>



13. Aproximadamente, ¿cuántas horas pasás en el CCCN cada semana?

Answer Choices	Responses	
De 1 a 3 horas	14.86%	96
De 4 a 6 horas	59.60%	385
De 7 a 9 horas	9.60%	62
Más de 9 horas	15.94%	103
	<b>Answered</b>	<b>646</b>
	<b>Skipped</b>	<b>25</b>

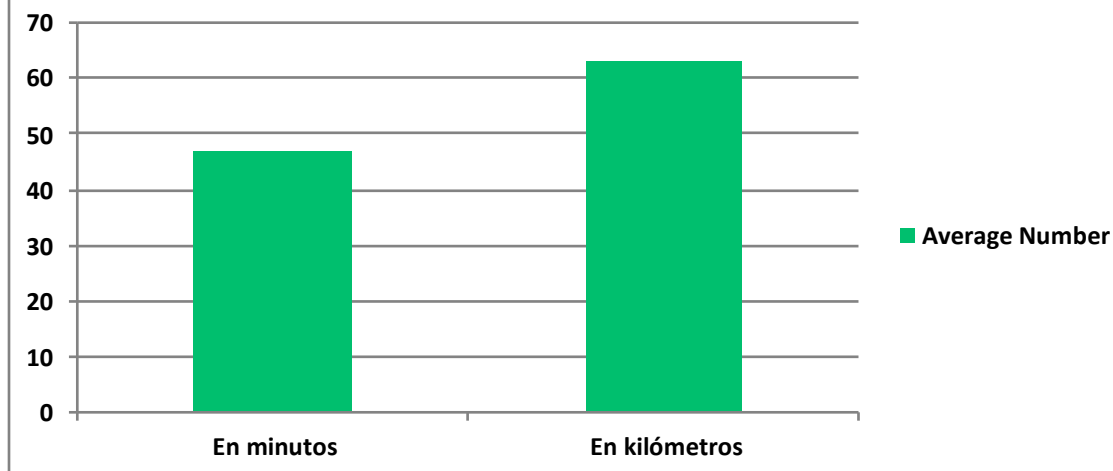
## 2. Aproximadamente, ¿cuántas horas pasás en el CCCN cada semana?



14. ¿Qué tan lejos está el CCCN del lugar desde donde viajás para ir a clases de inglés?

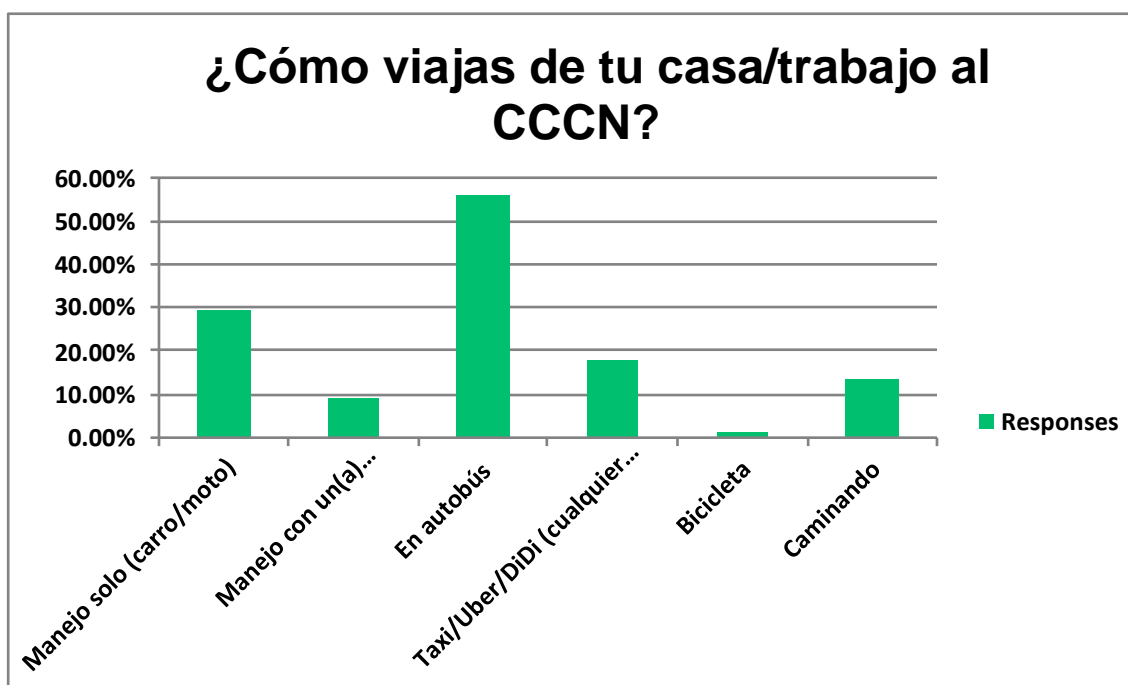
Answer Choices	Average Number	Total Number	Responses
En minutos	46.76006192	30207	646
En kilómetros	62.76006192	40543	646
	Answered	646	
	Skipped	25	

## ¿Qué tan lejos está el CCCN del lugar desde donde viajás para ir a clases de inglés?



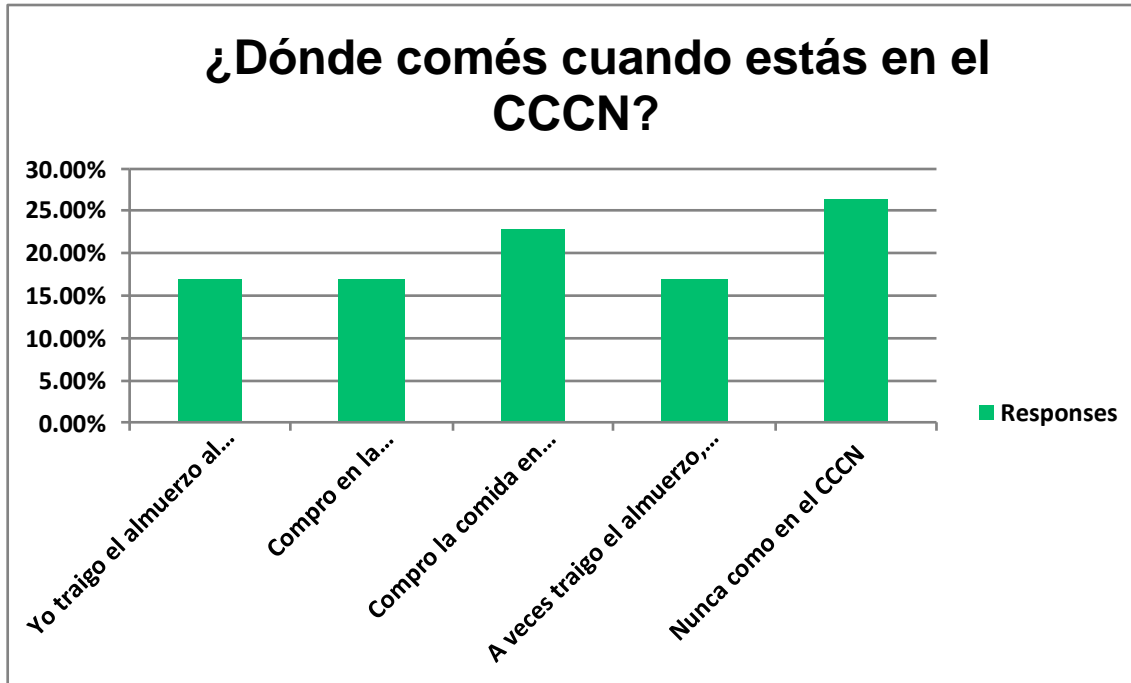
15. ¿Cómo viajas de tu casa/trabajo al CCCN?

Answer Choices	Responses	
Manejo solo (carro/moto)	29.26%	189
Manejo con un(a) amigo(a) o un compañero (a)	8.98%	58
En autobús	55.73%	360
Taxi/Uber/DiDi (cualquier otra aplicación de transporte)	18.11%	117
Bicicleta	1.39%	9
Caminando	13.78%	89
	<b>Answered</b>	<b>646</b>
	<b>Skipped</b>	<b>25</b>



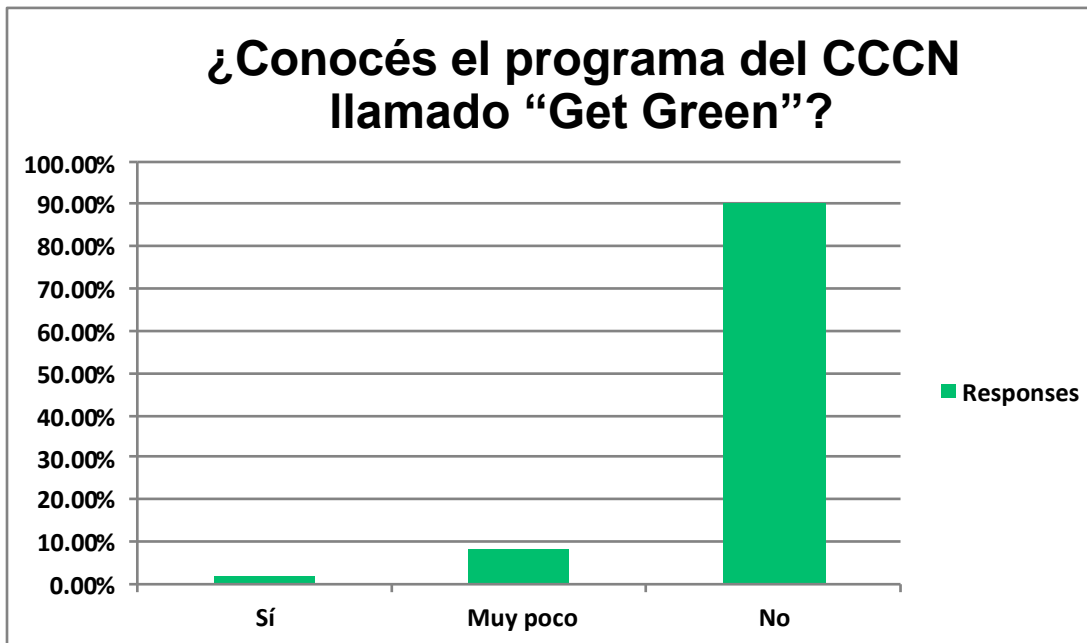
8. ¿Dónde comés cuando estás en el CCCN?

Answer Choices	Responses	
Yo traigo el almuerzo al CCCN	17.00%	109
Compro en la soda/vending machine del CCCN	16.85%	108
Compro la comida en restaurantes/sodas/supermercados cerca del CCCN	22.93%	147
A veces traigo el almuerzo, a veces compro en los restaurantes/sodas/su	16.85%	108
Nunca como en el CCCN	26.37%	169
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>



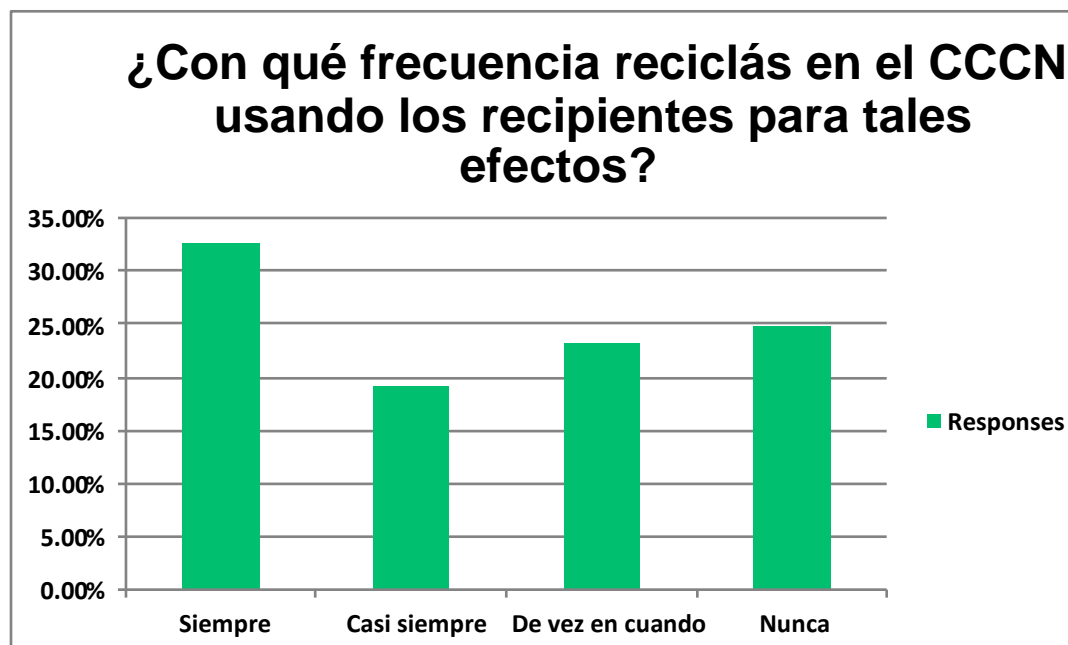
8. ¿Conocés el programa del CCCN llamado “Get Green”?

Answer Choices	Responses	
Sí	1.72%	11
Muy poco	8.11%	52
No	90.17%	578
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>



9. ¿Con qué frecuencia reciclás en el CCCN usando los recipientes para tales efectos?

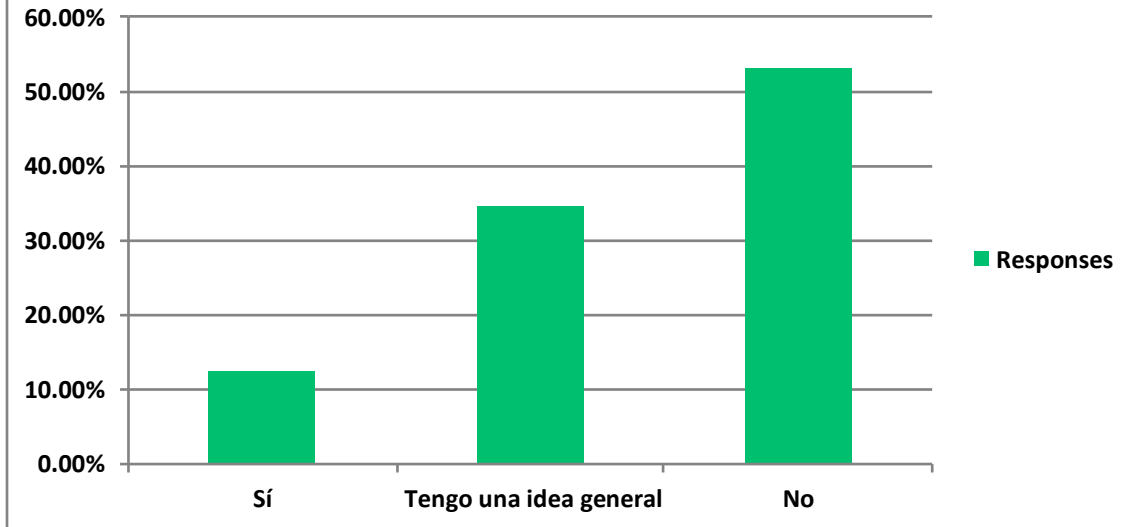
Answer Choices	Responses	
Siempre	32.76%	210
Casi siempre	19.19%	123
De vez en cuando	23.24%	149
Nunca	24.80%	159
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>



10. ¿Conocés los lineamientos del CCCN sobre lo que se puede o no reciclar?

Answer Choices	Responses	
Sí	12.48%	80
Tengo una idea general	34.48%	221
No	53.04%	340
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>

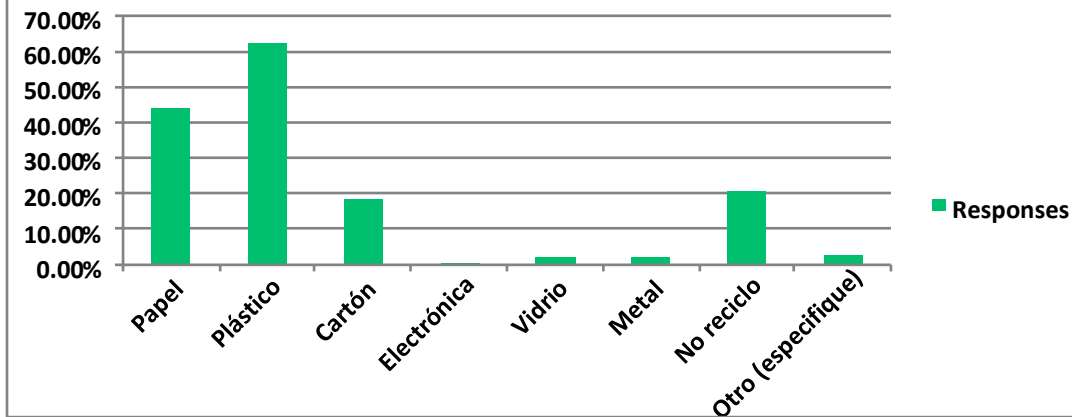
## ¿Conocés los lineamientos del CCCN sobre lo que se puede o no reciclar?



11. ¿Qué material reciclás más a menudo en el CCCN?

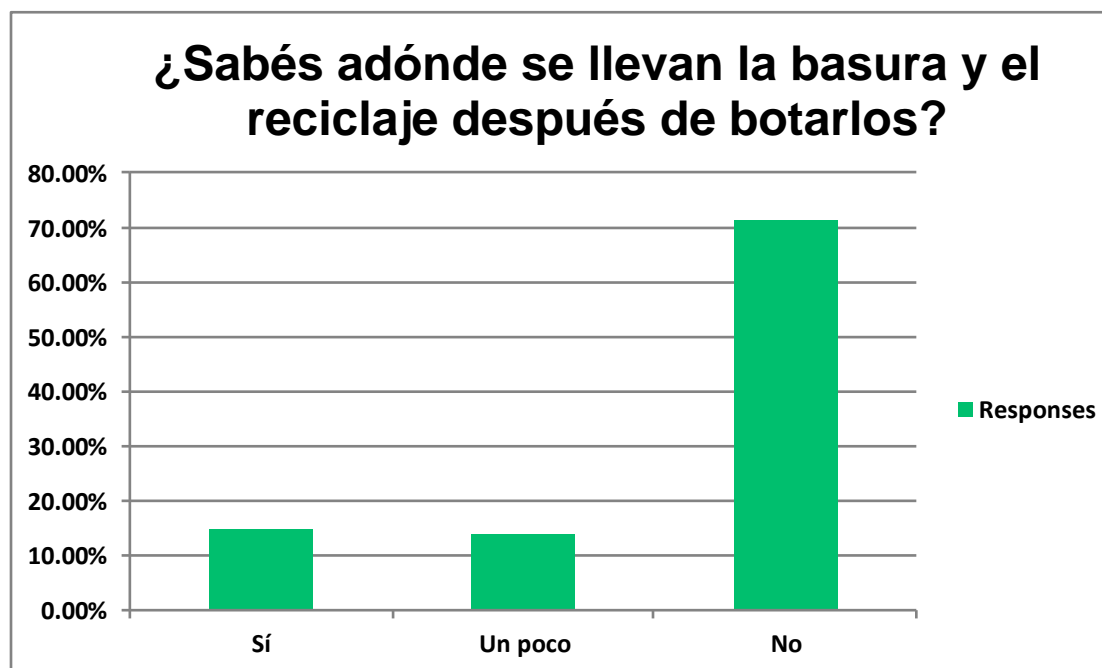
Answer Choices	Responses	
Papel	44.31%	284
Plástico	61.93%	397
Cartón	18.41%	118
Electrónica	0.62%	4
Vidrio	2.34%	15
Metal	1.87%	12
No reciclo	20.59%	132
Otro (especifique)	2.81%	18
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>

## ¿Qué material reciclás más a menudo en el CCCN?



12. ¿Sabés adónde se llevan la basura y el reciclaje después de botarlos?

Answer Choices	Responses	
Sí	14.98%	96
Un poco	13.73%	88
No	71.29%	457
	<b>Answered</b>	<b>641</b>
	<b>Skipped</b>	<b>30</b>



13. El CCCN quiere realizar esfuerzos para reducir la huella de carbono y cuidar el medio ambiente. ¿Qué puede hacer el CCCN para alcanzar este objetivo?

<b>Answered</b>	567
<b>Skipped</b>	104

14. ¿Cuáles son algunas de las prácticas que seguís mientras estás en el CCCN para ayudar a conservar los recursos? (Por ejemplo, conservar agua, reciclar papel u otros m materiales, apagar las luces cuando se puede, etc)

<b>Answered</b>	567
<b>Skipped</b>	104

## Appendix C.4: Employee Survey Questions: English

### Employee Survey

Dear employees:

In the Costa Rican North American Cultural Center, we have set the goal of being carbon neutral by 2023. For this purpose, it is necessary to measure our impact as an institution with the environment. All of us, professors, administrators, suppliers and students, leave a mark on this world. What we want is for that footprint to be as small as possible in order to have a better world in the future. We thank you if you could participate in the following survey that will not take more than 5 minutes of your time. Your answers are totally anonymous, and we will use that information to generate specific actions that help the Cultural Center be better and better. Thank you for being part of this change.

1. What location do you work at?
  - a. San Pedro
  - b. Cartago
  - c. Sabana
  - d. Heredia
  - e. Alajuela
2. What is your gender?
  - a. Female
  - b. Male
  - c. Other
3. What is your age?
  - a. 18-21
  - b. 22-25
  - c. 26-29
  - d. 30-33
  - e. 34-37
  - f. 38-41
  - g. 42-45
  - h. 50-53
  - i. 54-57
  - j. 58-61
  - k. 62 or older
4. Approximately, how many hours do you spend at the CCCN each week?
  - a. Less than 25
  - b. 25-30
  - c. 31-35
  - d. 36-40
  - e. 41-45
  - f. 46-50
  - g. more than 50
5. What department do you work in?



6. How do you commute to and from the CCCN?
  - a. I drive alone
  - b. I drive with a friend or coworker
  - c. Public bus transportation
  - d. Taxi/Uber/DiDi
  - e. Bike
  - f. Walk
7. How long is your commute to the CCCN?
  - a. \_\_\_\_\_ Minutes
  - b. \_\_\_\_\_ Kilometers
8. What do you have for lunch at the CCCN?
  - a. I bring lunch to the CCCN
  - b. The café at the CCCN
  - c. I go to restaurants nearby
  - d. Sometimes I bring lunch, sometimes I go to restaurants
  - e. I never eat in the CCCN
9. Do you know about the CCCN's "Get Green" program?
  - a. Yes
  - b. A bit
  - c. No
10. How often do you recycle at the CCCCN?
  - a. Always
  - b. Almost always
  - c. Sometimes
  - d. Never
11. Do you know what can and cannot be recycled?
  - a. Yes
  - b. I have a general idea
  - c. No
12. What material do you recycle the most often?
  - a. Paper
  - b. Plastic
  - c. Cardboard
  - d. Electronics
  - e. Glass
  - f. Metal
  - g. Other
  - h. I do not recycle
13. Do you know where the garbage and recycling go after throwing them away?
  - a. Yes
  - b. A bit
  - c. No
14. The CCCN wants to make efforts to reduce the carbon footprint and take care of the environment. What can the CCCN do to achieve this goal?
15. What are some of the practices that you follow while at the CCCN to help conserve resources? For example, conserve water, recycle paper or other materials, turn off the lights when you can.

## Appendix C.5: Employee Survey Questions: Spanish

### Encuesta de Colaboradores

Estimados colaboradores:

En el Centro Cultural Costarricense Norteamericano nos hemos puesto la meta de ser carbono neutrales para el 2023. Para tal efecto, es necesario medir nuestro impacto como institución con el medio ambiente. Todos nosotros, profesores, administrativos, proveedores y estudiantes, dejamos una huella en este mundo. Lo que queremos es que esa huella sea la menor posible para poder tener un mundo mejor a futuro. Te agradecemos si pudieras participar de la siguiente encuesta que no tomará más de 5 minutos de tu tiempo. Tus respuestas son totalmente anónimas y utilizaremos esa información para generar acciones puntuales que ayuden que el Centro Cultural sea cada vez mejor. Gracias por ser parte de este cambio.

1. ¿En cuál sede trabajás?
  - a. San Pedro
  - b. Sabana
  - c. Cartago
  - d. Alajuela
  - e. Heredia
  
2. ¿Cuál es tu sexo?
  - a. Femenino
  - b. Masculino
  - c. Otro
  
3. ¿Cual es tu edad?
  - a. Entre 18 y 21 años
  - b. Entre 22 y 25 años
  - c. Enter 26 y 29 años
  - d. Entre 30 y 33 años
  - e. Entre 34 y 37 años
  - f. Entre 38 y 41 años
  - g. Entre 42 y 45 años
  - h. Entre 46 y 49 años
  - i. Entre 50 y 53 años
  - j. Entre 54 y 57 años
  - k. Entre 58 y 61 años
  - l. 62 años o más
  
4. Aproximadamente, ¿cuántas horas pasás en el CCCN cada semana?
  - a. Menos que 25
  - b. 25-30

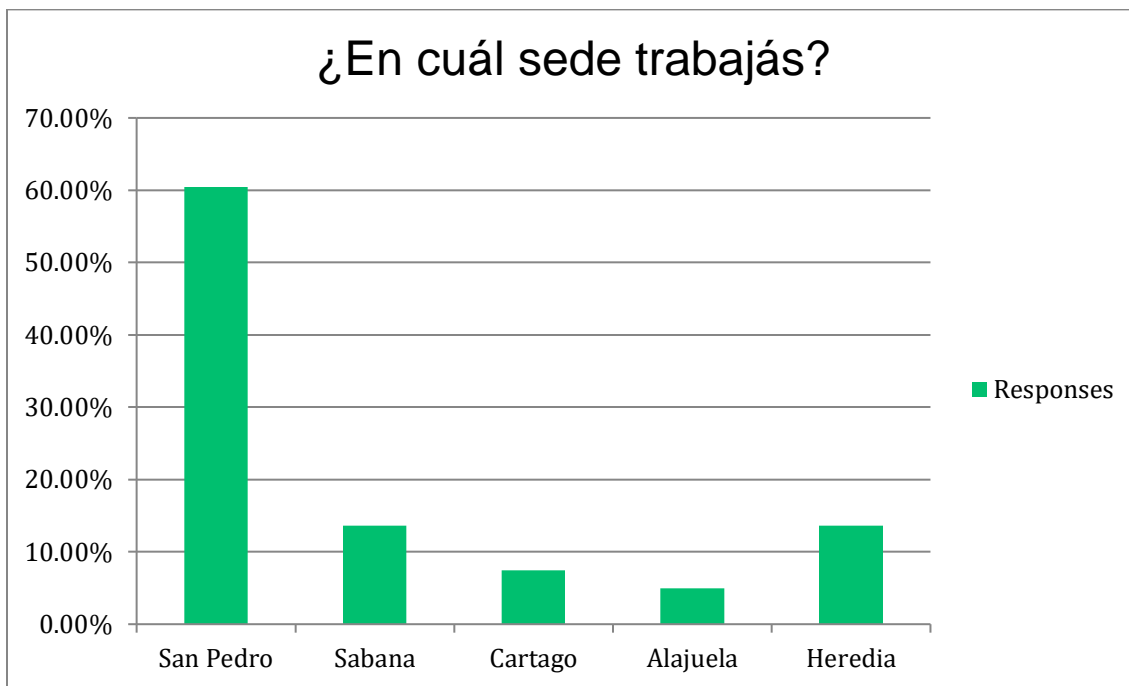
- c. 31-35
  - d. 36-40
  - e. 41-45
  - f. 46-50
  - g. Más que 50
5. ¿Para cuál departamento trabajás?
6. ¿Cómo viajás de tu casa al CCCN?
- a. Manejo solo (carro/moto)
  - b. Manejo con un(a) amigo(a) o un compañero (a)
  - c. En autobús
  - d. Taxi/Uber/DiDi (cualquier otra aplicación de transporte)
  - e. Bicicleta
  - f. Caminando
7. ¿Qué tan lejos vivís de tu sede de trabajo?
- a. \_\_\_\_ En minutos
  - b. \_\_\_\_ En Kilometros
8. ¿Dónde almorzás cuando estás en la sede?
- a. Yo traigo el almuerzo al CCCN
  - b. Compro en la soda/vending machine del CCCN
  - c. Compro la comida en restaurantes/sodas/supermercados cerca del CCCN
  - d. A veces traigo el almuerzo, a veces compro en los restaurantes/sodas/supermercados
  - e. Nunca como en el CCCN
9. ¿Conocés el programa del CCCN llamado "Get Green"?
- a. Si
  - b. Muy poco
  - c. No
10. ¿Con qué frecuencia reciclás en el CCCN usando los recipientes para tales efectos?
- a. Siempre
  - b. Casi siempre
  - c. De vez en cuando
  - d. Nunca
11. ¿Conocés sobre lo que se puede o no reciclar?
- a. Si
  - b. Tengo una idea general
  - c. No
  - d.

12. ¿Qué material reciclás más a menudo en el CCCN?
- Papel
  - Plástico
  - Cartón
  - Electrónica
  - Vidrio
  - Metal
  - No reciclo
  - Otro (especifique)
13. ¿Sabés adónde se llevan la basura y el reciclaje después de botarlos?
- Si
  - Un poco
  - No
14. El CCCN quiere realizar esfuerzos para reducir la huella de carbono y cuidar el medio ambiente. ¿Qué puede hacer el CCCN para alcanzar este objetivo?
15. ¿Cuáles son algunas de las prácticas que seguís mientras estás en el CCCN para ayudar a conservar los recursos? (Por ejemplo, conservar agua, reciclar papel u otros materiales, apagar las luces cuando se puede, etc)

## Appendix C.6: Employee Survey Results

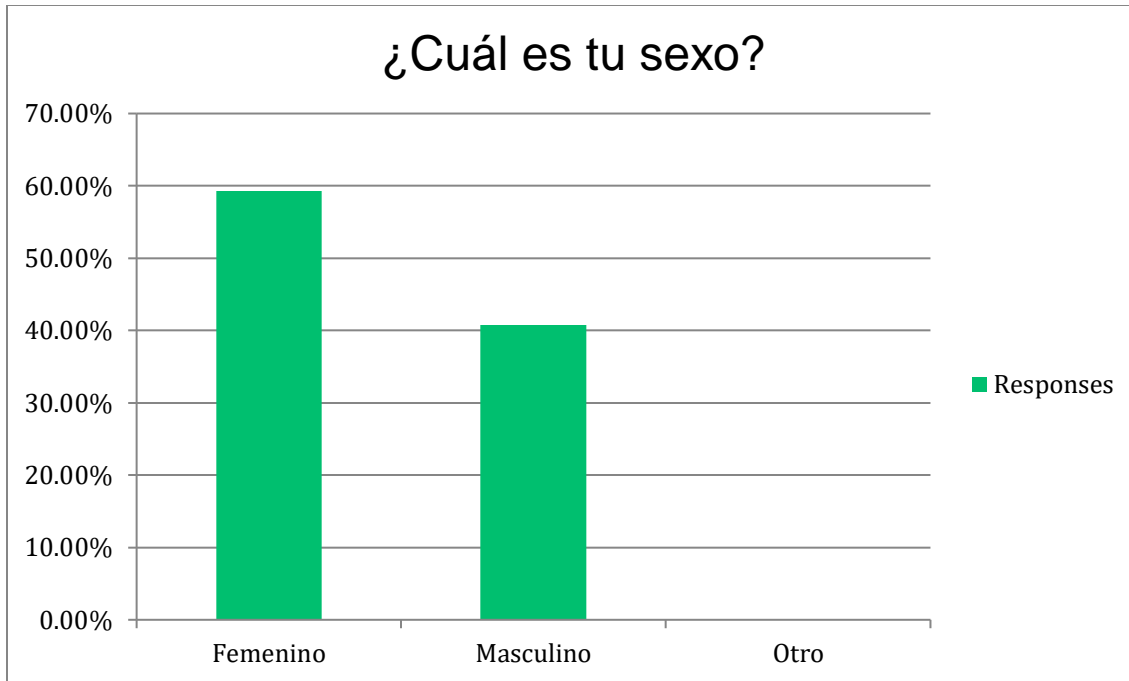
1. ¿En cuál sede trabajás?

Answer Choices	Responses	
San Pedro	60.49%	49
Sabana	13.58%	11
Cartago	7.41%	6
Alajuela	4.94%	4
Heredia	13.58%	11
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



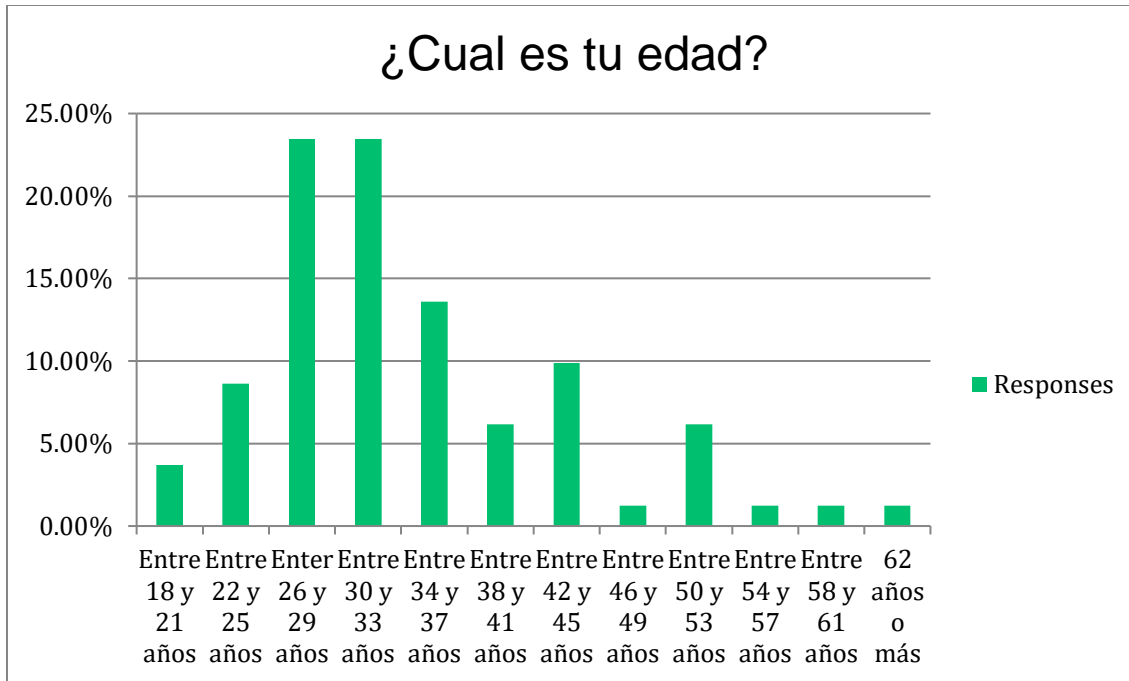
2. ¿Cuál es tu sexo?

Answer Choices	Responses	
Femenino	59.26%	48
Masculino	40.74%	33
Otro	0.00%	0
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



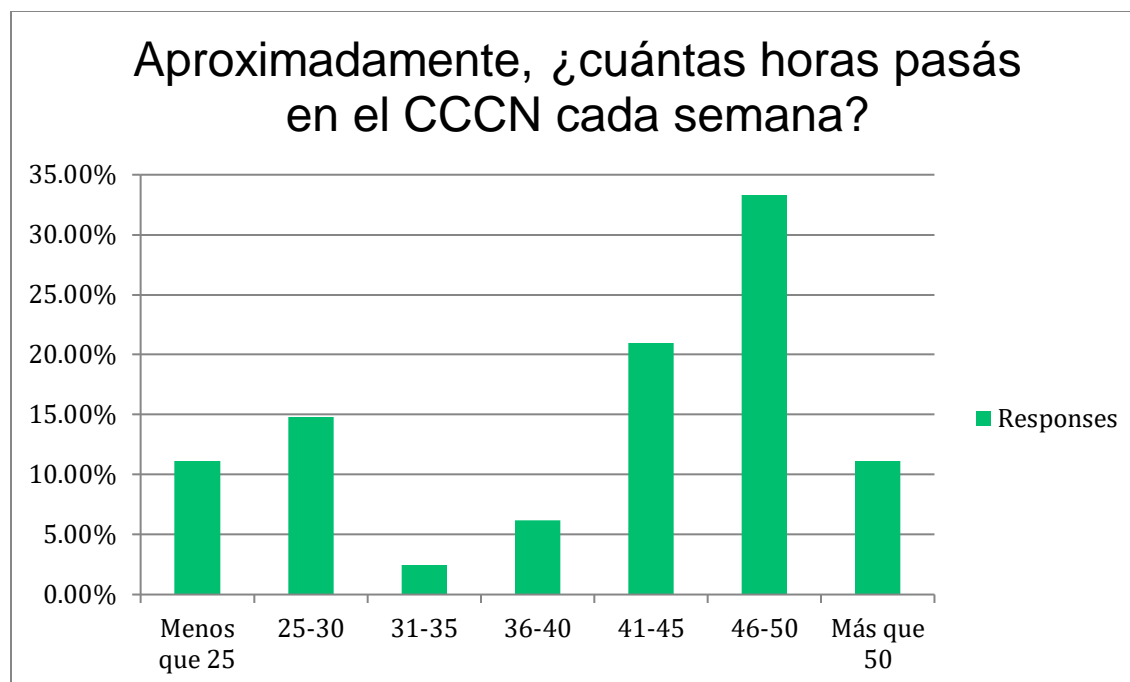
### 3. ¿Cual es tu edad?

Answer Choices	Responses	
Entre 18 y 21 años	3.70%	3
Entre 22 y 25 años	8.64%	7
Entre 26 y 29 años	23.46%	19
Entre 30 y 33 años	23.46%	19
Entre 34 y 37 años	13.58%	11
Entre 38 y 41 años	6.17%	5
Entre 42 y 45 años	9.88%	8
Entre 46 y 49 años	1.23%	1
Entre 50 y 53 años	6.17%	5
Entre 54 y 57 años	1.23%	1
Entre 58 y 61 años	1.23%	1
62 años o más	1.23%	1
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



4. Aproximadamente, ¿cuántas horas pasás en el CCCN cada semana?

Answer Choices	Responses	
Menos que 25	11.11%	9
25-30	14.81%	12
31-35	2.47%	2
36-40	6.17%	5
41-45	20.99%	17
46-50	33.33%	27
Más que 50	11.11%	9
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



5. ¿Para cuál departamento trabajás?

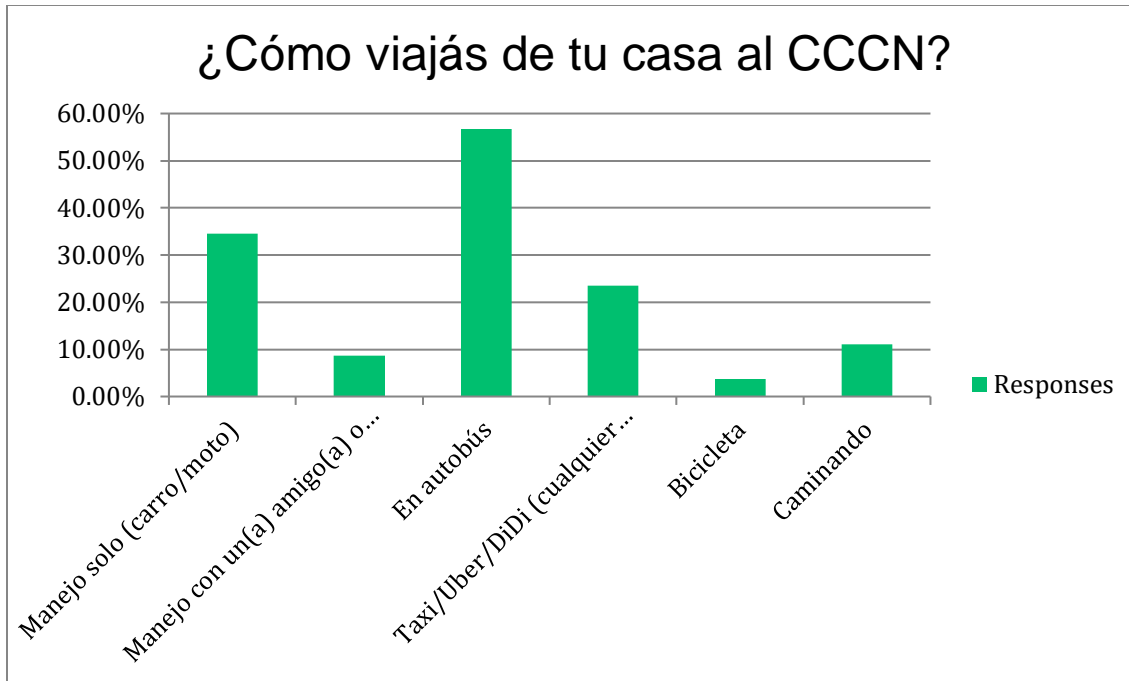
Answer Options	Responses	
	Percentage	Count
Académico	46.91%	38
Administrativo	2.47%	2
Contabilidad	3.70%	3
Culturales	2.47%	2
Dirección Ejecutiva	2.47%	2
Financiero	3	3
Mantenimiento	1	1
Mercadeo y Ventas	13	13
Pruebas Internacionales	4	4
Recursos Humanos	3	3
Operaciones	1	1
Servicio al cliente	4	4
TI	4	4
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>





6. ¿Cómo viajás de tu casa al CCCN?

Answer Choices	Responses	
Manejo solo (carro/moto)	34.57%	28
Manejo con un(a) amigo(a) o un compañero (a)	8.64%	7
En autobús	56.79%	46
Taxi/Uber/DiDi (cualquier otra aplicación de transporte)	23.46%	19
Bicicleta	3.70%	3
Caminando	11.11%	9
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



7. ¿Qué tan lejos vivís de tu sede de trabajo?

Answer Choices	Average Number	Total Number	Responses	
En minutos	48.85185185	3957	100.00%	81
En kilómetros	13.4691358	1091	100.00%	81
			<b>Answered</b>	<b>81</b>
			<b>Skipped</b>	<b>0</b>



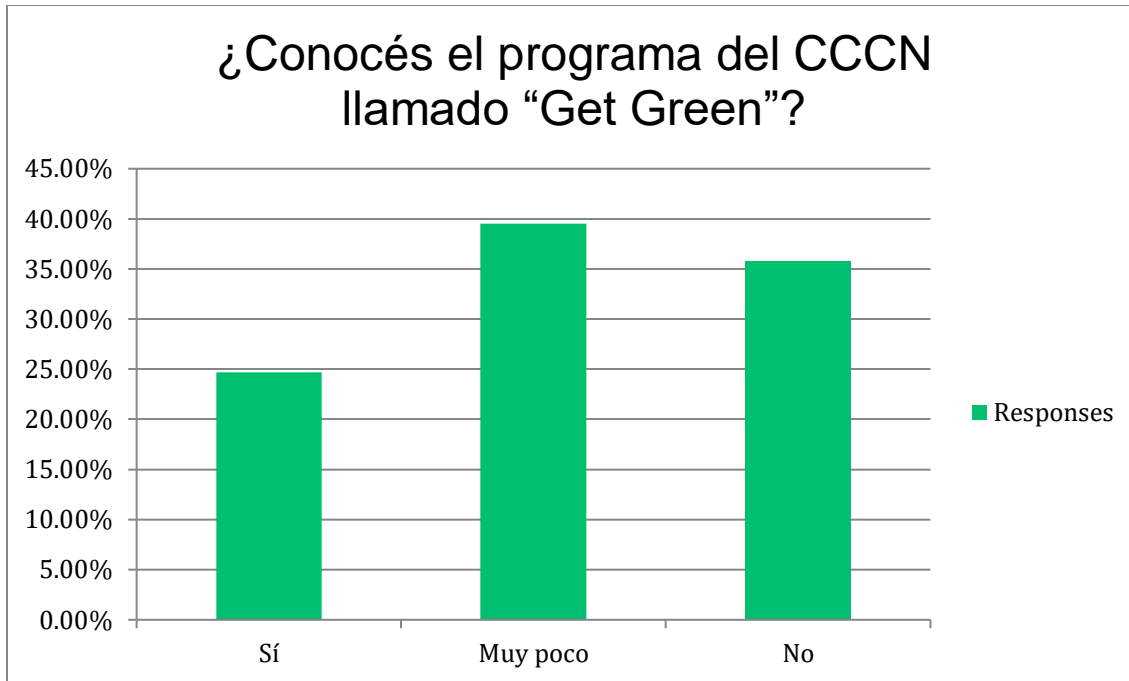
8. ¿Dónde almorzás cuando estás en la sede?

Answer Choices	Responses	
Yo traigo el almuerzo al CCCN	60.49%	49
Compro en la soda/vending machine del CCCN	0.00%	0
Compro la comida en restaurantes/sodas/supermercados cerca del CCCN	6.17%	5
A veces traigo el almuerzo, a veces compro en los restaurantes/sodas/supermercados	22.22%	18
Nunca como en el CCCN	11.11%	9
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



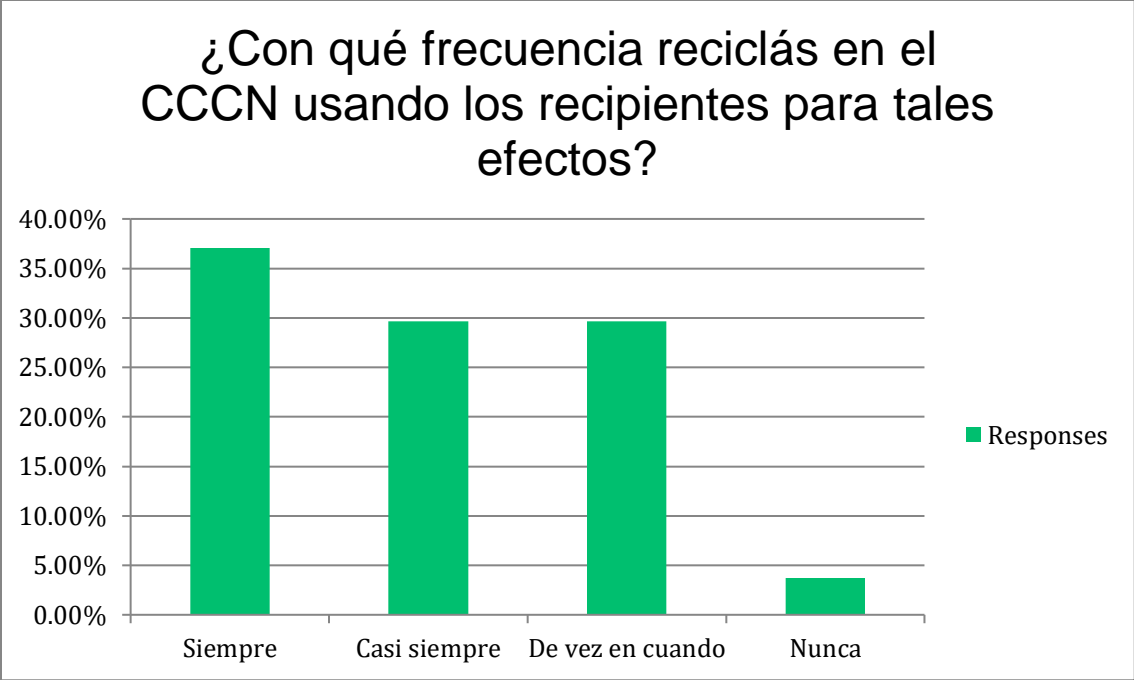
9. ¿Conocés el programa del CCCN llamado "Get Green"?

Answer Choices	Responses	
Sí	24.69%	20
Muy poco	39.51%	32
No	35.80%	29
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



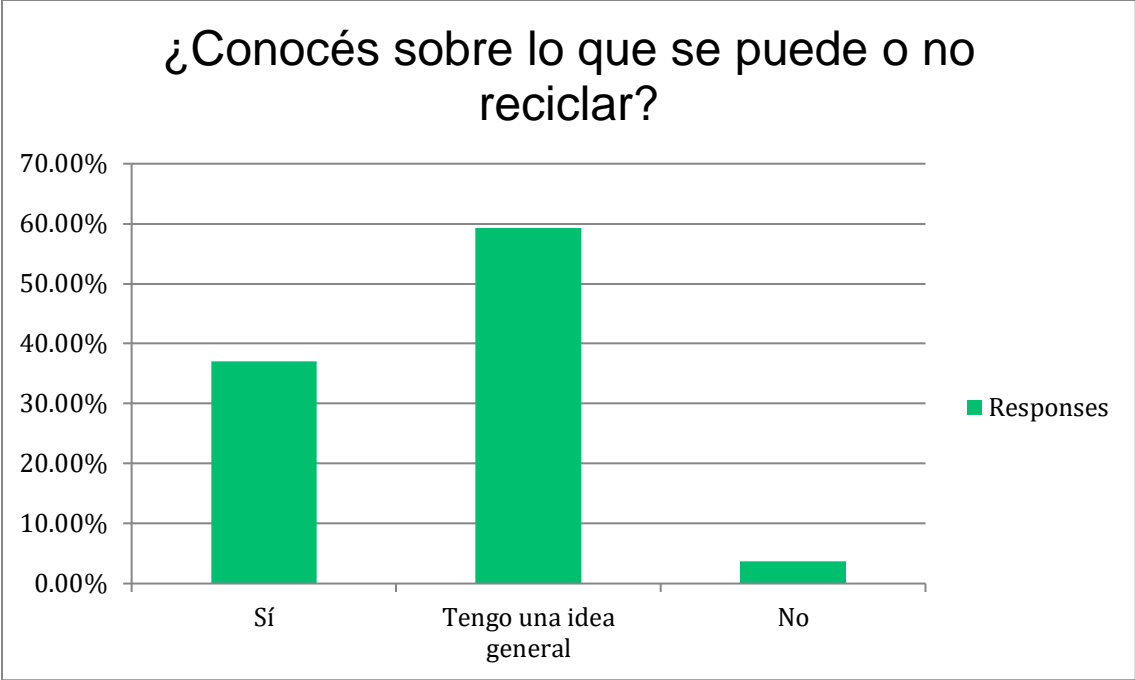
10. ¿Con qué frecuencia reciclás en el CCCN usando los recipientes para tales efectos?

Answer Choices	Responses	
Siempre	37.04%	30
Casi siempre	29.63%	24
De vez en cuando	29.63%	24
Nunca	3.70%	3
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



11. ¿Conocés sobre lo que se puede o no reciclar?

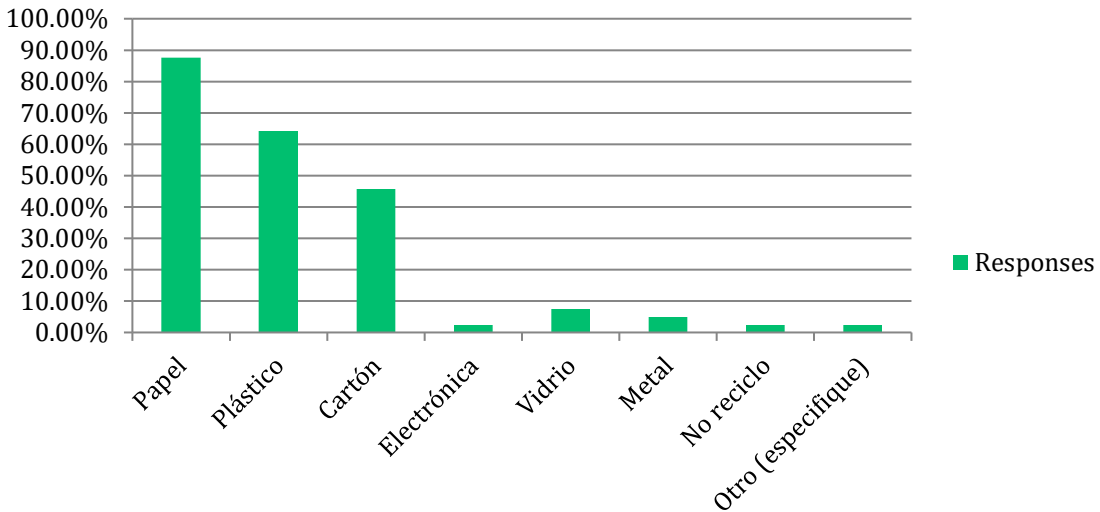
Answer Choices	Responses	
Sí	37.04%	30
Tengo una idea general	59.26%	48
No	3.70%	3
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>



12. ¿Qué material reciclás más a menudo en el CCCN?

Answer Choices	Responses	
Papel	87.65%	71
Plástico	64.20%	52
Cartón	45.68%	37
Electrónica	2.47%	2
Vidrio	7.41%	6
Metal	4.94%	4
No reciclo	2.47%	2
Otro (especifique)	2.47%	2
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>

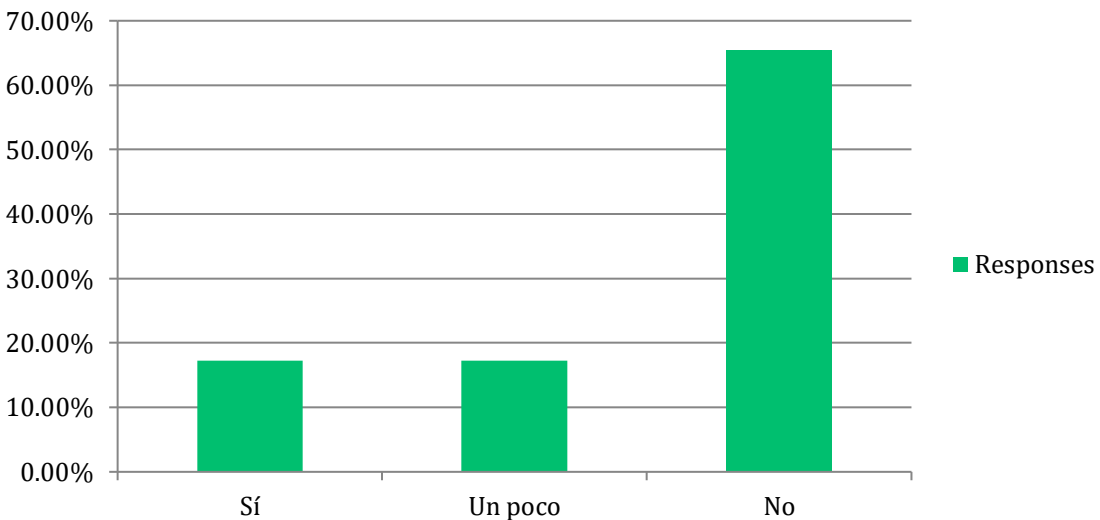
### ¿Qué material reciclas más a menudo en el CCCN?



### 13. ¿Sabés adónde se llevan la basura y el reciclaje después de botarlos?

Answer Choices	Responses	
Sí	17.28%	14
Un poco	17.28%	14
No	65.43%	53
	<b>Answered</b>	<b>81</b>
	<b>Skipped</b>	<b>0</b>

### ¿Sabés adónde se llevan la basura y el reciclaje después de botarlos?





14. El CCCN quiere realizar esfuerzos para reducir la huella de carbono y cuidar el medio ambiente. ¿Qué puede hacer el CCCN para alcanzar este objetivo?

<b>Answered</b>	<b>79</b>
<b>Skipped</b>	<b>2</b>

15. ¿Cuáles son algunas de las prácticas que seguís mientras estás en el CCCN para ayudar a conservar los recursos? (Por ejemplo, conservar agua, reciclar papel u otros materiales, apagar las luces cuando se puede, etc)

<b>Answered</b>	<b>79</b>
<b>Skipped</b>	<b>2</b>

## **Appendix D: Sample Purchasing Policy Guidelines**

### **DRAFT      Green Purchasing Policy      DRAFT**

WPI recognizes that the products that the Institute purchases can profoundly affect the environment through their use and ultimate disposal. Purchased services may also have substantial environmental impact. The community is strongly encouraged to take a pro-active position in recognizing and exploring opportunities to procure “environmentally friendly” materials/equipment. It is the intent of WPI to integrate environmental considerations into acquisition decisions, while maintaining cost and value standards.

The intent of this policy is to reduce the adverse environmental impact of our purchased products and services. By including environmental considerations in our purchasing decisions, along with concerns about price, performance, and availability, we will remain fiscally responsible while promoting practices that do not harm human health, are less polluting, that minimize waste, maximize use of bio-based or recycled materials, conserve energy and water, and reduce the consumption or disposal of hazardous materials.

Nothing in this policy shall be interpreted as requiring a buyer or contractor to procure products that do not perform well for their intended use or are not available at a reasonable price or in a reasonable period of time.

WPI Faculty and Staff can contribute to improving the environment by:

- Consolidating orders,
- Using electronic rather than paper catalogs,
- Making use of Life Cycle Cost Analysis where appropriate,
- Buying items that contain recycled material,
- Choosing items made from renewable resources,
- Opting for the non-hazardous alternative,
- Looking for the most energy efficient model,
- Buying locally,
- Buying only what is needed to minimize waste.

In determining whether a product is environmentally preferable, the following attributes should be considered:

- Durable, not single use or disposable
- Made of recycled materials
- Biodegradable
- Recyclable or capable of being safely disposed
- Made from raw materials obtained in an environmentally sound, sustainable manner
- Produced by companies with good environmental track records
- Cause minimal environmental damage during normal use or maintenance
- Carcinogen-free and low toxicity
- Compostable

- Energy efficient
- Heavy metal free (e.g., no lead, mercury, cadmium)
- Made from rapidly renewable materials
- Reduced greenhouse gas emissions
- Reduced packaging
- Resource efficiency
- Upgradeable
- Water efficient

## Appendix E: Recycling Certification Example



## Appendix F: Recommendations Deliverable

# **Worcester Polytechnic Institute: Recommendations for the Centro Cultural Costarricense-Norteamericano (CCCN)**



**2 March, 2020**

**San Jose, Costa Rica**

**Presented by Cameron Henchy, Carina Kennedy, Monét Norales, Timothy Ryan**

*This document is a summary of the findings by Cameron Henchy, Carina Kennedy, Monét Norales and Timothy Ryan from 15 January to 2 March while working with the Centro Cultural Costarricense-Norteamericano.*

## **Acknowledgements**

We would like to thank the following members of the Centro Cultural Costarricense-Norteamericano for their cooperation and support of our project:

- Sra. Lilly Sevilla Gamboa
- Sr. Carlos Rodolfo Cortés
- Sra. Sonia Salas Abarca
- Sr. Guillermo Madriz Salas
- All other individuals that were interviewed and/or surveyed

We would also like to thank our advisors Professor James A. Chiarelli and Professor Darko Volkov for their generous guidance and assistance.

## **About**

We are a group of students from Worcester Polytechnic Institute in Worcester, Massachusetts. We worked with the Centro Cultural Costarricense-Norteamericano (hereinafter referred to as the "CCCN") in accordance with our Interactive Qualifying Project (IQP). We were initially tasked with the inquiry of a Carbon Footprint Certification. However, upon arrival to the CCCN San Pedro campus, our task was diverted. Through firsthand observation of the San Pedro campus, our new goal became clear: create awareness of the Get Green Program. While we could focus on obtaining a Carbon Footprint Certification, we were first tasked with analyzing the CCCN and the sustainable efforts that are practiced at the organization's San Pedro campus. Upon analysis of the Centro Cultural, we proposed practical solutions, as noted in the *Recommendations* section of this article.

## **Findings**

Our initial observation of the physical CCCN San Pedro campus included a lack of visuals and posters expressing the goals of the CCCN that related to sustainability. Additionally, we were provided a Microsoft PowerPoint document detailing the efforts of the Get Green Program. However, upon arrival to the San Pedro campus, the only initiative that was evident were the recycling bins. Efforts such as the stickers that were placed on the lights to remind individuals to turn off the lights when leaving a room had been removed. Upon consultation with Sr. Carlos Cortés, the Get Green Program has experienced a decrease in participation. This program ultimately ceased to exist when the individual who ran the program left the Centro Cultural approximately five years

ago. Our interviews and surveys provided valuable information for the course of action for the CCCN. The following sections detail the results and conclusions of those documents, as well as a summary of our observations at the Centro Cultural Costarricense-Norteamericano.

We surveyed 3804 students and 210 employees. We received responses from 668 students and 81 employees. The following is an analysis of the results:

### **Notable Survey Results:**

#### **“How Old Are You?”**

It is worthy to note that 52.53% of the student population is below the age of 25. This data is significant in the creation of educational programs about the Get Green Program and environmentally conscious practices. A target audience can be established using this information, as well.

#### **“How Far is the CCCN from Where You’re Coming From to go to English Classes?”**

On average, employees are traveling from approximately 13 kilometers away. Students travel from 19 kilometers away. The commute is approximately 50 minutes long, for employees as well as students.

#### **“How Do You Travel to the CCCN?”**

For the following question, individuals could select multiple answers, as the method of transportation is subject to change on a daily basis. As evident from the charts above, the main method of travel to and from the CCCN is the bus system in San Jose. The trends are very similar between the two surveys, as 43.27% of students travel by bus and 41.07% of employees use this method of public transportation. The bus system is the most popular method of transportation and bicycle is the least popular, with 1.08% and 2.68% participation by the students and employees, respectively. Only 25.00% of employees and 22.72% of students drive their own car. This is important, as one strategy to reduce the potential Scope 3 sources of greenhouse gases of the CCCN is to encourage the use of public transportation such as buses and taxis/Uber.

#### **“Do You Know About the CCCN’s Get Green Program?”**

After conducting the employee interviews, it was evident that most individuals that are employed by the CCCN knew of the Get Green Program. However, a few employees had not heard of such a program or did not know what the program does

for the CCCN. According to the employee survey, that observation was supported, as some members knew of the program while a majority had limited knowledge or did not know of it at all. In total, 24.69% of employees know of the Get Green Program, 39.51% had a general idea of what the program is, and a shocking 35.80% did not know what it is. In contrast to the even distribution of the employee survey, 90.17% of students did not have any prior knowledge of the Get Green Program. Only a mere 1.72% of students replied that they knew of the program. We hypothesize that the students that do not know of the program are from a younger generation, since the Get Green Program was disbanded approximately five years ago. For this reason, we proposed infographics to appeal to the younger generation to spread awareness of the Get Green Program, as well as various other environmentally conscious efforts.

### **“How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”**

Similar to the previous question regarding the Get Green Program, students do not have the knowledge that the employees have regarding environmentally beneficial efforts. When asked, “How frequently do you recycle in the CCCN using the recycling bins?”, employees were more likely to respond positively, while the student population does not recycle as often. Only 32.76% of students always recycle, while 37.04% of employees recycle using the recycling bins. However, the percentage of students who do not recycle is a notable observation from the survey. In total, 24.80% of students responded that they do not recycle while at the CCCN. In contrast, 3.70% of employees stated that they do not recycle at the CCCN.

Students may not recycle due to the limited time that they spend at the CCCN. Additionally, they may not have materials that need to be recycled, such as paper or disposable water bottles. However, we can conclude that the source of the issue is a lack of knowledge of proper recycling habits. In the free response section of our survey, we ask the individuals what the CCCN can do to achieve carbon neutrality and reduce its impact on the environment. Many of the responses from the students include references to classes or informational sessions to teach the students about recycling and encourage them to do so. Our proposed poster ideas include teaching these individuals at the CCCN about recycling and that they are helping the environment and the CCCN. We hypothesized that students may not recycle because they do not know how to and do not know what happens to the recycled material once it leaves the CCCN. We believe if they have knowledge of the recycling process and that the recycled goods are not delivered to a landfill with other waste materials, they will be more likely to recycle.



Additionally, promoting environmental consciousness will encourage all students to participate in the effort of becoming carbon neutral.

### **“Do You Know the CCCN’s Guidelines About What Can and Cannot be Recycled?”**

Evidence of the lack of knowledge regarding proper recycling habits is included in the question regarding the recycling guidelines of the CCCN. The CCCN recycles paper/cardboard, plastic, aluminum, glass, and organic material. This broad range of materials may confuse students and employees regarding what objects can go in each bin. A picture of the recycling bins is included below:



According to the student survey, 53.04% of students do not have any knowledge of the recycling guidelines. In contrast, only 3.70% of employees responded “No”. At least 96.30% of employees know what they can and cannot recycle or have a general idea, while only 46.96% of students know what can and cannot be recycled in each bin.

### **“What Material Do You Recycle Most Often at the CCCN?”**

After interviewing members of each department at the CCCN, it is no surprise that the most recycled material for employees is paper. In the interviews, every employee stated that paper is the main source of waste in their respective department. This claim is supported by the employee survey, in which 40.34% of the total material recycled was paper. Plastic was the second most common recycled material for employees, accounting for 29.55% of the total recycled material. However, the student survey was slightly different. As each department, especially the academic department, is striving to become paperless, students may not have paper that they can recycle. For that reason, plastic was the most recycled material by students. Plastic accounted for

40.51% of recycled materials for the student population, while paper was the second most recycled material at 28.98% of total recycled material. We can hypothesize that the plastic use of the students is from single-use bottles or containers. However, further investigation is necessary to identify the cause of the plastic use. After that conclusion is made, we can then analyze methods to eliminate the use of plastics by the students, helping the CCCN become more environmentally friendly.

### **“Do You Know Where the Garbage and Recycling Go After Throwing It Away?”**

As mentioned in the analysis of the question “How Frequently Do You Recycle in the CCCN Using the Recycling Bins?”, knowledge of the recycling process may incentivize students and employees to engage in recycling and encourage others to participate as well. In response to the question “Do you know where the garbage and recycling go after throwing it away?”, the lack of knowledge of both student and employee populations was very prevalent. In total, 65.43% of employees and 71.29% of students do not know where garbage and recycling go after it is thrown away. This is not the fault of these individuals; it is the lack of education on the recycling process that we hope will be improved through the implementation of our recommended initiatives at the CCCN in the near future. Our proposed posters and educational sessions will promote conventional recycling practices as well as create an environmental consciousness of the CCCN that will benefit its sustainable goals. Education on the process of recycling and the recycling certificate that guarantees recycled materials are properly disposed of may increase participation in recycling and other environmentally conscious efforts.

### **Conclusions**

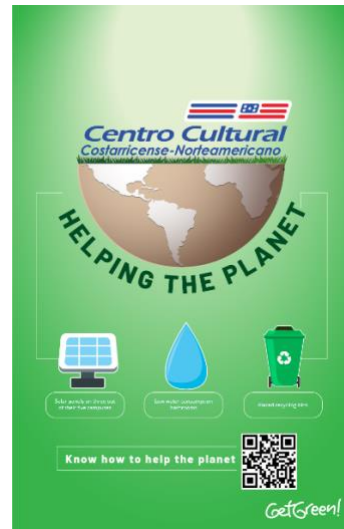
One prevalent conclusion that can be drawn from the gathered data is that education is necessary for the CCCN to become the sustainable organization that it strives to be. The CCCN has already implemented various environmentally friendly alternatives to traditional methods of operation (ex. solar panels instead of grid electricity, waterless urinals, energy efficient LEDs). However, we have included recommendations in the section below regarding environmentally conscious practices, as well as educational techniques that can be implemented to improve the sustainable atmosphere of the CCCN.

## Recommendations

### Short Term:



- Create awareness of the Get Green Initiative
  - Creating awareness will increase community involvement in the Get Green Program. Many of the issues we observed with the Get Green Program are related to a lack of knowledge or commitment to the program by the CCCN community. Informing individuals of the stakes, the measures already taken, and proper practices will help remedy these issues. Community involvement (including students and staff) will encourage others to take action as well. If individuals such as students practice environmentally friendly habits and encourage others to do so, an atmosphere at the CCCN that is built around sustainability will be created. We hypothesize that positive reinforcement will enable others to participate in various actions such as recycling and turning lights off when it is not necessary, all of which are beneficial to the CCCN's goal of carbon neutrality and sustainability.
  - Through the creation and implementation of various posters and infographics throughout the campuses, presentations, and extracurricular activities, information can be spread to employees, as well as students. The posters must be permanent fixtures around the campuses, as it is contradictory and hypocritical to express the importance of recycling and reducing the use of paper on a disposable poster or pamphlet. Sample posters that were produced by the marketing department at the CCCN are included on the next page:



- Create a dedicated committee to lead the Get Green Program
  - Establishing a group dedicated to the operation of the Get Green Program will ensure the continuation of the program in the future. This committee shall oversee the planning and funding of future initiatives along with the ongoing effort of raising awareness through the use of emails, posters, lectures and potential guest speakers.
  - This volunteer group can consist of collaborators from each department, as well as students and teachers that are dedicated to the maintenance of a sustainable environment at the CCCN.
  - This group will be responsible for:
    - Communicating information about the Get Green Program and its current initiatives. This can be achieved via email, physical posters at the CCCN, as well as verbally communicated to students by the teachers.
    - Establishing a budget for the Get Green Initiative
  
- Eliminate paper in each department
  - Throughout our interview process, the most prevalent source of waste was identified as paper. We believe that the amount of paper in the Centro

Cultural can be greatly reduced. We acknowledge that the Centro Cultural cannot become paperless in the foreseeable future, due to legal constraints. However, most of our interviewees stated that the amount of paper in the offices can be reduced.

### Long Term:



- Implement a greywater recycling system
  - A greywater recycling system will take water from faucets and sinks and use it for the flushing of toilets. This will help to further reduce the water usage of the Centro-Cultural.
  - For more information, visit <https://greyter.com/> or <http://www.aesarabia.com/grey-water-treatment-system/>
  - Price:
    - Varies greatly from project to project, depending on needs and complexity
    - Might expect something in the range of \$10,000-\$20,000
  - Other accommodations
    - As the plumbing infrastructure of the CCCN would have to be altered to accommodate a greywater recycling system, a few problems arise. As construction would be necessary, the offices of many collaborators would potentially be temporarily unavailable. A temporary office for these individuals would be required. Additionally, classrooms may also be affected, and temporary classrooms for the students would be required., as well.
- Create purchasing guidelines that are adhered to throughout the entirety of the Centro-Cultural

- Creating purchasing guidelines will ensure that all the products used at the CCCN were created in a sustainable matter. These guidelines can apply to items ranging from cleaning products (for which such guidelines already exist) to the food used in the cafeteria to the office supplies used within each department
  - A sample of such purchasing guidelines has been attached to the document.
  - Cost – Will depend on the price difference between environmentally friendly products and those currently in use
- Finish the installation of solar panels across all campuses

**Other Initiatives:**

- Add timers to lights / use more natural light
  - Cost – \$85-\$200 per light switch  
– 50,000 CRC - 114,600 CRC per light switch
- Place recycling bins in ALL classrooms
  - Cost – \$6.13 per bin  
– 3,610 CRC per bin
- Encourage opening windows instead of using AC
  - Cost – Included in raising awareness
- Discourage the use of single occupancy vehicles in favor of public transportation or non-vehicular modes of transport
  - Cost – Included in raising awareness
- Compost at sites where it is practical

## Green Purchasing Policy Sample:



### DRAFT Green Purchasing Policy DRAFT

WPI recognizes that the products that the Institute purchases can profoundly affect the environment through their use and ultimate disposal. Purchased services may also have substantial environmental impact. The community is strongly encouraged to take a pro-active position in recognizing and exploring opportunities to procure “environmentally friendly” materials/equipment. It is the intent of WPI to integrate environmental considerations into acquisition decisions, while maintaining cost and value standards.

The intent of this policy is to reduce the adverse environmental impact of our purchased products and services. By including environmental considerations in our purchasing decisions, along with concerns about price, performance, and availability, we will remain fiscally responsible while promoting practices that do not harm human health, are less polluting, that minimize waste, maximize use of bio-based or recycled materials, conserve energy and water, and reduce the consumption or disposal of hazardous materials.

Nothing in this policy shall be interpreted as requiring a buyer or contractor to procure products that do not perform well for their intended use or are not available at a reasonable price or in a reasonable period of time.

WPI Faculty and Staff can contribute to improving the environment by:

- Consolidating orders,
- Using electronic rather than paper catalogs,
- Making use of Life Cycle Cost Analysis where appropriate,
- Buying items that contain recycled material,
- Choosing items made from renewable resources,
- Opting for the non-hazardous alternative,
- Looking for the most energy efficient model,
- Buying locally,
- Buying only what is needed to minimize waste.

In determining whether a product is environmentally preferable, the following attributes should be considered:

- Durable, not single use or disposable
- Made of recycled materials
- Biodegradable
- Recyclable or capable of being safely disposed
- Made from raw materials obtained in an environmentally sound, sustainable manner
- Produced by companies with good environmental track records
- Cause minimal environmental damage during normal use or maintenance
- Carcinogen-free and low toxicity
- Compostable
- Energy efficient
- Heavy metal free (e.g., no lead, mercury, cadmium)
- Made from rapidly renewable materials
- Reduced greenhouse gas emissions
- Reduced packaging
- Resource efficiency
- Upgradeable
- Water efficient