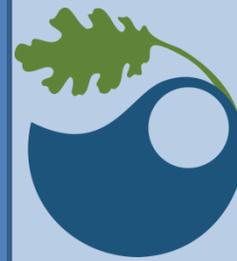


# Sustainable Supply Chain Management

## Developing a Framework to Assess and Reduce Environmental Impacts from UCSB Procurement



Smart Source Team:

Alex Dragos  
Sarah Richman  
Katy Sartorius  
Eric Sutherlin

Project Advisor:

John Melack

Client:

UCSB Purchasing Department

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### Project Objectives

The primary goal of this project was to develop and implement a framework that:

- Assesses the environmental impacts of purchases by UCSB
- Identifies areas to reduce environmental impacts by restricting, reducing or substituting targeted products for those with lower environmental impacts
- Performs an analysis of purchasing behavior to improve the effectiveness of sustainable procurement measures

In order to prescribe efficient strategies to reduce the environmental impacts that result from the University's purchases

### Project Background

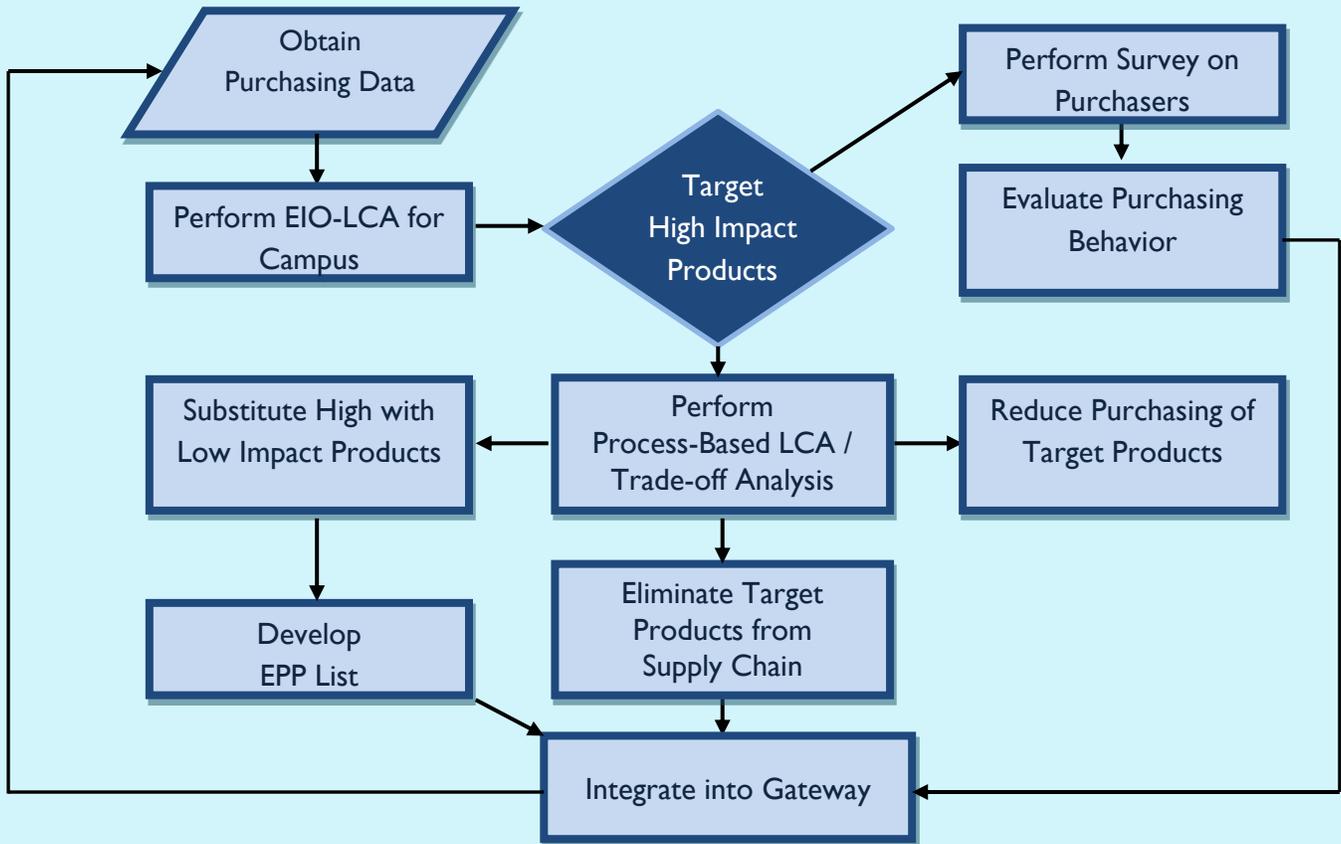
The UC System Board of Regents has prescribed sustainability goals that include a pledge to reduce greenhouse gas emissions (GHG) to 1990 levels and to maximize procurement of environmentally preferable products (EPP) and services.

The UC system spends \$2 billion annually on goods and services and UCSB expenditures account for \$70 million of this total.

In 2013, UCSB transitioned to a centralized online purchasing system. This new system *Gateway* can capture detailed information for all purchasing transactions. *Gateway* can also be used as a tool to increase the sustainability of purchasing by affecting the types of products purchased, as well as the knowledge and behavior of purchasers across campus.

# Smart Source Framework

## Improving Sustainable Procurement



This process flow diagram of the project framework illustrates the phases and decisions necessary for assessing and reducing the environmental impacts which result from purchasing. After purchasing data is obtained, an **EIO-LCA** should be conducted to determine the **product categories** with the highest environmental impacts. Next, these product categories are analyzed based using **process-based LCA** and **trade-off analysis** to determine the feasibility and benefits of product restriction, reduction, or substitution from the supply chain. A survey should also be conducted to determine opportunities and barriers to sustainable purchasing from a operational and behavioral perspective. The substitution of high impact products with low impact products results in the creation of an Environmentally Preferable Product (EPP) List. The EPP list, restriction of products from the supply chain and the behavioral information from the survey results can be integrated into the Gateway system. After this integration, more data can be obtained and the process repeated to continually monitor and improve sustainable procurement.

### Life Cycle Assessment (LCA)

Compiles the inventory of energy and material inputs and outputs for a product or process. Evaluates the environmental impacts of these inputs and outputs.

### Product Categories

Products aggregated into categories based on similar characteristics and functionality within distinct economic sectors. Product categories are used to perform EIO-LCA which efficiently assesses environmental impacts.

### Economic Input Output LCA (EIO-LCA)

A method that uses economic and environmental data to estimate environmental impacts of products.

### Process-Based LCA

A method that uses material and environmental data to estimate environmental impacts of specific products from material extraction through disposal.

### Trade-Off Analysis

Analysis of the environmental and operational trade-offs associated with substituting, reducing or restricting products within the supply chain.

# CEDA

The EIO-LCA tool used for this project is known as the Comprehensive Environmental Data Archive (CEDA). By pairing the purchasing data from UCSB with the CEDA database, environmental impacts were determined for each product category. Impacts include global warming potential (GWP), acidification, energy use, water use, and land use.

This project focused on GWP to align with the UC Sustainable Practices Policy targeting the reduction of greenhouse gases.

A breakdown of the top 10 product categories contributing to GWP focuses on four academic departments and Central Stores, the campus-wide distributor of office and cleaning supplies (Fig. 1). Each department was further analyzed to identify the environmental impacts from products specific to their operations. Figure 2 highlights Central Stores products with high GWP.

# EIO-LCA Results

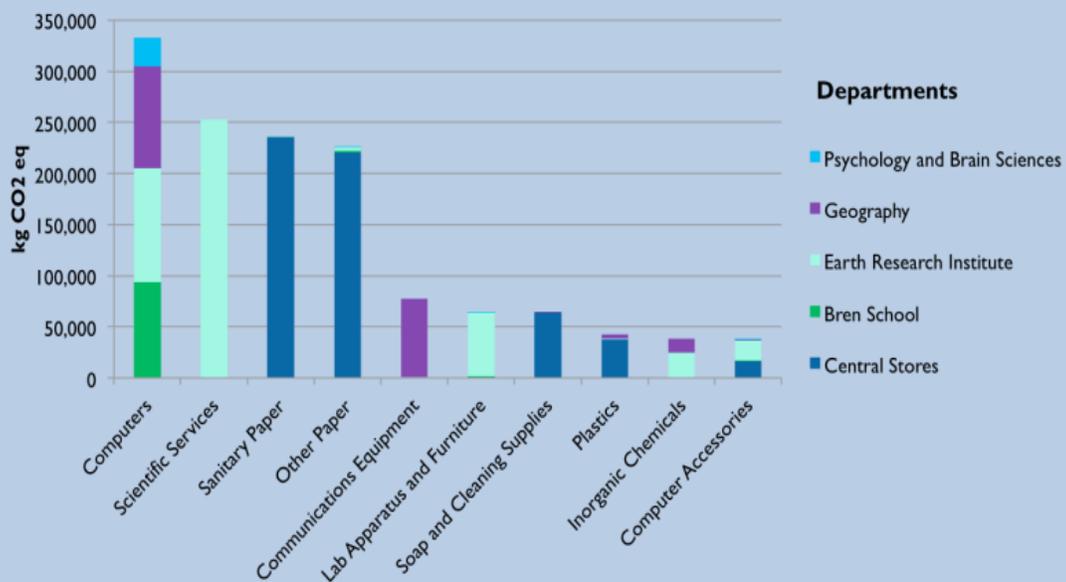


Figure 1 Top 10 Product Categories Contributing to Global Warming Potential

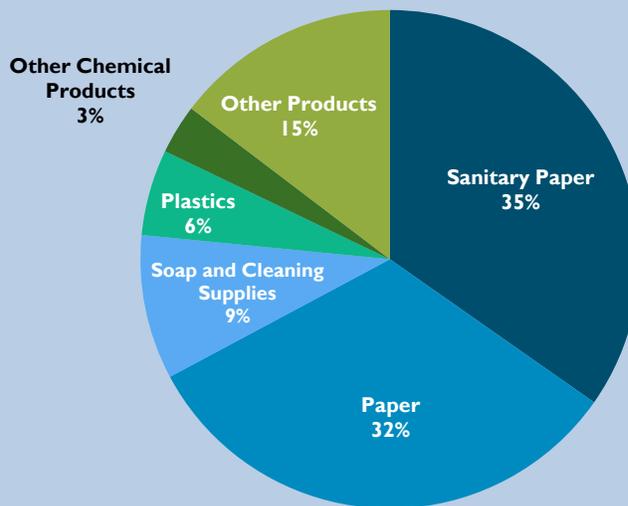


Figure 2 Central Stores High Impact Products Proportion of Global Warming Potential

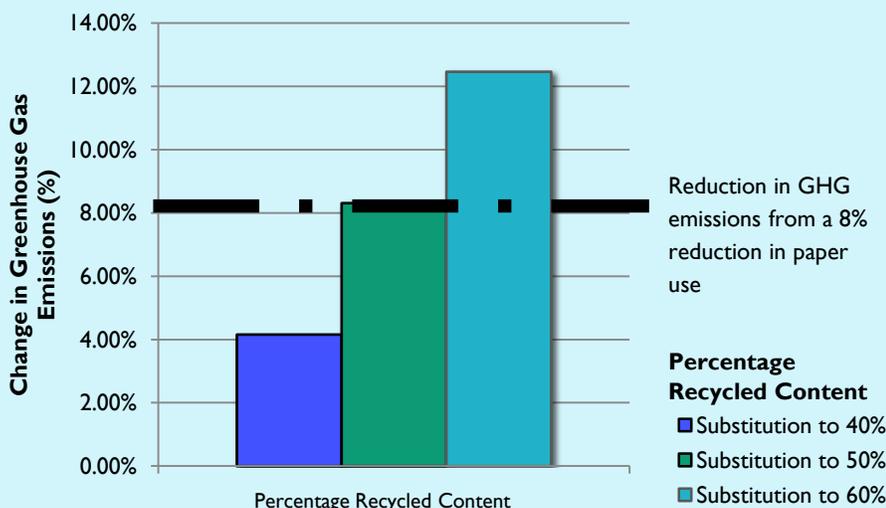


Figure 3 Copy Paper Reduction vs. Substitution

## Process-Based LCA and Trade-Off Analysis for Copy Paper Products

In order to determine the comparative environmental effects of substitution versus reduction, a process-based LCA was conducted. Substitution requires transitioning from 30% recycled content paper (currently the most commonly used paper) to 50% or 100% recycled content. It was found that a reduction of 8% in overall use of copy paper was equivalent to substituting all paper with 50% recycled content paper (Fig. 3).

**Survey** Completed by 100 employees who make purchases for UCSB. The responses were used in order to determine barriers and opportunities for reducing the environmental impacts from purchasing

## Major Findings

81% of survey respondents reported that their decisions about purchasing are affected by sustainability →

The most frequent reason for not purchasing a sustainable option was not knowing where to find it (33% of respondents). Price was the second most popular explanation (19%) →

Many purchasers are unaware of sustainable purchasing guidelines →

## Opportunities

Increased visibility of sustainable products on campus purchasing system

Develop a ranking system within Gateway to prioritize products that 1) meet UC approved third-party certifications 2) have vendor reported certifications 3) are uncertified

Increased visibility of sustainable guidelines on campus purchasing system

## Recommendations for UCSB

### Tracking and Monitoring

of all campus purchases

### Perform EIO-LCA

to identify target product categories

### Conduct Process-Based LCA and Trade-Off Analysis

to most effectively eliminate, reduce, and substitute high impact products

### Use Gateway as a Tool

to optimize sustainable purchasing

### Administer Follow-Up Surveys

to improve the procurement process

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