

Sustainable Supply Chain Management



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

INTRODUCTION

Project Background:

The University of California, Santa Barbara (UCSB) requested a methodology to improve the sustainability of its supply chain to work in conjunction with its new online procurement system, called Gateway. UCSB spends roughly \$70 million annually on goods and services, which will be managed by this system, providing UCSB with the ability to track and monitor its purchases.



Project Objectives:

The main goal of this project was to develop a framework that:

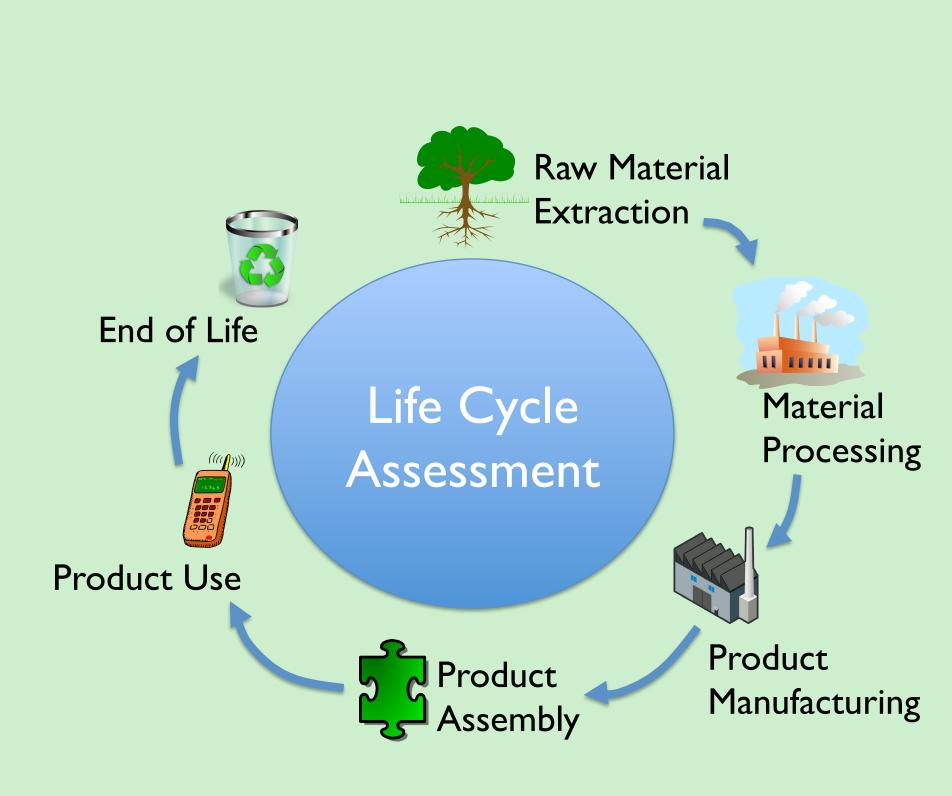
- Assesses the environmental impacts of purchases by UCSB
- Targets areas to reduce environmental impacts by restricting, reducing, or substituting products for those with lower environmental impacts
- Performs an analysis of purchasing behavior

All in order to prescribe strategies to optimize sustainable purchases

METHODOLOGY

Life Eycle 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 and assesses the results of the analysis

- **Economic Input-Output LGA** (EIO-LCA) uses an organization's expenditures along with data from national economic and environmental databases to determine the environmental impacts of the products it purchases
- **Process-Based LGA** is a more detailed accounting of all physical materials and energy associated with a product over its life cycle from material extraction through disposal



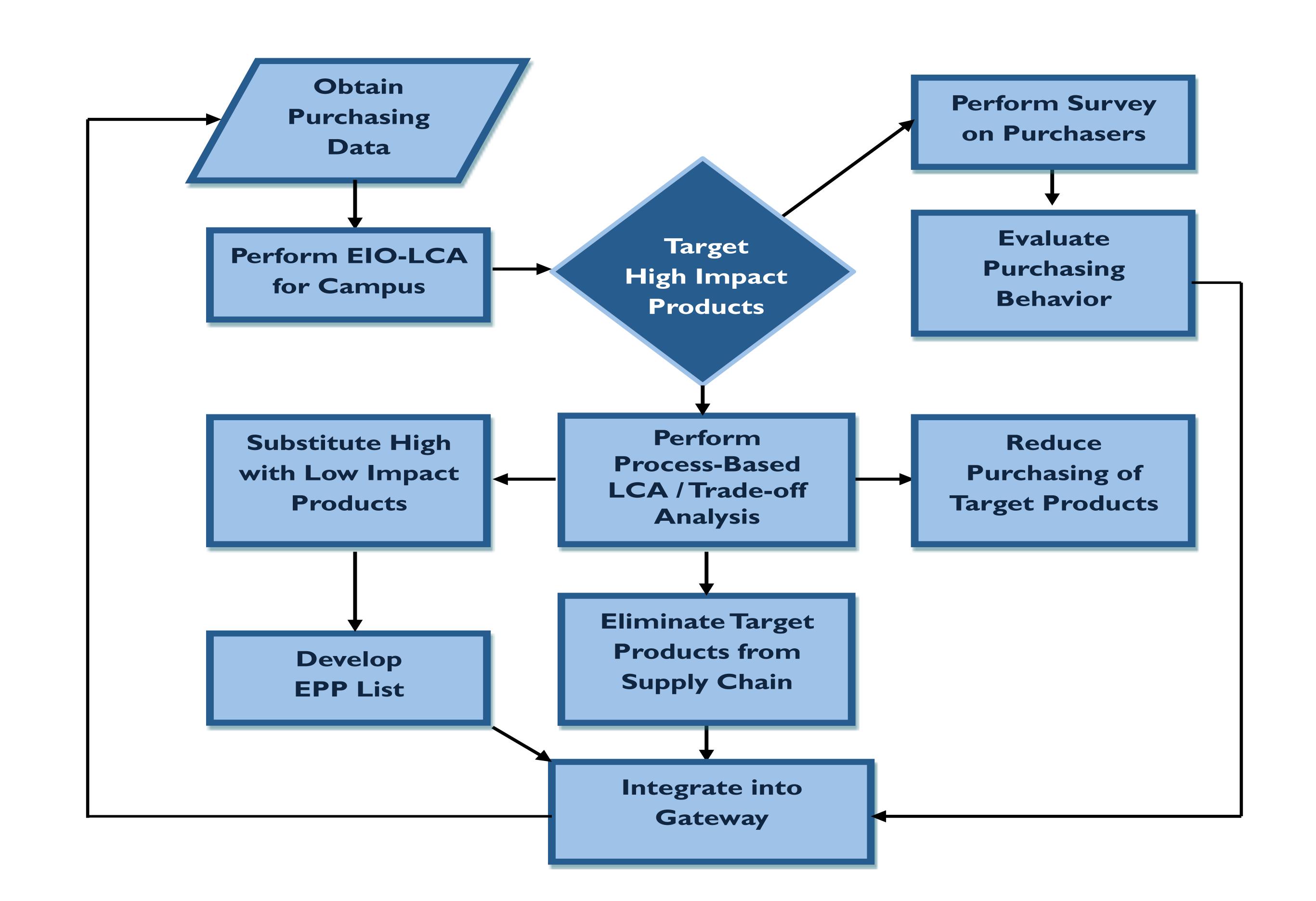
EIO-LCA was used to identify the products with the greatest environmental impacts. The EIO-LCA model used for this project is known as the Comprehensive Environmental Data Archive (CEDA). This provided a starting point for determining what products to focus on in order to reduce environmental impacts. Several environmental impacts can be measured using CEDA. This project focused on Global Warming Potential to align with the University of California's Sustainable Practices Policy. Four academic departments and Central Stores, the campus-wide distributor of office and cleaning supplies, were analyzed. Process-based LCA tools were then used to analyze one product with a high contribution to Global Warming Potential.

Purchasing Survey: an online survey was completed by 100 campus members who make purchases. The responses were used to determine barriers and opportunities for reducing the environmental impact of purchasing.

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SMART SOURCE FRAMEWORK



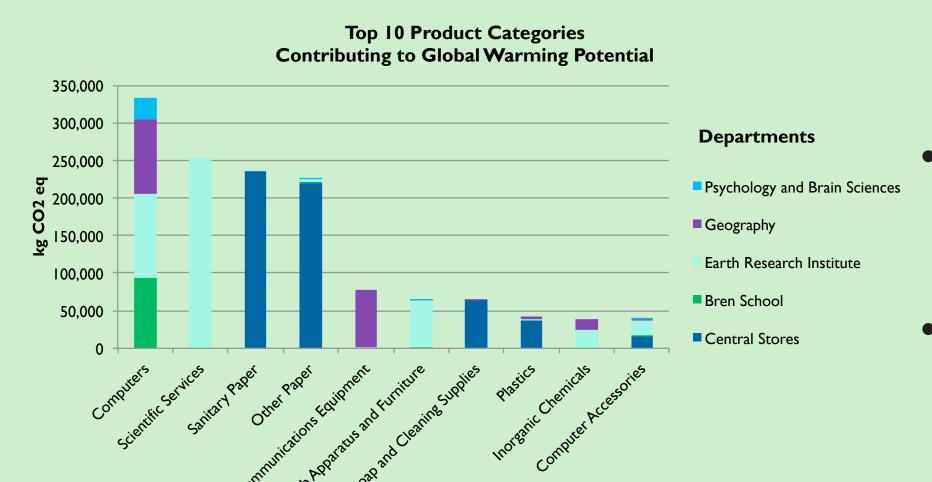
This process flow diagram of the framework created for this project illustrates the stages and decisions necessary for assessing and reducing the environmental impacts which result from purchasing. After purchasing data is obtained, an EIO-LCA should be conducted to determine the product categories with the highest environmental impacts. Next, these product categories are analyzed to determine the feasibility and opportunities for product elimination (or restriction), reduction, or substitution from the supply chain based on process-based LCA and trade-off analysis. A survey should also be conducted to determine opportunities and barriers to sustainable purchasing from a more operational and behavioral standpoint. The substitution of high impact products with low impact products will result in the creation of an Environmentally Preferable Product (EPP) List. This EPP list, the 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 sustainability.

NEXT STEPS FOR UCSB

- Tracking and Monitoring of all campus purchases, specifically for sustainability purposes
- Perform EIO-LGA to identify target product categories
- Conduct Process-Based LCA and Trade-Off Analysis to most effectively eliminate, reduce or substitute
- Use Gateway as a Tool to optimize sustainable purchasing
- Administer Follow-Up Surveys to improve the procurement process



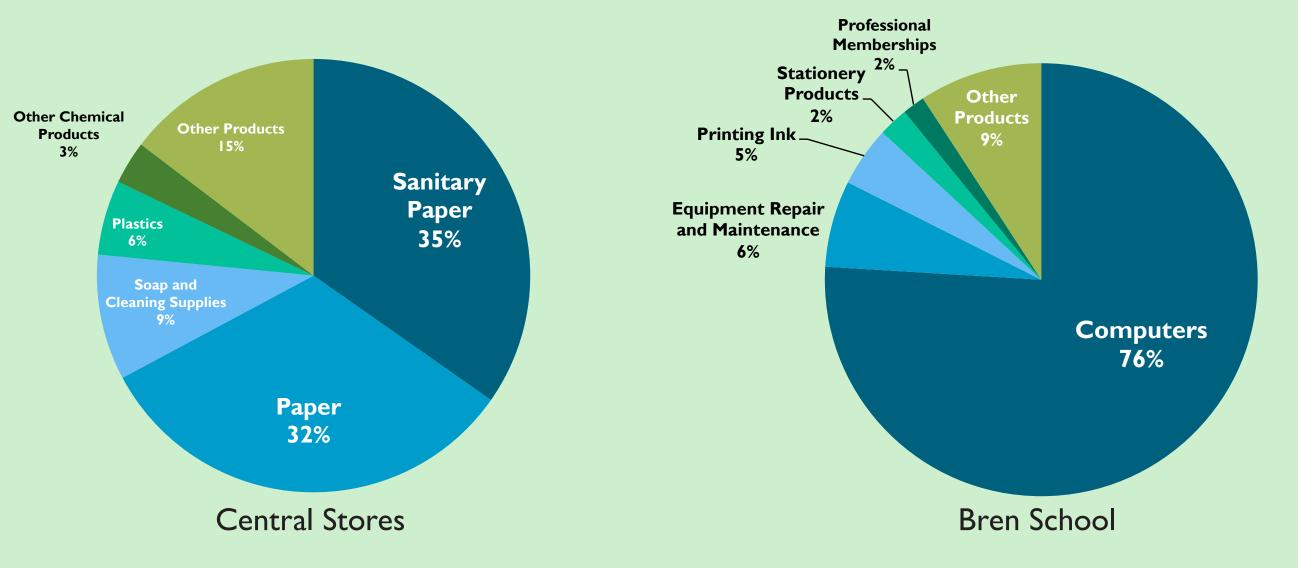
FINDINGS



EIO-LCA Results

- Total estimated emissions were 1.86 million kg. CO₂ equivalent
- 74% of total emissions were from the 10 highest contributing products

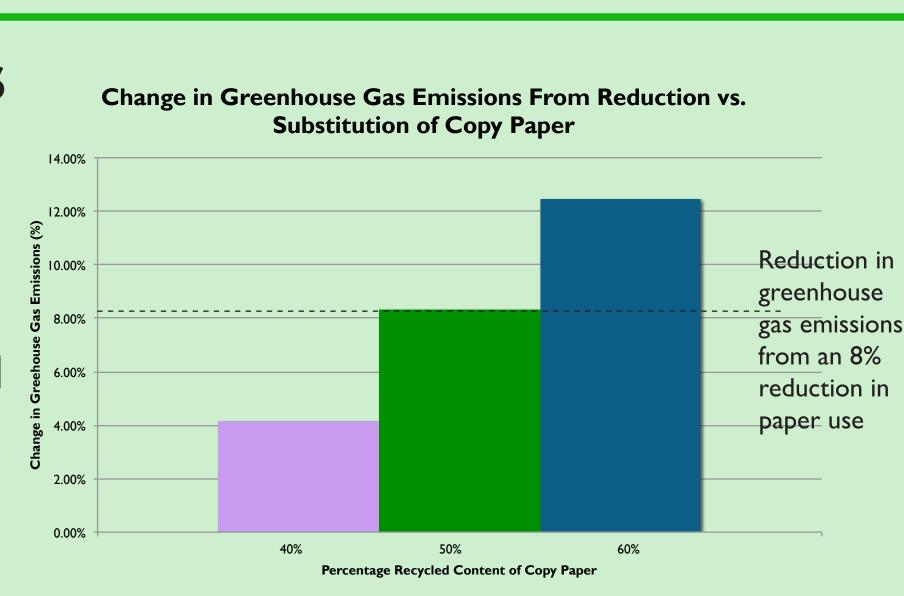
The charts below depict the proportion of high impact products contributing to Global Warming Potential. Central Stores represents campus-wide purchases, while results for the academic departments reflect purchases specific to each department's operations.



Process-Based LCA Results

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 (the most commonly used paper now) to 50% or 100% recycled content paper. It was found that a reduction of 8% in overall use of copy paper was equivalent to substituting all paper with 50% recycled content



Survey Results

81% of survey respondents reported that their decisions about purchasing are affected by sustainability BUT less than 50% bought sustainable products. 30% didn't know if their purchases were sustainable.

• Opportunity: **Education** of department buyers

The last time respondents didn't buy a sustainable product... 33% didn't know where to find a sustainable option. Less than 20% didn't buy a sustainable product due to: price, quality or performance

• Opportunity: increased **Visibility** of Environmentally Preferable Products on the new online procurement system

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