Communicating and Modeling Sustainability in Design
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Need and Industrial Relevance

“If we design a great sustainable product, people who care about the environment will buy it.”
Need and Industrial Relevance

Visible: Chrome finish: bad for the environment, highly desirable for customers

Practically Invisible: One-touch button to reduce flow to a trickle while shampooing – saves water and is innovative

Invisible: Low flow, high-pressure valve: saves water and pressure makes customers happy

Visible: Hand-held option: Allows for more directed rinse-off, potentially saves water
Need and Industrial Relevance

The sustainable designer’s dilemma #1: Make a sustainable product that doesn’t look or act like a sustainable product but sells because it is sustainable.
Need and Industrial Relevance

The sustainable designer’s dilemma #2: If no one buys the product (or only a few people), it does little to reduce environmental impact of the product category.
Need and Industrial Relevance

Research Thrust Area: New Design Paradigms and Processes (and Design Optimization)

Engineers spend much effort on designing sustainable products, but this effort may be wasted if customers do not value this work.

- Sustainable products need to communicate with the customer through design
- Models of environmental impact need to include customer decisions in order to have predictive power
Project Goals

Improve the manner in which sustainable design is addressed in engineering research by:

- Exploring seven cognitive concepts related to sustainable design
- Using optimization of interdisciplinary design models
- Motivating all customers to think about sustainability when they purchase and use products (via design)
Objective: Create Design Methods Focused on Communicating Sustainability
Objective: Optimization with Customer Decisions

- Price
- Context-effect Investment
- % Recycled Paper Pulp

Factors:
- PEP activation
- Performance
- Cost

Demand:
- Competing Products
- Profit
- GHG emissions

Graphs:
- Effects of d=0 and d=10 million on Profit (million) vs. Recycled Paper Content (0 to 1 = 100%)
Objective: Design for Consideration

CAR MODELS FOR SALE IN U.S.

“I want either a Toyota or Ford”

“I can spend $28,000 - $35,000”

“I care about Sustainability: Fuel Economy, Fuel Type, and/or Life Cycle Impact”

“It needs to have luxury finishes”

“I’ll only consider sedans and hatchbacks”
Outcome/Deliverables

New design methods and models that promote the purchase and use of sustainable products.
Impact

- Increase the demand for sustainable products
- Increase R&D resources devoted to the design of sustainable products
- Establish sustainable design as both a customer- and product-driven field
Project Duration & Proposed Budget

- Proposed focus: Any of the three objectives briefly presented (communication, optimization/modeling, design for consideration)
- Proposed Duration: 2 Years
- Proposed Budget: $30,000 per year