

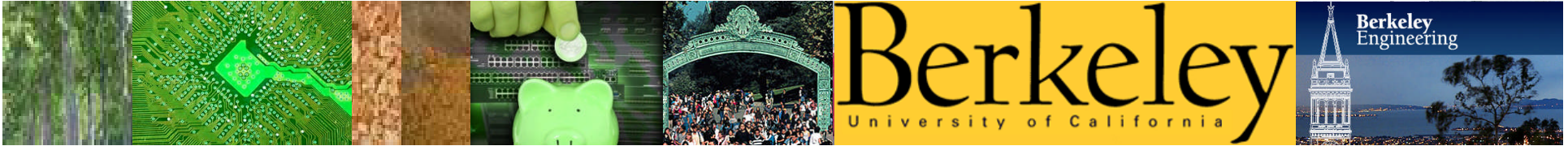


Enabling the Adoption of ICT for Sustainable Business Transformations

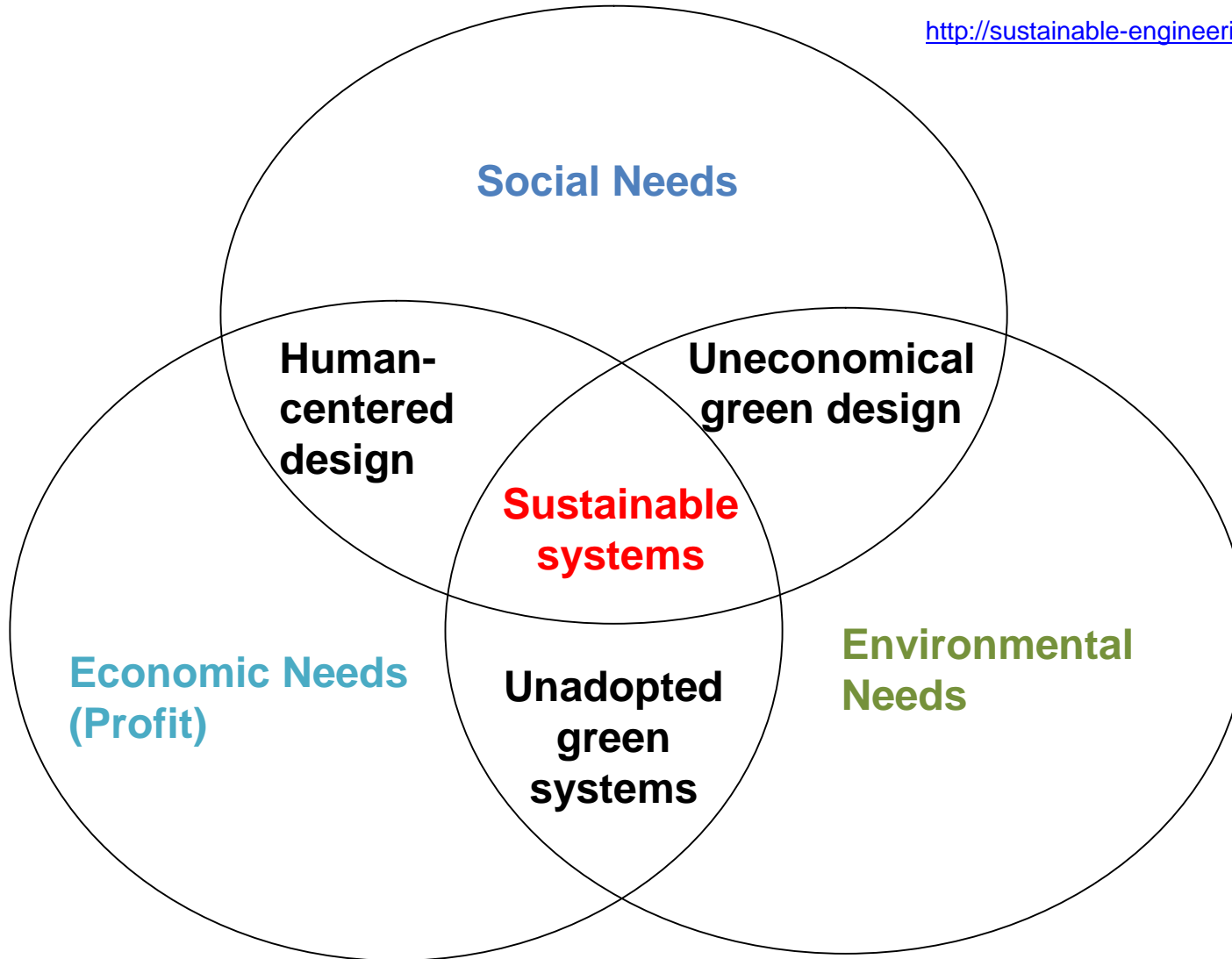


Sustainable Innovations Workshop
HP Corporate Offices

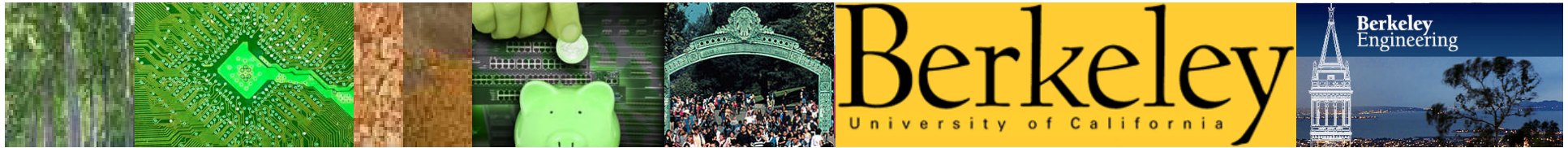
Alice Agogino
Engineering and Business for
Sustainability
University of California at Berkeley



<http://sustainable-engineering.berkeley.edu/>



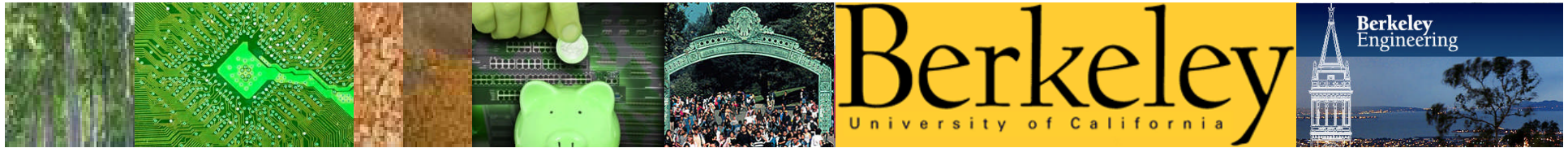
Integrated Bottom Line for Innovation Success



What Defines a Good Sustainable Product?

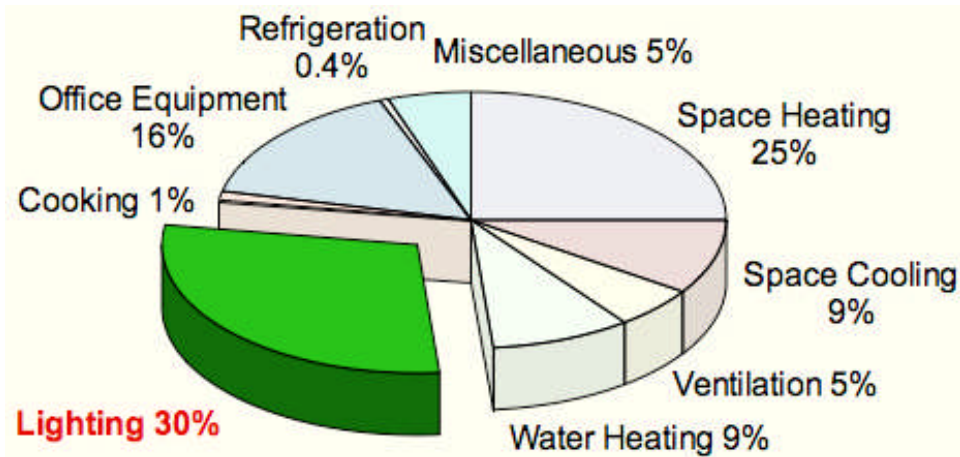
- It gets used
- It satisfies the right needs and functions according to the context of use
- Evaluates well in a full life cycle analysis
- It doesn't stand alone but is part of an infrastructure
- For consumer products: It fits the culture





Smart ICT Offices Example

- 1/3 primary energy in the US
- 2/3 energy use attributes to electricity
- Lighting accounts for 30% energy use in office buildings



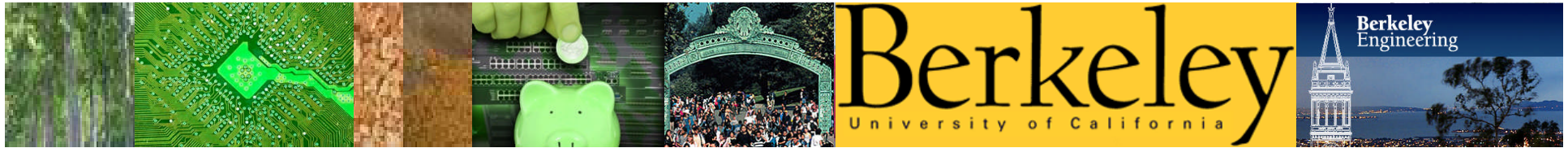


Smart Lighting

- Two most important aspects in modern lighting management in buildings
 - Energy savings
 - Up to 40-70% potential savings with energy efficient lighting management technologies
 - Personal lighting preference & satisfaction
 - Lighting satisfaction correlates to productivity
 - Diverse among individuals
 - Varies with tasks and ages

Market for lighting annually





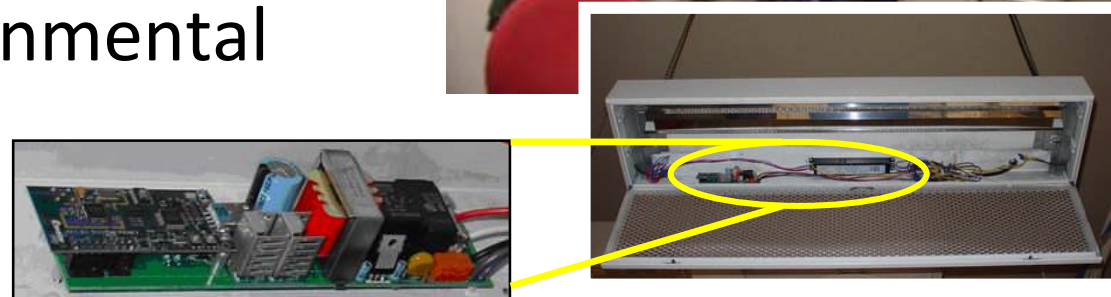
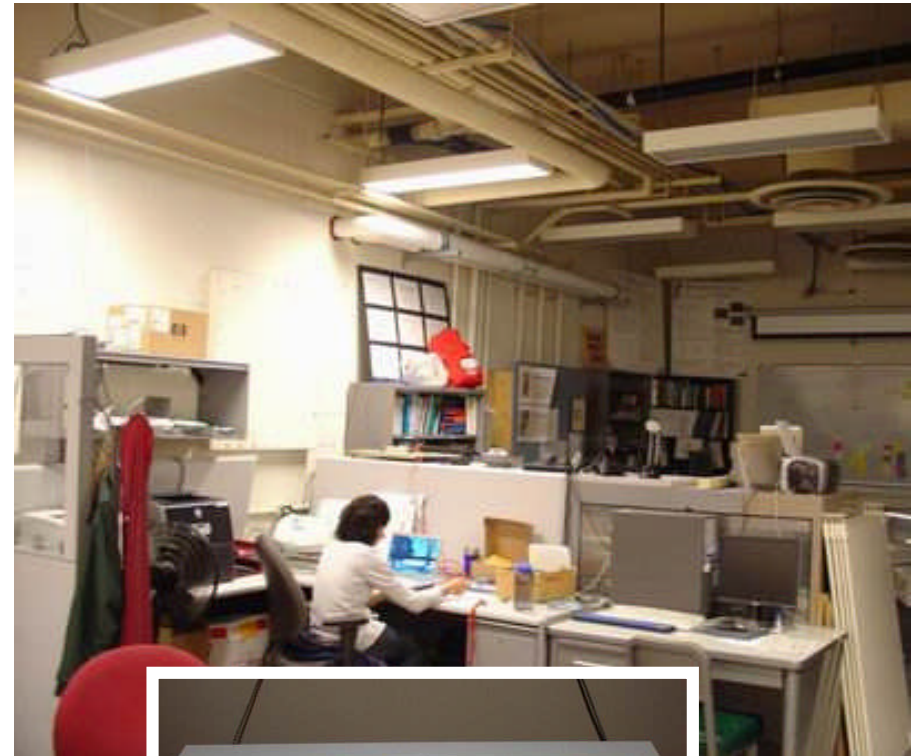
Unadopted Systems

- Exorbitant retrofitting/rewiring cost
- Designed only for energy savings
- Lamps wired together can only be controlled identically
- Impossible to deliver personalized lighting in open space offices



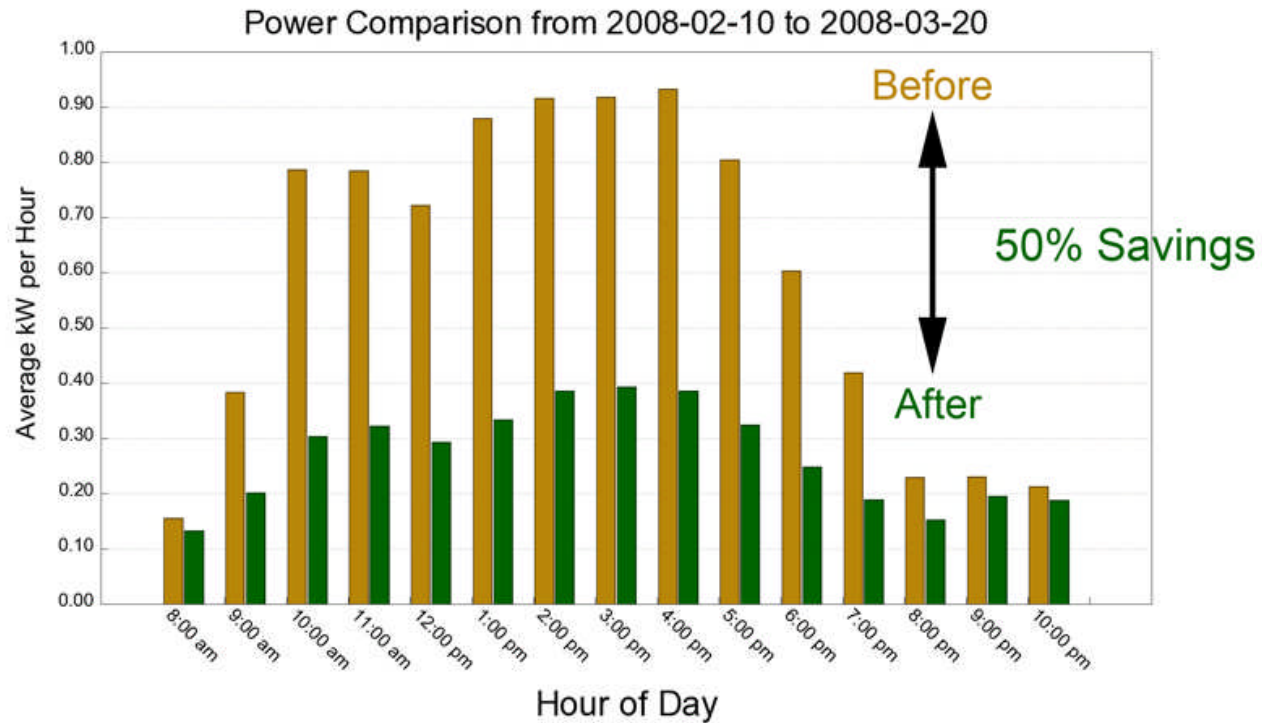
Sustainable ICT Solution

- Personalized settings using wireless micro platform
- Minimal retrofitting
- Extensible to load shedding building technologies
- 17-344 environmental improvement





Successful Proof of Concept



50% energy savings in pilot implementation
 Over 70% savings with simulated daylight harvesting



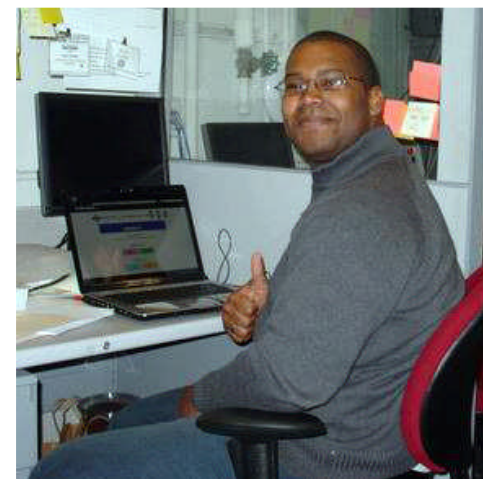
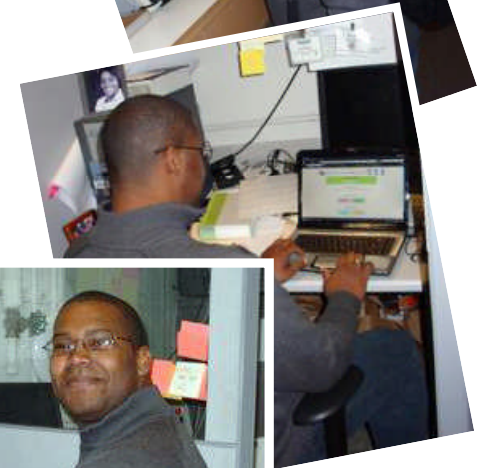
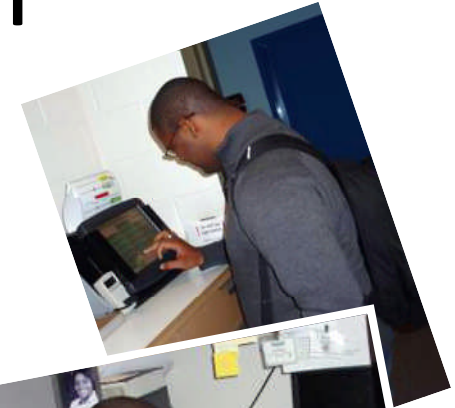
High User Satisfaction

Personalized & optimized lighting

Energy efficiency

Ease of adoption

“Before this system, I wasted a lot of energy when I was in the office alone. Now when I come into the office, I can adjust the lights to meet my needs while reducing energy consumption at the same time.” – Ryan Shelby

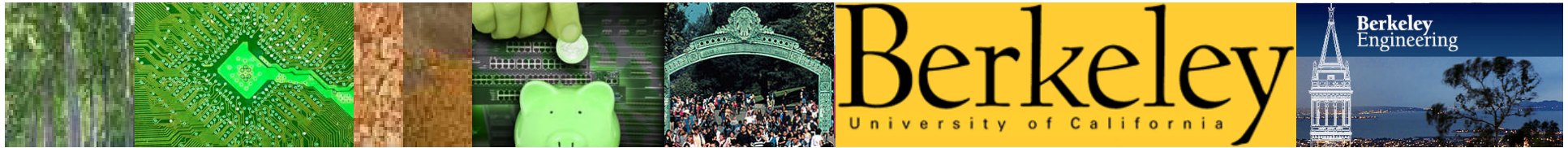




Class Examples – Sustainable Product Design

- Greywater Connect: Resources for adoption of greywater recycling
- Treading Lightly: Style & Sustainability for Pets
- **CARES: Community Assessment of Renewable Energy and Sustainability**
- PACTapparel: Sustainably-made underwear supporting social justice and environmental campaigns
- The Merelan Alliance: Harnessing the potential of the ocean to solve global water scarcity
- Green Modular Furniture
- Wasted Energy Shutdown
- DonorLink Product Suite
- **Nutritional School Lunches - Revolution Foods**
- Sustainable IT

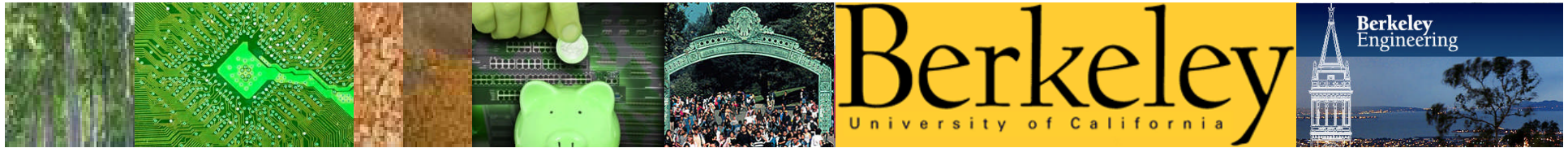




SPD Class Example – Revolution Foods Serves Healthy School Lunches

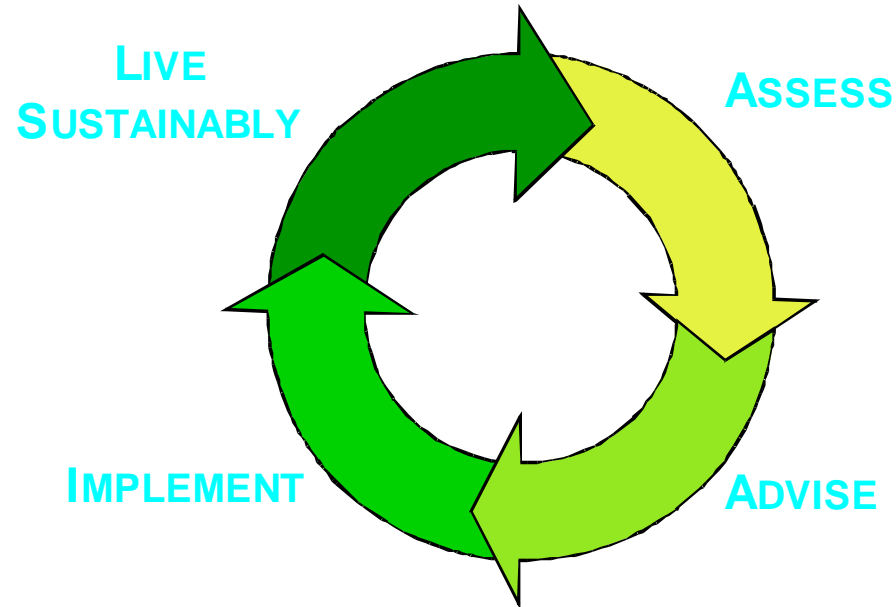


- ❑ In class, the team worked on understanding customers and users, and on a variety of designs of ways to deliver food to children.
- ❑ Today, Revolution Foods serves thousands of healthy meals to kids throughout the SF Bay Area and is expanding to other geographic areas as well
- ❑ Has a product line it sells through Whole Foods



SPD Class Example – Community Assessment of Renewable Energy and Sustainability (CARES)

- Gives consumers, communities, governments and corporations **access to the latest data, models and solutions will accelerate adoption of sustainable solutions**, thus enabling communities to reduce their environmental footprints.



Students in Residence Halls

Retailers – Real Goods

Manufacturers

Academics and Researchers

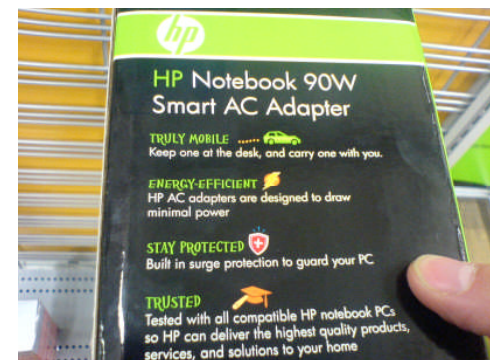
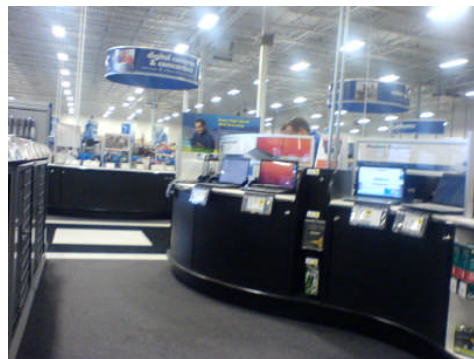
Community Leaders

Pinoleville Pomo Nation of Ukiah, CA



SPD Class Example – Sustainable IT

- Understand user needs and barriers to Sustainable IT.
- Understand what makes business ecosystems more sustainable, and codification of this knowledge into tangible business strategies.
- Expeditious and robust sustainability analysis tools.
- Provenance and Open innovation via a Sustainability Hub.





Sustainable IT Needs Statements

- People want things to be easy, and admit to laziness.
- Need to know more about the process of sustainability, desire education.
- People like to be comfortable and enjoy themselves.
- People prioritize functionality.
- People want both the economic benefit, and the pat on the back.
- A recycling option is good.
- Most would pay more for good information if it was available.
- A lack of information exists.



Sustainable IT Needs Statements

- Economic problems keep many people from being sustainable.
- Laziness keeps people from being sustainable.
- People want easily repairable products.
- People care about the opinion of friends.
- People feel the need to be more aware of lifecycle.
- Information is not easily available for consumers.
- The definitions of sustainability are not clear.
- People would be willing to pay more if there is better information.
- People love their things, fast, when and where they want them.



Sustainable IT Needs Statements

- People recognize that their impact is small.
- Key factors in purchasing decisions are convenience, cost efficiency, value.
- Sustainability seems expensive.
- There are other issues (ex. Financial crisis) that are top of mind.
- People experience societal guilt.
- People do not feel guilty until specifically confronted or asked about sustainability.



Measuring Sustainable IT Needs

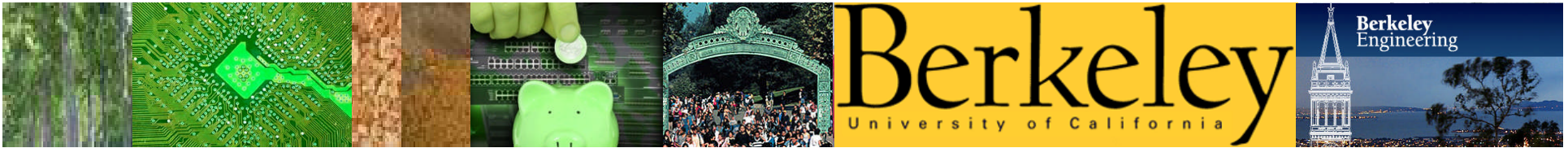
- Information must be clear and easily understood: What information is desirable? How best to present? When to present?
- There must be a clear value and benefit: What are the top benefits? How is value measured? What are price point trade-offs?
- Must be relevant to personal experiences: What are the key personal issues target populations have in regards to sustainable IT?





Questions?





Wireless Network Technologies

- Circumvent massive rewiring and minimize installation costs
- Enable individual addressability
 - Independent control of each light fixture
 - Flexible lighting configuration

