

DEFINITIONS, BENEFITS, AND CASE STUDIES OF SUSTAINABLE BUSINESS PRACTICES AND PRODUCTS

Eugene Mayor Piercy's Sustainable Business Initiative

Sustain - to cause to continue (as in existence or a certain state, or in force or intensity); to keep up, especially without interruption diminution, flagging, etc.; to prolong.

Webster's New International Dictionary

Eugene Mayor Kitty Piercy has launched the Sustainable Business Initiative (SBI). The SBI seeks to identify mechanisms to retain, expand, and create business and job opportunities in 'sustainable' business practices and products.

I. What is Sustainable Development?

Eugene community members want a healthy economy that conserves the environment and ensures equitable access to jobs with good wages, benefits and other vital amenities that support their families. Business and job practices and products that simultaneously enhance economic, social and environmental wellbeing are often called 'triple bottom line' sustainability initiatives. Mayor Piercy established the SBI to expand Eugene's emphasis on 'triple bottom line' sustainable business and job initiatives. Her goal is to make Eugene a nationally known 'center of excellence' in this rapidly growing field.

The term 'sustainable development' was coined by the U.N World Commission on Environment and Development in their report "Our Common Future": "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"

Although this definition describes a laudable goal, it does not describe how an organization or community would ensure that its activities do not compromise the ability of future generations to meet their needs. As a result, numerous experts have proposed definitions and approaches to achieve those ends. The variety of definitions and methods underscores there is no 'best' way to describe sustainability. The approach adopted by an organization or community should fit its needs, geography, and cultural backdrop. Careful review of the most common approaches, however, finds there is core agreement that from an economic perspective sustainability involves a shift from a linear 'take-make-waste' production model (where resources are taken from the Earth's surface, made into goods and services, then the byproducts and end of life materials are discarded without much concern) to a circular 'borrow-use-return' approach (where products and processes are designed to continually re-circulate natural and man-made materials in closed loop systems).

Figure 1 describes the traditional take-make-waste approach while Figure 2 describes the sustainable circular 'borrow-use-return' or 'closed loop' system.

Figure 1: The Linear Take-Make-Waste Economic System¹

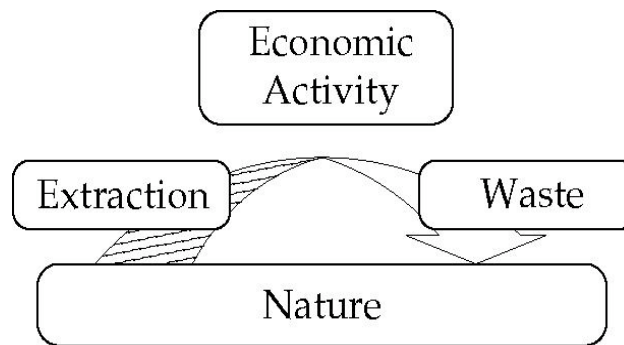
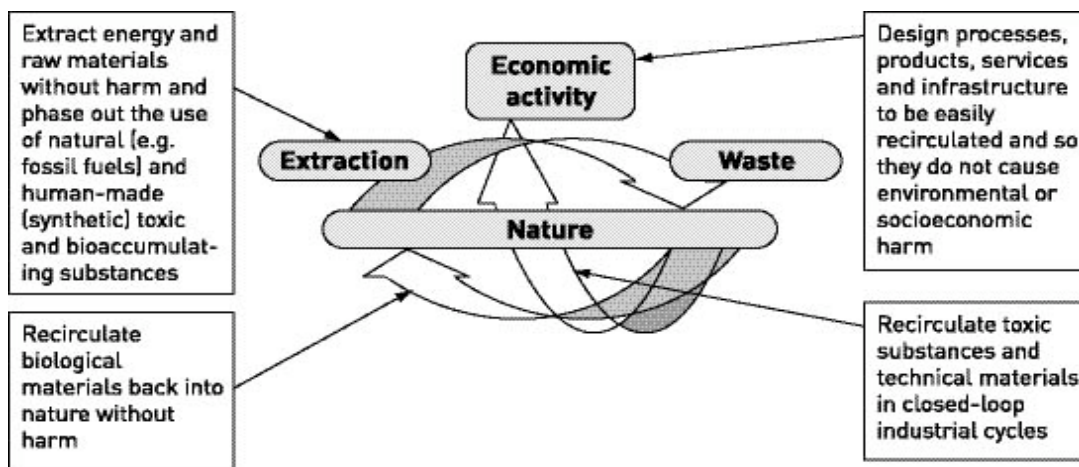


Figure 2: The 'Borrow-Use-Return' Or 'Closed Loop' Economic System



The sustainable circular 'borrow-use-return' economic model

Sustainability Involves Enhanced Social Equity and Capacity

The successful transition to a circular borrow-use-return economic model requires that employees be fully supportive, engaged, and productive and that community members support organizations involved with the shift. This can be achieved only by finding ways to pay living wages, providing affordable access to sufficient health care and other benefits, offering education and training opportunities to support employee skill advancement, and in other ways enhancing the capacity of workers and community members.

¹ The term 'borrow-use-return' system was coined by Bob Doppelt in his book *Leading Change Toward Sustainability: A Change Management Guide for Business, Government, and Civil Society* (Greenleaf Publishing, UK, 2003)

II. Practical Applications

"Triple bottom line" sustainability initiatives in Eugene can focus in the following types of business and job practices and products:

- **Green building**- Building and landscape design and construction techniques and technologies that minimize environmental impacts, reduce energy and water consumption, and enhance livability.
- **Biofuels**- Alternatives and additives to petroleum-based fuels, including biodiesel and ethanol, made from renewable resources such as agricultural materials, vegetable oils, animal fats, or algae.
- **Natural consumer, household, and personal care products**- Consumer, household, and personal health care products made from plants and other renewable materials, e.g. corn or potato based biodegradable plastics, plant-based lubricants, cosmetics and health care supplements.
- **Renewable energy**- Energy derived from sources other than fossil fuels such as wind, solar and biomass.
- **Organic and natural foods**- Agricultural food products that meet federal organic certification standards (e.g. Oregon Tilth) or sustainable certification standards (e.g. the Food Alliance) and do not include genetically modified substances (GMOs).
- **Reuse/recycling businesses**- Reuse businesses utilize discarded products, such as clothing and furniture, for the same or similar uses; Recycling businesses produce products made from recycled materials, such as rubber mats made from old tires.
- **Sustainable forest products**- Dimension lumber, plywood, cabinets and other value added products made from wood harvested from forests that meet environmental certification standards established by independent organizations and/or are manufactured in environmentally sound ways.
- **Sustainable tourism and recreation**- Tourism and recreation with low impact on the local environment and culture.
- **Sustainable healthcare**- Healthcare facilities, practices, and products with low environmental impacts and reduced waste.

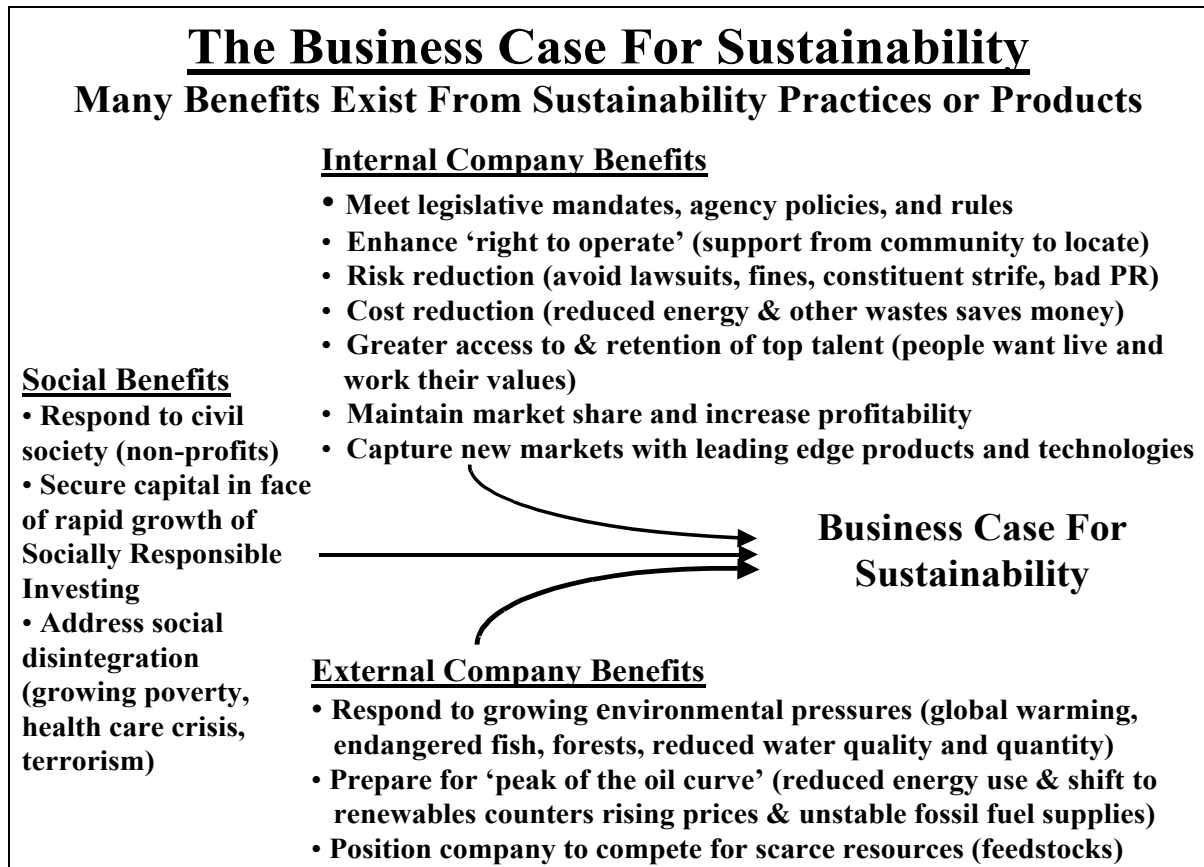
III. Drivers

Businesses have different motivations for the adoption of sustainability measures. Research by Dr. Dave Ervin at Portland State University found seven categories of socioeconomic motivations of firms that adopt business sustainability measures:

- Reduce cost (waste) and improved productivity
- Mitigate or preempt government environmental programs
- Serve emerging green markets more effectively
- Control business risks
- Achieve positive public relationships
- Manage competitors
- Meet CEO personal or business objectives

IV. Benefits

Research shows that companies find numerous benefits through the use of sustainability practices or production of sustainable products. Benefits can be divided in those that address internal company issues, those that address the external pressures companies face, and those that address broader social and public issues. The chart below summarizes these benefits.



V. Costs and Payback

A growing stream of research shows that by starting with 'low hanging fruit' many sustainability practices require small investments of time and money and produce immediate cost savings. For example, energy, water, and waste audits often lead to immediate savings in energy and water costs and waste tipping fees. Once the low hanging fruit has been picked, investments in new practices and technologies can yield significant savings with short payback periods. For example, the use of solar hot water for commercial purposes usually has a payback of 4-7 years or less, after which significant savings can be achieved. Other investments, such as the use of renewable energy such as solar systems or constructing buildings to LEED standards, can have higher up-front costs. However, they may pay for themselves in 7-10 years depending on the size of the operation and current energy load.

Figure 3: Cost Savings By Leading Private Firms

- Interface, one of the world's largest producers of commercial floor covering, saved over \$200 million from 1996-2002 through its sustainability efforts.
- SCA AB, a European-based integrated paper company, saved between \$7-8 million by reducing waste by 18-percent.
- Hewlett Packard in Roseville, California, reduced its waste by 95 percent and saved \$870,564 in 1998.
- ST Microelectronics, a Switzerland-based technology manufacturer, reported that its sustainability policies are projected to save \$900 million between 1994-2010. In 2000, the company saved \$38 million in energy and \$8 million in water costs.
- Many IKEA retail furniture outlets are saving \$5,000 per month due to waste reduction, reuse, and recycling programs and retail prices have been reduced by about 2.5-percent annually due to sustainability efforts.
- Whisler-Blackcomb Resort in British Columbia, Canada, is saving \$110,000 a year through waste reduction efforts related to its sustainability plan.
- Deutsche Telekom, the German telephone company, reduced energy consumption by DM 141 million from 1995 to 2000 while reducing CO² emissions by almost one million tons per year. The company also saved between DM 4 and 5 million by recycling and reusing raw materials in its cabling sector.
- Dupont slashed its energy use by one-third at its New Jersey Chamber Works facility & saved over \$17 million per year on power while reducing greenhouse gas pollution per pound of product by nearly one-half. In 2000, the company saved almost \$400 million due to resource & productivity improvement efforts.
- Baxter International, a Deerfield, Illinois-based medical products maker saved \$12 million out of a net income of \$740 million in 2000, or 1.5-percent of the company's net income, from its sustainability efforts. The company is saving \$35,000 a year at its Vienna, Austria, facility due to new recycling operations.
- NNT, Japan's largest single purchaser of electric power believes it will generate 100 billion yen in savings over 10 years through energy conservation.
- The Collins Company, a U.S. forest products firm saved over \$1 million through a sustainability initiative at its Oregon hardboard and plywood plants.
- Herman Miller, a \$2 billion-per-year manufacturer of office furniture, conservatively estimates it has saved millions from energy and packaging waste reductions.
- Scandic Hotels saved over \$1.5 million from 1996 to 2001 reducing energy, water, and waste while spending \$150,000, a ten-fold return on investment.
- Xerox Corp achieved several billion dollars in costs saved or avoided through its "Waste Free" product and factory initiatives while decreasing municipal, hazardous, and chemical waste and water discharges by 90-percent.

Markets for many products that meet sustainability criteria are expanding rapidly. For example, organic and natural foods are growing at greater than 205 annually while other segments of the food industry remain flat. The production of these new products usually requires changes in the normal product and process improvement cycle. For example, it is in the research and development phase that products can be made with non-toxic materials and substances and designed to be easily taken apart and thus reused and recycled. The key step in this type of R&D process is the establishment of an explicit goal to achieve these ends.

Figure 3 provides examples of the cost savings large corporations found through the adoption of sustainability practices and technologies.

Not just large corporations can save money through the adoption of sustainability measures. Small and mid-sized firms can also benefit. Figure 4 describes some of the savings local businesses achieved in the small rural community of Hood River, Oregon, during a sustainability initiative called the 'Green Smart' program, once run through the Hood River Chamber of Commerce.

Figure 4: Cost savings by small firms through the Hood River 'Green Smart' Program

Hood River “Green Smart” Program

- **Duckwall-Pooley Fruit Co. changed to a tighter bin-stacking arrangement and made energy-efficient upgrades saving \$46,000 annually in energy with a seven year payoff.**
- **Columbia Gorge Veterinary Clinic cut energy costs by 25-30% by upgrading ventilation that reduced need for air conditioning.**
- **Accent Painting reduced the amount and costs of water and thinner used for clean-up and saved money by reusing plastic-coated curtains as drop cloths.**
- **Gorge Publishing Company installed ground source heat pump that reduced heating bills 50%.**
- **Hood River Chamber of Commerce reduced costs by installing efficient lighting, heating fixtures, occupancy sensors and low flush toilets. They also reduced paper use and costs by 40%.**
- **Hood River Sports Club installed energy and water efficient fixtures in a building expansion and saved \$25,000 with 1.5 year payoff.**
- **Luhr Jensen and Sons Inc. replaced degreasing system and probable ozone depleting chemicals with an aqueous-based system saving \$4,600 per month.**

VI. Case Studies

The case studies are divided into two sections, with the first portion providing examples of businesses applying sustainable practices in the Pacific Northwest and the second half describing national businesses. In both cases, the businesses are grouped by sector and where possible, economic, environmental and social impacts are highlighted.

A. Applications of Sustainable Development in the Pacific Northwest

Food and Beverages

Trailblazer Foods² <http://www.tbfoods.com/>

Located in Portland, Oregon, Trailblazer Foods employs 45 people to manufacture syrups, fruits and jams. When moving to a new building, the company designed and installed an innovative water recycling machines for heating and cooling with the goal of pollution reduction and energy and water efficiency.

- The system cost \$40,000
- The system cuts the company's water and electric use (and therefore costs for energy and water) by 50%, resulting in a two year payback.
- The system cuts water use by 1.5 million gallons per year and gasses by 10%.
- The water system also eliminates the release of hazardous sludge into the water stream, thanks to a filter that separates out sludge.
- The system helped the company comply with state environmental requirements for process effluents.

Lamb's Thriftway <http://www.thriftwaystores.com/>

This grocery store is saving over 1.3 million kWh/year (worth about \$65,000/yr) through a comprehensive package of renovations to their 1981 store. This was done at the same time they were expanding their floor space by about 80 percent. They have upgraded their refrigeration systems, the store lighting, and heating and air conditioning control systems. The annual energy savings are equal to what Lamb's net income increase would be if they boosted their grocery sales by \$8.7 million a year.³

Agriculture

Stahlbush Island Farms. www.stahlbush.com

Purchased in 1985, this 353-acre farm outside of Corvallis on the banks of the Willamette River grows and processes fresh produce. Most of the company's customers are large food product manufacturers. While they are not certified organic, they farm sustainably through crop rotation, pesticide reduction & elimination, cover cropping and more. The chemicals they do use are approved for organic agriculture.

² U.S. Department of Energy, Energy Efficiency and Renewable Energy. "Trailblazer Foods, Inc." http://www.eere.energy.gov/industry/financial/case_studies10.html

³ Resource Innovations. "Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples." 2000.

- Water use has been reduced by more than 50%, due to an innovative system where water is used in three or four different applications.
- Timers were installed on fan motors in freezers so that fans don't run all of the time.
 - Financial Savings: \$4,500/year.
 - Resource Savings: 133,000 kWh/year.
- As targeted motors wear out, they are replaced with high-efficiency motors.
 - Financial Savings: when fully implemented, this will save \$2,300/year in electric bills.
 - Resource Savings: 50,000 kWh/year.
- Only "natural" (uncolored) 5-gallon HDPE plastic pails are used. These pails are easier for customers to recycle. Ammonia compressor head pressure and boiler pressure have been adjusted to conserve energy. The farm composts food scraps and is experimenting with using food scraps as cattle feed. Some bulk products are shipped in reconditioned drums. Stahlbush recycles corrugated cardboard boxes and office paper.⁴
- Job creation: 1985 - 2 full-time employees; 1999 - _____ full-time employees.
- 2000 acres certified sustainable.⁵
- New business development:
 - In 1990, they expanded with construction of a food processing plant that allows them to add value to their fresh produce with fruit and vegetable purees and "Individually Quick Frozen" packaged goods.
 - Expansion with the purchase of a 500 acre farm near Pleasant Hill
- Environmental Benefits – Creation of a sustainable farm system that goes beyond organic certification to include health of the surrounding ecosystem
- Social Benefits - "In 14 years of operation, Stahlbush Island Farms has never had a single lay-off," according to Karla Chambers, co-owner of Stahlbush Island Farms.⁶

Viewmont Orchards

- This Hood River farm conserved energy by replacing an inefficient oil pressure heating system, and installing capacitors and control circuitry to regulate energy use. Produced a savings of \$55,000 per year.
- Water use was also reduced with a switch to micro-irrigation.

⁴ Resource Innovations. "Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples." 2000.

⁵ Back, Brian J. Editor. Celilo Group Media. *Sustainable Industries Overview: 2005 Northwest Edition*.

⁶ 1998 Case Study by Sustainable Northwest, Founders of a New Northwest Award (<http://www.sustainablenorthwest.org/>) for Sustainable Oregon (the Oregon Sustainability Board), <http://www.sustainableoregon.net/oregon/>.

Electronics

Wacker Siltronic⁷

A Portland-based manufacturer of silicon wafers for the electronics industry, which employs 1700 people. Once known as one of the largest hazardous waste generators in the state in 1985, Wacker Siltronic has now won numerous awards for their environmental track record.

- The company changed from saws using single pass cooling to saws using recirculating glycol and a heat exchanger. These changes and others reduced water use by 37 million gallons per year.
- Transportation -- Wacker's employee commute reduction program has reduced employee vehicle trips by 33%. The result is an annual savings of nearly 2.9 million vehicle miles traveled (approximately equal to 143,000 gallons of gasoline). They offered 12 shift schedules to all production workers, which gave them more time off, reduced trips, and avoided rush hour traffic. In addition they increased their bus pass subsidy to 100% for their employees that wish to ride the bus. Telecommuting was successfully pilot-tested in 1996. They expanded their modem capacity to allow off-site computer access and e-mail retrieval allowing some employees to work from home.⁸
- Environmental Benefits: Between 1985 & 1996, they
 - 1) completely eliminated the use of ozone-depleting chemicals,
 - 2) reduced air pollution by 89%,
 - 3) reduced solid-waste generation by 30%,
 - 4) cut overall use of chemicals at their facility by 47%
 - 5) reduced hazardous waste generation by 99%
- Economic Benefits: Savings of more than \$1 million annually from the above mentioned changes

Fluke Corporation. www.fluke.com

Fluke Corporation is a manufacturer of electronic test and measurement equipment located in Everett, WA.⁹ Started in the 1950s, by 1998, the company employed 2000 people with gross receipts of approximately \$440 million dollars. In the early 1980s when they became part of a Superfund cleanup site, they adopted a new perspective toward managing waste. What began as a way of addressing long-term financial ramifications and an environmental issue has become a way of addressing an internal quality problem; what's good for the environment is seen as good for financial stability of the corporation. Environmental and economic benefits follow:

- 90-99% of hazardous materials are treated on-site with a large percentage recycled; in 1986 this amounted to 1000 tons that used to be shipped off-site for treatment and disposal. Approximate savings of \$500,000/year in disposal costs.

⁷ U.S. Environmental Protection Agency. *Evergreen Awards-Walker Siltronic*. 1996
<http://yosemite1.epa.gov/r10/OI.NSF/0/f19d37b871375f338825675b005d5ed7?OpenDocument>

⁸ Resource Innovations. "Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples." 2000.

⁹ 1998 Case Study by Sustainable Northwest, Founders of a New Northwest Award.
<http://www.sustainablenorthwest.org/programs/fndsearch.php>

- Elimination of ozone depleting chemicals from the company's production process - price of a 50-gallon drum of freon had jumped from \$50 to \$5,000. Elimination of this and other hazardous wastes has saved approximately \$340,000/year.
- Reductions in annual water use between 1990 & 1996 of 24 million gallons produced a savings of \$86,000/year.
- Reduction of solid waste & increased office recycling saves approximately \$50,000/year; scrap reduction and circuit board recycling saves approximately \$9600/year in manufacturing.
- They've phased out use of mercury batteries in new products and provided retro-fit packages for previous generation products.

Manufacturing

Evanite Fiber Corporation¹⁰ <http://www.evanite.com/>

- Evanite Fiber Corporation has three manufacturing facilities at its Corvallis campus: hardboard (wood interior panels), glass fibers, and battery separator material. Faced with an air compressor system that was not performing well enough, Evanite reconfigured and repaired leaks in the compressor system.
- Financial Savings: \$36,000/year in electric bills, plus an avoided capital cost of \$27,000 to replace the compressor system.
- Resource Savings: 900,000 kWh/year (estimated).
- When Evanite closed one of its plants, a purchasing agent chose to list 34 items needing removal as "available" materials in the Industrial Materials Exchange (IMEX). Within two months, Evanite had found users ranging from Portland to New Jersey for 12 of these listings, including various types of plastics and organic chemicals.
- Financial Savings: at least \$3,500 in avoided disposal costs. The market value of materials re-used is over \$11,500.

Rejuvenation¹¹ <http://www.rejuvenation.com>

Founded in 1978 as an architectural salvage shop, Rejuvenation has now expanded to manufacturing period lighting and hardware. The company employs approximately 200 people and has been an environmental leader in the construction and remodeling industry, encouraging reuse and recycling of materials from house demolition.

- Their clear coating system has decreased VOC emissions by 75%.
- The company pays employees to walk, carpool, bike or take public transit to work and based their decision to remain in Portland, rather than moving to the suburbs, on reducing employee commuting. A fleet of bikes is available to staff for meetings, errands, etc.
- The Rejuvenation store in Portland includes 5,000 square feet of salvaged building material.

¹⁰ Resource Innovations. "Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples." 2000.

¹¹ Information comes from Rejuvenation's website at <http://www.rejuvenation.com> and from an Oregon Natural Step case study from 2000 at <http://www.ortns.org/documents/Rejuvenation.PDF>.

- A take back program minimizes the landfilling of their products.

Graphic Sciences www.graphicsciences.com

Headquartered in Portland, they are a leading manufacturer of environmentally friendly inks and coatings for the flexographic printing industry – inks used on corrugated boxes and paper and plastic bags.

- Environmental Benefits: In 1997 they installed a cooling tower to their pigment grinding process. This allows most of the cooling water to be reused, cutting water use by 80%.
- Economic Benefits: The installation paid for itself in a matter of months, using 2,500,000 less gallons of water a year for a savings of about \$12,000 annually.

Boeing¹² <http://www.boeing.com/flash.html>

Boeing Commercial Airplane Group reduced air-compressor energy use by 50 percent at its three-building campus in Portland, Oregon.

- A \$180,000 upgrade cut energy use from 4.5 million kWh down to just 2.2 million kWh, saving \$92,000 a year, a two-year payback.
- In addition to these energy savings, the company saves \$9,500 in equipment depreciation and \$8,500 on maintenance, parts, and labor each year.
- The local utility provided a \$40,000 incentive.
- Improving air compression systems dramatically increases airflow to existing equipment and tools, allowing a manufacturer to avoid or delay the capital costs of purchasing a new compressor as demand for air grows; this factor alone can double the return on investment. Some system upgrades improve product quality and increase productivity.
- Because virtually all of the energy used for compressing air is electricity, upgrades achieve significant carbon dioxide savings.

Construction, Development and Building Products

Neil Kelly Company <http://www.neilkelly.com/>

Neil Kelly Company has been providing home repairs and remodels since 1947 for the greater Portland area, and more recently, Eugene. The company also works with new home design and specializes in cabinets, windows and doors.

- PGE Earth Advantage named Neil Kelly Co. the winner of its 2003 Earth Advantage Remodeler Award for their excellence in sustainable building. Several other awards have been given to the company for their sustainable designs and products.
- Almost all of the wood the company uses is sustainably harvested and much of it is reclaimed.¹³

¹² Resource Innovations. “Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples.” 2000.

<http://cwch.uoregon.edu/publicationspress/justplaingoodbusiness.pdf>

¹³ Eric Churchill, Project Manager for Custom Homes. Personal Interview, 14 July, 05.

- Producer of cabinets made from wheatboard and/or sustainably harvested wood with low or non-toxic finishes and adhesives. They also create products made of cork and lyptus.
- Their delivery van and portions of their fleet run on biodiesel. In 2004, Neil Kelley became one of the first Portland businesses to install a 100% biodiesel tank for their own use.
- Provide Natural Step trainings for employees to promote sustainable practices.¹⁴
- History of team based, collaborative management style.¹⁵
- The company gets a good deal of business because of their sustainable practices and products.

Gerding/Edlen Development Company <http://www.ge-dev.com/>

Gerding/Edlen is a commercial real estate consulting and development firm that specializes in mixed use urban renewal projects. The firm began in 1996 and has since completed projects including several developments on Portland's well know Brewery Blocks.

- "Gerding/Edlen's goal is to create buildings that create more energy than they use, keep all stormwater on site, eliminate toxic materials, and create a sustainable environment for people to live and work."
- Grants, assistance and tax credits offset twice the value of the \$700,000 the company spent on green design elements of their Brewery Blocks projects.
- The company's condominium project, "The Henry," sold out in record times at record high prices, despite a challenging market. Dennis Wilde, Senior Project Manager, estimates that residents will save about \$600 per year in utilities thanks to the incorporation of green design.
- Cost premiums are decreasing as their contractors become more familiar with green design.
- Wilde told Oregon Natural Step, "We couldn't have bought all the PR that this has brought us. We've had one or two articles published about us or our projects every week for the past two years."¹⁶

Forestry and Wood Products

The Collins Companies www.collinswood.com

The Collins Companies is a wood-products company founded in 1855 and now headquartered in Portland, Oregon. As a privately-held company with 1100 employees and revenue in excess of \$200 million, The Collins Companies has developed a reputation for sustainable forestry practices that sets it apart from many of its competitors.¹⁷

¹⁴ Neil Kelly Company. "Neil Kelly's Environmental Vision." <http://www.neilkelly.com/>

¹⁵ Hitchcock, Darcy. Natural Step. "Neil Kelly Company; A Natural Step Case Study." 2001. http://www.naturalstep.org.nz/downloads/International_Case_Study_pdfs/TNSI_Neil_Kelly.pdf

¹⁶ Hitchcock, Darcy. AXIS Performance Advisors. *Gerding/Edlen Development Company: An Oregon Natural Step Network Case Study*. 2004. http://www.ortns.org/resources_grn.htm

¹⁷ Castle, Duke. The Castle Group. *The Collins Companies: An Oregon Natural Step Network Case Study*. 1997; updated February 1999. <http://www.ortns.org/resources.asp>

- Collins adopted a plan to eventually eliminate all waste at their manufacturing facilities, which helped the company save \$1 million in the first year alone.
- Collins now sells products to Home Depot Inc. because of its forest certification.
- Their Klamath Falls manufacturing facility employs 600 people. After a team of five completed The Natural Step (TNS) training in spring of 1997, Collins used modified TNS material to emphasize sustainability in training the remainder of their employees. This was completed by November of 1997 and the following economic and environmental benefits were realized within the next two years:¹⁸
- “The heat from ovens that cure hardboard coating is now reclaimed, run through a heat exchanger, and sent back to heat the building. At the particleboard plant, a new 300-horsepower motor does the work previously done by six, saving \$118,000 per year in electricity costs. These projects will have a financial payback of four and two years respectively.
- New equipment was installed that allows sander dust to be incorporated into particleboard. This dust, which was previously burned in a boiler, actually improves the appearance of the board in addition to saving \$562,000 per year and reducing air emissions.
- Piles of old chips, which used to be landfilled, are now sold to an energy recovery facility. This cleanup is expected to generate \$18,000 in revenue.
- Making steam traps more efficient is expected to save \$25,000 per year.
- By switching from compressed air to a fan to clean conveyors, the particle board plant is saving \$18,000 per year in electricity costs.

Other

Legacy Health System¹⁹ <http://www.legacyhealth.org/>

This hospital system in Portland has undergone a variety of changes to increase their resource efficiency and save money. In addition to all the activities described below, they recycle cardboard, office paper, glass bottles, metal cans, and several resins of plastics.

- Replaced disposable foam mattresses with reusables.
 - Financial Savings: \$81,527/year.
 - Resource Savings: 16,350 pounds/year.
- Eliminated rarely-used items from custom packs of surgical supplies.
 - Financial Savings: more than \$30,000/year.
 - Resource Savings: 11,000 pounds/year.
- Consolidated duplicative admitting kits for maternity patients.
 - Financial Savings: more than \$3,500/year.
 - Resource Savings: 2,700 pounds/year.
- Reduces photocopying by keeping originals in shared files.
 - Financial Savings: more than \$128,000/year.
 - Resource Savings: 2,100 pounds/year.

¹⁸ Castle, Duke. 1997.

¹⁹ Resource Innovations. “Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples.” 2000.
<http://cwch.uoregon.edu/publicationspress/justplaignoodbusiness.pdf>

- Customized the distribution of reports and newsletters; periodically checks distribution lists and only sends reports and newsletters to departments and individuals who request them.
 - Financial Savings: more than \$10,000/year.
 - Resource Savings: 4,100 pounds/year.
- Consolidated seven different patient forms into a single flow sheet.
 - Financial Savings: \$158/year.
 - Resource Savings: 300 pounds/year.
- Eliminated unused third page of three-part carbonless form.
 - Financial Savings: \$199/year.
 - Resource Savings: 60 pounds/year.

Norm Thompson www.normthompson.com

Norm Thompson Outfitters is an Oregon based clothing and accessory catalog retailer with three sales divisions. “In 2002, Norm Thompson will distribute approximately 80 million catalogs to its national customer base. Annual revenues are approaching \$200 million. The company employs approximately 675 year-round employees and an additional 1200 during the peak holiday season.”²⁰

- In 1995, they built a new headquarters in Portland, one of the first “green buildings” in the U.S. “The added costs of the building’s environmental features were paid off in the first four years by energy savings. These energy savings, 35% over Oregon code, now contribute approximately \$30,000 per year to the company’s bottom line.”²¹
- From fall of 1997 to April 1999, The Natural Step training model was implemented by top management, then modified and presented to all employees. The following economic benefits resulted from these efforts:²²
- By 2001, after research with Environmental Defense’s Alliance for Environmental Innovation and working with paper suppliers, they were able to include 10% post-consumer waste paper in all catalogs at the same cost as using virgin paper.
- By eliminating the use of envelopes for catalogs to new requestors, they save \$50,000/year.
- By implementing a voluntary “Ship all Together” policy when orders contain multiple products and at least one is out of stock, they save \$252,000 annually as well as over 30,000 shipping boxes and associated mailing supplies.
- They’ve implemented a five-year zero-waste goal, which reduced waste at their headquarters site by 41% in its first year.
- By providing every headquarters employee with a reusable mug, they’ve eliminated the use of 120,000 disposable cups/year and seen a saving of almost \$10,000 annually.

²⁰ Owens, Heidi. The Oregon Natural Step Network. *Norm Thompson: An Oregon Natural Step Network Case Study*. Feb., 1999 (Allaway, David. 2000 update; the Network, Oct. 2002 update.)

<http://www.ortns.org/resources.asp>

²¹ Owens, Heidi, et.al. 1999-2002

²² Owens, Heidi, et.al. 1999-2002

- “The company goal is to replace all conventionally grown cotton with organically grown cotton within five years.”

Corvallis Hardware/True Value²³

Corvallis Hardware purchases the large majority of its products from Cotter & Company. Deliveries from the Portland distribution center are shipped in reusable plastic totes. Empty totes from the previous week are picked up for reuse when new merchandise is dropped off. Cotter & Company also redesigned its billing statement; invoices are now sent every two weeks rather than weekly.

- Financial Savings: more than \$20,000/year (Cotter & Company).
- Resource Savings: 22.5 tons of paper/year (Cotter & Company).
- Corvallis Hardware is also retrofitting magnetic ballasts and T-12 fluorescent lamps with electronic ballasts and T-8 lamps as old lamps and ballasts burn out. This will eventually reduce electricity bills by about \$1,300/year.

B. National Case Studies²⁴

Companies in this section have diverted more than 90% of their wastes and thus can be considered to be Zero Waste Businesses (or darn close).

Food and Beverages

Anheuser-Busch www.anheuser-busch.com/

The Fairfield plant opened in 1976, employs 485 people and brews over four million barrels of beer each year. It is one of the first breweries in the United States to be ISO 14001 certified by the International Organization of Standardization. The facility sent over 94,000 tons of spent grain to cattle feed alone in 2001. An additional 1,500 tons of aluminum, glass, cardboard, scrap metals, office paper, computer paper, phone books, plastic and glass soda bottles, aluminum cans, ink, oil and toner cartridges were recycled. The facility also diverted some 220 tons of beech wood chips to composting and recovered almost 970 tons of alcohol from fermentation bottoms, waste yeast and waste beer for use in fuel blending. As a result, the facility achieved a 98% diversion rate from landfill and incineration in 2001. Diatomaceous Earth, a filtering agent, makes up 85% of the plant’s landfilled material. However, Robert Wachter, Resident EHS Manager, believes he will have an agricultural use for this material by the end of 2002, which should bring the plant to a 99% plus diversion rate.

The facility has received numerous awards including recognition from the Governor’s Economic and Environmental Leadership Award and the 2001 “WRAP of the Year” award from the California Integrated Waste Management Board. For more information

²³ Resource Innovations. “Just Plain Good Business: The Environmental and Economic Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples.” 2000. <http://cwch.uoregon.edu/publicationspress/justplaingoodbusiness.pdf>

²⁴ The following information and introduction comes from Gary Liss and the Grassroots Recycling Network. <http://www.grrn.org/> With the exception of rearranging the document so that businesses are divided by sector, we have not altered the document.

contact Robert Wachter, P.O. Box AB, Fairfield, CA 94533, bob.wachter@anheuser-busch.com.

Frankie's Bohemian Café, San Francisco, CA

Frankie's, a local chain of three restaurants, has been participating in San Francisco's organics and recyclables collection program for just over one year. They have seen a dramatic increase in recycling and reduction in disposal to landfill since the program's inception. All three restaurants separate their kitchen-prep food scraps, plate scrapings, soiled paper (e.g., paper napkins), scrap paper, natural fiber produce bags and the like for compost collection. Recyclable plastic, glass and metal beverage and produce containers are commingled for recycling. Cardboard is collected separately. The restaurant also self-hauls approximately 500 pounds of used fry-oil to a local fry-oil recycler each month. What remains is difficult to recycle broken china, various plastics and composite materials. Frank, the restaurants' owner, says that his motivation to recycle is two-fold: to help the environment and to reduce their garbage bill. He's happy to have succeeded in doing both. For more information contact Frank Pazderka, 1862 Divisadero Street, San Francisco, CA 94115, 415-710-3737.

Greens Restaurant www.greensrestaurant.com

Greens was founded in 1973, employs 87 people and is one of San Francisco's longest established and well-known gourmet vegetarian restaurants. Annie Somerville, the executive chef, has earned a national reputation for her imaginative vegetarian dishes. She is also committed to keeping the restaurant's waste to a minimum. The restaurant has three recycling dumpsters: one for cardboard, newspaper, office paper and other mixed paper; a second for plastic and glass bottles and jars; and a third for metal beverage and produce cans. These are collected twice weekly. In addition, the restaurant fills fifty 40-gallon cans with kitchen scraps, plate scrapings, unusable produce and soiled paper twice weekly. Half of these are collected through San Francisco's green waste collection and recycling program. The remainder is composted at the Green Gulch organic farm, located 20 miles of San Francisco, to help grow organic vegetables that find their way back into Greens' tasty vegetarian meals. The restaurant also donates their fresh but unused bread and other foods to Food Runners, a food donation organization that serves the needy. Contact: Annie Somerville, Building A, Fort Mason, San Francisco, CA 94123, 415-771-6222, www.greensrest.citysearch.com

Larry's Markets www.larrysmarkets.com

Larry's Markets instituted a composting program in 1996 as part of their plan to run environmentally responsible stores. The company's five stores recovered 90% of their food discards, sending 750 tons of food, floral and waxed cardboard to compost and 120 tons of meat products to rendering. Their efforts realized a net savings of approximately \$41,000 a year. Source: Target Zero Canada at <http://www.targetzerocanada.org/>.

New Belgium Brewery, www.newbelgium.com/

Founded in a basement by Jeff Lebesch and Kim Jordan in 1991, New Belgium Brewery now produces over 250,000 barrels of beer annually, employs 150 people and is the 12th largest craft brewer in the U.S. The company endeavors to infuse environmental mitigation in the entire brewing process and outlines the company's environmental

policies in their “Steps to Being Green” guide. The brewery diverts 55,500 lbs/day in spent grain to dairy cow feed alone. It also recycles bottles and cans, amber glass, cardboard, paperboard, mixed office paper, wood, plastic wrap, plastic wrap rolls, plastic bags, Styrofoam, consumer batteries, used oil, computers, ink cartridges and fifty-five gallon plastic drums. Cafeteria food waste is vermi-composted onsite. It is exploring agricultural markets for its diatomaceous earth (a filtering agent). The brewery landfills less than one 30-yard compactor of trash each month.

The brewery also completed construction of an onsite water treatment facility that should pay for itself within 5 years through energy production and reduced water discharge fees. Methane generated during treatment will power a cogeneration plant to ease the brewery’s peak hour energy use. Treated water will be pure enough to be released into the Cache la Poudre River. The company plans to treat the plant’s sludge on its 50-acre site through vermi-composting. This employee owned company also pays 2.5 cents more per kWh to ensure that 100% of its energy is wind generated. The employee owners voted to reduce their annual bonuses to offset the additional cost. The company has won numerous environmental awards, including Colorado’s Certificate of Achievement in Pollution Prevention, the EPA’s Green Power Partnership “Founding Partner” Award and the North Front Range Solid Waste Action Group’s Waste Savers Award. “Fat Tire” is its most widely selling beer. For more information contact: Hillary Kaufman, Sustainability Goddess and Donations Deemer, 500 Linden Street, Fort Collins, Colorado 80524, hkausman@newbelgium.com, 970-221-0524, Toll-Free: 888-NBB-4044,

Scoma’s Restaurant www.scomas.com/home.htm

San Francisco, CA – Scoma’s is an award winning, family-owned seafood restaurant located on Pier 47, in the heart of historic Fisherman's Wharf, since 1967. It is the 13th highest grossing restaurant in the U.S., serves an average of 1,200 customers per day (up to 1,800 during high season) and employs 150 people. Scoma’s has made waste reduction and recycling part of its employee training and business culture. It enthusiastically participates in San Francisco’s all food and organics recycling program by separating plate scrapings, kitchen scraps, unusable produce, meat, fish, cheese, soiled paper and non-office paper for daily collection and composting. Office paper is kept separate for recycling. The restaurant also encourages reuse by allowing local vendors to collect and reuse approximately ten percent of their cardboard boxes. The remainder is collected daily for recycling. They also recycle all glass, metal and plastic beverage bottles; metal produce cans; glass bottles and jars; and recyclable plastic produce bottles. Fry oil is cycled through a filtration system to extend its freshness and is eventually collected by a cooking oil recycler.

Their daily trash fits into two 96 gallon containers and consists primarily of difficult to recycle items such as plastic wrap, jell packs, plastic packing ribbons, Styrofoam, clothes hangers (from laundry service), plastic straws and the like. The restaurant has recycling stations strategically located throughout the restaurant in prep areas, soiled dish area, server stations, bar and office. Steve Scarabosio, the restaurant’s Executive Chef, says their motivation is, “to do the right thing and lower our garbage bill. And we hope our compost will help grow good organic produce.” Scoma’s purchases organic produce

whenever viable favors biodegradable cleaning products and avoids the purchase of farm raised fish. For more information contact: Steve Scarabosio, Executive Chef, Pier 47, San Francisco, CA 94133, 415-771-4383, steve@scomas.com

Vons-Safeway www.Vons.com

Southern California and Southern Nevada District – This retail, warehouse and manufacturing district includes 328 stores and 4 distribution and manufacturing facilities. The stores and facilities have implemented a number of successful source reduction and recycling programs. These include such traditional programs as cardboard recycling; meat and fish scrap rendering and pallet recycling. However, the company has gone beyond the norm and has implemented an organics collection and composting program for unusable/inedible produce, bread, wax-coated cardboard boxes, non-reusable wood packing crates and other compostable materials. The company also collects and compacts mixed plastics, such as six-pack rings, buckets, film and bags and ships them to a mixed plastics recycler. In addition, Vons-Safeway has converted much of their wood and cardboard shipping crates and boxes to reusable, recyclable and sometimes collapsible plastic containers. These are used for shipping milk, bread, watermelons and other goods from their distribution centers to their stores. The company regularly donates large volumes of un-saleable but edible breads, canned goods, produce and other foodstuffs to numerous food banks. Vons-Safeway has been a frequent winner of the California Waste Reduction Awards Program (WRAP) award. For more information contact Curt Smith, Distribution Warehouse Manager, 562-802-6311.

Fetzer Vineyards www.fetzer.com/

America's sixth largest premium wine producer is located in Hopland, California. Fetzer has reduced its garbage by 93 percent in the last seven years. Its goal is to achieve zero waste by 2009. The winery recycles paper and cardboard, cans, glassware, metals, antifreeze, pallets - even its wine barrels. They compost 12 cubic yards of corks and 10,000 tons of grape seeds each year. Landscaping is based on zeriscape practices. Contact: Patrick Healy, Environmental Coordinator: patrick_healy@b-f.com

Mad River Brewery www.madriverbrewing.com/

Mad River Brewery in Blue Lake, CA currently diverts 98% of its garbage from landfills from its 15,000 square foot facility. They produce less than two 90-gallon cans of trash per week and saved over \$35,654 in 1998. They recycle scrap, metals, glass, and office paper. They compost spent grain & hops. Hops are also broadcast on pastures. Grain is also made into livestock & poultry feed. They rebuild and recycle pallets. Construction materials are reused & salvaged. They store reusables on-site. They take-back 6 pack containers. They reuse plastic mesh backs from grain shipped in by donating them to a composter to package compost and to Bolla to make into reusable shopping bags. Cellulose filter pads and staff food scraps are composted on site. PET & metal strapping is recycled. Shrink wrap is donated to Mt. People's Warehouse to recycle. Cardboard boxes are recycled. Bottles, 6 pack containers & cardboard are made of recycled material. Even part of everyone's job description is to reuse & recycle. Contact: Bob Ornelas, Box 767, Blue Lake, CA 95525, 707-269-0398, arcatacy@tidepool.com.

Pillsbury www.pillsbury.com/

The Eden Prairie, MN facility diverts over 96% of waste generated and the Chanhassen plant diverts over 94%. Pillsbury has adopted a Zero Waste goal. Overall, Pillsbury's manufacturing facilities recycled or reused 83% of all manufacturing waste in fiscal 1999, including enough paper and cardboard to save 200,000 trees, almost 82 million gallons of water, and more than 48 million kWh of electricity. Pillsbury increased recycled content of its folding cartons for dry mixes to approximately 50%. Pillsbury's distribution centers now use rented or recycled shipping pallets for the majority of its products. Pillsbury has adopted a principle in their Environmental Affairs program to eliminate potentially harmful discharges and emissions into the air, onto land, and into water. Pillsbury strives to improve their waste efficiency by 10% each year. They estimate that they save over \$500,000 per year through these efforts. Contact: Dottie Shay, Environmental Health & Safety Manager, 612-474-7444x7576, Dshay@Pillsbury.Com, www.pillsbury.com/about/successstories.asp#waste

Electronics

Apple Computer www.apple.com/

According to the 2000 California Integrated Waste Management Board Awards news release, the Elk Grove manufacturing plant recycled 91%, or nearly 6,000 tons of waste, in fiscal year 1999. The plant achieved this result by forming a core team of employee volunteers to promote recycling and discover waste reduction solutions. Among the materials they have been able to capture are paper, glass, cardboard, wood pallets and polystyrene. The Elk Grove facility is a six-time Waste Reduction Awards Program (WRAP) award winner and continues to search for recycling and waste reduction opportunities to increase their recycling rate. For more information contact Tamara Weil-Hearon, Public Relations, tamarawh@apple.com.

Epson, Inc. www.epson.com/

Hillsboro, OR - This is the sole U.S. manufacturing affiliate of Japan's Seiko Epson Corporation. There are 2 major buildings, with 1,100 employees in 392,000 square feet of space on 38 acres of land. This facility manufactures inkjet printers, including the printer assemblies, circuit board assemblies, plastic injection molding, manufacturing of ink cartridges and warehousing. The facility achieved zero solid waste to landfill in March, 2000.

Epson reuses or recycles 90% of their materials, then disposes of the rest of their waste in a waste-to-energy (WTE) facility. In FY2000, they also decreased the overall amount of materials wasted by 36%. They recycle the following materials at their facility: ABS plastic; Alcohol/Flux waste from manufacturing; Aluminum Cans; Batteries; Blood borne Pathogen waste; Cardboard OCC; CDs; Circuit board scrap; Computer scrap; Dry Garbage; GPPS (black trays from printer assembly); HIPS (black, random and mixed polystyrene); Ink cartridges and toner; Ink sludge from ink treatment; Ink treatment resin filters; Laminated copper; Lamps & Ballast; Magazines (manuals); Manufacturing equipment; Metal - (steel, tin); Metal Special (copper, brass, etc.); Mixed paper (desk side recycling); Office furniture; Packing material (peanuts); PBT regrind (plastic's black

regrind); Pins on tape; Plastic bags, film, and wraps; Polycarbonate (heat proof trays); Polycarbonate (multi color parts); Polypropylene (battery trays, 118 white trays); Polypropylene (ink cartridges); Polystyrene foam #6; Polystyrene trays; Printer cords and cables; Pure water resin filters; PVC plastic trays, Mpa tape, IC tubes; Solder dross ; Solder scrap; Sorted white ledger (print test paper); Used oil and grease from kitchen; Used oil from compressors and mold machines; Used printers / computer / electrical equipment; Wet Garbage; Wood (pallets, scrap) Yard debris Plastic film.

Epson established goals to accomplish by 2004 as Zero hazardous waste & VOC's 100% of purchases "environmentally green" Manufacture products with recovered or recycled content, All packaging > 50% post-consumer content, Publication/ Promotion of Environmental Aspects, Green Purchasing Program: Surveying suppliers for chemical use & EMS status; An EMS will eventually be required to remain our supplier. For more information, contact: George W. Lundberg, Environmental & Safety Engineer, (503) 617-5607, george.lundberg@epi.epson.com.

Hewlett-Packard www.hp.com/

Hewlett-Packard in Roseville, CA (9,000 employees) is diverting 92-95% of its solid waste; saving almost a million dollars a year in avoided waste disposal costs (\$870,564 in 1998). HP recycles cardboard, metal, foam, plastic peanuts, low density polyethylene plastics (LDPE), Instapak, polystyrene plastics, and reuses and recycles pallets. Contact: Bill Coffee, Somers Building Maintenance (HP contractor), 916-785-7595.

Manufacturing

NUMMI www.nummi.com/

Fremont, CA – The New United Motor Manufacturing, Inc., a Toyota and General Motors manufacturing joint venture, employs 5,000 people and manufactures approximately 350,000 Toyota Corollas, Tacomas and Pontiac Vibes each year. Stewart Rupp, Manager of Environmental Affairs, says the facility's long focus on lean manufacturing has borne a number of successful waste reduction and recycling programs. NUMMI's largest source reduction effort was to encourage their parts suppliers to switch from cardboard to reusable shipping containers. The reusable containers are made of collapsible and recyclable plastic and are "reverse-shipped" to the various suppliers of the 1,500 automobile parts used in the manufacturing process. NUMMI estimates that they save \$20 million dollars per year with this reuse program alone.

In addition, the automobile manufacturing plant separates various materials for recycling, including scrap metal, cardboard and pallets. The plastic parts manufacturing plant, which produces bumpers and other components, recycles all plastic scrap through a local recycler. The facility also has an office recycling program in which employees have only a very small plastic bag for their trash and a larger, rigid recycling bin for their mixed paper. The company has found that this encourages recycling and is considering eliminating the trash bags all together. Employees would then take their trash to centrally located trash containers. To ensure that as many resources are captured as possible, all of NUMMI's trash passes through a small materials recovery facility ("mini-MRF") that

recovers metals, wood, cardboard and plastic film. The remaining trash primarily consists of difficult to recycle plastics, cafeteria waste, composites and other difficult to recycle items.

Finally, NUMMI sends the sludge generated from their on-site water treatment plant to Nevada for use by a cement plant. The facility also cut their hazardous chemical usage by 50% by reducing the tube diameter and length of paint and other chemical lines. This results in the reduction of hazardous waste when the various lines are cleaned. Hazardous solvents are recycled by and repurchased from Romac Chemical, a local hazardous waste recycling facility, at a two to three-fold cost savings to the company. NUMMI is also looking at biodegradable plastics for cafeteria use. NUMMI is a repeat CA Waste Reduction Awards Program (WRAP) awards winner. For more information contact Stewart Rupp, Manager of Environmental Affairs, srupp@nummi.com.

Regale www.regale.com.

Napa, CA – Regale is an innovative packaging company creating recyclable, molded fiber packaging solutions that can replace plastic bubble wrap, Styrofoam, traditional six-pack beverage carriers and other difficult to recycle packaging. They use a unique mold making process that is remarkably cheaper and faster to produce than traditional molds, removing a barrier to entry for new packaging designs. All of Regale's packaging is manufactured using locally discarded, 100% post-consumer mixed paper and corrugated cardboard. Their manufacturing process is virtually a closed system that has no negative effects on the local sewage system, with the only effluents being pulp and water. The only landfilled byproducts generated from the manufacturing process are contaminants screened from the post-consumer paper such as staples, tape, and the like. The contaminants are equivalent to 1% of the waste paper received from the local transfer station.

The company employs 15 people, has been in the research, development and patenting phase for the past 7 years and has registered twenty-one U.S. patents. It began producing product in May 2002 and lists Libby Glass, Shalom Wine Group, Nike and Nestles among their clients. The company plans to initiate full-scale operations in November 2002. Contact: Greg Gale, President, 2545 Napa Valley Corporate Drive, Napa, CA 94558. Telephone: 707-252-7420, Fax: 707-252-4818, info@regale.com,

Collins & Aikman www.collinsaikman.com/

Collins & Aikman, Dalton, GA – Sent zero manufacturing waste to landfill in 1998. Implemented waste minimization programs and energy efficiency programs that over the past four years (1998) have allowed them to increase production 300%, lower all corporate waste 80% and use no more energy than what they did four years ago. (ref. Phil Bailey, 9/11/98, personal communication). Contact: Dobbin Callahan, 800-241-4902x2309, mresearch@aol.com

Interface, Inc. www.interfaceinc.com

\$1 billion carpet sales in 1996. In 1999, 4 of 16 manufacturing facilities diverted more than 90% of their waste from landfills. Several others are in the 80% range. Since 1994, Interface has eliminated more than \$90 million in waste.

Interface has pioneered, among other things, the ‘Evergreen Lease,’ giving the company and its customers economic incentives to take back old carpets and recycle them, while assuring customers of clean, attractive carpets. Interface is reexamining its sources of waste and creating ways to reduce and finally eliminate them. It’s redesigning and rethinking products so that it can deliver more with less. It’s reengineering production processes to reduce resource consumption. If part of a process or product doesn't add value, it eliminates it. And that philosophy goes beyond manufacturing. Its aim is zero waste in every discipline, from accounting to sales to human resources.

Interface also recently introduced its biodegradable carpet tile, the first of its kind that replaces petroleum-based nylon with fiber from corn. Interface has a ReEntry program, that will reclaim existing carpet tile or broadloom and either recycle, downcycle, or repurpose it. Interface guarantees that old carpet they collect (theirs or competitors) won't end up in a landfill. Contact: Buddy Hay, Buddy.Hay@interfaceinc.com or Reva Revis, 312-961-9067, Reva.Revis@interfaceinc.com

Xerox Corp www.xerox.com

Rochester, NY – Since the early 1990s, Xerox adopted Waste-Free Factory environmental performance goals. The Waste-Free Factory criteria include significant reductions in waste, emissions, and energy consumption, and increased recycling. In 1998, worldwide non-hazardous solid waste recycling rates reached 88% and savings amounted to \$45 million.

In 1998, Xerox set environmental requirements for its suppliers worldwide, to design products that are durable and reusable, in factories that make dramatic reductions in air, water, and solid waste. Xerox is asking all of their facilities and suppliers to achieve a 90% reduction in all emissions from a 1990 baseline. In 1999, a revision of the Waste-Free Factory criteria will increase focus on reducing waste generation.

Contact: Anne Slocum, Anne.Slocum@usa.xerox.com or Jack Azar, Jack.Azar@wb.xerox.com, 716-422-9266.

Building and Development

Playa Vista Project, Los Angeles, CA – The Playa Vista Project is a major development of a new community on a former Howard Hughes aircraft plant site, north of Los Angeles airport. The Playa Vista master developers are currently developing 3,000 homes and a new entertainment, media and technology center on 1,086 acres. They renovated and reused half of the 22 major structures on-site (11 historic buildings) and demolished the remaining 1.2 million square feet. Playa Vista worked with the City of Los Angeles to incorporate the City’s model recycling specifications into the decommissioning contract specifications, partly in response to a City EIR mitigation measure requiring the Project to meet all the City’s recycling goals (the City of LA has a goal to recycle 70% of all wastes in the City by 2020). Those specifications required the decommissioning contractor to prepare a Solid Resources Management Plan, deposit concrete and asphalt on site, grind wood and green waste on site, and separate materials for offsite recycling.

Thanks to this careful planning, 84,035 tons of recyclables were recovered, fully 92% of all materials generated from demolition on site, including: scrap metals, wood, drywall. Ceramics, glass, corrugated cardboard, concrete and asphalt. Materials crushed on-site saved thousands of truck trips (and related air pollution) and saved \$2 million for the Project. The Project used both source-separated bins in some locations, and commingled recycling bins in other locations, depending on the materials involved and nature of activities underway. Careful attention was paid to on-site builder education programs and coordination with builders on the location and frequency of service required for all bins. The project also diverted 92% of all construction debris during the first phase of construction activities of 1,600 residential units and 425,000 SF of offices. For more information, contact Catherine Tyrrell, Environmental Affairs Director, Playa Vista, 12555 West Jefferson Boulevard, Suite 300, Los Angeles, CA 90066, 310-822-0074, CTyrrell@PlayaVista.com

Miscellaneous

San Diego Wild Animal Park www.sandiegozoo.org/

San Diego Wild Animal Park, San Diego, California, works to preserve endangered plants and animals and their habitats. The park reduces use of natural resources derived from wild areas such as trees, mined ore and water. Staff practices wise use of office supplies, recycling containers and paper products, and compost huge amounts of organic wastes. Park visitors are encouraged to use recycling containers located throughout the facility. Waste disposed at landfills represents only 4% of the Park's waste stream and saves over \$1 million annually in tipping and hauling fees. Source: Target Zero Canada at <http://www.targetzerocanada.org/>.

Yost Printer & Lithographers, Monrovia, CA – Yost printers was founded in 1932 and has always minimized waste. Darrell Yost, the company's owner, says reuse and recycling is a printing business tradition that saves money. As a result, the company recycles all of its paper scraps, trimmings, and printing spoilage; separates its newspaper, bottles and cans for donation to a local church; and donates 8 _ x 11 sized trimming scrap to churches, schools, and non-profits. Packing cartons from vendors are reused in-house and the company encourages their repeat customers to return their cartons for reuse. The company also reuses craft paper packaging from received shipments to cushion their own product during packing. Pallets are either returned to paper suppliers or reused in house. Aluminum printing plates are also recycled. The only items left in the trash are odds and ends like used packing tape, window envelopes, convenience store cups and other difficult-to-recycle items. Yost Printers has been a repeat recipient of the California Waste Reduction Awards Program (WRAP) awards. In September 2002, the company will merge with The Processors, another progressive printing shop, where Darrell says the reuse and recycling tradition will continue. For more information contact: Darrell Yost, 132 East Lemon Avenue, Monrovia, CA 91017. Telephone: 626-359-5325.

Recycling

Battery Council International www.batteryCouncil.org

Battery Council International (BCI) reported in the June 19, 2000 edition of Waste News that the average annual recycling rate for the lead in lead-acid batteries is now 94.6 percent. The lead-acid battery industry has been recycling its products for more than 70 years, and today operates an infrastructure of retailers and service providers that collect spent batteries from customers. The same trucks that deliver new batteries pick up the spent batteries for delivery to secondary lead smelters. Consumer, commercial and industrial users turn in spent batteries for recycling when they buy new batteries. The lead and plastic from spent batteries is used to produce new batteries. The recovered sulfuric acid electrolyte also can be used as new product, or neutralized. BCI is a nonprofit association that conducts education campaigns. BCI has drafted model recycling laws that have been adopted by 37 states, which prohibit disposal and require retail collection of spent batteries. Contact: Ronald Pogue, BCI, 401 North Michigan Avenue, Chicago, Illinois 60611, 312-644-6610, Fax: 312/321-6869, info@batteryCouncil.org.

Zanker Road Landfill www.z-best.com/ZMPF/

San Jose, CA – Zanker has had an overall diversion rate of more than 90% for the past five years. Zanker owns and operates three major recycling and composting facilities in the San Jose area. Currently up to 2,000 tons per day is received at the Zanker Road Landfill facilities, of all types of materials. Zanker currently processes and markets yard waste and compost, wood waste, cardboard, gypsum, concrete, clean and mixed demolition debris, metal and bulky items. The material produced from the C&D processing is sold mostly to construction and paving contractors as Class II aggregate and engineered fill. Wood is sold as biomass fuel and soil amendments. Metals are separated and sold by categories of tin, #2 unprepared steel, copper, brass and aluminum. Zanker markets its finished organics products to over 170 customers and has more demand for its products than it produces.