Climate Change

CASE STUDIES

Preserving Resources, Preventing Waste

PSEG—Devoting Energy to Waste Reduction

PSEG
We make things work for you.

Power producers face greater challenges than ever before—businesses and consumers require more electricity each year, yet still demand that power be delivered efficiently and economically. Public Service Enterprise Group (PSEG), the fourth-largest independent power producer in North America, not only meets these energy demands but does so with a focus on environmental sustainability.

> "Scientific evidence has progressed to the point where prudent action on reducing greenhouse gases is warranted."
>
> —Statement of Frank Cassidy, President & COO of PSEG Power, before US Senate Committee on Commerce, Science & Technology

Carbon dioxide (CO_2), sulfur dioxide (SO_2), and nitrogen oxides (NO_x) are all byproducts of solid waste disposal. They also constitute greenhouse gases (GHGs), the main contributors to climate change. Committed to reducing its impact on climate change, PSEG is equally focused on waste prevention, waste reduction, and recycling since waste generation and treatment are contributors to GHG production. In 1993, PSEG set an ambitious goal that confirmed its dedication—by the year 2000, the organization would produce no more CO_2 per year than it did in 1990. PSEG reached its 2000 goal while generating almost 2 million more megawatt hours than in 1990.

But PSEG's commitment does not end with capping CO_2 emissions. In January 2002, PSEG signed a voluntary agreement with the New Jersey Department of Environmental Protection to reduce CO_2 emissions from its fossil-fuel power plants by an additional 15 percent. This new target will only be achieved through a coordinated effort to invest in new technology, end process inefficiencies, and conserve resources. To ensure that it reaches its goals, PSEG partnered with the U.S. Environmental Protection Agency's (EPA) WasteWise program, which provides information and support to PSEG's resource conservation program. PSEG also participates in Climate Leaders—another prominent EPA program—to strengthen its commitment to decreasing its impact on climate change.

PSEG has already achieved great success with its waste reduction programs. Since joining WasteWise as a charter partner in 1994, PSEG has reduced the disposal of municipal solid waste by nearly 500,000 tons and purchased more than $20 million of recycled-content products. Calculated by EPA's WAste Reduction Model, also known as WARM—a tool that allows organizations to calculate GHG emissions reductions from waste prevention and recycling activities—PSEG's waste reduction efforts reduced GHG emissions by 192,411 metric tons of carbon dioxide equivalent ($MTCO_2E$).

PSEG's Waste Prevention Activities—Stopping

PSEG's computer recovery program is an excellent example of an effective waste prevention initiative—it demonstrates PSEG's commitment to reducing solid waste and associated GHG emissions, thus reducing its environmental footprint.

In the information technology area, PSEG upgrades computer technology and replaces desktop computers on an as-needed basis, and large amounts of retired equipment accumulate. The computer recovery program maximizes the life of these retired computers, preventing unnecessary waste.

To begin the recovery process, PSEG facilities send old desktop computers to the organization's Resource Recovery Center for evaluation. There, technicians sort the equipment by type, visually inspect each piece, and evaluate the equipment for remaining useful life. They judge each type of equipment by specific criteria (e.g., processing speed, monitor size, or printer type) and immediately separate damaged or outdated equipment. Technicians then test the remaining equipment, erase usable computers' hard drives, and install new operating systems. PSEG sells refurbished equipment to employees and the general public or donates it to schools or charitable organizations for less intensive applications.

In the case of non-working equipment, PSEG technicians utilize a plug and pull approach for domestic demanufacturing—scavenging the working components from the equipment for use in repairing other computers. PSEG consolidates and ships all equipment identified for demanufacturing and recycling to a facility that shreds and recovers the constituent materials for use in other products. As part of this process, the facility reclaims precious metals, such as gold and silver, hazardous materials, such as lead and cadmium, as well as plastics and glass.

The results of this program are substantial. In 2002, PSEG extended the working life of 39 percent (by weight) of the equipment collected while saving money and supporting charitable organizations. Since 1997, PSEG has removed 370 tons of computer equipment from the waste stream.

PSEG's computer recovery program represents one of the company's many waste prevention initiatives. The following highlights describe other successful efforts.

Amount of Waste Prevented Due To The Computer Recovery Program (tons)

Activity	1997	1998	1999	2000	2001	2002
Redeployment	2.1	0.6	0.0	0.2	0.9	1.4
Donation	19.1	30.7	25.3	12.7	26.4	16.9
Sales	27.0	15.4	34.6	6.4	0.6	1.1
Demanufacturing	0.0	23.8	26.5	30.4	39.0	30.7
Total	48.2	70.5	86.4	49.7	66.9	50.1

- **Lighting Residuals Management Program.** Before PSEG's initiation of the Lighting Residuals Management Program, the company removed in bulk or recycled all high-density discharge (HID) lamps collected during group lamp replacement, regardless of whether the lamps had failed in service or were working. Now, in order to prevent premature lamp recycling of working lamps inadvertently removed from service in the field, or thought to have failed in the field, technicians collect and test lamps for opportunities to determine their remaining life and reuse, or in the case of failed lamps, to determine if warranty issues apply. In the case of failed lamps, PSEG returns the lamps for credit under manufacturer's warranty. In 2002, PSEG redeployed nearly 200 pounds of HID lamps, returned almost 380 pounds under manufacturer's warranty, and sold more than 50 pounds.
- **Chemical Commodity Strategic Sourcing Initiative.** In 2002, PSEG launched a pilot project to reduce waste by eliminating duplicative chemical procurement and encouraging substitution of hazardous chemicals with less hazardous alternatives. PSEG now coordinates the procurement of identical chemicals for various purposes and consolidates orders, ensuring the purchase of limited surpluses and avoiding unnecessary waste generation.

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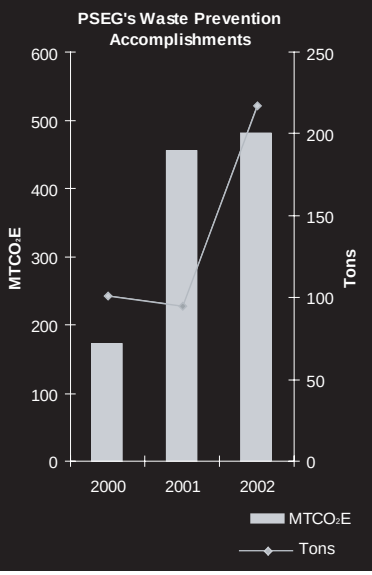
Waste Before It Starts

- **Resource Recovery Center.** PSEG's Resource Recovery Center seeks out and develops pollution prevention and waste reduction opportunities. In 2002, the Resource Recovery Center sold nearly 139,000 tons of coal combustion products for reuse as brownfield site remediation backfill, coal surface mine reclamation fill, dredge material for landfill closure capping, roadway ice and snow anti-skid product, and building material.

Based on WARM calculations, PSEG's waste prevention efforts can claim a 480 $MTCO_2E$* reduction in GHG emissions in 2002 alone. Such accomplishments are equivalent to the annual carbon storage of nearly 4 acres of established, rapidly growing trees or the annual emissions from power consumption of more than 60 households.

* 3.67 $MTCO_2E$ = 1 MTCE
MTCE = Metric Ton of Carbon Equivalent
$MTCO_2E$ = Metric Ton of Carbon Dioxide Equivalent



PSEG's Recycling Program—Making Goals, Meeting Goals

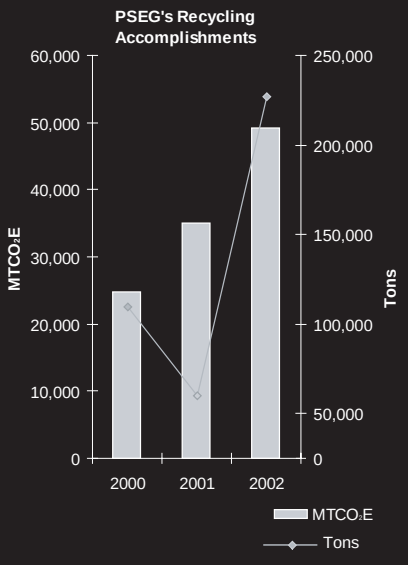
2002 marked the seventh year in a row that PSEG met its goal to recycle 90 percent of all non-hazardous waste commodities. Having achieved that goal, the organization set forth a new goal. PSEG now pledges to maintain a 94 percent recycling rate while preserving established markets for its industrial products.

PSEG exceeded its 94 percent recycling rate target in three of the last four years. In 2002, PSEG removed more than 200,000 tons of non-hazardous solid and universal waste from the waste stream, achieving a 96 percent recycling rate. Expansion of its recycling program to include non-routine construction materials such as treated wood from utility poles, landscape debris from power transmission right-of-way clearings, vehicle parts, washing liquids from vehicle maintenance programs, and street lamps from upgrade programs, accounted for PSEG's remarkable success. The company also recycled additional waste commodities generated from industry-specific processes such as manhole and underground vault cleanings, boiler cleanings, spill cleanups, and coal combustion.

Year	Recycling Rate
1996	92%
1997	92.7%
1998	93.1%
1999	94.4%
2000	94.1%
2001	92.8%
2002	96.4%

According to WasteWise's WARM calculations, PSEG's recycling efforts account for GHG emissions reductions of nearly 50,000 $MTCO_2E$. These reductions—based on recycling more than 400 million pounds of waste—are equivalent to the annual carbon stored by more than 400 acres of established, rapidly growing trees or the annual emissions from power consumption of nearly 64,300 households.

* 3.67 $MTCO_2E$ = 1 MTCE
MTCE = Metric Ton of Carbon Equivalent
$MTCO_2E$ = Metric Ton of Carbon Dioxide Equivalent



PSEG's Buy Recycled Program—Saving Money and The Environment

In 2002, PSEG spent more than $3 million on office products and furniture containing recycled-content materials. Purchasing recycled-content products eliminates the waste and energy consumption associated with virgin material production and eliminates premature disposal of resources that would otherwise be sent to landfills.

PSEG's toner cartridge recycling initiative contributes to its buy recycled program on two fronts. The organization sends empty toner cartridges back to the vendor, which either refills the cartridges for resale or recycles them into new cartridges. To close the loop, PSEG purchases the refilled or refurbished cartridges. By continually sending toner cartridges back to the vendor for refurbishment and purchasing pre-used cartridges in return, PSEG minimizes the environmental impact of this product. The venture has proven quite lucrative as well—throughout the past 5 years, PSEG's toner cartridge program has saved the company nearly $400,000.

In 1998, PSEG established a goal to increase the number of suppliers required to provide reports detailing the sale of recycled-content products to the company. Prior to 1998, only one organization provided the information necessary to promote and document this area of PSEG's waste reduction efforts. In 2002, PSEG succeeded in obtaining recycled-content product reporting information from seven suppliers.

EPA is developing the Manufacturing and Purchasing Greenhouse Gas (MAP_GHG) Tool to assist organizations in estimating GHG emissions reductions related to the manufacture and purchase of recycled-content products. MAP_GHG will provide organization managers with the information they need to make educated decisions about recycled-content materials.

PSEG & WasteWise—Making Strides Together

EPA and PSEG are not only partners, they complement each other's waste reduction efforts. As a member of WasteWise's Hall of Fame—a select group of member organizations that have continually excelled with their waste reduction efforts, supported WasteWise initiatives, and served as role models—PSEG will work with EPA to increase the awareness of the program and the value of reducing waste through prevention, recycling, and procurement. EPA helps PSEG lead the way toward environmentally responsible energy production. The WasteWise program not only quantifies PSEG's success—it contributes to it.

- WasteWise calculations show that PSEG reduced GHG emissions by nearly 49,700 $MTCO_2E$ in 2002. This reduction would be equivalent to removing nearly 10,350 cars from the road for one year.
- PSEG uses the data it calculates in its WasteWise annual report to internally assess its environmental efforts. By analyzing WasteWise information, PSEG evaluates the effectiveness of its GHG emissions reductions efforts and conceives ways to improve them.
- PSEG utilizes WasteWise information to promote its environmental programs externally via its Web site, public forums, and stakeholder dialogues. PSEG has found that WasteWise's GHG emissions reductions data are easily understandable and meaningful to the general public—making the data invaluable for use in marketing materials and other informational publications.
- PSEG also uses its annual report data to identify cost savings due to waste reduction. By using WasteWise data, PSEG realized savings of $278,000 by avoiding disposal costs for recycled paints, resins, batteries, and computer cartridges. PSEG also earned $1.4 million from the sale of recycled materials.

WasteWise helps PSEG make the link between waste reduction and climate change mitigation, allowing the organization to significantly reduce its environmental footprint. If you would like to learn more about the processes PSEG uses to reduce its environmental footprint or how WasteWise can assist your organization, please contact the WasteWise Helpline at (800) EPA-WISE.

Resources

PSEG Web Site
<www.pseg.com/environment>

WasteWise Web Site
<www.epa.gov/wastewise>

Climate Leaders Web Site
<www.epa.gov/climateleaders>