Regional Solid Waste System

Sustainable Operations

2008 - 2009 Work Plan

Greenhouse gas and particulate air emissions

Resource conservation and pollution prevention

Procurement and construction

Work life and community health and safety

Metro | www.oregonmetro.gov

Contents

Getting Started

What is this work plan?

Concerns about global climate change and resources for future generations have led to a growing awareness of sustainability and an emphasis on sustainable practices at home and work. This plan is intended to further the implementation of sustainable practices in the region's solid waste system. Its target audience: public and private sector solid waste service providers. Its contents: 13 opportunities for implementing sustainable practices in operational and administrative settings.

Where did the work plan come from?

Two groups convened by Metro developed this guidance. The first group created sustainable operations goals for the Regional Solid Waste Management Plan (see Appendix A). Based on that general direction, a second group developed the work plan itself. Solid waste service providers and regulators participated in both groups.

How will it work?

Implementation of the opportunities in this work plan relies on the motivation and voluntary actions of the target audience: haulers and disposal transporters, as well as processing, transfer and disposal facility owners in the regional solid waste system.

Participants will use the work plan to identify: (a) opportunities they have already implemented; (b) priorities for implementation in 2008/09; and c) data collection needs for measuring results. Priorities may differ among companies and agencies using the work plan.

Metro will coordinate with all users of this work plan to:

- identify previously implemented and newly chosen opportunities
- collect measurement data for annual progress reports
- recognize achievements.

How can I find out more?

The implementation of this work plan will be coordinated by Metro, in cooperation with the region's solid waste service providers and regulators. Implementation details and information on sustainable practices generally will be provided through networking meetings that Metro will convene on a regular basis. Companies and public agencies can share information regarding successes, struggles and best management practices -- potentially saving time and money by not having to reinvent the wheel!

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Implement energy reduction and efficiency programs

Overview

Approximately 30 to 40 percent of all electrical energy supplied to the Metro region comes from coal-fired power plants. These coal-fired plants are a significant source of pollution and greenhouse gas emissions. By implementing a comprehensive energy reduction program for administrative and operational activities, dependence on coal, natural gas and other nonrenewable energy sources can be reduced.

Implementation

Power providers such as PGE and Pacific Power work in cooperation with the Energy Trust of Oregon in providing free energy audit and reduction assessments to commercial and residential customers. After receiving an audit, the best plans for energy reduction and conservation can be determined and implemented. Numerous program options are available to reduce energy use (www.energytrust.org).

Operational and maintenance energy reduction opportunities include:

- variable frequency drive on industrial motors
- energy-efficient lighting
- timing systems to ensure that certain areas are not illuminated during daytime hours.

Administrative services will reduce energy by:

- turning off lights
- turning off computers overnight
- replacing high energy use incandescent bulbs with energy-efficient compact fluorescent bulbs or LED lighting systems
- replacing aging, inefficient appliances and tank water heaters with energy-efficient appliances and tankless water heaters.

Measurement

A history of the previous two years of energy usage will be used as a baseline. Over time, energy usage will be measured and comparisons made between the baseline and ongoing energy use. (See Appendix B for energy reduction and efficiency programs.)

Install renewable onsite power generation

Overview

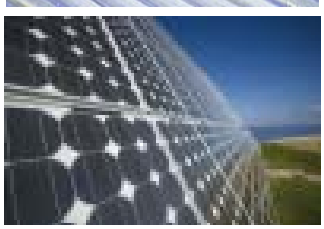
Examples of onsite generation in the solid waste industry include solar, wind and biomass/biogas power generation. Because not all sites are ideal for onsite energy generation, an evaluation should be conducted to provide a step-by-step process to thoroughly address a site's energy generation potential.

Implementation

Onsite energy generation evaluations and assessments can be obtained by contacting the Energy Trust of Oregon. In addition to giving technical advice, the Energy Trust has incentive programs for qualified companies. Several options may be available for significantly reducing or eliminating the first cost of installing onsite generation technologies. It is important to contact the Energy Trust during the early planning phases of a project to take full advantage of available cost-saving strategies and incentives.

Measurement

A two-year historical energy usage baseline should be obtained from the local power provider. Upon installation of the onsite energy generation system, comparisons between current power usage and historical power usage will be established. In addition, if energy is sold back to the power provider, the amount of energy sold back will be recorded. (See Appendix B for additional onsite power generation information resources.)



Implement programs to purchase power from renewable resources

Overview

Nonrenewable energy sources supply over 50 percent of the Metro region's electrical energy needs. Participating in renewable energy purchasing options will not only increase the development of renewable energy in the state, but will also reduce CO_2-equivalent emissions.

Implementation

Investigate options and purchase renewable energy through local power providers.

Measurement

Renewable power should be recorded over quarterly periods; CO_2 offsets can be determined based on that usage. (See Appendix B for renewable power purchasing resources.)

Install diesel particulate matter filters on diesel transportation and processing vehicles where feasible

Overview

The health and environmental effects of emissions from combustion engines (diesel emissions in particular) have been the subjects of extensive research worldwide. A growing consensus among health experts is that diesel exhaust is a likely carcinogen to humans at sufficiently high exposure levels. The pollutants of greatest concern are:

- particulate matter (PM)
- toxic compounds
- nitrogen oxides (NOx).

These experts have also concluded that older diesel engines pose the greatest health risks, emitting PM and NOx levels that are up to 80 percent higher than emissions from diesel engines being sold today.

Implementation

Using the existing Metro diesel retrofit program database, identify all relevant vehicles. For equipment and vehicles not covered by the retrofit database, use year of manufacture and manufacturer's data to establish applicability:

1. determine best available technologies for mitigating PM and other emissions
2. explore funding mechanisms for the retrofit.

Measurement

Diesel particulate reduction will be determined using data on particulate filter installation. (See Appendix B for diesel particulate matter filter and retrofit resources.)

Implement engine idling reduction policies

Overview

As a rough rule of thumb, a modern diesel engine typically consumes about one gallon per hour while idling at 1,000 RPM. Reducing idling time for both diesel and gasoline engines has numerous benefits, including:

- reduced emissions
- reduced fuel consumption
- extended engine life
- no vibration and less noise
- longer oil change intervals.

Implementation

Idle reduction can be accomplished by:

- establishing an idle reduction policy to change vehicle and equipment operation behavior
- using idle reduction technologies.

A variety of technology approaches are available to reduce idling emissions. Those with greatest potential for use in refuse/ recycling truck operations include automatic engine shutdown/ startup, and direct-fired heaters (for winter operation).

Measurement

The success of engine idling reduction policies will be reported in cost savings from fuel conservation and reduced engine wear. (See Appendix B for engine idling reduction resources.)

Implement water-saving programs; install necessary equipment upgrades

Overview

Business, industry and government (BIG) customers are the largest users of water services. In Portland, BIG customers use about 9.4 billion gallons of water per year, or about 44 percent of the water used by retail customers. Due to specific industrial needs, these customers have the opportunity to take advantage of specific conservation programs such as free water usage audits tailor-made for their water use habits.

Implementation

Schedule water audit, identify all potential conservation actions, savings and costs. Select and implement cost-effective recommendations. Monitor and manage onsite water conservation programs.

Operations and maintenance services will realize water savings by:

- capturing onsite stormwater for irrigation use
- using a closed-loop wash-down system
- sweeping property instead of using water to wash down asphalt and concrete areas
- using xeriscaping principles in property and landscape management.

Administrative services will realize water savings by:

- installing low-flow toilets, faucet aerators and efficient showerheads
- installing water conservation signage in restrooms and kitchen areas
- installing tankless water heaters
- landscaping using xeriscape landscape design to incorporate rainwater harvesting, drought-resistant species and limited lawn areas.

Measurement

Compare historical flow amounts with flow amounts after water conservation measures have been implemented. Record these and note any changes to water usage habits over periods of time.

Implement stormwater mitigation practices

Overview

Stormwater mitigation practices support both environmental protection and water conservation efforts. Stormwater runoff from onsite structures can be diverted or harvested rather than burden municipal wastewater treatment systems. Stormwater can be diverted for natural filtration and recharge of groundwater systems. Harvesting of this stormwater can provide onsite uses that will lessen dependency on potable water for irrigation and wash down purposes.

Implementation

Design and develop stormwater mitigation systems that take full advantage of site characteristics. These could include bioswale installation, eco-roofs, dry wells, water harvesting systems, porous concrete/asphalt applications and closed-loop irrigation systems.

Measurement

Stormwater mitigation results should be identifiable through changes in sewage discharge rates and potable water usage measurements. (See Appendix B for stormwater mitigation resources.)

Phase out toxic materials

Overview

Exposure to small doses of toxic chemicals can accumulate over time and potentially affect human health. Avoiding sources of toxic substances may allow a longer, healthier life.

Unfortunately, many people live and work in unhealthy environments. It has been estimated that most Americans spend up to 90 percent of their time indoors, often in highly synthetic environments that may compromise their health.

Implementation

Complete an inventory of toxic materials used in operational and administrative activities. After completion of the inventory, determine potential nontoxic substitutes for your toxic materials. Develop company and agency wide policies for the phase out and reduction of toxic materials.

Measurement

Complete an inventory, introduce policies for the phase out of toxic materials and produce a record of toxic materials eliminated and the nontoxic alternatives that have replaced them. (See Appendix B for nontoxic alternative resources.)

Develop sustainability guidelines and checklists for purchasing

Overview

With millions of purchasing dollars expended by companies and agencies throughout the regional solid waste community, great opportunities exist to address social and environmental concerns through procurement practices. Many local governments already have successful sustainable purchasing and procurement policies in place.

Implementation

Adopt sustainable procurement programs. The joint City of Portland/ Multnomah County program is a successful comprehensive program that can be used as a model.

Many options for sustainable procurement and contracting are available for the private and public sectors. Sustainable procurement strategies and plans, specialized contractor lists and local vending companies that specialize in environmentally friendly and sustainable materials and services are available through various internet and local government resources.

Examples of sustainable products for use in operation and maintenance services include biobased fuels and oils, low-VOC and low-toxic paints and solvents and reusable protective wear laundered by an eco-friendly laundry company.

Examples of sustainable products for administrative use include 100 percent recycled-content paper, earth-friendly cleaning products, earth-friendly electronics and energy-saving appliances.

Measurement

Use baseline data from the past two years of procurement practices and measure changes in purchasing and contracting behavior, highlighting sustainable products and services. If a procurement database is in place, use information on new sustainable purchases and new sustainable vendors to report successes. (See Appendix B for sustainable procurement resources.)

Support local vendors and contractors who employ sustainability practices

Overview

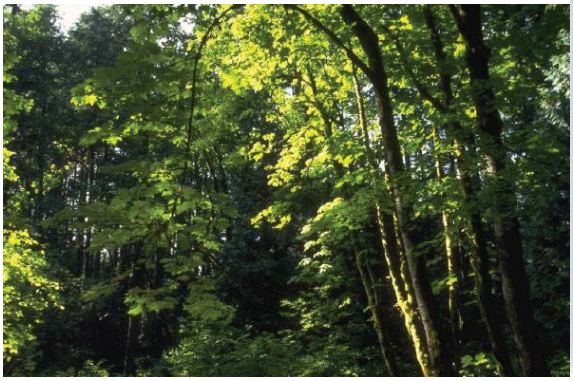
The Portland metropolitan area is rich with vendors and contractors that walk their talk in employing sustainable practices. From office supplies to sustainable construction, almost any service or product a company desires may be purchased from a local company engaged in sustainability efforts.

Implementation

Implement procurement and purchasing policies to "buy local and sustainable." Use existing networks such as the Sustainable Business Network to locate sustainable vendors and contractors in the Metro region. Set quarterly purchasing goals for businesses that engage in sustainable practices.

Measurement

Measurement will include dollars spent in the local sustainable business community. Review quarterly purchases to determine purchasing goals were met. (See Appendix B for local vendor and procurement resources.)



Build to LEED standards when constructing new facilities or conducting a major facility renovation/ expansion project

Overview

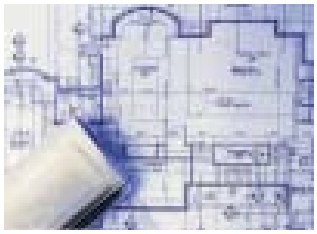
Green building is rapidly coming into greater use. There are several LEED-certified transfer stations and MRFs around the country. With so many resources and professionals providing support for green building standards, increasing opportunities exist to integrate green building practices in any new building or renovation project.

Implementation

Before constructing, expanding or renovating, seek out accredited or qualified professionals to incorporate green building and sustainable construction standards.

Measurement

Provide results of the project's green building attributes and specific certification if applicable. (See Appendix B for LEED and green building resources.)



Promote community service

Overview

A company or agency can promote community service in many ways. Organizing a blood drive or a food drive or volunteering to participate in a neighborhood cleanup program are but a few. Organized community service programs within a company or agency not only benefit others, but also can raise morale among the employees in the organization.

Implementation

Set community service goals for the organization. Sponsor a blood drive or charitable giving campaign. Coordinate a food donation drive during seasons when food bank supplies are at the lowest.

Measurement

Though one may not be able to measure all aspects of community service, measurements including dollars donated to charity, employee hours contributed, and pints of blood and pounds of food donated are easily obtained. (See Appendix B for community service resources.)

Implement zero tolerance policies for unsafe actions and behaviors

Overview

According to the National Solid Wastes Management Association, both injury and fatality accident rates among solid waste industry workers have decreased over the past two years. These decreases may be attributed to more comprehensive safety programs.

Implementation

Implement a zero tolerance company policy for unsafe actions and behaviors. Maintain safety-briefing meetings focusing on zero tolerance for unsafe actions, conditions, equipment, decisions and attitudes. Develop intra-company education campaigns to promote positive attitudes toward safety among staff and management.

Measurement

Compare historical accident statistics with statistics compiled after changes are made in safety education and/or implementation of new safety programs. (See Appendix B for safety program resources.)

Appendix A

Sustainable operations guidance in the Regional Solid Waste Management Plan

Definition

To guide a common understanding of "sustainable" and "sustainability," the following definition, consistent with the State of Oregon, will apply:

> "Sustainability" means using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives [ORS 184.421 (4)]."

Framework

The Natural Step's four system conditions are the framework for examining and developing opportunities to increase sustainability in the solid waste system.

> "The sustainable operation of the solid waste system considers economic, environmental and societal resources and is consistent with the Natural Step system conditions so that nature is not subject to systematically increasing:
>
> 1. Concentrations of substances from the Earth's crust;
> 2. Concentrations of substances produced by society, or
> 3. Degradation by physical means; and in that system
> 4. Human needs are met worldwide."

Priorities

The following goals and objectives are intended to guide the implementation of sustainable practices at public and private solid waste facilities and services over the next 10 years. This first sustainable operations work plan addresses seven of nine goal areas.

Goal 1.0 Reduce greenhouse gas and diesel particulate air emissions

Objective 1.1: Implement plans for greater energy efficiency.
Objective 1.2: Utilize renewable energy sources.
Objective 1.3: Reduce direct emissions of greenhouse gases from landfills and other facilities.
Objective 1.4: Reduce diesel particulate emissions in existing trucks, barges and rolling stock through best available control technology.
Objective 1.5: Implement long-haul transportation and collection alternatives where feasible.

Goal 2.0 Reduce stormwater runoff

Objective 2.1: Implement stormwater runoff mitigation plans.

Goal 3.0 Reduce natural resource use

Objective 3.1: Implement resource efficiency audit recommendations.
Objective 3.2: Implement sustainable purchasing policies.
Objective 3.3: Reduce disposed waste.

Goal 4.0 Reduce use and discharge of toxic materials

Objective 4.1: Implement toxics reduction and management plans.

Goal 5.0 Implement sustainability standards for facility construction and operation

Objective 5.1: Implement sustainability standards for site selection.
Objective 5.2: Require new construction to meet the Leadership in Energy and Environmental Design (LEED) or equivalent program standards.
Objective 5.3: Provide incentives for existing facilities to meet LEED or equivalent program standards.

Appendix A (cont.)

Goal 6.0 Adopt best practices for customer and employee health and safety

Objective 6.1: Reduce injuries by automating operations where effective.

Objective 6.2: Implement health and safety plans that meet or exceed current minimum legal standards.

Goal 7.0 Provide training and education on implementing sustainability practices

Objective 7.1: Train key regional waste industry employees, government waste reduction staff and political officials in adopted sustainability practices.

Objective 7.2: Inform suppliers, contractors and customers of the adoption of sustainability goals and practices.

Goal 8.0 Support a quality work life

Objective 8.1: Pay a living wage and benefits to all workers.

Objective 8.2: Promote community service.

Objective 8.3: Strive to employ a diverse work force.

Goal 9.0 Employ sustainability values in seeking vendors and contractors

Objective 9.1: Request sustainability plans from potential vendors and contractors.

Objective 9.2: Assist vendors and contractors in achieving sustainable practices.

Objective 9.3: Support local vendors when feasible.

From the 2008-2018 Regional Solid Waste Management Plan, Chapter V, Sustainable Operations

Appendix B

Resources

Implement energy reduction and efficiency programs

www.energytrust.org
www.eere.energy.gov
www.energystar.gov
www.bpa.gov
www.aceee.org/industry/index.htm

Install renewable onsite power generation

www.energytrust.org
www.oregon.gov/ENERGY/index.shtml
www.oregonseia.org
www.greenpoweroregon.com

Implement programs to purchase power from renewable resources

www.energytrust.org
www.rnp.org/greenpower/ORutilities.html
www.rnp.org/greenpower/cec_info.html
www.portlandgeneral.biz/RenewablePower

Install diesel particulate matter filters on diesel transportation and processing vehicles where feasible

www.westcoastdiesel.org
www.epa.gov/otaq/retrofit/index.htm
www.deq.state.or.us/aq/diesel
www.deq.state.or.us/aq/factsheets/03-AQ-007CleanDiesel.pdf

Implement engine idling reduction policies

www.westcoastdiesel.org/programs.htm
www.epa.gov/diesel/idle-ncdc.htm
www.eere.energy.gov/vehiclesandfuels/pdfs/idling_news/oct05_network_news.pdf

Implement water-saving programs; install necessary equipment upgrades

www.portlandonline.com/water
www.pprc.org/pubs/greencon/h2oener.cfm

Implement stormwater mitigation practices

www.stormwaterauthority.org/regulatory_data
www.oeconline.org/rivers/stormwater
www.epa.gov/ebtpages/watestormwater.html

Phase out toxic materials

www.oregontoxics.org
www.zerowaste.org
www.deq.state.or.us/pubs/general/AlternativeCleaning.pdf
www.ecocycle.org/hazwaste/recipes.cfm
www.turi.org

Develop sustainability guidelines and checklists for purchasing

www.newdream.org
www.sustainableoregon.net/toolkit/green_purchasing.cfm
www.sustainprocure.com/category/about

Support local vendors and contractors that employ sustainability practices

www.sbnportland.org/marketplace
www.thinklocalportland.org
www.oeconline.org/livinggreen/shopping/buylocal

Build to LEED or equivalent standards when constructing new facilities or conducting a major renovation/ expansion project

www.usgbc.org
www.nrdc.org/buildinggreen/leed.asp
www.gbci.org
www.gvrd.bc.ca

Appendix B (cont.)

Promote community service

www.handsonportland.org
www.earthshare-oregon.org/partners
www.solv.org
www.portlandimpact.org/volunteer.htm
www.redcross-pdx.org

Implement zero tolerance policies for unsafe actions and behaviors

www.orosha.org
www.lni.wa.gov
www.oregon.gov/BOLI
www.nswma.org
www.croetweb.com
www.wasteage.com/Waste_Safety
www.swana.org/www/default.aspx

Glossary

Baseline data - consist of basic information gathered before a program begins. It is used later to provide a comparison for assessing program impact.

CO_2-equivalent or carbon dioxide-equivalent - is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential. For example, the global warming potential for methane over 100 years is 21 to 1. This means that an emission of one million metric tons of methane is equivalent to an emission of 21 million metric tons of carbon dioxide.

Energy audit - an inspection, survey and analysis of energy flows in a building, process or system with the objective of understanding the energy dynamics of the system under study.

Greenhouse gases (GHG) - refer to carbon dioxide, nitrous oxide, methane, ozone and chlorofluorocarbons occurring naturally and resulting from human (production and consumption) activities, and contributing to the greenhouse effect (global warming).

LEED (Leadership in Energy and Environmental Design) - is an ecology-oriented building certification program run under the auspices of the U.S. Green Building Council (USGBC). LEED concentrates its efforts on improving performance across five key areas of environmental and human health: energy efficiency, indoor environmental quality, materials selection, sustainable site development and water savings.

Porous concrete - A concrete pavement that allows water to percolate through to the ground beneath the surface. By capturing stormwater and allowing it to seep into the ground, porous concrete is instrumental in recharging groundwater, reducing stormwater runoff and meeting U.S. Environmental Protection Agency (EPA) stormwater regulations.

Renewable resources - energy and materials that are either totally replaced through natural processes or are practically inexhaustible.

Renewable energy - effectively uses natural resources that may be naturally replinished such as sunlight, wind, water, tides and geothermal heat. Renewable energy technologies range from solar power, wind power and hydroelectricity/micro hydro to biomass and biofuels for transportation.

VOC (Volatile Organic Compounds) - are compounds that have a high vapor pressure and low water solubility. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, pharmaceuticals and refrigerants. VOCs typically are industrial solvents, such as trichloroethylene; fuel oxygenates, such as methyl tertiary butyl ether (MTBE) or by-products produced by chlorination in water treatment, such as chloroform. VOCs are often components of petroleum fuels, hydraulic fluids, paint thinners and dry cleaning agents. VOCs are common groundwater contaminants.

Xeriscape - landscaping designed specifically for areas that are susceptible to drought or for properties where water conservation is practiced. Derived from the Greek "xeros" meaning "dry," the term, xeriscape means literally "dry landscape."