Inflation Reduction Act

CPRG Tools and Technical Resources – Waste and Materials Management Sector

This webpage provides a list of tools and resources that support CPRG Planning Grantees meet the sector-based requirements for the Comprehensive Climate Action Plan (CCAP) and Priority Climate Action Plan (PCAP) if it includes the waste and materials management sector as a priority sector. These requirements are laid out in the Program Guidance for States, Municipalities, and Air Pollution Control Agencies and Federally Recognized Tribes, Tribal Consortia, and U.S. Territories.

EPA and other federal organizations publish and maintain a variety of resources that grantees may leverage to meet these requirements, including Waste and Materials Management Sector Emissions Quantification Tools and on Understanding Waste and Materials Management Sector Emission Reduction Opportunities. These resources are further described below.

Note: EPA does not require the usage of a specific dataset or tool, or the inclusion of any particular measure type.

Visit the Greenhouse Gas (GHG) Inventory and Projections webpage for more information on GHG inventory and projections data, methods, tools, and resources.

Where to get started?

The resources below broadly describe waste and materials management sector GHG emissions and strategies to reduce them. Grantees can use them to consider approaches to reduce emissions in their jurisdiction.

- The Example Government Climate Action Plans that Address Materials Management and Waste webpage catalogs existing Climate Action Plans from states, Tribes, and local governments with materials management and waste actions.
- EPA's Quantified Climate Action Measures Directory presents information on the quantified greenhouse gas (GHG) emission reduction measures in state and local climate action plans published between January 2018 and August 2023. Grantees may use this tool to draw inspiration for PCAP and CCAP emissions reductions measures and understand how they were quantified by states, MSAs, and tribes of similar sizes, geographies, economic conditions, etc.

- - Access the State Quantified Measures Directory
  - Access the Local Quantified Measures Directory
- The Managing and Transforming Waste Streams Tool is a compilation of 100 policies and programs to assist communities in waste management. Communities can use this tool to guide implementation of new material reuse and waste reduction and prevention strategies, for inclusion in their PCAP and CCAPs.
- The Sustainable Materials Management (SMM) Prioritization Tools Index shares life cycle-based tools that give users a starting place to establish priorities for environmental improvement, focus resources and action for greater holistic benefit, and consider key industries for collaboration.
- The Sustainable Materials Management: The Road Ahead is a report that provides a suggested roadmap for the future based on preferred materials management, including reducing material use, reducing toxics, and increasing the level of recovered materials.

Note: There are waste and materials management sector training recordings and supplemental resources for CPRG Planning grantees located on the CPRG Technical Assistance Forum (TAF) Resource Library SharePoint site. If you are planning grantee, planning grantee partner, or TAF participant and would like access to the site, please contact cprg.epa@endyna.com.

Waste and Materials Management Sector Emissions Quantification Tools

The following resources provide tools for quantifying GHG emission reductions for the waste and materials management sector. These tools can be used by states, local governments, Tribes, and territories to quantify GHG reduction measures in their PCAPs and CCAPs.

- The Waste Reduction Model (WARM) is an Excel-based tool that estimates the potential lifecycle GHG emissions and energy savings of waste management practices, including source reduction, recycling, combustion, composting, anaerobic digestion, and landfilling. The model calculates emissions, energy units, and economic factors across a wide range of material types commonly found in solid waste.
- The Non-CO2 GHG Mitigation Assessment Model provides projected emissions estimates and technical and economic mitigation estimates of non-CO2 GHGs from anthropogenic sources for all 50 states in the U.S. This tool allows users to filter by mitigation assessments or emissions, GHG, year, and national versus global to understand GHG projections and mitigation assessments. As the CCAP inventory requires parties to account for non-CO2 emissions, this resource may help improve GHG Inventory accuracy.
  - The Non-CO2 Methodology Report guidance document provides methodology for the Non-CO2 GHG Mitigation Assessment Model.
- The US Environmentally-Extended Input-Output (USEEIO) Model bridges the gap between traditional economic calculations, sustainability, and environmental decision-making and it can be the basis for a consumption-based emissions inventory. It estimates the potential sector-wide impacts— environmental and economic—associated with the production or consumption of goods and services.

- The [Municipal Solid Waste Decision Support Tool (MSW DST)](#) ↗ is a model to help solid waste planners with cost evaluation and environmental analysis in MSW management. The tool enables users to simulate existing MSW management practices and conduct scenario analyses of new strategies based on cost and environmental objectives. MSW DST includes multiple design options for waste collection, transfer, materials recovery, composting, waste-to-energy, and landfilling.

Understanding Waste and Materials Management Sector Emission Reduction Opportunities

The resources below focus on areas of the waste and materials management sector where opportunities for GHG emissions reductions might be found. The resources can help grantees refine emissions reduction strategies and select measures to implement their strategies in their PCAP and CCAP.

Landfill Gas Recovery

The resources provided below can support state, local, and tribal governments evaluate and estimate the emissions associated with landfill gas (LFG) recovery, as well as evaluate practices in their jurisdiction.

- EPA's [Landfill Methane Outreach Program (LMOP)](#) promotes the use of LFG as a renewable, green energy source. LMOP forms partnerships with communities, landfill owners, utilities, power marketers, states, project developers, tribes, and non-profit organizations to overcome barriers to project development by helping them assess project feasibility, find financing, and market the benefits of project development to the community.

- The [LFG Energy Project Development Handbook](#) provides an overview of LFGenergy project development guidance and presents the technological, economic, and regulatory considerations that affect the feasibility and success of LFG energy projects. State, local, and tribal governments can utilize this resource when assessing potential opportunities to mitigate landfill emissions in their PCAPs and CCAPs.

- The [LFGcost-Web — Landfill Gas Energy Cost Model](#) is an excel-based tool that evaluates the initial economic feasibility and environmental and job creation benefits of an LFG energy project. Analyses performed using LFGcost-Web are considered estimates and should be used for guidance only.

- The [LFG Energy Benefits Calculator](#) estimates the direct methane, avoided carbon dioxide and total GHG reductions attributable to an LFG energy project for the current year, calculated from the project size entered by the user.

- The [Toolkit for Expiring Landfill Gas Electricity Power Purchase Agreements](#) provides information on options that LFG electricity project owners may have when their power purchase agreement (PPA) is nearing expiration. This web-based tool offers specific criteria, pros and cons, economic considerations and other information to help guide the decision-making process.

- EPA's [Biogas Toolkit](#) serves as a centralized knowledge hub for biogas project stakeholders. The toolkit is designed to allow stakeholders to search and browse for information and resources that meet their

specific project needs. It includes tools and resources compiled from several EPA programs, including [AgSTAR](#), LMOP and the [Global Methane Initiative](#).

- The [Landfill Gas Emissions Model (LandGEM) Version 3.03](#) estimates total LFG and methane generation, as well as emissions of carbon dioxide, non-methane organic compounds, and individual air pollutants from MSW landfills. Model results can be used to estimate the recoverable methane available for a potential LFG energy project.
  - The [Landfill Gas Emissions Model (LandGEM) Version 3.02 User's Guide](#) contains key information necessary to properly operate the model.

Sustainable Management of Food

The anaerobic decomposition of landfilled food waste is a significant source of methane emissions. Methane has a high warming potential compared to other GHG gases, like carbon dioxide, and thus poses a significant risk to accelerating climate change. However, it also presents opportunities for GHG reductions that have significant impacts in the short term. The following tools help assess the GHG emissions and impacts from food waste, as required in the PCAP, as well as assess opportunities for emissions mitigation in waste management, necessary for the CCAP.

- [From Farm to Kitchen: The Environmental Impacts of U.S. Food Waste](#) is a report that describes the environmental footprint of food loss and waste in the U.S., and the environmental benefits that can be achieved by reducing it. The report focuses primarily on five inputs to the U.S. cradle-to-consumer food supply chain — agricultural land use, water use, application of pesticides and fertilizers, and energy use — plus one environmental impact — GHG emissions.
- EPA's [Guide to Conducting and Analyzing a Food Waste Assessment](#) provides guidance on target-setting, assessment planning, waste sorting, and analysis. The appendices provide examples of data recording worksheets.
- The [Tools for Preventing and Diverting Wasted Food](#) page includes kits and guides for preventing and diverting food waste.
- [Preventing Wasted Food in Your Community: A Social Marketing Toolkit](#) helps communities to implement a social marketing campaign for food waste reduction.
- The [Food Loss Prevention Options for Grade Schools, Manufacturers, Restaurants, Universities and Grocery Stores](#) provides tip sheets for sites where source reduction is applicable, providing suggestions for ways these sections can prevent food loss and waste.
- The [Excess Food Opportunities Map](#) bridges the gap between potential generators of excess food and potential recipients who can use it. It displays the locations of nearly 1.2 million excess food generators and about 5,000 potential recipients, as well as communities with source separated organics programs. It aims to divert excess food away from landfilling and toward beneficial use.

Energy Management, Energy Efficiency and Renewable Energy at Wastewater Plants

Wastewater treatment processes produce carbon dioxide, methane, nitrous oxide, and other non-methane volatile organic compounds (NMVOCs)—all GHGs that must be accounted for and addressed in reduction measures in this sector. The following sources present opportunities for reductions in this sector, as well as assessment tools for monitoring.

- The Energy Use Assessments at Water and Wastewater Systems Guide outlines how to assess baseline energy consumption and costs to identify areas for improved energy efficiency and operational savings.

    - This resource is accompanied by the tool guide for EPA'S Energy Use Assessment Tool (EUAT).

- The Energy Efficiency for Water Utilities webpage contains a number of tools to help incorporate practices into their water and wastewater plants to reduce GHG emissions and save money. The tools include informational primers, best practices guidebooks, case studies, trainings, and excel tools to administrate energy efficiency audits, examine alternative energy sources, and implement best practices for energy efficiency.

- The Local Government Guide to Developing and Implementing GHG Reduction Programs describes how water and wastewater facilities can lead by example and achieve multiple benefits by improving the energy efficiency of their new, existing, and renovated buildings and their day- to-day operations. It is designed to be used by facility managers, energy and environment staff, local government officials, and mayors and city councils.

- EPA's Energy Efficiency in Water and Wastewater Facilities: A Guide to Developing and Implementing GHG Reduction Programs provides comprehensive information for local government staff and policy makers on how to design and implement energy management programs for water and wastewater facilities, including new, existing, and renovated buildings, and day-to-day operations.

- The Primer on Energy Efficiency for Municipal Water and Wastewater Utilities ↗ focuses on infrastructure in developing nations, but may also be applied to small and medium, and urban and rural, water and wastewater systems.

- EPA's Wastewater Management Fact Sheet provides guidance on assessing wastewater treatment facilities for energy efficiency. It recommends best practices for tracking and evaluating energy usage and costs, performing energy audits, and proposes ideas for energy conservation. The following webinars provide information on Energy Efficiency for Water and Wastewater Utilities:

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Asistans

Assistência

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