



**CLIMATE &
CLEAN AIR
COALITION**
TO REDUCE SHORT-LIVED
CLIMATE POLLUTANTS

CCAC Waste Initiative Tools and Resources

2018 International Solid Waste
Association World Congress
24 October, 2018
Kuala Lumpur, Malaysia



Joe Donahue
Abt Associates
On behalf of the U.S. EPA



Overview

- CCAC Waste Initiative has developed numerous tools and other resources
- Designed to assist cities in addressing waste management challenges
 - Focus on aspects of waste management that contribute methane and black carbon emissions
- Free and accessible on the Municipal Solid Waste Knowledge Platform
- Cities do not need to join the Waste Initiative to access tools and resources
- However, cities that join the initiative can receive support in using them



Introduction to Key Waste Initiative Tools



City Assessment Tool

- An Excel-based framework for consistent collection and storage of solid waste data
- Supports:
 - Development of solid waste master plans
 - Preparation and implementation of projects
 - Identification of opportunities to reduce short-lived climate pollutants emissions from the solid waste sector
 - Data gap identification
- Provides basis for action plan development and implementation
- All cities that participate in the Waste Initiative are required to use this tool



Solid Waste Emissions Estimation Tool (SWEET)

- Excel-based tool for quantifying pollutant emissions from sources across the waste sector
- Project-, source-, or system-level emissions estimates
- Baseline scenario and up to four alternative scenarios
- Pollutants include: Black Carbon, CH₄, and co-emitted pollutants



OrganEcs

- Excel-based tool for estimating costs of composting projects and anaerobic digesters
- Provides an assessment of the financial viability of a project
- Determines what tipping fees and product prices (e.g., price for compost) are needed to support the project



Anaerobic Digestion Project Screening Tool

- Excel-based screening tool
- Limited inputs required
 - Waste stream composition, planned system type
- Answers basic questions with minimal time and resources
 - How much biogas and digestate will my project generate?
 - What are the best potential end uses for the biogas?

Digestate Production	Value	Unit
Total Non- Biodegradable Solids	27,068	kilograms/year
Remaining Volatile Solids	88,335	kilograms/year
Total Digestate	114,637	kilograms/year
Recovered Solids	80,246	kilograms/year
Wastewater	34,391	kilograms/year

Biogas Production (m ³)	Value	Unit
Annual Biogas Production	27,071	(m ³ /year)

Energy Recovery Options	Value	Unit
Electricity Production (cleaned biogas to CH ₄)	159,721	kWh
Electricity Production (bioigas only)	103,818	kWh
Natural Gas Production	15,972	m ³ /year
Cooking Gas Potential	247	homes/year
Home Heating Potential	185	homes/year
Gas Lamps Powered	49	lamp/year



Landfill Gas Project Screening Tool

- Helps answer basic questions about viability of landfill gas projects
- Minimal inputs required
 - Site opening/closing years, annual disposal rates, etc.
- Outputs
 - Estimated LFG recovery rates
 - Preliminary project assessment
 - Example applications based on projected LFG recovery rates and community energy needs



Microturbine at East Delhi landfill



Financing Readiness Evaluation

- Evaluation questions to help cities think about whether they are ready to seek financing for a project
 - Raises awareness of challenges and potential pitfalls in several areas
 - Helps city identify gaps or areas of potential risks
 - Cities can use the evaluation develop a plan for improving their readiness for financing
- Political environment
 - Regulatory environment
 - Legal frameworks
 - Revenue streams
 - Financial and technical expertise
 - Bidding



Primer for Accessing Financing

- Guides decision-makers in their efforts to access financing
- Identifies common financing challenges
 - Articulating the financial feasibility of a program or project
 - Establishing creditworthiness
 - Others
- Provides a suggested “road map” for financing projects
- Includes recommended resources and information



Introduction to the Municipal Solid Waste Knowledge Platform



Introduction to the Knowledge Platform

- Access is free and does not require membership or subscription
- Cities do not need to formally join the CCAC Waste Initiative to access these materials
- By joining the Waste Initiative, cities can receive assistance in using these tools and resources



Introduction to Knowledge Platform

The screenshot shows the homepage of the Climate & Clean Air Coalition Municipal Solid Waste Knowledge Platform. The header includes the logo and navigation menu. The main content area features a title and a world map with location markers. A legend at the bottom explains the map markers.

CLIMATE & CLEAN AIR COALITION MUNICIPAL SOLID WASTE KNOWLEDGE PLATFORM

Enter your keywords

[CITIES](#) [DOCUMENTS](#) [TOOLS](#) [DATABASES](#) [EVENTS](#) [WEBINARS](#) [FORUM](#)

Knowledge platform to support cities and governments in short-lived climate pollutant reduction.

Address methane, black carbon, and other air pollutants emissions from the waste management sector!

Legend:

- Letter of intent
- Assessment stage
- Action plan development
- Work plan development
- Implementation plan development
- Mentor
- About stages and our work

Knowledge Platform Link: <http://www.waste.ccacoalition.org/>



Knowledge Platform Contents

- Cities
- Documents
- Tools
- Databases
- Events and Webinars



Map of cities participating in the Waste Initiative



Knowledge Platform Contents

- Cities
- Documents
- Tools
- Databases
- Events and Webinars



PENANG MALAYSIA

MITIGATING METHANE AND BLACK CARBON FROM THE MUNICIPAL SOLID WASTE SECTOR

Penang is a densely populated state of approximately 1.8 million people in Malaysia. The state has two geographic regions: Seberang Perai, which is located on the mainland and governed by the Seberang Perai Municipal Council (MPSP); and the more densely populated Penang Island, which is governed by the Penang Island City Council (MBPP). Penang faces a number of solid waste management challenges, especially related to organic waste management. In 2013 the municipality began working with the Climate and Clean Air Coalition (the Coalition) Municipal Solid Waste Initiative (Waste Initiative) to address these challenges and improve solid waste management in general. Through this partnership the city is implementing several activities that will generate a range of environmental, economic, and public health benefits, including reduced emissions of short-lived climate pollutants (SLCPs), primarily methane and black carbon.

CITY FACTS
Population: ~ 1.8 million
Waste Generation Rate: ~ 1.3 kg waste/person/day
Waste Collection Rate: ~ 100%

CHALLENGES AND OBJECTIVES

Approximately 2,200 tonnes of waste are generated each day in Penang. Nearly all of this waste is sent to a single sanitary landfill, Pulau Burung. This landfill is currently half full and is expected to be completely full by 2028. Moreover, because 40–60% of the waste generated is organic, the landfill generates large volumes of leachate and methane (approximately 11,000 tonnes/year). Leachate pollutes nearby land and waterways, and methane emissions contribute to air pollution and climate change. In addition, the state has had trouble changing people's behaviour and encouraging a shift away from a "throw away" mindset.

Through the Waste Initiative, Penang worked with the United Nations Environment Programme International Environmental Technology Centre (IETC) to develop a work plan for improving solid waste management and reducing SLCP emissions. As a part of this work plan, Penang decided to focus its efforts on an organic waste management plan. The plan, which was published in April 2015, aims primarily to divert organic waste from the Pulau Burung Sanitary Landfill and includes a goal of eventually banning disposal of organic waste in the landfill altogether.

Penang's [organic waste management plan](#) identifies specific implementation actions. First, the state intends to mandate source separation and treatment of organic waste, which has the additional

The Climate and Clean Air Coalition Municipal Solid Waste Initiative unites national and local governments, international organizations, and other partners to reduce emissions of short-lived climate pollutants, such as methane and black carbon, from the municipal solid waste sector.

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

Sample case study



Knowledge Platform Contents

- Cities
- Documents
- **Tools**
- Databases
- Events and Webinars

Anaerobic Digestion – Project Screening Tool
(AD-PST)
Version 1
February 2018

Developed by Abt Associates on behalf of the U.S. Environmental Protection Agency and the Climate and Clean Air Coalition Municipal Solid Waste Initiative (contract # EP-C-13-039, Work Assignment 4-53).

Municipal Solid Waste Initiative Coordinator: Sandra Mazo-Nix | sandra.mazo-nix@un.org
Tool Support | AD-PST@abtassoc.com



 United States Environmental Protection Agency

 **Abt**
ASSOCIATES

BOLD THINKERS
DRIVING
REAL-WORLD
IMPACT

 CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS



Knowledge Platform Contents

- Cities
- Documents
- Tools
- **Databases**
- Events and Webinars

Plans and Actions	Subcommittee Members	Tools & Resources	Projects (625)	Events (169)	Project Network (612)
Name	Year	Type	Country	Sector(s)	
2014 MSW BG: LFG Workshop in Sofia, Bulgaria	2014	Workshop/Training	Bulgaria	MSW	
2014 MSW CN: China Scoping Mission - Beijing & Ningbo	2014	Study	China	MSW	
2014 MSW CN: Meetings and Scoping in Beijing and Ningbo	2014	Study	China	MSW	
2014 MSW CO - GMI Landfill Gas and LFG Utilization Workshop for CARs - Tunja	2014	Workshop/Training	Colombia	MSW	
2014 MSW DR - GMI Landfill Operations and LFG Utilization Workshop	2014	Workshop/Training	Dominican Republic	MSW	
2014 MSW GMI Presentation at Venice Symposium	2014	Meeting	Partnership-wide	MSW	
2014 MSW Indonesia - Comments on Ministry of Public Works Technical Manual	2014	Technical Assistance/Outreach	Indonesia	MSW	
2014 MSW Indonesia - Malang Workshop	2014	Workshop/Training	Indonesia	MSW	
2014 MSW Indonesia -- Meeting with DKI Jakarta for CCAC Activities	2014	Meeting	Indonesia	MSW	

Screenshot of Global Methane Initiative's international database of projects in the MSW sector



Knowledge Platform Contents

- Cities
- Documents
- Tools
- Databases
- Events and Webinars



2016 regional workshop for cities in Southeastern Europe



Thank you! Questions?

ccac_secretariat@unep.org
[@CCACoalition](https://www.facebook.com/ccacoalition) | [facebook.com/ccacoalition](https://www.facebook.com/ccacoalition)
www.ccacoalition.org

