



Environmental Justice and the Landfill Gas Energy Industry

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U.S. EPA Landfill Methane Outreach Program



Agenda

- Introduction
- Considering Environmental Justice
- National Map Demo
- Next Steps
- Questions



Introduction to LMOP



About LMOP

- Established in December 1994
- Voluntary program that creates partnerships among states, energy users/providers, the landfill gas (LFG) industry and communities

Mission: Work cooperatively with industry & waste officials to reduce or avoid landfill methane emissions by encouraging the recovery & beneficial use of biogas generated from organic municipal solid waste.



**LANDFILL METHANE
OUTREACH PROGRAM**

Why Methane Matters

Methane Emissions

Trap 28 times more heat than carbon dioxide over 100 years

Contribute to ground-level ozone pollution

Create industrial safety problem

Methane Mitigation

Opportunity to capture and convert methane to useful energy

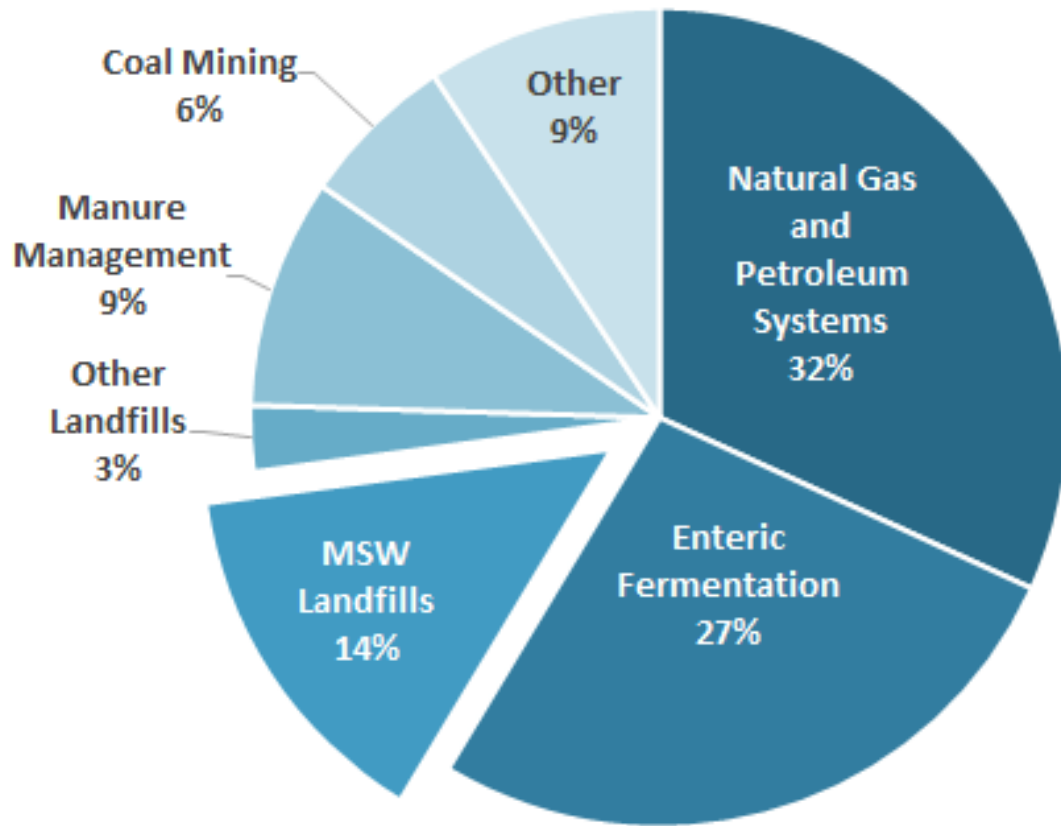
Positive Outcomes of Capturing and Using Methane



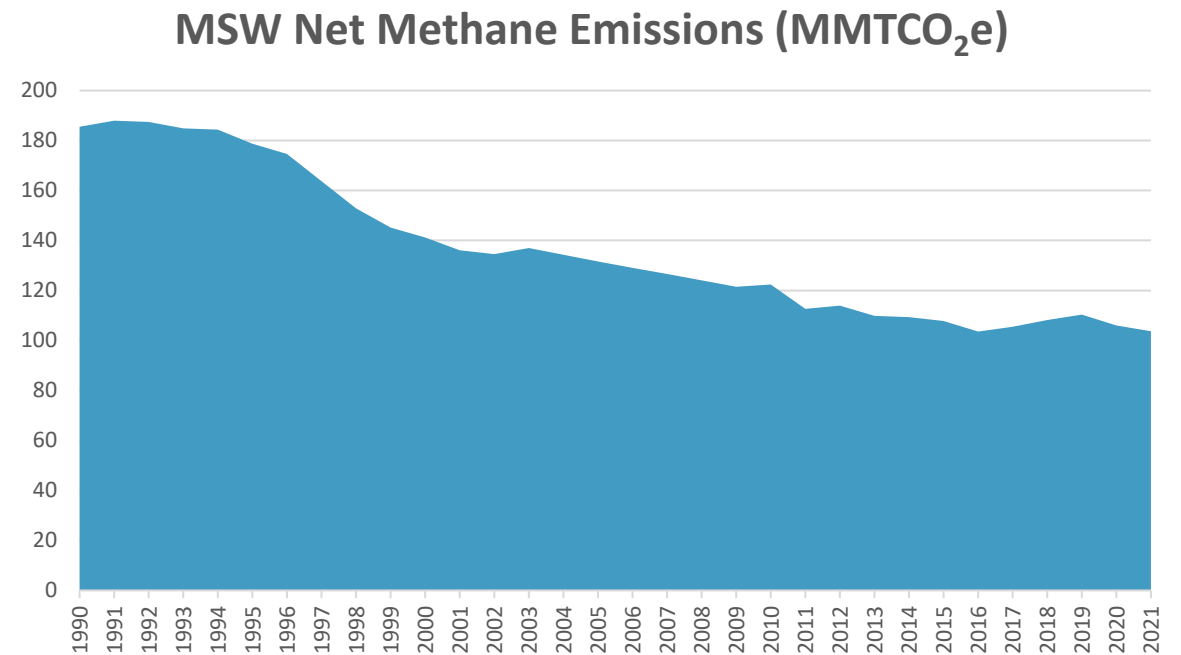
- ✓ Better air and water quality
- ✓ Improved human health
- ✓ Increased worker safety
- ✓ Enhanced energy security
- ✓ Increased economic value
- ✓ Reduced odors

MSW Landfill Methane Emissions

- Landfills remain third-largest source of anthropogenic methane in the United States

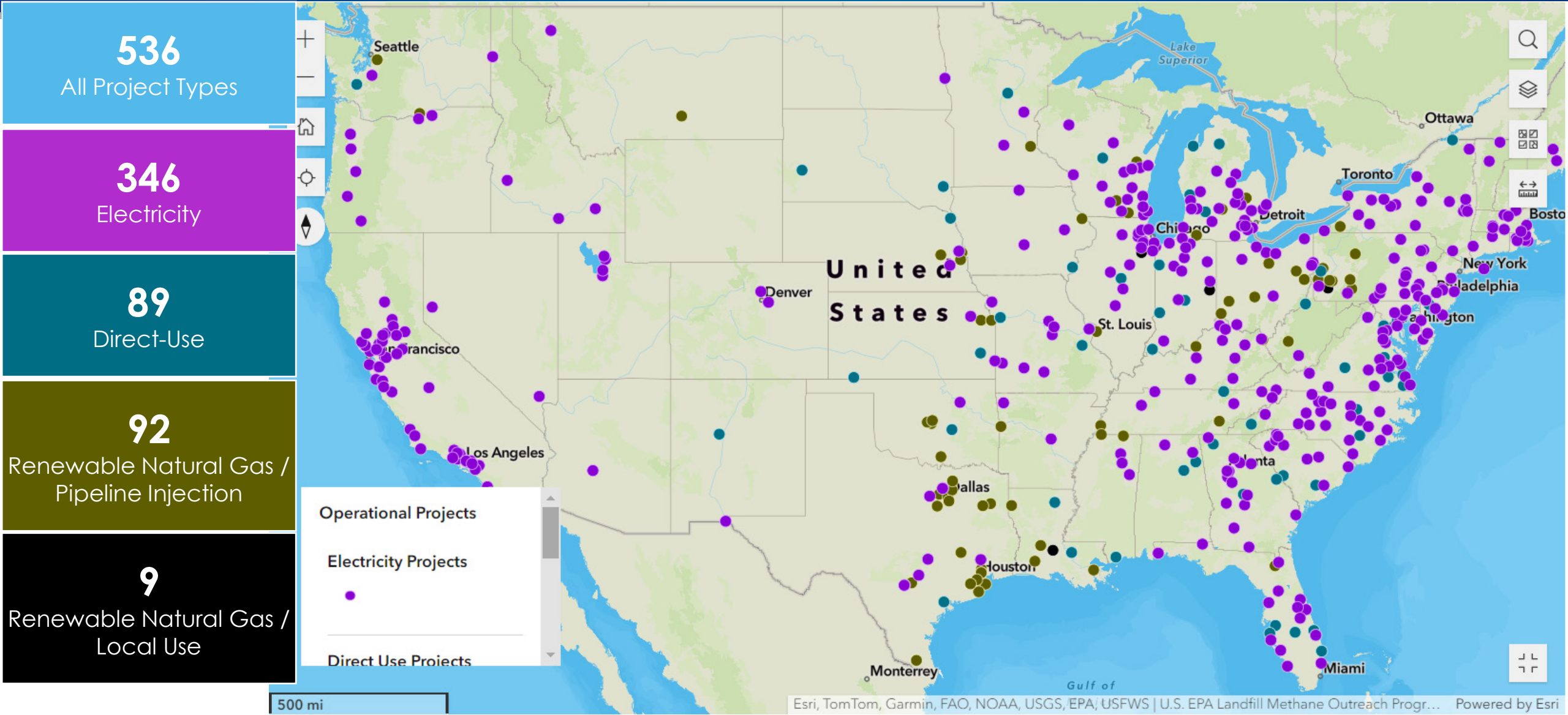


From *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021*



From *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021*

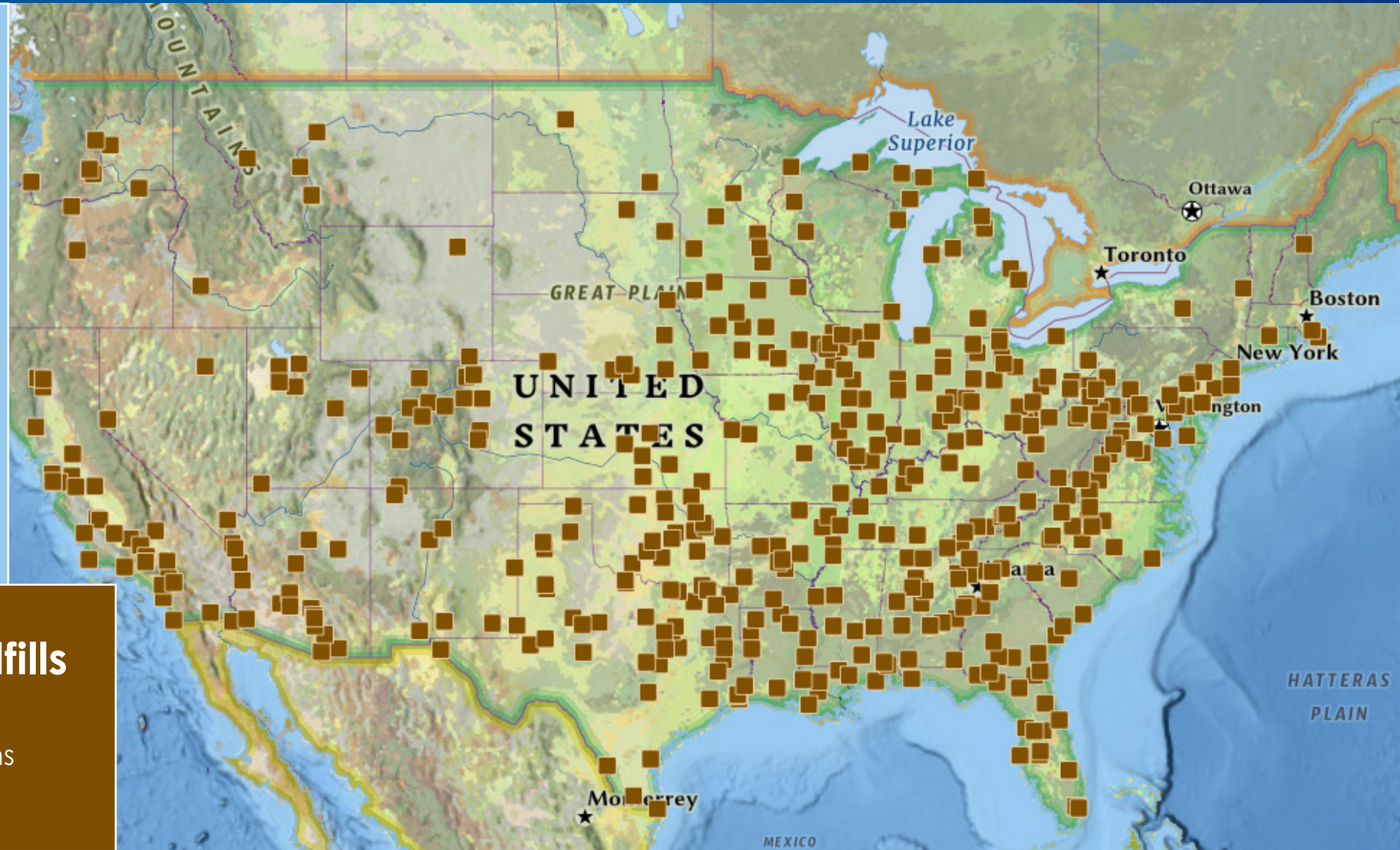
National View of LFG Energy Projects



Candidate Landfills

What is a candidate landfill?

- Landfill is accepting waste or has been closed for five years or less
- Has at least one million tons of waste
- Does not have an operational, under-construction or planned project
- Can also be designated based on interest by the site



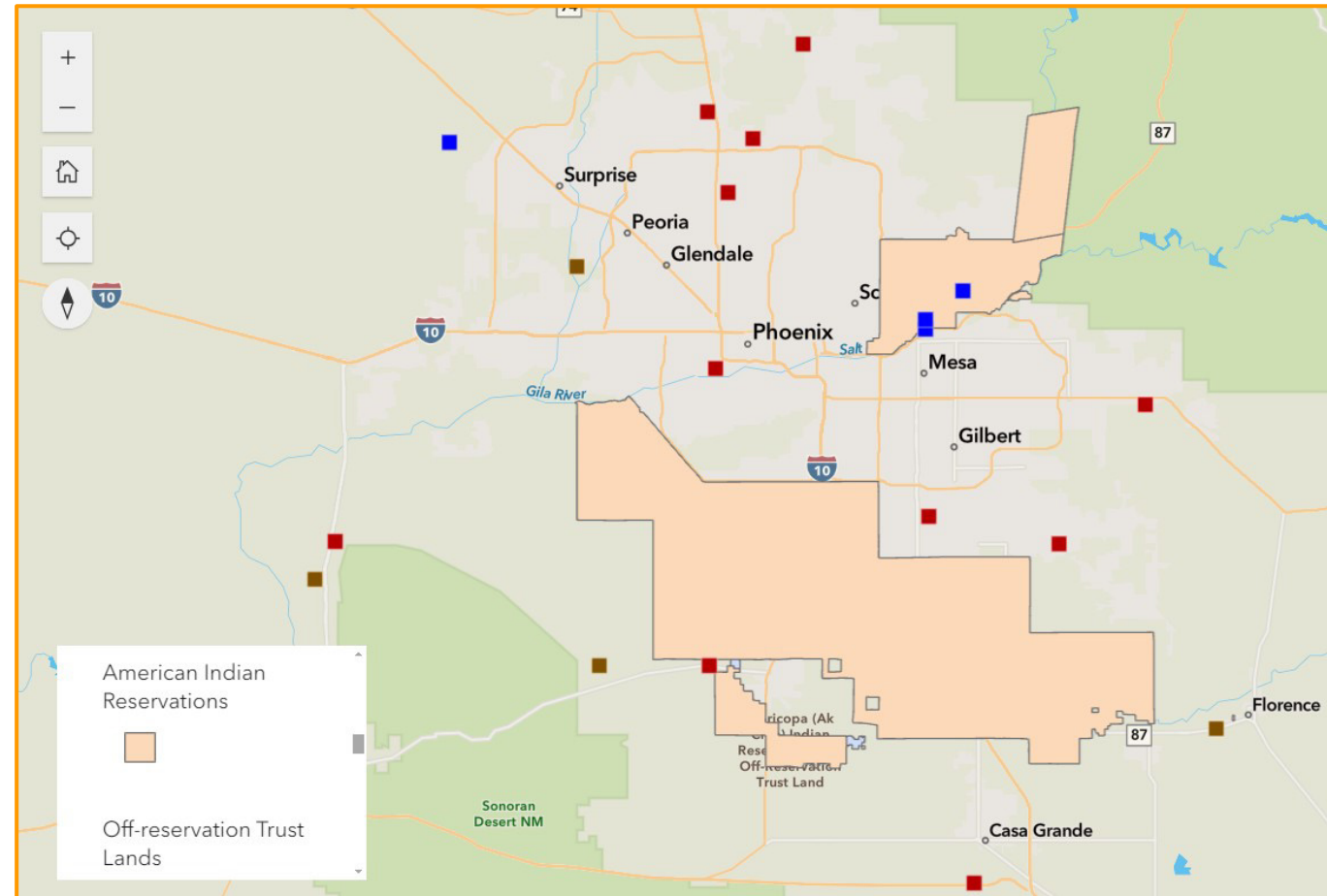
~ 459 Candidate Landfills

913 MW or 507 mmscfd

Potential Direct CH₄ Reductions
of 51 MMTCO₂e/year

LMOP Tools and Resources

- Interactive National Map
- Landfill and LFG Energy Project Database
- Publications and webinars
- LFGcost-Web model
- Toolkit for Expiring Power Purchase Agreements
- LFG Energy Benefits Calculator
- RNG Flow Rate Estimation Tool
- LFG to Vehicle Fuel fact sheet



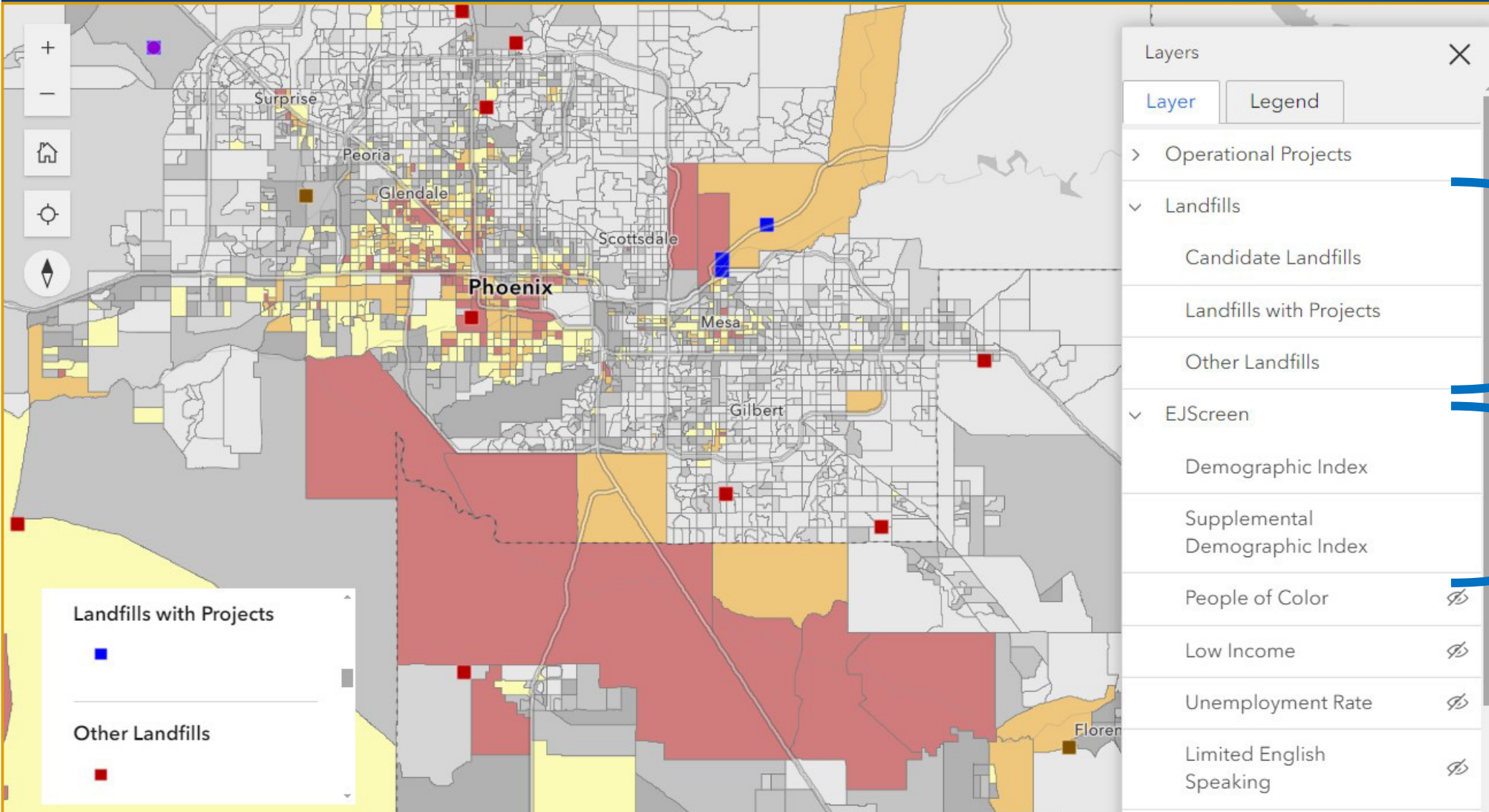
Considering EJ



Environmental Justice and LFG Energy

- **What:** EJ means the **just treatment** and **meaningful involvement** of **all people** in Agency decision-making and other Federal activities that affect human health and the environment.
- **Why:** Several executive orders direct federal agencies to address EJ issues through programs, policies and activities; incorporating EJ considerations into LFG energy project development will help **build trust and result in better projects**
- **How:** Use tools like LMOP National Map and EJScreen to **identify communities with potential EJ concerns** near a landfill; perform additional analysis or information gathering based on results

LMOP Interactive National Map



Landfill layer options

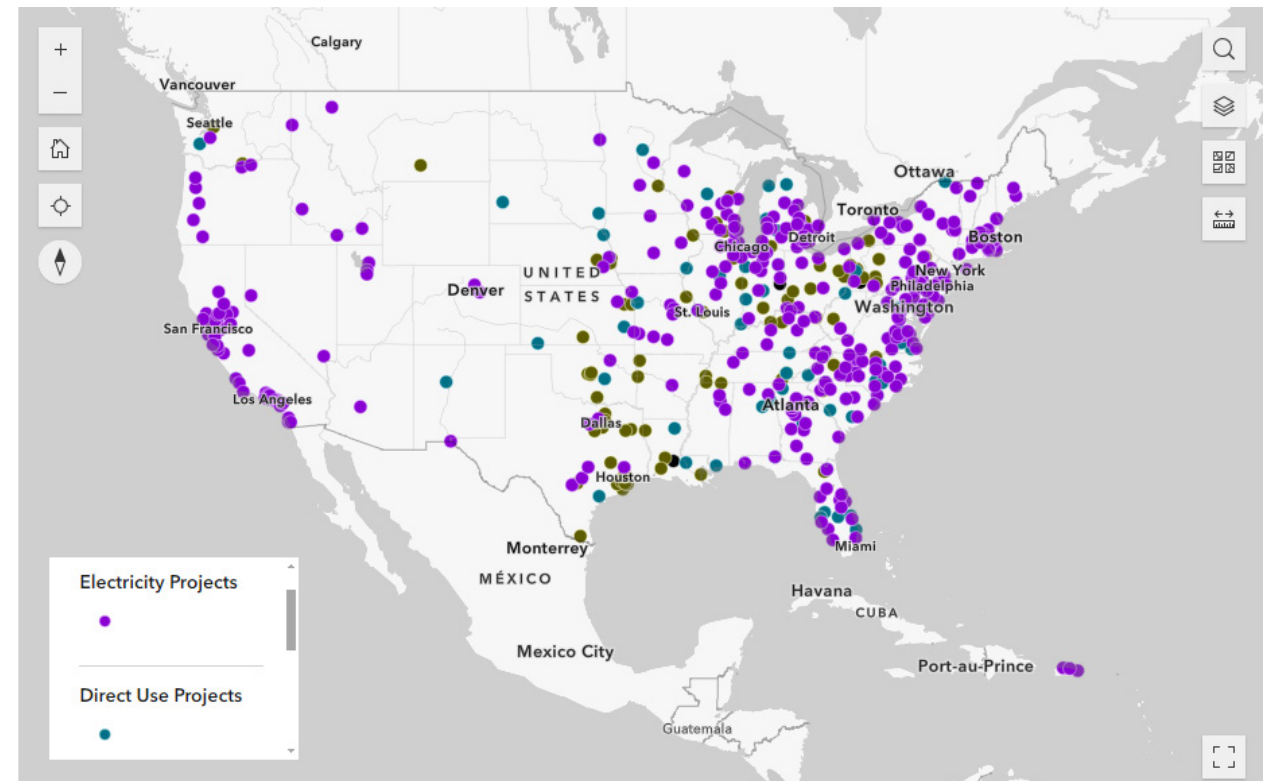
Two demographic indexes

Data Available in National Map

Refreshed 2-3x per year with each update of the LMOP Database of Landfills and Landfill Gas Energy Projects

- Active and closed MSW landfills
 - Candidate landfills
 - Landfills with a project
 - Other landfills
- Operating LFG energy projects
 - Electricity
 - Direct-Use
 - RNG – Pipeline Injection
 - RNG – Local Use

- National demographic indicators and indexes from EJScreen
- Tribal lands: areas and points



EJScreen

- Environmental Justice Screening and Mapping Tool (EJScreen) is EPA's environmental justice mapping and screening tool
- Provides a nationally consistent dataset and approach for combining environmental and demographic socioeconomic indicators
- All EJScreen indicators are publicly-available data



www.epa.gov/ejscreen

Appropriate Uses of EJScreen

*EJScreen was developed by EPA to **highlight places that may be candidates for further review, analysis or outreach** to support the Agency's environmental justice work.*

EPA is releasing EJScreen to the public in part to be more transparent about how the Agency considers environmental justice in its work.

There is no mandate or guidance expressed or implied that state governments or other entities should use the tool or its underlying data.

EJScreen Demographic Layers & Indexes

- People of color
- Low-income
- Unemployment rate
- Limited English speaking
- Less than high school education
- Under age 5
- Over age 64

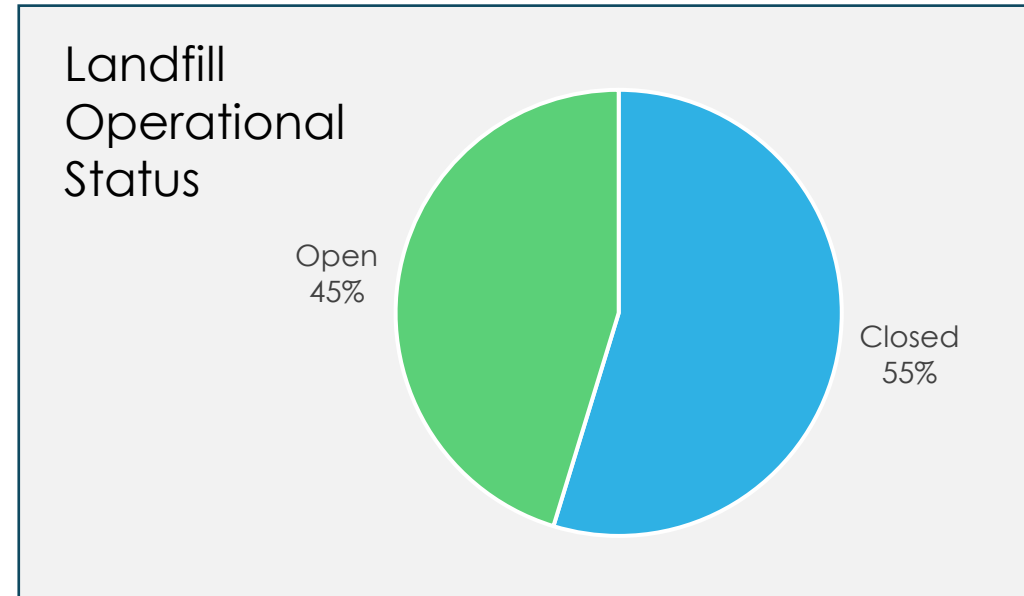
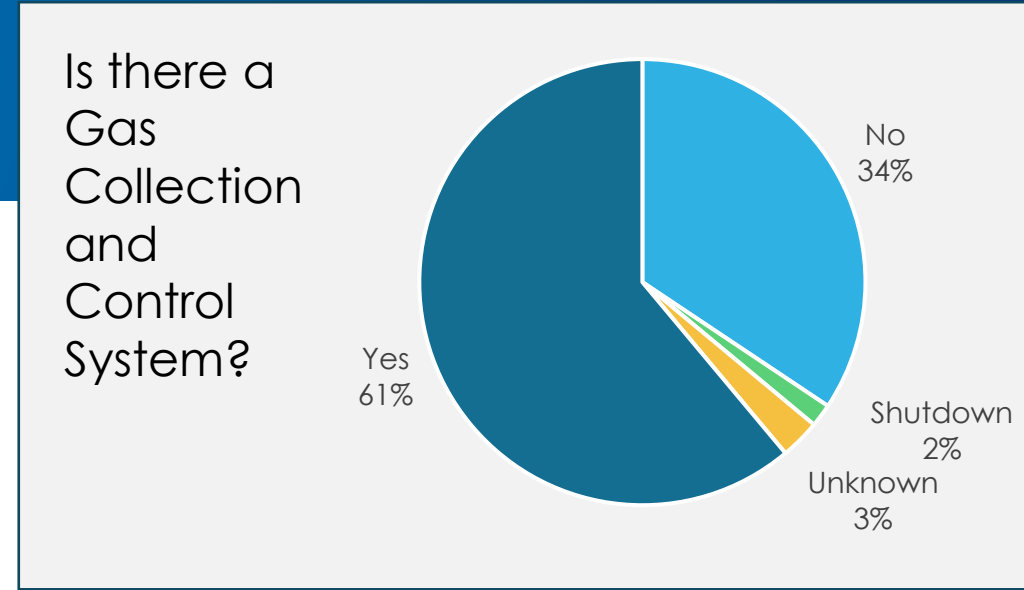
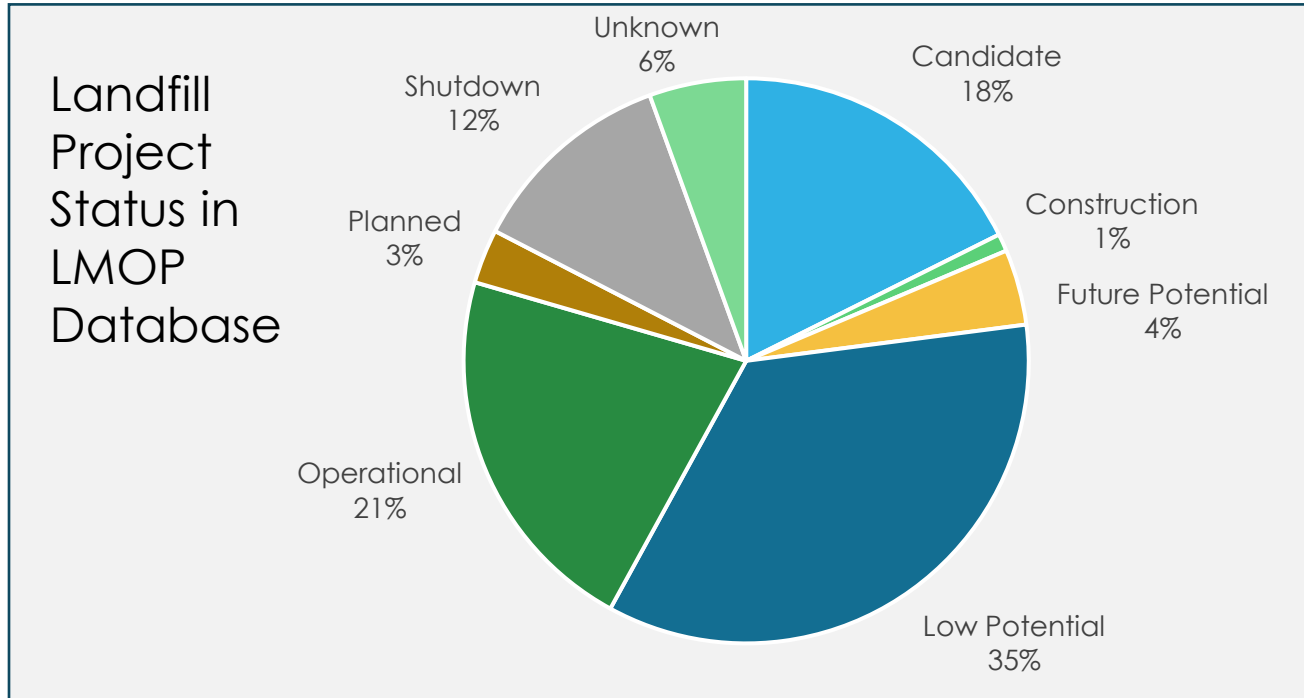
Demographic Index (based on average of 2 indicators)

Supplemental Demographic Index
(based on average of 4 indicators plus low life expectancy)

National Results

There are **902 landfills** within 3 miles of a census block group with EJ demographic index (% low-income and % people of color) at or above national 80th percentile

These landfills are characterized in the charts:



Data sources: LMOP Database (March 2024) and EJScreen (September 2023)

What Does this Mean?

- 902 of the 2,600+ landfills in the LMOP Database, about 35%
- Screening is a useful first step in highlighting locations that may be candidates for further review. However, it is essential to remember that screening-level results:
 - Do not, by themselves, determine the existence or absence of environmental justice concerns in a given location
 - Do not provide a risk assessment
 - Have other significant limitations

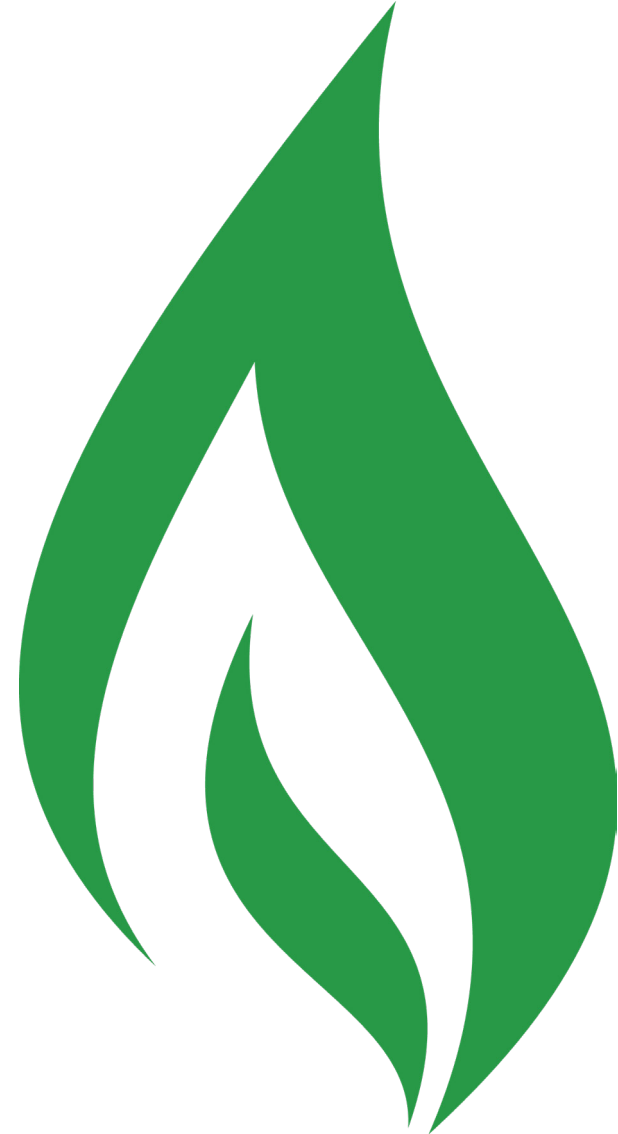


Demonstration



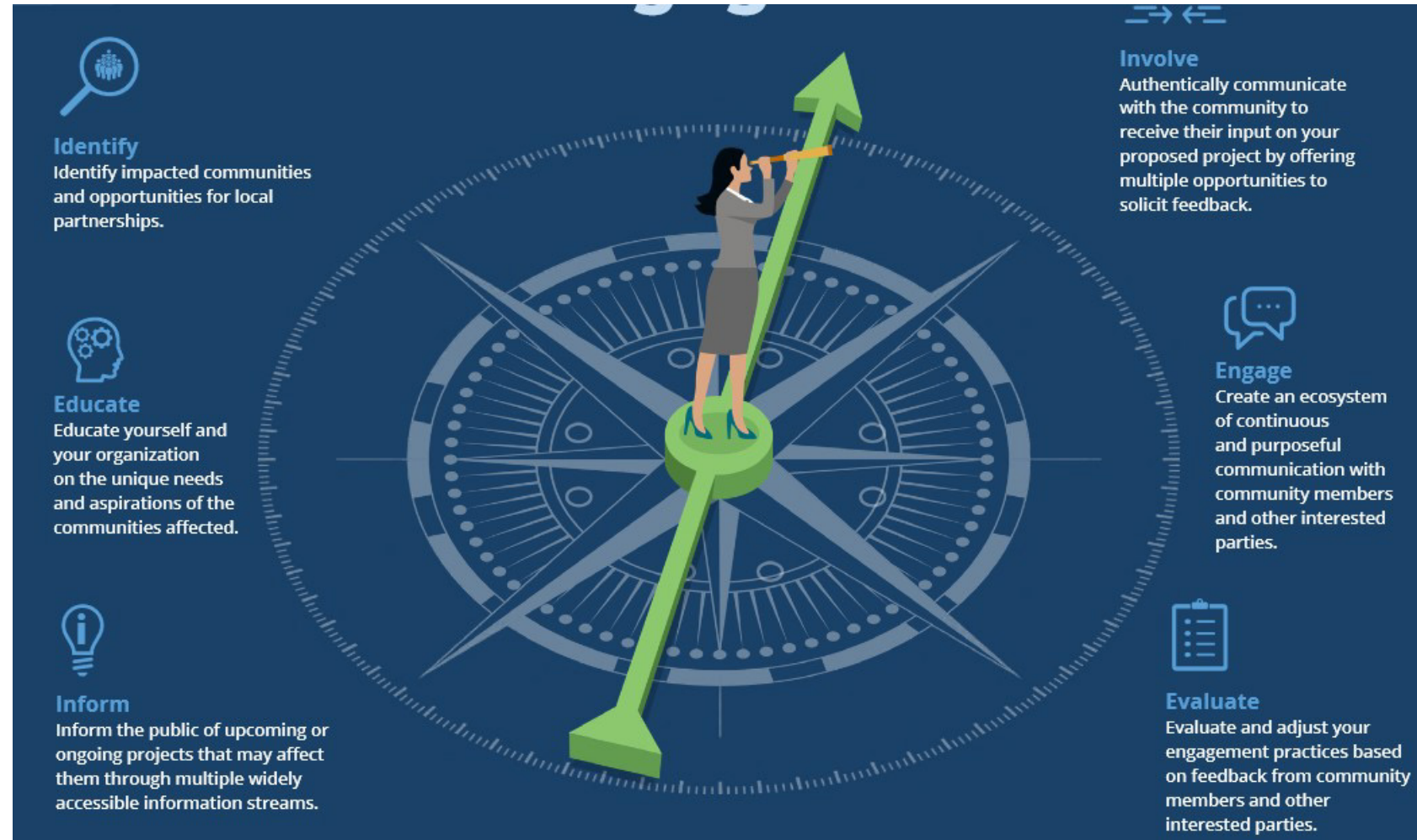
National Map Demonstration

Next Steps



Step 1: Plan Community Outreach Efforts

- Meet language needs
- Determine level of involvement
- Understand community's need to participate
- Ensure culturally appropriate engagement



Compass to Meaningful Engagement. From Capacity Building Through Effective Meaningful Engagement. U.S. EPA.

Step 2: Listen To and Document Community Concerns

- Listen to understand local concerns
- Conduct a community assessment
- Ascertain community trust in the landfill and any outstanding issues
- Work with community to address concerns

Conduct Community Assessments

Conventional planning processes might not always capture detailed information about specific community challenges or priorities. A community assessment can empower residents to fill those gaps. In a community assessment, community members gather, analyze, and report information to produce a more complete picture of current conditions, needs, and available resources. An assessment typically focuses on a priority issue in a specific area, such as housing or transportation options in a neighborhood. Examples include walkability audits, which evaluate the safety and convenience of the walking environment, and community food assessments, which analyze the availability of healthy food options.

From *Creating Equitable, Healthy, and Sustainable Communities*. U.S. EPA.

Step 3: List Community-Specific Risks and Benefits

- Communicate specific LFG energy project impacts to community
- Acknowledge cumulative risks and impacts
- Understand benefits community is seeking
- Provide system for community to express concerns

Potential Concerns about Projects

- Increased waste disposal or landfill expansion to maintain LFG flow rate
- Continued odors/air/water pollution despite an energy recovery project
- Increased traffic to site / noise

Potential Benefits Communities Seek

- Reduction or elimination of odors and air pollution from landfill
- Having a voice and being heard
- Safe drinking water
- No reduction in property value

Step 4: Hold Public Meetings to Listen and Share

- Use plain language
- Communicate in community's primary languages
- Schedule meetings for best time and location for community
- Engage any underrepresented groups in community

WHAT ARE THE RESULTS OF WELL-DESIGNED MEANINGFUL ENGAGEMENT?¹

- **INCREASES THE LIKELIHOOD OF ACCEPTANCE** for projects and solutions.
- **GENERATES SOLUTIONS** that are more effective.
- **EMPOWERS AND INTEGRATES PEOPLE** from different backgrounds.
- **BUILDS LOCAL NETWORKS** of community members that are committed to helping make the project and solutions come to fruition.
- **INCREASES TRUST** in community organizations and governance.
- **CREATES OPPORTUNITIES** for discussing concerns.

¹ Penn State University and the College of Agriculture Sciences' Center for Economic and Community Development. (n.d.). *Why community engagement matters*. Retrieved from <https://aese.psu.edu/research/centers/cecd/engagement-toolbox/engagement/why-community-engagement-matters>. Adapted from Bassler, A. (2008). *Developing Effective Citizen Engagement: A How-to Guide for Community Leaders*. Center for Rural Pennsylvania.

EMPOWERED DECISION-MAKING TOOLS

A word cloud of decision-making tools and engagement concepts. The words are arranged in a circular pattern, with some words being larger and more prominent than others. The words include: ACCESSIBILITY, DISTRIBUTING, INFO, TWO-WAY COMMUNICATION, TRANSPARENT, INPUT, QUALITY, MULTIPLE LANGUAGES, ADVISORY BOARDS, PUBLIC PARTICIPATION, LIMITATIONS, RELATIONSHIP BUILDING, CAPACITY BUILDING, EMPowerment, FEEDBACK LOOPS, CROSS-CULTURAL FORMATS, and CONTINUOUS ENGAGEMENT.

From *Capacity Building Through Effective Meaningful Engagement*. U.S. EPA.

Resources



LMOP Links

- **NEW!** Considering EJ in LFG Energy Project Development:

epa.gov/lmop/list-publications-related-landfill-gas-and-waste-management#puba

- LMOP National Map:

epa.gov/lmop/lmop-national-map

- **NEW!** Using the LMOP National

Map: epa.gov/lmop/using-lmop-national-map

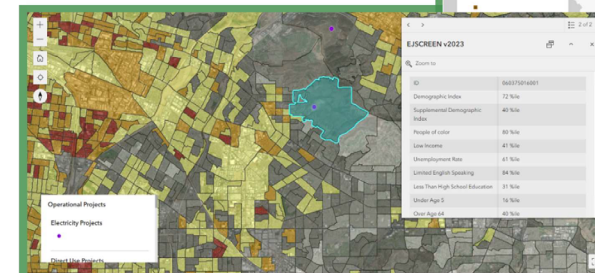
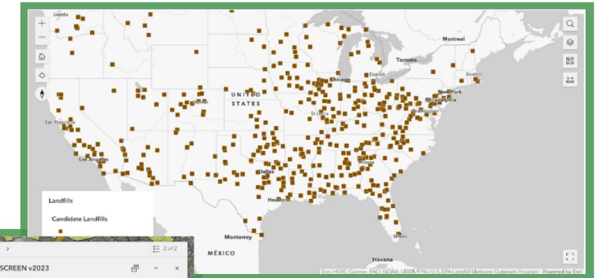


What Is Environmental Justice and Why Is It Important?

- **Environmental justice (EJ)** means the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation or disability, in Agency decision-making and other Federal activities that affect human health and the environment so that people:
 - Are fully protected from disproportionate and adverse human health and environmental effects (including risks) and hazards; and
 - Have equitable access to a healthy, sustainable and resilient environment.
- **Meaningful involvement** means:
 - Providing timely opportunities for members of the public to share information or concerns and participate in decision-making processes;
 - Fully considering public input provided as part of decision-making processes;
 - Providing technical assistance, tools and resources to assist in facilitating meaningful and informed public participation; and
 - Seeking out and encouraging the involvement of persons and communities potentially affected.
- **Why consider EJ?** Executive Orders 12898, 14096 and 14008 direct federal agencies to address EJ issues through programs, policies and activities. Most states also have laws and policies pertaining to EJ. Incorporating EJ considerations into landfill gas (LFG) energy project development will help build trust and result in better projects.

What Information Is Available in LMOP's National Map?

- Basic data from the LMOP database for:
 - **Active and closed municipal solid waste landfills**, color-coded by group: candidate landfills; landfills with an operational, under-construction or planned LFG energy project; and other landfills.
 - **Operating LFG energy projects**, color-coded by end-use category: electricity; direct-use; renewable natural gas (RNG) to pipeline; and RNG to local vehicle fuel use.
- Layers for national demographic indicators and indexes from EPA's **EJ Screening and Mapping Tool (EJScreen)**, based on nationally consistent data that can be used to highlight Census "block groups" that may have potentially vulnerable populations.
- Area layers and points that identify **Tribal lands**, from EPA's EnviroMapper for Envirofacts.



For instructions on how to use the LMOP national map when considering EJ in LFG energy project development, visit epa.gov/lmop/lmop-national-map and select the "Instructions" link.

Additional EPA Resources

- **Main EJ website:** epa.gov/environmentaljustice
- **EJScreen tool:** epa.gov/ejscreen
- **Environmental Protection in Indian Country:** epa.gov/tribal
- **Capacity Building Through Effective Meaningful Engagement:**
epa.gov/system/files/documents/2023-09/epa-capacity-building-through-effective-meaningful-engagement-booklet_0.pdf
- **Creating Equitable, Healthy, and Sustainable Communities:**
epa.gov/sites/default/files/2014-01/documents/equitable-development-report-508-011713b.pdf

Connect with Us

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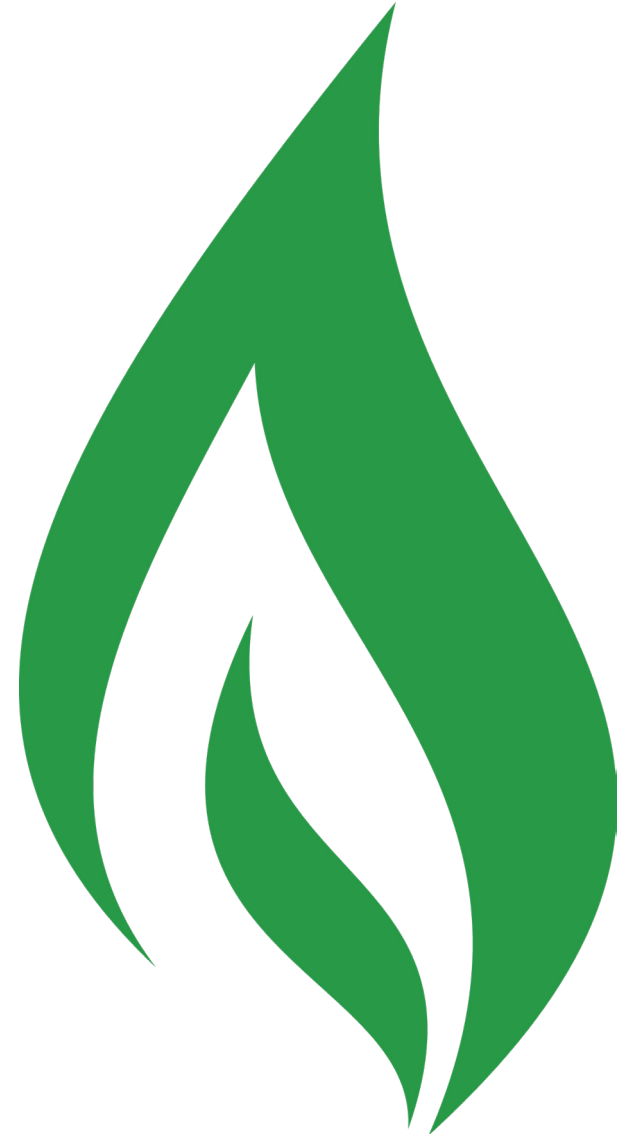
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SOAR 2024 Exhibit Space #112

epa.gov/lmop



Questions





THANK YOU!