

LMOP Workshop: Tools & Resources

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LMOP Tools and Services

- Website – www.epa.gov/lmop
- Direct project assistance
- Technical and outreach publications
- Project and candidate landfill database
- Network of 900+ Partners
- Newsletter and listserv
- Support for ribbon cuttings/other PR
- Presentations at conferences
- State training workshops
- ***LMOP 15th Annual Conference, Project Expo & Partner Awards – January 2012***

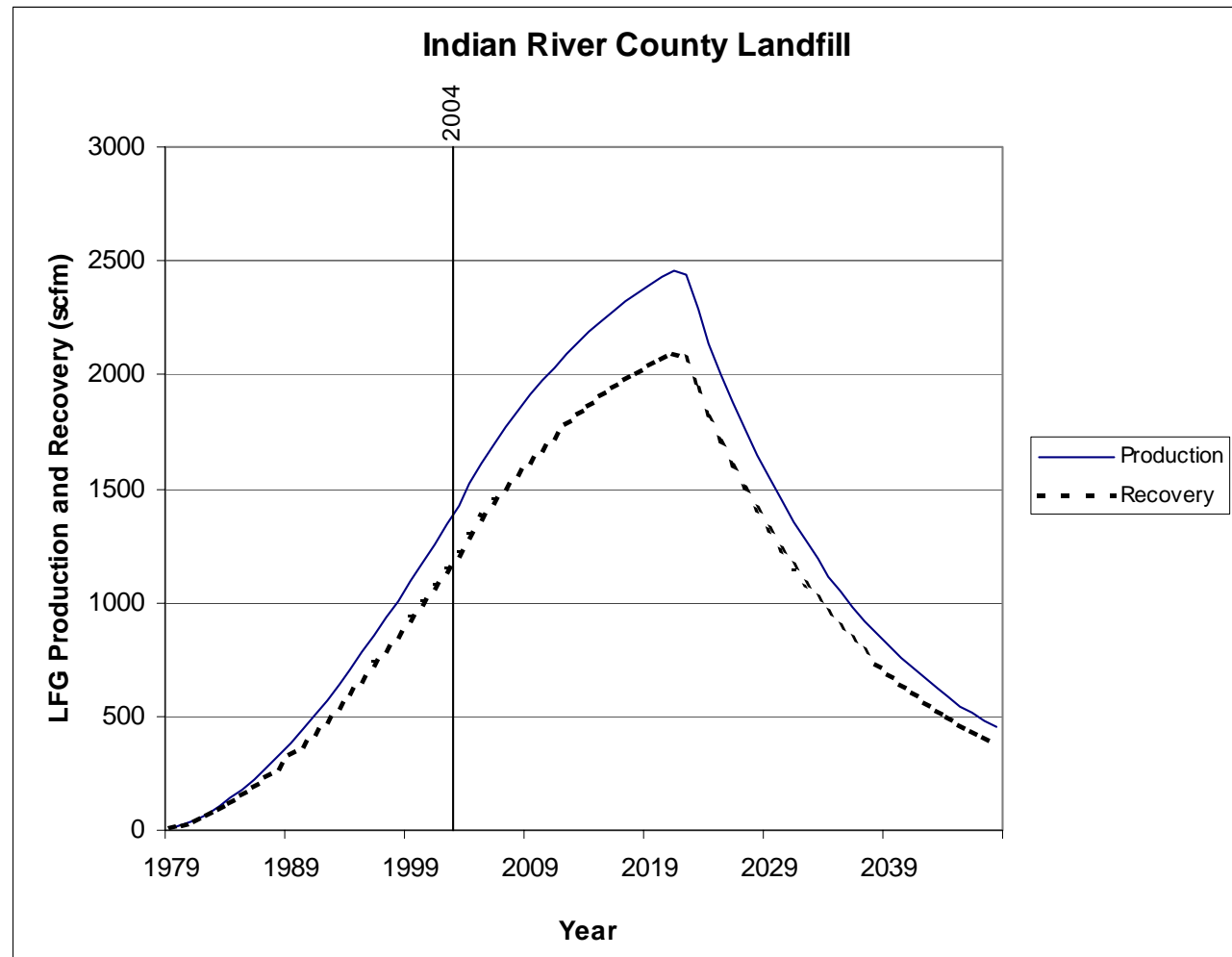


How Can We Work Together? Direct Project Assistance

- Analyze landfill resource – gas modeling
- Identify potential matches – *LMOP Locator*
- Assess landfill and end user facilities
- Look at project possibilities
 - Direct-use (boiler, heating, cooling, direct thermal)
 - Combined Heat & Power (engine, turbine, microturbine)
 - Electric (engine, turbine, microturbine)
 - Alternative Fuels (medium- or high-Btu, LNG, CNG)
- Initial feasibility analyses – *LFGcost*



Analyze Energy Potential from Landfills





LFGcost – Example Inputs and Outputs

INPUTS / OUTPUTS

Enter Landfill Name or Identifier: Example Landfill

Print Summary Report

Required User Inputs:

Type of Input Required		Input Data
Year landfill opened		1960
Year of landfill closure		2020
Area of landfill waste for LFG to be collected (acres)		100
Method for entering waste acceptance data [CHOOSE ONLY ONE METHOD]:	Average annual waste acceptance rate (tons/yr)	200,000
	Waste acceptance rate calculator (in WASTE worksheet)	Go to WASTE
	Annual waste disposal history (in WASTE worksheet)	Go to WASTE
LFG energy project type: (D)irect use, (T)urbine, (E)ngine, (L)NG, microtu(R)bine, small en(G)ine, or lea(C)hate evaporator?		E
Will LFG energy project cost include collection and flaring costs? (Y)es or (N)o		N
For leachate evaporator projects only: Amount of leachate collected (gal/yr)		
Year LFG energy project begins operation		2005
Expected LFG energy project lifetime (years)		15

Outputs:

Type of Output	Output Data
Economic Analysis:	
Average project size for projects NOT generating electricity: (million ft ³ /yr)	0.000
[based on actual LFG use] (ft ³ /min)	0.000
Average project size for projects generating electricity (k'wh/yr)	34,992,195
Total installed capital cost for year of construction (\$)	\$5,493,824
Annual costs for initial year of operation (\$)	\$696,312
Internal rate of return (%)	14%
Net present value at year of construction (\$)	\$569,101
Net present value payback* (years after operation begins)	13





LMOP Locator – Example End User Search Report

Landfill Name: Pine Ridge Recycling
 Landfill Address: 105 Bailey Jester Road, Griffin, GA 30224
 Latitude: 33.24
 Longitude: -84.12
 County Searched: Butts
 Distance Searched (miles): 10

Potential End User Facility Name	Distance (miles)	Facility Physical Address Line 1	Facility Physical City	Facility Physical State	Facility Physical Zip Code	Facility SIC	Facility Site ID	Emission Process Description	MACT Description	Facility Contact Name	Facility Contact Phone	Facility County	Facility Latitude	Facility Longitude
Tanimura & Antle Southeast	4.45	148 Riverview Park Rd	Jackson	GA	30233-6132	209903	1303553402				770-504-7100	Butts County	33.2130	-84.0510
Mercer University	6.34	390 Wilson Rd	Griffin	GA	30224-4548	822101	1325535235			Mr. G Hollums	678-547-6311	Spalding County	33.2293	-84.2323
STANDARD PRODS. CO.	6.45		GRIFFIN	GA	30223	3069	13255E S0713#0101		Printing, Coating & Dyeing Of Fabrics			Spalding County	33.2353	-84.2344
STANDARD PRODS. CO.	6.45	200 WILSON RD.	GRIFFIN	GA	30223	3069	13255T \$3715	Industrial Processes, Miscellaneous Manufacturing Industries, Miscellaneous Industrial Processes, See Comment**	Printing, Coating & Dyeing Of Fabrics			Spalding County	33.2353	-84.2344
Coca-Cola Bottling Co	7.87	410 E Taylor St	Griffin	GA	30223-3428	208601	1325510926			Mr. K Bobbitt	770-228-8636	Spalding County	33.2470	-84.2583
Griffin Light & Water Account	8.07	217 E Solomon St	Griffin	GA	30223-3313	912104	1325522318			Ms. B Harker	770-229-6403	Spalding County	33.2486	-84.2616
Griffin Lights Out Svc	8.10	120 N 6th St	Griffin	GA	30223-3334	491101	1325522319			Mr. J Jones	770-229-6406	Spalding County	33.2502	-84.2619
Robert Brooker Paving Co	8.23	114 1/2 W Solomon St	Griffin	GA	30223-3045	161101	1325545800			Mr. R Brooker	770-227-3938	Spalding County	33.2486	-84.2645



Ford County Landfill
Dodge City, Kansas

LMOP PROJECT EXPO

2010

Incentives for LFG Energy

The state of Kansas currently offers a number of incentives for renewable energy produced from landfill gas, including:

- ◆ Renewable Energy Property Tax Exemption
- ◆ Efficiency Kansas Revolving Loan Program
- ◆ Midwest Energy - Energy Efficiency Finance Program
- ◆ Renewable Electricity Production Tax Credit
- ◆ Renewable Energy Cogeneration Facility Tax Credit

More information can be found at

http://www.kcc.state.ks.us/energy/business_incentives.htm

Landfill Location



Ford County Landfill Overview

Open Year

1996

Closure Year

Estimated 50 years+

Waste in Place

527,000 tons

Design Capacity

4.7 million tons

Annual Acceptance

45,000 tons (2009)

Landfill Area

57 acres

Wells in Place

No

Methane Content of Gas

Estimated at 50%

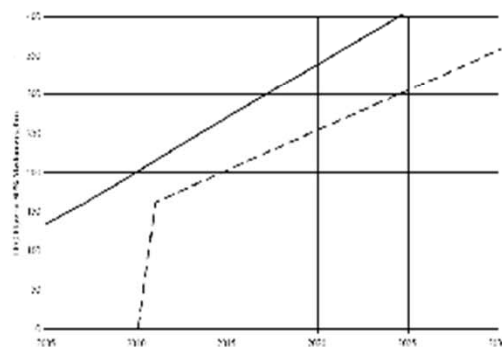
Ford County Landfill reports that it is not currently required to collect and combust landfill gas under the Landfill NSPS/EG.

Collection and utilization of the landfill gas at an estimated extraction rate of 160 scfm in 2011 would result in direct destruction of methane gas and avoided emissions from conventional electricity sources, equivalent to preventing emissions of 19,000 metric tons of CO₂e per year.

These emission reductions are equivalent to any one of the following annual environmental benefits for 2011:

- ◆ Annual greenhouse gas emissions from more than 3,600 passenger vehicles
- ◆ Carbon sequestered annually by 4,060 acres of pine or fir forests
- ◆ CO₂ emissions from more than 2,100,000 gallons of gasoline consumed
- ◆ CO₂ emissions from more than 44,300 barrels of oil consumed

Landfill Gas and Energy Potential



— Gas Generation - - - - Gas Recovery
LandGEM Recovery Estimation: 160 scfm (in 2011)

Contact

Ford County Landfill
10349 110 Road
Dodge City, KS 67801

Ford County (Landfill Owner)
Edward W. Elam, LLS, ICM-CM
County Administrator/Surveyor
100 Gunsmoke
Dodge City, KS 67801
620.227.4670
elam@fordcounty.net



NEW

LMOP's LFG Energy Project Development Handbook!



Looking for an easy-to-use, one-stop source for all your questions about developing a landfill gas (LFG) energy project? The U.S. Environmental Protection Agency's Landfill Methane Outreach Program (LMOP) has released a new, online *Project Development Handbook!*

LMOP developed the Web-based handbook to meet the needs of its Partners and others interested in LFG energy development, including landfill owners, project developers, energy service providers, corporate energy end users, and state and local governments.

The easy-to-use handbook gives step-by-step guidance about the LFG energy project development process, and includes the most up-to-date technical, regulatory, and practical information available. The handbook includes chapters (in PDF format) on the following topics that can be read online or downloaded and printed, if needed:

- LFG energy basics
- Landfill gas modeling
- Project technology options
- Project economics and financing
- Contracts, regulations, and permitting
- Selecting and working with project partners

Each chapter includes links to LMOP technical tools and resources as well as other EPA and third-party sites where users can find more detailed or specialized information, based on their own needs and interests.

To access the Project Development Handbook, visit:
www.epa.gov/lmop/res/handbook.htm



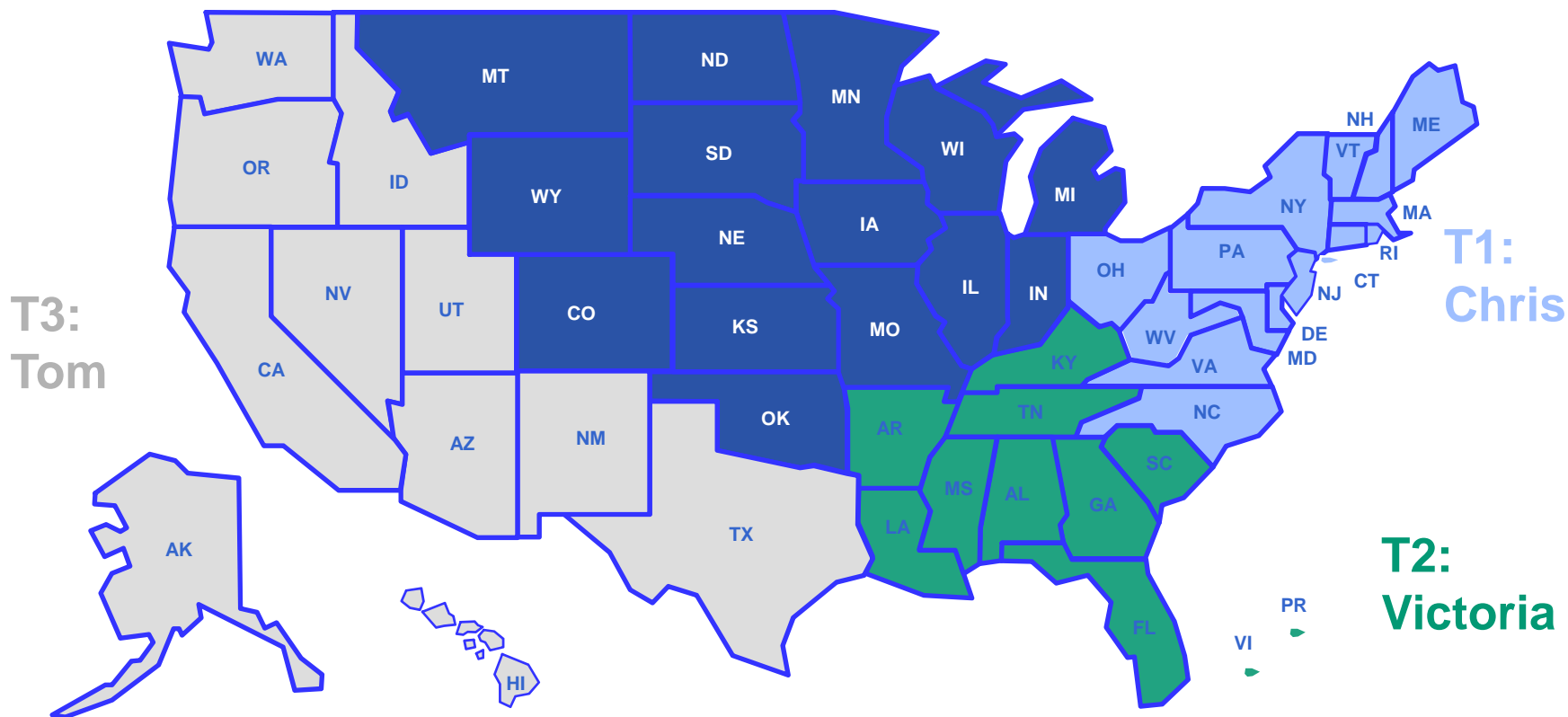
The U.S. EPA's Landfill Methane Outreach Program (LMOP) is a voluntary assistance and partnership program that promotes the use of landfill gas as a renewable, green energy resource. Landfill gas contains methane, a potent heat-trapping gas that can be captured and used to power businesses, greenhouses, vehicles, and homes. By finding ways to use this gas, LMOP helps businesses, states, energy providers, and communities protect the environment and build a sustainable future.



For More Information

www.epa.gov/lmop

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**T2:
Victoria**

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(202) 343-9795*

The Global Methane Initiative

Building on the Success of the Methane to Markets Partnership



What is Global Methane Initiative?

- International public-private partnership to reduce greenhouse gas emissions by increasing the capture and use of methane.
- Estimated to reach 180 MMTCO₂ reductions annually by 2015.

OBJECTIVES

- Advance the recovery and use of methane while:
 - Enhancing economic growth
 - Promoting energy security
 - Improving local air quality and public health.

BENEFITS

- Stabilization/Decline in Methane Concentrations will result in:
 - Sustainability
 - Energy security
 - Health and safety
 - Profitability



Cost-Effective Projects Recover and Use Methane

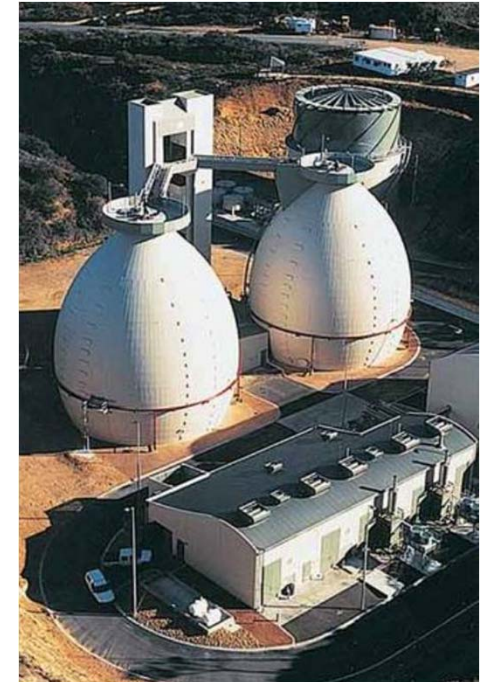
Coal Mines



Oil and Gas Systems



New sector: Wastewater



Landfills



Livestock Waste

Global Methane Initiative

38 Partner Countries

Argentina	Japan
Australia	Kazakhstan
Brazil	Korea
Bulgaria	Mexico
Canada	Mongolia
Colombia	Nicaragua
Chile	Nigeria
China	Pakistan
Dominican Rep.	Peru
European Comm.	Philippines
Ecuador	Poland
Ethiopia	Russia
Finland	Serbia
Germany	Thailand
Georgia	Turkey
Ghana	Ukraine
India	United Kingdom
Indonesia	United States
Italy	Vietnam



- Private companies, multilateral development banks and other relevant organizations participate by joining the **Project Network – over 950 organizations now participating**

Project Support

Three Main Types of Project Support:

- **Training and technical support:** Assist with project identification, assessment, design, end-user identification, and development
- **Financing:** Work with international agencies and the private sector to identify financing
- **Outreach:** Work with project partners to communicate project benefits on local and national levels

Landfill Sector



- 28 countries are on the Subcommittee, led by chairs from Argentina, Colombia, and the US
- 9 countries have developed country specific action plans, and more are being developed.
- More than 650 landfills are now listed in the International Landfill Database.