

# *14<sup>th</sup> Annual LMOP Conference & Project Expo*



***Your LMOP... Rachel Goldstein,  
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Tom Frankiewicz, & Chris Godlove***

***U.S. Environmental Protection Agency  
Landfill Methane Outreach Program (LMOP)***





# *Conference Highlights*

- Yet another RECORD breaking year – 654 pre-registered attendees!!!

**Thanks!!!**

- Happenings

- *California Session*
- *Regulatory Session*
- *Awards Luncheon*

- Reception at the Baltimore Aquarium



# Thank You Sponsors!

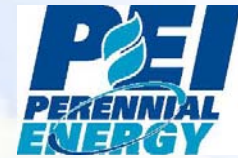
## LMOP Capitol Club



## LMOP Friend AXD

AXD Service Industries Corp.

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# *Exhibits and Expo*

*Be sure and visit the 86 Exhibits  
(record) and 11 Project Expo  
Landfills!!!*





# *Project Expo Landfills*

## Arizona

- *Cinder Lake LF*
- *Rio Rico LF*

## Georgia

- *Crisp County-US  
41 S Sites 1 & 2*

## Indiana

- *Monroe County LF*

## Kansas

- *Ford County LF*

## Kentucky

- *Glasgow Regional LF*

## Missouri

- *Black Oak R&D LF*
- *Central Missouri LF*
- *Newton-McDonald  
County LF*

## Virginia

- *Livingston LF No. 2*

## Washington

- *Port Angeles LF*



# *State of the LFGGE Industry*

*(December 2010)*

- **541 operational projects currently**
  - 13.7 billion kWh of electricity produced and 100 billion cubic feet of gas delivered in '10
- **At least 50 projects under construction for '11 & more in the advanced planning stages**
- **At least 510 candidate landfills with 1,160 MW of potential capacity *or* 210 billion cubic feet/yr of LFG for direct use AND ~13 MMTCE in potential emission reductions!**



# *Estimated 2010 Environmental and Energy Benefits*

- **Environmental:**

- Carbon sequestered annually by **20,600,000 acres of pine or fir forests**, or
- CO<sub>2</sub> emissions from more than **224,900,000 barrels of oil consumed**, or
- Annual greenhouse gas emissions from nearly **18,500,000 passenger vehicles**, or
- CO<sub>2</sub> emissions from burning **505,000 railcars' worth of coal**.

- **Energy:**

- Powering more than **994,000 homes** and heating nearly **720,000 homes**



# '10 New LFGE Projects and Expansions Online

- \* Morgan County Regional LF, AL
- \* City of Glendale LF, AZ
- \* Calabasas SLF, CA
- Lamb Canyon Disposal, CA
- \* **Cherry Island LF, DE**
- \* Perdido LF, FL
- \* Superior LF & Recycling, GA
- \* **Woodland RDF, IL**
- \* Earthmovers LF, IN
- \* **Liberty Landfill, IN**
- \* Newton County LF, IN
- \* Oak Grove Landfill, KS
- \* Rolling Meadows LF, KS
- \* North Baton Rouge LF, LA
- \* River Birch Landfill, LA
- \* Reich's Ford Road SLF, MD
- \* Northern Oaks R&DF, MI
- Prairie View & Lamar LFs, MO
- \* Auburn SLFs #1 & #2, NY
- Ava Landfill, NY
- \* Bath Landfill, NY
- \* Chautauqua County LF, NY
- \* Fulton County LF, NY
- \* Hoffman Road SLF, OH
- \* Riverbend Landfill Co., OR
- \* Alliance SLF, PA

Orange = project expansion

\* = LMOP-assisted





# *'10 New LFGE Projects and Expansions Online (cont.)*

- \* **Georgetown County LFs, SC**
- \* **Westside Sanitary LF, TX**
- \* **Frederick County LFs, VA**
- \* **King George LF, VA**
- \* **Montgomery Regional SWA LF, VA**
- \* **Rockingham County LF, VA**
- \* **Springfield Road LF, VA**
- \* **Cedar Hills Regional LF, WA**

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# '11 Under Construction Projects & Expansions

- \* Coffee County SLF, AL
- \* Magnolia Subtitle D LF, AL
- \* Eco-Vista LLC, AR
- Tangerine Road MSWLF, AZ
- \* Bakersfield Metropolitan SLF (BENA), CA
- \* Chiquita Canyon SLF, CA
- \* Olinda Alpha SLF, CA
- \* Ostrom Road LF, CA
- \* Larimer County LF, CO
- \* Jones Crossroads LF, DE
- \* Naples SLF Collier County, FL
- \* Zemel Road Landfill, FL
- \* Dougherty County Fleming/Gaissert Road, GA
- \* SR247 MSW LF, GA
- Des Moines County SLF, IA
- Wheatland Prairie RDF, IL
- \* Prairie View RDF, IL
- \* Eagle Valley Landfill, MI
- \* Venice Park R&DF, MI
- \* East Central SLF, MN
- Spruce Ridge LF, MN
- \* Black Oak R&D SLF, MO
- \* Fred Weber SLF, MO
- \* Fulton SLF, MO

Orange = project expansion

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# '11 Under Construction Projects & Expansions (cont.)

- \* St. Joseph City SLF, MO
- Billings Regional LF, MT
- \* Davidson County LF, NC
- \* Gaston County LF, NC
- \* Piedmont SLF, NC
- \* Sampson County LF #2, NC
- \* Watauga County LF, NC
- \* Sarpy County LF, NE
- \* Salem County SLF, NJ
- \* Apex Regional LF, NV
- Lockwood Regional LF, NV
- \* Ontario County SLF, NY
- \* Erie County SLF, OH
- \* Hancock County SLF, OH
- \* WMI Suburban R&D LF, OH
- \* Greenridge Reclamation, PA
- \* Lanchester LF, PA
- \* Mostoller Landfill, Inc., PA
- \* Seccra LF, PA
- Seneca LF, PA
- \* Berkeley Co. LFs, SC
- \* Wellford LF, SC
- \* Bi-County LF, TN

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# '11 Under Construction Projects & Expansions (cont.)

- \* C M Hinton Landfill, TX
- \* Camelot Landfill, TX
- \* Castle Drive Landfill, TX
- \* Mesquite Creek LF, TX
- \* Newport News SWDF No. 2, VA
- \* SPSA Regional LF, VA
- \* Brattleboro Landfill, VT
- Chittenden Co. LF, VT
- \* Roosevelt Reg. MSWL, WA
- Dane Co. #2-Rodefald, WI
- \* Orchard Ridge RDF, WI
- Ridgeville Site II, WI
- Veolia ES Emerald Park LF, WI
- Veolia ES Hickory Meadows LF, WI
- \* City of Charleston LF, WV

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# ***LMOP Partner and Endorser Update***

- **Currently 968 Partners and Endorsers**
  - 669 Industry Partners
  - 110 Energy Partners
  - 40 State Partners
  - 119 Community Partners
  - 30 Endorsers
- **90 new Partners joined in 2010**
  - 71 Industry Partners
  - 8 Energy Partners
  - 1 State Partner
  - 8 Community Partners
  - 2 Endorsers



# ***LMOP 2010 Accomplishments***

- Completely revamped the program brochure**
- New State Resources Web page**
- New detailed annual cash flow report in *LFGcost***
- PublicWorksOnline article (Jan '11)**
- Handout on regulations affecting LFGE**
- Sent 57 listservs for RFPs/RFQs, funding announcements**

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### State Resources

To aid those searching for state-specific information regarding permits and policies that may affect landfill gas (LFG) energy projects, LMOP has listed key state organizations and their websites in the table below. These organizations provide a range of functions and services and varying types of information. The list is not intended to be comprehensive but to represent the main state agencies and departments that provide information related to topics such as air permitting, energy policy planning, and public utility regulation. In the table below, you can also access state-specific information that resides on LMOP's website for LMOP State Partner contacts, landfills and LFG energy projects, and funding incentives.

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

State	Organizations	Related LMOP Resources
AK	<a href="#">Alaska Department of Environmental Conservation</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (33K, Download Microsoft Excel Viewer)</li> <li>Funding incentives</li> </ul>
	<a href="#">Alaska Energy Authority</a>	
	<a href="#">Alaska Industrial Development and Export Authority</a>	
	<a href="#">Regulatory Commission of Alaska</a>	
AL	<a href="#">State of Alabama, Department of Economic and Community Affairs, Energy Division - LMOP Partner Contact</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (45K, Download Microsoft Excel Viewer)</li> <li>Funding incentives</li> </ul>
	<a href="#">Alabama Department of Environmental Management</a>	
	<a href="#">Alabama Public Service Commission</a>	
AR	<a href="#">Arkansas Department of Environmental Quality</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (39K, Download Microsoft Excel Viewer)</li> </ul>
	<a href="#">Arkansas Alternative Energy Commission</a>	
	<a href="#">Arkansas Economic Development Commission</a>	
	<a href="#">Arkansas Development Finance Authority</a>	
	<a href="#">Arkansas Public Service Commission</a>	
AZ	<a href="#">Arizona Department of Environmental Quality</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (41K, Download Microsoft Excel Viewer)</li> <li>Funding incentives</li> </ul>
	<a href="#">Arizona Commerce Authority</a>	
	<a href="#">Arizona Corporation Commission</a>	
CA	<a href="#">California Energy Commission - LMOP Partner Contact</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (135K, Download Microsoft Excel Viewer)</li> <li>Funding incentives</li> </ul>
	<a href="#">California Environmental Protection Agency</a>	
	<a href="#">CalRecycle - Department of Resources Recycling and Recovery</a>	
	<a href="#">California Air Resources Board</a>	
	<a href="#">California Public Utilities Commission</a>	
CO	<a href="#">Colorado Department of Public Health and Environment</a>	<ul style="list-style-type: none"> <li>Landfills and projects (XLS) (41K, Download Microsoft Excel Viewer)</li> <li>Funding incentives</li> </ul>
	<a href="#">Office of Economic Development and International Trade</a>	
	<a href="#">Colorado Public Utilities Commission</a>	



Landfill Methane Outreach Program  
and Landfill Gas Energy:

# The Power of Partnership







Normal Page Layout Page Break Preview Custom Views Full Screen  
 Ruler Formula Bar Gridlines Headings Message Bar  
 Zoom 100% Zoom to Selection  
 New Window Arrange All Freeze Panes Unhide  
 Split Hide Synchronous Scrolling  
 View Side by Side Reset Window Position  
 Save Switch Workspace Windows  
 Macros

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**Detailed Cash Flow Analysis**

Landfill Name or Identifier: Example Landfill  
 Project Type: Standard Reciprocating Engine-Generator Set  
 Expected LFG energy project lifetime (years): 15

Cash Flow Inputs:	Construction Year	Operating Years															
	Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total installed capital cost (\$)	8,811,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total annual cost (\$)	-	1,017,600	1,043,800	1,070,600	1,098,000	1,126,100	1,154,800	1,184,200	1,214,300	1,245,100	1,276,700	1,302,700	1,329,500	1,357,100	1,385,500	1,414,800	
Landfill gas sold to direct use (ft³)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Net electricity produced (KWh)	-	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	28,960,600	
CHP hot water/steam produced (million Btu)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
High Btu gas produced (million Btu)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Leachate disposed (gallons)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Landfill gas utilized (ft³)	-	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	692,351,200	
Direct methane reductions (MMTCE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Avoided CO <sub>2</sub> emissions (MMTCE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Economic Analysis:</b>																	
Year of Operation	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Revenue</b>																	
Direct or High Btu Gas sales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Electricity sales	-	1,737,600	1,772,400	1,807,800	1,844,000	1,880,900	1,918,500	1,956,900	1,996,000	2,035,900	2,076,600	2,118,200	2,160,500	2,203,700	2,247,800	2,292,800	
CHP hot water/steam sales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Operating Costs</b>																	
Greenhouse gas credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Renewable electricity credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Leachate credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gas royalty	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Capital Costs</b>																	
Down payment	1,762,300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Construction grant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Loan (principle)	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	1,050,600	-	-	-	-	-	-	
Loan (interest)	564,000	525,000	483,000	437,600	388,500	335,600	278,400	216,600	149,900	77,800	-	-	-	-	-	-	
Equity payment	496,600	525,500	567,600	613,000	662,000	715,000	772,200	834,000	900,700	972,700	-	-	-	-	-	-	
Principle remaining	7,049,400	6,562,800	6,037,200	5,469,600	4,856,600	4,194,600	3,479,600	2,707,400	1,873,400	972,700	-	-	-	-	-	-	
<b>Taxes</b>																	
Depreciation	-	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	587,400	
Tax liability	-	(392,400)	(341,800)	(287,800)	(230,000)	(168,200)	(102,100)	(31,400)	44,400	125,500	212,500	228,000	243,600	259,200	274,800	290,600	
Tax before credit	-	(137,400)	(119,600)	(100,700)	(80,500)	(58,900)	(35,700)	(11,000)	15,500	43,900	74,400	78,800	85,200	90,700	96,200	101,700	
Tax credit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Net tax	-	-	-	-	-	-	-	-	15,500	43,900	74,400	78,800	85,200	90,700	96,200	101,700	
<b>Net Income</b>																	
Net income	(564,000)	(392,400)	(341,800)	(287,800)	(230,000)	(168,200)	(102,100)	(31,400)	28,800	81,600	138,100	148,200	158,300	168,500	178,600	188,900	
Cash flow	(2,812,300)	(330,500)	(322,000)	(313,300)	(304,600)	(295,800)	(286,900)	(277,900)	(268,400)	(258,700)	(248,600)	(238,100)	(227,200)	(215,900)	(204,300)	(192,400)	
Internal rate of return	-2%																



# ***Global Methane Initiative '10 Landfill Accomplishments***

- **Successful partnership Expo in India – showcasing over 50 global landfill opportunities**
- **Reductions – Argentina, China, Ukraine**
- **Prepared 21 landfill reports (assessment studies, pre-feasibility studies, and desk top evaluations ); 7 study tours**
- **Piloting direct-use project assistance in Latin America**
- **Country-specific LandGEM models – Colombia, Philippines, Thailand**
- **ILD has over 700 LFs**



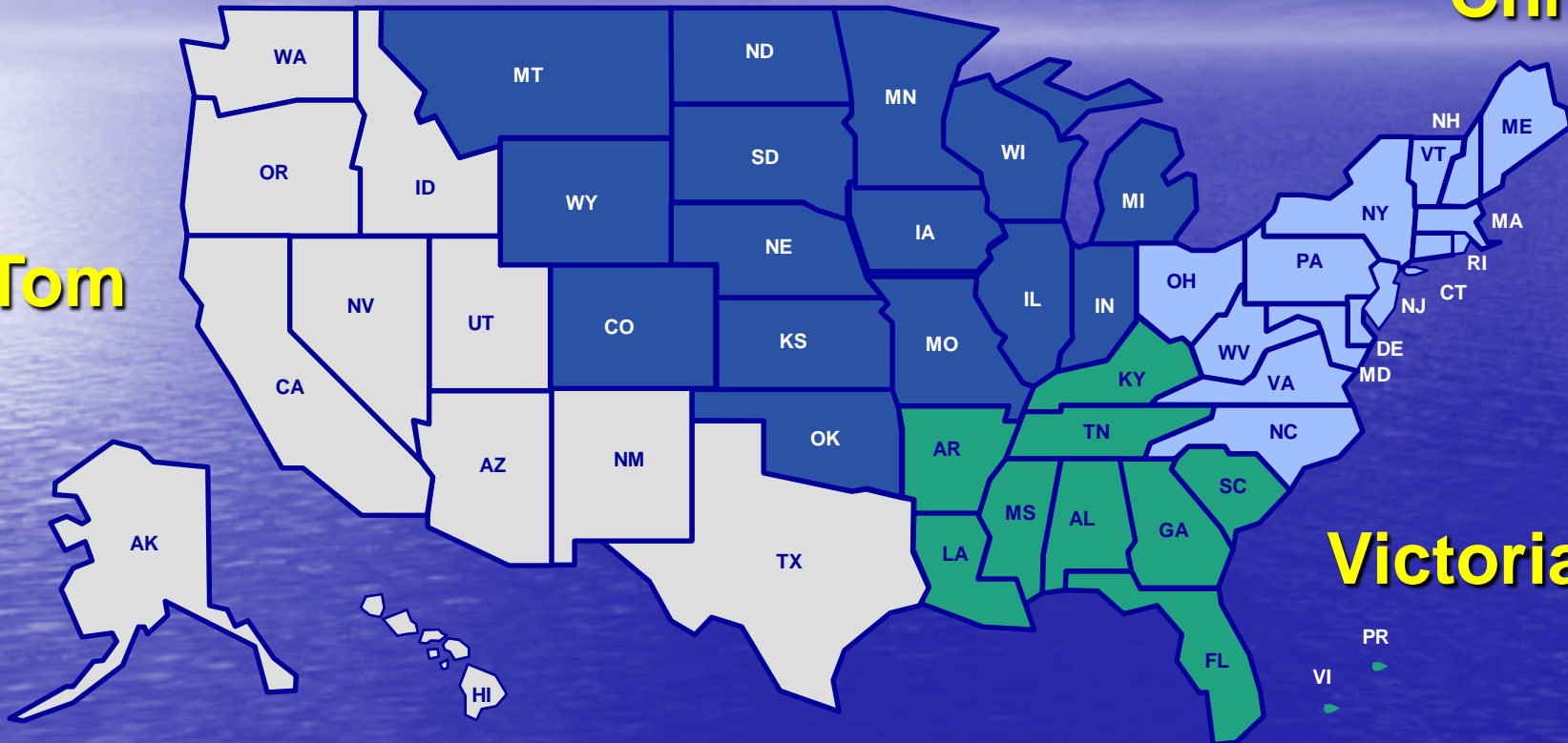
# Your LMOP...

[www.epa.gov/lmop](http://www.epa.gov/lmop)

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