

LMOP Webinar

Renewable Natural Gas from LFG
and Sustainability at L'Oréal

December 12, 2018



Welcome and Agenda

Agenda

LMOP and Renewable Natural Gas

Kirsten Cappel, EPA LMOP

L'Oréal Operations Americas

Jay Harf, L'Oréal USA

Questions and Answers

Wrap Up and Poll Questions

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LMOP and Renewable Natural Gas



Introduction to LMOP

U.S. EPA's Landfill Methane Outreach Program (LMOP):

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

Mission: To work cooperatively with industry and stakeholders to reduce or avoid methane emissions from landfills by encouraging the recovery and beneficial use of biogas generated from organic municipal solid waste.

LMOP Partners (as of September 2018)

There are more than 1,000 LMOP Partners

Benefits of LMOP Partnership:

- Opportunities to participate in LMOP events, webinars, etc.
- Recognition for commitment to renewable energy
- Use of LMOP logo on Partner website (within guidelines)
- LMOP support for groundbreaking or ribbon cuttings
- Information about new developments, events, and other LFG related information

To join the Partnership, visit our website at:
www.epa.gov/lmop/join-landfill-methane-outreach-program

EPA Voluntary Programs Involved in RNG



Encourages the recovery and beneficial use of biogas generated from organic municipal solid waste.



Encourages oil and natural gas companies to adopt cost-effective technologies and processes that improve operational efficiencies and reduce methane emissions.



Promotes the use of biogas recovery systems to reduce methane emissions from livestock waste.

Background: What is RNG?

- Renewable natural gas (RNG) is a “term of art” used to describe biogas that has been upgraded for use in place of traditional fossil natural gas
- Biogas for RNG production can come from MSW landfills, and digesters at water recovery facilities, livestock farms, food production facilities and organic waste management operations
- RNG has many end uses: in thermal applications (e.g., heating, drying, steam, hot water), to generate electricity, for vehicle fuel or as a bio-product feedstock
- RNG can be used locally at the site where the gas is created or it can be injected into natural gas transmission or distribution pipelines

Waste Types Used to Make RNG

Municipal Solid Waste



Sewage Sludge



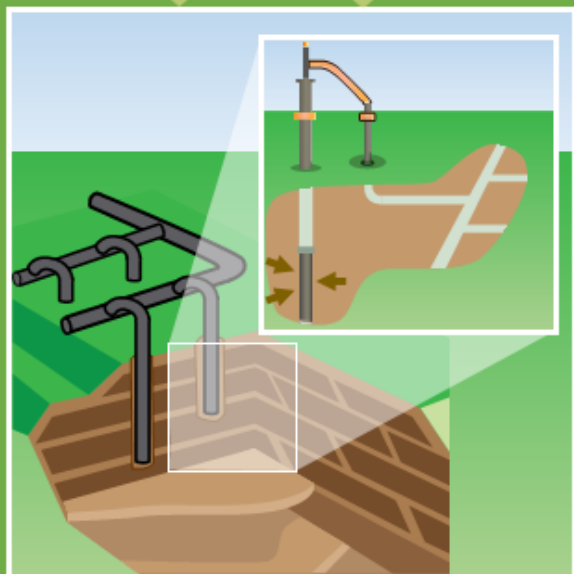
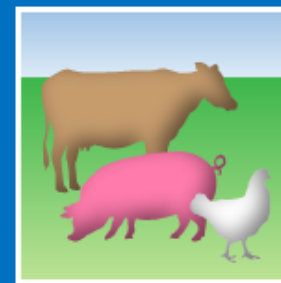
Yard and Crop Wastes



Food and Food Processing Wastes



Manure

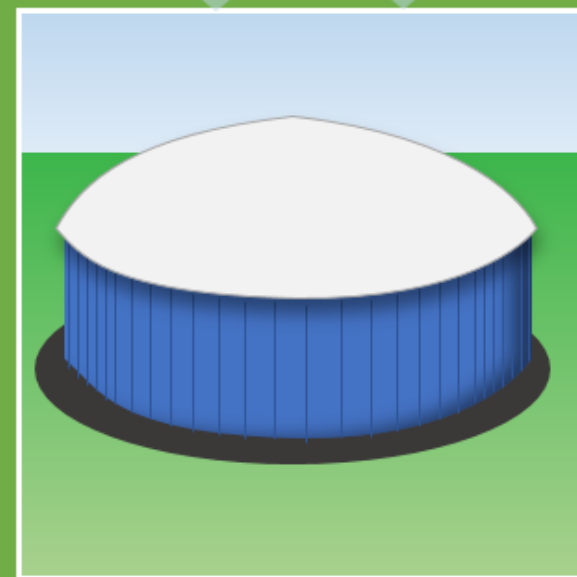


Landfills

Biogas made from organic sources through anaerobic processes contains 45–65% methane.

Biogas is treated to remove moisture, particulates, contaminants and other gases (CO_2 , O_2 , N_2 and VOCs); this increases the methane content to 90% or greater—typically 96–98% for pipeline injection.

The resulting product is **renewable natural gas (RNG)**.



Anaerobic Digesters

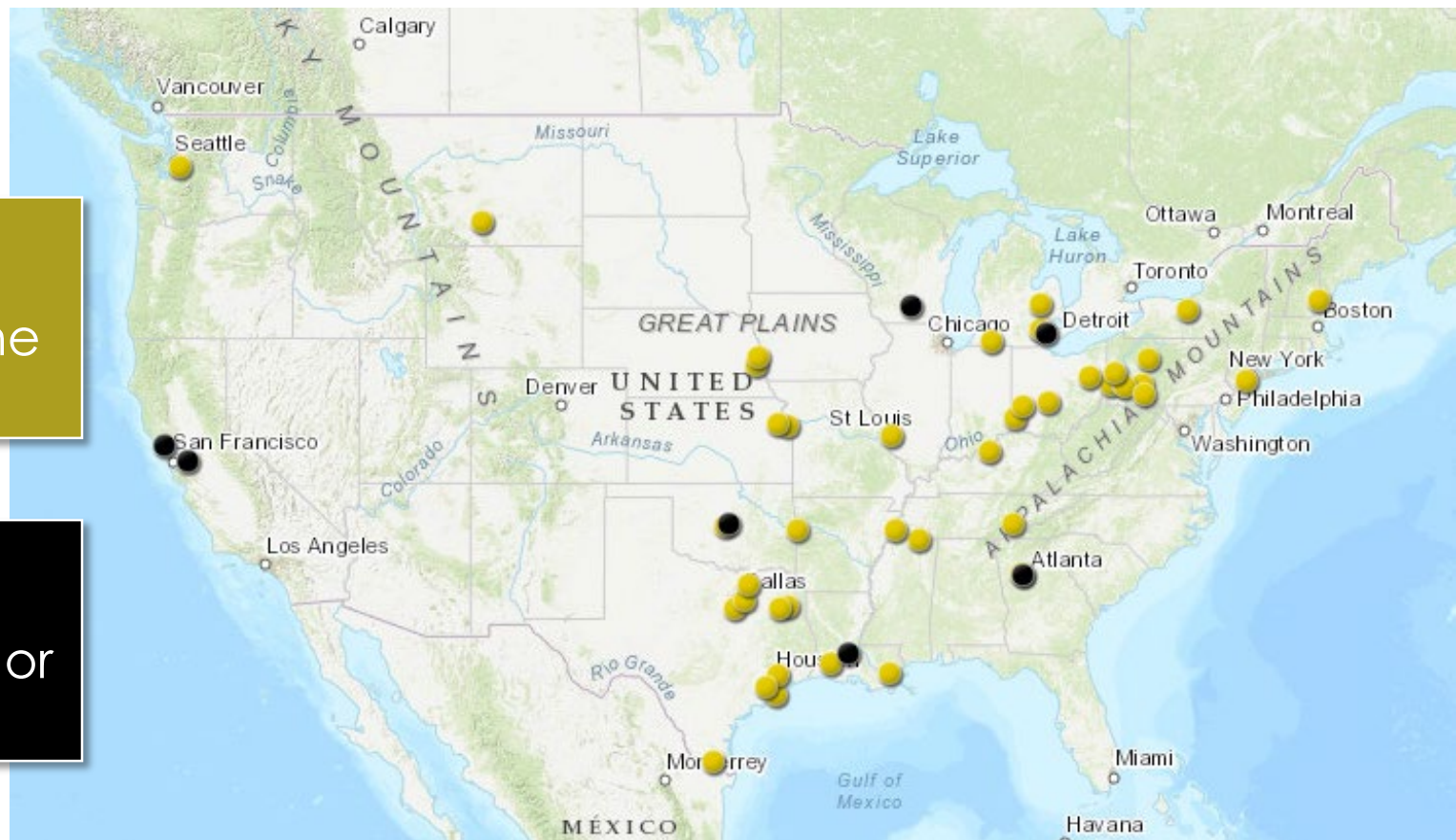
Map of Landfill Gas to RNG Projects

44

RNG – Pipeline injection

7

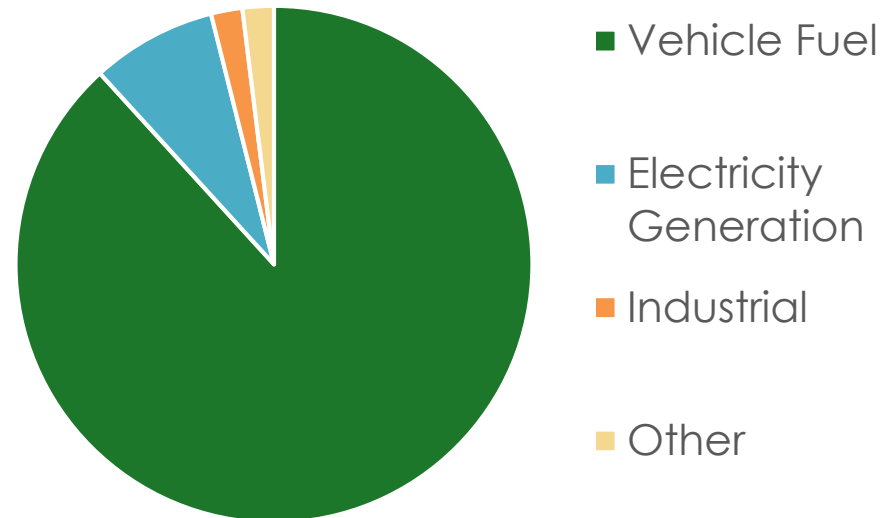
RNG – Onsite or local use



Landfill Gas to RNG End Uses

- As of September 2018, there are 51 operational LFG to RNG projects
- The majority of those projects are producing RNG for use as vehicle fuel
 - 38 inject the RNG into natural gas pipeline
 - 7 use the fuel locally (at or near the site)

LFG to RNG Projects by End Use



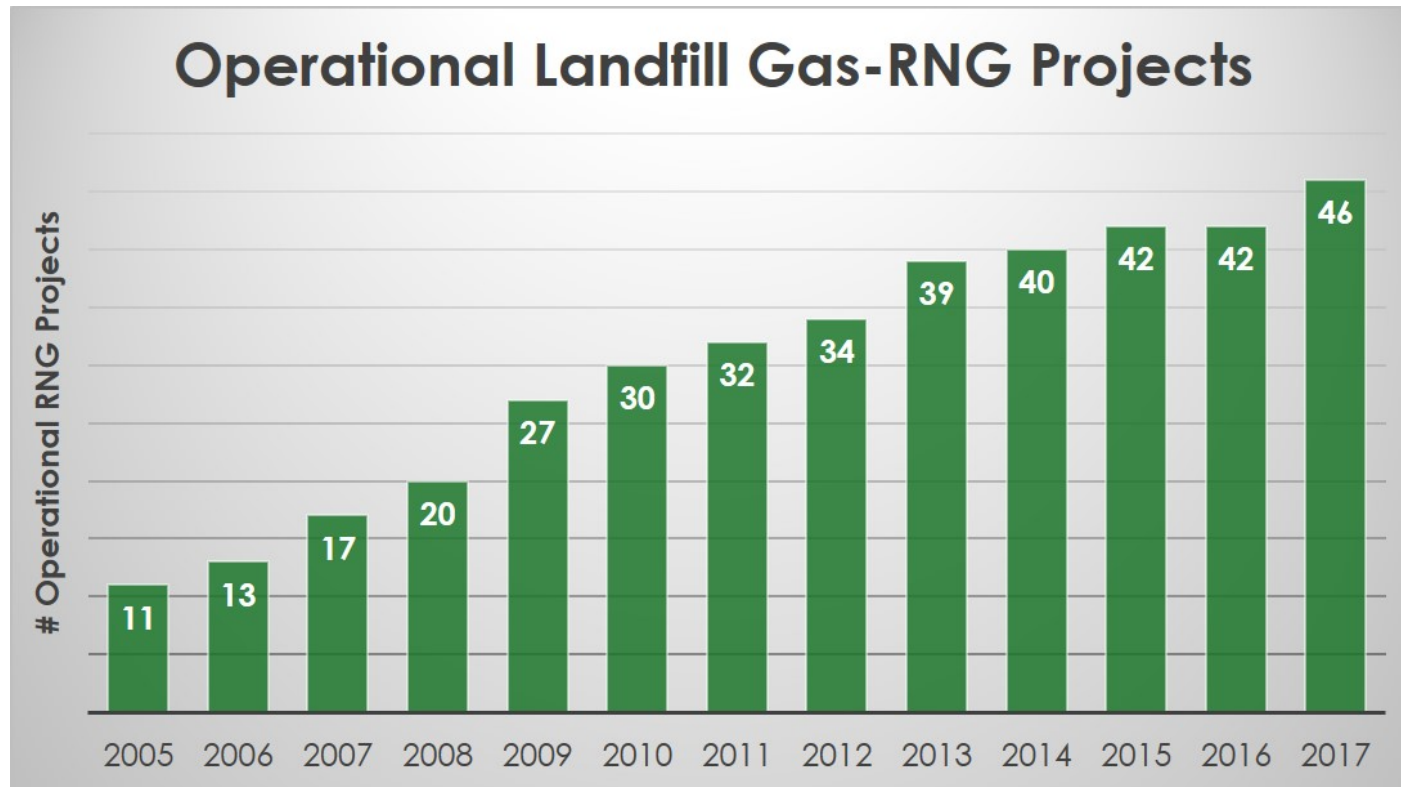
Example uses of RNG as vehicle fuel:

- Waste hauling and collection trucks
- County vehicles
- City buses



Landfill Gas to RNG Projects Over Time

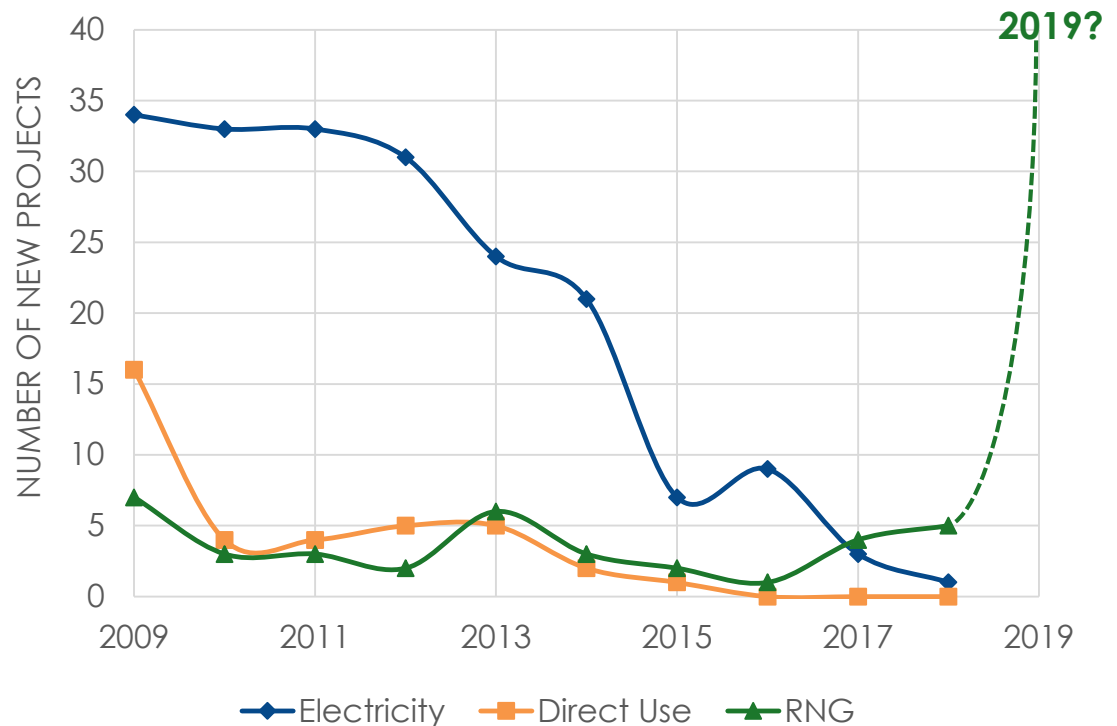
The first recorded Landfill Gas – RNG project came online in 1975 at the Palos Verdes Landfill in CA



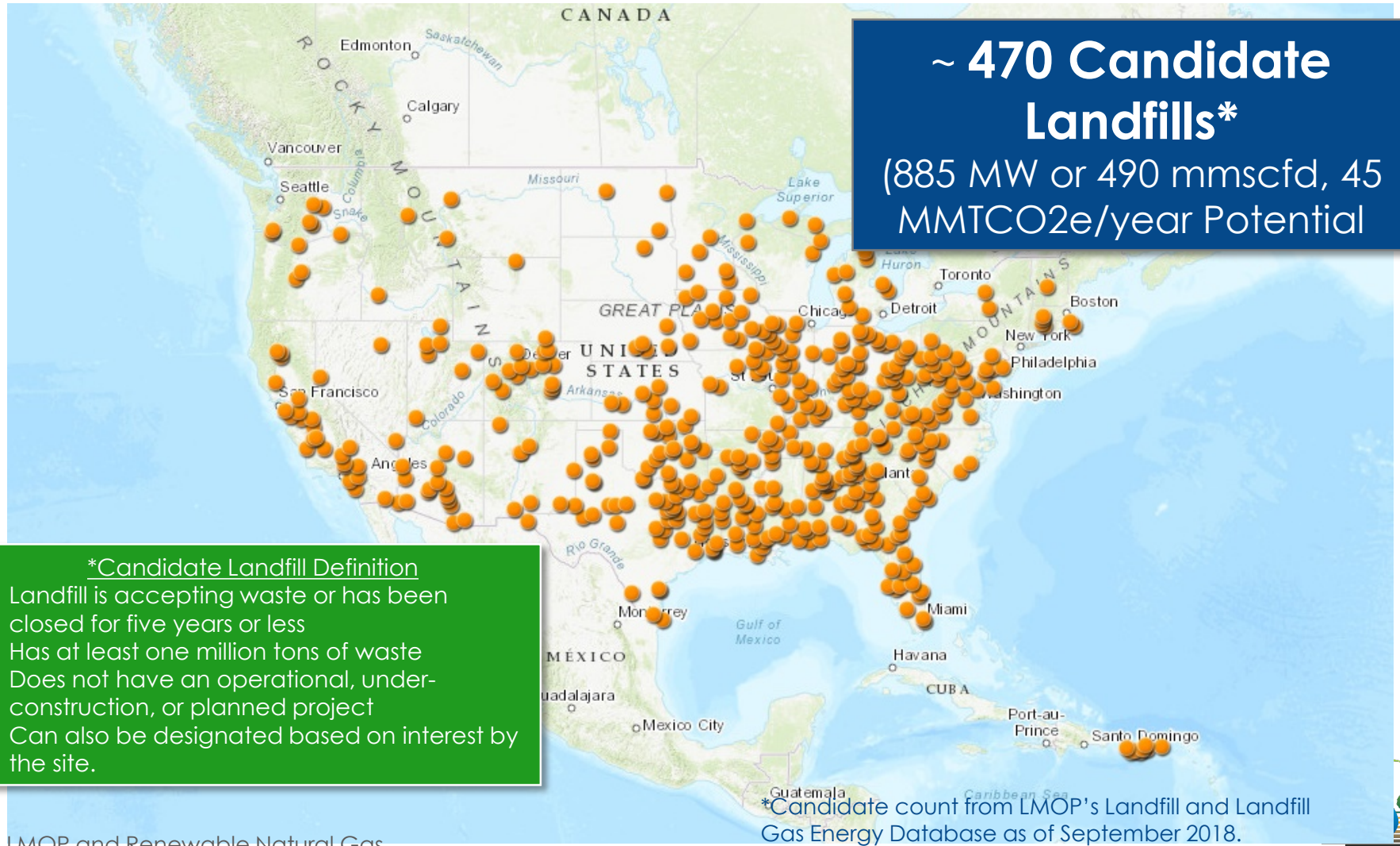
Growth of New Landfill Gas Energy Projects

- LMOP Database identifies **39 planned or under-construction RNG projects**
- The majority have a planned start date within the next year
- If all come online as planned, the number of operational LFG to RNG projects would nearly double

NEW LFG ENERGY PROJECTS BROUGHT ONLINE (ALL TYPES)



LMOP Candidate Landfills



Existing Resources on RNG

- LFGcost-Web: High Btu and onsite CNG module
 - A preliminary financial feasibility model for LFG energy projects
 - Available at <https://www.epa.gov/lmop/list-publications-tools-and-resources>
- RNG Flow Rate Tool (NEW)
 - A tool to help landfills quickly estimate normalized gas flows for RNG projects
 - Available at <https://www.epa.gov/lmop/list-publications-tools-and-resources>
- Project Development Handbook
 - Basic information about LFG energy project development
 - Available at <https://www.epa.gov/lmop/landfill-gas-energy-project-development-handbook>
- Listserv messages
 - Contact us via program websites to sign up

Consolidated RNG Webpage – Under Development

- Basic information about RNG
- Map and database of projects
- Webinar and event recordings
- Links to papers
- Links to EPA voluntary programs
 - AgSTAR, LMOP, Natural Gas STAR, Green Power Partnership

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L'Oréal Operations Americas

Jay Harf, L'Oréal USA

Questions and Answers

Wrap Up and Poll Questions

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L'Oréal Operations Americas

Jay R. Harf

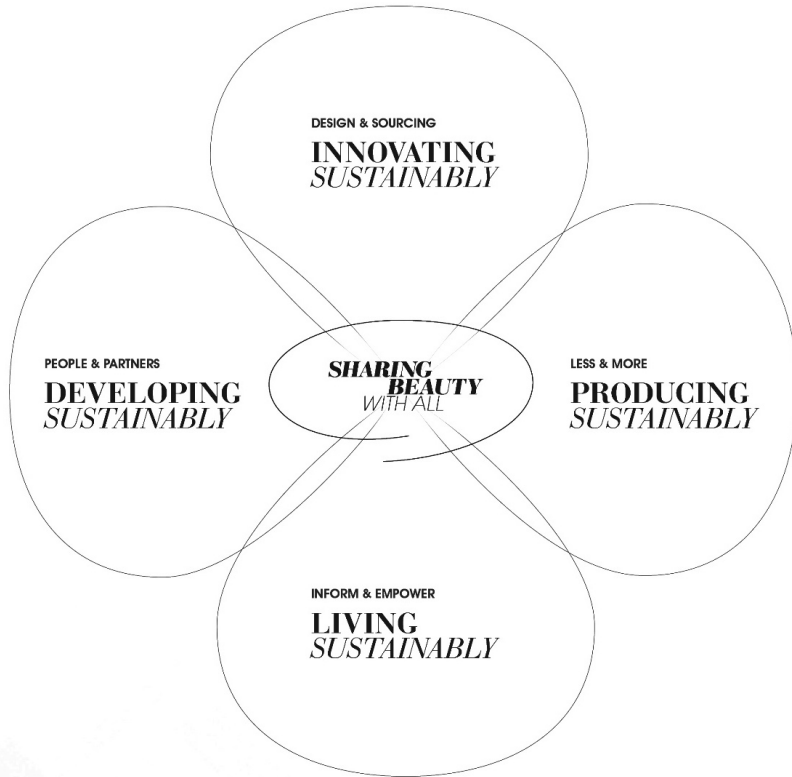
Vice President

Environment, Health, Safety & Sustainability



How We Got Here

Sharing Beauty With All: 2020 Strategy



Producing Sustainably

Reduce our environmental footprint (CO₂, Water, Waste) by **60%** for our Operations facilities

Producing Sustainably

Path to Carbon Neutrality – Energy Portfolio



17 renewable energy projects



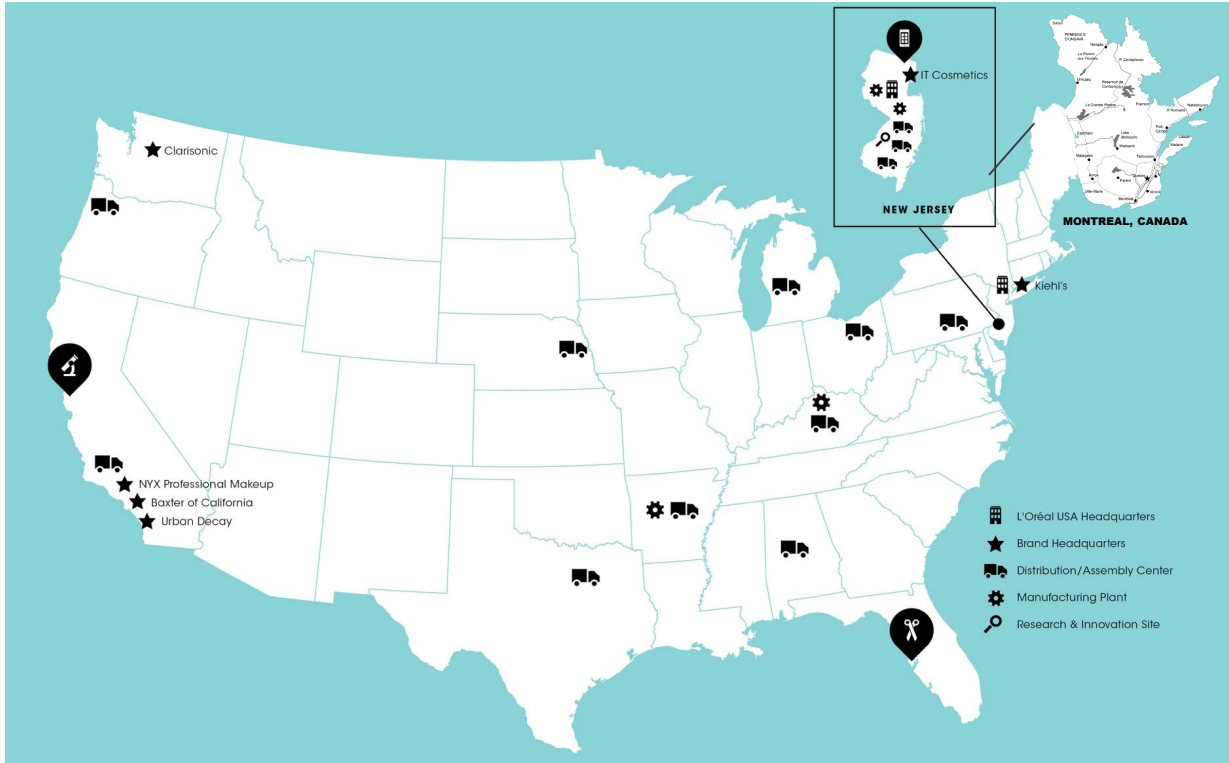
45 miles of solar panels



84% reduction in carbon emissions



100% renewable electricity



USA OPERATIONS DIRECTED BIOGAS PROJECT 2018 – SUSTAINABLE INNOVATION

Reduction of 20% of global CO₂ Footprint for L'Oréal

1

Anaerobic Digester -

- Capital / Time Investment Intensive
- Feed Stock Concerns
- Cost of Stock / Supply of Stock
- Maintenance / Headcount
- Electricity Consumption Concerns

2

Carbon Offsetting -

- Not recommended by Group
- Reputation for “Greenwashing”
- Continuing to burn brown gas
- Need Project

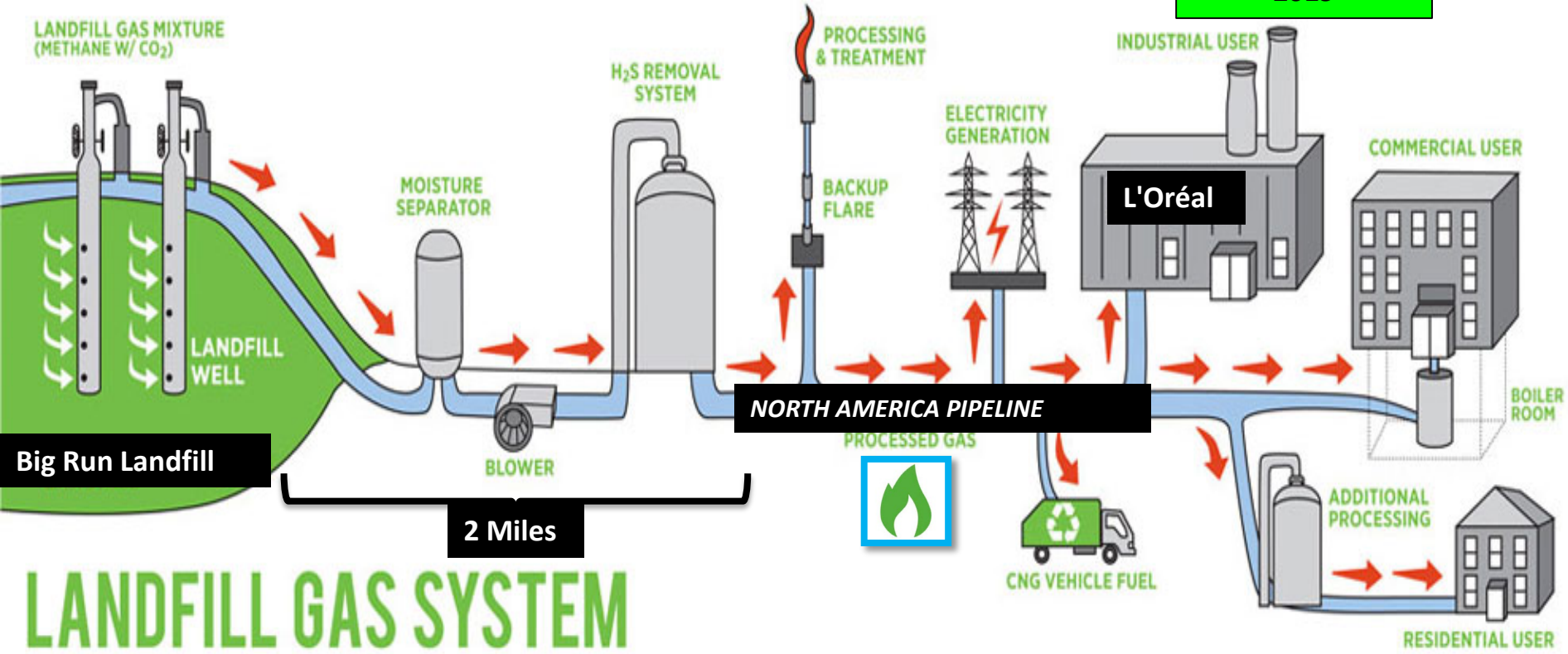
3

Landfill BioGas -

- Single long term solution
- Multiple Agency support
- Community Impact Locally (Jobs)
- Media attention
- Biogas Purchaser / No Capex / limited exposure

DIRECTED BIOGAS

**Carbon Neutral
2019**



Big Run Landfill

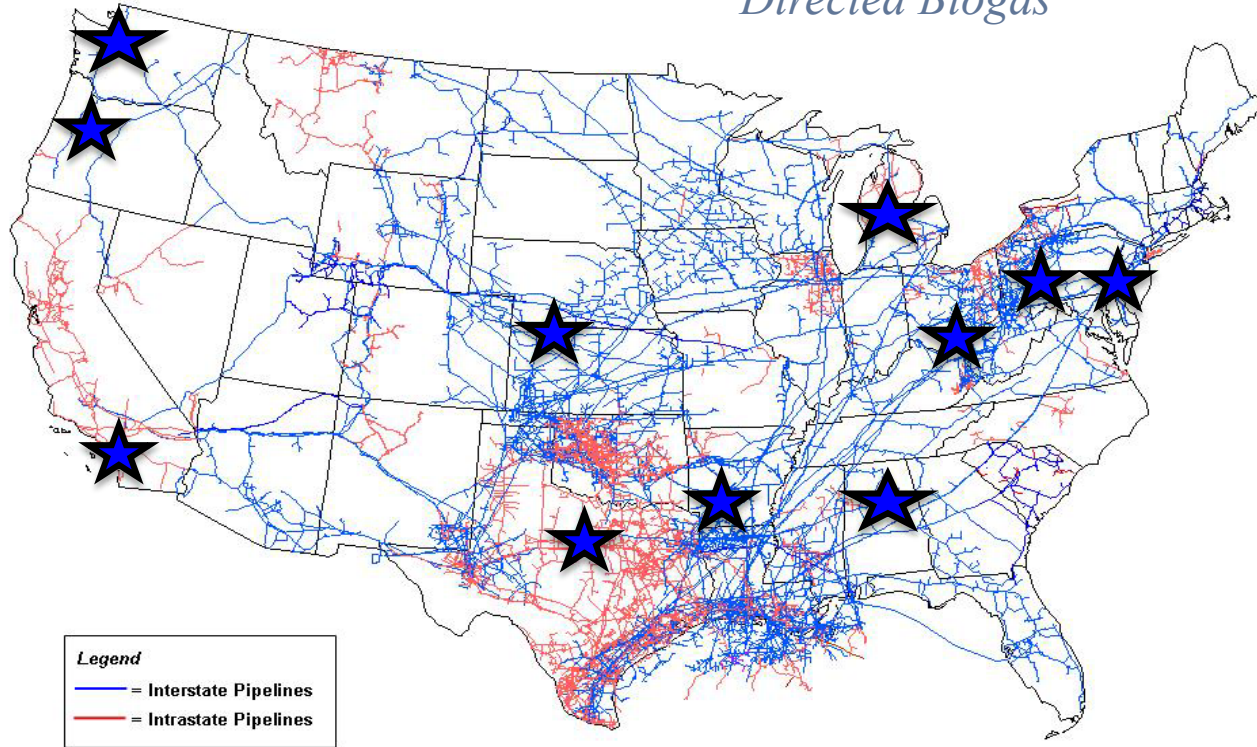
2 Miles

LANDFILL GAS SYSTEM

— GAS COLLECTION — | — GAS CONTROL AND PROCESSING — | — GAS UTILIZATION —

The Solution

Directed Biogas

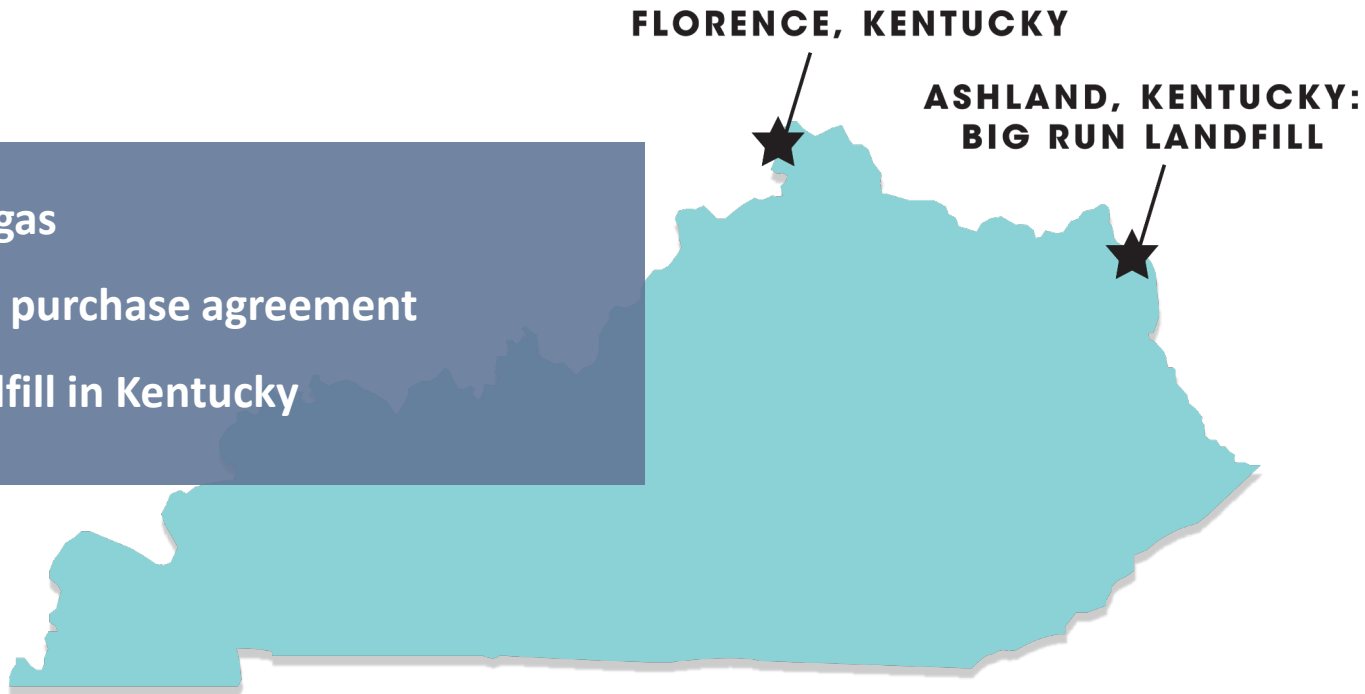


Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System

The Solution

Directed Biogas

- Directed Biogas
- 15-year RNG purchase agreement
- Big Run Landfill in Kentucky



L'ORÉAL

OPERATIONS

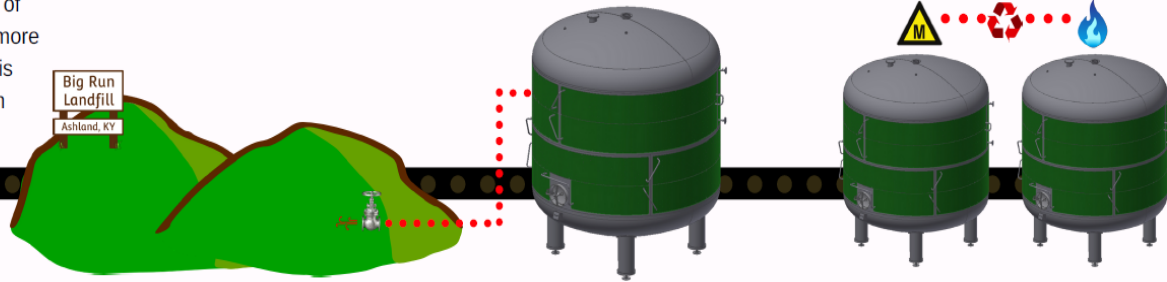
Biogas Transformation

L'Oréal USA Operations has signed a 15-year purchase agreement for renewable natural gas (RNG) from a Kentucky landfill. RNG or biomethane, is derived from many abundant renewable sources, including decomposing organic waste in landfills, wastewater treatment, and agriculture. This scalable, financially viable solution will propel L'Oréal USA Operations, including 21 manufacturing and distribution facilities across 12 states, to be carbon neutral by 2019.

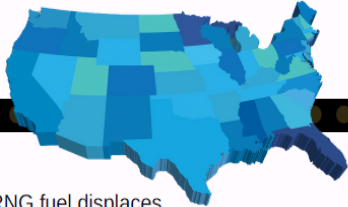
Landfill gas, predominantly consisting of methane – a greenhouse gas 25 times more damaging to the climate than CO₂ – is collected from the Big Run Landfill in Ashland, Kentucky.

Big Run
Landfill
Ashland, KY

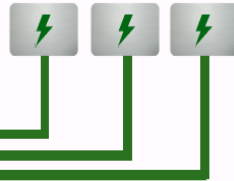
The RNG is injected from the Big Run Landfill processing plant into the natural gas pipeline network.



The collected landfill gas is then processed to remove impurities to produce pipeline quality renewable natural gas (RNG).



The RNG fuel displaces conventional natural gas, reducing carbon emissions.



This RNG transformation further diversifies L'Oréal's renewable energy portfolio and is a key element of the global Sharing Beauty With All sustainability program.

Questions

Q&A

Wrap Up

Contact Information

Wrap Up

- The slides and recording from today's webinar will be posted on the LMOP website
- To learn more about LMOP or LFG energy, visit our website at epa.gov/lmop
- Please complete the poll questions – we appreciate your feedback

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Landfill Methane Outreach Program (LMOP)

CONTACT US SHARE

LMOP Events

December 12, 2018 – [RNG from LFG & Sustainability at L'Oréal](#)

Join LMOP for a webinar about renewable natural gas from landfill gas, including how one LMOP Partner is achieving their corporate sustainability goals.

- [Webinars and Events](#)
- [LMOP Listserv](#)
- [Publications and Tools](#)

LANDFILL METHANE OUTREACH PROGRAM

LMOP is a voluntary program that works cooperatively with industry stakeholders and waste officials to reduce or avoid methane emissions from landfills. LMOP encourages the recovery and beneficial use of biogas generated from organic municipal solid waste. [Learn more about LMOP.](#)

Learn and Engage

- [Basics of Landfill Gas \(LFG\)](#)
- [Benefits of LFG Energy](#)
- [Join the Program](#)
- [Connect with LMOP Partners](#)

Access Data

- [LFG Energy Project Data](#)
- [Landfill Technical Data](#)
- [Data by State](#)
- [Project Profiles](#)

Research

- [Project Development Handbook](#)
- [LFGcost-Web](#)
- [LFG Energy Benefits Calculator](#)
- [Resources for Funding](#)

National Map of LFG Energy Projects

Thank You

Please reach out with any questions or comments

Lauren Aepli

aepli.lauren@epa.gov

(202) 343-9423

Kirsten Cappel

cappel.kirsten@epa.gov

(202) 343-9556