



# WASTE-TO-WHEELS RNG AS A VEHICLE FUEL A CASE STUDY

PRESENTED TO

Air & Waste Management  
Association

Environmental Focus 2012

OCTOBER 30, 2012

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St Landry Parish Solid Waste  
Disposal District





# PRESENTATION OUTLINE



- BACKGROUND
- EVOLUTION (GCCS)
- PROJECT DRIVERS
- PROJECT BUDGET
- CONSTRUCTION & INSTALLATION
- ONGOING MONITORING





# BACKGROUND



## ST LANDRY PARISH SOLID WASTE DISPOSAL DISTRICT

- HOME TO ZYDECO CAJUN MUSIC
- LEGISLATIVE ACT 1980
- SERVES 90,000 RESIDENTS
- GOVERNS ALL WASTE ACTIVITIES





# BACKGROUND



## ST LANDRY PARISH SANITARY LANDFILL

- TYPE II MSW PERMITTED 1986
- ACCEPTANCE RATE OF 400 TPD
- 3 MILLION TONS WASTE IN PLACE
- 300 scfm LANDFILL GAS





# GCCS EVOLUTION



- The EPA has promulgated regulations governing landfill emissions of non-methane organic compounds (NMOC) in March of 1996. The intent of the New Source Performance Standards (NSPS) and Emission Guidelines (EG) is to reduce emission of greenhouse gases (methane) and NMOCs. Applicability in both Rules depends on the NMOC emission rates (tons per year) calculated by the EPA Landfill Emissions Model.





# GCCS EVOLUTION



- Landfills that exceed the NMOC emissions limit are required to install a landfill gas (LFG) collection system to extract and combust LFG (e.g., in a flare, boiler, or engine generator). Operations, monitoring, record keeping, and reporting for the installed collection system must be in accordance with the requirements of the regulations.





# GCCS EVOLUTION



- Exemptions:

MSW landfills with design capacity lower than 2.5 million Mg or annual emissions less than 50 Mg (approximately 55 tons) non-methane organic compounds (NMOC)





# GCCS EVOLUTION



- CARBON CREDIT
  - Reduction of one ton of GHG either by destruction or preventing the emission from occurring, measured in metric tons of carbon dioxide equivalent
- VCS credits or **Voluntary Carbon Units** (VCU) must be real, the abatement must have occurred, they must be additional by going beyond business-as-usual activities, be measurable, permanent, not temporarily displace emissions, the findings need to be independently verified and unique so they cannot be used more than once to offset emissions.







# LFG CARBON PROJECT OBJECTIVES



- PERMIT, DESIGN AND CONSTRUCT A GCCS IN ANTICIPATION OF GOING NSPS WITH SALE OF VOLUNTARY OFFSETS IN MIND



- OWN / OPERATE SYSTEM
- SUCCESSFULLY VERIFY REDUCTIONS AND MAXIMIZE THE SALE OF CARBON CREDITS
- DEVELOP BENEFICIAL USE FOR METHANE





# GCCS EVOLUTION



## GAS COLLECTION AND CONTROL SYSTEM

**GROUNDBREAKING  
AND  
CONSTRUCTION  
WINTER OF 2008**





# GCCS EVOLUTION



## GAS COLLECTION AND CONTROL SYSTEM

- COMMISSIONED IN JANUARY 2009
- TOTAL COST OF \$750,000
- LA'S FIRST VOLUNTARY LANDFILL CARBON PROJECT





# SALE OF CARBON OFFSETS



Year	2009	2010	2011	2012	2013
Q1 (Jan-Mar)	4,915	6,921	7,228	7,385	0
Q2 (Apr-Jun)	5,400	6,530	6,915	7,600	0
Q3 (Jul-Sep)	6,400	6,998	6,885	0	
Q4 (Oct-Dec)	7,900	7,770	6,618	0	
<b>Total CRT Volume Estimated</b>	<b>24,615</b>	<b>28,219</b>	<b>27,646</b>	<b>14,985</b>	<b>0</b>
CRT Transaction Price	\$7.50	\$5.50	\$5.75	\$5.75	\$5.75
CRT Transaction Volume	20,000	13,451	14,143	14,985	0
CRT Transaction Value	\$150,000.00	\$73,980.50	\$81,322.25	\$86,163.75	\$0.00
CRT Transaction Price	\$5.50	\$5.50	\$5.75	\$5.75	\$5.75
CRT Transaction Volume	4,615	14,768	13,503	0	0
CRT Transaction Value	\$25,383	\$81,224	\$77,642	\$0	\$0
Average Price per CRT Sold	\$7.13	\$5.50	\$5.75	\$5.75	
Total CRTs Forward Sold	24,615	28,219	27,646	14,985	0
<b>Total Gross Estimated Revenue*</b>	<b><u>\$175,383</u></b>	<b><u>\$155,205</u></b>	<b><u>\$158,965</u></b>	<b><u>\$86,164</u></b>	<b><u>\$0</u></b> ←

**GROSS SALE OF CARBON OFFSETS  
TO DATE \$575,717**





# BENEFICIAL USE PROJECT DRIVERS



- SUCCESS OF CARBON PROJECT
- STAFFED TO OPERATE THE SYSTEM
- AN UNDERSTANDING OF THE LFG COMPOSITION
- COMMISSION WAS ABLE TO MAINTAIN COMPLETE CONTROL OF THE PROJECT AND ITS BENEFITS
- AVAILABLE FEDERAL AND STATE FUNDING





# PROJECT DRIVERS



- ACCESS TO FLEET VEHICLES
- LONG TERM TAXPAYER SAVINGS IN THE FORM OF LOWER FUEL PRICES
- LONG TERM ENVIRONMENTAL BENEFITS
- HISTORICALLY HIGH GASOLINE PRICES (\$3.76)

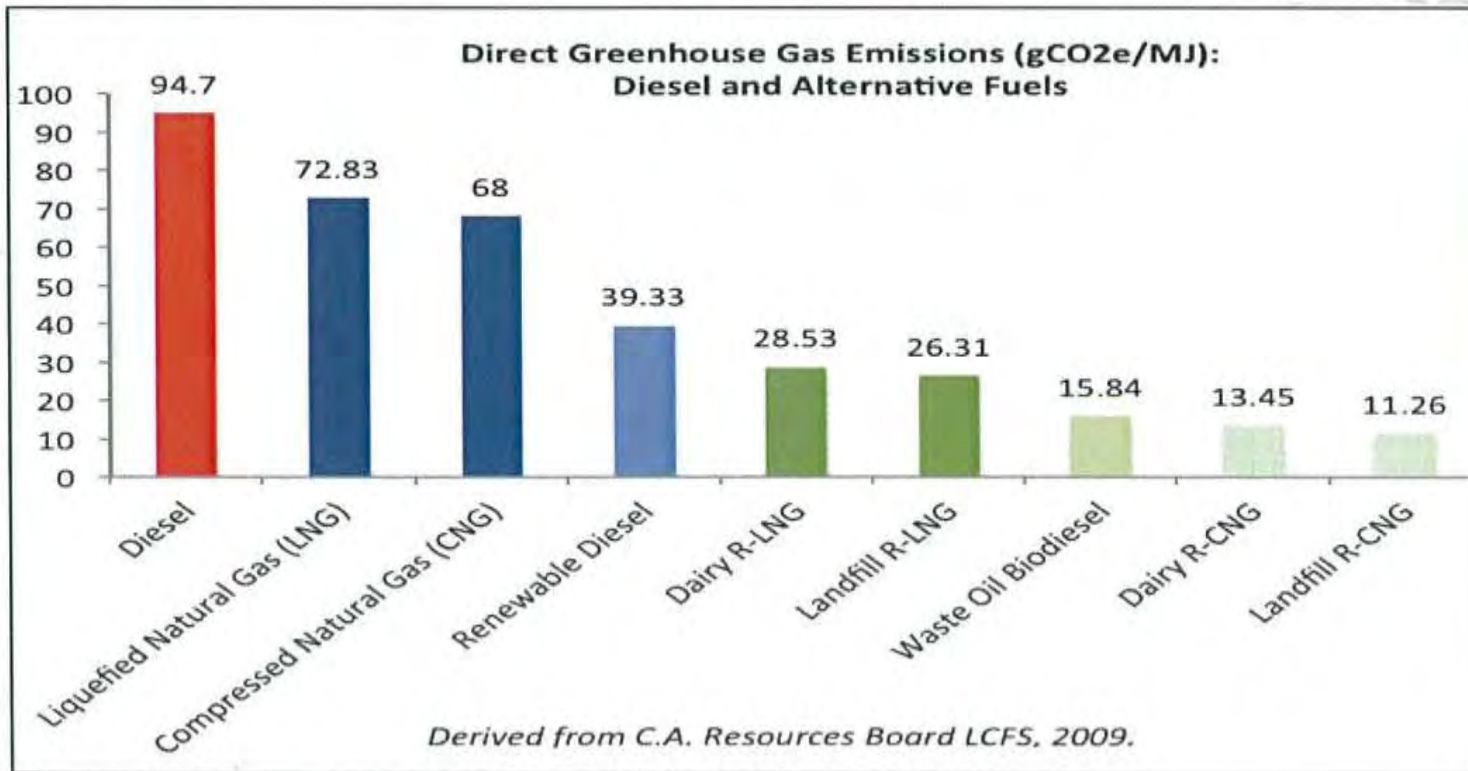




# ENVIRONMENTAL IMPACT



- **RNG slashes carbon emissions to near zero:** RNG's carbon footprint, measured over the "life cycle" of the fuel's production, transport and use, is the lowest of any vehicle fuel that is commercially available today according to research by the California Air Resources Board.<sup>11</sup>





# PROJECT FUNDING



## REVENUES

- EmPOWER LA-TRANS EFFICIENCY & ALTERNATIVE FUELS PROGRAM \$500,000
  - STATE RENEWABLE ENERGY TAX CREDITS \$250,000
  - LOCAL RESOURCES \$250,000
- \$1,000,000**







# PROJECT FUNDING



## EXPENDITURES

- FUELING STATION (TREATMENT, COMPRESSION, DISPENSING) **\$640,000**
- SITE WORK, GCCS MODIFICATIONS (ENGINEERING DESIGN, PROCUREMENT) **\$160,000**
- VEHICLE CONVERSIONS (15 PASSENGER CARS AND TRUCKS) **\$200,000**  
**\$1,000,000**





# COST RECOVERY



## ASSUMPTIONS

- 15 VEHICLES WOULD CONSUME 20,000 GGE/YR REPRESENTING 1/3 OF PRODUCTION CAPACITY
- SYSTEM OPERATING COST WOULD NOT EXCEED \$1/GGE
- SUCCESSFULLY MONETIZE THE RIN @ \$.50/GGE

## REVENUE BALANCE

- GASOLINE PURCHASE OFFSET/YR \$70,000
- ENVIRONMENTAL INCENTIVES \$10,000
- LESS ANNUAL OPERATING COST \$20,000

**\$60,000/YR TO**  
**RETIRE CAPITAL**





# CONSTRUCTION INSTALLATION



**SITE WORK BEGAN  
IN OCTOBER 2011**





# CONSTRUCTION INSTALLATION



**EQUIPMENT ARRIVED  
FEBRUARY 2012**





# CONSTRUCTION INSTALLATION



**INSTALLATION  
MARCH 2012**





# CONSTRUCTION INSTALLATION



**INTERCONNECTION  
COMPLETED LATE MARCH  
2012**





# CONSTRUCTION INSTALLATION



**PLANT  
COMPLETION APRIL  
2012**





# CONVERSIONS



## 15 VEHICLES

1 PASSENGER VAN

5 SEDANS

9 FLEET PU

TRUCKS







# COMMISSIONING



**ONLINE APRIL 2012**





# BioCNG



**St. Landry Parish  
Solid Waste**

**St. Landry Parish  
Sheriff**



***BioCNG CHARTER FLEET***  
*April 2012*





# GOING FORWARD



- MONITOR CONSUMPTION
- TRACK OPERATING COST
- WORK TO EXPAND FLEET

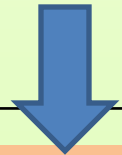




# FUEL CONSUMPTION REPORT



MONTH	SHERIFF DEPT			SHERIFF DEPT LITTER ABATEMENT			SOLID WASTE			Total
	Total Gallons	Price Per Gallon	Total Value	Total Gallons	Price Per Gallon	Total Value	Total Gallons	Price Per Gallon	Total Value	Total
JANUARY	0	\$0.00	\$0	0	\$0.00	\$0	0	\$0.00	\$0	\$0
FEBRUARY	0	\$0.00	\$0	0	\$0.00	\$0	0	\$0.00	\$0	\$0
MARCH	0	\$0.00	\$0	0	\$0.00	\$0	0	\$0.00	\$0	\$0
APRIL	0	\$0.00	\$0	0	\$0.00	\$0	0	\$0.00	\$0	\$0
MAY	560	\$3.76	\$2,105	40	\$3.76	\$149	412	\$3.76	\$1,549	\$3,804
JUNE	949	\$3.63	\$3,444	23	\$3.63	\$84	432	\$3.63	\$1,567	\$5,095
JULY	1,232	\$3.36	\$4,140	98	\$3.36	\$330	465	\$3.36	\$1,563	\$6,034
AUGUST	783	\$3.58	\$2,803	63	\$3.58	\$225	388	\$3.58	\$1,389	\$4,417
SEPTEMBER										
OCTOBER										
NOVEMBER										
DECEMBER										
<b>GAL</b>	<b>3,524</b>			<b>224</b>			<b>1,697</b>			<b>5,445</b>
<b>VALUE</b>		<b>\$12,493</b>			<b>\$788</b>			<b>\$6,068</b>		<b>\$19,349</b>





# SUMMARY NOTES



- **LANDFILL** GAS TO VEHICLE FUEL PROJECT SAVINGS WILL BE REALIZED BY ALL TAXPAYERS OF ST LANDRY PARISH NOT JUST THE SOLID WASTE DISTRICT AS WE CONTINUE TO BE GOOD STEWARDS OF THE ENVIRONMENT
- **SYSTEM** IS DESIGNED TO CONDITION FUEL FOR AS MANY AS 50 VEHICLES AND ENOUGH LANDFILL GAS IS COLLECTED FOR AS MANY AS 500 VEHICLES
- **IT WAS NECESSARY** TO IDENTIFY VEHICLES THAT WOULD FREQUENT THE AREA IN ORDER TO HAVE PRACTICAL ACCESS TO THE BIOGAS STATION





# SUMMARY NOTES



- **USING BIOGAS** FOR TRANSPORTATION WAS AN OBVIOUS CHOICE IN THIS APPLICATION AS OTHER USES WERE NOT ECONOMICALLY VIABLE
- **IN 2009** THE DISTRICT PIONEERED THE FIRST LANDFILL CARBON PROJECT IN THE STATE OF LOUISIANA
- **IN 2012** THE DISTRICT PIONEERED THE FIRST BIOGAS TO TRANSPORTATION FUEL PROJECT IN THE STATE AND ONE OF ONLY A FEW IN THE COUNTRY





# PROJECT PARTNERS





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# PROJECT PARTNERS



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VECHICLE CONVERSIONS





**THANK  
YOU**



*Merci*

**[WWW.SLPSOLIDWASTE.ORG](http://WWW.SLPSOLIDWASTE.ORG)**

