HARTFORD HAS IT

MIRA
Materials Innovation and Recycling Authority

Connecticut Department of ENERGY & ENVIRONMENTAL PROTECTION

MUSTANG RENEWABLE POWER VENTURES

resource rediscovery
Modernizing the CT Solid Waste System Project RFP

RESOURCE REDISCOVERY PROJECT PRESENTATION – SEPTEMBER 28, 2017

SIMS MUNICIPAL RECYCLING

O&G INDUSTRIES
The Gold Standard in Construction Services & Products

Mustang Renewable Power Ventures
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Presentation Outline

1. Background/Project Motivation
2. Mustang Development & Operations Team
3. Project Overview
4. Hartford Site Development Plan
5. Technology Overview
6. Project Benefits
7. Summary

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1. Background/Project Motivation

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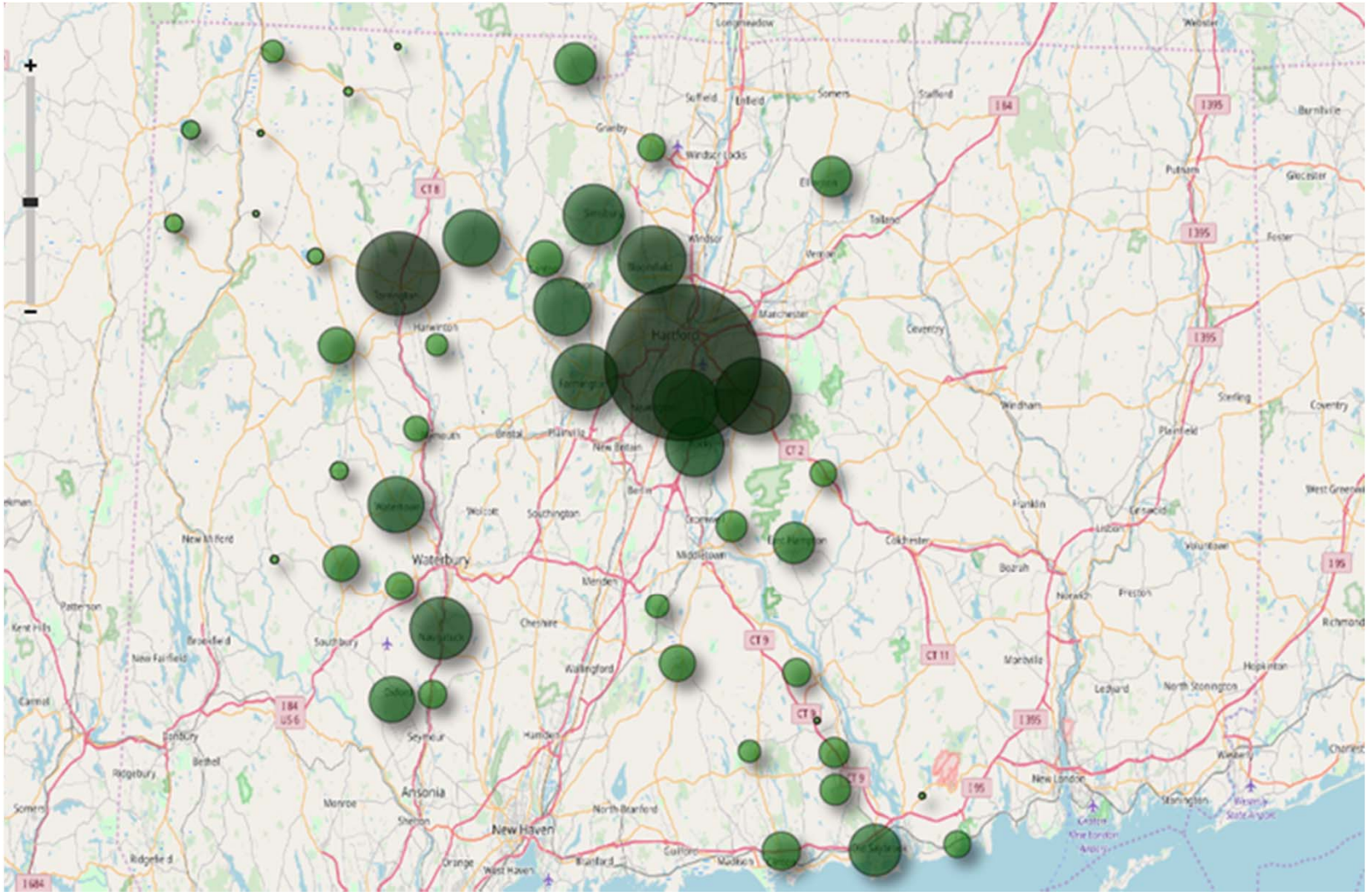
Central CT Solid Waste System Reach



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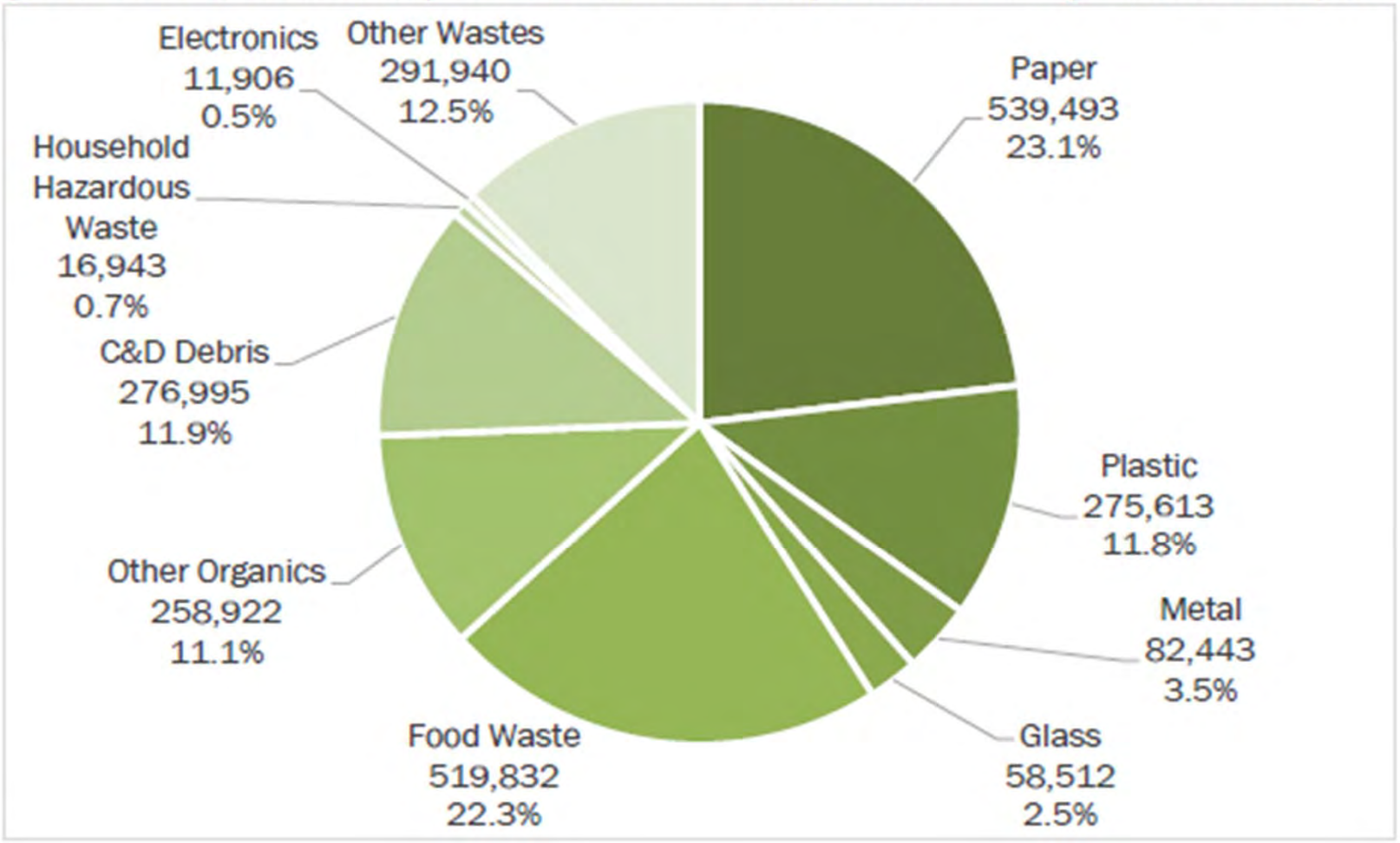
What's in Your Trash (MSW)?

Figure 3-1 2015 Municipal Solid Waste Composition and Quantities Disposed



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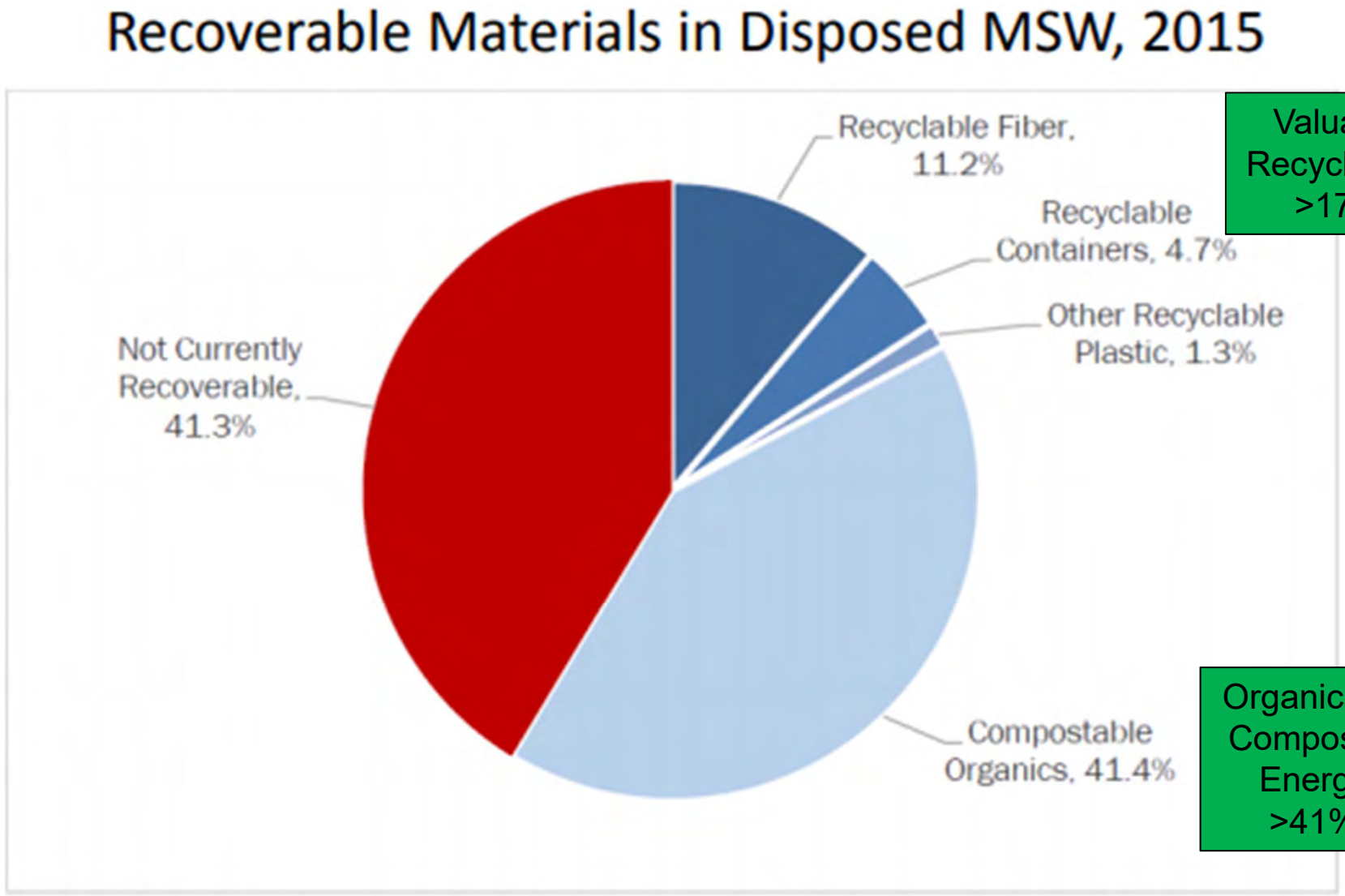
What's Recoverable in Your Trash?



Valuable Recyclables >17%

Organics → Compost & Energy >41%

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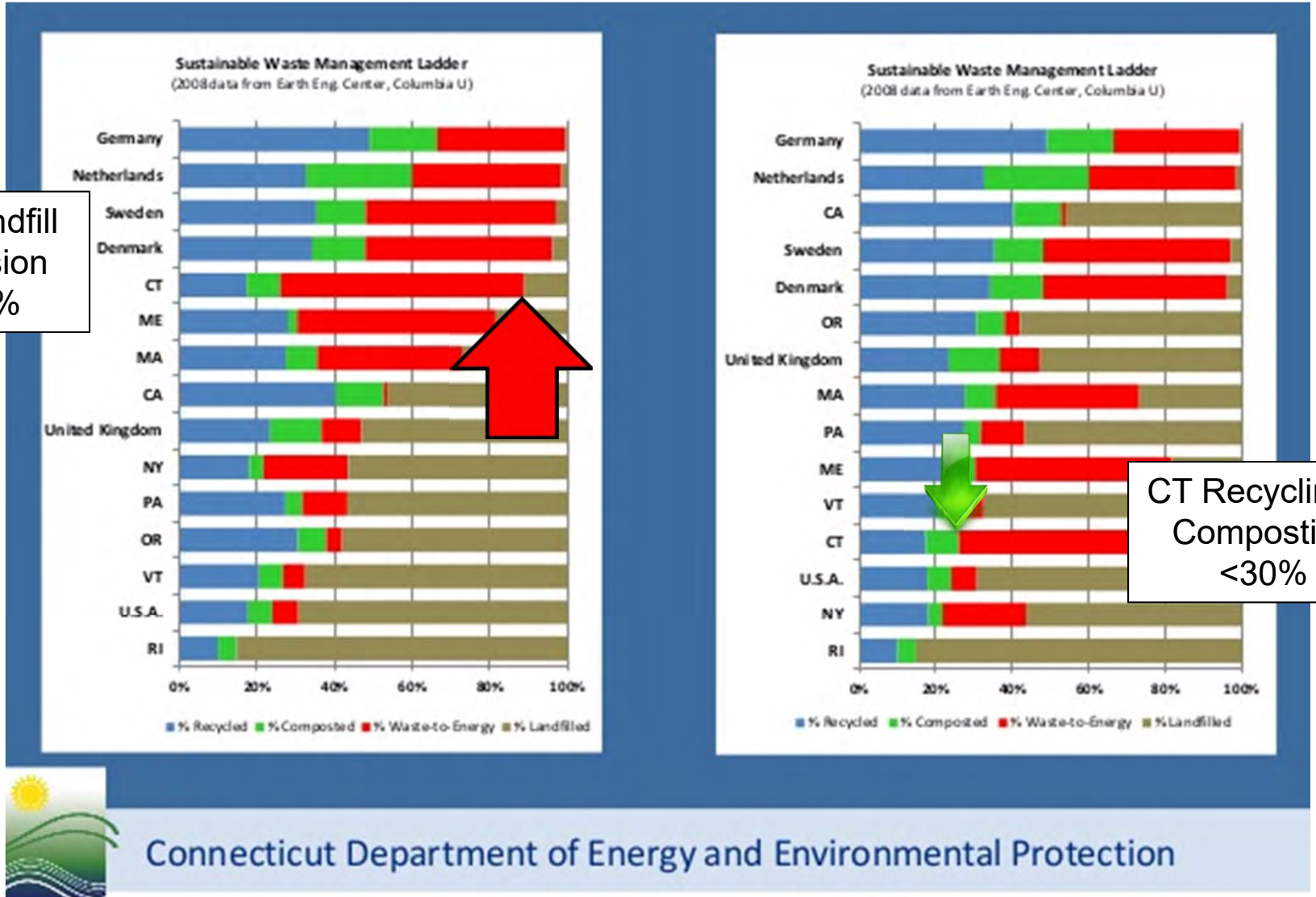
Is CT's Waste Management Sustainable?

CT Landfill Diversion >85%



CT Recycling + Composting <30%

Connecticut Department of Energy and Environmental Protection

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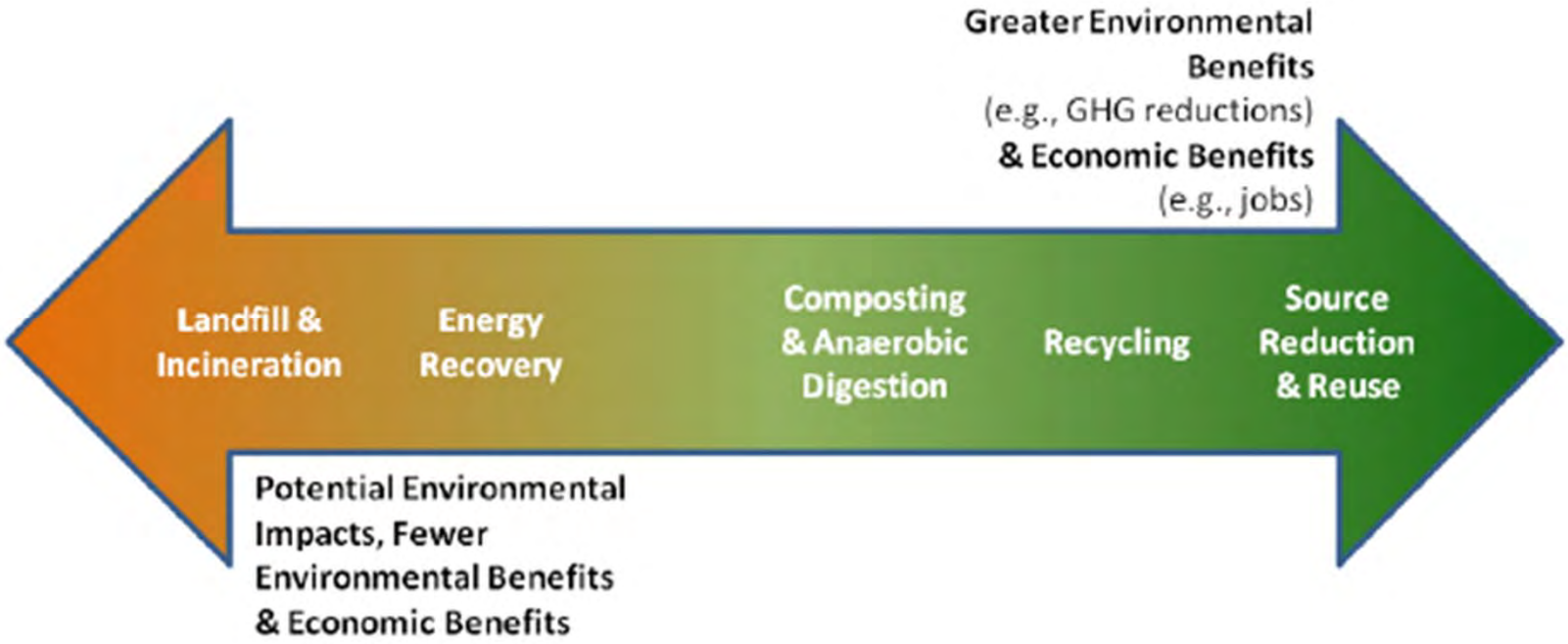
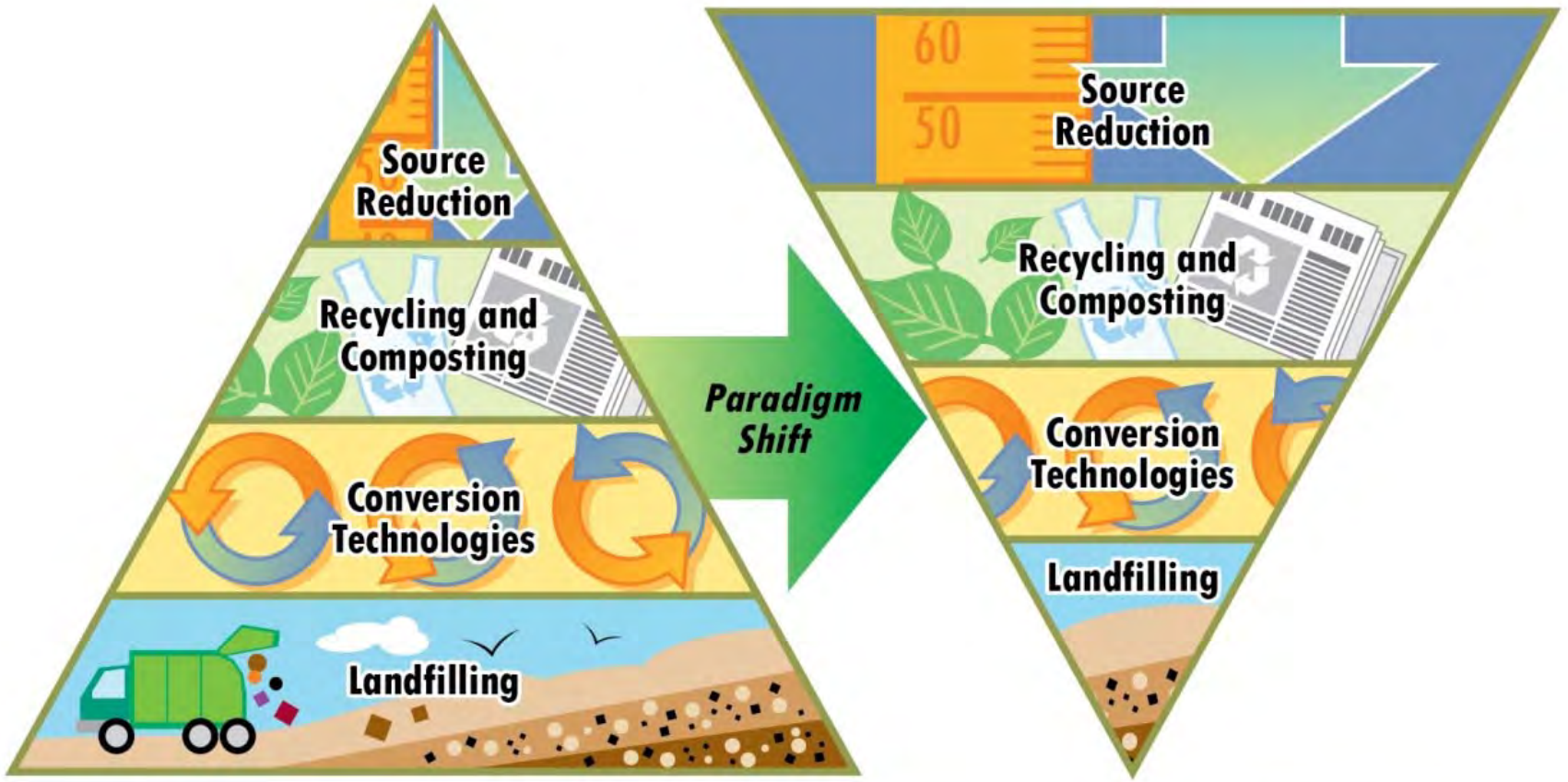
Where have you been?



Where do you want to go?

MUSTANG RENEWABLE POWER VENTURES

Where have you been?



Where do you want to go?

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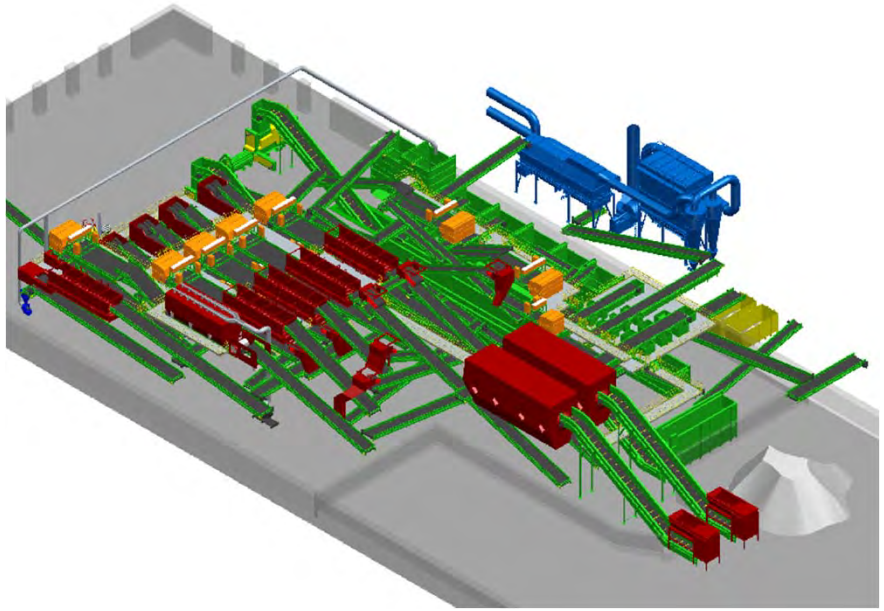
2. Mustang Team
Mustang Renewable Power Ventures

- Mustang is a Mixed Waste Processing Facility Developer
- Industrial RE Project Owner/Developer
  - >$1 Billion of projects, including 4 brownfield projects
- Mustang has collaborated with Sims Muni Recycling for the past five years on project opportunities in the US
- Proposed MIRA project based on proven Mixed Waste Processing Facility (MWPF) technology, design, engineering and environmental permitting standards

MUSTANG RENEWABLE POWER VENTURES

Mustang Renewable Power Ventures

- Selected Developer of 800 TPD MWPF + AD Project- Santa Barbara, CA
- Selected Developer of 900 TPD MWPF + Composting Project - Pensacola, FL



MUSTANG RENEWABLE POWER VENTURES

Sims Metal Management

World's Leading Recycler of Metals & Electronics

- Sims Metal Management – ferrous & non-ferrous metals
- Sims Recycling Solutions – electronic waste
- Sims Municipal Recycling – curbside recycling

Metal recycling operations on five continents
Electronics recycling operations on four continents
Largest curbside recycling program in US – NYC
+9 million tons of recyclable material a year

More than 240 facilities & 4500 employees worldwide

- 12 deep water export facilities
- Shipment by rail, container, bulk ship, truck and barge

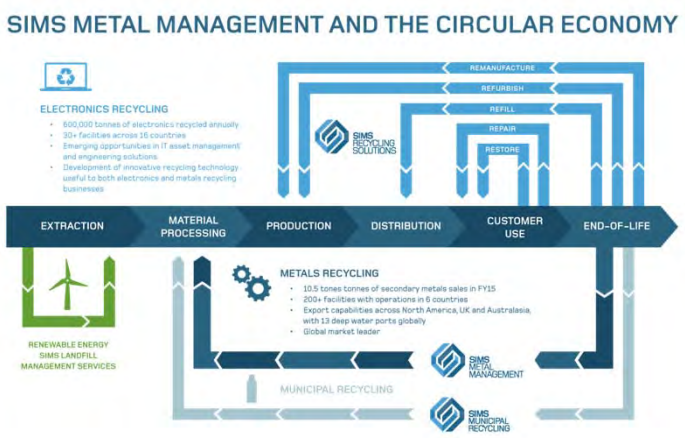
Committed to World Class Safety Performance

- Recordable Incident Rate = 1.3
- Lost Time Incident Rate = 0.3

Commitment to Sustainability

- Year over year improvements in energy use, water consumption, renewables production

Worldwide Operating and Trading Presence



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SIMS METAL MANAGEMENT

Sims Metal Management in CT

More than 100 years operating in CT

- 4 facilities
- 100 employees
- +10,000 scale transactions per month

North Haven Facility

- 80 acres
- Receive, process, ship 18,000 tons per month
- Shredding, shearing, sensors, etc.
- Rail, container & truck loading

North Haven is Headquarters for Sims New England Region

- Transportation Dept.
- HR, IT, Procurement
- Safety, Training & Environmental Compliance support for the Region

Sims North Haven Plant

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SIMS METAL MANAGEMENT

Sims Municipal Recycling

- 20 year contract with NYC Department of Sanitation. NYC has largest curbside program in the US, serving 8.5 million people:
  - ~270,000 tons/year of commingled recyclables
  - ~160,000 tons/year of paper
- Short term contracts serving approximately 800K population in NJ.
- Approx. 200 employees – experienced management, operations and marketing teams
- 4 barge-served receiving facilities
- 2 MRFs; 1 Glass Plant
- Manage a portion of Chicago's single stream program

10,000 Ton/Month Jersey City MRF

Rail Car Loading – Tin Can Bundles, Brooklyn

MUSTANG RENEWABLE POWER VENTURES

SIMS MUNICIPAL RECYCLING

SMR Sunset Park, Brooklyn MRF

- 11-acre pier on Brooklyn's working waterfront
- NYC-SMR partnership
- Barge, Rail & Truck Access
- 65-70 TPH capacity
- Central facility for all NYC commingled recyclables
- Wharf, buildings and equipment elevated 4' for sea-level rise and storm surges
- 2nd largest solar array (600kW) and 1st large scale (100kW) wind turbine in NYC
- On site stormwater treatment; marine habitat-reef construction
- Education & Visitor Center

MUSTANG RENEWABLE POWER VENTURES

SIMS MUNICIPAL RECYCLING

ENR THE TOP 400

ENR THE TOP 100
GREEN BUILDINGS CONTRACTORS

TOP WORK PLACES 2016
HEARST media services
CONNECTICUT POST
GREENWICH TIME
THE NEWS-TIMES
THE ADVOCATE

CONNECTICUT Family BUSINESS AWARDS

O&G INDUSTRIES, INC.

- Connecticut's largest privately-held construction company.
- Consistently ranked as one of the country's 400 largest construction companies for over 50 years.
- Over 900 highly-skilled construction industry professionals and 1,900 pieces of the industry's most well-maintained equipment.
- O&G self-performs such trade work as sitework, building demolition, cast-in-place concrete, masonry, and rough and finish carpentry

1000+ EMPLOYEES
Over 900 highly-skilled construction industry professionals, including more than 700 skilled trades people.

0.79 SAFETY RATING
O&G's aggressive safety program ensures that everyone goes home safe each work day.

400+ ANNUAL VOLUME
O&G Industries is one of the largest builders in the Northeast with an average annual volume of business in excess of $400 million.

$2B BONDING CAPACITY
One of the largest and most diversified construction companies, O&G has a bonding capacity in excess of $2 billion.

WHAT WE DO

O&G is Connecticut's largest privately-held construction company.

Building Construction & Renovation

O&G is Connecticut's Top Construction Builder for Municipal and Energy Construction Projects.

Heavy Civil Construction

O&G is Connecticut's Top Heavy Civil Contractor for Road & Bridge Projects.

Construction Materials

O&G manufactures and distributes asphalt, concrete, sand and stone through our network of 6 quarries, 8 concrete and 9 asphalt plants.

Asphalt Paving

O&G is one of Connecticut's leading Asphalt Paving contractors.

SAFETY IS MORE THAN A SLOGAN

- Work Zone Separation
- Good Neighbor Policy
- Dust Controls
- Soil and Sedimentation Controls
- Weekly Safety Meetings
- Constant Monitoring

24-HOUR
SAFETY HOTLINE

SAFETY MONITORING
& INCIDENT TRACKING

EXPERT
SAFETY TEAM

MIRA TRUCK MANEUVERING HALL

RIVERFRONT PLAZA, FOUNDERS BRIDGE & I-91

HARTFORD UNION STATION

SPORT & MEDICAL SCIENCES ACADEMY

UCONN INFORMATION TECHNOLOGY ENGINEERING BUILDING

UCONN WATER RECLAMATION FACILITY

BRADLEY INTERNATIONAL AIRPORT IMPROVEMENT PROGRAM

QUINNIPIAC UNIVERSITY YORK HILL CAMPUS

HARTFORD PROJECTS

- A.I. Prince Technical High School Additions & Renovations
- American Airlines Building Demolition, Concrete, Steel, Exterior Finish and Commercial Development
- Bushnell on the Park
- Bushnell Theater Expansion and Renovation
- Cabela's Store Rentschler Field Site and Access Road
- Founders Bridge And I-91 Rehabilitation / Riverfront Recapture
- Gayle King Studio
- Hartford Civic Center Reconstruction
- Hartford Insurance Company Parking Garage Concrete
- Hartford Municipal Garage Cast-In-Place Concrete Work
- Hartford School Construction Program
- Hartford Railroad Station Upgrades
- High Street Garage Concrete
- I-84 Bridge Deck Repairs & Resurfacing
- MIRA Facility
- MIRA Hartford Landfill
- MIRA Truck Maneuvering Hall
- Murtha Cullina, CityPlace I Floor 29 & 30 Renovation
- One Commercial Plaza Excavation Work
- One Commercial Plaza Phase II
- Pedestrian Bridge Over Columbus Boulevard & Access Ramp
- Sarah J. Rawson Elementary School Renovations & Additions
- Sport and Medical Sciences Academy
- Thomas Quirk Middle School
- Trinity College Chiller Replacement
- Trinity College Koeppel Sports Complex
- YMCA of Greater Hartford Renovations
- YMCA of Greater Hartford Towers

CT Energy & Technology

An O&G INDUSTRIES, INC. Subsidiary Company

FUTURE POTENTIAL DEVELOPMENT

- Mustang proposes to discontinue burn plant operations in lieu of recyclable recovery, anaerobic digestion and indoor composting
- Burn Plant could be redeveloped as a Class I Renewable fuel cell electrical generating facility
- Distributed generation to power greenhouse and hydroponic farming
- Supporting a restaurant/lifestyle zone with farm-to-table food processing, refrigeration and chilling systems
- Also supporting expansion of the Regional Farmers Market consistent with the Market Ventures "Master Plan"

Proposed Development Area

CT Energy & Technology, LLC is a Connecticut limited liability company and a wholly owned subsidiary company of O&G Industries, Inc.

- Specializing in large electrical, combined heat and power and distributed generation projects
- Integrating environmentally beneficial renewable energy, CO_2 absorption with greenhouse and hydroponic farming
- Supporting a robust feasibility study of complementary site uses synergistic with the Mustang Resource Recovery Project Proposal and City of Hartford objectives

MUSTANG RENEWABLE POWER VENTURES

Harvest Power

Harvest harnesses the maximum value from organic materials through the production of renewable energy and soils, mulches and natural fertilizers.

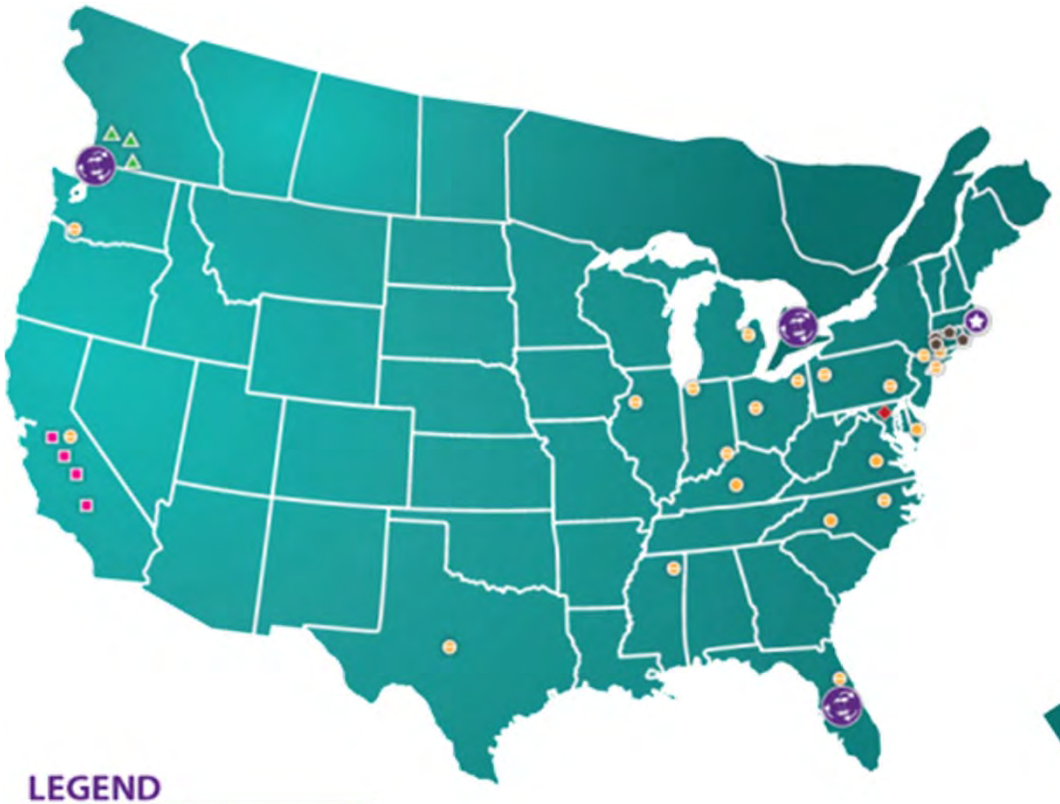
Company Profile

- Managing close to 2 million tons of organic materials, **largest processor of yard waste & food waste in North America**
- Operate or partner with over 25 processing facilities in North America with more than 400 employees
- Operating three of North America's **largest commercial anaerobic digestion facilities**
- Harvest's investors include True North Venture Partners, Industry Ventures, and Generation Investment Management LLP

MUSTANG RENEWABLE POWER VENTURES

HARVEST™

National and Local Knowledge



LEGEND

- Harvest, BC (4)
- Harvest, California (4)
- Harvest New England (4)
- Harvest Cosumer Products (3)
- Manufacturing Partner (25+)
- Harvest, RGI
- Headquarters
- Energy Garden

MUSTANG RENEWABLE POWER VENTURES

HARVEST™

Our Solution

Organics Processing

Yard waste and industrial wood residues

Composting and mulching

Bulk and bagged soils and mulches

Food Waste and energy

Food waste, biosolids, and agricultural residues

Anaerobic digestion

Biogas

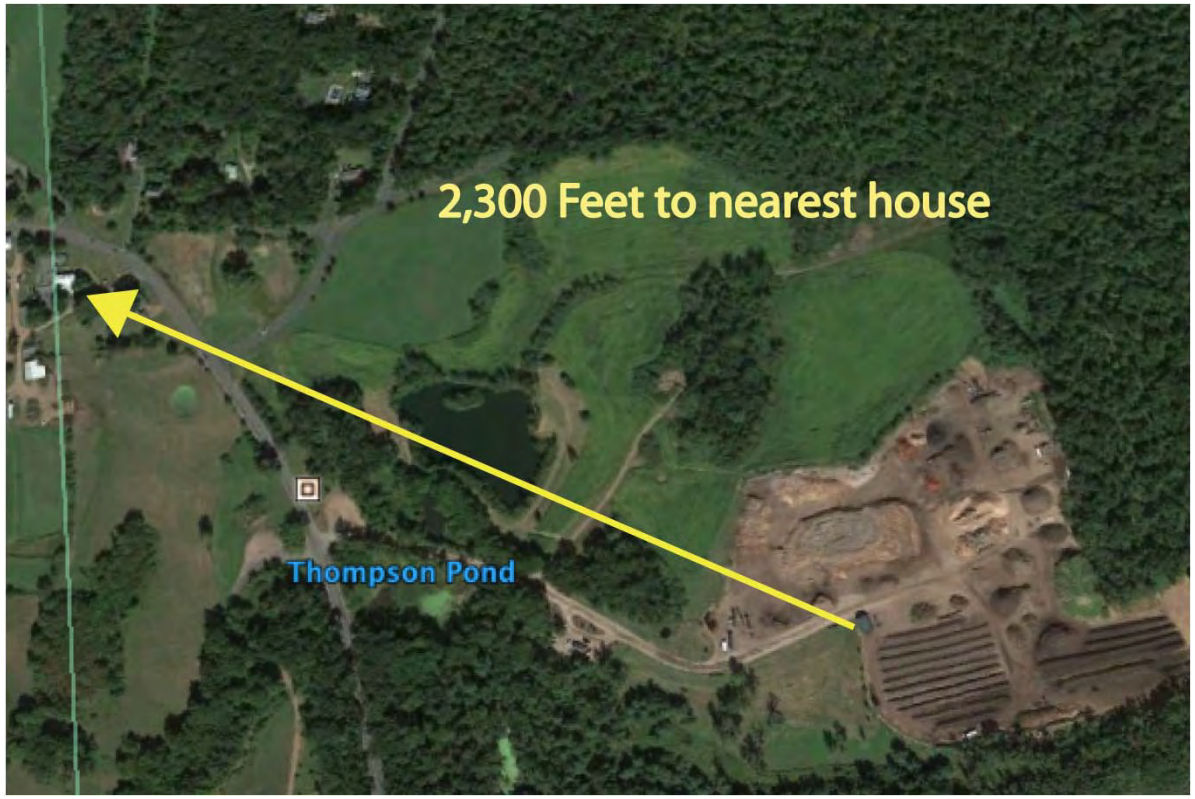
Fertilizers

MUSTANG RENEWABLE POWER VENTURES

HARVEST™

Harvest Thompson Farm Facility
Ellington, Connecticut

20 years of composting without an odor complaint



- **17.85 acres currently permitted**
- **157 total acres**
- **21 miles from Hartford**

MUSTANG RENEWABLE POWER VENTURES

HARVEST™

3. Project Description - Overview

- Mustang proposes to develop an integrated Mixed Waste Processing Facility(MWPF), Anaerobic Digestion (AD) Facility and Composting Facility (using fully enclosed boxes)
- Mustang's project estimated to divert ~70% of MSW from landfill disposal and incineration
- The project includes proven technologies to recover valuable resources (recyclables, compost & energy) from waste

MUSTANG RENEWABLE POWER VENTURES

Project Description - Overview

- **MIRA Recycling Facility**
  - Select modifications and upgrades
  - Continued processing of 50-100,000 TPY SSR (i.e., Recyclables)
  - Seek to grow this tonnage (i.e., education and outreach)

- **Mixed Waste Processing Facility (MWPF)**
  - ~15-20% of post-recycled waste is valuable recyclables
    - glass, paper, plastic, metal
- **Anaerobic Digestion Facility and Composting Boxes**
  - Converts organics (~35% food/green waste & wet -2" paper) into compost and biogas for electricity to meet on-site uses
- **Offsite Compost Storage**
  - Finished compost transported to a Harvest Power CT site
  - ~3 weeks final curing/maturation prior to marketing

MUSTANG RENEWABLE POWER VENTURES

Project Description - Overview

- **Process Engineered Fuel** (PEF)
  - Baled plastic waste residue (>9,000 btu/lb)
  - Sold to cement kilns, paper mills & industrial boiler applications
- **Rail-Based Residue Disposal**
- **Transfer Stations**
  - Select modifications and improvements
  - Continued acceptance of MSW and SSR
  - Seek to attract addt'l tonnage of both MSW and recyclables
- **Diversion Summary**
  - Curbside + Recyclables + Organics + PEF
  - Overall landfill diversion rate of ~70%

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4. Mustang's Resource Rediscovery Project

Hartford MWPF, ADF + Enclosed Composting Boxes

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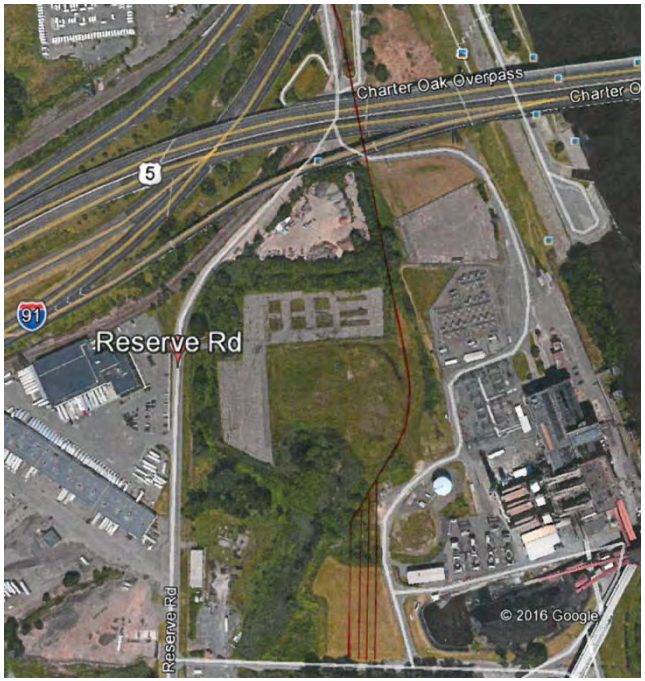
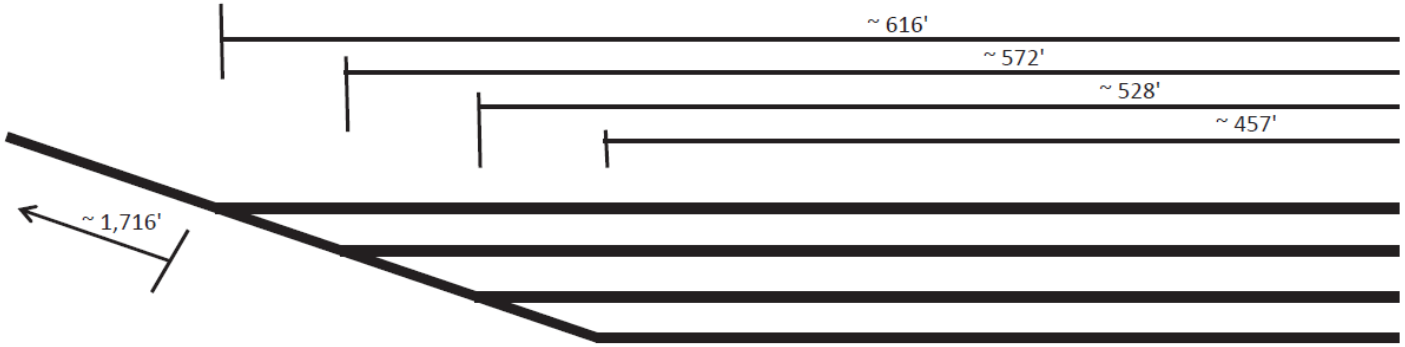
Rail Spur

(On site rail is preferred; off-site rail options exist)

- Track Work – 3,600’
  - 4 switches @ 80’ each
  - Modify existing crossings
  - Rail Scale
  - 4 rail stops
  - Derail @ main line switch
  - Misc – grading erosion control, seeding
  - Compatible w/ Regional Market





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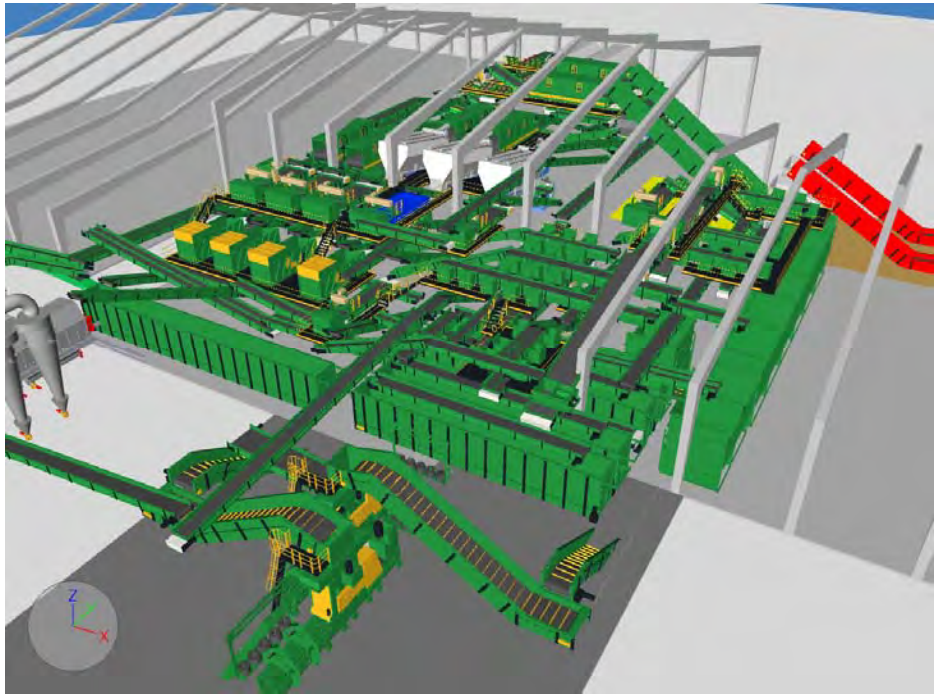
5. Mixed Waste Processing Facility

- 3 MSW lines (700,000 TPY= 2,250 TPD, 180 TPH)
  - ~20% Recyclable Recovery
  - ~35% Organics Recovery to AD/Composting
  - ~15% Residue to Process Engineered Fuel-PEF
  - ~30% residue to landfill
- Export of Recyclables to Markets
- ~175 full time employees
- Waste delivered by collection & transfer trucks
- ~300,000 TPY organic waste to Anaerobic Digestion & Composting
- Residue exported to remote landfill via rail



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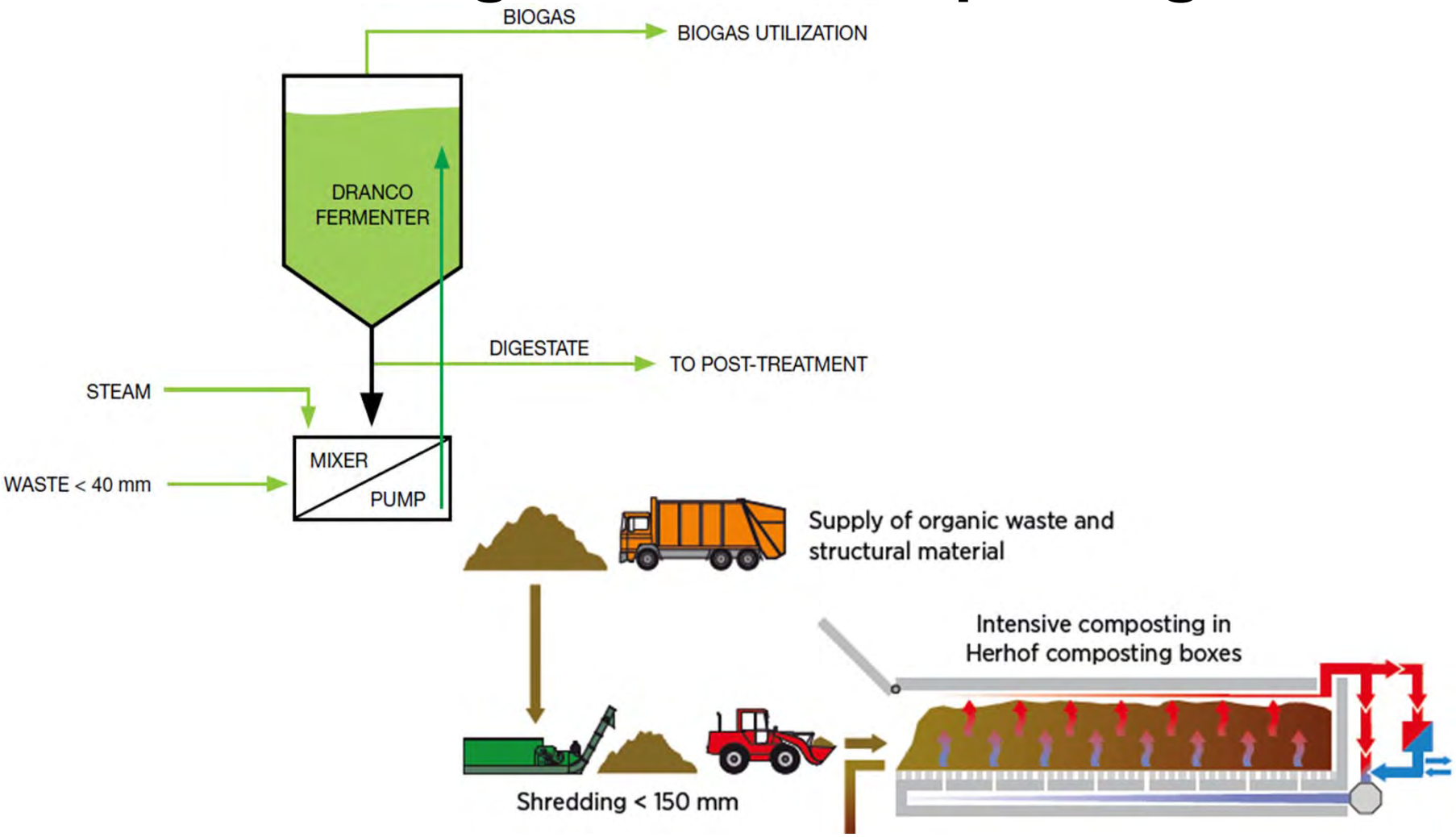
VAN DYK recycling solutions

Anaerobic Digestion & Composting Boxes



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6. Project Benefits

- Retirement of 30-year old Waste Incinerator
- Potential re-use of Power Block Facility to renewables or other economic development uses
- MWPF recovers maximum recyclables from MSW
- Anaerobic Digestion & Composting process wet, organic waste into compost & energy without combustion
- Generate renewable natural gas (RNG) transportation fuel from AD biogas
- Eliminate once through cooling warming of CT River
- ~70% landfill diversion rate
- 150-175 Full-Time Jobs (MRF, Composting, ADF and MIRA Recycling Facility)

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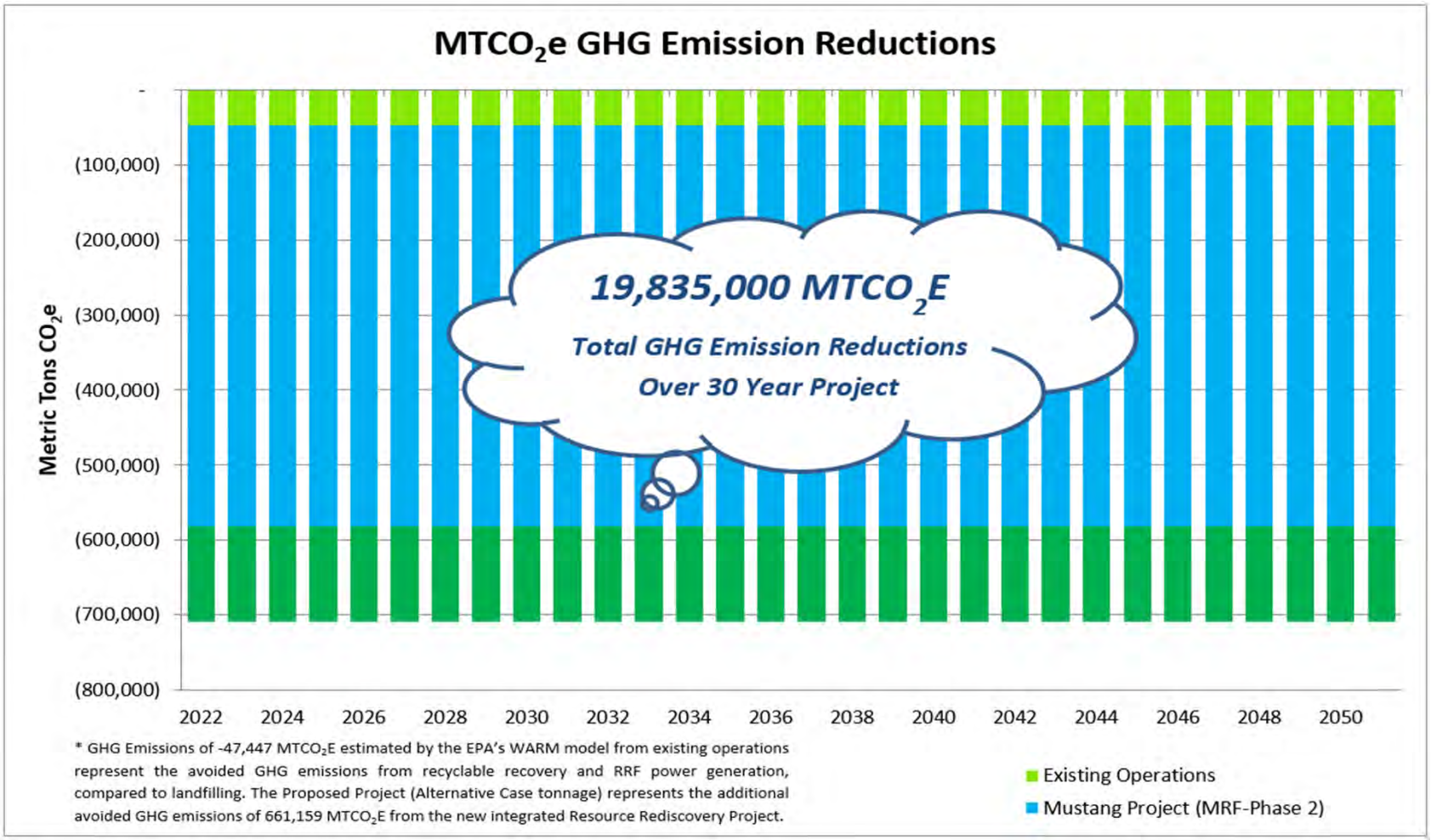
GHG Benefits



US EPA Waste Reduction Model (WARM) ~700,000 $MTCO_2e$/Year

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Project Impact Issues

- Odor – 99% controlled with negative pressure buildings, biofilters and active filtration
- Traffic – could be reduced by ~30-40% with proposed rail based residue and some recyclable transport
- Noise – all operations indoors
- Air Quality – improved through shut-down of WTE plant
- Soil Quality – includes brownfield cleanup of impacted coal storage pond area

MUSTANG RENEWABLE POWER VENTURES

Financial Summary: CapEx, GHG Reductions & Jobs

	Phase 1 - MRF + Composting + ADF + MIRA Recycling Facility		Phase 2 - MRF + Composting + ADF + MIRA Recycling Facility
Annual Delivery Tonnage	465,000 tpy MSW 100,000 tpy SSR		700,000 tpy MSW 100,000 tpy SSR
Diversion & Conversion Technologies	MWPF + Composting Boxes + ADF		MWPF + Composting Boxes + ADF
Est. Total Diversion Rate (incl. Curbside)	~70%		~70%
Future Tip Fee/Rate Increases	Limited to CPI		Limited to CPI
CapEx & OpEx Increase Risks	Borne by Project		Borne by Project
GHG Reduction (per EPA WARM Model)	(365,806) $MTCO_2e$ 77,012 Cars Removed		(587,864) $MTCO_2e$ 123,761 Cars Removed
Total Clean Tech Jobs	~150 FTE jobs		~175 FTE jobs

MUSTANG RENEWABLE POWER VENTURES

Mustang Team Project Benefits

- Recycling Experience & Sustainability Focused Private Public Partnership Developer/Operator/Financing team with extensive and long standing CT experience
- Santa Barbara experience is unique and directly applicable to achieving the CT-DEEP goals/objectives
- Best-in-class: Technologies (MRF, AD), MRF & ADF Operators (Sims Municipal Recycling & Harvest Power), Financial Partners (Mustang and Bank of America Merrill Lynch)
- Transparent, Collaborative, Flexible, Innovative, Cost Conscious Partner with Extraordinary Attention to Details

MUSTANG RENEWABLE POWER VENTURES

7. Summary

resource rediscovery
Modernizing the CT Solid Waste System Project RFP

Fulfilling a Green Vision for CT-DEEP, MIRA, City of Hartford, 51+ Towns

- Green/Clean Tech Jobs
- Significant Reduction of Greenhouse Gas Emissions
- ~70% Overall Waste Diversion
- Clean Renewable Heat, Power, Fuel & Compost
- De-risk Project for Communities

Triple Bottom Line – Good for the Planet, Great for the Communities, Economically Sustainable for Central Connecticut Solid Waste System, City of Hartford, Towns

MUSTANG RENEWABLE POWER VENTURES
SIMS MUNICIPAL RECYCLING
HARVEST
VAN DYK recycling solutions
OWS

Where have you been?

CSWS WTE Plant-Today

Retired CSWS WTE Plant-Future

Where do you want to go?

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