CR&R INCORPORATED
environmental services
the face of a greener generation

CR&R Anaerobic Digestion Facility
Renewable Fuel from Organic Waste Recycling
-Organics Infrastructure Development in California

CBA Symposium – Sacramento- November 2, 2018

Clarke Pauley - Vice President, Organics & Biogas Division

CR&R Environmental Services – Company Snapshot

- Over 50 Municipal Contracts
- 12 Processing Contracts
- 900 Trucks – 350+ CNG Vehicles
- 1,500 Employees
- 3 Million Customers served
- 25,000 businesses served
- 10 Solid Waste Service Centers
- 5 Transfer Stations / MRFs
- 2 Landfills
- Over 500,000 tons recycled/year

CR&R AD FACILITY VITAL STATISTICS

PRODUCTS:

- 4MM gallons (dge) Renewable Natural Gas (RNG) for vehicle fuel and pipeline injection
- SOIL PRODUCTS
  - Screw Press Solid
    - 35,000 tons per year/ phase
  - Liquid Soil Amendment
    - 10MM gallons per year/phase
  - Full Build out
    - Solids: 140,000 tons per year
    - Liquids: 40MM gallons per year

ANAEROBIC DIGESTION TECHNOLOGY

EISENMANN

BIOGAS UPGRADING TECHNOLOGY

BIOGAS Greenlane

CONSTRUCTION MANAGEMENT

Lyles CONSTRUCTION GROUP

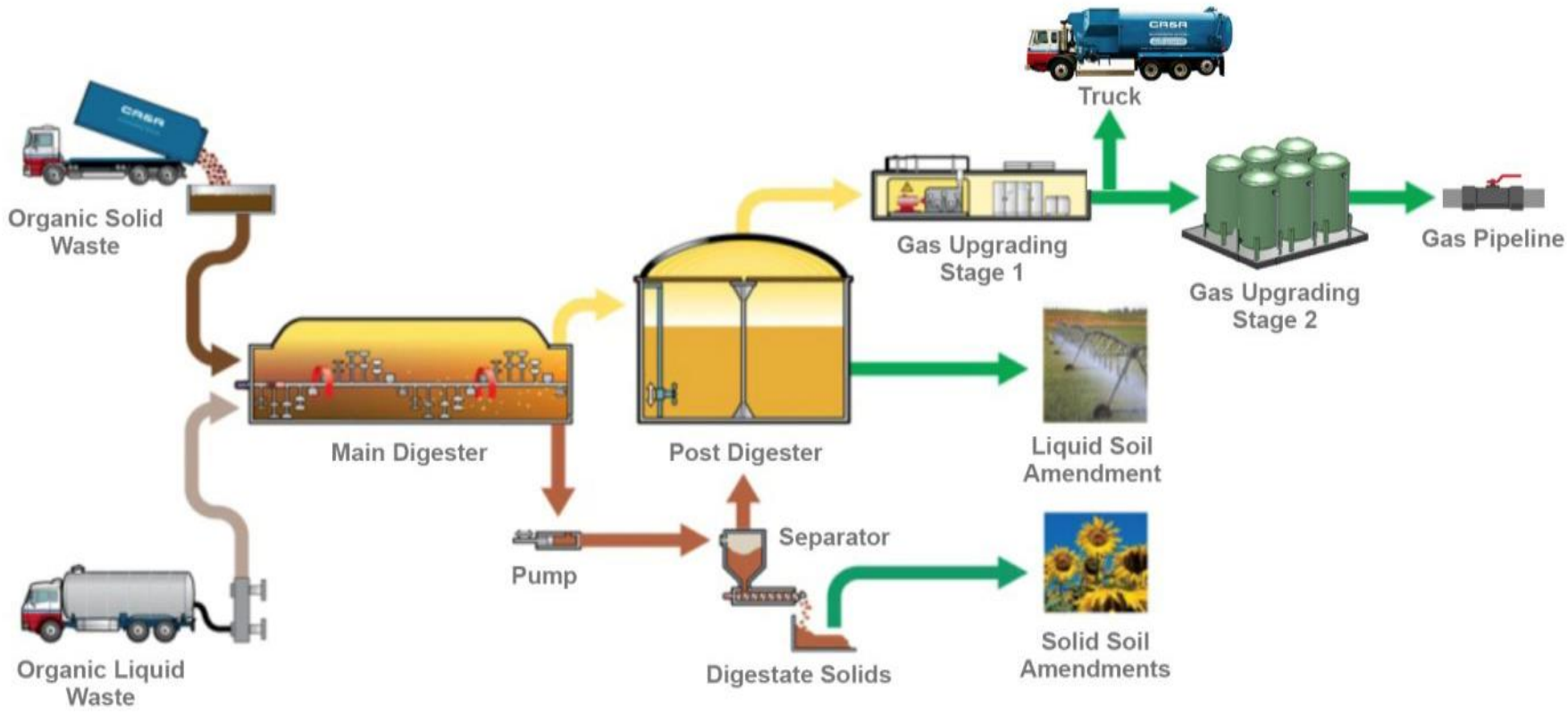
RELIABLE NATURAL GAS DISTRIBUTION

Southern California Gas Company®

PROJECT ENGINEER

JRM &A ARCHITECTS ENGINEERS PLANNERS

ANAEROBIC DIGESTION - FLOW CHART



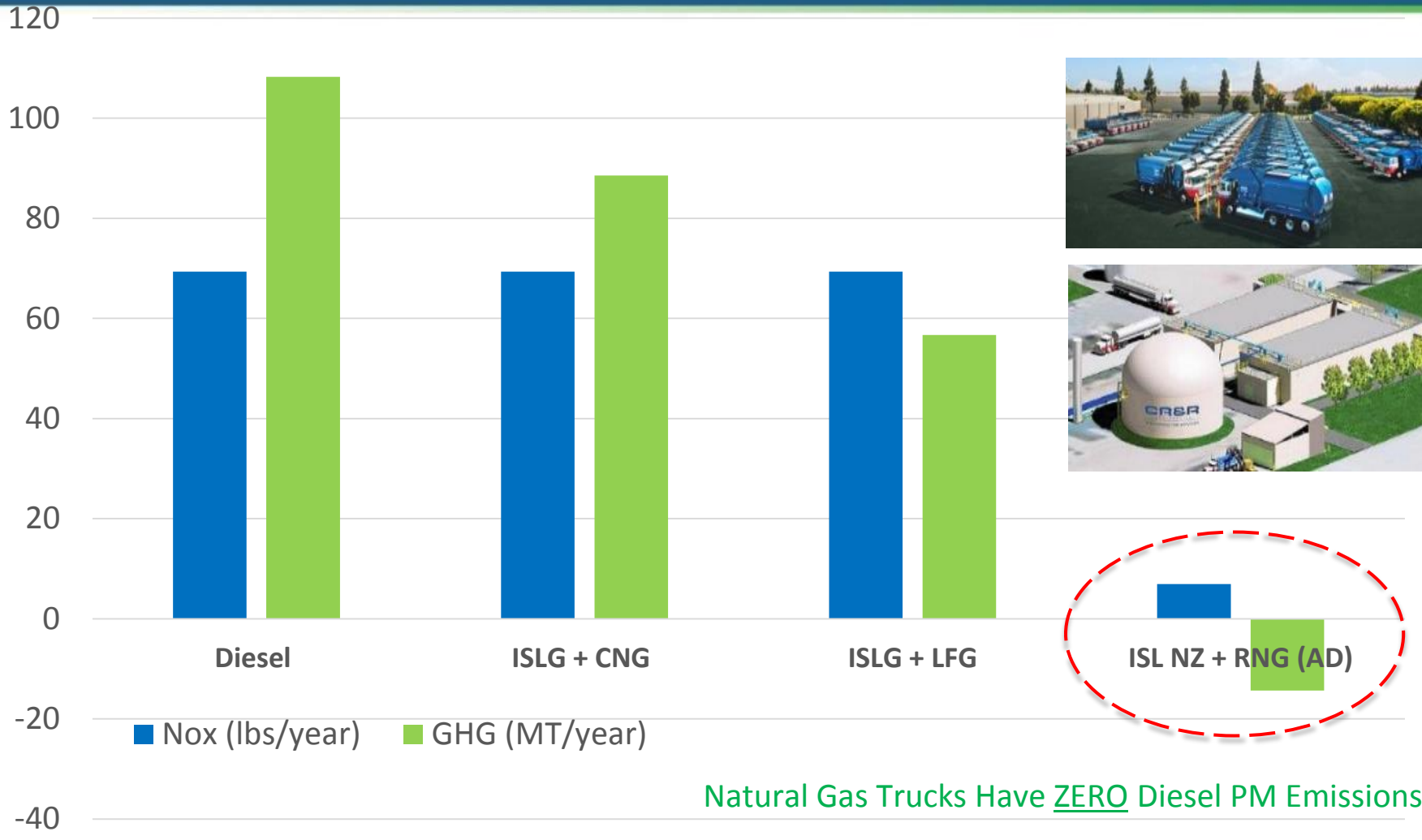
CR&R Anaerobic Digestion Facility
- Phase 1 - Operational
- Phase 2 - Commissioning November 2018

ANAEROBIC DIGESTION PROJECT OVERVIEW

- Our process runs 24/7 – 365 days/year and is fully automated.
- Our process provides maximum flexibility – waste mix, solids and liquids, different temperatures. Four different mixes and temperatures can be run simultaneously.
- The system will generate enough renewable natural gas to run our entire fleet of CNG vehicles, with a surplus, entirely from our collected green and food wastes.
- Our process is fully enclosed with zero untreated emissions and has a very high energy conversion rate due to its design and controls.
- The plant will handle 335,000 tons per year, generate 4 million gallons per year (DGE) of RNG, and create about 250,000 tons of soil products per year.
- Fleet-wide goal of 100 percent RNG vehicles by 2020

REFUSE TRUCK EMISSION COMPARISON

CR&R INCORPORATED environmental services



Natural Gas Trucks Have ZERO Diesel PM Emissions

FINANCIAL/REGULATORY DRIVERS

CNG/RNG Filling Station

- Time fill station for CNG trucks
- System capable of fuelling CR&R's entire fleet of CNG vehicles with carbon **negative** R-CNG

Infrastructure Cost Hurdles

- SoCalGas Pipeline interconnect
- 1.5 miles of pipeline to connect to the SoCalGas grid + Point of Receipt
- High Interconnection cost make injection less attractive

Infrastructure Cost Hurdles

- Rule 30 Gas Specification
- Basic Gas conditioning system 97% pure Biomethane
- Additional Gas Conditioning required to meet spec. $$

Infrastructure Cost Hurdles

- Physical contamination handling
- Dedicated organics tipping floor and sorting facility to provide clean feed-stock
- High CAPEX to remove contamination: SB1383?

Infrastructure Cost Hurdles

- Soil Product management
- Compost site permitting time and costs?
- Soil product processing equipment costs?

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Vice President, Organics & Biogas Division
ClarkeP@crrmail.com