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Presentation on The Coalition for Renewable Natural Gas

Additional submitted attachment is included below.

THE COALITION FOR

RENEWABLE NATURAL GAS

California's Challenges & Potential Solutions to Procuring Biomethane (RNG)

RNG Industry Perspective

May 31, 2013

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Meet the Presenters

- **Paul Morrow – Managing Director of Morrow Renewables LLC**
  - Developer of 6 RNG projects
  - Former owner of South-Tex Treaters, Inc. one of the largest gas treating firms that designs and manufactures natural gas treating facilities in U.S. – recently sold to Kinder Morgan
  - Co-founder of Coalition for Renewable Natural Gas
- **Evan Williams – President of Cambrian Energy Development LLC**
  - Developer of 50 LFG-to-energy projects and 3 RNG Projects; co-developer of largest RNG project in U.S. at McCommas Bluff Landfill in Dallas, Texas
  - Chairman and co-founder of Coalition for Renewable Natural Gas
- **Selection Process to Represent Coalition**

Evan's Political Qualifications

How Green Was My Valley (Best Film 1941)

Rhys Williams – Actor

(Evan's Father)

Mrs. Miniver (Best Film 1942)

Walter Pidgeon & Greer Garson

Kiss Tomorrow Goodbye (1950)

James Cagney

The World in His Arms (1952) Gregory Peck

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California Political Office Qualification Standards

- **Actor =**
  - Governor
    - Ronald Reagan

    - Arnold Schwarzenegger

  - U.S. Senator
    - George Murphy

- **Son of Actor =**
  - Lieutenant Governor
  - Member of California Energy Commission

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Overview

- Goal of AB 1900
- Potential Sources of RNG in California
- RNG Market Size – History & Number of Projects
- Technologies Used & Minimum Project Size
- RNG Developer's Essential Requirement – Secret Formula
- California Impediments to Development of RNG projects
- Menu of Potential Policy Solutions
- Needed Synchronization of State's Clean Air and Renewable Energy Policies
- Critical Math Lesson

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Stated Goal of AB 1900

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New Public Utilities Code Section 399.24

- Promote the In-State Production and Distribution of Biomethane

- Facilitate the Development of a Variety of Sources of In-State Biomethane

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Potential Sources of RNG in California

- **Anaerobic Digestion of Organic Matter from:**
  - Landfills
  - Digesters at wastewater treatment plants
  - Digesters for digestion or co-digestion of other organic matter
    - Fats, oils and grease
    - Agricultural waste
    - Municipal solid waste

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Potential Contribution by RNG to California Gas Market – All Uses

- **1% OR LESS - If all potential RNG projects from all organic sources were developed**
- **RNG, as a base load, storable, dispatchable, renewable fuel, would contribute significant value toward achieving California's renewable electric power and low carbon transportation fuel goals**
- **Size of available organic matter resources, proximity to pipelines and substantial capital investment required for RNG are limiting factors**
  - Projects typically developed at larger landfills and digesters relatively near pipelines

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RNG Production Technology – New or Old?

- **Based on natural gas processing technology – proven over many years**
- **Used to process landfill gas to RNG and injection into pipelines for many years**
  - At Fresh Kills Landfill on Staten Island, NY for more than 30 years
  - Operating on several of largest RNG projects for more than 20 years
- **However, due to investment required and limitations on access to markets, of 594 operational projects in U.S. per LMOP, only 39 are RNG projects (6.5%)**

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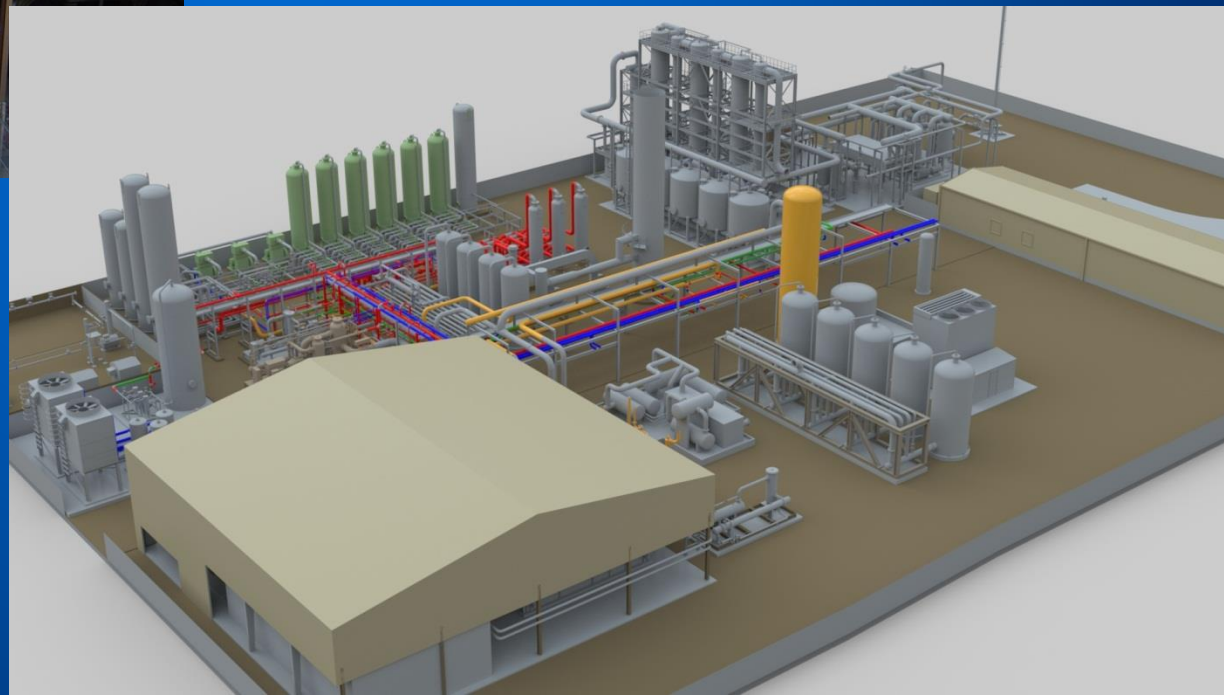
Scale of RNG Projects - Millions in Capital Required



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LFG Wells

400 Wells in Dallas @ $10,000 per well

Well Field Capital Replacement is 10% to 15% of Original Capital Cost each year

RNG Developer Business Model & Essential Requirement

- **Make Money**

- **Return of and return on investment**

- **RNG projects use proven technology but involve High Financial Risk**
  - McCommas Bluff project had 3 prior bankruptcies before current owners
  - Current Owners: used same technical engineering, but better financial engineering

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Key to Development of Successful RNG Project

- **Must Meet Secret Formula**

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Secret Formula

- Revenues > Expenses
- Predictably

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Costs for LFG to Pipeline Quality Renewable Natural Gas Project

Gas Processing Cost For 2 million Feet/Day Inlet in $/MMBtu	
$1.80	Plant Capital Amortization
$2.20	O&M for Processing Plant
$0.38	Collection System Expansion Per Year
$0.61	Collection System O&M Per Year
$0.49	Initial Collection System and Flare Capital Amortization
$0.78	12.5% Royalty
$5.48	Total Cost Per MMBtu

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Revenues from Sale of MMBtu of Natural Gas

- Henry Hub Pricing May 24, 2013 = $4.23

- Problem: Commodity Price of energy content in RNG does not meet Secret Formula requirement

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What Leads to RNG Development in California?

- **Access to Markets Essential**
  - If can't sell renewable energy to a customer, then how much is available or how cheaply it can be produced doesn't matter
- **State Policies must increase Positive Dollars and reduce Negative Dollars**
- **Environmental Policies must be synchronized**
  - Clean Air vs Renewable Energy

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What Hinders Access to Market?

- **Physical Constraints**
  - Project not close to natural gas common carrier pipeline
- **Utility or Other Energy Customer Constraints**
  - High interconnection costs
  - Pipeline Company gas specification tariffs don't accommodate differences in RNG from natural gas (e.g., no higher chain hydrocarbons with higher heating values)
  - RNG price constraints – i.e. insufficient price
- **Legal and Regulatory Constraints**
  - No available exemption from regulation as utility
  - Prohibitive air emission regulations
  - Before AB 1900, the Hayden Amendment codified in H&S Code Section 25421 led to prohibition of access to market for RNG

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What are Positive Dollars and Negative Dollars?

- **Positive Dollars**
  - result from any law, policy, support or source applicable to a renewable energy project that either

    increases revenues

    or

    decreases expenses

- **Negative Dollars**
  - result from any law, policy, support or source applicable to a renewable energy project that either

    decreases revenues

    or

    increases expenses

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Examples of Positive Dollars

- **Enhanced Revenues from sale of energy**
  - Feed-in Tariffs
- **Tax Credits (federal and state)**
  - Section 29 and Section 45 of IRC
  - Can be monetized with third party if developer can't use
- **Supplemental Energy Payments, Grants and other Governmental Supports**
- **Transferable Renewable Energy Certificates**
- **Transferable Emission Reduction Credits**

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Examples of Positive Dollars

➢ Exemptions from or Reductions of Certain Expenses

- Taxes
  - Sales tax
  - Energy tax
  - Ad valorem tax (property tax)
- Exemptions from regulation and reporting
  - Utility regulation
  - Reporting requirements
- Expedited permitting procedures
  - Negative declaration rather than full EIR
  - Favorable air emission regulations
    - » e.g., take into account positive emission reductions from use of LFG
    - » Cross species offsets

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Examples of Negative Dollars

- **Taxes**
  - Sales taxes
  - Energy taxes
  - Property Taxes
- **Regulations that Increase Capital Expenditures for Equipment, Permitting and Installation**
  - Restrictive Air emission standards
  - Pipeline standards that increase expenses for delivery of processed LFG or digester gas to gas utility pipelines
    - High Minimum Btu standards
    - Extensive Trace Constituent Standards
    - Continuous or frequent monitoring or testing for trace constituents that are difficult to measure

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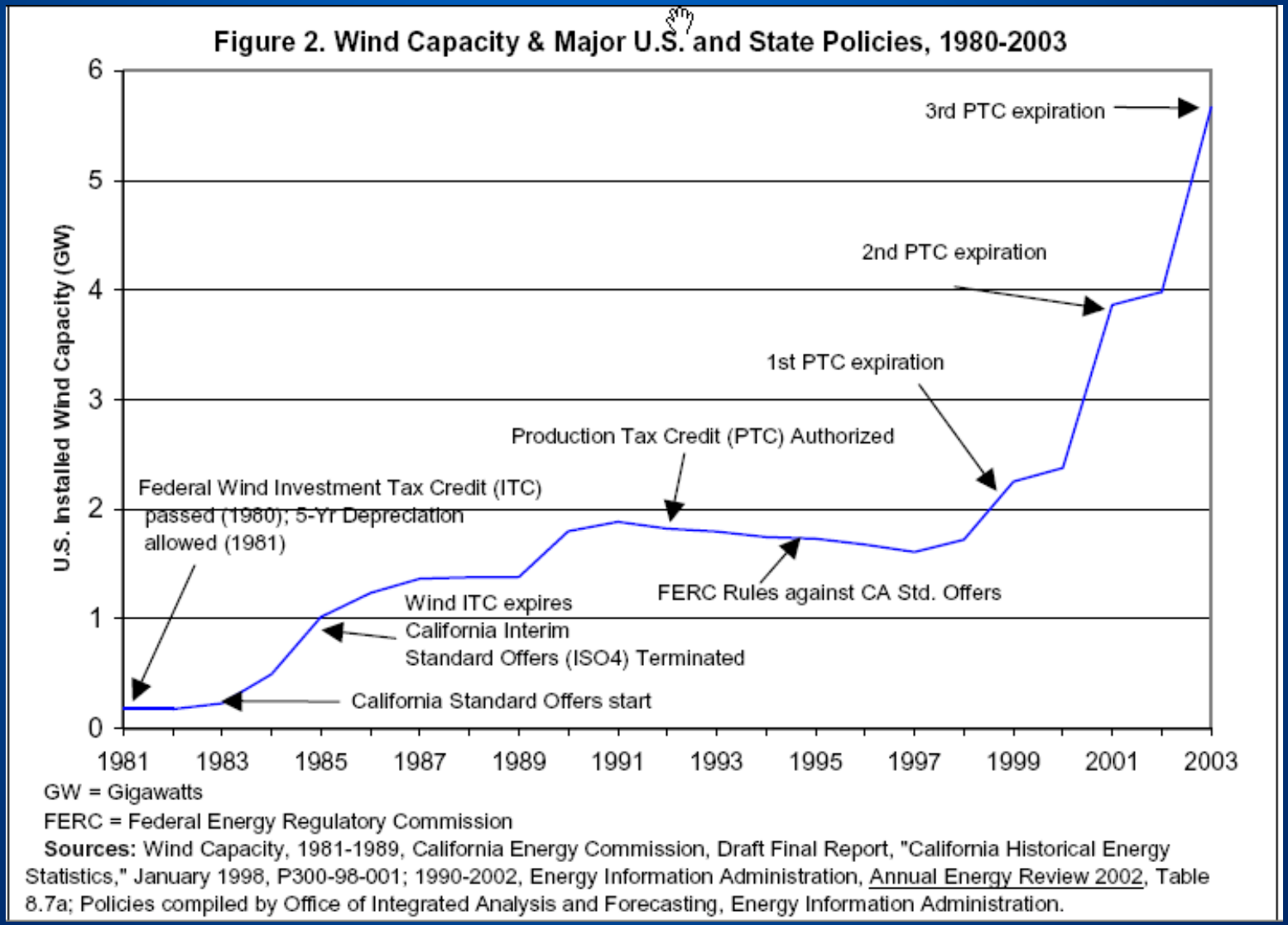
Positive Dollar Regulations and Mandatory Market Access Work



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Comprehensive List of Federal Tax Credit and Grants Available for RNG

- **None**
- **Zero**
- **Nada**
- **Zip**
- **NOTE: Federal EPA Renewable Identification Numbers under Renewable Fuel Standard 2 enhance value for RNG used for transportation fuel**
  - Pricing is Volatile and not predictable
  - Long-term off-take agreements at attractive pricing that will support debt financing not available

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California Access to Markets Impediments for RNG (Negative Dollars)

- **High California Pipeline Interconnection Costs**
- **Comparative Examples: Costs of interconnection at recent RNG projects developed by Morrow Renewables:**
  - $82,546 (2007)
  - $70,816 (2008)
  - $272,170 (2013)
- **California pipeline interconnection costs quoted to digester RNG projects**
  - Between $1,500,000 and $3,000,000

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California Access to Markets Impediments for RNG (Negative Dollars)

- Rule 30 minimum heating value specification of 990 btus/scf
- Mandated expensive continuous or very frequent monitoring of constituents of concern requiring expensive independent lab analyses
- Prohibition or restriction on blending of other natural gas or higher heating value fuels with RNG to meet minimum pipeline specifications
- Proposed restriction on volume of RNG that may be introduced into California pipeline
- Limiting injection of RNG only into transmission pipeline

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Potential Solutions to Increase Access to Markets for RNG

- **Pipeline Interconnection – have pipeline utility pay costs of interconnection and allow costs to be included in utility rate base**
- **Pipeline Easements – have interconnecting pipeline utility pay costs to acquire pipeline easements or rights of way required for pipeline to interconnect RNG project to natural gas pipeline**
- **Justification: Same as having electric utilities pay for transmission line costs and costs to construct, operate, fuel and maintain fossil-fuel based generation to support grid stability for intermittent renewable electric power resources, such as wind and solar. These utility-borne (and ratepayer paid) costs underwrite and encourage development of wind and solar projects.**
  - Allows RNG project development to proceed without the much higher costs for interconnection in California becoming an economic roadblock to the financing and financial success of the project.
- **Justification: ratepayer burden of paying for interconnection costs (by inclusion in utility rate base) is offset by solid waste disposal costs for landfill gas collection systems or digester infrastructure costs that are paid by RNG developer. Utility ratepayers and waste disposal customers overlap. Costs paid by RNG developer support lower waste disposal fees, whether at landfills or digester projects, such as WWTPs.**

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Potential Solutions to Increase Access to Markets for RNG

- **The following topics are the subject of hearings conducted by CPUC, CARB & OEHHA On Health Considerations and Pipeline Integrity & Safety Considerations of RNG**
- **RNG Industry Recommendations:**
  - **Heating Value:** For RNG, adopt heating value standard of 950 btus/scf, which is most common heating value standard in other states for injection of both natural gas and RNG into natural gas pipelines
  - **Blending**: Allow blending of either or both other natural gas or higher heating value fuel, such as propane, with RNG to achieve minimum heating value requirement for injection into natural gas pipeline
  - **Monitoring:** Adopt reasonable frequencies and costs for monitoring constituents of interest in RNG
    - CARB & OEHHA process completed and recommended standards in report can reasonably be met by RNG industry
  - **No RNG Volume Restrictions:** Resist adoption of any volume limitations on RNG that can be injected into natural gas pipeline, which would only serve to reduce revenues (Negative Dollars) available to receive return of and return on full invested capital in gas processing facility. Could have same practical effect as Hayden Amendment tariff provisions that included absolute prohibition of RNG.

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Potential Solutions to Increase Positive Dollars Available for RNG

- **Renewable Natural Gas Standard**
  - Worked for development of renewable electric power
  - May not be needed if Access to Markets occur and other solutions are implemented
- **RNG as Grid Support for Intermittent Renewables**
  - Require minimum percentage of RNG be used to fuel combustion generation required to provide grid support for intermittent renewable energy sources, such as wind and solar
  - Could be requirement separate from or count toward RPS generation requirement of obligated utility or covered party

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Potential Solutions to Increase Positive Dollars Available for RNG

- **Feed-in Tariff providing higher price for RNG**
  - Used successfully to increase available renewable electric power in California and other states
  - Premium prices to be paid would be allowable recoverable costs as part of rate-base of utilities
  - Pipeline utility excused from offering feed-in-tariff if RNG project sells RNG through natural gas pipeline to in-state electric power utility or marketer (RPS) or to transportation fuel supplier (LCFS)
- **Allow In-State Transportation of RNG by Displacement.**
  - Allow transportation by displacement of RNG of in-state RNG across multiple natural gas pipelines in state
  - Reduces transportation costs and allows same transportation of RNG as is allowed by FERC for natural gas

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Potential Solutions to Increase Positive Dollars Available for RNG – Transportation Fuel

- **Require RNG for State & Municipal CNG/LNG Vehicles**
  - Mandate all California state-owned and municipal-owned CNG and LNG vehicles procure a specified percentage of their natural gas fuel from RNG
    - Creates market and lowers carbon footprint of state and municipal vehicles
    - In-state sources of RNG get double credit to satisfy requirement than do out-of-state sources of RNG
- **Transportation of RNG for Transportation Fuel by Displacement**
  - Allow transportation by displacement of RNG used as transportation fuel for LCFS purposes so long as pipeline path exists
  - Transfer of environmental attributes of RNG occur by contract and not by pipeline
  - Aligns California rule with EPA treatment under Renewable Fuel Standard 2

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Potential Solutions to Increase Positive Dollars – Economic Incentives

- **Transferable Tax Credits**
  - Transferable California tax credit to be applied against California taxes equal to a percentage of either (i) the value of the RNG facility installed, or (ii) the value of the RNG energy sold each year for 10 years.
  - Transferability allows developer to utilize value of credits by monetizing them with California entities with large tax bill – same concept used for federal Section 29 tax credits
- **Grants**
  - Grant for specified percentage (e.g., 30%) of installed capital costs of RNG project payable 60 days after it is "placed in service." Can use same approach as Section 1603 grant provided by federal government.
  - Federal program very successful

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Potential Solutions to Increase Positive Dollars – Economic Incentives

- **Carbon Capture Credit**
  - Provide minimum “cap and trade” pricing and transferable and tradable credit for carbon capture benefits realized from in-state RNG projects
  - Specifically exclude carbon capture credits from environmental attributes that must be transferred to obligated utility in order to meet RPS requirement
  - Coordinate carbon capture credits allowable with Low Carbon Fuel Standard Offset credits to avoid double dipping when RNG used a vehicle fuel

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Potential Solutions to Increase Positive Dollars – Economic Incentives

- **Sales Tax Exemption**
  - Sales tax exemption for equipment used to collect, process, produce and deliver RNG
  - This duplicates the concept incorporated into SB 71, which provides for a 100% exclusion of the value of solar energy property from property taxation

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Potential Solutions to Increase Positive Dollars – Economic Incentives

- **Real and Personal Property Tax Exemption**
  - Similar to type of exemption available to solar projects
  - Doesn't take away funding from municipalities and schools since, without such exemption, these projects may not exist and no tax revenues would be realized. Could be made to apply only to new RNG projects developed, which, because of the recent repeal of the Hayden Amendment, would mean virtually all projects to be developed in California from January 2014 on.
  - Adopted by number of other states – Iowa, Kansas, Kentucky, Maine, Minnesota, Montana, Virginia, Wyoming
  - Would exempt from property tax both real property interests (such as possessory interests arising from leases with municipalities as well as leases of real property from private entities) and personal property (all of the processing equipment, collection system, pipes, meters, metering equipment, etc.)

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Potential Solutions to Increase Positive Dollars – Financing Assistance

- **State Guarantee of Debt**
  - Provide California guarantee of debt used to finance specified percent (e.g., up to 90%) of project costs provided that project can support minimum 1.2: 1 debt coverage ratio
- **Provide Preferential Tax-Exempt Bond Cap Allocation**
  - Authorize and provide preferential tax exempt bond cap allocation to in-state RNG projects for use of tax-exempt bonds to finance RNG projects in California
  - When coupled with state guarantee provision above, will help obtain investment grade rating for bonds that improve marketability of bonds and reduce interest expenses to RNG project

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Potential Solutions to Increase Positive Dollars – Synchronize Air Emission Regulations with Renewable Energy Objectives

- **RNG Processing Technologies Have Low Emissions**
  - Raw gas is collected, treated and injected into pipeline, not combusted
- **Always Categorize RNG as Zero Emission Fuel**
  - Need to modify CARB regulations adopted under Mandatory Reporting Requirements of emission reporting rules so that RNG from in-state sources are always treated as a zero emission fuel when purchased by an obligated party, such as a regulated utility or electric power marketer
  - No limitation on zero emission fuel treatment based on date contract signed or whether RNG is from incremental production
    - If not a zero emission fuel, then obligated party must purchase emission offsets with respect to combustion of RNG, and costs of offsets will be deducted from price for RNG --- Huge Negative Dollars.

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Potential Solutions to Increase Positive Dollars – Synchronize Air Emission Regulations with Renewable Energy Objectives

- **Adopt Exemption from Emission Requirements or More Reasonable Control Technology Emission Requirements for On-site Electric Power Generation at Landfills and WWTPs**
  - Old regulations used to provide offsets taking into account offset from reduced flare emissions and benefits of renewable energy production and relative inefficiency of on-site engine-generators.
  - New rules by air districts require lower emissions from on-site electric power generation at landfills and WWTPs than for a flare
  - Thus California policy: rather flare landfill gas than displace fossil fuel generation through onsite production of renewable electric power
  - Many existing California landfill gas-to-electric power generating facilities will be terminated, since cannot afford expensive gas treatment and exhaust emission control equipment required to meet new air emission regulations
  - Many of those landfill sites will be too small to install RNG production facility, so landfill gas will be flared.

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Development of RNG Projects is a Delicate Numbers Game

- Usually only works at larger landfills and WWTPs due to fixed costs of development and O&M
- Must meet Secret Formula
- Cannot engage in Fuzzy Math as to Positive Dollars and Negative Dollars

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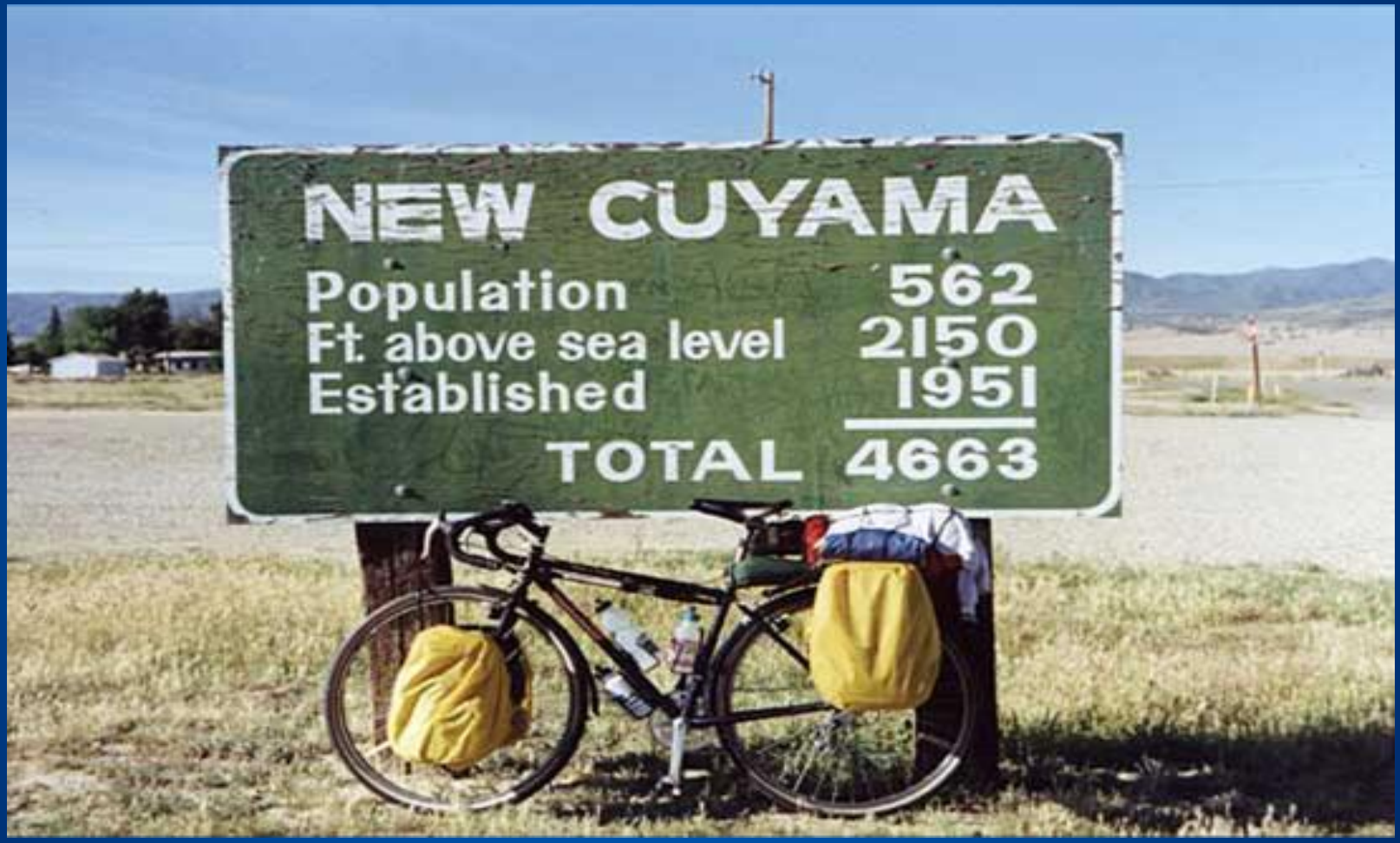
What is Fuzzy Math?



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Thanks for Listening!!

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