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***Sacramento Municipal Utility District  
(SMUD)***

***Barriers and Solutions to Developing  
Bioenergy in California***

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**Presented to the Bioenergy Interagency Working Group**

**June 11, 2007  
Sacramento, California**



**DOCKET  
06-BAP-1**

**DATE JUN 11 2007  
RECD. JUN 11 2007**

# SMUD Biomass Program

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- Contributes to SMUD's renewable energy goal & reduce greenhouse gases
- SMUD's Biomass Program - local benefits by turning problem wastes (resources) into renewable electricity
- Supporting policies - Biomass (Retail) Net Metering Rate

## Examples of program:

- “Leftovers to Lights” Program focused on diverting food waste from landfills into local projects
- Dairy Digester Incentive Program funds local dairies installing digesters to produce sustainable energy

# Biomass Resources, Opportunities, Risks

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- Great biomass resources:
  - forestry wood waste, municipal solid waste, manure
  - 6<sup>th</sup> largest economy in world, strong environmental leadership
- Great opportunities in bioenergy:
  - Can easily make targeted 20% of CA renewable electricity
  - Huge impacts on greenhouse gas reduction
- Great risk if we don't use these resources:
  - Climate change impacts our economy, our safety, enjoyment of our environment, and our long term viability
  - Drought, forest fires, flooding, sea level rise, heat waves, blackouts, inflation from reliance on fossil fuel supply

# Barriers and Solutions

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- Regulatory hurdles & business as usual market barriers
  - Biomass projects most complex renewable energy source
  - Requires multiple permits; air, water, solid waste
  - Produce many un-monetized external benefits
  - Produce many cross agency impacts – good and bad
- Barriers to implementing projects:
  - Regulatory silos, usually focused on controlling a single element despite existence of cross agency benefits
- Solutions
  - Create mechanisms that recognize the cross agency benefits
  - Recognize that tradeoffs exist – there is no free lunch!

# Barriers & Solutions to Onsite Generation-Dairies

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## Benefits

- Distributed electric generation benefits:
  - Only largest dairies can clean up gas to pipeline specs
  - Electric power produced where it is needed without new transmission, line losses
  - When using waste heat, more efficient than central plants

## Barriers

- Cannot meet central plant emission levels
  - Lacks cost-effective or proven low emission engine technology
  - Lacks cost-effective or proven gas cleanup technology

# Barriers & Solutions to Onsite Generation-Dairies

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## Solutions

- Policies that credit projects with **net benefit** exchange between NOx and Greenhouse gas emissions
- Funding for RD&D on technology improvements to reduce emissions
- Flexible permitting using proven technologies available at reasonable cost while progress is made

## Tradeoff

- If 50% of CA dairies adopted digester technology:
  - NOx emission would be about 98 tons
  - Greenhouse gas reduction benefit at 4.4 million tons

# Barriers and Solutions to Codigestion

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## Benefits

- Food waste in landfills can cause water and air quality impacts
- On-farm codigestion provides good resource for energy and soil nutrients – 20%% food waste can double energy production

## Barriers

- Elemental salts in manure and in food waste are retained during codigestion
- Study of salt management only beginning, standards not yet established

# Barriers and Solutions to Codigestion

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## Solutions

- Support Salinity Working Group in developing guidelines for salt application rates to farmland
- Support research on manure management with codigestion and desalinization

## Tradeoff

- Codigestion can provide farmers with revenue that supports digester projects without government funding.
- Codigestion adds to complexity of nutrient management

# Barriers and Solutions to MSW Conversion

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## Barriers

- Even after AB939, we dispose 46 million tons/year in landfills
- Regulations not current with technology - gasification defined as zero oxygen or air and zero emissions to air or water

## Solutions

- Legislative action to correct definition of conversion technology
- Support for demonstrations, possibly using fees from landfill

## Tradeoff

- Some emissions will result from conversion technologies
- Getting organics out of landfills will protect water and reduce fugitive greenhouse gas emissions