# THE OPPORTUNITIES AND CHALLENGES OF LARGE-SCALE BIOMASS POWER

Sierra-Cascade Logging Conference 2011

TSS Consultants

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# TSS Consultants



Bioenergy development consulting since 1986

- Renewable energy and fuels
- Environmental permitting and compliance
- Forestry and natural resources
- Climate change/life cycle analysis
- Fire planning and modeling

# Opportunities

# Benefits of Biomass Power



- Renewable baseload energy (unlike wind and solar)
- Domestic source of energy - Supports local economies with in-woods jobs, processing, hauling, and manufacturing
- Uses by-products of forest management, fuels reduction, and forest restoration, creating healthy forests and reducing wildfire danger
- Air quality benefits
- Greenhouse gas reduction

# Creating and Maintaining Jobs




1 MW of Biopower = 4.9 jobs

# Reducing Wildfire

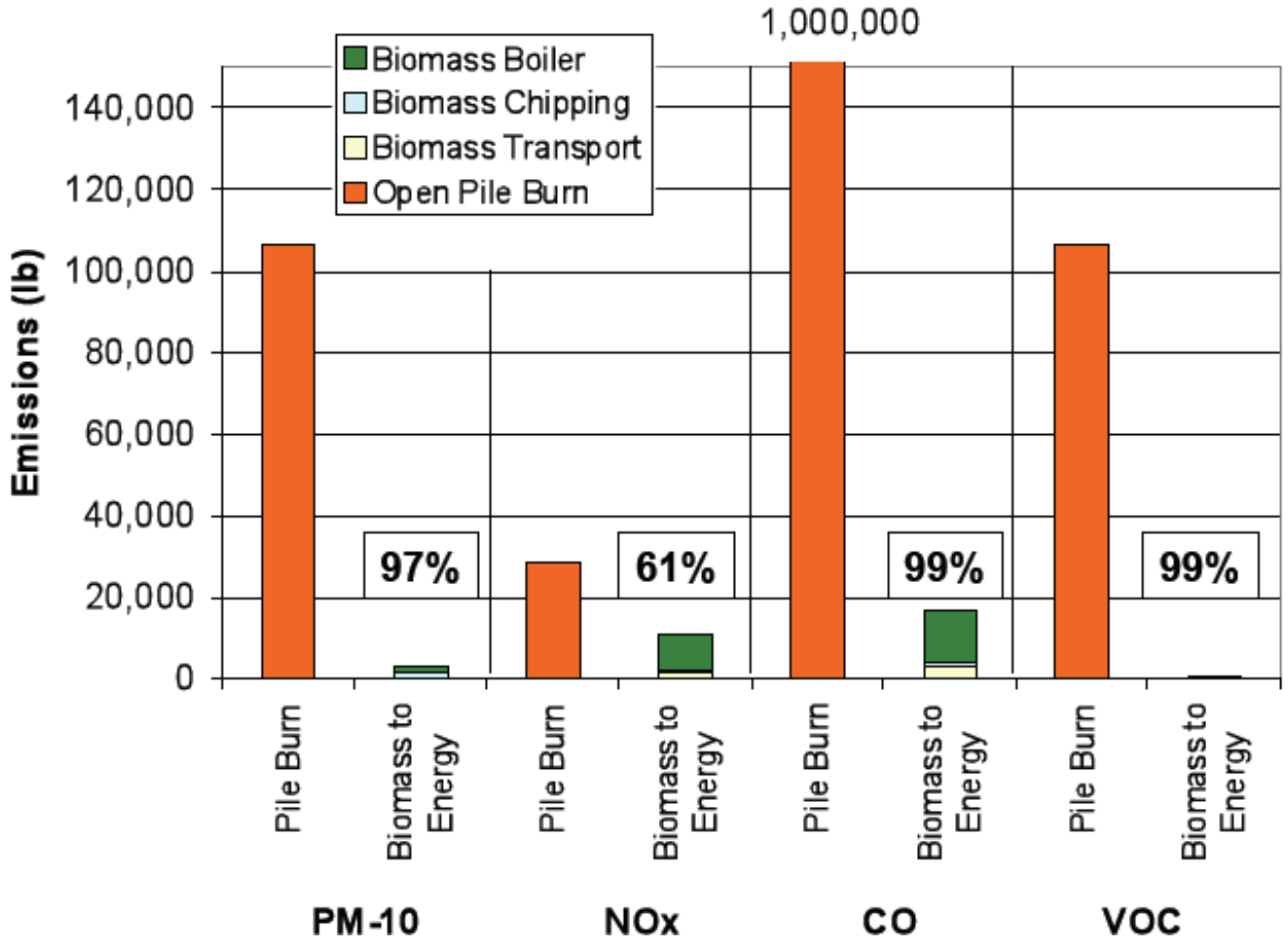


No treatment prior to fire

Fuel treatment prior to fire

# Air Quality Benefits of Biopower



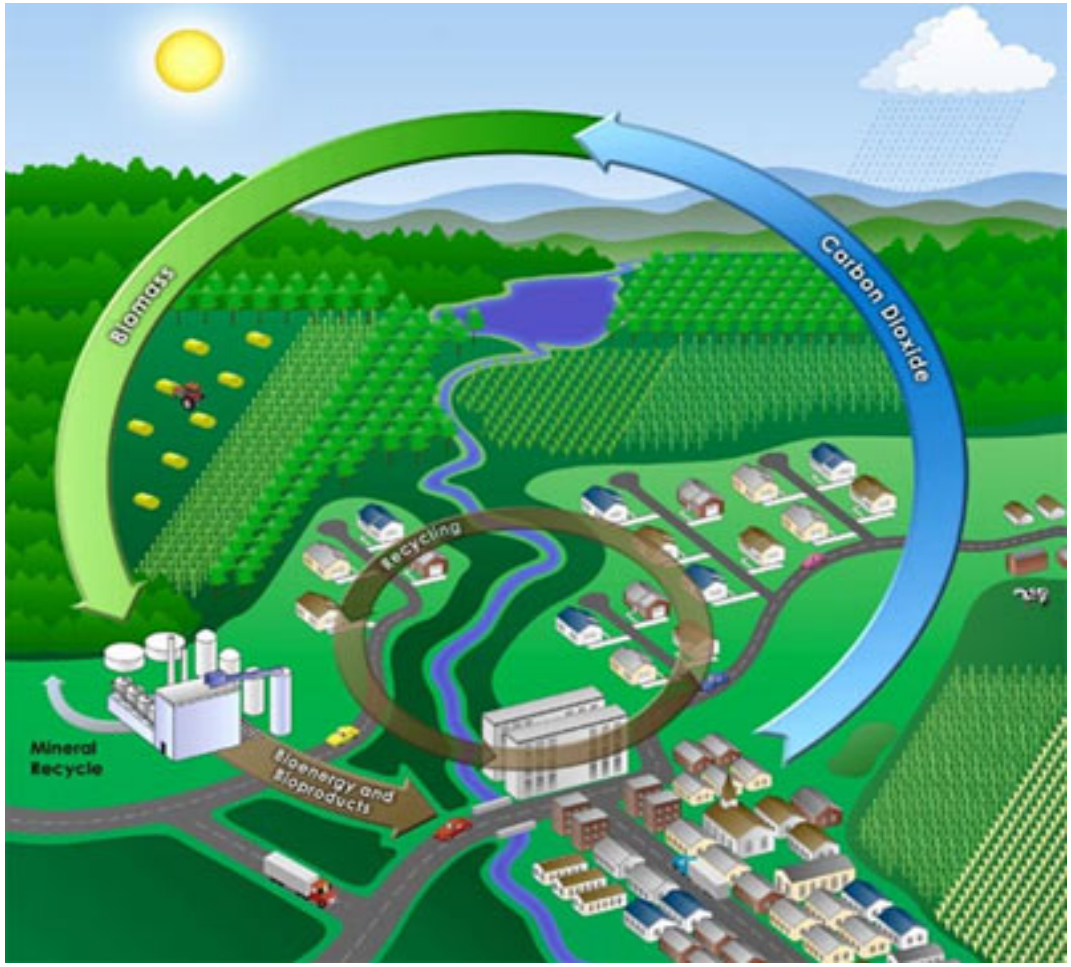


# The Carbon Impact



# Benefits of Biomass – Carbon Neutral






- Biomass absorbs carbon dioxide during growth of wood and green materials, and emits it during conversion
- It recycles the carbon and does not add to the greenhouse effect

# Challenges

# Public Perception (Misperceptions?) of Large Scale Biomass Power



- Scale and available/sustainable biomass fuel
- Air emissions and other environmental impacts
- Impacts on forest health
- Carbon surplus v. carbon debt

# Challenging Economics



- Biomass fuel price increases
- Low avoided cost rates for electricity
- Difficulty securing capital

# Potential Environmental Issues



- Air Quality
- Greenhouse Gas Emissions
- Water Use & Discharge
- Land Use
- Transportation
- Biological Resources
- Noise
- Visual/Aesthetics

**and, of course, NIMBYism**

# Air Quality Permitting for Biomass Power



- Principal air pollutants of concern:
  - NOx (ozone precusor)
  - PM
  - VOC (ozone precusor)
  - CO
  - HAPs (particularly HCl)

- Size of plant and associated emissions critical

# Carbon Debt v. Surplus
## "The eye of the beholder"



- **Carbon Surplus** – Count the carbon storage first and the carbon release afterwards, then direct emissions are simply returning carbon to the atmosphere that has already been sequestered.
- **Carbon Debt** – Count the biomass emissions first, and then consider the the biomass regrowth is restoring the stored carbon that was emitted when it was burned

# Water Quality Permitting for Biomass Power



- Water Use
- Water and Wastewater

  Discharge

  - Non-contact cooling wa
  - Waste water
- Storm Water
  - Construction
  - Operation

# Biomass Power and Land Use Issues



"Brownfield"


"Greenfield"

# Land Use Permitting for Biomass Power



- Siting
- Zoning Conformance
- Condition Use Permits
- Community Acceptance
- California Environmental Quality Act

# CEQA!



- CEQA – The California Environmental Quality Act*
- Purpose – to inform the public of environmental decisions by CA agencies
- Public process driven
- For biomass power plants usually led by land use or air quality agencies

* a.k.a. Consultants Employment in Quantity Act

# Basic CEQA Components

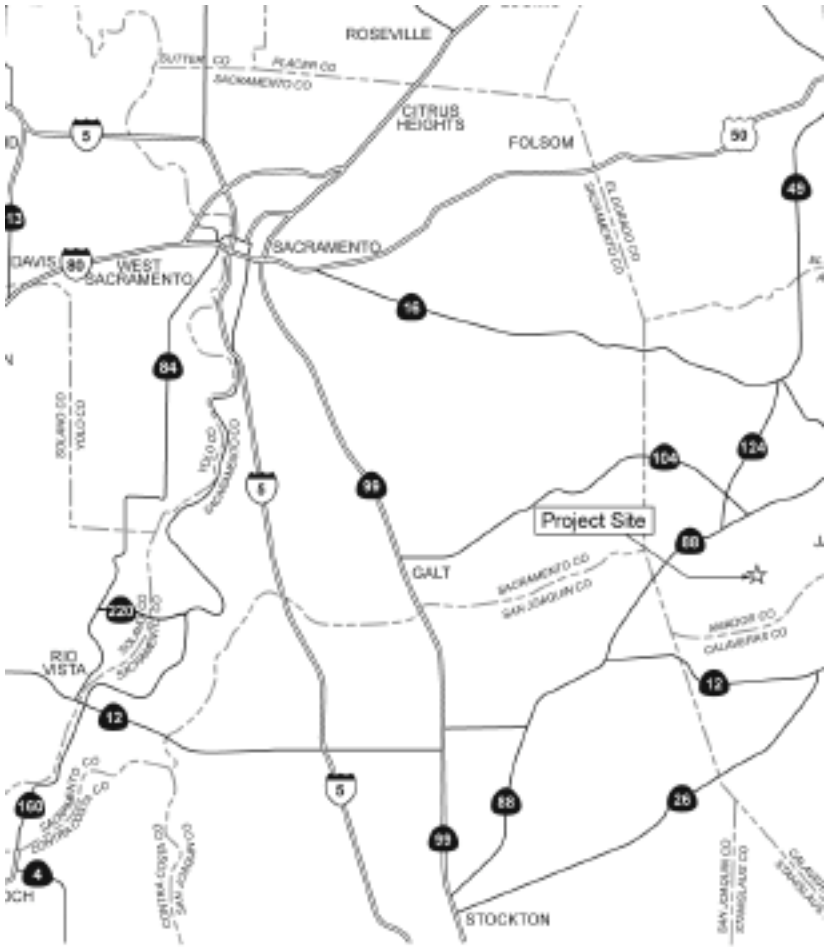


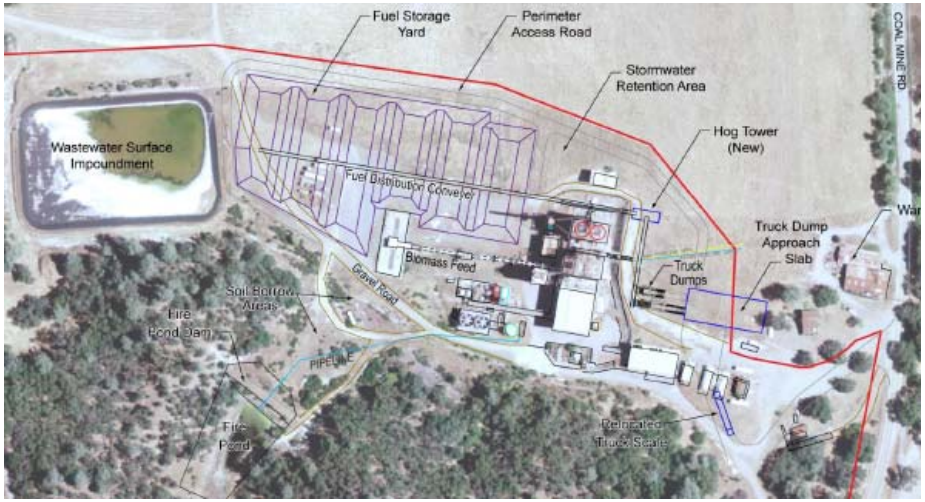
- Environmental Information Form
- Environmental Checklist & Initial Study
- CEQA Determination
  - Exempted
  - Negative Declaration
  - Mitigated Declaration
  - Focused EIR
  - Full EIR

# BUENA VISTA AS AN EXAMPLE

# Buena Vista Biomass Power






**Ione, CA**

# Buena Vista Biomass Power



- 18.5 MW of coal converted to biomass
- Partially fueled by forest-sourced woody biomass
- Innovative and progressive environmental controls
- Considerable utility, regulatory, and community acceptance
- Strong Power Purchase Agreement – Project economics good

# The "Big" Challenges for BV



- NIMBY
- Conditional Use Permit change
- CEQA
- Carbon debt v. surplus – Is biomass carbon neutral?

# NIMBY



- Very small group of local residents, but also very vocal
- Also upset with other nearby proposed developments
- Use of CEQA as a hammer
- Alignment with well-funded anti-biomass factions

# Conditional Use Permit Change



- Conversion of coal to biomass required CUP change
- Originally considered by County to be a minor issue
- Changes and uncertainties regarding CEQA changed the picture
- CEQA process led to full Environmental Impact Report

# CEQA as a Hammer



- Small opposition essentially controlled process
- CEQA process from initial minor CUP amendment application to certification of EIR took 14 months
- Even then – two lawsuits have been filed
- Use of CEQA process by anti-biomass factions

# Carbon Debt v. Surplus



- A major challenge for Buena Vista
- Addressed in EIR
- Even then – two lawsuits have been filed within the last week with emphasis on greenhouse gas emissions issues
- BV is the "poster child" - others may (will) follow

# Things That Can Be Done



- Lobby for a comprehensive definition of carbon neutrality of biomass
- Champion the societal and environmental benefits of biopower
- Plan for the CEQA process
- Work hard for community and regulatory acceptance

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