



Economic & Social Aspects of a Biomass Power Facility

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California & Biomass Power

- First state with large scale development
- Major decline in 1990's
- Resurgence after 2004
- Is there room for more?
 - Coal conversions




Macro Scale Look at Plant

- 15 MW
- 125,000 Bone dry tons/yr fuel
- \$40 million
- 16 plant jobs, 30 fuel supply jobs



A Closer Look - Size

- Big enough to be economic
- Small enough to not stress fuel supply
- Big enough to be steam supplier to multiple future businesses
- Small enough to not stress existing infrastructure
 - Transmission, roads, water/sewer



A Closer Look – Fuel Supply

- Utilize byproducts of county mills (bark, sawdust, shavings, chips)
- Home for harvest residues, precommercial thinnings now burned
 - Assume 50% utilization
- Outlet for local green waste, wood fraction, right-of-way thinning



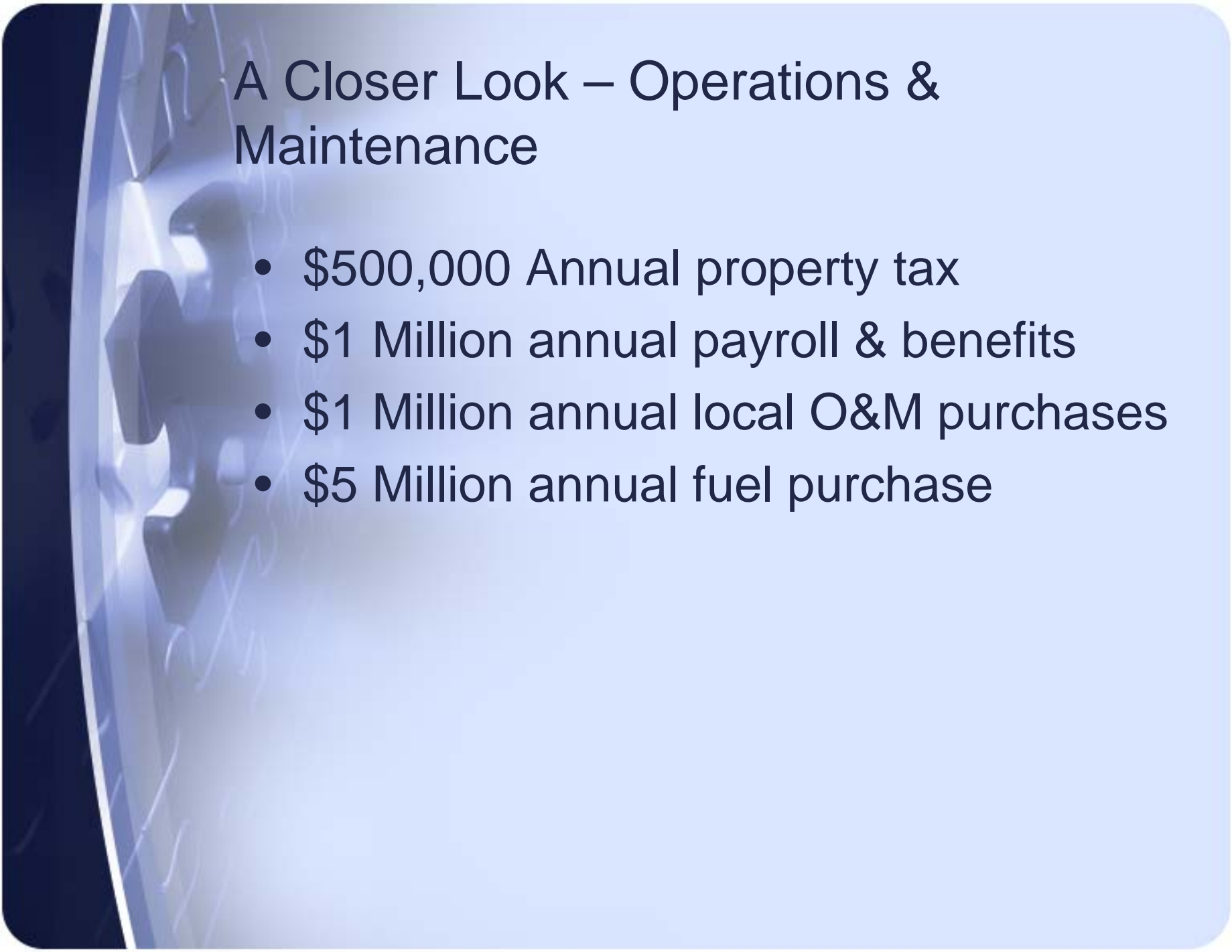
A Closer Look - Investment

- \$40 million Project
 - 70% materials and equipment
 - 30% local construction
- 40 construction jobs over 18 months
 - \$½ million in upfront studies, permitting, design
 - In kind services being provided now



A Closer Look - Jobs

- 16 permanent jobs at plant
 - 4 Admin/fuel
 - 8 Operations
 - 4 Maintenance
- 30+ fuel supply jobs
 - 3 chipping/grinding “sides”
 - 9 Jobs each
 - Additional drivers for mill byproducts



A Closer Look – Operations & Maintenance

- \$500,000 Annual property tax
- \$1 Million annual payroll & benefits
- \$1 Million annual local O&M purchases
- \$5 Million annual fuel purchase



Environment – Local

- Eliminate much slash pile burning/open burning (97% reduction in emissions)
- Potential to lower fire risk around communities
- Fuel hauled to central site for combustion
 - BACT required for pollution controls
 - Electrostatic precipitator
 - Multiple levels of overfire air
 - Probable selective non catalytic removal (SNCR) for NO_x
 - Local ash disposal
 - Water consumption/sewer use



Environment – State/Region

- Displace fossil fuel use for generation
- Help California meet Renewable Portfolio Standards (RPS)
- Help California meet AB32 Greenhouse gas reduction goals



Environment - Global

- Methane to carbon dioxide trade lowers greenhouse gas emissions from fuel
 - 50% Methane from landfilling
 - 10-15% Methane from decomposition
 - 5% from open burning
 - 0% from controlled combustion
- Less need to dig, drill, burn and release stored carbon



Environment/Social - Summary

- Downsides
 - Increase in local traffic
 - Steam plume at site
 - Local emissions
 - Use of other resources
- Upsides
 - Synergies with adjacent golf course
 - Improved forest management
 - Lower fire potential
 - Less open, uncontrolled burning
 - Renewable electricity
 - Negative carbon footprint



Green Industrial Park Concept

- Plant should be viewed as anchor tenant of green industrial park
- Provisions to supply steam/electric to other tenants
- Logical next tenant is small log sawmill
- Provisions to take wastes from other tenants
- Large volume flow of low/no value wood waste
 - Value added manufacturing improves overall economics
- Cutting edge concept – renewable combined heat and power



Bottom Line

Done correctly, plant is:

- Complement to local forest industry
- Catalyst to improve forest health, lower fire risk
- Place for community to safely dispose of woody materials
- Local source of green energy
- Improved power quality, reliability
- Minor source of emissions, use of other resources
- Economic engine for community



Why Ft. Bragg?

- No nearby other markets for local fuel
- Community/local government/industry support
- Good access to PG&E transmission
- Excellent California renewable power prices
- Synergies with park/golf course development

What Do They Look Like?

Freres Lumber, Lyons, OR

