

Using large volumes of low value wood in Colorado



PUTTING BEETLE KILL PINE AND FOREST THINNINGS TO BENEFICIAL USE

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Potential Wood Supply



BEETLE KILL PROVIDES A LOT OF HARVEST OPPORTUNITIES

TYPICAL CHALLENGES TO WOOD HARVEST

FOREST MANAGERS NEED TO ACT BEFORE DEAD TREES FALL AND MAKE HARVEST MUCH MORE DIFFICULT

AFTER BEETLE KILL THE SUSTAINABLE COLORADO WOOD HARVEST IS ESTIMATED AT 200,000 TO 250,000 TONS PER YEAR.

Value Added Wood Uses



- **LIQUID FUEL**
- **FINISH LUMBER**
- **FRAMING LUMBER (2X4'S \$600/TON)**
- **PAPER PULP**
- **ANIMAL BEDDING**
- **LANDSCAPE MULCH**
- **THERMAL ENERGY FUEL**
- **ELECTRIC POWER (\$100/TON)**

Lumber Industry supports other wood uses



**“THE LOWEST PRICE
WOOD CHIP RIDES ON
THE BACK OF A 2 X 4.”**

-CARL SPAULDING

**COLORADO TIMBER INDUSTRY
ASSOCIATION PRESIDENT**

Waste wood for fuel



USING WOOD FOR FUEL

INVENTING THE WHEEL

LIQUID FUELS ARE HIGHEST VALUE USE

**CELLULOSIC ETHANOL IS STILL BEING
COMMERCIALIZED**

**COMMERCIAL SCALE HEATING SYSTEMS
ELECTRIC GENERATION**

Commercial Scale Heating Systems



**COMMERCIAL HEATING PLANTS WOULD USE 1000
TO 5000 TONS OF CHIPS PER YEAR**

**SUSTAINABLE HARVEST COULD POTENTIALLY
FUEL A HUNDRED OR MORE HEATING SYSTEMS**

WHY ARE WE DOING IT? *TO USE WOOD!*

Obstacles to Commercial Wood Fueled Heating Systems

~~OWNERS DO NOT WANT THE HASSLE OF WOOD~~

LACK OF WOOD FUEL SYSTEM ENGINEERS AND DESIGNERS

LIMITED EQUIPMENT SELECTION

LIMITED SERVICE SUPPORT

LOCAL FUEL SUPPLY AVAILABILITY

HIGHER MAINTENANCE COSTS THAN FOSSIL FUELS

EMISSIONS CONCERNS

Challenges Creating a Wood Fueled Heating Industry



FUEL SUPPLIERS

MECHANICAL ENGINEERS

ARCHITECTS

OWNERS/DEVELOPERS

EQUIPMENT SALES AND SERVICE

Chicken and Egg Problem



**FEW COMMERCIAL WOOD SYSTEMS
BECAUSE THERE IS NO SUPPORTING
INDUSTRY**

**NO SUPPORTING INDUSTRY BECAUSE
THERE IS NO LOCAL DEMAND FOR
COMMERCIAL WOOD SYSTEMS**

Back to original need



**USING LARGE VOLUMES OF
LOW VALUE WOOD IN
COLORADO**

What consumes huge volumes of solid fuel today?



ELECTRIC GENERATION!

LOTS OF WORK HAS BEEN DONE ON SMALL SCALE GENERATION

TECHNOLOGY HAS BEEN SLOW TO DEVELOP

BEETLE KILL HAS A SHELF LIFE

IT WON'T WAIT FOR TECHNOLOGY

CO-FIRE WOOD IN COAL BOILER

Wood logistics disadvantages



**WOOD USUALLY CAN'T COMPETE AGAINST COAL AND
NATURAL GAS FOR ELECTRIC GENERATION**

**GAS ARRIVES BY PIPELINE
CONTINUOUS DELIVERY**

**COAL IS SHIPPED BY RAIL
10000 TONS PER DELIVERY**

**WOOD TYPICALLY MOVES BY SEMI-TRUCK
20 TONS PER DELIVERY**

Advantages to co-firing wood with coal for electric generation



CAN BE IMPLEMENTED IMMEDIATELY

NOTHING NEEDS TO BE INVENTED

WOULD CONSUME HUGE QUANTITIES OF WOOD

**INDUSTRIES DO NOT HAVE TO BE BUILT FROM
SCRATCH**

CONSTANT, PREDICTABLE WOOD DEMAND

Colorado Springs Utilities Co- Firing Highlights



100,000 TONS/YEAR

**OVER 20 COMPANIES INTERESTED IN SUPPLYING
FUEL**

CLAIMED 20 YEAR SUPPLY WITHIN 75 MILES

LOWER ASH AND SULFUR CONTENT THAN COAL

WOOD WILL DISPLACE 75,000 TONS/YEAR OF COAL

Wood fuel supports Colorado Renewable Energy Standard



**ELECTRIC GRID OPERATORS LIKE WOOD FUEL
BECAUSE IT IS DISPATCHABLE**

**WIND AND SOLAR ARE PREDICTABLE BUT
CANNOT BE TURNED ON AT WILL**

Conclusions



CO-FIRING USES EXISTING TECHNOLOGY

IT CAN START TODAY, NOT IN “THE FUTURE”

**CO-FIRING WITH COAL PROVIDES A LARGE,
LOCAL, BENEFICIAL USE FOR BEETLE KILL WOOD**

**AFTER BEETLE KILL IS GONE CO-FIRING WILL
CONTINUE TO PROVIDE AN OUTLET FOR LOW
VALUE WOOD**