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WOODY BIOMASS HARVESTING: TECHNOLOGY AND CHALLENGES

WOODY BIOMASS FOR ENERGY



WOODY BIOMASS FOR ENERGY

- ✘ Widely available
- ✘ Provides economic return to forest mgmt
- ✘ Generally year-round harvest and supply
- ✘ Generally less-intensive production
- ✘ Existing industry to produce and move wood
- ✘ 16B cu ft/yr

WOODY BIOMASS FOR ENERGY

- ✘ Regionally variable
- ✘ Competing markets for the fiber
- ✘ Concern about impact on other ecosystem



LOGGING RESIDUES



RESIDUE COLLECTION IN THE STAND



UNDERSTORY HARVESTING



TERRAIN CHIPPING



SHORT ROTATION HARDWOODS



NICHE WOODY BIOMASS SYSTEMS

- ✘ Range of technology to fit unique forests
- ✘ Logging residues at roadside are easy
- ✘ Other residues are costly
- ✘ Short rotation crops are ?

FUELWOOD THINNING



HIGH PRODUCTION HARVESTING



INTEGRATED RECOVERY



WOODY BIOMASS HARVESTING

- ✘ Range of technology—feedstock specific
- ✘ Bigger, more productive is cheaper
- ✘ Woody biomass systems are ready today

WOODY BIOMASS SUPPLY CHAIN—100M



- Silviculture
- Genetics
- Productivity
- Sustainability
- Markets
- Policy
- Land-use
- Landowners

- Integrated ops
- Biomass harvest
- Efficiency/Cost
- Field processing
- Feedstock quality
- Field storage
- Impacts
- Life Cycle Analysis

- Product form
- Density
- Efficiency/Cost
- Siting

- Feedstock quality
- Process technology
- Efficiency/Cost
- Markets

WORKFORCE AND CAPITALIZATION

- ✘ 100M dry tons ~50% of current harvest
- ✘ 20 to 40,000 more loggers
- ✘ 30 to 50 more occupational fatalities per year
- ✘ 5 to 8000 truck drivers
- ✘ 3 to 5,000 logging crews
- ✘ \$3B to \$7.5B capital investment

(rough numbers for illustrative purpose)

PUBLIC RESPONSE

- ✗ Cutting trees is bad
- ✗ Burning anything is bad
- ✗ Wasteful technology is bad
- ✗ Managed forests are bad
- ✗ Impact on existing uses



WOODY BIOMASS

- ✘ Critical to develop this use for forest biomass
- ✘ Current technology works
- ✘ Developments can improve logistics/cost
- ✘ Significant challenges to operating at scale