

WOOD-TO-WHEELS: A MULTIDISCIPLINARY RESEARCH INITIATIVE IN SUSTAINABLE TRANSPORTATION UTILIZING FUELS AND CO-PRODUCTS FROM FOREST RESOURCES

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Michigan Technological University (MTU) has established a broad-based university-wide research initiative, termed Wood-to-Wheels (W2W), to develop improved technologies for growing, harvesting, converting, and using woody biomass in renewable transportation fuel applications. MTU has established advanced facilities for biomass production and processing and biofuels-focused powertrain testing in support of the W2W research initiative. Research related to biotechnology, forest ecosystem management, vehicular systems, and decision-making sustainability include:

- Sustainable forest planning and woody biomass harvesting, soil element cycling, and the molecular biology and genetic engineering of trees
- Processes for biochemical and thermal conversion of biomass, including chemical pretreatment and enzymatic hydrolysis of cellulose, fermentation, product purification, and enzyme/microorganism improvement
- Bioprocessing facility location, harvesting, logistics, and community-related issues
- Developing, adapting, and testing engines and other system components to utilize ethanol, biodiesel, and other bio-products
- Technology evaluation and appraisal of commercialization potential
- Environmental assessment of the life cycle of biofuel production and usage and comparison with conventional alternatives

The presentation will summarize the activities associated with the Wood-to-Wheels initiative and describe the potential benefits that are achievable.

KEY WORDS: biofuels, sustainability, wood-to-wheels, value chain

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