

USING AI-ENHANCED NIR TECHNOLOGY TO OPTIMIZE FEEDSTOCK SORTING



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CHALLENGES IN BIOMASS SORTING

Inconsistencies in feedstock quality

- Variations in moisture content (drying needs and degradation)
- Particle size and uniformity (combustion vs. biochemical processing)
- Composition (chemical composition, ash and impurities)

Presence of contaminants

- Chemical contaminants, physical contaminants

Impact on end-product quality

- How inconsistent sorting affects biomass applications

WHAT ARE WE PROPOSING?

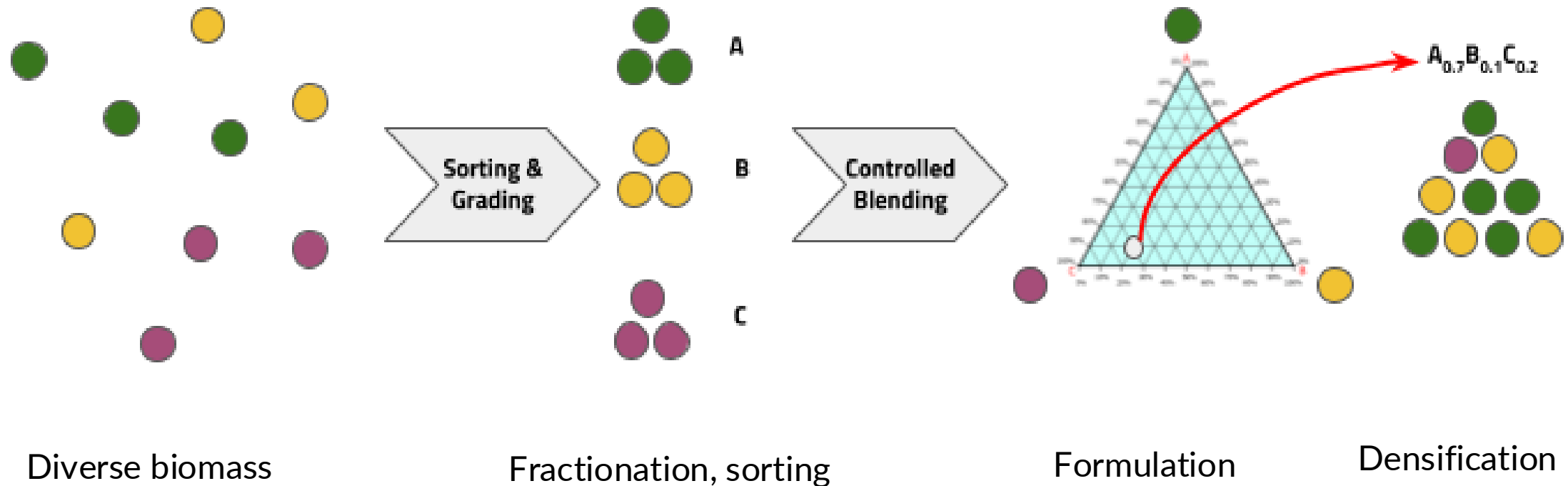
Develop a fast biomass characterization method using NIR technology

- Better understand feedstock and quickly decide on the optimal blend of biomass
- Use available feedstock to produce durable pellets that meet the requirements listed in ISO 17225-2

Investigate the application of NIR spectroscopy to rapidly homogenize diverse biomass feedstock streams arriving at pellet plants.

- Increase feedstock from forest residues, burnt wood, reclaimed/ recycled wood fibre, and other sources of underutilized wood fibre

FEEDSTOCK SORTING: WHAT DOES IT MEAN?



Key aspects: size sorting, moisture sorting, chemical composition sorting, energy content sorting, contaminant sorting, application-specific sorting

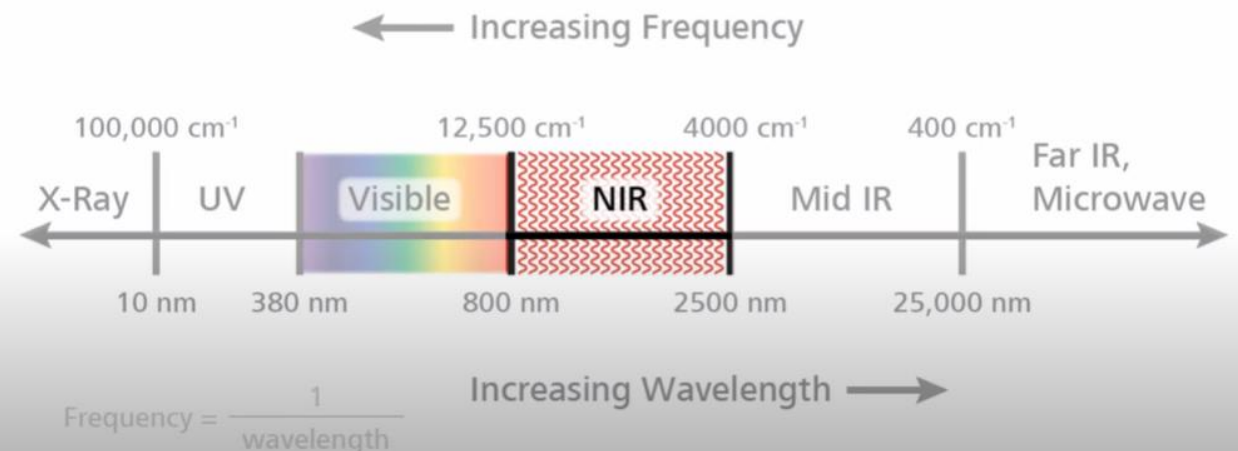
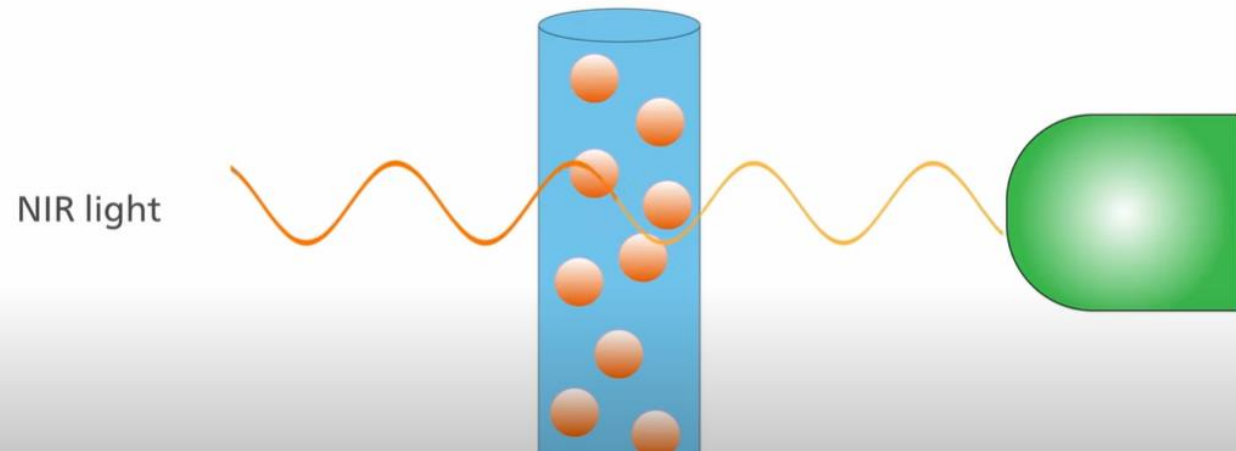
INTRODUCTION TO NIR TECHNOLOGY



- What is Near-Infrared (NIR) Technology?
- Applications of NIR in Biomass Sorting
- Measuring moisture content, chemical composition, and other properties

INTRODUCTION TO NIR TECHNOLOGY

- Shining near-infrared light on material to analyze molecular composition based on how certain wavelengths are absorbed, reflected, or transmitted.
- Each material has a distinctive NIR absorption spectrum, acting like a fingerprint to identify and quantify its components.
- A spectrometer captures spectrum, and software analyzes it using complex algorithms to determine substance concentrations.



THE ROLE OF AI IN ENHANCING NIR TECHNOLOGY

- Improved data interpretation
- Enhanced calibration models
- Real-time monitoring and decision-making
- Pattern recognition and anomaly detection
- Multivariate analysis
- Adaptability to diverse applications
- Cost and efficiency gains



INTEGRATION OF AI-ENHANCED NIR IN PELLET PLANTS

1. Assessment of current operations
2. Pilot testing and calibration
3. System integration with existing equipment
4. Training and onboarding
5. Full-scale implementation
6. Performance monitoring and continuous optimization
7. Scalability and expansion



BENEFITS OF AI-ENHANCED NIR TECHNOLOGY

- Improved feedstock quality
- Increased production efficiency
- Real-time monitoring and adjustments
- Reduced waste and energy consumption
- Enhanced predictive maintenance
- Higher market competitiveness
- Cost savings

CHALLENGES AND CONSIDERATIONS

- Integration with existing systems
- Initial investment and ROI
- Data management and processing
- Training and skill requirement
- Ongoing maintenance and calibration
- Resistance to change



POWERING INNOVATION: FUNDING THE NIR PROJECT

- we have applied for funding through several key government and industry programs (IFIT, CICE and Ignite BC), aimed at supporting innovative projects that push the boundaries of technology and sustainabilityIncreased production efficiency
- The **NIR Project** is a **futuristic, game-changing initiative** that integrates advanced **Near-Infrared (NIR) technology** to revolutionize our processes.
- We are seeking **funding support** to fully realize the potential of this groundbreaking project. **Collaboration and investment** in the NIR Project will drive **long-term benefits**, ensuring we stay at the forefront of technological advancements and secure a sustainable future.

Join us in supporting this transformative project to shape the future of our industry!

SKY IS THE LIMIT!

- Maximizing pellet quality and consistency
- Expanding biomass utilization
- AI-driven customization for market differentiation
- Continuous optimization of production efficiency
- Leading the industry in sustainability

*The future is wide open for AI-enhanced NIR technology,
and as its capabilities grow, so do the opportunities.
With this cutting-edge solution, the sky truly is the limit!*



WOOD PELLET
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