# Wind Energy Research Core Capabilities

## Advanced Manufacturing and Materials
*Lead:* Derek Berry

- Materials Research and Applications
- Manufacturing Processes at Scale
- Manufacturing Optimization, Onsite and Modular Manufacturing
- Recycling and Reuse

## Atmospheric Science
*Lead:* Caroline Draxl

- Resource, Site Characterization, and Forecasting
- Oceanographic and Meteorological Processes
- Global Weather, Mesoscale and Plant-level Effects
- Maps and Visualizations

## Economic Analysis and Data Analytics
*Lead:* Eric Lantz

- Technoeconomic Analysis
- Digitalization, Artificial Intelligence, and Machine Learning
- Wind Energy and the Future Power Grid
- Land-Use and Spatial Analysis
- Jobs and Economic Development Impacts (JEDI) Models

## Environmental Science
*Lead:* Cris Hein

- Environmental Processes and Impact Assessment
- Species-Specific Scientific Investigations
- Cost-Effective Mitigation

## Flatirons Campus Laboratories and Research Facilities
*Lead:* Dave Simms

- Structural Research Facilities
- Field and Technology Research Validation Sites
- Dynamometer Research Facilities
- Composites Manufacturing Education and Technology (COMET)
- Controllable Grid Interface

## Grid Integration
*Lead:* Dave Corbus

- Optimal Grid Planning and Operation
- Wind Plant Controls and Grid Stability Research
- Integrated Energy Systems
- Cybersecurity and Resilience
- Hybrid Power Systems

## Modeling and Validation
*Lead:* Mike Sprague

- High-Fidelity Modeling and Validation
- Engineering Modeling and Validation
- Systems Engineering and Optimization

## Stakeholder Engagement and Social Science
*Lead:* Chloe Constant

- Information, Tools and Resources
- Outreach and Engagement for Community Impact Issues
- Social Science Research of Wind Energy Acceptance

## Technology Innovation
*Lead:* Paul Veers

- Next-Gen Wind Turbines
- Floating Offshore Wind Systems
- Plant Level Control
- Drivetrain Technology, Operations, and Maintenance

## Workforce Development
*Lead:* Chloe Constant

- Workforce Analysis
- Workforce Pathway Development
- Workforce and Educational Program Development