Breakout Session: Developing and Using Alternative Feedstocks for Sustainable Manufacturing

Focus question #1: VISION AND GOALS

VISION

- Zero emissions industry
  - Especially energy intensive manufacturing sectors (e.g., refining, cement, chemicals, steel)
- Energy and resource efficient manufacturing
  - Reduce GHG emissions, reduce virgin materials consumption, etc.

TARGETS/METRICS

- Reduce the time of feedstock technology development to 2 years
- Quantify impacts of business-as-usual vs. sustainable manufacturing
- Make use of alternative feedstocks cost effective
  - De-risk and reduce cost
    - Need a functional replacement at 1/3 of current material cost

Focus question # 2: CHALLENGES

- Feedstock Availability, Cost & Variability
  - Availability of Feedstock → changing technology may make feedstock obsolete
  - Alternative feedstocks are highly variable (availability and composition) and non-homogeneous
- Value Proposition
  - Lack of a rapid cash flow opportunity -excessive complexity and interdependence
  - Failure to deliver technologies at appropriate times in the business cycle
- Lack of ability to demonstrate process at intermediate level (pilot scale)

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Focus Question #3: R&D NEEDS

- Process and product development and improvement
  - Pilot scale – detailed validation and understand coupling
  - Feedstock preparation to reduce variability
- Basic (crosscutting) research
  - Lower temperature/energy intensive processes and develop C-1 chemistry
  - Catalysis/kinetics – catalysis development
- Waste & byproduct stream utilization
  - Including but not limited to CO_2 , lignin, biobased, consumer electronics, water
- Crosscutting
  - Novel, low-cost chemical separations techniques
  - Reduction in Water Use
- Economic forecasting/modeling
- Analysis (chemical and process)
  - Characterization of feedstocks – maybe develop standards

Worksheet: R&D Focus Areas

- Waste stream feedstock utilization
- Lower temperature low energy processes
- Process and product development and improvement
- Novel, low-cost chemical separations techniques