Focus question #1: VISION AND GOALS

- **Reduce Use of Water**:  
  - Reduce water usage by 20% by 2020.  
  - Reduce cost of industrial water treatment by 50%  

- **Reduce Material Use**:  
  - Reduce coolant and metal working fluids by 50%.  
  - For 25% of the Small Manufactures, reduce material use by 10%  

- **Increase Reuse**:  
  - Increase scrap metal reuse by factor of 2 by 2020  
  - Increase end-of-life design by 100% 2030
Breakout Session 2: Challenges And Barriers

Technology

- Availability of sensors/ smart process equipment for process control
- Process /technology gap to re-engineer / cost efficiently recycle of spent finished products

Knowledge Gap

- Lack of open knowledge of industry specific waste footprint to facilitate innovation and entrepreneurship
- Lack of publically available benchmarking data

Testbed / demo facility

- Need for testbeds / modular systems that enable integration of emerging technologies at intermediate scale to demonstrate performance, costs, & lower risk

Resource / funding

- Lack of incentives, commitment, resources

Stakeholder Buy in

- Economics – what is the business model, metrics, etc…
- Education of key stakeholders – manufacturer leadership, consumers
Breakout Session 2: R&D Focus Area

**Technology: Smart Process Control**
- Real-time measurement of complex processes
- Ability to characterize complex, multi-variable process enabling computational modelling and process prediction

**Technology: Multi-material recycling**
- Design rules which consider total life cycle to make items more recyclable
- Enhanced “scrap” collection and separation techniques which limit recycled feedstock contamination

**Knowledge Gap: Metrics & Measures for Open Waste Inventory**
- Open data base and common format of information that is industry aggregated
- Waste stream analysis for multiple industry, and identification of sustainability opportunities

**Testbed / Demo facility**
- Reduce risk of innovation technologies
- Better understanding of technology advantages and limitations

**Resource / Funding / Stakeholder Buy in**
- Define industry focused business models
- Stakeholder education
- Clear understanding of different sustainability processes to understand benefit & ROI