Carbon Calculation Basics

- What factors go into calculating the carbon intensity?
  - Feedstock transportation
  - Co-Product Generation
  - Fuel Transportation
  - Energy Usage
  - Yield

- Biggest bang for your buck will come from targeting:
  - Energy Usage
  - Yield
Things To Consider
What about your plant makes it unique?

Considerations that make a technology more or less feasible/desirable?

- Carbon Market availability
  - LCFS/California
  - RFS2
    - Advanced RINs
    - Cellulosic RINs
  - Emerging Markets
    - Pacific Northwest
    - Canada
    - Midwest LCFS
- Feedstock availability/alternatives
  - E.g., Milo
- Energy markets/energy alternatives and related accessibility
  - Nebraska Public Power
  - Gas line accessibility
  - Utility provider problems
Goals for carbon reductions might not be a one technology answer

- **CHP:**
  - 6-10 points
  - Steam and electricity efficiency improvements
- **Whitefox:**
  - 0.9 – 2.0 plus points
  - Potential plant efficiency gains
- **Bioleap:**
  - 4-8 points
  - 4,500-8,500 btu/gal improvements
  - Other yield and energy improvements

Value in bolt on technologies

- Diversity of products
- Higher value products
- Better yield – ethanol, corn oil
- Energy reductions
- Reliable energy
- Reliable technology, improved safety
What is best for your plant?

• With so many technologies, how do you decide?
  • Feasibility Studies
    • How does the technology work at your plant, and/or with other technologies.
  • Energy Audits
    • Where are the areas of most improvement, where are the weaknesses
  • Meeting with Regulators
    • Understand what regulators are seeing, how technologies are implemented and regulatory ramifications
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