Biomass Project Development Tutorial 2009

ascendant partners, Inc.

Renewable Energy - Food - Agribusiness

Understanding Biomass Feedstock Risk

April 6-8, 2009

Introduction

Ascendant Partners Inc.

- Is an Experienced Business and Financial Advisory Firm Specializing in Agribusiness and Renewable Energy
- Has Completed over 150 Renewable Energy Projects in the Last 18 Months -- from Concept to Capital
  - First generation renewable fuels
  - Biomass to liquid projects
  - Biomass to energy projects
- Roots in Agricultural Production with an Appreciation for the Importance of Systems Alignment and Value Creation
- Previously ran Market Risk Management Functions for Leading Financial Institutions

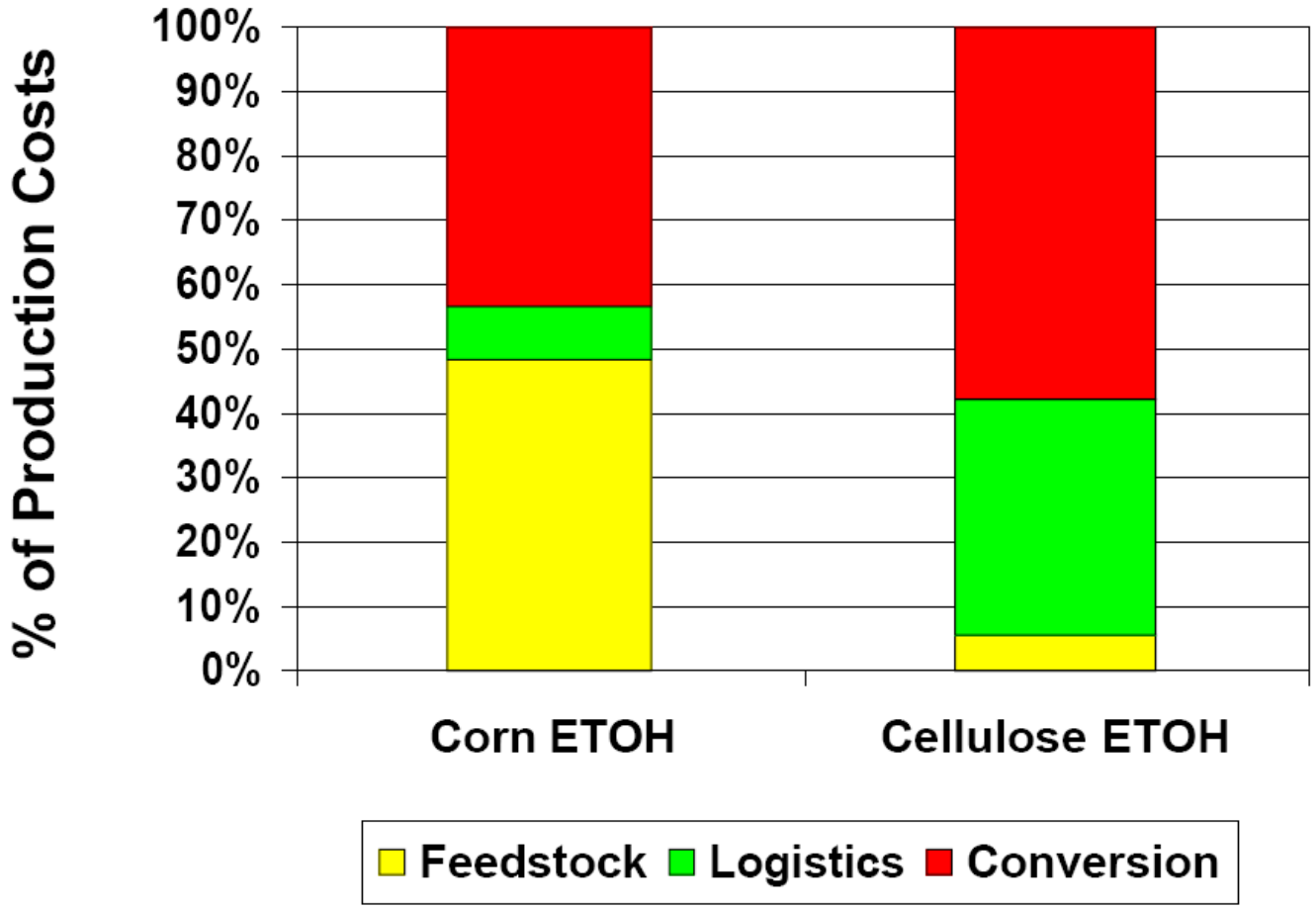
Why Biomass Risk Management is Important

- The Success of Your Biomass Business Begins with Feedstock
  - Raw materials drive costs and plant performance (yields)
- Biomass Feedstock Represents an Emerging Market with a Lot of Uncertainty
  - Plant science for cost-effective energy conversion
  - Harvesting and equipment to collect
  - Logistics costs
  - Availability of information

Why Biomass Risk Management is Important

- The Potential for Biomass is Exploding
  - RFS requires 21 billion gallons of ethanol from biomass
  - 28 states have renewable portfolio standards in place, and federal proposals are currently under consideration in the Senate calling for 25% of our electricity to come from renewable energy by 2025
  - Recently passed American Recovery and Reinvestment Act (i.e., the Stimulus Bill) extending generous incentives sure to stimulate the development of renewable energy projects
- **The Challenge & Opportunity**
  - The systems, markets and infrastructure to support the efficient production, harvesting, recovery and transportation of biomass feedstocks have not been developed nor optimized - yet

Biomass Feedstocks are Cheap to Buy…

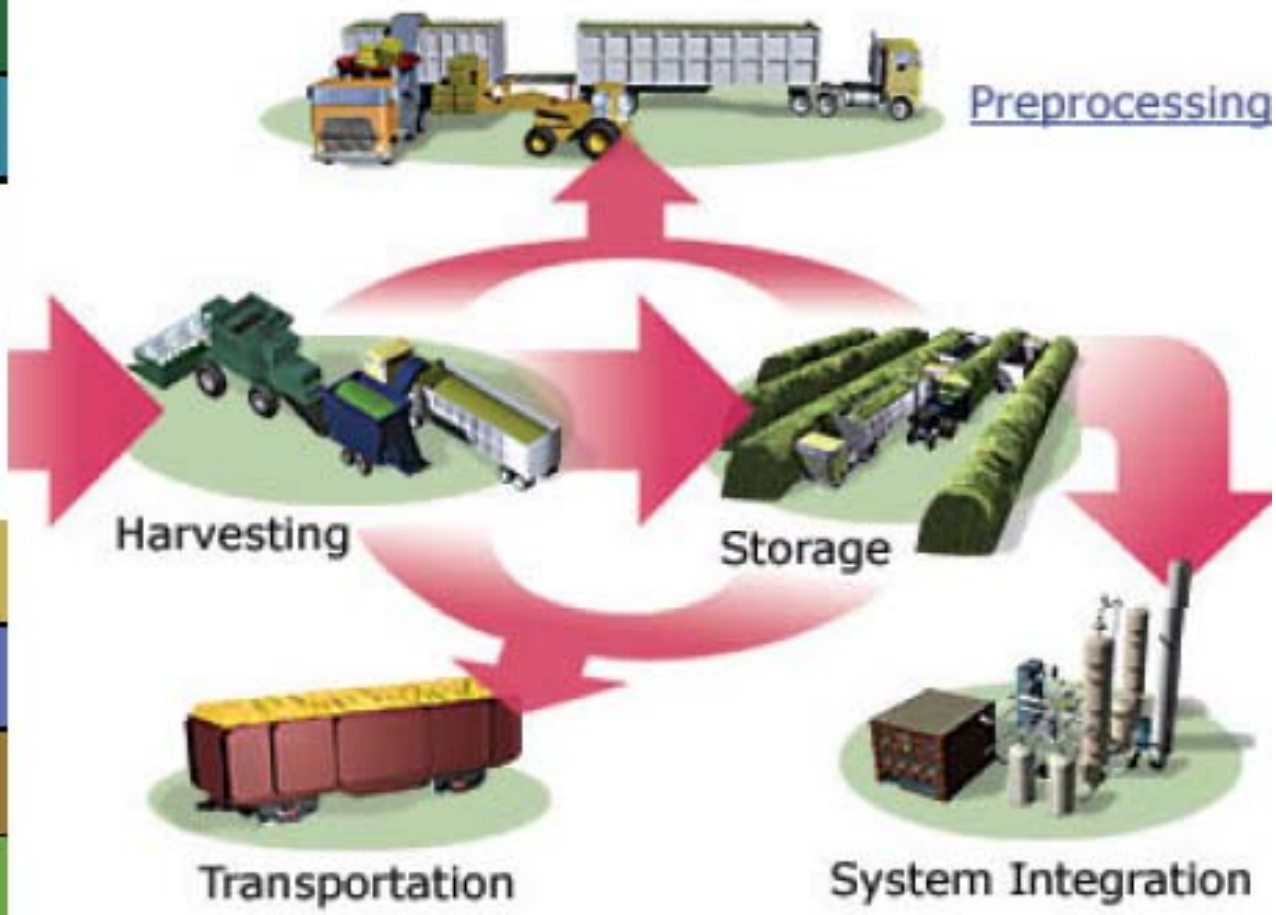


But Don't be Fooled - They are Expensive and Challenging to Acquire

Biomass Feedstocks - What's the Big Deal?

- Forestry Residue
- Herbaceous Crops

- Agricultural Residue
- Municipal/Urban Residue
- Oil Crops
- Short-Rotation Woody Crops



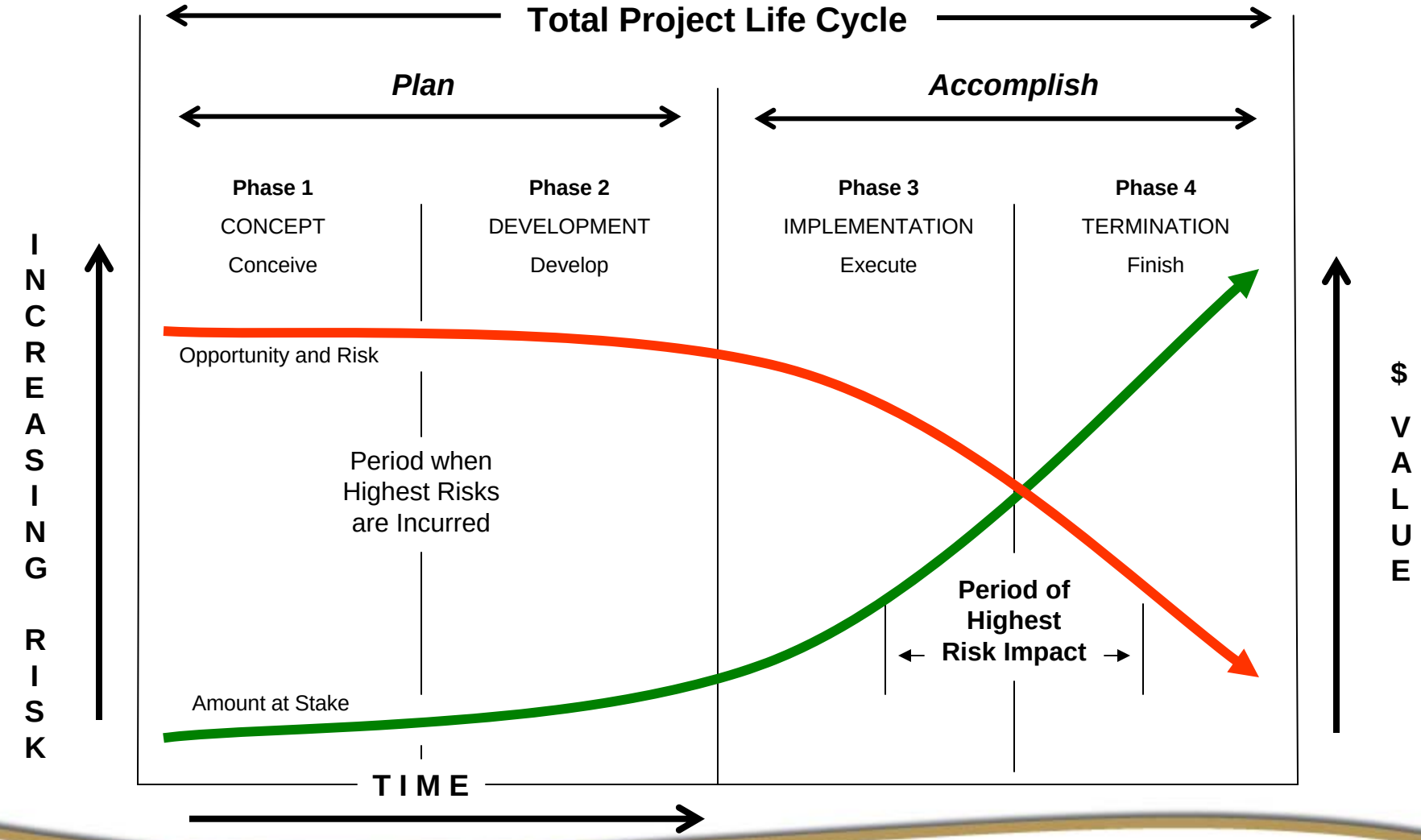
Risk - What is It?

- Risk Defined – The Exposure to a Chance or Probability of Loss, Damage or Harm
  - R = (Probability of an Event) * (Consequences of the Event)
- Risk Management – The Discipline for Dealing with the Chance, Probability or Possibility that Something will Cause Loss, Damage or Harm
- Risk and Expected Returns are Related
  - As are uncertainty and risk

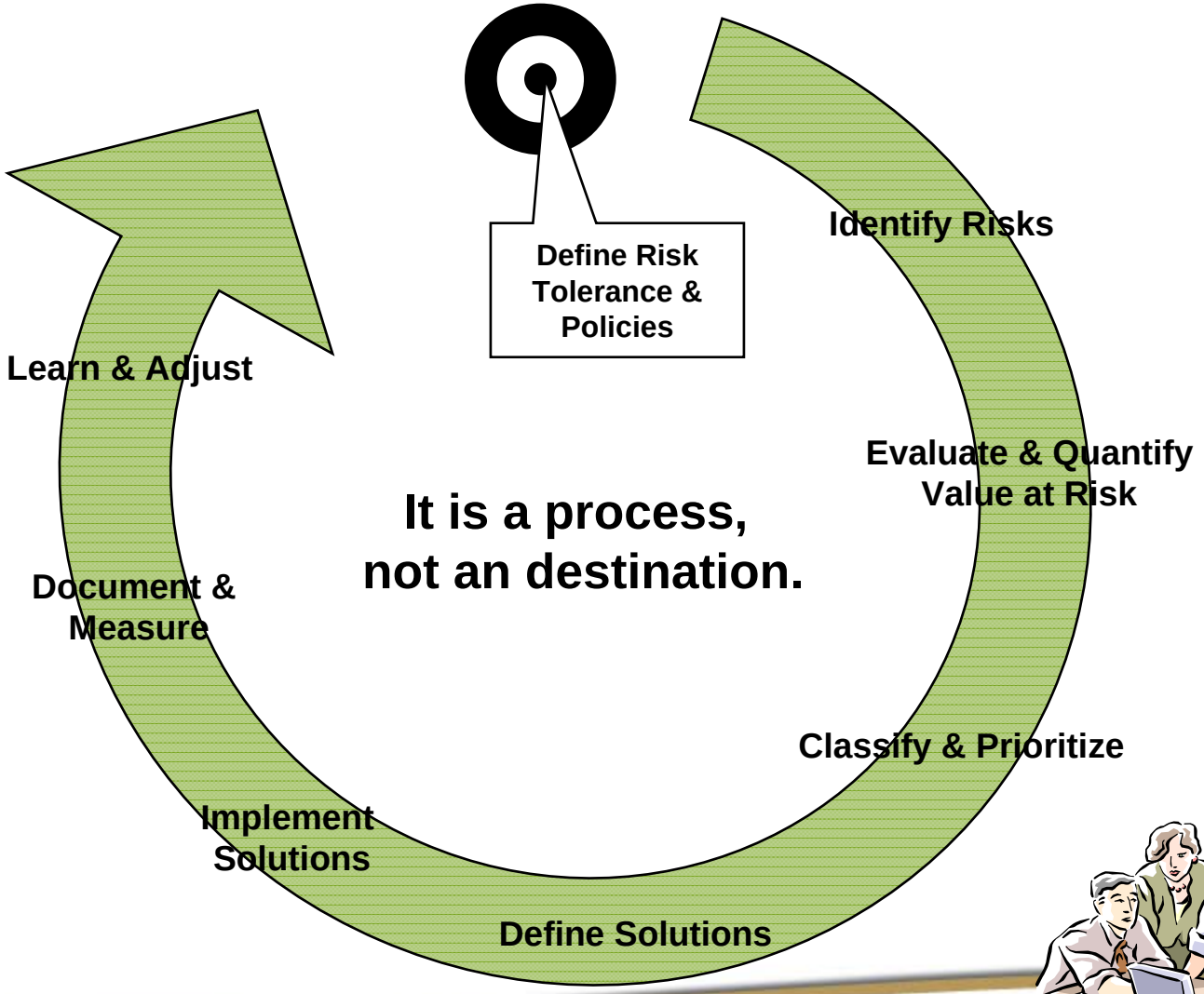
Risk - How do I Manage?

- Organize into the Three Major Risk Dimensions
  - Market Risks – risks outside the business that influence the business
  - Operational/Business Risks – risks within the business
  - Credit/Counterparty Risks – risks with relationships inside and outside the business
- Manage or Mitigate (Ready, Aim, Fire!!!!)
  - Start with the objective, which is to manage or mitigate risks in a way that increases the probability that the actual return will be at or above the expected return
  - Step one is to identify key risks
  - Focus on risks you have some influence over
  - What are your options and what is the cost to manage the risks
  - Execute

Risk & Project Life Cycle



A Systematic Approach to Managing Risk



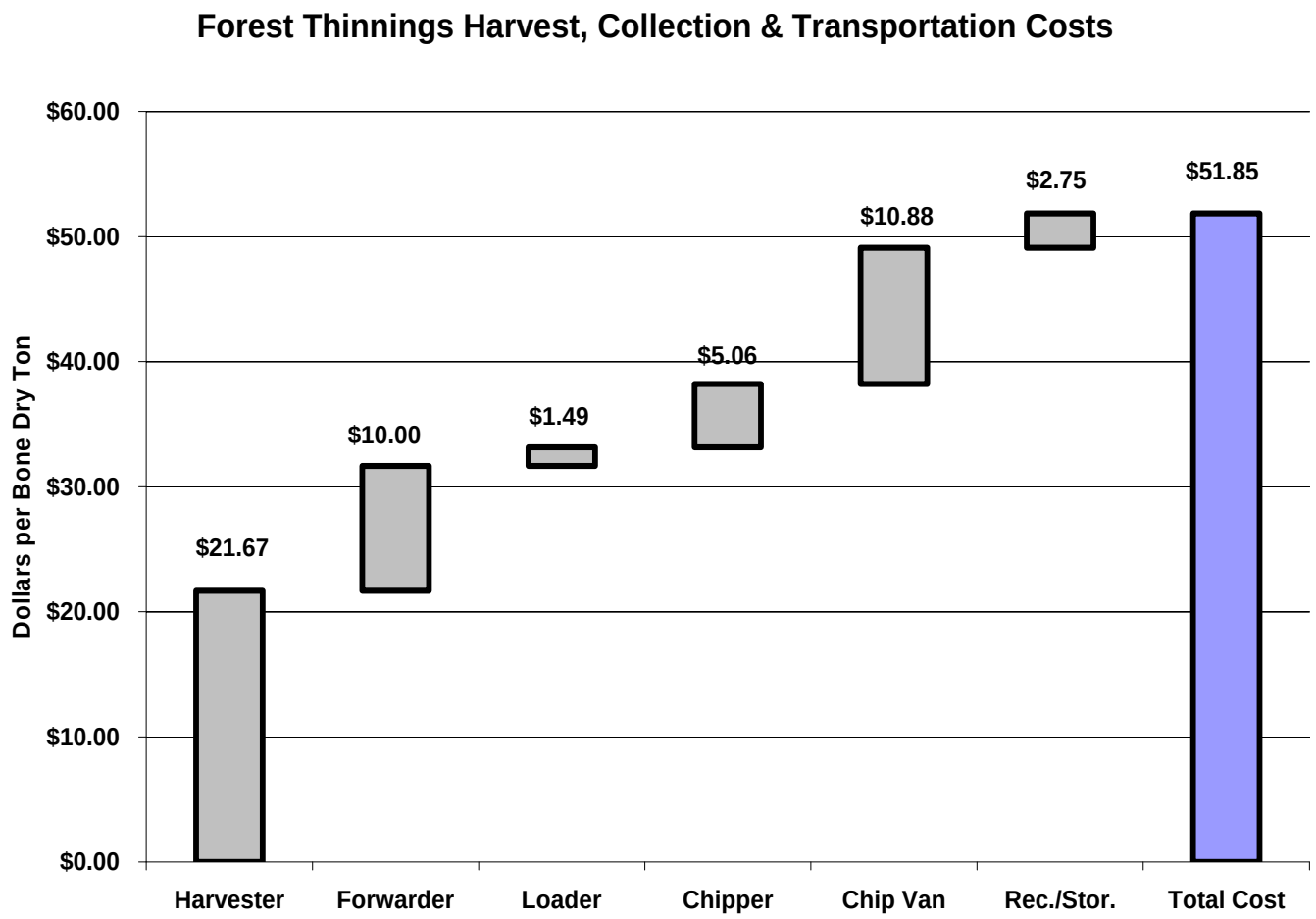
Factors Influencing Biomass Feedstock Risk

- Understand Detailed Breakdown of Costs and Drivers
- Availability of Supply
  - Reliability
  - Seasonality
  - Volatility
  - Production, harvest & collection
  - Competition
  - Outlook
- Quality and Composition
  - Sugar content
  - Ash content
  - Moisture level
  - Process inhibitors

Factors Influencing Biomass Feedstock Risk

- Transportation & Logistics
  - Bulk density
  - Area of influence
  - Receiving & storage
- Storage & Handling
  - Carrying costs & timing
  - Maintain quality
  - Pre-Processing
- Counterparty Considerations
  - Aligned incentives
  - Contracts
  - Credit
  - Business strength
  - Reputation, integrity & honesty

Detailed Understanding of Costs



- **$21/ton for Slash**
- **$52/ton/Culls**
- **$34/ton Production**
- **And the range was from $15/ton to $150/ton!**

Source: Idaho National Lab, Supply Systems Cost Study, Sept. 2008

Strategies to Mitigate

- Start with the End in Mind
  - Who is the customer
  - What is the value to them
    - BTU cost
    - Environmental, regulator and emissions compliance
    - Leverage existing assets & infrastructure
    - What are your objectives for risk management
- Do Your Homework
  - Assess supply availability
  - Who controls supply
  - Who is the competition today and potentially tomorrow
  - Can you get contracts or partners
  - Have a clear understanding and detailed plan for biomass acquisition, transportation, storage and quality requirements, and cost

Strategies to Mitigate

- Identify Areas to Reduce Costs or Enhance Value
  - Intermediate collection or pre-processing
  - Densification
  - Stabilize
  - Leverage federal and state incentives
- Align Incentives
  - Business structure
  - Pricing formulas (how do counterparties win and lose)

Strategies to Mitigate

- Risk Management Vehicles
  - Contracts
  - Outsourced contract services
  - Vertical integration and partners
- Risk Management Vehicle Key Terms
  - Price
  - Volume
  - Term
  - Enforceability & skin in the game
  - Exits

Conclusions

- Outlook for Biomass is Positive
- Accept that it All Starts with Feedstock
- Understand and Measure Risks (probability and consequences)
- Take a Systematic Approach to Defining and ‘Managing’ Risks Proactively