

The Forest Biorefinery

Net Revenue Assumptions:

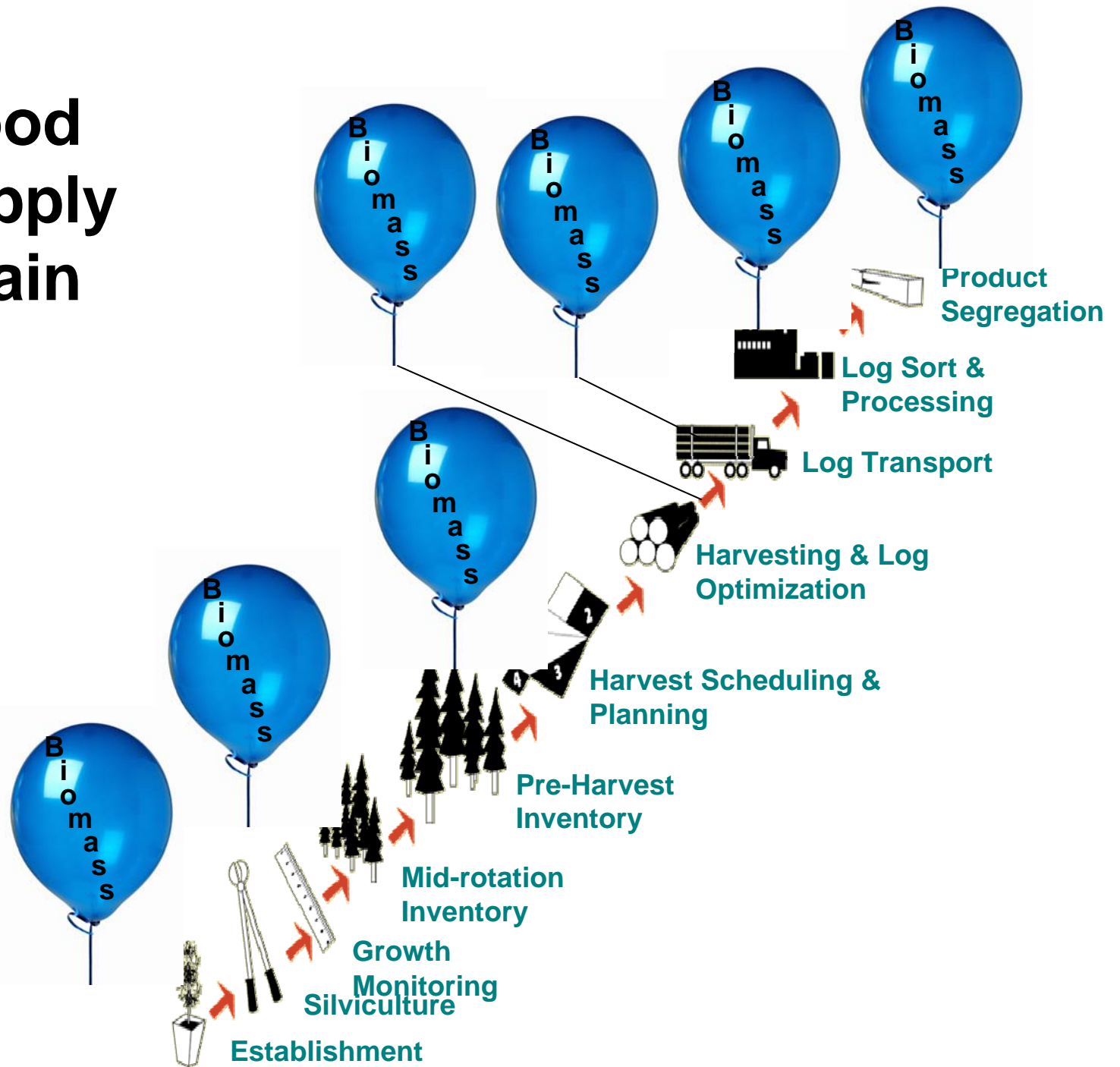
Acetic Acid - \$1.73/gallon	Purchased Electricity - \$43.16/MWH
Ethanol - \$1.15/gallon	Exported Electricity - \$40.44/MWH
Pulp - \$100/ton net profit	Renewable Fisher Tropsch Fuel - \$57/bbl

Fuels for Schools - Institutional Heating



Darby, MT

Wood Supply Chain



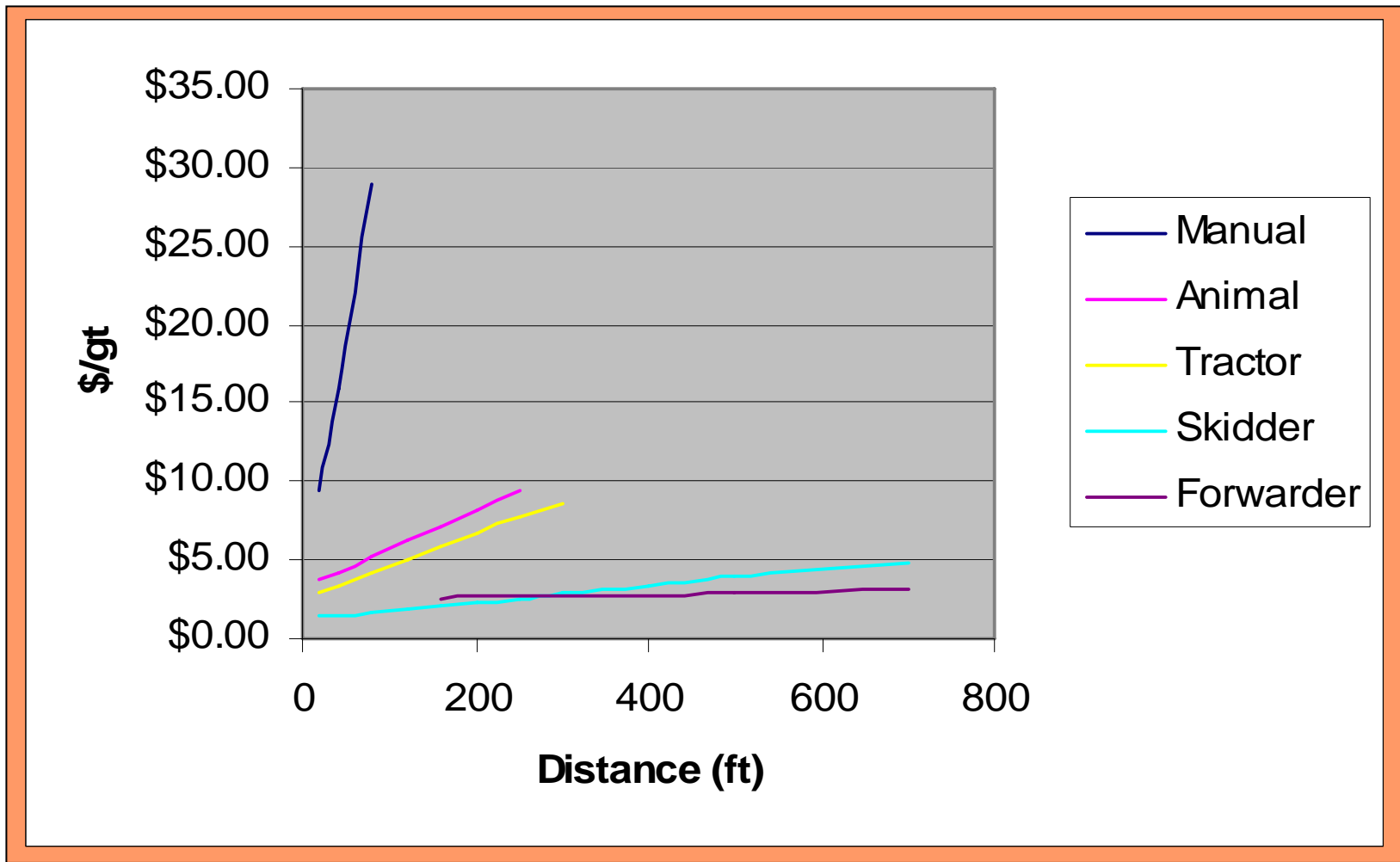
Key points

- **There are lots of opportunities with wood**
 - **Highest value--Specialty products**
 - **Largest potential market is energy**
- **Feedstock specifications are critical**
- **Proven conversion is marginal**
- **New technologies are very close**
- **Markets are very dynamic**
- **Biomass isn't free, not even cheap**

Smallwood operations

- **Efficiency**
 - Right-sizing machines
 - Reducing unnecessary operations
 - Improving payload
- **Multi-stem handling**
 - Swath cutting
 - Pre-bunching
- **Better product sorting**
 - Eliminate waste
 - Improved transport efficiency

Add the money



Improve efficiency: multi-stem cutting



Nicholson-Koch Mobile Chipharvester, 1980

Improve payload



Photo: Dan Len

Hyd-Mech High Speed Saw



Brush harvesting



Photo: Texas A&M Univ

More efficient alternatives

- Smaller
- Faster
- More Capacity

