

TechnoBusiness Forum -- 2005

Open Innovation

-- Enterprise Transformation --



Evolution of scope and opportunities

A Business Model for

North American Mill Survival

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Industry of 40 Years

- With average return less than WACC, and
- Financial community strongly indicated that mergers and acquisitions (M&A) would provide a major solution,
- It did not



Old Business Model

- Bringing logs into a mill and transforming them into a variety of cellulose-based pulp and paper products to be sold as commodities
- Is not working



Pulp and Paper Industry

- A new definition for business
- The primary solution for a healthy future.



Pulp and Paper Industry

- Companies with unique strategies focused on the customer and developing products to meet specific needs have been more successful.
- Examples include:
 - ✓ *P&G*
 - ✓ *KC*
 - ✓ *Specialty Industrial companies*
 - ✓ *More recently GP.*



Business Strategy

- The four major elements:
 - ✓ *VISION*
 - ✓ *MISSION*
 - ✓ *STRATEGY*
 - ✓ *OBJECTIVES*



Challenge

- Technology is a huge challenge but not the major one.
- The major challenge will be ridding our organizations of the commodity ways of doing business, which is:
 - ✓ *essentially producing high volumes of undistinguished products*
 - ✓ *with low margins.*



The History

- The U.S. pulp and paper had its “hey days” from around the 1950’s to about the 1970’s
- As a direct result of Dr. Charles Herty’s discovery of how to pulp southern pine



The History

- The prevalent business model was the low-cost position to satisfy the growing demand for commodity grades in the U.S. and selected overseas markets.
- New mills were made to capture economy of scale and totally use the mass of the logs that entered the mill where modest amounts of energy were made but not generally exported.



The History

- Around 1990, tropical hardwood pulp mills began doing to the U.S. what the U.S. did to Scandinavia in the 1950's and 1960's when it began pulping the relatively fast-growing southern pine.



The History

- It took the Northern European mills about 50 years to recover by:
 - ✓ *lowering labor and energy costs,*
 - ✓ *developing new technologies, and*
 - ✓ *producing a few superior grades like liquid packaging.*

Today

- Northern hemisphere mills producing only commodity hardwood pulp will continue to be a dying breed.
- Integrated mills will suffer as well.



Today

- Any new business model must have a much shorter time frame than 50 years.



Attractive Strategy

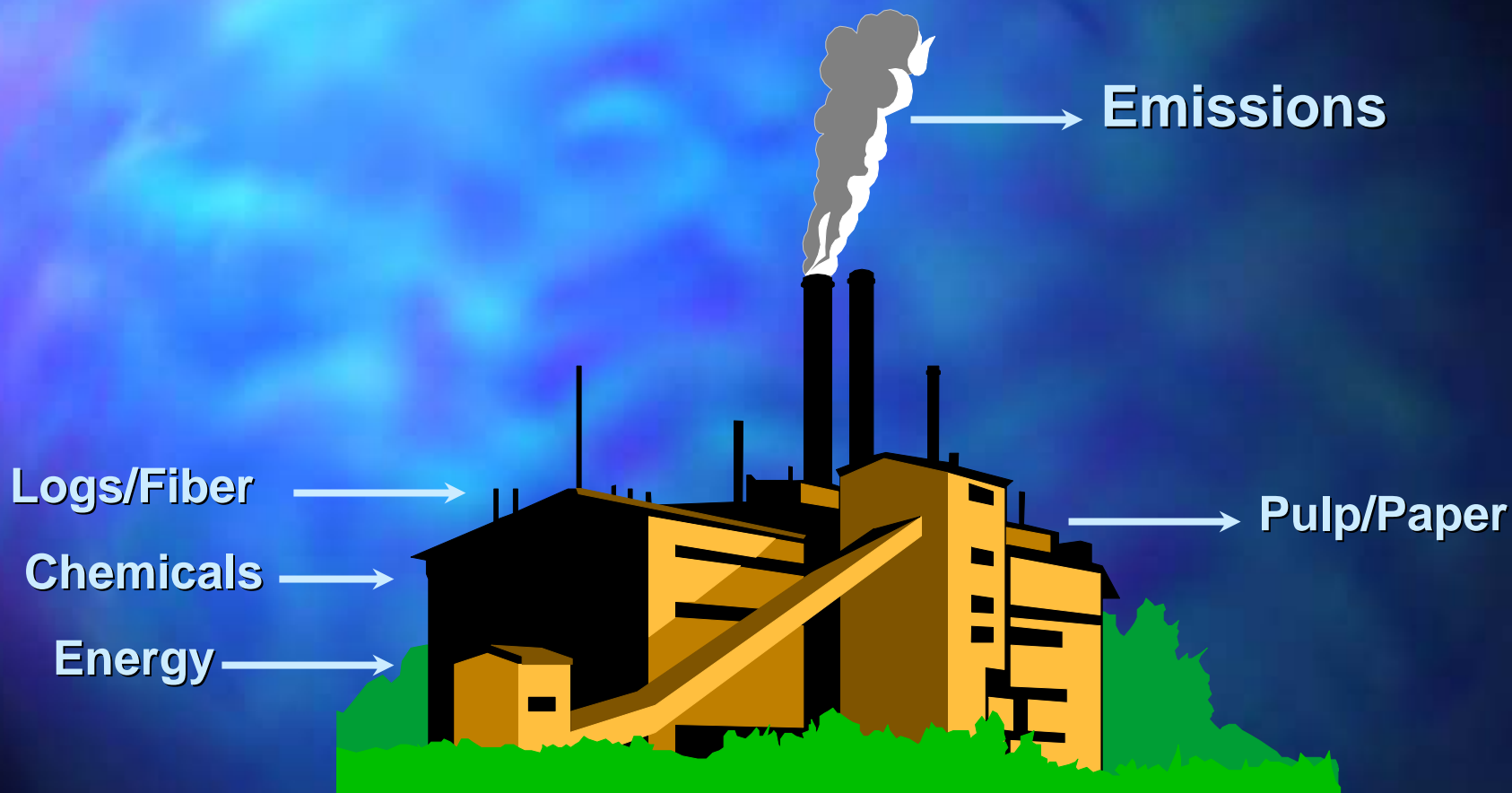
- The forest biorefinery provides more payback from the logs that mills already buy, transport and use.



The Option

- Existing pulp mills can be evolved into forest biorefineries where:
 - ✓ *fuels and chemicals are derived from by-products of the logs,*
 - ✓ *which are inefficiently used today.*

Current Mill

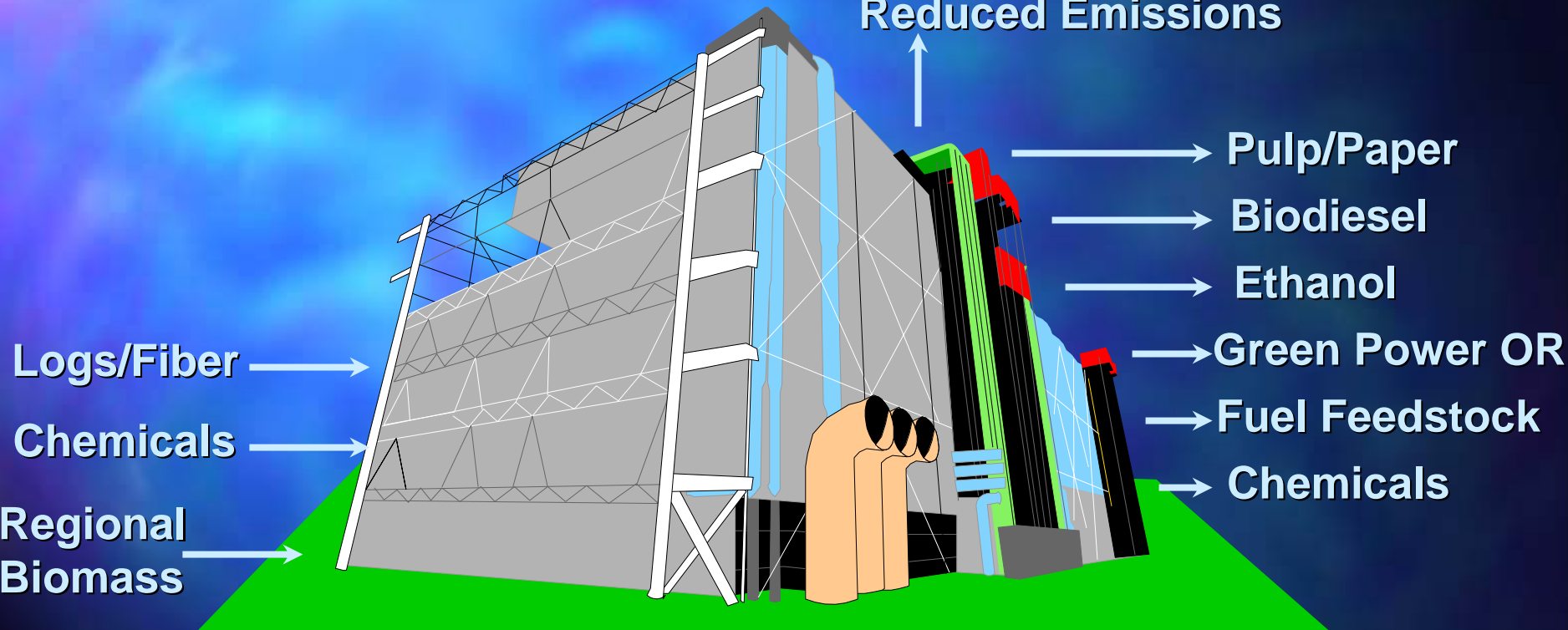


Kraft Mill



Future Mill

Significantly Reduced Emissions



Forest Biorefinery



Business Objectives

- This evolution can occur in at least five ways
- Some of which are already in place, while preserving or improving current cellulose quality and production levels.



Five Ways

1. Increase sustainable forestry
2. Extract water-soluble hemi-cellulose from chips prior to pulping

Potential annual production from all U.S. Kraft mills is ~2 billion gallons of ethanol and ~600 million gallons of acetic acid

3. Convert all or part of tall oil in southern softwood mills to ASTM certified biodiesel

Potential production rate from U.S. Kraft mills is about 140 million gallons/yr.

Five Ways (continued)

4. Replace aging Tomlinson recovery furnaces with black liquor gasifiers now running in North America

Annual U.S. potential is ~5 billion gallons

5. Replace conventional solid fuel boilers with solid fuel gasifiers



NONE of the Above Steps are
Dependent on the Other



Steps Forward

- These higher yield processes are more economical and energy efficient
- They are being studied by many, including Hasan Jameel of NC State



Steps Forward

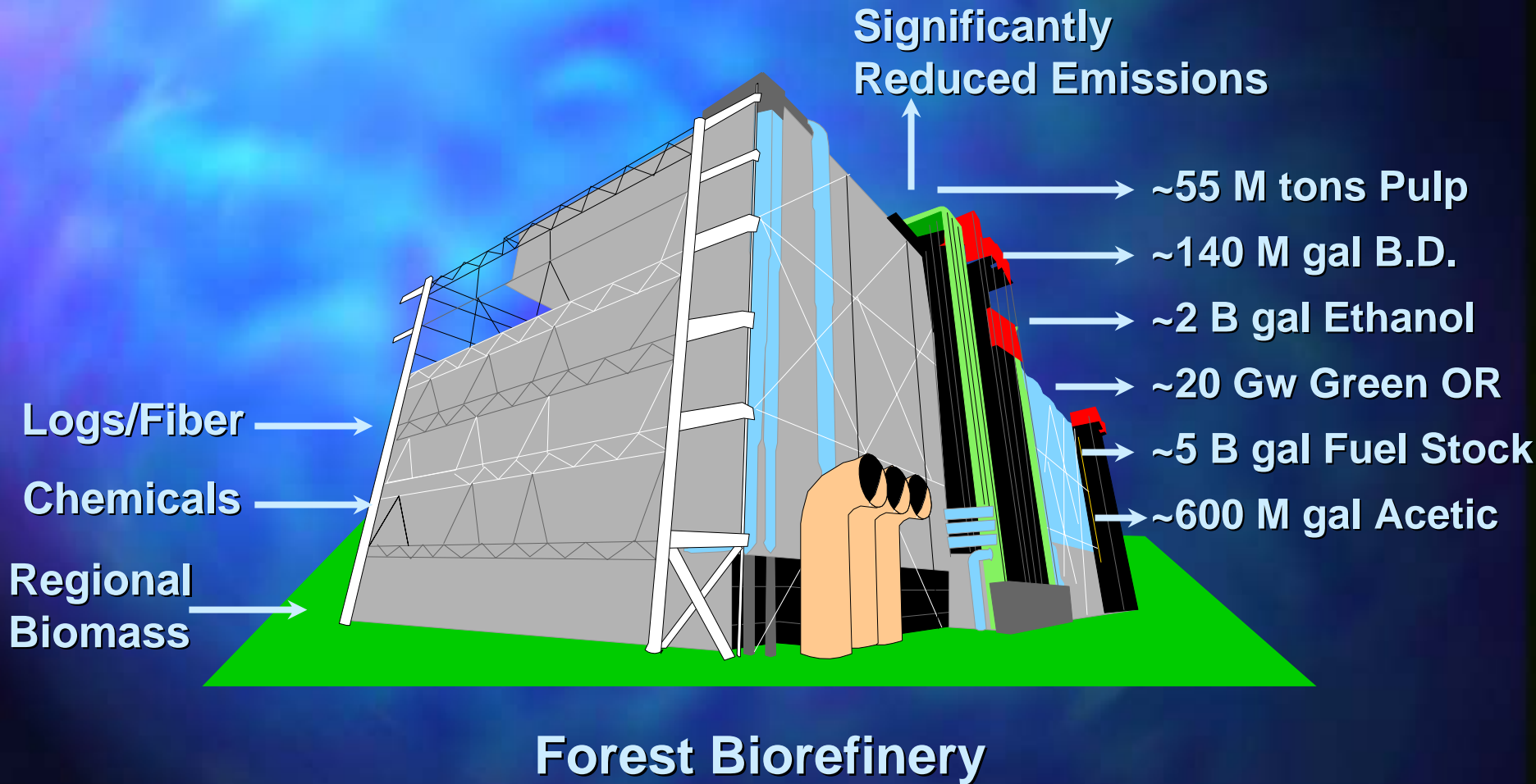
- Another opportunity is to make:
 - ✓ *engineered fillers that have shapes, charges, and even “nano-like” structures*
 - ✓ *that may allow these fillers to be substituted for cellulose to make equivalent and superior structures.*

Potential Impact

- For U.S. mills to substitute engineered fillers for cellulose has been forecasted to be as much as \$65 million in decreased costs.



Future Mill



Change

- **The biggest impediment to change is the mindset of existing industry leadership.**
- **The most difficult part of change from within is most companies have been optimized based on strategy that is primarily commodity oriented.**



Change

- Changing to an innovative strategy, focused on improving operating results for customers,
 - ✓ *requires totally different skill sets,*
 - ✓ *not only for the executives but also for marketing, sales, and manufacturing personnel.*



New Model

- The **VISION** is that the industry develops value added products through market driven innovation.
- There is already a trend towards this as evidenced by the transformation of GP and recent strategic announcements by IP.
- The **MISSION** will incorporate statements like
 - ✓ *processing materials that add value to customers, stockholders and society.*

New Model

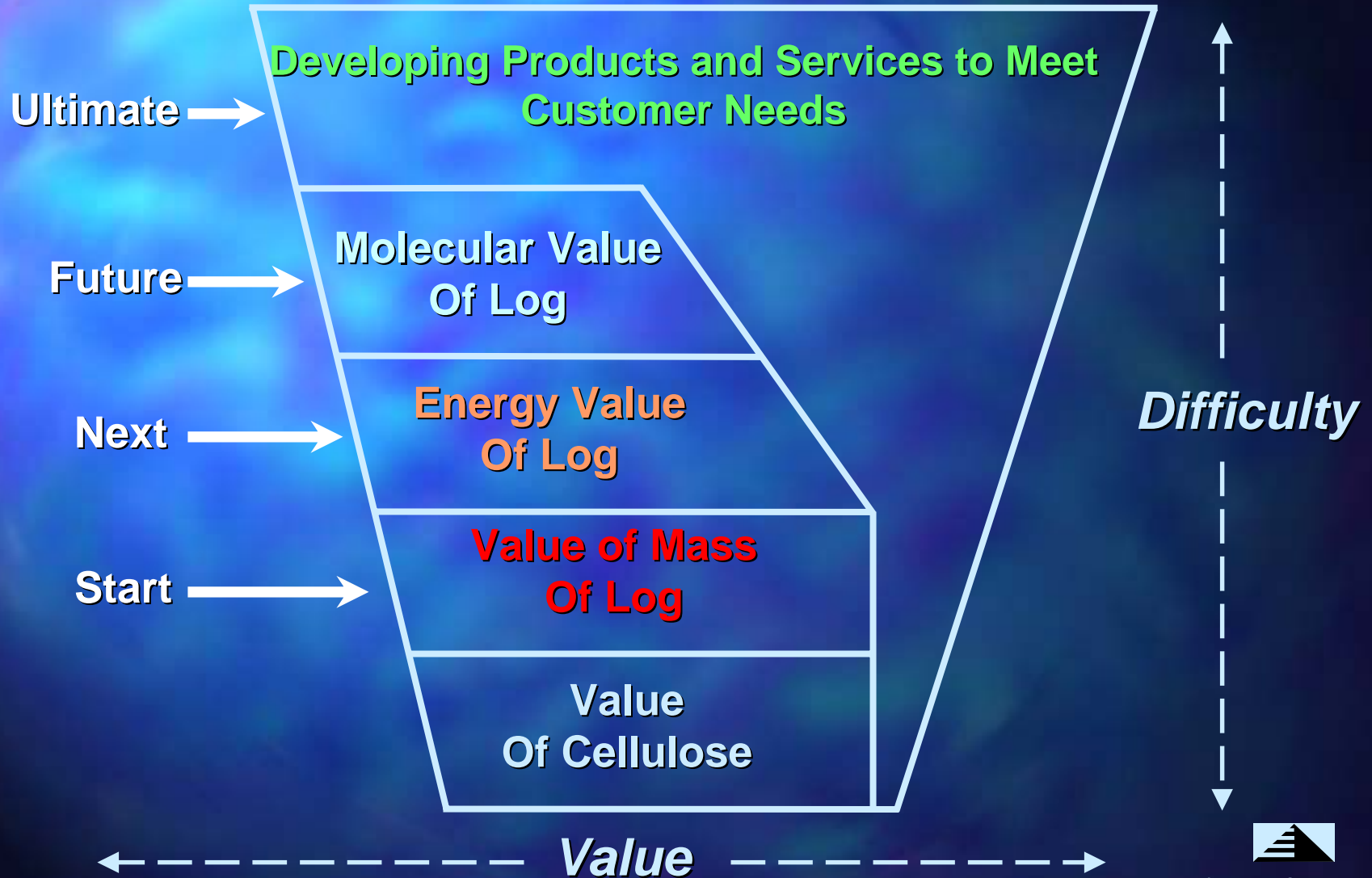
- One improved business model starts with
 - ✓ *evolving pulp mills into material mills*
 - ✓ *the name “material and forest biorefineries” might be descriptive, albeit not for marketing purposes.*
- The new mill will be optimized around the margins of the new product streams, and
- There is not enough data to know exactly what these margins look like.

Business Strategies

- The two strategies of Phase Two are:
 - ✓ *improving the operating results of customers*
 - ✓ *innovation.*
- **“Lowest cost”** (while it always helps margins) is not a primary focus of the new business model.



Value of 5 Different Business Models



Summary

- The U.S. pulp and paper industry needs to adopt an improved business model which should include:
 - ✓ *the VISION of market driven innovation, and*
 - ✓ *the MISSION evolving pulp mills into material producing forest biorefineries.*



Final Thoughts

- **Based on my experience, I am more confident that we can develop the appropriate technologies than we can develop the appropriate business strategies.** *(B. A. Thorp)*
- **If you expect markets will erode and go only to the low cost providers, you are engaging in capitulation and abdication.....Understand what customers want and develop a great value chain.** *(Ronee Hagan, SAPPI)*

