



SternBrothers&Co
Investment Banking Since 1917

The Latest Derisking Techniques For Commercial Scale Project Financing in Bio

Commercial Aviation Alternative Fuels Initiative
CAAFI SOAP-Jet Webinar
May 19,2017

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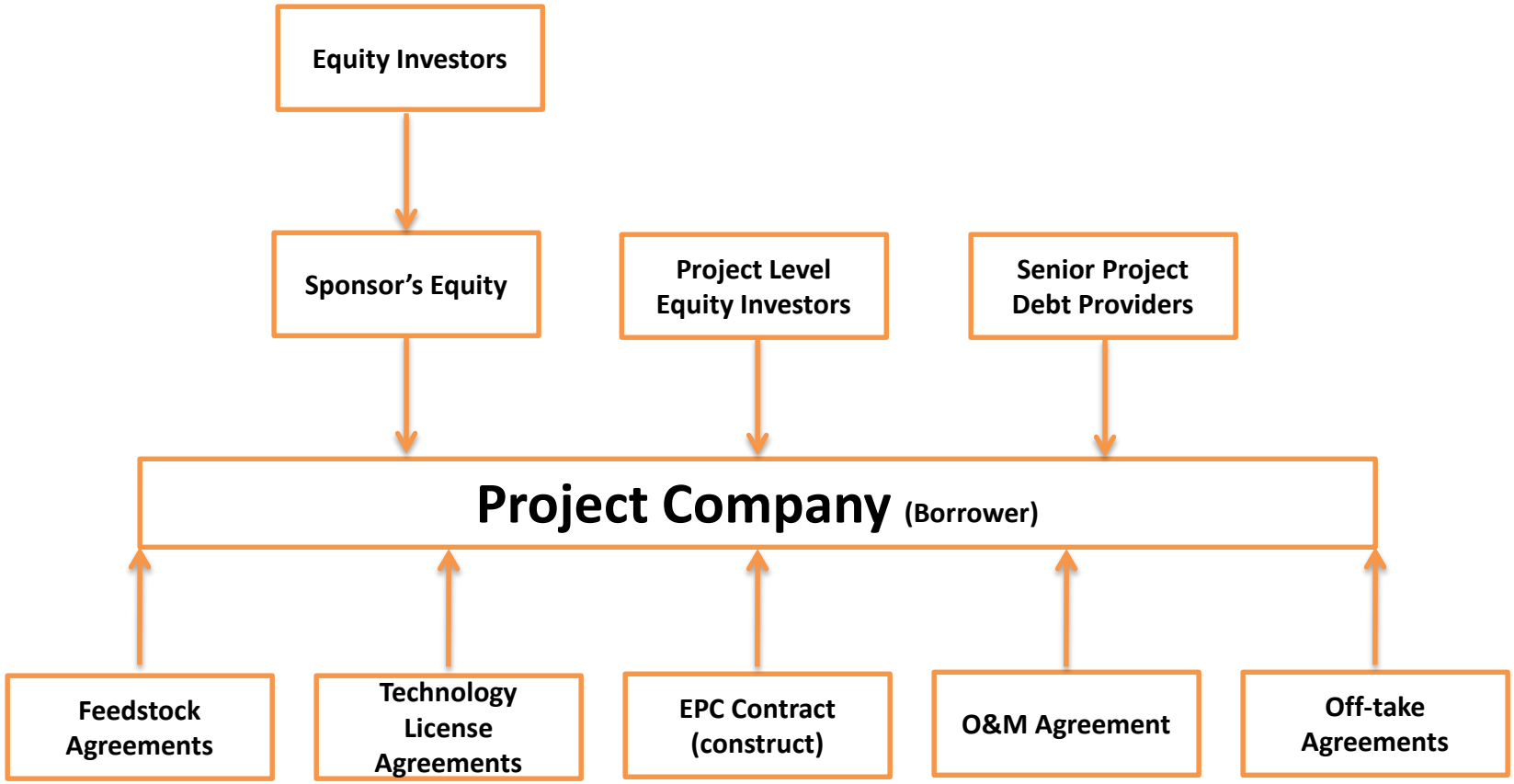
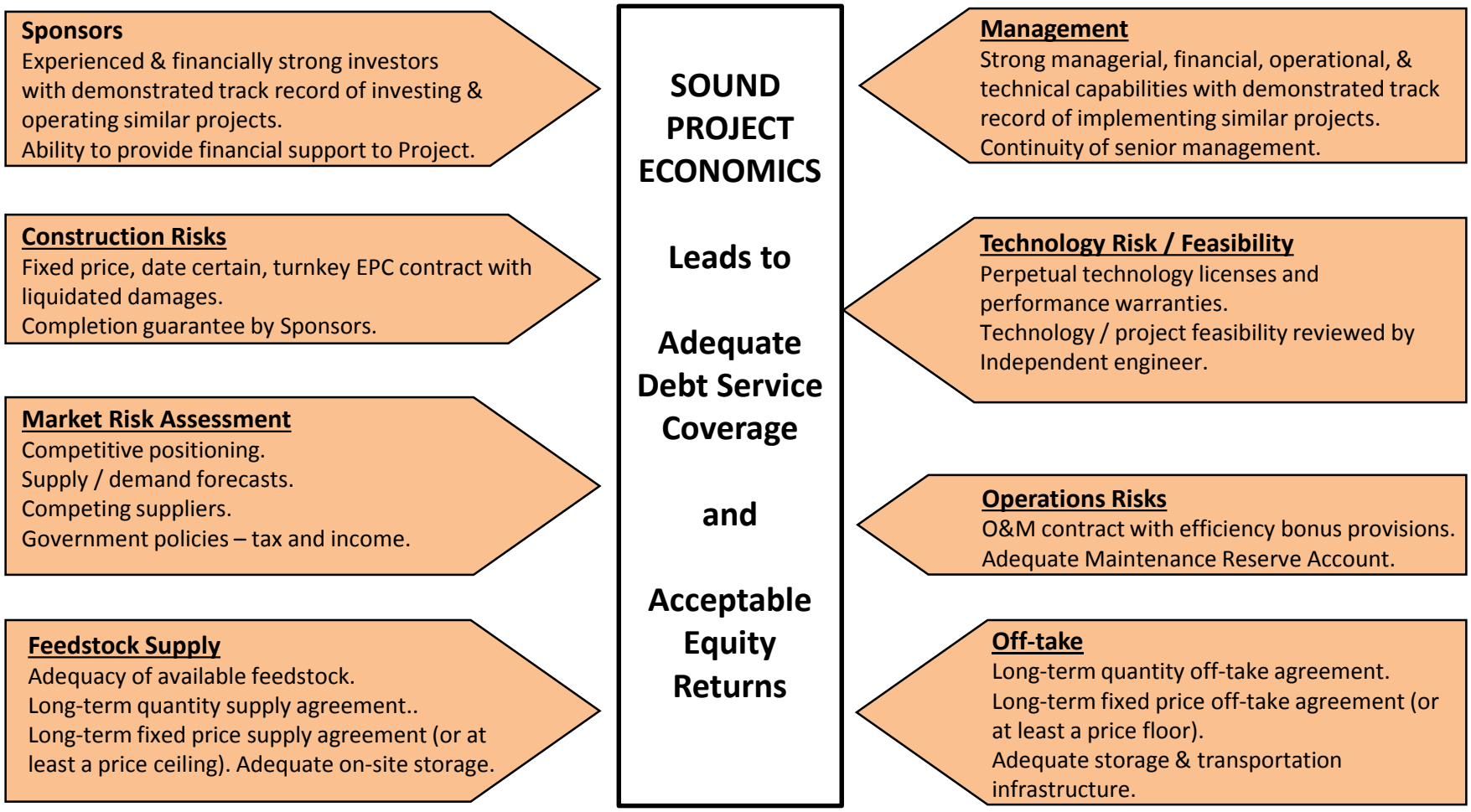
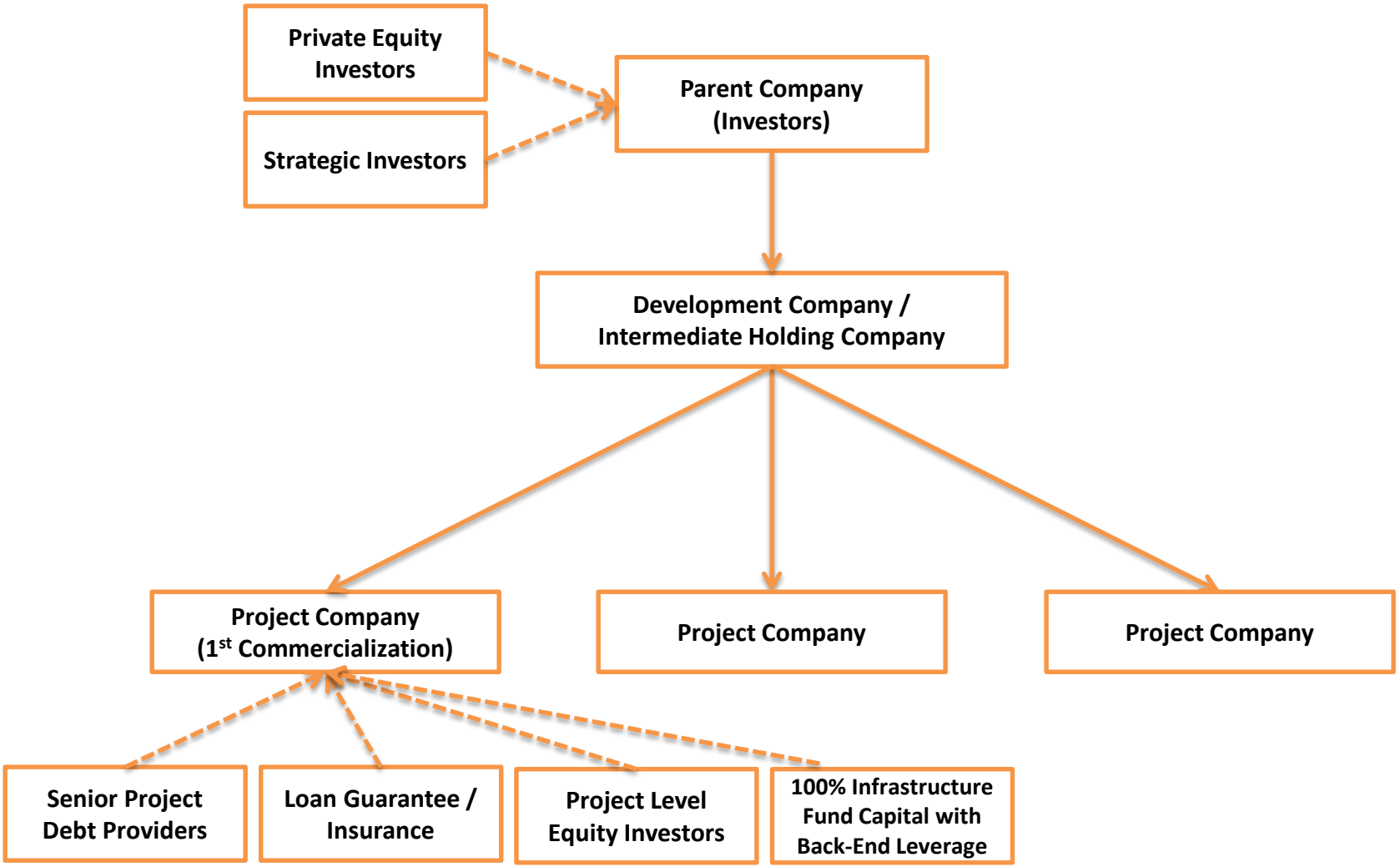
Typical Project Finance Structure



Project Structure Mitigates Project Risks



Development Company (DevCo) Structure



Project Essentials

- “Reasonable” Leverage
- EPC Wrap (excluded technology)
- Decreasing Technology Risks with demo facilities and/or insurance

NER / ABLC Slides

Jon Cozens

March 2, 2017

NEW ENERGY RISK

Demonstrated Reliability

NEW ENERGY RISK

- Anatomy of Reliability
  - How can we derive a feeling of reliability from an organization that is growing and a product that is evolving?
- Failure Modes
  - What can go wrong?
  - How severe are the consequences?
  - How often will it occur?
  - How important is the IE?
- Data
  - How much is enough?
  - How relevant are the data?
  - How will the next technology release perform?
  - Policy evolution

Who is New Energy Risk?

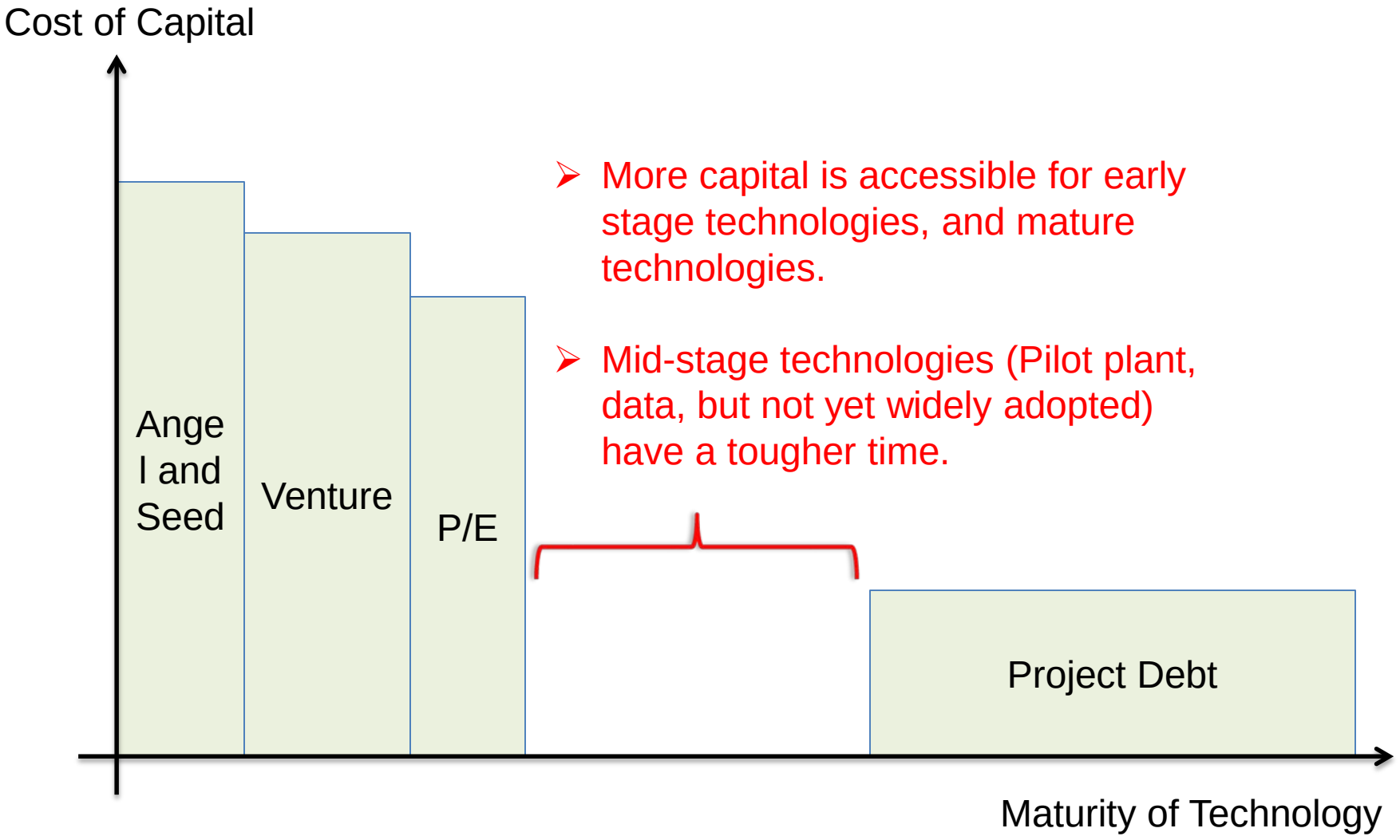
NEW ENERGY RISK

- Underwriter of long-term renewable energy performance
- Owned by insurer XL Catlin (S&P “A+”)
- Partner with Munich Re (world’s largest reinsurer)

- No other insurer has deployed more long-term performance insurance for renewable energy

- Wait, what do you mean by long-term performance?
  - **We insure the output or availability of systems over a multi-year period**
  - **Generally, we’re asked to do so in order to help companies raise project debt.**

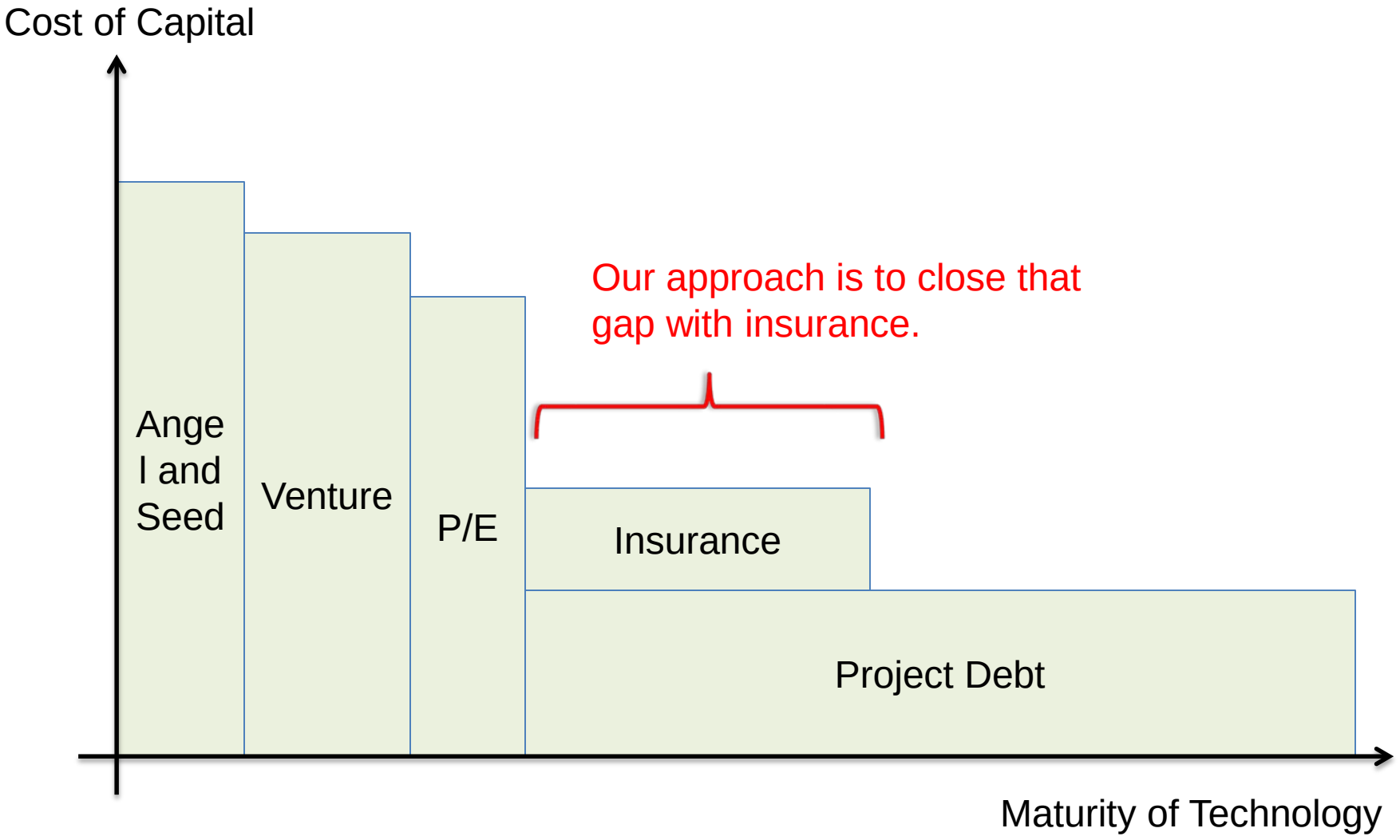
Financing Barbell Curve



- More capital is accessible for early stage technologies, and mature technologies.
- Mid-stage technologies (Pilot plant, data, but not yet widely adopted) have a tougher time.

Financing Barbell Curve

NEW ENERGY RISK



What We've Done

NEW ENERGY RISK

- **Industrial biofuel client base**
  - **$150 million capex**
  - **50+ test campaigns on like-size demonstration plant in batch and continuous run, using expected feedstocks.**
  - **Stable design, low heat, low pressures**
  - **Off-take with investment grade entity**

- **Realized Financing**
  - **10 year amortization term**
  - **1.33x debt service coverage ratio**
  - **70% advance rate**
  - **Insurance is coterminous with debt, full principal protection**
  - **L+200 to L+350 debt terms (BBB-rated in one transaction)**

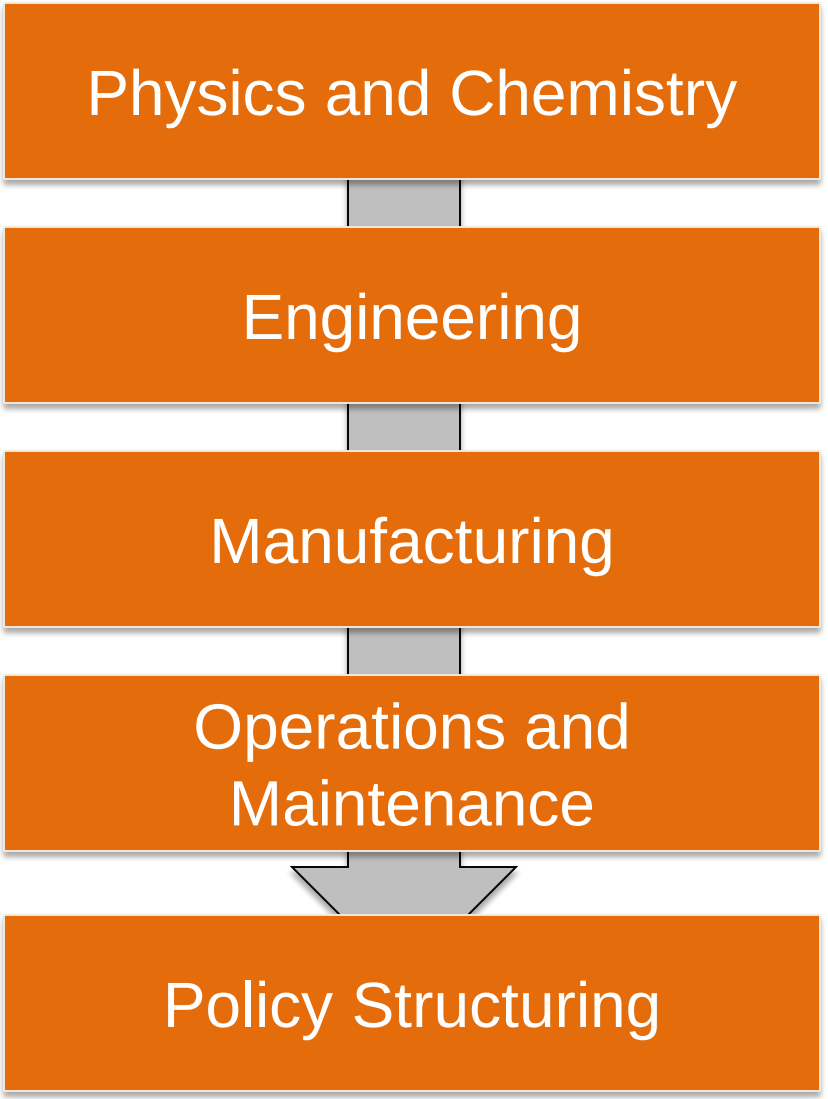
- **Wide Expertise**
  - **Industrial biofuels (pyrolysis, gasification, anaerobic digestion)**
  - **Battery Storage**
  - **Fuel Cells**
  - **Synthetic lubricants**
  - **Medical devices**

- **We've learned lenders are most efficient at evaluating credit**
  - **We are structured to evaluate technology and performance.**
  - **No other insurer can deploy capacity on our scale**

Anatomy of Reliability

NEW ENERGY RISK

- We don't insure technologies; we insure products and projects.
- We do so based on our understanding of the fundamental reasons why they might underperform.



Failure Modes

NEW ENERGY RISK

- Design FMEA and Process FMEA are the cornerstones of our underwriting
  - **What can fail?**
  - **What is the probability of that failure?**
  - **What are the consequences?**

- Frequently rely on IE to corroborate our understanding and the manufacturer's analysis
  - Is an IE report relevant?
    - Structure, operating conditions, design stability
  - Put the IE in our shoes:
    - **IE's like to use "reasonable, feasible, possible"**
    - **We want to know "expected, probable, likely"**

Performance Data

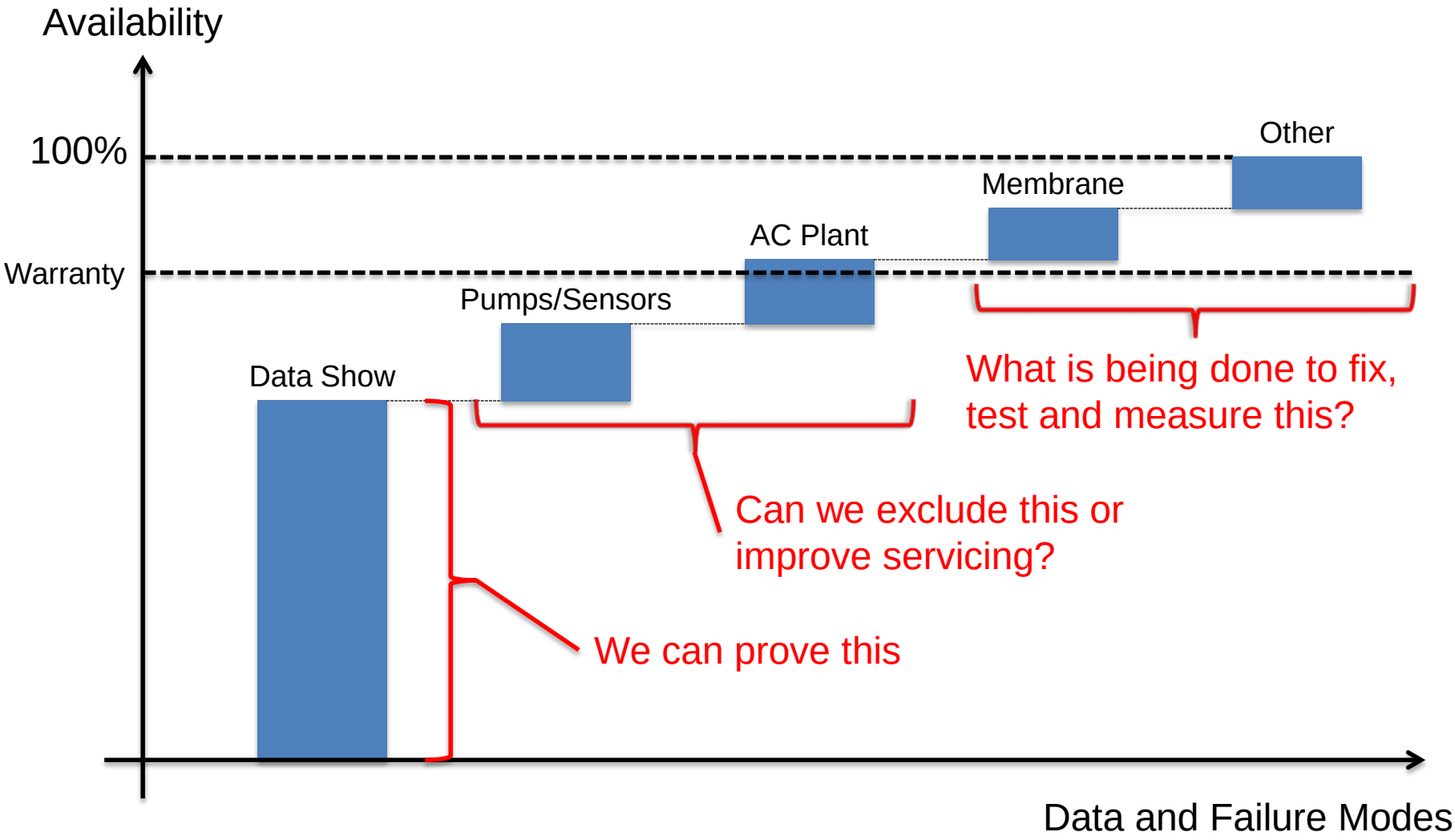
NEW ENERGY RISK

- How much performance data is enough?
  - **I don't know.**
  - **Operating conditions and behavior are more relevant that the sample size**
    - **Is 8,000 cycles of bench data more relevant than 2,000 cycles of field data?**
  - **The fundamental understanding of the electrochemistry gives the data context**
    - **With VRB, we anticipate a stable chemistry and negligible electrolyte degradation**
    - **We are really worried about the membrane failure, and stress on the BOP**
    - **HALT testing on the system is key**

- What are the performance thresholds in the product warranty?
  - **Distributions are paramount**
  - "The warranty is tied to P90" tells us a lot more than "The warranty is tied to 70% of P50", even if your customer wants to know the opposite.

- Be reasonable; don't expect an insurer to take a ten-year risk based on a month of performance data

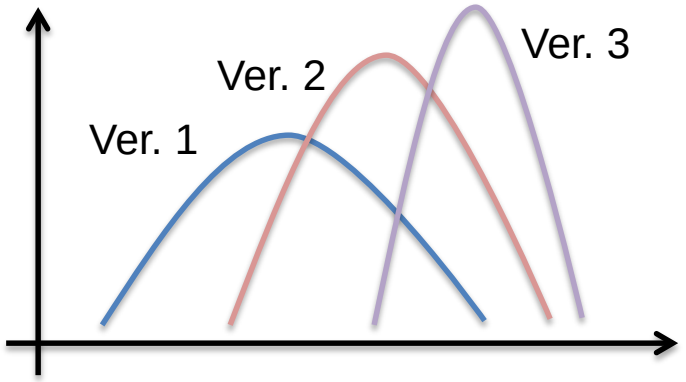
Pareto Analysis



Evolving Technology

NEW ENERGY RISK

- Clients want us to insure a technology vintage for 10+ years
- That vintage has only been in production for a year.
- No field data exist.
- How do we extrapolate performance?
- How do we evaluate manufacturing?



- Are the distributions getting contracting?
- We have bigger data sets for older vintages (more equipment produced and sold).
- As incremental systems are produced, how do they perform as compared to the first systems produced in a vintage?
- Does the team have a track record of success?
- Are the new systems backward-compatible?

Does Insurance Get Cheaper?

NEW ENERGY RISK

- In theory, the more we know the more comfortable we are
  - Client creditworthiness increases as they sell more
- In theory, insurance gets cheaper, or eventually clients don't need us
- In reality, the hardware design evolves, creditworthiness is slow to develop, and lenders like having insurance.
  - Clients do bigger and bigger deals
  - Prices come down, but more often than not, execution gets cleaner and terms get better.

Contact Info

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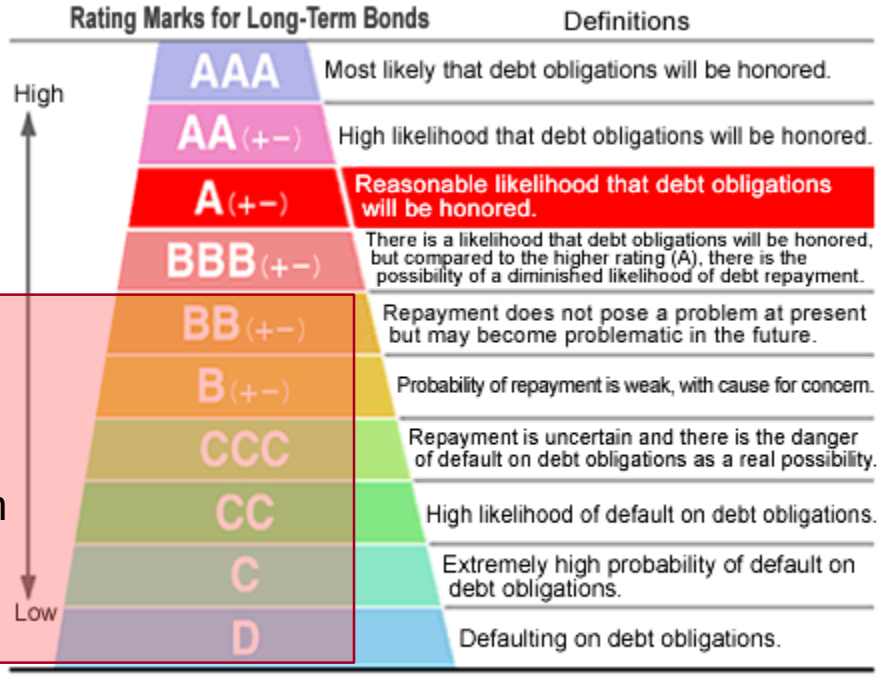
De-Risking Biomass Feedstock Supply Chains:
How Advanced Predictive Analytics© Can Lower Debt Cost

Jordan Solomon
Managing Director & CEO
Ecostrat Inc.

ECOSTRAT
Superior Analytics
Real Experience

Most Bioenergy Projects Carry BB Rating or less ~ Junk

Typical bioenergy project ratings are in the junk region



Biomass Supply Chain Risk: Complexity

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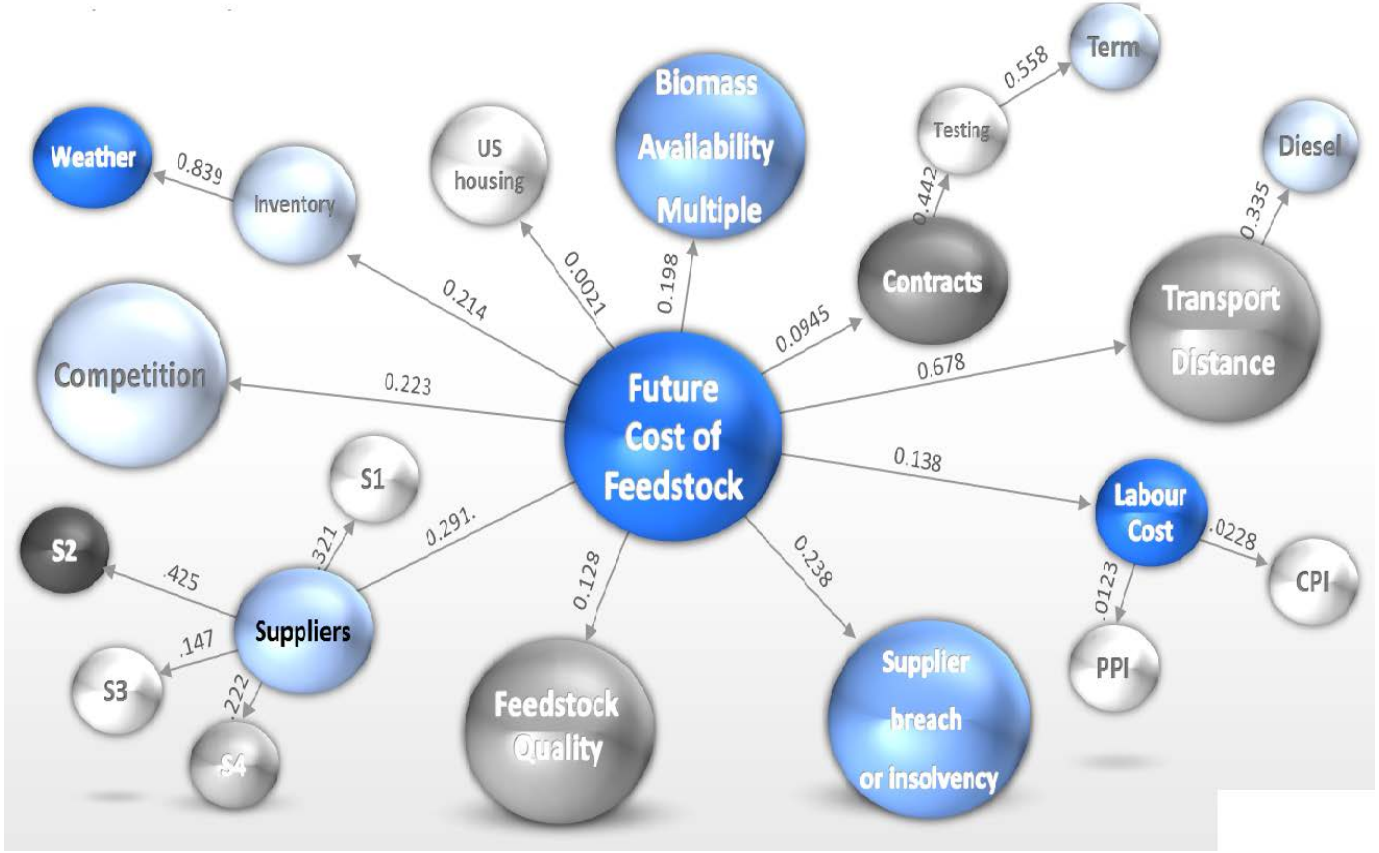
Multiple components with indeterminate risk of occurrence and impact



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In the real world, questions about feedstock risk are simple

- What is the likelihood that feedstock price will exceed $x per bone dry ton over the next 10 years?
- How big is too big? What is the ideal plant size?
- What are the real risks to the feedstock supply?
- What is the vulnerability of the supply chain to a disruption risk?
- Which particular variable has the largest impact upon feedstock cost?
- What is the impact of various mitigation strategies on multiple disruption risks?
- What is the ideal supplier mix to minimize risk and cost?

The fact is that 10 experts can give 10 different opinions.

So…. What makes for reliable predictions in biomass feedstock?

And … When do you know you can trust the information?

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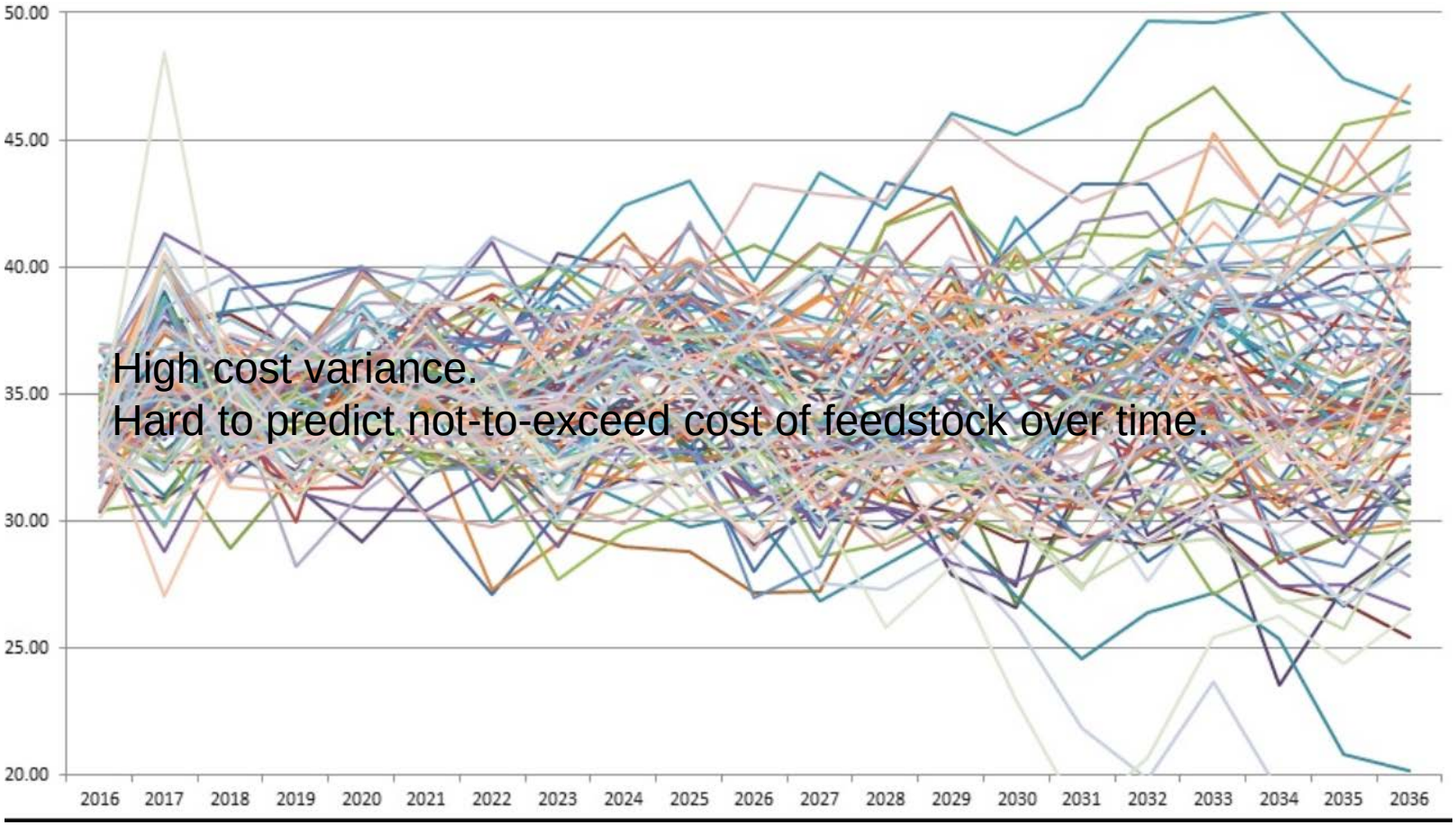
20 Yr Supply Chain Risk in US (risk pathways with typical stumpage variance)



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The Impact of More Accurate Modeling of Supply Chain Risk

1. Increase the credit rating of bioenergy projects
2. Enable better pricing of risk by commercial lenders and debt providers
3. Decrease financial drag on bioenergy/ lower debt and capital cost

The Bottom Line:

Accelerate the rate of bioenergy project development in Canada

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Real Experience

To discuss your project please contact us

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Offtake Essentials

- Contracted Cash Flows
  - Trade off of pricing upside vs. floor price
  - Avoid one-sided termination provisions

- Risks related to RFS2/RINs are hard to understand and quantify

Financing an RFS project

Companies endeavoring to build and register a renewable fuel production facility must familiarize themselves, on an un-biased basis, with:

- Part 79 – fuel registration regulations – what a company can and cannot do with their fuel
- Part 80 RFS regulations **in depth** -
  - Registration – company/facility
  - Reporting – quarterly/annual
  - Recordkeeping – ongoing/extensive !
  - Product Transfer Document requirements
  - Product testing – frequency/extent
  - Common RIN generation mistakes
  - Fuel and RIN buyer expectations
  - Regulatory costs – initial and ongoing compliance, including staffing needs
- Part 80 gasoline and diesel regulations (as applicable)

Strategic Partners

- Every successful renewable fuel production project employs well-qualified strategic partners for financing, design, engineering, construction, etc.
- Often overlooked is the value that a “regulatory consultant” can bring. Such a firm should also be considered an essential partner – one familiar with ALL applicable fuel regulations, compliance requirements and options, and knowledge of the marketplace including potential fuel and RIN buyers
  - The consultant should have a good working relationship with EPA and other applicable regulatory agencies (verify this!)
  - The consultant should have an excellent reputation within the industry, especially with prospective fuel and RIN buyers (verify this too!)
- Of the available regulatory consultants, Weaver meets all of the above requirements.
  - Their well-qualified staff includes a former head of EPA Fuels Enforcement, attorneys, engineers, chemists and CPAs
  - Weaver’s reputation for integrity (incl. confidentiality), and knowledge of fuels regulations is unsurpassed

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- **A global consulting firm specializing in the energy industry**
  - Incorporated in the state of Texas in 1983, headquartered in Dallas
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    - Bridging the gap between operational and financial performance
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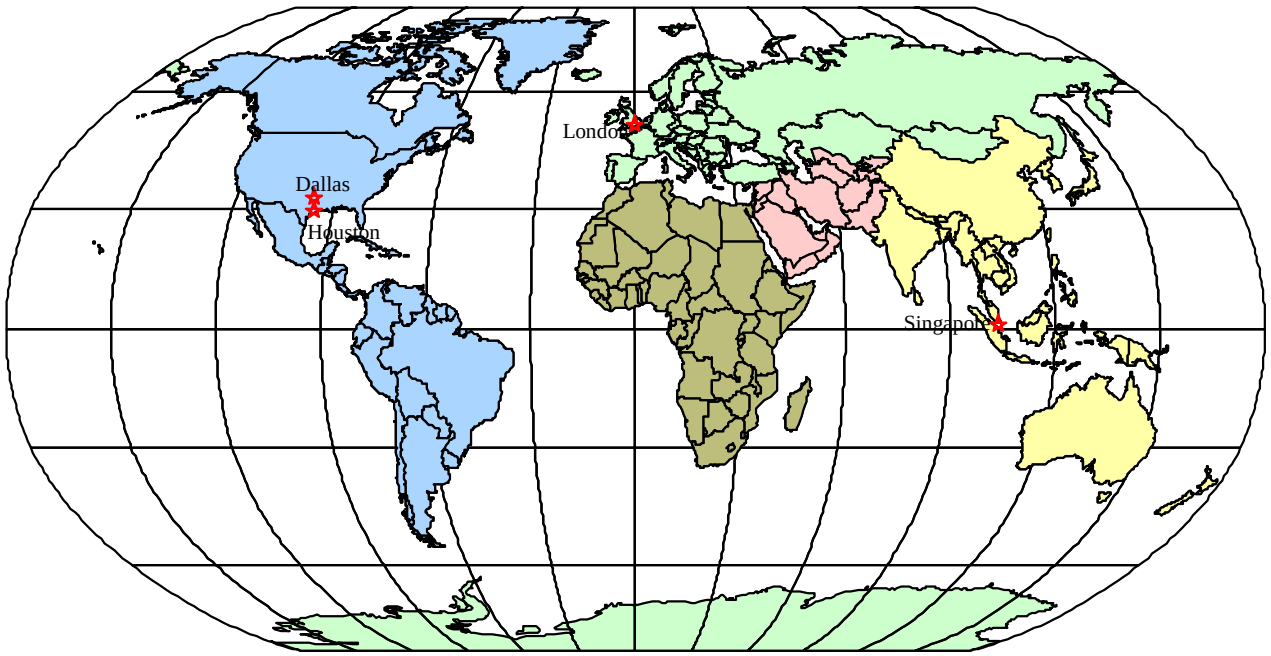

MUSE'S GLOBAL OPERATIONS

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Six Key Practice Areas

- *Asset Performance*
- *Commercial Development*
- *Valuation*
- *Mergers and Acquisitions*
- *Business Strategy*
- *Dispute Resolution*

Six Key Business Areas

- *Refinery and Marketing*
- *Crude Valuation*
- *Gas Processing*
- *Petrochemicals*
- *Biofuels*
- *Logistics*

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RENEWABLE AND ALTERNATIVE FUELS

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•RENEWABLE FUEL MARKET STUDY

•Provided a market study for an advanced biofuel project seeking a federal grant to supplement project funding. Assessed the RIN market and provided opinion regarding future RIN values under a substantially diminished RFS2. Reviewed competing feedstocks for bio-diesel and non-differentiated advanced biofuel

•RIN MARKET ANALYSIS

•Conducted a detailed RIN market analysis on behalf of a bio-diesel producer relying mainly on lower cost fats, oil, and greases as feedstock. Reviewed other technologies and forecast incremental production volumes of competing biodiesel, renewable diesel and non-differentiated advanced biofuel.

•CELLULOSIC ETHANOL MARKETING ASSISTANCE

•Provided market intelligence, contract review and development assistance, price forecasting, and RIN relationships to an international firm looking to market future cellulosic ethanol in the U.S. Screened and helped select off-take partners.

•ETHANOL CONSTRUCTION PROJECT DUE DILIGENCE

•On behalf of an equity investor, carried out a complete due diligence evaluation and North American ethanol market study for a proposed ethanol construction project in the upper Midwest. Conducted management interviews, performed a technology assessment, and assessed competitive positioning of proposed facility. Provided client with various updates and follow-up market analysis during financing and construction phases. Plant is currently operating.

•ETHANOL MARKET STUDY

•Performed an ethanol market study and competitive analysis of a proposed multi-plant ethanol construction project on behalf of a financial institution mandated to arrange the senior debt for the project. Estimated local and export market supply/demand balances, assessed competitive positioning for each facility, and evaluated project risks/mitigates. Provided long-term ethanol and related gasoline price forecast in various markets of interest to the project. Fielded questions and comments from potential investors on behalf of client.

RENEWABLE AND ALTERNATIVE FUELS

MUSE STANCIL

•ETHANOL COMPANY DUE DILIGENCE

•Provided commercial and technical due diligence for a Section 144A securities offering on behalf of various investors. Conducted on-site inspections of the company's facilities and interviewed management.

•ETHANOL MARKET STUDY

•Conducted an ethanol market study and competitive analysis of a proposed ethanol plant on behalf of a financial institution mandated to arrange the senior debt for the project. Provided client with an in-depth site analysis as proposed location for facility was well outside the traditional center of ethanol production in the U.S. Midwest. Also provided client with in-depth grain report that included long-term supply/demand balances in local area and price forecasts for corn, sorghum, and distillers grains.

•BIODIESEL PRICING

•Provided expert testimony in Texas court regarding biodiesel pricing and contracting practices in dispute between biodiesel producer and trader

•RFS2 RIN VALUES

•Provided analytical service for the development of RFS2 valuation projections

•BIODIESEL LOGISTICS

•Advised mid-western U.S. petroleum refiner concerning biodiesel logistics, blending, and marketing

•BIODIESEL MARKET ANALYSIS

•Developed market analysis and project of future biodiesel usage patterns for U.S. Gulf Coast terminal operator

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John M. May, Managing Director, is co-hHead of the firm's Cleantech Practice, which he founded in 2003. He is a seasoned project finance investment banker who has financed over $11 billion in loan and par values for over 100 clients in his 25-year banking career. In the past ten years, he has become one of the top renewable energy bankers in the country, having developed a national practice in renewable energy finance focusing on biofuels, biomass, biochemical and bio-products. He is credited with having pioneered the use of bonds as a form of project finance debt in the renewables market. He is financial advisor to numerous renewable companies and has placed senior and subordinated debt financing for new projects, expansions and acquisitions. He has also been placement agent to companies raising debt through the issuance of tax-exempt and taxable bonds. In 2003, he underwrote the country's first tax-exempt bond issue to fund a landfill gas-to-electricity project. In 2005, he was responsible for developing one of the first tax-exempt bond structures sold to major U.S. institutional investors to fund ethanol projects. He was the first banker to use a State guarantee of debt for a biofuel financing. In 2006, he secured a $15 million full faith and credit guarantee from the State of Illinois for a biodiesel project. Also in 2006, he introduced the use of bonds as a complement to syndicated bank debt in large biofuels financings. In 2008, he was placement agent for bonds used to finance the first U.S. ethanol plant with an off-take agreement from a major international oil company. In 2010, he created the bond finance structure adopted by the USDA in its Bio-Refinery Loan Guarantee Program; this resulted in the Agency's adoption of a new Interim Final Rule for the program in 2011.

In 2012, John led the investment banking team that closed the first project financing for a biochemical company in U.S. history, for Myriant Corporation. The deal was awarded "Deal of the Year" by *Biofuels Digest* Magazine for 2012. He currently represents approximately 30 biofuels, biomass and biochemical and biorefinery technology, development and feedstock companies worldwide. John has been involved in financing renewable projects in ten states in the U.S., and is currently at work on financings for clients seeking to develop projects offshore in Canada, Latin America and the EU. He has developed Stern Brothers' international practice into one of the most recognized brands in the financing of biofuels in the U.S.

John is a frequent speaker at national conferences and webinars in the industry for such sponsors as: ACORE, Infocast, Advanced Biofuels Association, BIO, Platts, Projects and Money CDFA, Midwest Energy, GreenPower, The National Governor's Association and the American Bar Association. He has provided counsel on financing options and the credit markets to such government and association industry stakeholders as the USDA, the Staff of the U.S. House Agriculture Committee, the U.S. Department of Energy/NREL, and the United States Congress Joint Committee on Taxation. He has been featured in recent articles on biofuels finance authored or sponsored by *Biofuels Journal, Biofuels Digest, Biorefining Magazine, Renewable Energy from Waste Magazine,* and *Waste Advantage Magazine* and published on *Grainnet.com*.

In 2011, John was elected to the Advisory Board of the Rockefeller Brothers Fund's Climate Prosperity Partnership. In 2012, John was voted one of the "Top 100 People in Bioenergy 2012" by the readers of *Biofuels Digest*. In November 2012, John was featured on the cover of Biomass Magazine in an article entitled "Meet the Biobanker". Mr. May is also a member of the Board of Directors of the Donald Danforth Plant Science Center's BRDG Park.

In early 2013, John was named the 50th most influential person in the world in Bioenergy by Biofuels Digest. On March 17, 2013, John was featured on the Platts Energy Week Sunday morning television broadcast which aired on selected PBS and CBS stations in major markets in the U.S. He was invited to speak as a global leader in the field of bioenergy and biochemical/product project financing.

At the World Biofuels Markets conference held in Rotterdam in March, 2013, John's credit enhanced bond financing for Myriant Corp was shortlisted with two others for the World Biofuels Deal of the Year.

John begun serving on the Power Generation & Infrastructure Advisory Committee of the American Council on Renewable Energy (ACORE) beginning in 2013.

Prior to beginning his investment banking career, John practiced law at two national firms in Kansas City and Dallas. He received his J.D. and M.B.A. (with concentration in Finance) degrees from the University of Kansas, and his B.A. with Honors Cum Laude from Brown University.

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John Kirkwood assists developers, investment banks and governmental entities in securing debt and equity financing for the industrial biotech industry, including biofuels, renewable chemicals and related low-carbon clean energy, and bio-based products. He also represents companies, investment banks and governmental entities in all aspects of public finance matters.

Alternative Energy and Renewable Chemicals Financing
John represents nationally recognized alternative energy and renewable chemical companies as well as investment banks, senior lenders, junior lenders and equity providers in finance transactions for the alternative energy and renewable chemical industries. He has advised ethanol, cellulosic ethanol, green diesel, green jet, waste-to-energy, hydroelectric, solar, renewable chemical and other developers and their investment banks in raising more than $4 billion of equity and debt to develop alternative energy and renewable chemical facilities.

Municipal Law
John also counsels on tax and securities matters, advising cities, towns, colleges and universities, school and fire districts, investment banks, commercial banks, nonprofit organizations, real estate development firms, manufacturers and alternative energy developers on the issuance of tax-exempt and taxable obligations.

Read more: http://www.faegrebd.com/john-kirkwood

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