M4L2 - Biodiesel Business Case

Slide #1

In this video, I would like to illustrate the data-driven decision-making process with a biodiesel business case.

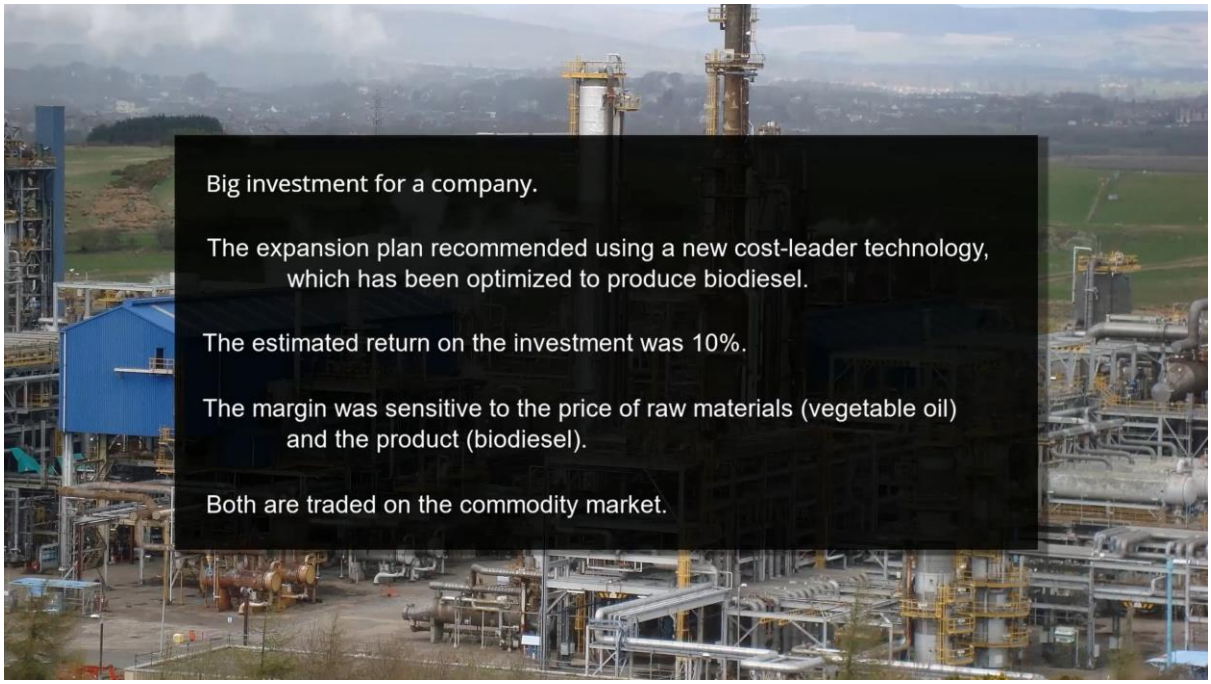
Slide #2

A Texas-based biodiesel company with an annual revenue of 500 million dollars.

Analysts forecasted the biodiesel market to grow at a rate of 9.6% in the next 10 years.

In September 2013, the company directors proposed to expand the current production plant and add 10,000 tons per year of biodiesel capacity with capital investment of 200 million dollars.

Slide #3



This is a big investment for a company.

The expansion plan recommended using a new technology, optimized to minimize the production technology.

The estimated return of investment was 10%, while the margin was very sensitive to the price of raw materials, vegetable oil, and the product biodiesel.

Both are traded on the commodity market.

Slide #4

The CTO of the company disagreed with the plan and proposed a new process, which could be used to produce other biofuels, such as marine and jet fuels.

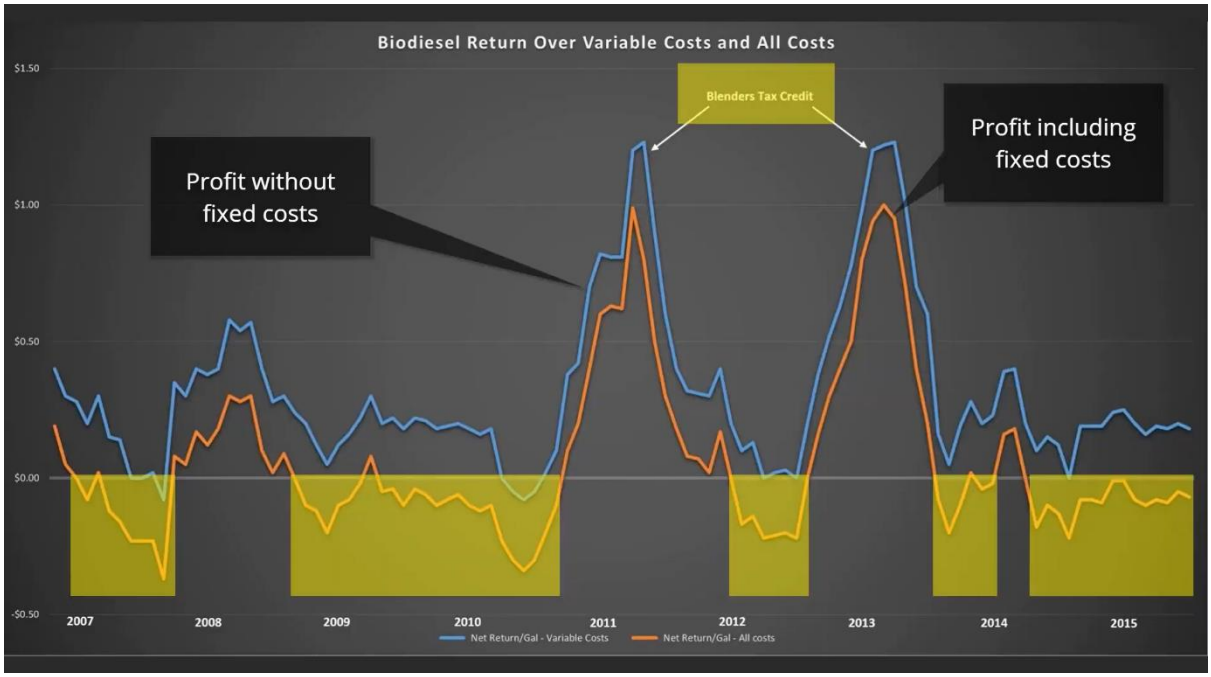
The process would increase the production cost by 2%, but the flexibility might enable the company to switch to other products if the biodiesel price tanks.

Slide #5

The company needs to make a decision about which technology to use for a new plant, mature technology or new technology that gives them the flexibility.

The first step is to look at the market and the business strategy to understand what factors drive the profitability of the industry.

Slide #4



The chart shows the profit fluctuation of biodiesels.

We can see the profit fluctuates in a large range.

The blue line represents the profit without taking into account the fixed costs, such as capital investment of a plant. The data is more relevant to those old plants.

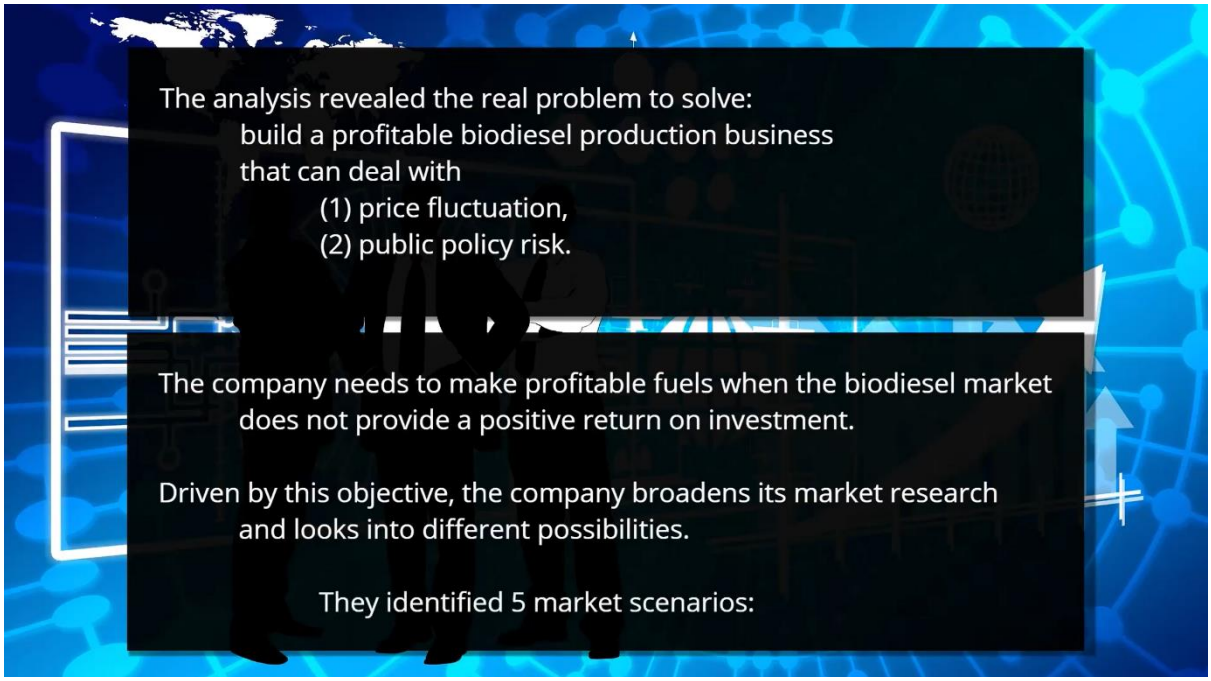
The orange line is the profit after all cost, variable and the fixed cost. It represents newly constructed plants.The orange line is more relevant to the company to their current decision.

This is a simple example of focusing on relevant data when you are making decisions.

From the data, we can see most of the quarter's biodiesel business is not profitable. It became profitable only when the government offered tax credit to diesel blenders.

The public policy drives up the price and the profit. So the business strategy is to improve profitability. That is the primary competitive advantage.

Slide #5



The analysis revealed the real problem to solve.

The problem is to build a profitable biodiesel production business that can deal with the price fluctuation and public policy risk.

The problem is not to build a plant that is profitable under the current environment.

It is more about how to survive when the government stops its tax credit policy.

The company needs to make profitable fuels when the biodiesel market does not provide a positive return on the investment.

Driven by this objective, the company broadens its market research and looks into different possibilities.

They identified five market scenarios.

Slide #6

Market Condition	Probability	Financial Impact ($ millions)	
		Option 1	Option 2
Exceptional Demand	10%	$40.0	$35.0
High Demand	25%	$30.0	$25.0
Moderate Demand	10%	$20.0	$16.0
Weak Demand	35%	$7.5	$5.0
Market Downturn	20%	($10.0)	$0.0

While both decision options face the same set of possible market situations and probabilities, their outcome values differ because each option provides the company with a unique competitive advantage.

Option one minimizes costs, enabling the company to maximize its profit when the market favors biodiesel.

Option two, however, maximizes flexibility, allowing the company to profit from differentiated products when the market demands less biodiesel.

This flexibility helps the company avoid the losses that the current technology option would incur under the worst-case scenario.