

# Key Considerations When Using Industrial-Grade Crude Corn Oil as a Feedstock

By Mark Warren

The past year has been a volatile time in the renewable fuels industry. The increased demand for all commodities, including agricultural commodities such as corn and soybeans, has driven up prices affecting the profitability of renewable energy plants. As a result, business models not accounting for this relatively recent market pressure are struggling to keep pace in this rapidly changing environment. Both start-up and mature companies must leverage their unique capabilities, reduce operating costs and diversify revenue streams in order to position themselves for market success. More often than not, this requires a customized approach for each business and an in-depth understanding of its business and relevant markets.

One option that could potentially increase shareholder profitability for both biodiesel and ethanol plants is the extraction of industrial-grade crude corn oil from the ethanol process for use as an alternative feedstock for biodiesel plants. This solution has caught the eye of many given that ethanol plants can further enhance and diversify their revenues with this relatively low capital-intensive “add-on” asset while biodiesel plants can secure a less-expensive feedstock compared to the bulk of food-grade crude vegetable oils.

On the surface, this outcome looks to be a “win-win” for both the buyer and seller of the industrial-grade crude corn oil. The payback on the ethanol asset is often within a few years, and shareholders quickly see an uptick in enhanced returns to the plant. At the same time, biodiesel plants have a new source of feedstock that isn't solely dependent on the vegetable oil market and is priced at a discount to those traditional oils.

Even with all the positive attributes associated with this relationship, ethanol and biodiesel plants need to be thoughtful of business, financial, technical, marketing and ownership structure risks associated with the endeavor. Generally speaking, two business models are evolving related to the selling of industrial-grade crude corn oil. One, for lack of a better term, is the “vertically integrated” model, while the other is your typical market-based supply model. Each model has its own strengths, weaknesses and dependencies. Thus, an investor should not only get comfortable with these attributes, but also—and more importantly—consider ways in which to mitigate the underlying risks associated with each approach.

## Vertical Integration

In the vertically integrated model, several ethanol producers form a new entity with the sole intent of producing biodiesel. Often, the biodiesel plant is built to scale based on the volume of industrial-grade crude corn oil that the participants can supply. Listed below are some of the attractive attributes of this business model:

1. The ethanol plants have aligned interest with the biodiesel plant. With this model, those ethanol producers usually contribute equity into the biodiesel plant. Thus, those participating have “skin in the game.” Make no mistake, the ethanol producers are interested in capturing a nice return for their industrial-grade crude corn oil but won't sacrifice the viability of the biodiesel plant to do so.
2. Often, the pricing for the industrial-grade crude corn oil is indexed off either biodiesel prices (product), animal fat prices (substitute) and/or other petroleum markets (indexed product) to ensure that the biodiesel plant secures a strong operating margin or crack spread between wholesale biodiesel prices and industrial-grade crude corn oil. Thus, as prices fluctuate, the biodiesel plant can remain competitive while generating a strong return for investors.
3. The biodiesel plant will usually collocate next to an ethanol plant that is an investor and supplier of the crude corn oil. A collocated approach allows the biodiesel plant to reduce its capital costs for infrastructure (rail, storage, utilities, water/wastewater), as well as capture other synergies from the ethanol plant (waste heat, staff, existing contracts for infrastructure).
4. Transportation costs of the feedstock are generally less expensive than the competition due to the close proximity of the ethanol plants to the biodiesel plant. Usually the investors will locate the biodiesel plant in an area most centrally located among all of the ethanol participants.

*Industrial-Grade Crude Corn Oil Index Pricing  
-Possible Pricing Scenarios-*



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Although there is a lot of value in this vertically integrated model, there are several key considerations that should be fully considered in order to make an informed investment decision. Listed below are just a few of the many questions that should be explored before proceeding with the venture:

1. Strategic issues: 1) What impact will this strategy have on the distillers grains prices and marketing options for the ethanol plant? 2) What impact might it have on future options such as corn fractionation or others? 3) Are the involved participants aligned in terms of return expectations, culture and value fit? and 4) How will the board address key strategic decisions (buy, sell, merge), and what impact does that have on each ethanol plant?
2. Business structure: 1) How will the board be structured (equity contribution, business line expertise, etc.)? 2) What are the issues regarding the transfer of ethanol ownership if an ethanol plant is sold? 3) What impact will that have on the biodiesel plant's ownership structure and control? and 4) What steps can be taken at inception of the biodiesel plant to mitigate long-term business structure issues?
3. Contracts and risk management: 1) What are the risk of default and implications to the ethanol plant and biodiesel plant? 2) What is the contingency plan in case default occurs? and 3) What measures can be documented to minimize exposure?
4. Pricing: 1) How will the pricing of industrial-grade crude corn oil be established? (Length of contract? Methodology? Timing and requirements for delivery?) 2) How will quality control of the product be measured? (What are the standards of the product? How are discounts established?) and 3) What is the contingency plan for policy issues? (Possible expiration of the biodiesel tax credit, and state incentives and grants?)
5. Technology and performance standards: 1) Will all the ethanol plants be utilizing the same corn oil extraction technology? If not, what are the performance risks? (Composition of the crude corn oil? Yield conversion?) 2) Will there be any issues with pretreating and processing different compositions of industrial-grade crude corn oil at the biodiesel plant? and 3) What are the performance guarantees associated with the extraction technology? (What impact does that have on the biodiesel plant's performance? Shareholder returns?)
6. Counterparty risk assessment: 1) What is the financial stability of other participating ethanol plants? 2) What is the debt exposure at the ethanol plants? 3) What are the implications for securing funding based upon existing loan covenants and liens? and 4) Can the ethanol plants secure funding for extraction technology?

As can be seen, a number of items need to be diligently explored. Ascendant Partners Inc. has only hit on a handful of the key considerations that ethanol and biodiesel board members should consider when exploring this business model. We recommend working closely with legal counsel, equity participants, banks, technology providers and the project developer/consultant to ensure there is alignment around these critical business issues.

## **The Supply Model**

For biodiesel plants interested in sourcing industrial-grade crude corn oil, often the best way to secure the volume is to work directly with an ethanol plant. There are several procurement approaches that a biodiesel plant can take when looking to lock in the crude corn oil.

One approach would be to establish a long-term offtake contract with the supplier for a certain amount of volume. The buyer and seller would need to work through many of the contracting issues previously mentioned in order to develop a healthy and sustainable business relationship. Another option would be for a biodiesel plant to purchase the extraction asset for the ethanol plant. With this type of arrangement, the ethanol plant wouldn't have to source the capital for the extraction asset but would likely be required to sell the industrial-grade crude corn oil at a discount to the biodiesel plant. Both parties would need to actively work with their banking relationships to ensure that all parties are comfortable with the risks and structure of the business relationship. Lastly, a biodiesel plant could source industrial-grade crude corn oil on the spot market. This approach is not likely a strong one given the lack of product available on the open market, minimal amount of price transparency/discovery in the market and the technical requirements that a biodiesel plant must plan for when utilizing this product. Ultimately, hinging one's hopes on finding industrial-grade crude corn oil in the spot market is highly risky and not recommended.

The primary reason for the industrial-grade crude corn oil's price discount is its composition. Compared with other vegetable and rendered oils, it has a high free-fatty-acid (FFA) composition (12 percent to 17 percent), as well as waxes and other chemicals that make it unsuitable for human consumption and a challenge to pretreat. With the high FFA content, many producers utilizing this oil resort to acid esterification as the most economical way to convert FFAs into triglycerides versus stripping out the FFAs and selling them for a steep discount to the purchase price of the oil. This level of pretreatment will require a retrofit for existing assets, but the payback can be quick if all works smoothly. One should be cautious when selecting a technology provider for this add-on or first-time install and should utilize a proven technology. Proper performance guarantees and liquidated damages will need to be clearly defined and agreed upon by the plant's banker and shareholders alike.

Utilizing industrial-grade crude corn oil definitely has a number of advantages for a biodiesel producer. This competitively priced oil provides feedstock diversity and, in many cases, a vertically integrated business model. Additionally, corn oil doesn't have the cold-flow issues associated with animal fat. With all its promise, investors should proactively address the existing and potential risks to protect their shareholders' returns, as well as ensure alignment between the board, management, buyer and seller regardless of what business model is utilized.

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