

In today's unpredictable and volatile marketplace, a flexible facility can avoid foreclosure and bankruptcy

# Successful community oilseed project – key considerations

**T**here is growing opportunity to successfully develop community-scale oilseed processing facilities to supply cost-effective feedstocks to the biofuel industry. There are a number of strengths that are found in well-designed and resilient community plants and, if these had to be summarised in a word, it would be flexibility.

To be sustainable through market swings and instability, decentralised facilities can be designed to incorporate myriad processing and marketing options that span the entire range of the value added processes they operate in. Because of these market fluctuations and policy gaps, plants that want to stay in this industry long-term will need to utilise a diverse set of biomass and energy inputs that can supply vegetable oil-based products to numerous markets including renewable diesel, human food and animal feed markets.

A community-scale oilseed expelling facility can be defined as one that could process up to about 100 tonnes per day of prepared biomass. While facilities larger than this can still leverage decentralised advantages and be considered 'community-scale', they must be carefully tailored to the available resources and markets to ensure sustainability in the hard times as well as the good.

Another defining aspect of a



Solid shaft machines are easy to operate and can also be operated in a portable manner that brings the machine to the seeds

community-based facility is the opportunity for local ownership and investment. The one who owns the plant is the one that ultimately benefits the most. In the case of local ownership, the community model would ideally include ownership by local feedstock growers, animal feed consumers, fuel consumers and others who can benefit from being owners in the business and be directly involved.

Local ownership makes a huge difference in terms of the economic development

footprint compared to a comparable facility that would have corporate and/or distant ownership. The latter usually tends to bring in its own staff and use its own suppliers and contractors. In the US Midwest in general, economic development built around a decentralised sustainable biofuels industry in rural areas, where biomass energy abounds and jobs are scarce, would be a tremendous benefit.

Flexibility, a paramount feature of the successful

community-based plant, should be integrated throughout the process from types of biomass that can be processed to the markets that the value added materials will be sold to. The unpredictable and volatile marketplace of today can turn a profitable enterprise into tomorrow's foreclosure and bankruptcy unless the facility has both the knowledge base and infrastructure to quickly shift markets to one that would provide better returns for the materials.

A market shift would typically appear when one item loses profitability but the facility is able to create another opportunity by switching operations to meet the requirements of a new, promising market.

For example, a market drop in the value of vegetable oil sold to the biofuel industry could spell disaster for a large monolithic facility designed to make only one product. But an agile decentralised facility can shift processing steps around and access the other markets that would still be available if this oil could be refined and sold into food markets or converted into biodiesel directly, or if a cheaper feedstock could be accommodated into the raw materials.

Having the ability to directly access a variety of biomass resources on the inputs and having products that can be sold into a variety of markets is the best insurance that can be taken out to ensure a facility keeps on running through periods of market and policy volatility.

Being able to process the full spectrum of oil-bearing biomass available in a particular area is as simple as including these considerations in the design of the seed pre-treatment section of the facility and installing the right equipment for the biomass most likely to be encountered in that area.

It is here that the feedstock preparation and extraction technology selected for the facility can play a role. Generally speaking mechanical crushing of oil bearing seeds is the only cost-effective method of operating in the capacity range under consideration in this article. Chemical extraction on a small-scale is not cost-effective and gas extraction methods are only showing viability for high value materials at very small scales. Many variables must be deliberated when considering equipment to perform the

## The benefits of community-scale facilities

- Utilise abandoned, under-utilised or otherwise debilitated agricultural processing facilities to house their oilseed processing facilities, utilising existing infrastructure and zoning while driving economic development in rural areas
- Community scale oilseed processing facilities will promote development of specialty, organic and high value crops in rural areas. Flexible types of processing capabilities that accept a variety of seeds generally do not exist for people to take high value materials to for processing.
- These facilities would have the opportunity to add further value to the processed oil through conversion to fuel or food grade oil through refining processes. The oilseed facility is also an excellent location to integrate algal oil production that utilises waste streams from the plant
- In Nebraska, the production of oil through facilities such as this would support the decentralised production of renewable energy. Only a small fraction of the oilseeds grown in Nebraska is processed by such crushing facilities and 100% of liquid fuels are imported.
- Because of commodity vegetable oil values and even higher values for specialty and organic oils, crush margins are volatile and diversifying market opportunities will be a key to future success. When properly established, these facilities could grow rapidly in any region where biomass feedstocks are available.

critical steps of the process including cost, manpower, ease of flexibility, variability, efficiency, expandability and maintenance. In some regions labour is not a big issue, in others it is. These variables must be taken into account in the context of the specific example being studied.

Of the mechanical expelling technologies available, there are myriad choices but the most common type are the machines with larger sectional, horizontal screws of varying pitch surrounded by cage bars separated by spacers of a selected thickness to allow oil release when the oil bearing biomass is put under pressure in the cage. Chinese types are unique and not considered in the US as they are best suited for individual producers.

Although the horizontal bar machines as invented and patented by Valerius Anderson in 1901 still dominate this industry, smaller, solid shaft machines can offer distinct advantages over these units. These solid shaft machines do not require the expertise of experienced operators to run efficiently like the horizontal bar machines do. In fact, these solid shaft machines are meant to operate without any supervision and boast much

greater efficiencies. Solid shaft machines, best exemplified by the Komet machine produced by IBG-Montforts, cost more per tonne of rated capacity but are often the most cost-effective units when all things are considered, as they are able to properly develop the agile and sustainable plant meant to adjust to instability in the markets.

US oilseed processing systems provider Nebraska Screw Press has often noted the importance of this step in eliminating the question of 'What came first the chicken or the egg?' In other words, the agricultural producer will not grow a potentially risky new crop unless he knows for sure there will be a local outlet for his seed and the seed processor is loathe to invest in a processing facility until he knows that the seed he needs will be planted. A community facility can directly address these issues and answer the question with 'They were both created at the same time'.

Locally-owned facilities are generally better capitalised and have less debt and interest on loans to keep the facility at risk. If lenders cannot be paid because of an unforeseen shift in the market, the facility will end up at auction for

pennies on the dollar.

Nebraska Screw Press saw this play out between two facilities that were started in Nebraska in 2008. The smaller, locally-owned facility was much better able to survive the market conditions of 2008 than the larger, corporate facility. The large, inflexible facility sits idle after being sold off at auction and the smaller plant simply reorganised and is operating today using a different feedstock and serving a different market than what it was originally set out for, but the leadership, infrastructure and storage flexibility has kept it in the game.

With the ever increasing cost of transportation, the community facility will be far less impacted than the large facilities that not only depend on large areas for their feedstocks, but are often dependent on distant markets with the resulting increase in costs for shipping. This factor will play a much larger role in the future and favour decentralised production that uses local materials to serve local markets. ●

### For more information

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