

Resilient processes counteract volatile feedstock markets

High-quality end products

Pretreatment of fat-based feedstock plays a crucial role in ensuring efficient and reliable biofuel production, regardless of whether the end product is biodiesel, renewable diesel (RD), or sustainable aviation fuel (SAF).

Considering the significant impact of raw material costs on production expenses and the evolving legislation favouring the use of waste oils and fats in biofuel production, the RD and SAF markets predominantly emphasise the utilisation of these resources.

This requires more complex pretreatment processes to meet stringent quality requirements.

At the technological forefront of feedstock pretreatment is BDI-BioEnergy International, the Austrian-based international provider of waste-based biodiesel plant construction.

BDI's Advanced PreTreatment process is a result of over 25 years of experience and expertise in waste oil and fat processing.

With this technology, biofuel producers are able to process a diverse array of low-quality feedstock into high-quality end products.

The process

The BDI Advanced PreTreatment process is a versatile and modular system designed to accommodate both fresh vegetable oils and waste oils and fats, purifying them for use in renewable diesel and SAF production.

For waste oils and fats, it relies on an effective pre-purification method specially developed by BDI.

This method consists of a tricanter process, which is specially-designed to boost yield, while bypassing the problems posed by the



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inefficacy of conventional centrifuges for these types of substances.

This process is then followed by a drying phase.

After pre-purification is complete, a subsequent advanced adsorption stage, tailored specifically for waste feedstock, follows.

The design and operation of this adsorption stage holds particular importance in optimising the efficiency of the entire process.

BDI, therefore, offers guidance and support to its customers in the selection of the most appropriate adsorption medium, with a variety of options currently available in the market.

In addition to the fundamental pre-purification and adsorption stages, additional process units may be added as necessary, depending on the feedstock.

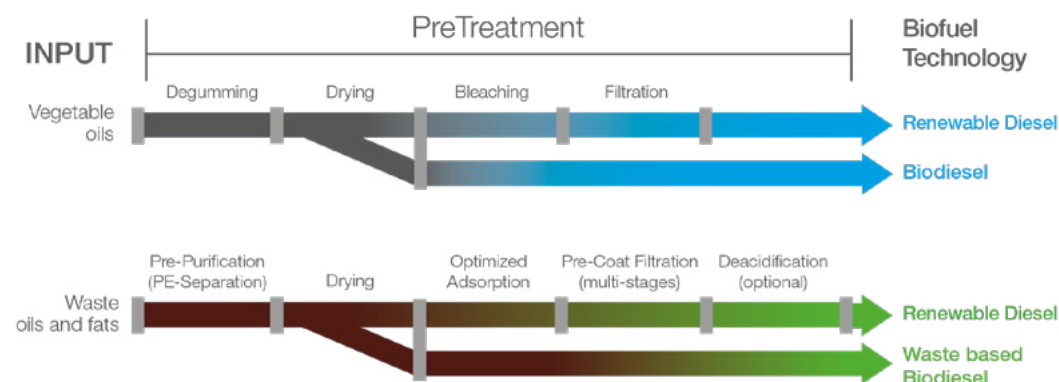
For example, when using animal fats as feedstock, a

challenge arises concerning the presence of polyethene (PE) particles in the rendered fat.

These plastic particles cannot be effectively removed by a centrifuge or tricanter due to their low density.

However, failure to remove these particles may result in clogging and subsequently in capacity problems during operations.

To solve this problem, BDI has, therefore, developed an innovative PE removal



process (patent pending), which is integrated upstream of the pre-purification unit.

Other additional units can be incorporated downstream as needed, for example to reduce or convert free fatty acids.

In the case of vegetable oils and feedstock with minimal solid or sticky residues, disc centrifuges can also be employed within the pretreatment process.

As illustrated by these examples, BDI can offer customised pretreatment solutions for many types of waste-based feedstock.

The benefits

This is good news for RD and SAF producers, given the expected amount of competition for feedstock in the years to come.

Understanding that the availability of feedstock may change significantly over time, establishing flexibility from the beginning, could be crucial for ensuring a plant's profitability in the future.

With the global biofuel market growing, there is a subsequent steep rise in feedstock demand and future feedstock scarcity could become an issue.

Thus, the ability to efficiently process a variety of waste oils and low-quality raw materials becomes an even more valuable asset for biofuel producers.

The plants constructed by BDI are specially designed for waste oils and fats, and thus have the capabilities to process such feedstock for use in RD and SAF production.

Additionally, each plant is built specifically to meet the requirements of each producer – from the definition of available feedstock qualities and quantities, to defining the incorporated equipment and units.

The company also provides construction and commissioning for its pretreatment plants

worldwide, as well as offering its customers support and maintenance services after commissioning.

In short, the company offers its customers comprehensive support throughout all the project development phases, from plant concept to completion and beyond.

However, it is necessary to add the following caveat – despite the extensive flexibility offered by BDI's Advanced PreTreatment technology, it is nevertheless important to understand the production of RD or SAF requires much cleaner raw materials than that of conventional biodiesel.

The costly catalysts required for RD and SAF production are extremely sensitive and even the tiniest impurities can compromise their functionality.


Extremely low-grade feedstock thus jeopardises economical production, due to the lengthy process of purification required.

When only such feedstock is available, it is, therefore, recommended to utilise it for the production of biodiesel, rather than for RD or SAF.

Conclusion

The adaptability provided by BDI's Advanced PreTreatment process positions RD and SAF producers favourably in the evolving and increasingly competitive feedstock landscape.

Importantly, BDI-built plants are explicitly designed to excel with waste oils, emphasising the importance of a flexible pretreatment process configuration that can effectively address impurities.

This flexibility is especially critical when different feedstock types are processed within the same production line, ensuring readiness for potential challenges in the future. 

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