



B100
BIODIESEL

PROJECT UPDATE
JANUARY 2019

TRANSFORMING REFUSE INTO REVENUE
BROWN FOG TO B100 BIODIESEL

A Growing Supply and a Growing Need



What is FOG

Any Combination of animal fats and oils used to prepare food and mixed with wastewater. Accumulates in sanitary sewers from cleaning cooking utensils. Food Service Establishments (FSEs) are the major generators. Residential homes are minor generators but collectively can be significant.

The Problem

Billions of kg/year are discharged into sewers around the world. FOG causes pipe blockages which lead to Sanitary Sewer Overflows (SSOs). WWTPs receive large quantities of FOG from wastewater. High cost for O&M, treatment and disposal.

The Solution

Prevent FOG from entering sewer system at the source of generation. Collect FOG at local FOG Receiving Facilities. Resource recovery of FOG as a feedstock for biodiesel rather than disposal as a waste.

Transforming Refuse Into Revenue



Why is brown grease such a problem?

There are very few ways to dispose of it and those methods are costly or not efficient.

Benefits of REA's Proprietary Biodiesel Production Technology to Wastewater Treatment Plants

Highlights & Benefits

- Proprietary and patented
- Resource recovery of negative value waste stream of fats, oils and grease (FOG) into value added products, biodiesel
- Capturing previously missed opportunity to generate valuable biofuel from brown FOG
- Utilize low quality feedstocks for production
- Biodiesel created can be used for power generation, transportation or heat
- Convert brown grease and activated sludge waste streams to liquid fuels and specialty chemicals
- Innovative approach is far less costly than biogas systems
- Environmental responsibility by not incinerating or landfilling
- GNHWPCA/UConn/REA demonstration system now generates heating-grade biodiesel
- Final step in process to reduce sulfur to less than 15 ppm to create B100 biodiesel



APPROXIMATELY

110

MUNICIPAL, STATE & PRIVATE
WATER POLLUTION CONTROL
FACILITIES IN CONNECTICUT ALONE.



28 THOUSAND

WATER POLLUTION
CONTROL FACILITIES

APPROXIMATELY
IN THE
U.S.A.
ALONE



4%

(20,000mw)

CONSUMPTION
OF U.S. ELECTRIC
POWER GENERATION



5 BILLION

LITERS DISCHARGED PER
YEAR OF BROWN GREASE



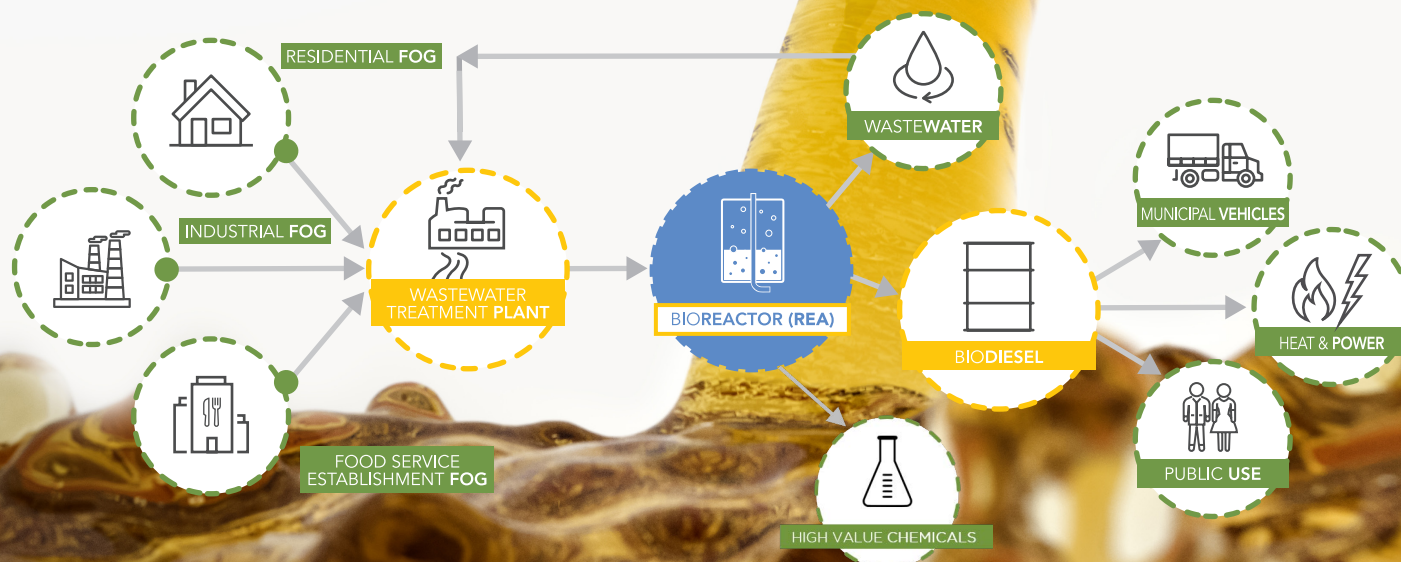
75 BILLION LITERS

DISCHARGED PER YEAR
OF ACTIVATED SLUDGE



The Process

Collection • Separation & Recovery • Conversion



Competitive Tech Advantage

Automated continuous flow process technology raises production efficiency with faster and higher conversion rates, and can provide more consistent product quality and plant safety.

Our technology is transportable, built off-site on transportable skids, making installation fast and cost effective. The small footprint requires less dedicated space at your facility. Your equipment can be designed and constructed to process anywhere from 500,000 gallons per year to multi-million gallon capacity.

Methanol recovery and recycle is included in the basic system design, reducing methanol consumption by more than 75% compared to the case where methanol is not recycled.

The patented reactor design provides for the simultaneous separation of the glycerol by-product, thereby eliminating an additional module, the glycerol separation module, that most current systems require.

The catalyst used in REA's fatty acid reactor is safer to handle than the sulfuric acid typically used in yellow grease reactors, and does not add sulfur to the product biodiesel as does sulfuric acid, making compliance with ASTM standards more easily achieved.

Feedstock Flexibility allows REA systems to process any vegetable oil or animal fat based feedstock available, thereby opening new opportunities for wastewater facilities to receive greater quantities of those types of municipal waste streams.

Sulfur Distillation will reduce sulfur to below 15 ppm, ultimately producing B100 biodiesel



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