

# SUSTAINABLE FUELS

*Delivering sustainability driven solutions  
to your biofuel projects.*



Sustainable fuels, commonly known as biofuels, are a type of transportation fuel that utilizes renewable feedstocks. The aim of biofuels is to reduce the carbon footprint associated with traditional transportation fuels. By using renewable feedstocks, such as biomass or organic waste, biofuels offer a more environmentally friendly alternative that helps decrease greenhouse gas emissions. The production and use of biofuels contribute to the promotion of sustainability and the transition to a more sustainable energy system.

## Materials and Corrosion

Our corrosion experts offer specialized testing services specifically designed for the biofuel and renewable diesel production industry. These services focus on addressing integrity challenges related to corrosion and pitting. The corrosion services provided by our team include:

- Corrosion rates assessments
- Flow regime simulation
- Cracking simulation under a variety of conditions
- Scanning electron microscope (SEM) imaging

These tools allow our materials experts to fully characterize the effect processes have on material performance and allow operators to learn from identified issues and reduce downtime. As part of SES's offerings to biofuel producers, our experts have performed

risk-ranking analyses for material susceptibility to high temperature hydrogen attack (HTHA) and failure analyses on production equipment.

## Design and Analysis

Over our many decades of service in the energy sector, we have developed an extensive expertise in the field of refining and facilities applications. Our capabilities encompass two key areas: Fitness for Service (FFS) assessments and Computational Fluid Dynamics (CFD) analyses.

**Fitness for Service (FFS) assessments:** We expertly perform FFS evaluations, which involve determining pass/fail criteria for equipment and structures. These assessments allow operators to make critical decisions regarding the continued operation and repair of their assets. FFS evaluations ensure that the equipment remains fit for its intended purpose, considering factors such as structural integrity, material degradation, and safety.

**Computational Fluid Dynamics (CFD) analyses:** Our team employs CFD techniques to study and analyze fluid flow and mixing points within biofuel production processes. CFD simulations provide insights into the behavior and performance of fluids, enabling a comprehensive understanding of mixing efficiency and optimization.

## Instrumentation and Monitoring

Just like process equipment found in fossil fuel refineries, instrumentation and monitoring of biofuel process equipment can help ensure safe and economical operation. We offer a number of field measurement services for collecting critical operational data. Specific offerings include:

- Acoustic emission (AE) monitoring for crack growth
- Vibration monitoring
- Strain and temperature measurement

In addition to these field measurement services, we offer long-term monitoring systems for facilities. This continuous monitoring generates valuable data that serves as inputs for physics-based analyses, including our NeoSight® platform. This platform utilizes the collected data to perform advanced analyses and provide insights for optimizing operations and ensuring the long-term reliability of the biofuel production facility.

## About SES Renewables

SES Renewables Solutions™ is a division of Stress Engineering Services, Inc. that specializes in renewable energy consulting. Our expertise lies in supporting clients throughout the entire lifecycle of renewable energy projects, regardless of their scale. We offer comprehensive guidance in developing, executing, and commercializing these projects. Our focus is on providing clients with sound technical solutions to design, install, commission, operate, and maintain their energy systems safely and economically.

## About Stress Engineering Services

Since 1972, Stress Engineering Services, Inc. has been a global leader in engineering services and solutions for a variety of industries. We are committed to providing the most comprehensive design, analysis, and testing services with an unsurpassed level of engineering integrity and skill. For more information, visit our website at [www.stress.com](http://www.stress.com).

