# Dossier: SPECTRAL ENERGIES LLC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $149,814.90

**Award Date:** 2024-08-05

**Branch:** MDA

## AI-Generated Intelligence Summary

**Company Overview:**

Spectral Energies LLC is a research and development company specializing in advanced sensing and diagnostic technologies, primarily for combustion environments and high-speed flows. Their core mission is to develop and commercialize innovative optical diagnostic tools that provide real-time, in-situ measurements of key parameters such as temperature, pressure, species concentration, and velocity in harsh, inaccessible environments. The company aims to solve critical problems in propulsion system development, energy efficiency improvement, and environmental monitoring by enabling more precise and efficient combustion processes. Spectral Energies' unique value proposition lies in its ability to provide highly sensitive and robust diagnostic solutions that overcome the limitations of traditional measurement techniques, allowing for improved understanding and control of complex fluid and energy systems.

**Technology Focus:**

* Laser-Induced Breakdown Spectroscopy (LIBS) Systems:\*\* Develops and deploys LIBS-based sensors for real-time elemental analysis in harsh environments, enabling precise monitoring of fuel composition, pollutant formation, and material degradation. Specifically, they offer miniaturized LIBS systems capable of operating in extreme conditions (high temperatures, pressures, corrosive environments).
* Coherent Anti-Stokes Raman Scattering (CARS) Thermometry:\*\* Provides advanced CARS systems for accurate and spatially resolved temperature measurements in reacting flows and combustion chambers. This technology allows for non-intrusive temperature mapping with sub-millimeter resolution.

**Recent Developments & Traction:**

* SBIR/STTR Grants:\*\* Received multiple SBIR/STTR awards from agencies like NASA, the Air Force, and the Department of Energy to develop and commercialize advanced diagnostic technologies for various applications, including hypersonic propulsion and advanced engine development (various dates across 2021-2023). Details available through award databases.
* Partnerships with Academia:\*\* Actively collaborating with leading universities, such as Purdue University, on research projects related to combustion diagnostics and sensor development. This collaborative approach allows for access to cutting-edge research and expertise.

**Leadership & Team:**

* Details not readily available. Extensive research did not reveal named leadership publicly.

**Competitive Landscape:**

* Princeton Instruments:\*\* Offers a range of spectroscopic and imaging solutions, including LIBS and Raman systems, competing in the broader analytical instrumentation market. Spectral Energies differentiates itself by focusing on customized solutions optimized for harsh environments and specific applications within combustion and propulsion.

**Sources:**

* [https://spectralenergies.com/](https://spectralenergies.com/)
* [https://www.sbir.gov/](https://www.sbir.gov/) (Search for 'Spectral Energies LLC' for award details)
* [https://scholar.google.com/](https://scholar.google.com/) (Search for relevant publications)