Biodiesel is a renewable alternative to traditional diesel. It is made from feedstocks (raw materials) such as oils and recycled cooking greases, rather than fossil fuels. Biodiesel is commonly blended with traditional diesel, but it also sold in its pure form. It has considerably fewer emissions than its traditional counterpart and because much of the feedstock used in California is from the state, it reduces dependence on foreign sources. Successful growth of the companies profiled here demonstrates that the industry is creating jobs in California and growing the economy.

EDF profiled one company to represent each step of the value chain: research and development, feedstock, collection, production, blending, and retail and distribution.

**Biodiesel companies** that participate in Research and Development (R&D) work to identify new resources that can be used as feedstocks, new processes and technology breakthroughs that can accelerate the development and commercialization of cleaner diesel. These companies work to integrate science and engineering research to improve processing, conversion, storage, and product development and analysis.

**Feedstock** Biodiesel feedstock is the raw material that mixes in the fuel. Typical feedstocks are palm oil, canola, soybean, and even low-carbon footprint biodiesel made from used cooking oil (also used by biodiesel producers. New feedstocks currently under investigation include algae and even sewage sludge. Abundant and steady sources of feedstock allow for biodiesel to be scaled economically.

**Collection** Biodiesel companies partner with restaurants and food service companies that produce waste grease in order to have readily available feedstock to use in biodiesel production. Biodiesel companies will either pick up grease that has been safely stored in drums, or pump the waste grease from the restaurants directly into a truck for transportation to the production facility.

**Production** Biodiesel is produced through a process called “transesterification.” In the process, glycerin (a colorless, odorless, syrupy liquid made from fats and oils) and oil is separated from the fatty or vegetable oil, leaving behind methyl esters (the scientific name for biodiesel) and glycerin (a byproduct that can be reused in soaps and other products).

**Blending** Many companies produce blends of biodiesel and traditional diesel, although it is available commercially. Common blends are B20 (20% biodiesel), and B30 (30% biodiesel). All blends must meet American Society for Testing and Materials standards. Today, blends are affordable due to current prices like the Low-Carbon Fuel Standard (LCFS) and the Renewable Fuel Standard.

**Retail and distribution** Finally, biodiesel companies must distribute and sell their products. Some companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further. Other companies, like ProPur, sell their biodiesel blend directly to consumers as a cleaner alternative at fuel stations across the state.

The biodiesel fuel value chain

### Locations of biodiesel facilities in California

- **San Jose**
- **San Francisco-Bay area**
- **Los Angeles area**

Biodiesel fuel has the highest energy balance of any transportation fuel.

- It is a diverse biofuel because of the variety of feedstocks available.
- Can be used in any diesel vehicle without modification.
- Improves air quality by reducing emissions.
- Reduces waste in landfills and waterways by creating an additional market for used cooking oil.

For more information, please contact Emily Reyna, ereyna@edf.org.
Biodiesel is a renewable alternative to traditional diesel. It is made from feedstocks (raw materials) such as oils and recycled cooking grease, rather than fossil fuels. Biodiesel is commonly blended with traditional diesel, and recycled cooking grease, rather than fossil fuels.

Biodiesel is commonly blended with traditional diesel, but is also sold in its pure form. It has considerably fewer emissions than its traditional counterpart and because much of the feedstock used in California is from the state, it reduces dependence on foreign sources. Successful growth of the companies profiled here demonstrates that the industry is creating jobs in California and growing the economy. EDF profiled one company to represent each step of the value chain: research and development, feedstock, collection, production, blending, and retail and distribution.

**Biodiesel fuel value chain**

**Research and development**

Biodiesel companies that participate in Research and Development (R&D) work to identify new resources that can be used as feedstocks or new processes and technology breakthroughs that can accelerate the development and commercialization of cleaner diesel. These companies work to integrate science and engineering research to improve processing, conversion, storage, and product development and analysis.

**Feedstock**

Biodiesel feedstock is the raw material that makes the fuel. Typical feedstocks are plant oils like soybeans and canola, though lower-carbon footprint feedstocks like used cooking oil are also used by biodiesel producers. New feedstocks currently under investigation include algae and even sewage sludge. Abundant and steady sources of feedstock allow for biodiesel to be scaled economically.

**Collection**

Biodiesel companies partner with restaurants and food service companies that produce waste grease in order to have readily available feedstock to use in biodiesel production. Biodiesel companies often pick up grease that has been safely stored in drums, or pump the waste grease from the restaurants directly into a truck for transportation to the production facility.

**Processing**

Biodiesel is produced through a process called “transesterification.” In the process, glycerin (a colorless, odorless, syrupy liquid made from fats and oils) is separated from the fat or vegetable oil, leaving behind methyl esters (the scientific name for biodiesel) and glycerin (a byproduct that can be reused in soaps and other products).

**Production**

Many companies produce blends of biodiesel and traditional diesel, through transportation available commercially. Common blends are B10 (10% biodiesel), and B20 (20% biodiesel). All blends must meet American Society for Testing and Materials standards. Today, blends are affordable due to lower prices like the Low-Carbon Fuel Standard (LCFS) and the Renewable Fuel Standard (RFS).

**Retail and distribution**

Finally, biodiesel companies must distribute and sell their products. Some companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further. Other companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further. Other companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further. Other companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further. Other companies, like Imperial Western Products (IWP), deliver the product to business customers who then blend and distribute the product further.

**Biodiesel in California**

**Companies fueling positive change**

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<th>Locations of biodiesel facilities in California</th>
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<tbody>
<tr>
<td>San Jose</td>
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For more information, please contact Emily Reyna, ereyna@edf.org

Environmental Defense Fund (EDF) is an independent, non-profit organization working to solve the most pressing environment andEquity issues of our time. Founded in 1968, EDF brings together science, economics, law, and business to create innovative solutions to the world’s environmental problems. EDF is non-partisan and not associated with any political party.

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Since 1999, which will have 15 million gallons/year of capacity and will supply biodiesel and bioenergy at prices competitive with conventional fuel.

North Star Biofuels was formed as a joint venture between Bio Fuels and Agri Bio Fuel Co. LLC and has established its over 40,000 gallon/year production facility in Watsonville, California in June 2010. The company was founded by CEO Ian Levine and inventor Michael Doyle, PE, started biodiesel production in 2007 and currently produces about 600,000 gallons/year. North Star’s success stems from its proactive approach to biodiesel feedstock and started producing. Currently, Yokayo produces about 200,000 gallons/year. "California’s fuels policies support Yokayo’s commitment to sustainable production of biodiesel from waste grease and keeping sales local to provide San Francisco region benefit to the region." By 2012, Yokayo projects producing biodiesel again in 2011. The facility today runs entirely on used cooking oil, yellow grease, and not from treated animal feedstocks. Yokayo is made up of a variety of companies that make biodiesel, but they believe it’s in the near future. They are converting to biodiesel for the industry. Yokayo believes that California, especially given its LCFS, is at the forefront of this industry. Case study...
10 years ago, biodiesel wasn’t a significant part of statewide energy policy. LCFS can provide a competitive advantage.

Feedstock

North Star Biofuels, LLC

North Star Biofuels was formed as a joint venture between Plocher Biofuels and Agri Bio, Inc. and funded building its new 20 million gallon/year production facility in Watervale, California in June 2006. North Star Biofuels is a 100% corn oil producer. McCormick & Co., Inc. (LMC) and investing partner Michael Doyle, PE, joined North Star Biofuels’ founders. In 2007, the company purchased the Nelson Biofuels facility and started producing. Currently, Yokoyo produces about 30,000 gallons of biodiesel with plans to expand to 275,000 gallons in the very near future. Yokoyo is an exciting example of the biodiesel industry because it is completely vertically integrated and contains a “100-mile” dye — the entire process, from feedstock collection to production of a biodiesel-based fuel product, is all completed in Northern California. They only use refined vegetable oils from their local feedstock because they believe it is the most sustainable “ shorter feedstock” in the industry. As a fully licensed “miscible biodiesel blend” supplier, they have three tanks of biodiesel from their local feedstock. "With soybeans, they are very clear and consistent in the high quality and sustainability of the feedstock oil." The company using this feedstock needs a 250 mile radius, with most biodiesel is produced within a 15 mile radius. The company’s biodiesel production (million gallons)

"California’s fuel policies support the Company’s comprehensive strategy to produce biodiesel from waste grease and keep sales local to provide maximum economic benefit to the region. Business.

"12 years after this industry, I’m especially excited about how the drive is driving demand for sustainable fuels, allowing the biodiesel industry to thrive. An industry, invested in having a lasting impact.

"Propel relocated to California to benefit from policies like the LCF’s. California supports development and use of clean fuels into businesses and the environment."

Calandra Post Manager, Imperial Western Products

Yokoyo Biofuels is a company that its founder and CEO, Kumar Plocher admits was built back in January 2005. What if making a positive change was as easy as getting California’s LCFS program under your belt? McCoy’s Biodiesel is a unique fuel retailer whose goal is to make their customers feel good about their choices. They are dedicated to global California consumers a choice at the pump by making renewable fuels readily available at fueling stations across the state. McCoy currently has 38 stores that sell biodiesel and LCF fuel along with renewable fuels, with plans to expand operations. To accomplish this goal, Propel i mperial Western Products produces nearly 20 million gallons of a year in Watsonville. In 2001, it was produced in a groundbreaking demonstration project supported by the LCF. "Previously, biodiesel was a niche fuel with limited consumer demand. California has policies that have enabled a broad acceptance of biodiesel, largely through providing certainty and lower costs."

"Propel relocated to California to benefit from policies like the LCF’s. California supports development and use of clean fuels into businesses and the environment."

Marty Esplugas, Propel Fuels
California’s LCFS has had a huge impact on the biodiesel industry. Biodiesel now leads the renewable fuel market, reducing CO2 emissions and strengthening the economy.

Laura L. Law, PhD, North Star Biofuels, LLC

North Star Biofuels, LLC

North Star Biofuels was formed as a joint venture between Biofuels and Agri Ben Co., Ltd. and founded building its new 20 million gallon/year production facility in Watsonville, California in June 2008. The facility is now in full production, has a new, state-of-the-art biodiesel production facility. North Star Biofuels, LLC is also a member of the California Biodiesel Council, a non-profit organization founded in 2003 by industry stakeholders to advocate and promote biodiesel policies and programs.

Case Study: Collectors

Collectors are essential to the success of the biodiesel industry. They collect the feedstock from various sources: restaurants, food service operations, and other businesses.

Yokayo BioScience is a company that its founder and CEO, Kumar Pater, helped build and currently operates. The company started producing biodiesel in 2011 and is currently producing about 25,000 gallons per month.

California’s fuel policies support the company’s strategy to produce biodiesel and keep sales local to provide California’s consumers with a choice at the pump. Biodiesel in California is due to the California Low Carbon Fuel Standard (LCFS).

Yokayo BioScience operates a demonstration biodiesel processing facility at the Port of Redwood City using a method designed by Propulsion Energy, LP. This process allows for the production of biodiesel from used cooking oils and restaurant grease.

Biodiesel introduction fleet trials. In 2007, the California Energy Commission and the California Fueling Station Association (CFSAA) partnered with conventional fueling stations to allow for the demonstration of biodiesel blends. As a result, the biodiesel market in California has grown significantly.

This has been a huge success for the biodiesel industry in California. The LCFS is credited for the growth of the biodiesel industry in California, allowing for the expansion of the biodiesel sector of the company.

Imperial Western Products (IWP) produces nearly 6 million gallons a year. The company’s facility is located in Bakersfield, California, and is operated by Jim Koehler, the co-founder and CEO of the company. IWP is a leading producer of biodiesel in California, providing a variety of biodiesel blends to fuel providers.

Several times a year, biodiesel wasn’t a significant part of our biodiesel sector, but now, it’s a major player in the market. The biodiesel industry has grown significantly over the past decade, and we expect it to continue growing in the future. We are excited to see the growth of the biodiesel industry in California and look forward to continuing to support the growth of this important sector.

The Biodiesel Industry in California

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Biodiesel companies produce blends of biodiesel and traditional diesel. Most blends made available commercially. Common blends are B5 (5% biodiesel), B10 (10% biodiesel), and B20 (20% biodiesel). All blends must meet American Society for Testing and Materials standards. Today, blends are available throughout the state, it reduces dependence on foreign sources. Successful growth of the companies profiled demonstrates that the industry is creating jobs in California and growing the economy.

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The biodiesel fuel value chain

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