Government – Industry – Consumers

Clean Diesel Fuel Alliance

INFORMATION CENTER

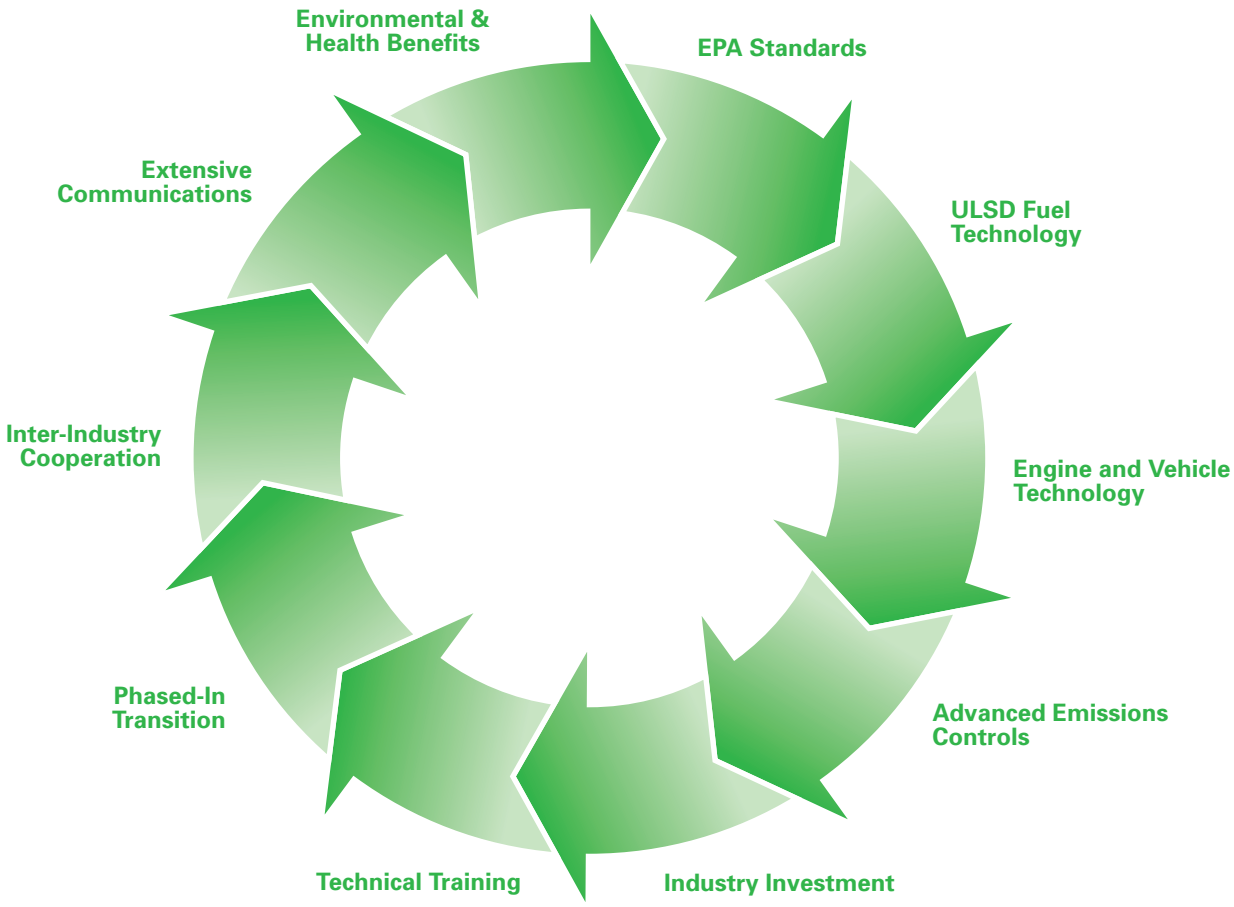
New Ultra Low Sulfur Diesel fuel and new engines and vehicles with advanced emissions control systems offer significant air quality improvement.

The U.S. Environmental Protection Agency (EPA) has issued new standards to improve air quality.

To meet EPA standards, the petroleum industry is producing Ultra Low Sulfur Diesel (ULSD) fuel, a cleaner-burning diesel fuel containing a maximum 15 parts-per-million (ppm) sulfur. By June 1, 2006, 80 percent of the highway diesel fuel produced or imported will be ULSD fuel, replacing most Low Sulfur Diesel fuel which contains up to a maximum of 500 ppm sulfur.

In combination with cleaner-burning diesel engines and vehicles, ULSD fuel will help to improve air quality by significantly reducing emissions.

ULSD fuel is designed to facilitate cleaner engine and vehicle technology.



Highway ULSD Fuel.

Diesel engines power vehicles and equipment for both highway and non-road uses. EPA requirements for highway fuel will be predominantly implemented by mid-2006.

- By June 1, 2006, refiners and importers nationwide must ensure that at least 80 percent of the volume of the highway diesel fuel they produce or import is ULSD-compliant.
- Diesel fuel classified as ULSD must reach distribution and marketing points downstream from refineries (i.e., pipelines, distributors, terminals and transporters) by September 1, 2006 (July 15, 2006 in California).
- ULSD fuel is expected to be available at many retail locations by October 15, 2006 (September 1, 2006 in California).
- Diesel fuel classified as Low Sulfur Diesel may still be sold at retail locations outside of California between October 15, 2006 and December 1, 2010.

Effective Dates for Highway ULSD Fuel.

Who	What	U.S.	California
Refiners & Importers	Import/produce at least 80% ULSD for on highway use	6/1/06	
	Import/produce **100%** ULSD for on highway use	6/1/10	6/1/06
Downstream from Refineries through Fuel Terminals	Facilities that choose to carry ULSD must meet 15 ppm sulfur specification	9/1/06	
	All highway diesel **must** be ULSD	10/1/10	7/15/06
Retail Outlets	Facilities that choose to carry ULSD must meet 15 ppm sulfur specification	10/15/06	
	All highway diesel **must** be ULSD	12/1/10	9/1/06

California is an early adopter of the new fuel and engine technologies. In California, 100 percent of the diesel fuel sold – downstream from refineries, up to and including fuel terminals that store diesel fuel – must be ULSD fuel by July 15, 2006. And, all diesel fuel offered for sale at retail outlets in California must be ULSD fuel by September 1, 2006.

Non-Road ULSD Fuel.

EPA fuel standards for locomotive, marine and non-road diesel fuel engines and equipment, such as farm or construction equipment, will become effective at dates later than those for highway vehicles (except in California):

- Diesel fuel intended for locomotive, marine and non-road engines and equipment must meet the Low Sulfur Diesel fuel maximum specification of 500 ppm sulfur in 2007.
- By June 2010, the ULSD fuel standard of 15 ppm sulfur will apply to non-road diesel fuel production.
- Beginning in 2012, locomotive and marine diesel fuel must meet the ULSD fuel standard of 15 ppm sulfur.

Non-Road Diesel Fuel Standards.

Who	Covered Fuel	2006	2007	2008	2009	2010	2011	2012	2013	2014
Large Refiners & Importers	Non-road	500+ ppm	500 ppm	500 ppm	500 ppm	15 ppm	15 ppm	15 ppm	15 ppm	15 ppm
Large Refiners & Importers	Locomotive & Marine	500+ ppm	500 ppm	500 ppm	500 ppm	500 ppm	500 ppm	15 ppm	15 ppm	15 ppm
Small Refiners and other exceptions	Non-road, Locomotive & Marine	500+ ppm	500+ ppm	500+ ppm	500+ ppm	500 ppm	500 ppm	500 ppm	500 ppm	15 ppm
Except in California, compliance dates for Non-Road, Locomotive and Marine fuels are: June 1 for refiners and importers, August 1 downstream from refineries through fuel terminals, October 1 for retail outlets, and December 1 for in-use.										
In California, all diesel fuel will transition in 2006. Compliance dates for Non-Road fuels are: June 1 for refiners and importers, July 15 downstream from refineries through fuel terminals, and September 1 for retail outlets. Locomotive and Marine diesel fuels must transition to 15 ppm ULSD by January 1, 2007.										

Supply, distribution and marketing.

The full transition to ULSD fuel is complex and involves coordination at many levels.

Although ULSD fuel will be the dominant highway diesel fuel produced, EPA does not require service stations and truck stops to sell ULSD fuel. Therefore, it is possible that ULSD fuel might not be available initially at every service station or truck stop and that a retailer may choose to sell Low Sulfur Diesel fuel instead of ULSD fuel. The industries involved in the transition are doing all they can to minimize potential inconveniences during the conversion to the new diesel fuel.

Federal regulations require the labeling of all diesel fuel pumps to specify the type of fuel dispensed by each pump (except in California where all diesel fuel must be ULSD by June 1, 2006). Similar instrument panel and fuel inlet/fill cap labeling is being mandated for 2007 and later model year engines and vehicles that require ULSD fuel. Consumers are advised to check the pump labels and vehicle labels to ensure they are refueling with the proper diesel fuel consistent with their vehicle warranties.

The new standards provide strong incentives for suppliers to provide the proper ULSD fuel formulation. Civil penalties of up to $32,500 per violation per day can be assessed for non-compliance with EPA's ULSD fuel standards, or for misrepresentation of the sulfur level of diesel fuel.

Vehicle performance.

Owners of 2007 and later model year diesel-powered highway vehicles must refuel only with ULSD fuel. Owners of 2006 and earlier model year diesel-powered engines and vehicles may use ULSD or Low Sulfur Diesel fuel during the transition period. Only ULSD fuel will be available for highway use starting on December 1, 2010.

Under typical operating conditions, there should be no noticeable impact on overall power using ULSD fuel. Fuel economy may be reduced slightly because the process that removes sulfur also can reduce the energy content of the fuel.

Engine and vehicle manufacturers expect ULSD fuel to be fully compatible with the existing fleet, including 2006 and earlier model year vehicles. In some instances, the introduction of ULSD fuel to older vehicles may affect fuel system components or loosen deposits in fuel tanks. As part of a good maintenance program, owners and operators of existing cars, trucks and buses are encouraged to monitor their diesel-powered vehicles closely for potential fuel system leaks or premature fuel filter plugging during the change-over to ULSD fuel.

Diesel-powered engines and vehicles for 2007 and later model year vehicles are designed to operate only with ULSD fuel. Improper fuel use will reduce the efficiency and durability of engines, permanently damage many advanced emissions control systems, reduce fuel economy, and possibly prevent the vehicles from running at all. Manufacturer warranties are likely to be voided by improper fuel use. Additionally, burning Low Sulfur Diesel fuel (instead of ULSD fuel) in 2007 and later model year diesel-powered cars, trucks and buses is illegal and punishable with civil penalties.

Additives, kerosene and biodiesel blends.

Like Low Sulfur Diesel fuel, ULSD fuel requires good lubricity and corrosion inhibitors to prevent unacceptable engine wear. As necessary, additives to increase lubricity and to inhibit corrosion will be added to ULSD fuel prior to its retail sale. With these additives, ULSD fuel is expected to perform as well as Low Sulfur Diesel fuel.

Only ultra low sulfur kerosene (No. 1 diesel with no more than 15 ppm sulfur) may be blended with ULSD fuel to improve cold weather performance. With so many kerosene formulations on the market, care must be taken to select kerosene with a maximum of 15 ppm sulfur. Blend rates will remain the same as with Low Sulfur Diesel fuel.

Most engine and vehicle manufacturers allow biodiesel blends in concentrations up to five percent provided those blends meet accepted (ASTM) fuel quality standards. (Biodiesel blends are mixtures of petroleum-based diesel fuels and fuels produced from soybean oil, waste cooking grease or other organic matter. These fuels may contain biodiesel in concentrations ranging from two percent to levels approaching 100 percent by volume.) To ensure proper quality, consumers should use only biodiesel-ULSD fuel blends that are properly mixed by a qualified biodiesel blender. Consumers should not create their own biodiesel blends by adding biodiesel to ULSD fuel in a vehicle's fuel tank.

There should be no operational problem if consumers switch from a biodiesel-ULSD fuel blend to ULSD fuel without biodiesel.

Fuel price.

ULSD fuel costs more to refine and distribute than Low Sulfur Diesel fuel. No one can predict with certainty the price of ULSD fuel at the pump. Many factors affect the consumer price of fuels, including the price of crude oil on the global market, geopolitical, weather, transportation and economic events, as well as supply and demand.

For more information on fuel prices, visit the Energy Information Administration web site at **www.eia.doe.gov**.

Environmental and health benefits.

ULSD fuel will enable the use of cleaner technology diesel engines and vehicles with advanced emissions control devices, resulting in significantly improved air quality.

Annual emission reductions will be equivalent to removing the pollution from more than 90 percent of today's trucks and buses, when the current heavy-duty vehicle fleet has been completely replaced in 2030.

EPA, the California Air Resources Board, engine manufacturers and others have completed tests and demonstration programs showing that using the advanced emissions control devices enabled by the use of ULSD fuel reduces emissions of hydrocarbons and oxides of nitrogen (precursors of ozone), as well as particulate matter to near-zero levels.

EPA studies conclude that ozone and particulate matter cause a range of health problems, including those related to breathing, with children and the elderly those most at risk. EPA estimates that there are significant health benefits associated with this program.

As an additional environmental benefit, ULSD fuel will enable diesel-powered passenger cars and light trucks to meet the same stringent emissions standards as gasoline-powered vehicles. Diesel-powered vehicles tend to be more fuel efficient than gasoline-powered vehicles.

For information on health and environmental benefits, visit **www.epa.gov/cleandiesel**.

An alliance of government, industry and consumers.

Many public and private organizations are collaborating through the Clean Diesel Fuel Alliance to facilitate the introduction of ULSD fuel. The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), engine, vehicle and component manufacturers, all sectors of the petroleum industry, and fuel consumers, such as truckers, are providing comprehensive information and technical coordination. For a complete list of participating organizations and for detailed technical and implementation information regarding ULSD fuel, visit **www.clean-diesel.org**.