



Biofuel Classroom Session

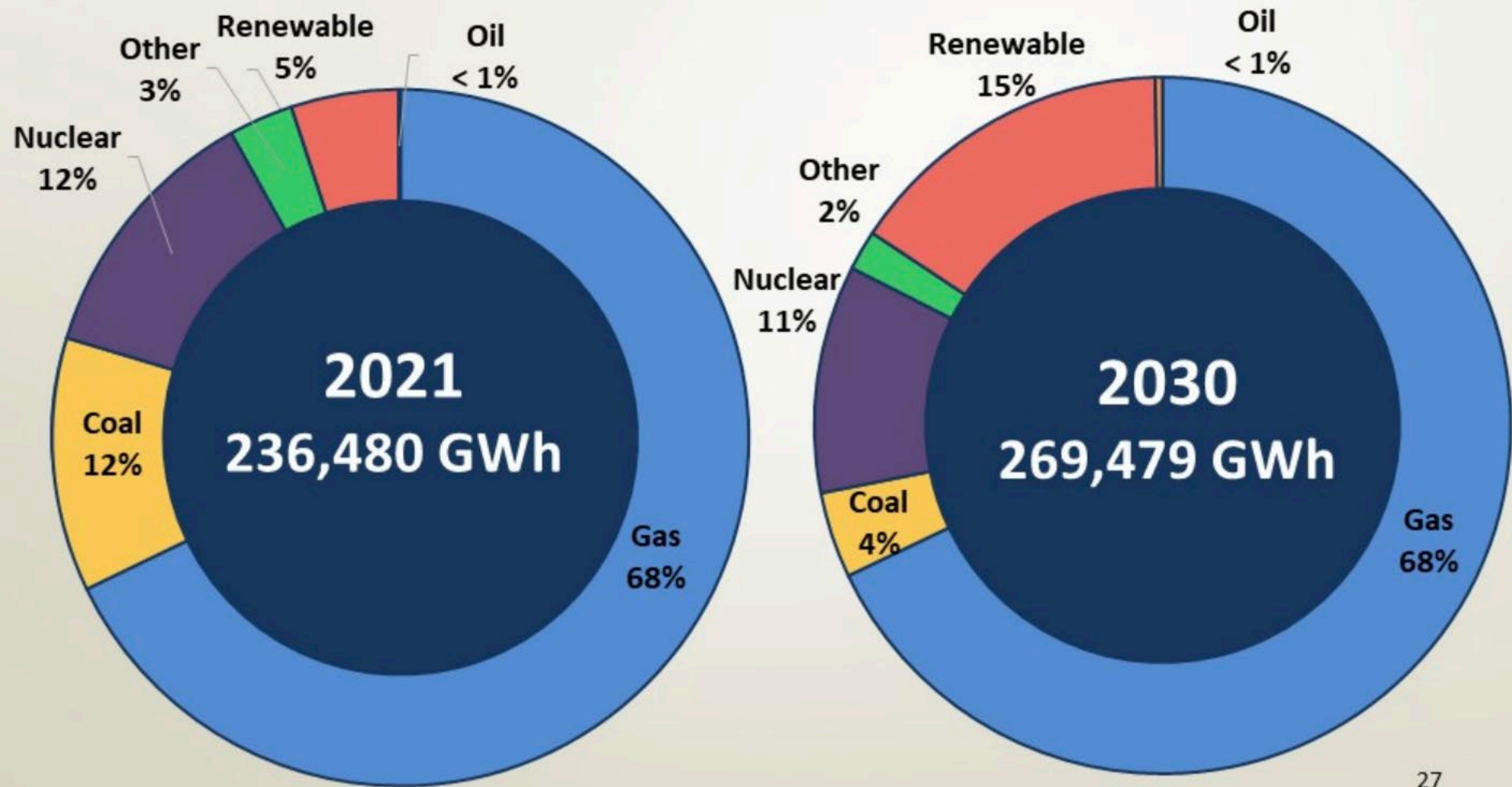
ENERGY IS AN ec·o·sys·tem

- a complex network or interconnected system.



Forecasted Fuel Mix¹

Net Energy for Load (GWh)



¹ As of 6/30/2022 capacity, demand, and energy data will include the integration of Gulf into FPL. The data presented for years 2022 through 2030 is for the single integrated system (FPL).





FIRST GENERATION

edible biomass



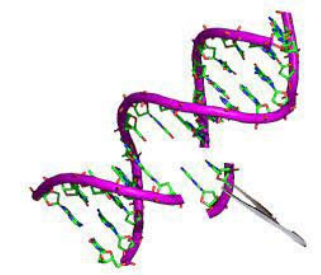
SECOND GENERATION

non-edible biomass



FOURTH GENERATION

breakthrough



THIRD GENERATION

algal biomass



Biofuel, Biodiesel, Ethanol, RD, SAF, HVO?

Biofuels are liquid fuels produced from renewable biological sources.

Diesel Alternatives:

Biodiesel is a **long-chain fatty acid esters** produced via esterification and transesterification reactions.

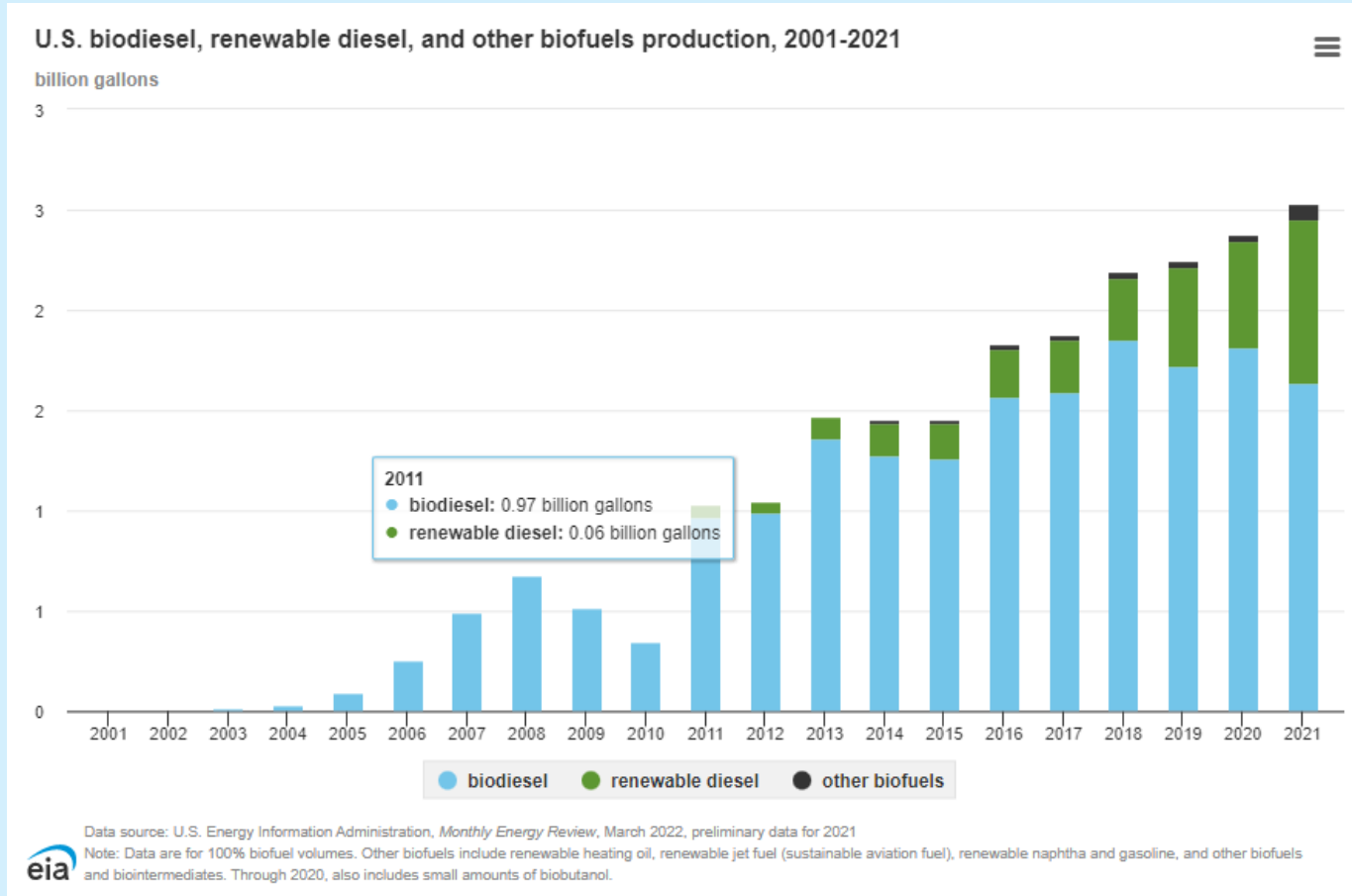
Renewable diesel is a **hydrocarbon** produced most often by hydrotreating.

Gasoline Alternatives:

Ethanol is an **alcohol** produced made by fermenting the sugar in the starches.



Biodiesel vs Renewable Diesel





- Can I blend it with diesel?
- Does it affect the vehicle performance?
- What about the Engine Warranty?
- Biodiesel prices are uncertain?

- Biodiesel Blends
 - B5 and lower blends – The Norm
 - B6 to B20 blends – The Usual
 - B99, B99.9 and B100 – The Visionary

FUEL SMARTS

Running on 100% Biodiesel? Yeah, That's Happening.

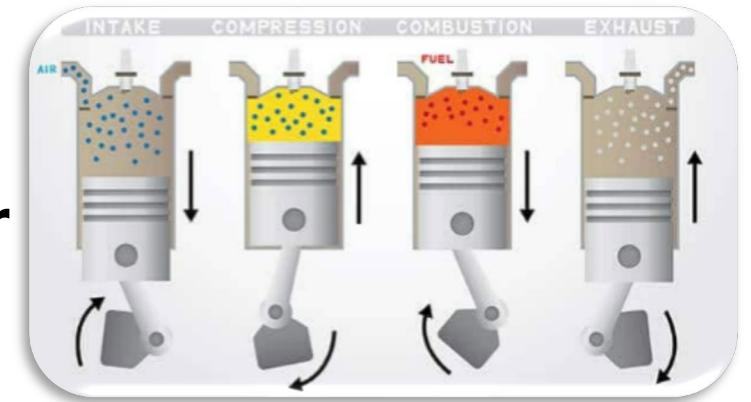
July 7, 2021 • By Dave Slade, Renewable Energy Group • 

o Vehicle Performance



Increased Lubricity

Higher Cetane Number



Generate less fumes

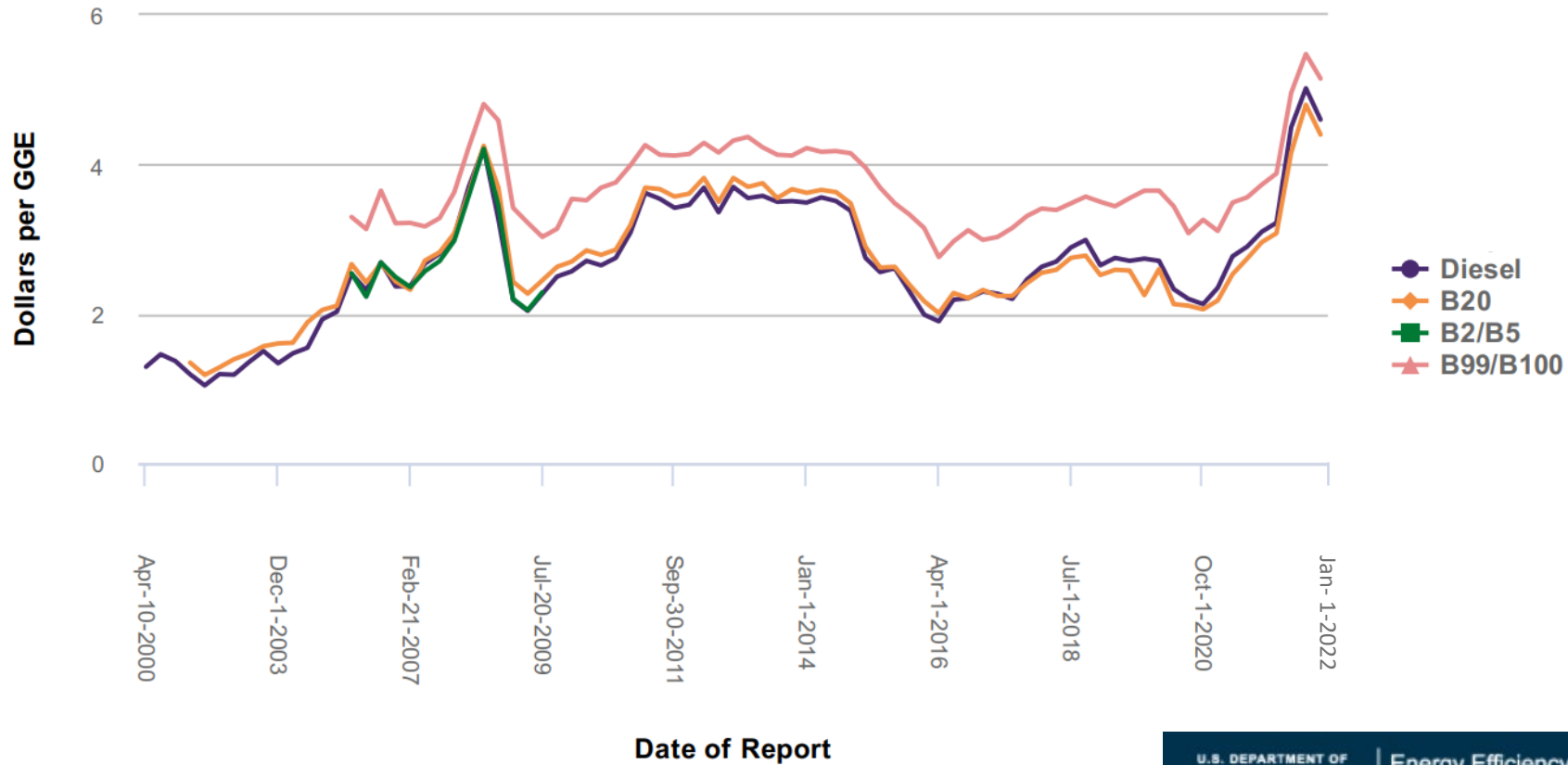
○ Engine Warranty

Engine companies do not produce or sell fuel, so they do not provide a warranty for fuel.

If a customer brings in a vehicle that has used biodiesel and the customer is told that the warranty is voided solely because the customer is using biodiesel, **this violates the Magnuson-Moss Warranty Act.**

o Biodiesel Prices

Average Retail Fuel Prices in the United States



National Average Price Between October 1 and October 15, 2022	
Fuel	Price
Biodiesel (B20)	\$4.89/gallon
Biodiesel (B99-B100)	\$5.25/gallon
Diesel	\$5.17/gallon

Source: [Alternative Fuel Price Report, October 2022](#) and [U.S. Energy Information Administration](#)

Last updated: January 2023
Printed on: January 25

o Biodiesel Prices

NEWS

How Much Diesel Is Left? Shortage Fears as East Coast Supplies 'Very Low'

BY **GIULIA CARBONARO** ON 11/16/22 AT 7:08 AM EST

YOUR MONEY

Hurricane season could threaten gas prices, expert says

Phillips 66 expects tight gasoline, diesel supplies in summer -executive

By Erwin Seba

○ Who is using it?

Portland is first in nation to phase out petroleum diesel, replace with biofuels

Updated: Dec. 12, 2022, 11:52 a.m. | Published: Dec. 07, 2022, 6:49 p.m.

Renewable Diesel & SAF: Project Roundup Report

Biodiesel Magazine's annual production map showed 34 renewable diesel/SAF plants under development, construction or operating in the U.S., as of September. The following includes updates regarding some of these projects.

By Anna Simet | December 13, 2022

DEC 13, 2022

Sulzer enables production of 3 billion litres of renewable fuel from waste

Sulzer has supplied flow technology solutions to convert an existing US West Coast refinery into one of the world's largest renewable biofuels plants.

The pumps will support a number of critical applications to convert waste oils and fats into renewable fuels with a lower carbon cost. Once complete, the new facility is expected to produce 3 billion litres of renewable fuels per year.

The conversion will slash greenhouse gas emissions from the plant and help our customer and California to achieve their low-carbon targets.



Government Business Fuel Noël Fletcher | Staff Reporter
October 6, 2022 10:43 AM, EDT

Biodiesel Fuel Gets Latest Push in Missouri

Shell acquires waste oil recycling company EcoOils

By Shell Eastern Petroleum | November 01, 2022

THANK YOU

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