



Florida Power & Light Biodiesel Program

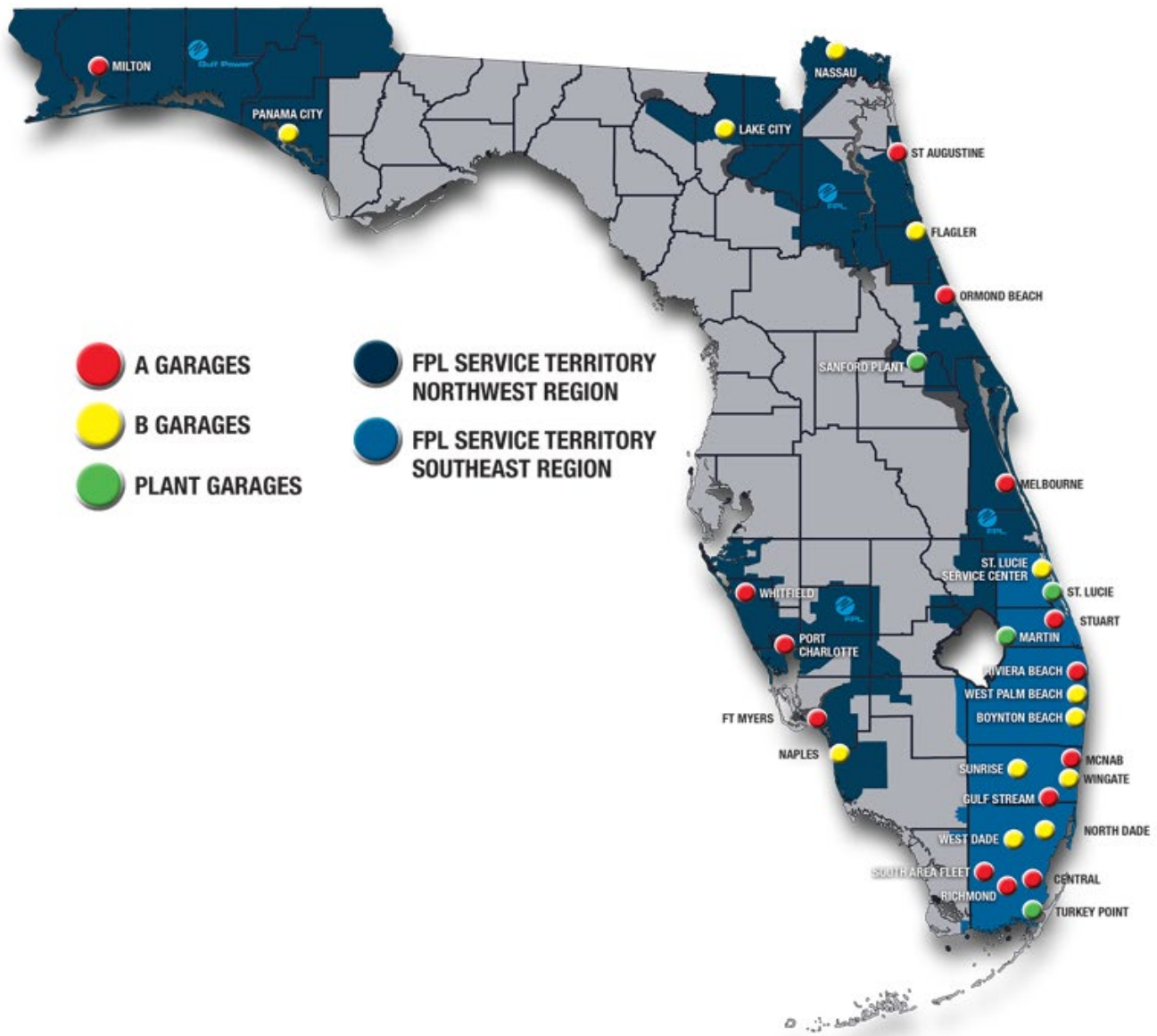
Patti Earley, CAFM

Fleet Fuel Operations Manager

February 28, 2023

NextEra Energy/Florida Power and Light

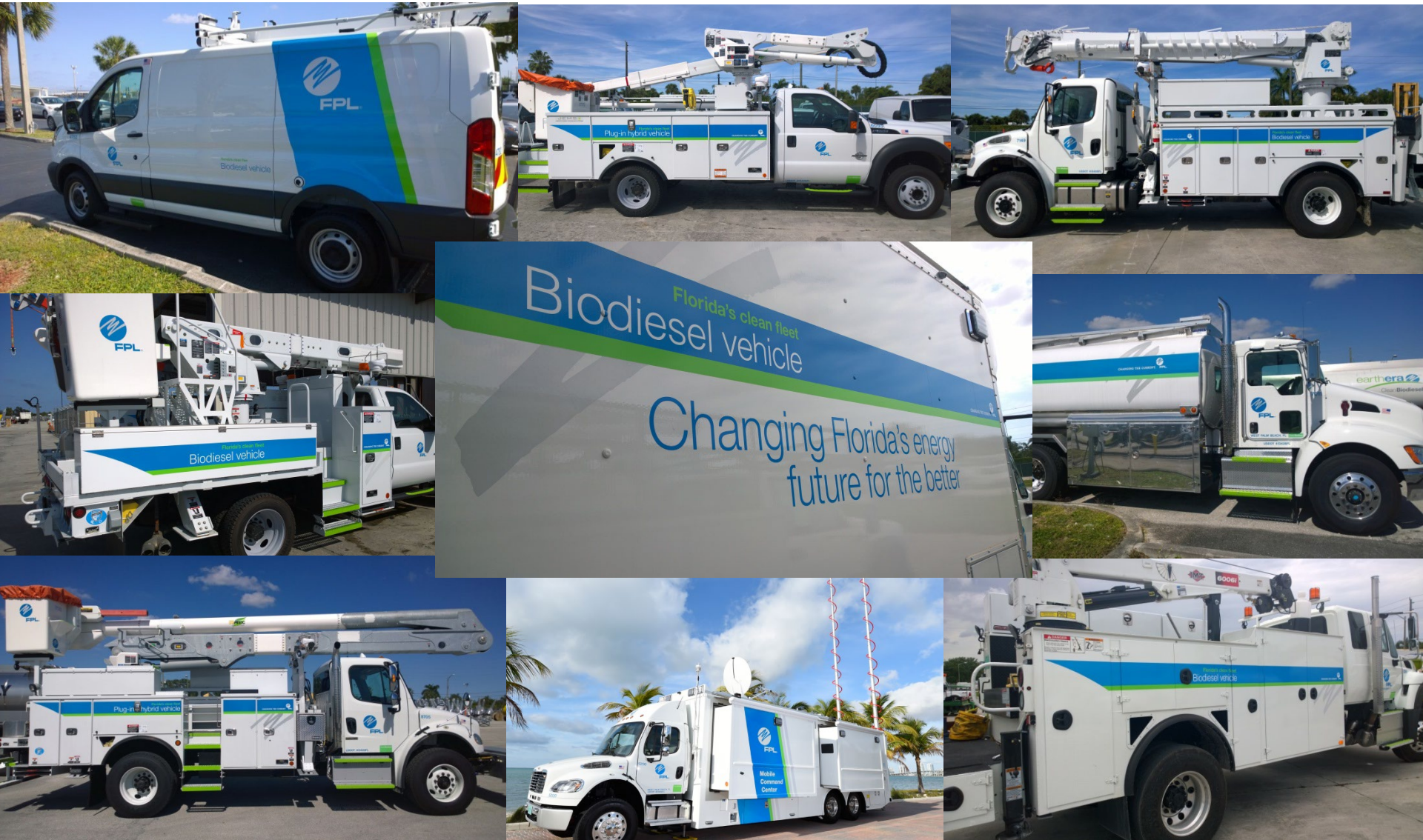
- **NextEra Energy (NEE) is the world's largest generator of renewable energy from the wind and sun**
- **NEE has one of the lowest emissions profiles of any utility in North America¹**
- **NEE has operations in 48 states and Canada**
- **Florida Power & Light (FPL) serves 5.6 Million Customer accounts in the State of Florida - ~ 11 MM people**
- **FPL's Service Territory is ~35,000 Square Miles**
- **6,200 Vehicle Fleet**



Original Biofuel Use



Today's Biofuel Use

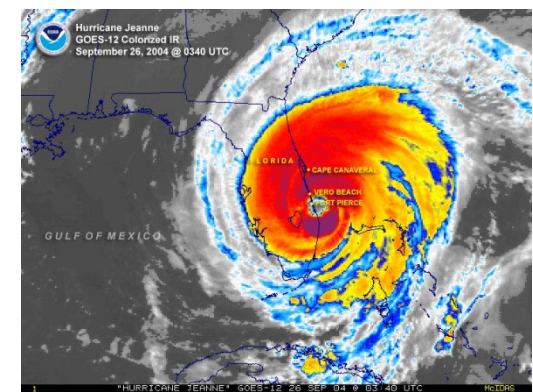
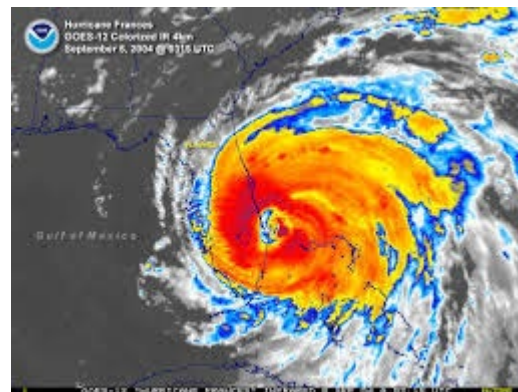
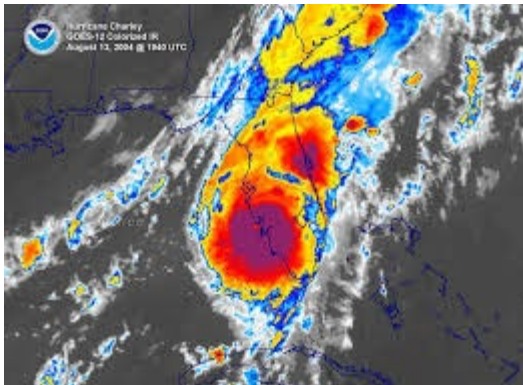


FPL Program History

- **A 6-month B20 pilot program was initiated in 1999**
 - Initially at only limited fueling locations
 - Vehicle inspections and fuel sampling encouraged broader adoption
- **Increased use to 200,000 gallons B20 per year through 2003**
 - No appreciable change in fuel economy, engine wear, or maintenance parameters
 - Transparent to driver (the end user)
- **Since 2003, ~2.5 million gallons B20 consumed annually**
 - Continued satisfactory maintenance, performance, and mileage results
- **2004 storms changed the way we handled fuel...**

Business Strategy Changed in 2004...

- 3 Major hurricanes hit Florida
- “Majors” allocate fuel to customers
- Port closures prior to landfall
- Pre-storm activities by retail consumers strain distribution network.
- No fuel availability for 3-4 days
- FEMA can take control of assets



Added Fuel Storage

- Gave FPL ability to maintain constant, reliable fuel supply
- Ability to blend biodiesel
- Price advantage of bulk fuel purchases
- Much tighter control over fuel quality



FPL Specification

		Sample Type	Submitted	
		Sample Number	062-1603592-01-004	
Method	Test	Result	ASTM Limits	FPL Limits
ASTM D2500	Cloud Point , ° C / ° F	-2 / 28		8°C Max.
ASTM D6584	Free Glycerin , % Mass	0.011	0.020 Max.	
	Total Glycerin , % Mass	0.021	0.240 Max.	0.150 Max.
	Monoglyceride Content , % Mass	0.029		
	Diglyceride Content , % Mass	<0.092		
	Triglyceride Content , % Mass	0.009		
ASTM D2709	Water and Sediment , % V/V	<0.01	0.050 Max.	0.035 Max.
ASTM D6304 Proc. A	Water Content , % Mass / ppm (mg/kg)	0.0369 / 369	Report	350 Max.
ASTM D664	Total Acid Number , mg KOH/g	0.26	0.50 Max.	0.35 Max.
ASTM D4052	API Gravity @ 60°F	28.5		
	Density at 15°C , kg/m ³	883.9		
EN 14538	Calcium , ppm (mg/kg)	<1		
	Magnesium , ppm (mg/kg)	<1		
	Ca+Mg , ppm (mg/kg)	<2	5 Max.	
	Sodium , ppm (mg/kg)	<1		
	Potassium , ppm (mg/kg)	<1		
	Na + K , ppm (mg/kg)	<2	5 Max.	
ASTM D4951	Phosphorus , % Mass	<0.001	0.001 Max.	
ASTM D874	Sulfated Ash , % Mass	<0.005	0.02 Max.	
ASTM D7501	Sample Volume , mL	300	300 Min.	300 Min.
	Filtration Time , sec	106	360 Max.	150 Max.
	Heat Treated	Yes		
EN 14112	Oxidation Stability , h	9.6	3 Min.	4 Min.
ASTM D93 Proc. C	Flash Point , ° C / ° F	>194.5 / >382	93°C Min.	

Biodiesel Fuel Specifications: It's all about Quality Control

- **Most or all problems associated with biodiesel use are due to fuel quality issues, not to the biodiesel per se**
- **Quality control problems largely a result of a rapidly growing industry, inexperience and lack of diligence.**
- **Fleet managers can set up their own Quality Assurance programs and set requirements for their fuel vendors to do the same...from driver training to fuel testing**
- **Older tanks or tanks accidentally contaminated with infected, deteriorated diesel fuel can infect biodiesel**



FPL Program Quality Control Strategies

- **Purchase only from BQ-9000 certified producers**
 - Require COA before fuel is shipped
- **Require specifications that meet or exceed all ASTM D6751 requirements**
 - Additives mixed at point of production to ensure consistent and continued quality of stored inventory
- **Anti-oxidants, biocides, and cetane additives ensure long shelf-life and performance**
 - In addition to producer Certificate of Analysis, product acceptance procedures require point-of-shipment and point-of-receipt sampling and analysis
- **Regular mixing and sampling of fuel inventory to ensure consistent product**



FPL Program Results

- **300+ million miles driven**
 - No biodiesel related issues
 - Higher blends
- **500,000 Gallons+ (B100/B99) purchased annually for Fleet use and sales**
- **Transparent to driver – end user**
- **220,000 gallons dispensed nightly after Irma without fuel related issues**
- **Used after Super Storm Sandy and recently for Hurricanes Ian and Nicole.**
- **In 2022, FPL reduced CO₂ output by over 4,800 tons just through the use of biodiesel**



Questions?