FLEET OWNER PERSPECTIVE ON EFFORTS TO REDUCE DIESEL EMISSIONS

Keith Wilson
TITAN Freight Systems

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Regional Time-Sensitive LTL Overnight Carrier

Founded in 1968 – Corporate office in Portland, Oregon

84 staff members / 50 drivers / 44 trucks / 124 trailers

7 service centers located throughout Oregon, Washington and Idaho

$8 million annual revenue

24-hour operation

Innovation focused

Equipment & Duty Cycle

- Medium & Heavy-Duty Class 6, 7 & 8 Vehicles

- Duty cycle = 15 years or 800,000 miles, whichever comes first
  - *Light and medium repair focus*
  - *Equipment salvaged before major repair or engine replacement required*

- Exceeding HB 2007
  - *6 units 2005 to 2007 scheduled for replacement*
  - *After which all units will be 2012 or newer*

Vision 2020 - Energy – Scorecard

Energy 20 / 20 Vision

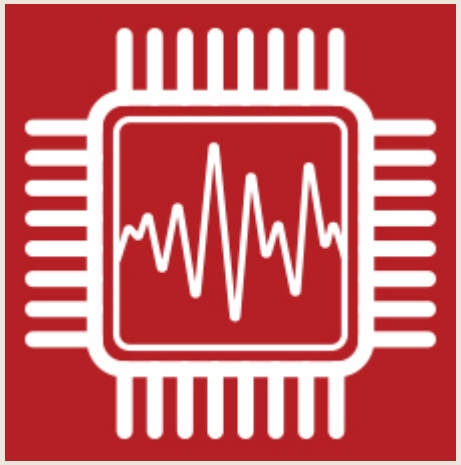
- Cut energy use 20% by 2020
- Environmental care as a core value
- We know that even small efforts make a big difference in the struggle for a healthy planet
- As we strive for continued environmental stewardship, we urge our team, customers and business partners to join our efforts

										Q1
Fleet MPG	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Baseline MPG	6.50									
Goal MPG	6.50	6.50	6.50	6.60	6.80	7.00	7.20	7.60	7.80	7.80
Goal Target Reduction		0%	0%	0%	-5%	-8%	-11%	-17%	-20%	-20%
Actual MPG		6.40	6.36	6.61	6.71	6.93	7.12	7.20	7.26	7.07
Actual Target Reduction		2%	2%	-2%	-3%	-7%	-10%	-11%	-12%	-9%

Missing MPG Target Despite Every Available Add-On

- Air Deflectors

- Artificial Intelligence



- Engine Idle Shutoff

- Trailer Side Skirts

- Aero Wheel Covers

- Aero Mud Flaps

- Low Rolling Resistant Tires

Unlearn MPG - Focus On Reducing Emissions

Diesel Application Energy Options	**ASTM** (American Society for Testing and Standards)	**Carbon Intensity** [g CO2e / MJ]	**CI Reduction vs. Petroleum Diesel**
Petroleum Diesel (B5)	D975	99.48	---
Compressed Natural Gas	WK40094	79.93	20%
Biodiesel (UCO & Feedstock)(OR-WA)	D6751	58.25	42%
Renewable Diesel (UCO & Feedstock)	D975	33.45	67%
Electricity		31.85	68%

- City of Knoxville - http://www.tncleanfuels.org/docs/Renewable-Diesel-Report_City-of-Knoxville_6-15-17.pdf
- City of Oakland - https://www.youtube.com/watch?v=9IkiBCRJtNo
- City of Eugene - https://eventsimages.bobitstudios.com/upload/pdfs/gfx/2017/speaker-presentations/renewable_diesel_-_facts_from_fleet_users_-_richard_battersby_and_gary_lentsch.pdf
- Oregon Department of Energy – Rick Wallace http://gtsummitexpo.socialenterprises.net/assets/docs/past-events/GTSE-tacoma-2016/april-5/gtse-tacoma-2016-GTSE-Session-1B-Rick-Wallace-ODOE-Calculating-Your-GHG-Emissions-April-5th.pdf

Replaced Petroleum with 100% Renewable Diesel

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- Renewable Diesel requires no vehicle or infrastructure modifications and may be mixed directly with ULSD
- Missing target not because of equipment we were using but the energy source
- Largest Oregon private carrier using Renewable Renewable

Energy 20 / 20 Vision

Cut emissions 20% by 2020

		Q1	Q2 RD
Fleet MPG	**2011**	**2020**	**2020**
Baseline MPG	**6.50**		
Goal MPG	6.50	7.80	7.80
Goal Target Reduction		-20%	-20%
Actual MPG		7.07	7.22
Actual Target Reduction		-9%	-11%
ULSD - B5			
Carbon Intensity		99.48	99.48
Gallons Used		66140	28637
Renewable Diesel			
Carbon Intensity		33.45	33.45
Gallons Used		0	34352
Emissions Reductions			**-36%**
MTCO2		661	**402**
100 Gallons = 1 MTCO2			

Results –

- 36% emissions reductions for entire fleet (OR, WA, ID)
- Oregon emissions were circa 67% lower

RD VS B5 Cost Per Mile (CPM) Case Study

Fuel Cost Study		Q2 2020	
B5 Avg	Per Gallon	$1.597	
R99	Per Gallon	$1.695	
Renewable Diesel Cost Increase		$0.0980	
MPG Q2 2020		7.22	
RD Per Gallon CPM Increase			$0.014
Fuel Economy +/-			
Q1 2020	B5	7.07	
Q2 2020	B5 & RD	7.22	
Fuel Economy Increase		2.1%	
Per Gallon Cost Reduction		$0.036	
RD Fuel Economy CPM Improvement			-$0.003
Exhaust System Maintenance Cost Study			
2018 to Q1 2020 CPM - B5		$0.022	
Q2 2020 - RD		$0.013	
RD Exhaust System Maint CPM Improvement			-$0.009
RD TOTAL COST INCREASE			**$0.002**

Results –

- Near ZERO cost difference
- Additional cost reductions
  - *DEF reductions*
  - *Equipment down time reduced*
  - *Oil change interval extended*
    - 30% less soot
- Performance
  - *Cetane*
    - RD 80
    - B5 50


ON ROAD DIESEL
GASBOY
COMBUSTIBLE
NO SMOKING
STOP YOUR MOTOR
RENEWABLE
ULTRA-LOW SULFUR
HIGHWAY DIESEL FUEL
15ppm Sulfur Max
Required for use in all model year 2007 and later highway diesel vehicles and engines.
Recommended for use in all diesel vehicles and engines.
R99
MEETS DIESEL
ASTM D975


FedEx
DIESEL
ONLY


Dirty DPF
Clean DPF