NC STATE UNIVERSITY

SUSTAINABLE FLEET TECHNOLOGY

VIRTUAL CONFERENCE 2020

Session #15: Idle Reduction an Easy Win

December 02, 2020

NC CLEAN ENERGY TECHNOLOGY CENTER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

SUSTAINABLE FLEET TECHNOLOGY

VIRTUAL CONFERENCE 2020

https://www.sustainablefleetexpo.com/

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VIRTUAL CONFERENCE 2020

Next Series Dates & Topics:

December 09: The Green Garage Winners

December 16: Change Management to Rmove Resistance & Roadblocks

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Format

- Q&A at the end
- Submit questions and comments to “Panelists”
- Scheduled for 2:00p-3:30p
- Handout
- Recording

Rick Sapienza
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Phone: 919-515-2788

- **Clean Transportation Program Director NC Clean Energy Technology Center at NC State University**
- **8 years with NC State**
- **30+ years experience including General Motors, Draper Lab and Great Lakes Pulp & Fibre in both engineering and business management roles**

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Idle Reduction and Easy Wing
December 02, 2020

2:00-2:05 **Rick Sapienza, NCCETC-**-Introduction and Welcome
2:05-2:20 **Patricia Weikersheimer, Argonne National Lab-**-Idle Reduction Overview & Strategies
2:20-2:24 **Neeraj Chirmulay, Viatec-**-SmartPTO Idle Reduction Technology
2:24-2:28 **Eric Neumann, Town of Apex NC-**-Viatec Application Story
2:28-2:38 **John Ferguson, City of Durham NC-**-City of Durham Idle Reduction Strategies/Deployments
2:38-2:46 **Mike MacComiskey, Advantage Asset Tracking-**-Using Telematics in Idle Reduction
2:46-2:54 **Charlie Mahoney, Derive Systems-**-Derive Efficiency for Idle Reduction & Fuel Savings
2:54-3:02 **Yake Klat, IdelAir/eNow**--TRU Application Case Study
3:02-3:12 **Keith Kerman, NYC DCAS**--NYC Idle Reduction Strategies/Deployments
3:12-3:30 Q&A

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Patricia Weikershimer
PWeikersheimer@anl.gov
630-252-3124

- Communications writer and editor for Argonne National Laboratory
- Area of expertise is idling and idle reduction technologies
- Researched and wrote *National Idling Reduction Network News*, a monthly newsletter of the Department of Energy's Vehicle Technologies Office (2009-2017)
- Key member of the team that developed Clean Cities IdleBox

2020 SUSTAINABLE FLEET TECHNOLOGY VIRTUAL CONFERENCE

IDLE REDUCTION BASICS AND AN INTRODUCTION TO IDLEBOX

PATRICIA WEIKERSHEIMER
Argonne National Laboratory
pweikersheimer@anl.gov

December 2, 2020

ARGONNE SUPPORTS THE U.S. DOE CLEAN CITIES PROGRAM

Argonne National Laboratory supports the U.S. Department of Energy's Clean Cities program with

- Technical expertise
- Analysis and case studies
- Development of data-based tools (e.g., life-cycle analysis)
- Training and outreach
- Workforce development

to help Clean Cities coordinators— and stakeholders—make sense of the wide array of potential fleet solutions.

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SO, WHAT'S THE BIG DEAL ABOUT IDLING?

- **Individually: Idling slashes fuel efficiency—idling vehicles consume from 0.2 to 1+ gallons of fuel per hour.**
- **Nationally: Idling in the U.S. consumes more than 6 *billion* gallons of fuel at a cost of $15+ billion each year.**

SO, WHAT'S THE BIG DEAL ABOUT IDLING? *CONT.*

- Each gallon of fuel burned produces about 20 pounds of CO_2
- Idling vehicles emit and contribute to the formation of pollutants that degrade air quality
- Idling not only wastes fuel, but idling may count as "engine hours"—more idling means more-frequent maintenance
  - Higher annual costs = higher cost of ownership

IDLING MYTHS

- *“Doesn’t restarting my engine use more fuel than idling?”*
- *“Isn’t idling good for my engine?”*

WHY DO DRIVERS IDLE?

- **Habit**
- **Need for stationary power**

Some vehicles need power while stopped for:

- Climate control
- Communications
- Emergency lights
- Hotel load (for long-haul truck drivers hoteling in their sleeper bunks during rest periods)
- Performing nonpropulsion work (e.g., diggers, bucket trucks)

TECHNICAL SOLUTIONS TO REDUCE OR ELIMINATE IDLING

Solutions depend on the needs of the stationary vehicle

- **Idle timer/limiter**
- **Automatic engine shut-down/start-up system**
- **Auxiliary power units (APUs)**
  - Fuel- or battery-powered
- **Heaters and air conditioners**
- **Electrification/hybridization**
  - Powertrain
  - Power take-off (PTO)
  - Wayside power (also called “shore power” or electrified parking spaces)
- **Telematics**

Auxiliary battery in a police cruiser (Courtesy of ZeroRPM).

WHAT IS IDLEBOX?

IdleBox is an **electronic, modular toolkit** to help you advance the acknowledged low-hanging fruit of fuel economy—**idling reduction**.

STOP Idling.
START $aving.

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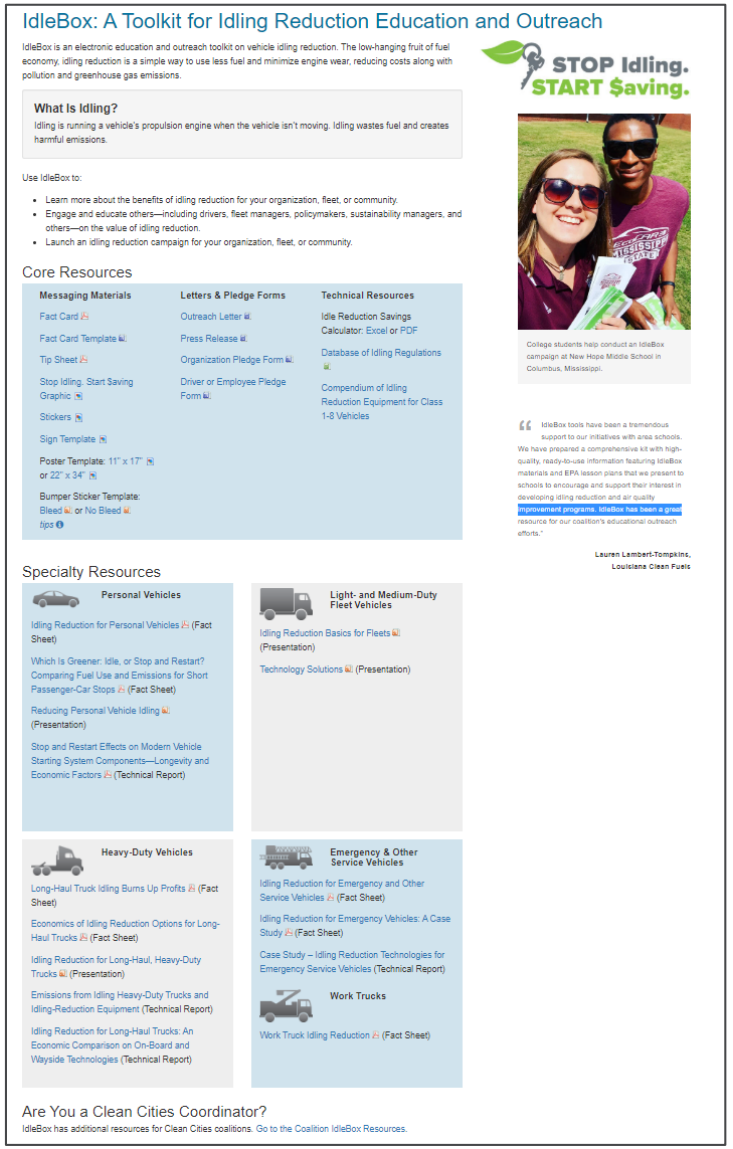
IDLEBOX HOME PAGE

Core Resources →

Specialty Resources →

cleancities.energy.gov/idlebox



IDLEBOX: CORE RESOURCES

Core Resources

Messaging Materials

- Fact Card
- Fact Card Template
- Tip Sheet
- Stop Idling. Start $aving Graphic
- Stickers
- Sign Template
- Poster Template: 11" x 17" or 22" x 34"
- Bumper Sticker Template: Bleed or No Bleed

tips

Letters & Pledge Forms

- Outreach Letter
- Press Release
- Organization Pledge Form
- Driver or Employee Pledge Form

Technical Resources

- Idle Reduction Savings Calculator: Excel or PDF
- Database of Idling Regulations
- Compendium of Idling Reduction Equipment for Class 1-8 Vehicles

BASIC MESSAGING PRODUCTS

- Sticker
- Fact card
- Tip sheet
- Poster
- Sign

Sticker ▲

Fact card ▲

Tip sheet ▲

▲ Sign with space for logo

▲ Poster

▲ Modifiable poster

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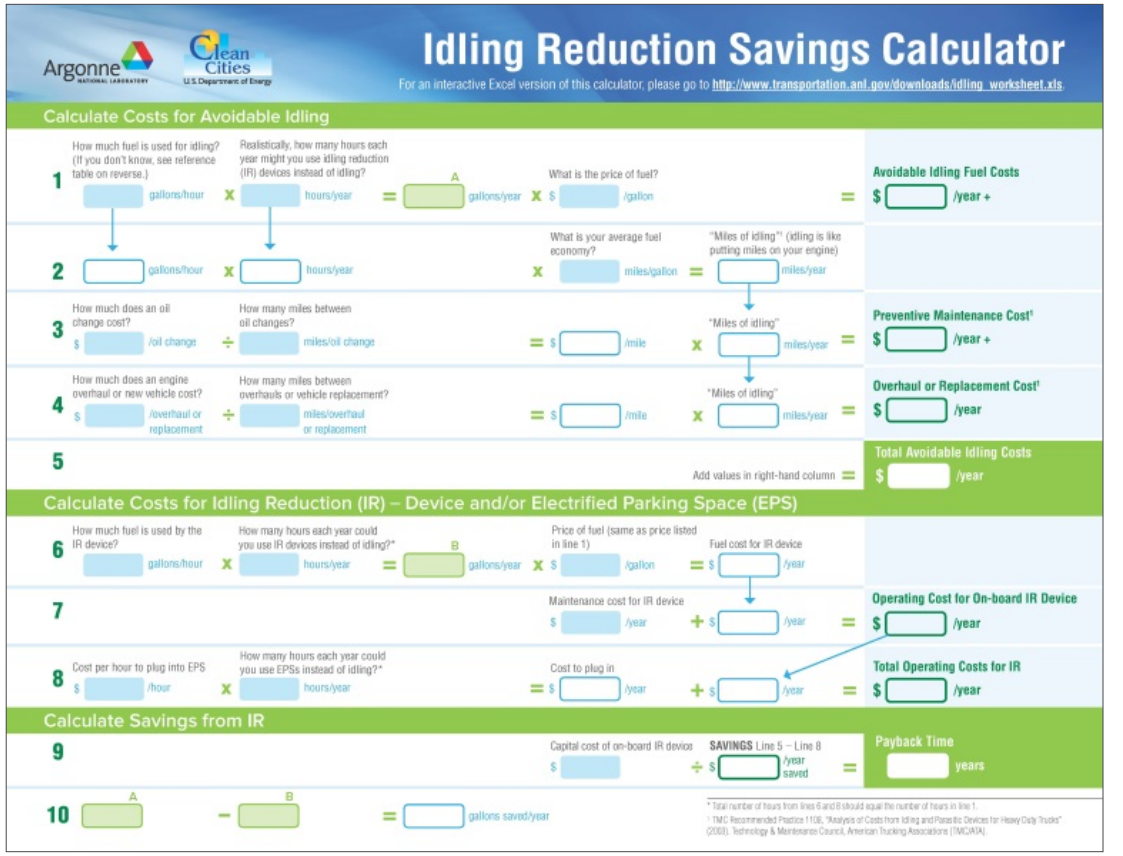
IDLING REDUCTION SAVINGS CALCULATOR

The **Idling Reduction Savings Calculator** helps fleet managers and others estimate how much they can save with idling reduction.



www.anl.gov/es/reference/vehicle-idle-reduction-savings-worksheet-pdf
www.anl.gov/es/reference/vehicle-idle-reduction-savings-worksheet-excel

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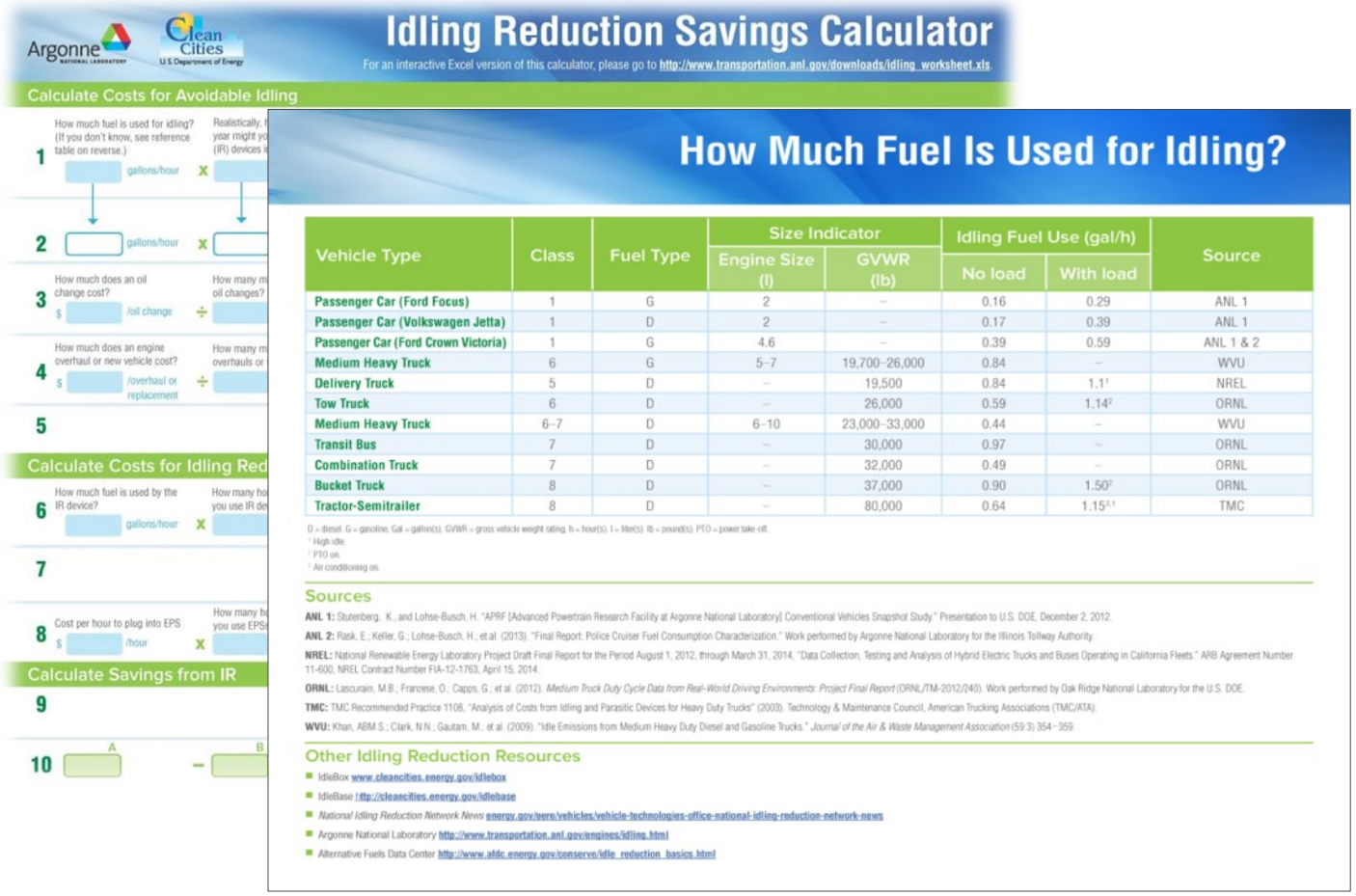
IDLING REDUCTION SAVINGS CALCULATOR



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Clean Cities U.S. Department of Energy

Idling Reduction Savings Calculator

For an interactive Excel version of this calculator, please go to http://www.transportation.anl.gov/downloads/idling_worksheet.xls.

Calculate Costs for Avoidable Idling

1 How much fuel is used for idling? (If you don't know, see reference table on reverse.) ____ gallons/hour x ____

2 ____ gallons/hour x ____

3 How much does an oil change cost? $ ____ /oil change ÷ How many oil changes?

4 How much does an engine overhaul or new vehicle cost? $ ____ /overhaul or replacement ÷ How many overhauls or

5

Calculate Costs for Idling Red

6 How much fuel is used by the IR device? ____ gallons/hour x How many ho you use IR de

7

8 Cost per hour to plug into EPS $ ____ /hour x How many h you use EPS

Calculate Savings from IR

9

10 A ____ – B ____

How Much Fuel Is Used for Idling?

Vehicle Type	Class	Fuel Type	Size Indicator		Idling Fuel Use (gal/h)		Source
			Engine Size (l)	GVWR (lb)	No load	With load	
Passenger Car (Ford Focus)	1	G	2	–	0.16	0.29	ANL 1
Passenger Car (Volkswagen Jetta)	1	D	2	–	0.17	0.39	ANL 1
Passenger Car (Ford Crown Victoria)	1	G	4.6	–	0.39	0.59	ANL 1 & 2
Medium Heavy Truck	6	G	5–7	19,700–26,000	0.84	–	WVU
Delivery Truck	5	D	–	19,500	0.84	1.1[1]	NREL
Tow Truck	6	D	–	26,000	0.59	1.14[2]	ORNL
Medium Heavy Truck	6–7	D	6–10	23,000–33,000	0.44	–	WVU
Transit Bus	7	D	–	30,000	0.97	–	ORNL
Combination Truck	7	D	–	32,000	0.49	–	ORNL
Bucket Truck	8	D	–	37,000	0.90	1.50[3]	ORNL
Tractor-Semitrailer	8	D	–	80,000	0.64	1.15[3,1]	TMC

D = diesel, G = gasoline, Gal = gallon(s), GVWR = gross vehicle weight rating, h = hour(s), l = liter(s), lb = pound(s), PTO = power take-off.
[1] High idle.
[2] PTO on.
[3] Air conditioning on.

Sources

ANL 1: Stutenberg, K., and Lohse-Busch, H. "APRF [Advanced Powertrain Research Facility at Argonne National Laboratory] Conventional Vehicles Snapshot Study." Presentation to U.S. DOE, December 2, 2012.

ANL 2: Rask, E.; Keller, G.; Lohse-Busch, H.; et al. (2013). "Final Report: Police Cruiser Fuel Consumption Characterization." Work performed by Argonne National Laboratory for the Illinois Tollway Authority.

NREL: National Renewable Energy Laboratory Project Draft Final Report for the Period August 1, 2012, through March 31, 2014, "Data Collection, Testing and Analysis of Hybrid Electric Trucks and Buses Operating in California Fleets." ARB Agreement Number 11-600, NREL Contract Number FIA-12-1763, April 15, 2014.

ORNL: Lascurain, M.B.; Franzese, O.; Capps, G.; et al. (2012). *Medium Truck Duty Cycle Data from Real-World Driving Environments: Project Final Report* (ORNL/TM-2012/240). Work performed by Oak Ridge National Laboratory for the U.S. DOE.

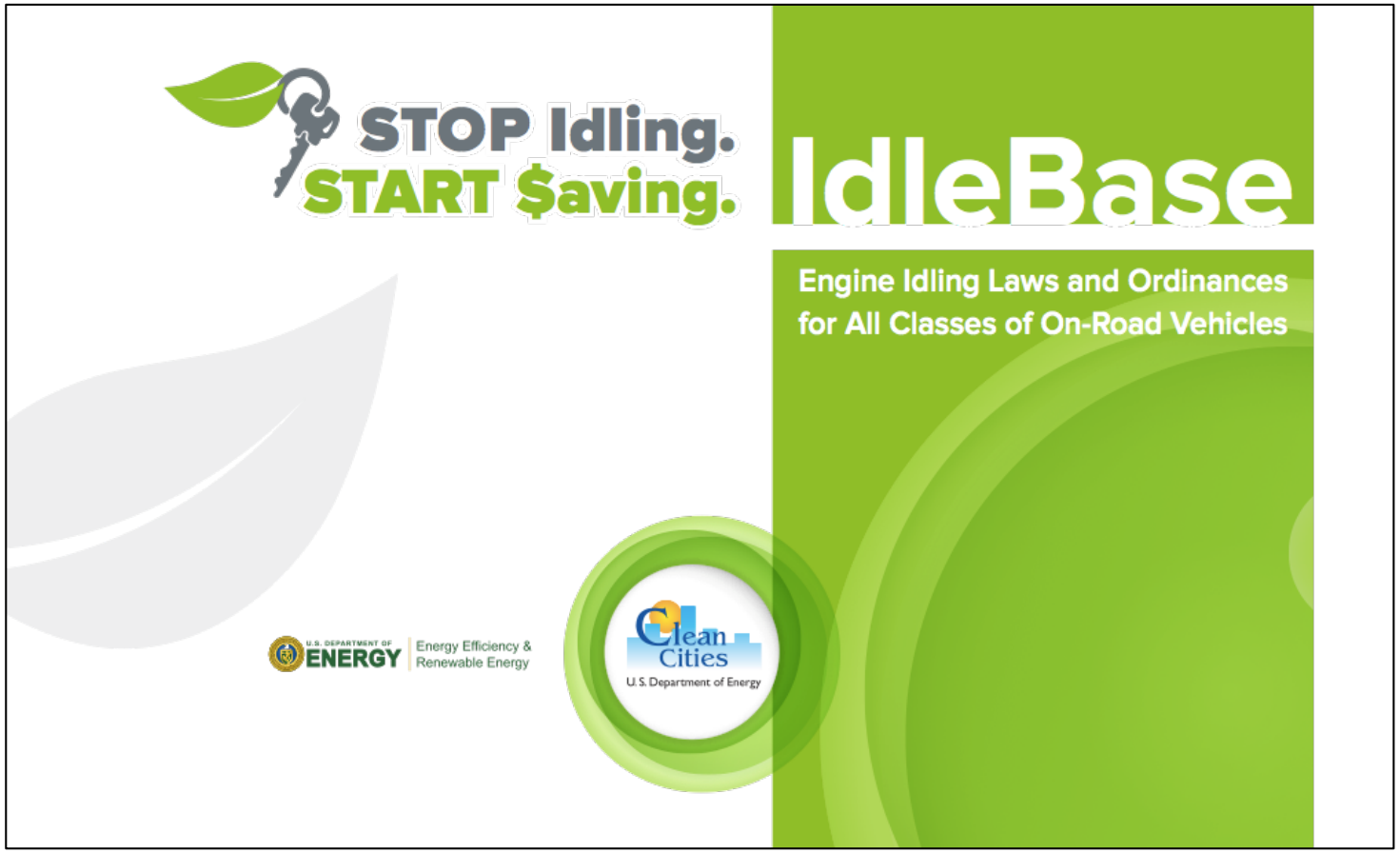
TMC: TMC Recommended Practice 1108, "Analysis of Costs from Idling and Parasitic Devices for Heavy Duty Trucks" (2003). Technology & Maintenance Council, American Trucking Associations (TMC/ATA).

WVU: Khan, ABM S.; Clark, N.N.; Gautam, M.; et al. (2009). "Idle Emissions from Medium Heavy Duty Diesel and Gasoline Trucks." *Journal of the Air & Waste Management Association* (59:3) 354–359.

Other Idling Reduction Resources

- IdleBox www.cleancities.energy.gov/idlebox
- IdleBase http://cleancities.energy.gov/idlebase
- *National Idling Reduction Network News* energy.gov/eere/vehicles/vehicle-technologies-office-national-idling-reduction-network-news
- Argonne National Laboratory http://www.transportation.anl.gov/engines/idling.html
- Alternative Fuels Data Center http://www.afdc.energy.gov/conserve/idle_reduction_basics.html

IDLEBASE



cleancities.energy.gov/idlebase

IDLEBASE, CONT.

Illinois	Type of Vehicle	Idling Restriction	Exemptions	Consequences of Infraction	Regulation	Resources
Counties in the Chicago Area: • **Cook** • **DuPage** • **Lake** • **Kane** • **McHenry** • **Will** • **Aux Sable and Goose Lake Townships in Grundy** • **Oswego Township in Kendall** **Counties in the Metro East St. Louis Area:** • **Madison** • **St. Clair** • **Monroe**	Diesel vehicles ≥8,000 lbs	10 minutes/hour	Traffic conditions or controls. Prevent a health or safety emergency. Emergency or law enforcement purposes. Service or repair. Government inspection. Idling necessary to operate auxiliary equipment to accomplish intended use of vehicle. Guarding contents of armored vehicle. Bus can idle a maximum of 15 minutes/hour to maintain passenger comfort. Resting in sleeping berth. Mechanical difficulties out of control of operator. Airport ground control support. Buses owned by public transportation authorities on bus route. Implements of husbandry. Electric utility service vehicles. If temperature <32F or >80F, idle limit to 30 minutes/hour while in queue.	$90 for first conviction. $500 for second or subsequent conviction in 12-month period. Fines are divided and paid to 3 gropus, dependant on the county that wrote the ticket.	625 Illinois Compiled Statutes (ILCS) 5/11-1429	http://www.ilga.gov/legislation/ilcs/fulltext.asp?DocName=062500050K11-1429
City of Chicago	Diesel-powered vehicles	3 minutes/hour	Emergency vehicles providing health and safety services. Airport support vehicles necessary for airport operations. Engine running is necessary to operate auxiliary equipment to accomplish the intended use of the vehicle. Vehicles standing with engine running for purpose of service, repair, or inspection. Vehicles standing in traffic. Air conditioning if temperature >80F or heat if temperature <32F. Operation of APU or generator set. Mechanical requirements or difficulties out of operator's control. Vehicles standing due to automatic regeneration of diesel particulate filters or pre-shutdown cooling required by engine manufacturer.	$250 per violation	Chicago Municipal Code, Section 9-80-095	http://www.cityofchicago.org/dam/city/depts/doe/general/ESB_PDFs/StandingLimitOrdinanceAsPassed.pdf
Chicago	City fleet vehicles	3 minutes in a 60-minute period	**a.** Emergency service vehicles; **b.** Vehicles standing in traffic; **c.** Airport support equipment; **d.** Vehicles being serviced or repaired; **e.** Idling to operate auxiliary equipment that is required to accomplish the intended use of the vehicle; **f.** Idling to provide heat within the cab of the vehicle if the outside temperature is less than 32F and there is no accessible temperature-controlled area within a reasonable distance; or **g.** Idling to provide cooling within the cab of the vehicle if the outside temperature is more than 80F, there is no accessible temperature-controlled area within a reasonable distance, and the vehicle is equipped with air conditioning.	NA	City of Chicago Vehicle Idling Management Policy	http://www.cityofchicago.org/content/dam/city/depts/doe/general/ESB_PDFs/CitysVehicleIdlingManagementPolicy05202010.pdf

IDLING REDUCTION TECHNOLOGY SOLUTIONS

Describes and provides links to 50+ products.

Organized by service(s) needed:

- Idle management
- Heat only
- Cooling only
- Heat, cooling, and power (auxiliary power unit)
- Power take-off
- Cargo refrigeration
- Wayside power / truck stop electrification

Idling Reduction Technology Solutions for Class 1–8 Vehicles*, †

Services provided	Vehicle type (LD, MD, HD, trailer)	Power source	Company/Product(s)	EPA verification‡	Notes
Idle management					
	LD, MD	Battery/electric	**Derive Systems** / Derive Efficiency	No	Idle efficiency gains are achieved by reducing idle RPM levels
	LD, MD, HD	Battery/electric	**GRIP** / Grip Idle Management	No	Enables use of heat and cooling and provides power for auxiliaries while maintaining battery state of charge
	LD	Battery/electric	**Havis** / ChargeGuard	No	Automatic idle shutoff timer
	LD, MD	Battery/electric	**Havis** / IdleRight2	No	Monitors the battery's voltage while the vehicle is turned off and electronics, such as emergency lighting, are on. Restarts vehicle when battery voltage drops below a preset level
	MD, HD	Battery/electric	**IdleSmart** / IdleSmart	No	Cycles engine on and off as needed to maintain battery state of charge and coolant heat
	LD, MD, HD	Battery/electric	**InterMotive Vehicle Controls** / EcoStar	No	Programmable system that automatically turns the engine off when specific customizable conditions are met
	HD	Battery/electric	**Temp-a-Start** / Temp-a-Start system	No	Cycles engine on or off to maintain engine block temperature, battery state of charge, and/or bunk temperature
	LD, MD, HD	Battery/electric	**Vanner** / IdleWatch	No	Idle management system to cycle on and off engine as needed to maintain battery state of charge and coolant heat

www.anl.gov/es/reference/idling-reduction-technology-solutions-for-class-18-vehicles

IDLEBOX: SPECIALTY RESOURCES

Specialty Resources

Personal Vehicles

Idling Reduction for Personal Vehicles (Fact Sheet)

Which Is Greener: Idle, or Stop and Restart? Comparing Fuel Use and Emissions for Short Passenger-Car Stops (Fact Sheet)

Reducing Personal Vehicle Idling (Presentation)

Stop and Restart Effects on Modern Vehicle Starting System Components—Longevity and Economic Factors (Technical Report)

Light- and Medium-Duty Fleet Vehicles

Idling Reduction Basics for Fleets (Presentation)

Technology Solutions (Presentation)

Heavy-Duty Vehicles

Long-Haul Truck Idling Burns Up Profits (Fact Sheet)

Economics of Idling Reduction Options for Long-Haul Trucks (Fact Sheet)

Idling Reduction for Long-Haul, Heavy-Duty Trucks (Presentation)

Emissions From Idling Heavy-Duty Trucks and Idling-Reduction Equipment (Technical Report)

Idling Reduction for Long-Haul Trucks: An Economic Comparison on On-Board and Wayside Technologies (Technical Report)

Emergency & Other Service Vehicles

Idling Reduction for Emergency and Other Service Vehicles (Fact Sheet)

Idling Reduction For Emergency Vehicles: A Case Study (Fact Sheet)

Case Study – Idling Reduction Technologies for Emergency Service Vehicles (Technical Report)

Work Trucks

Work Truck Idling Reduction (Fact Sheet)

FACT SHEETS

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THANK YOU

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Find your nearest coalition at cleancities.energy.gov/coalitions/contacts/

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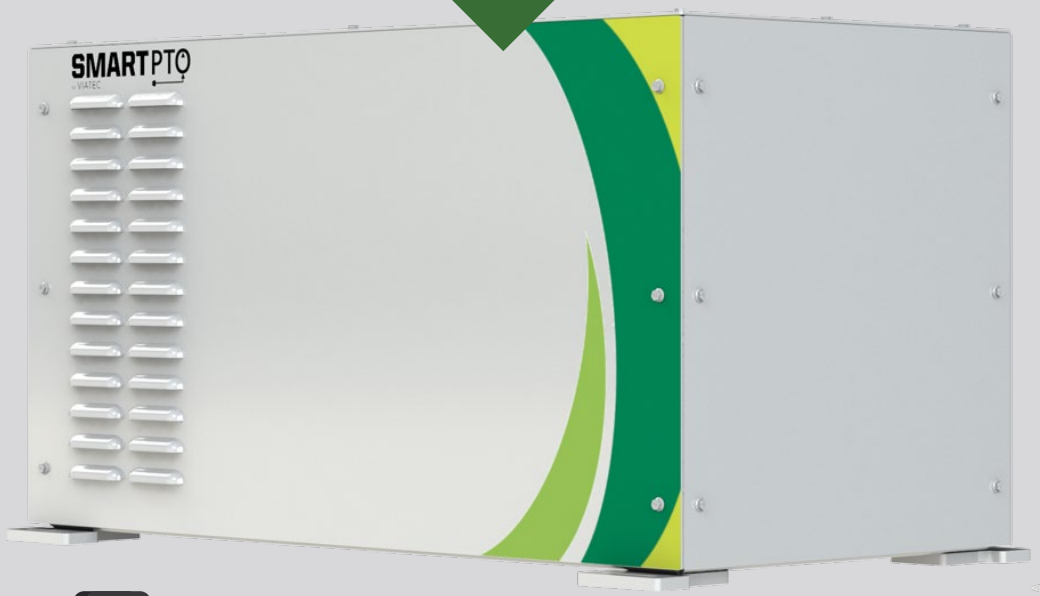
- Co-Founder and CTO for Viatec
- Primary interest and expertise is in systems engineering where different disciplines of engineering--mechanical, electrical and software--meet to create a final product
- Previous experience as a consultant for Washington DC Metro and with transportation electrification on electric buses and an off-highway multi-purpose electric work vehicle & power station
- Before jumping into transportation electrification worked on diesel engine development
- Master's degree at Clemson University's International Center for Automotive Research

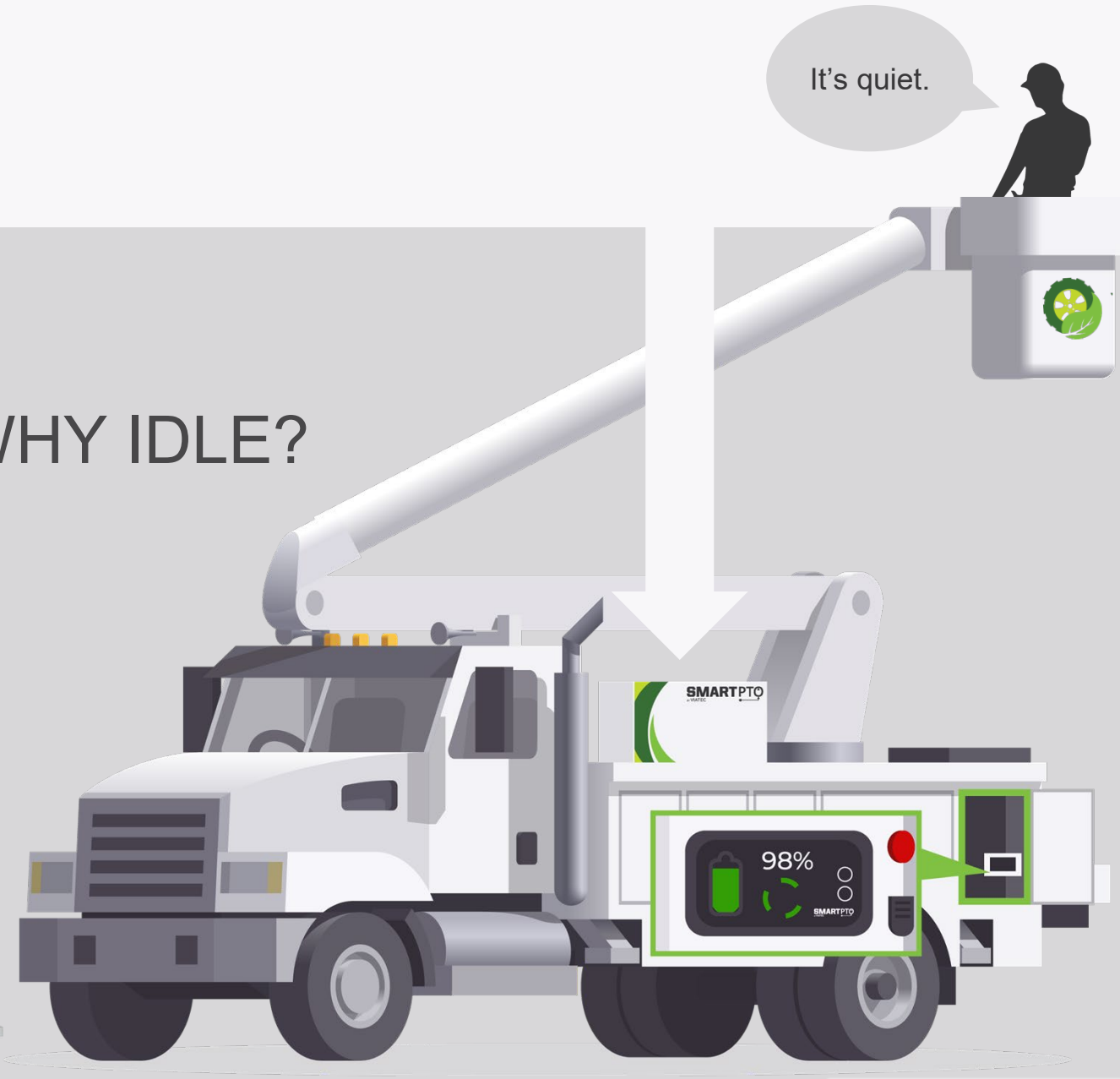
VIATEC

SMARTPTO

Truly Parallel Auxiliary Power for Vocational Vehicles and Equipment

WHY IDLE?





VIATEC

Simple Installation

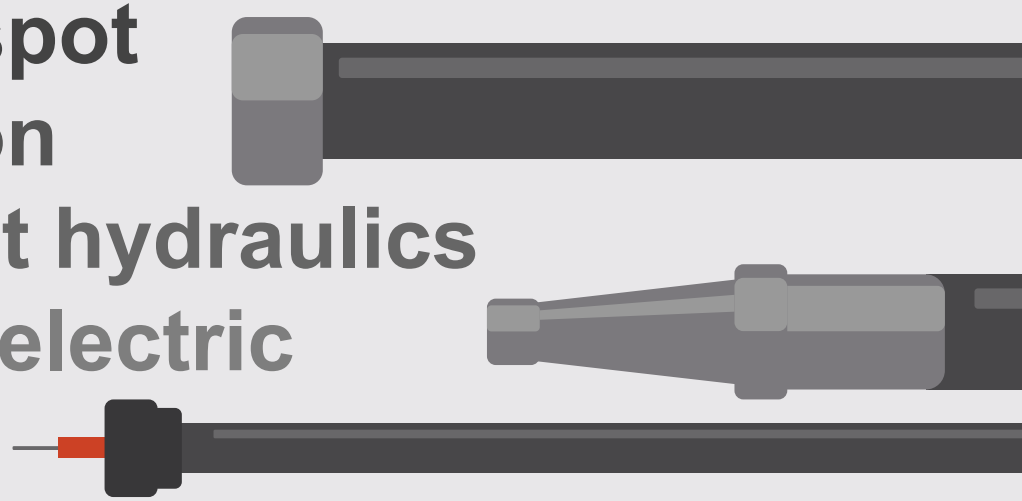
Pick a spot

Bolt it on

Connect hydraulics

Plug in electric

Done.



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Minimal Interfacing

ELECTRIC

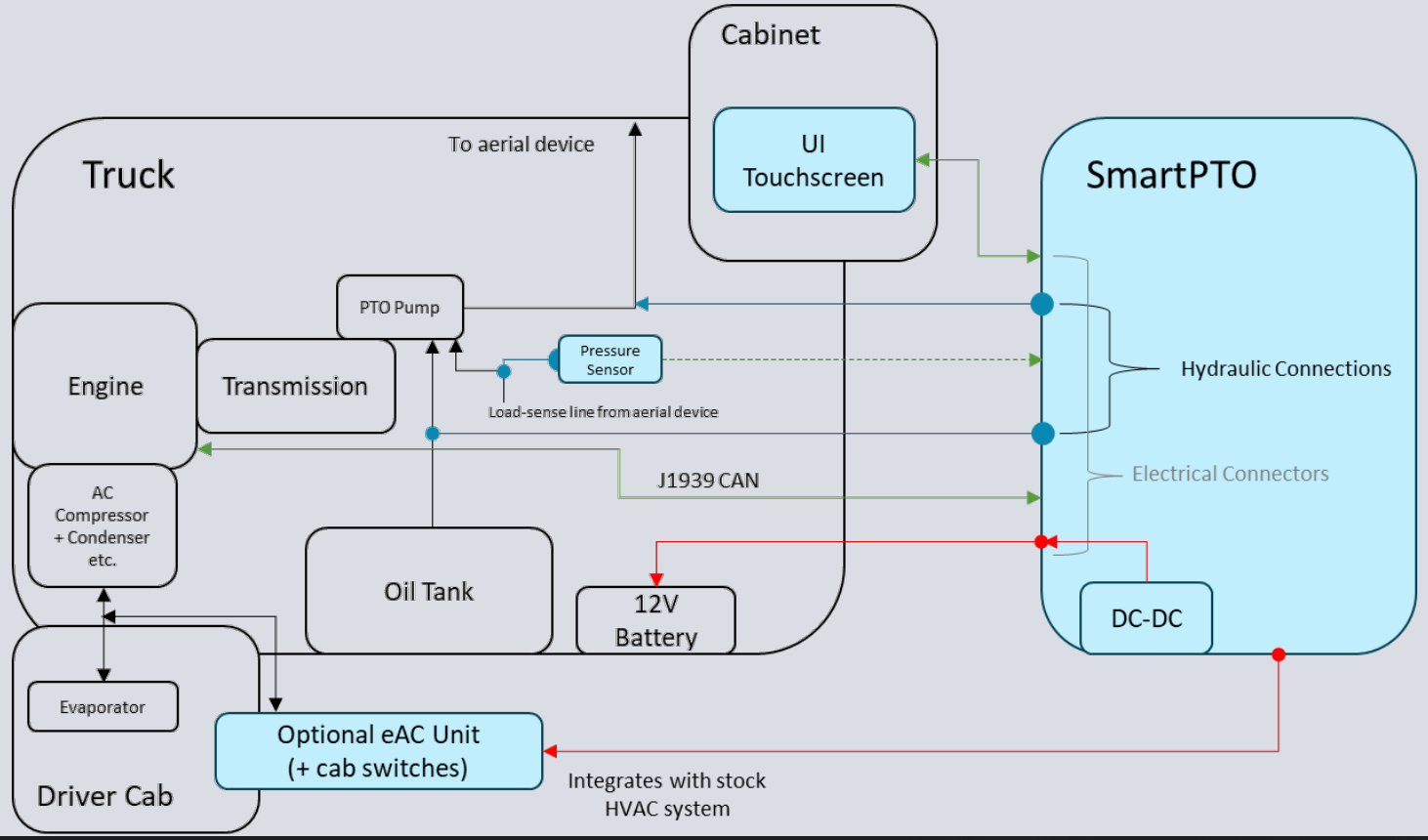
HYDRAULIC

550-570 lbs

8-16 hours
Installation Time

VIATEC

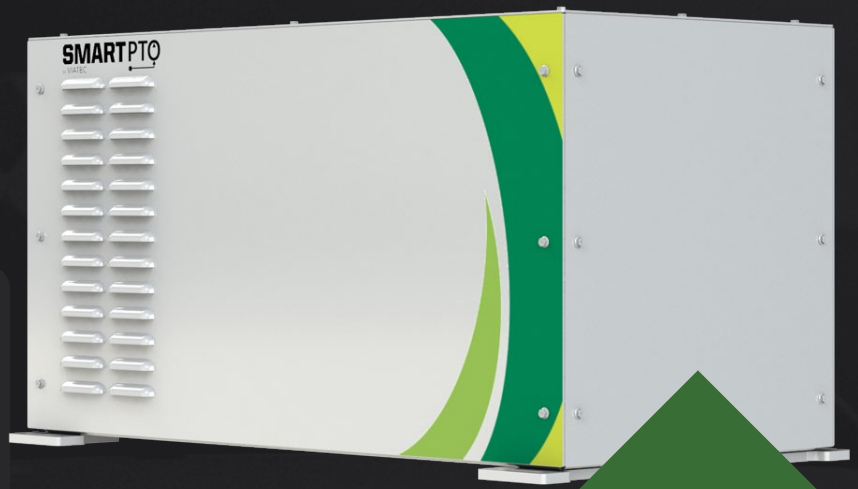
Schematic


Cabinet
UI
Touchscreen
To aerial device
Truck
SmartPTO
PTO Pump
Pressure
Sensor
Engine
Transmission
Hydraulic Connections
Load-sense line from aerial device
J1939 CAN
Electrical Connectors
AC
Compressor
+ Condenser
etc.
Oil Tank
12V
Battery
DC-DC
Evaporator
Optional eAC Unit
(+ cab switches)
Integrates with stock
HVAC system
Driver Cab

Setting Trends…

Technology Integration

ZERO MOTORCYCLES®



$100M+ in Engineering, Testing and Validation

CORE TECH & POWERTRAIN

HYDRAULIC INTERFACE

Hydraulic Pump + Valves
"Rear Wheel"

Zero Motorcycles Powertrain
"Motorcycle In a Box"

Viatec Electronics + Software
"Virtual Rider"

USER INTERFACE

9/28/2020

Polaris Announces Partnership with Zero Motorcycles to Co-Develop Electric Vehicles

…big names are following

VIATEC

Scalable

V3

SMART PTO

V3

Along with 55’ Material Handlers, we are adding smaller trouble-trucks and larger digger derricks.

V3 will have configurations to ‘fit’ all devices/ use cases

VIATEC

Equipment, not just ‘trucks’

SmartPTO can help you electrify other equipment like cable pullers/ tensioners
We are even working on a SmartPX system that can electrify non-hydraulic equipment!

VIATEC

Now’s the time!

Provisional CARB Approval

55+ Units Deployed (EOY2020)

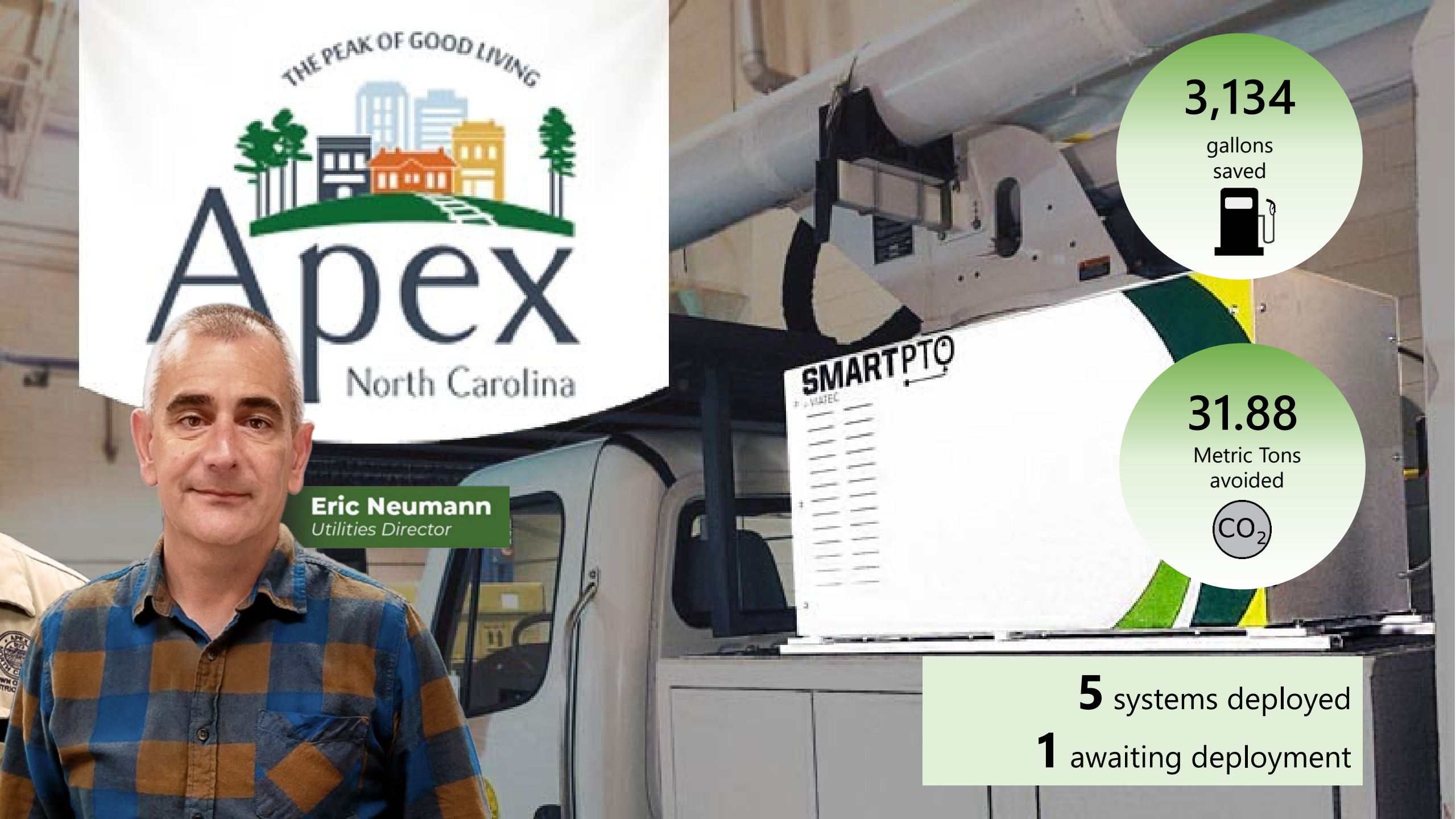
OEM Preferred
Option for 2 leading manufacturers

$100M invested in powertrain development and testing

Equipping your trucks with SmartPTO counts towards your EEI commitments!

Edison Electric INSTITUTE

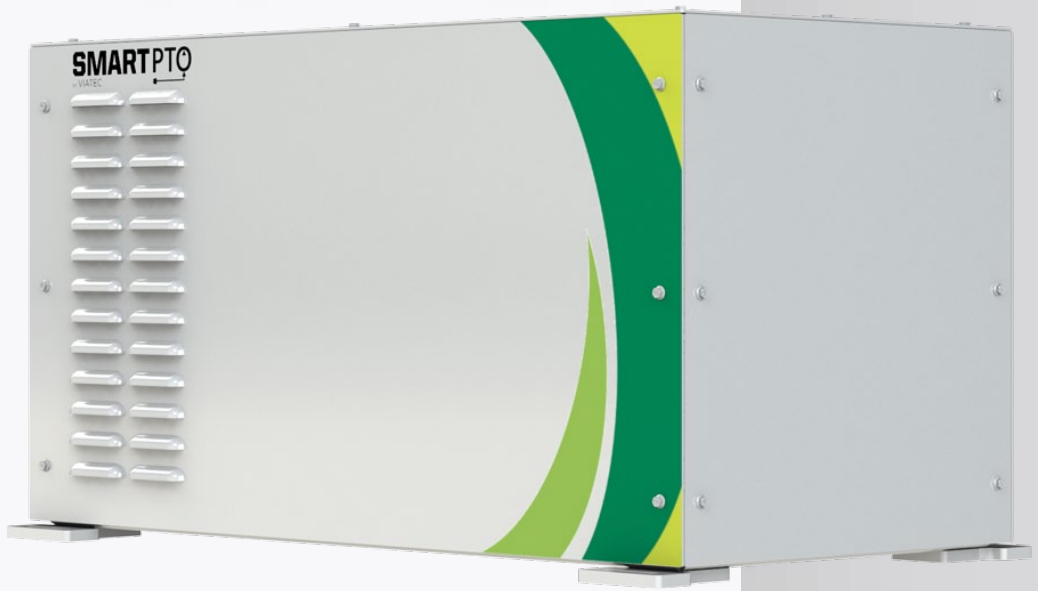
VIATEC


THE PEAK OF GOOD LIVING
Apex
North Carolina
SMARTPTO
Eric Neumann
Utilities Director
3,134
gallons
saved
31.88
Metric Tons
avoided
CO_2
5 systems deployed
1 awaiting deployment

VIATEC

SMARTPTO

Thank You!

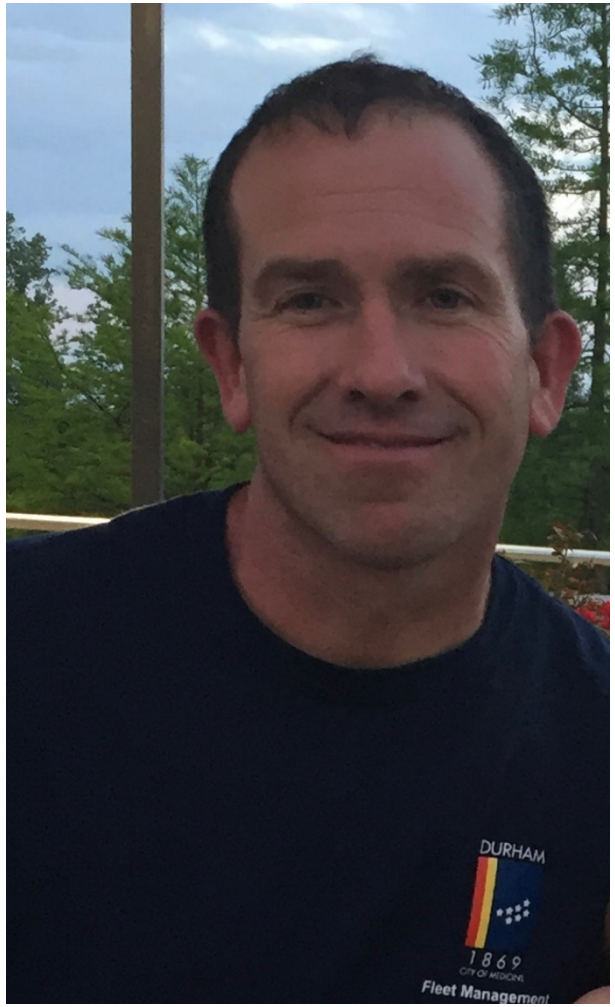


FLEET MANAGEMENT

CITY OF DURHAM

2020 Sustainable Fleet Technology

Idle Reduction| December 2, 2020



John Ferguson
Assistant Director
Fleet Management Department

Bucket Truck

- CFAT grant for VIATEC Smart PTO
- Recently place into service
- Some pushback from the aerial OEM
- APU powered HVAC-Employee heat stress policy drives excessive idle in the summer months

Fire Truck

- Harrison Diesel 6KW APU
- Automatic engagement with the ability to manually disable
- 20% Fuel savings
- 2 units in service with 7 units ordered with full battery powered APU’s by Harrison
- More efficient emissions system with less regeneration events

Mike MacComiskey
mike@advtracking.net
816-503-1826

- Senior Fleet Management Consultant for Advantage Asset Tracking
- Recently teamed up with Advantage Asset Tracking and GEOTAB
- Industry expert and a respected advisor in the government Telematics market an understands the explicit needs of municipalities and government fleets
- Avid supporter of Clean Cities Coalitions all over the country on their mission to convert fleets to utilize clean fuels, optimize fleet sustainability and assisting with EV conversion

Expandability That Grows With Your Business

We have the know-how you need to navigate through the complex world of fleet management and personal safety solutions.

advantage
ASSET TRACKING

advantage
ASSET TRACKING

GPS Telematics

You can’t manage what you can’t measure

What can you do?

Educate & Communicate with your drivers!

- Adopt an idling reduction policy
- Host an idling reduction workshop for drivers
- Post signs to remind drivers NOT to idle
- Ask drivers to make a pledge to idling reduction
- Offer incentives/rewards for idling reduction efforts

Good vs Bad Idle

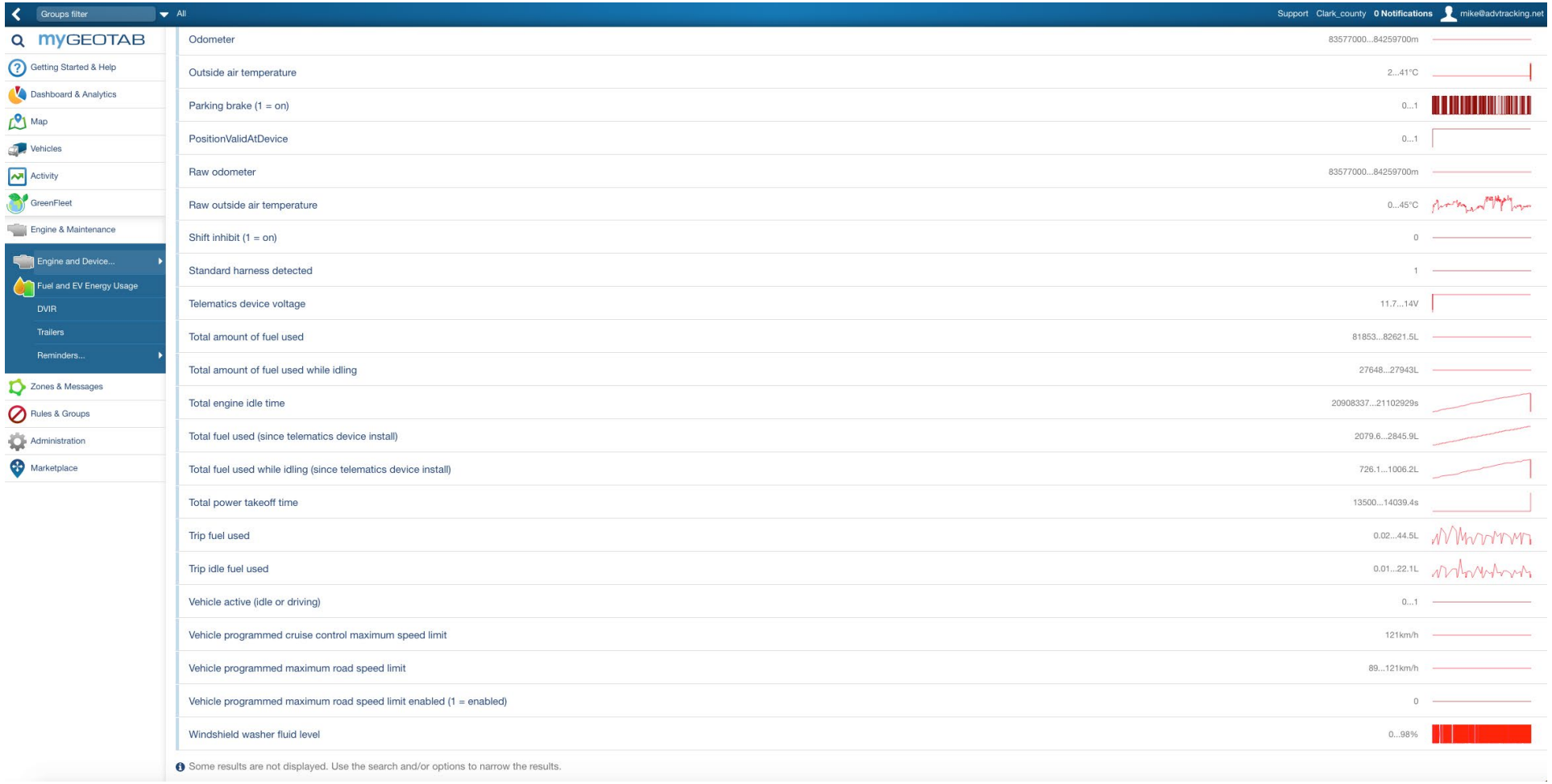
Good Idle

- Trucks operating PTO, (engine MUST be running)
- First responders
- Utility vehicles with power equipment
- Law Enforcement
- Trucks that do a regeneration cycle to clean particulate traps

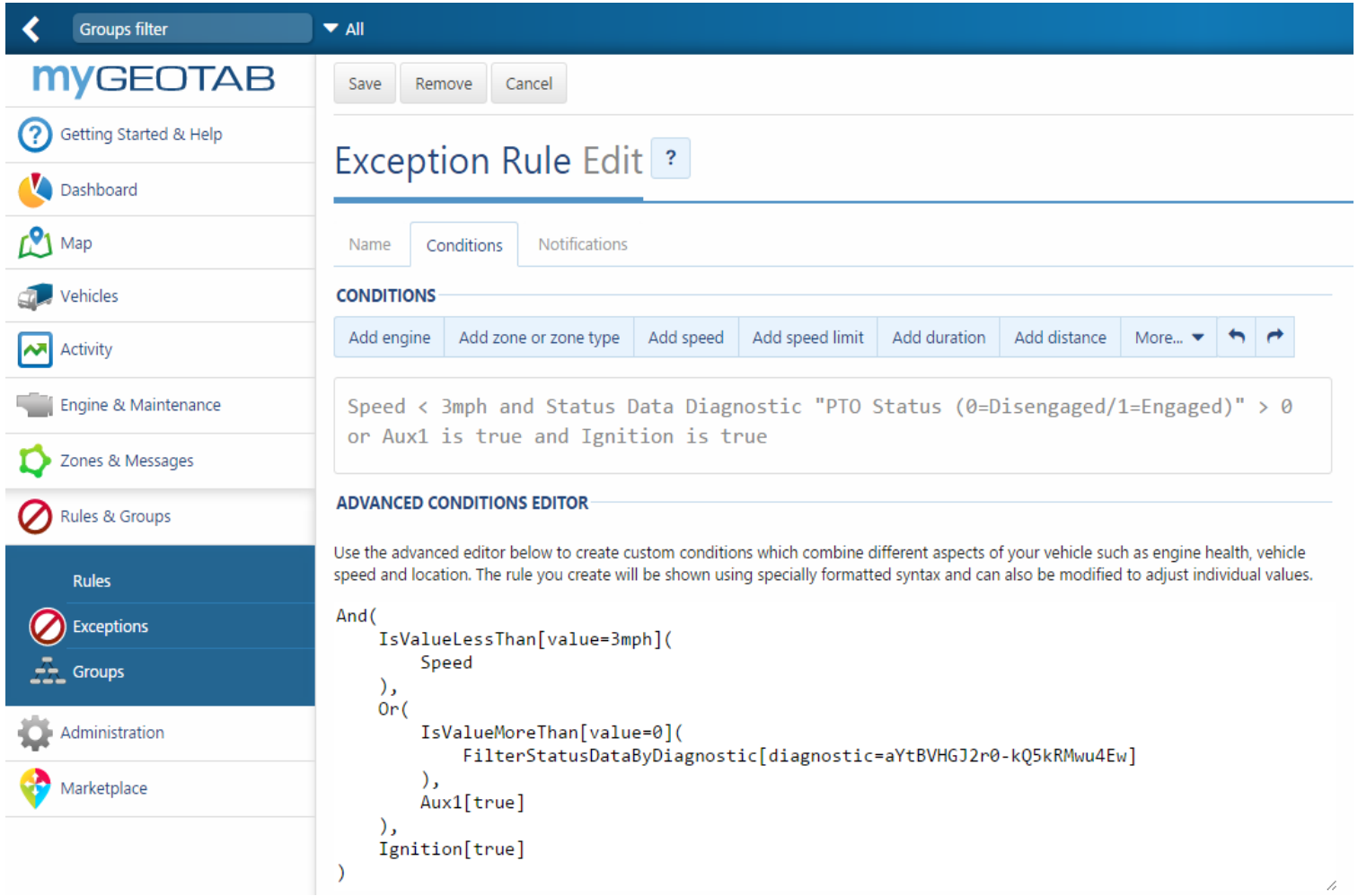
Bad Idle

- Delivery trucks
- Transit busses
- Shuttle busses
- Taxis
- Engine warming
- Sitting in vehicle for lunch breaks, filling out work orders, make phone calls

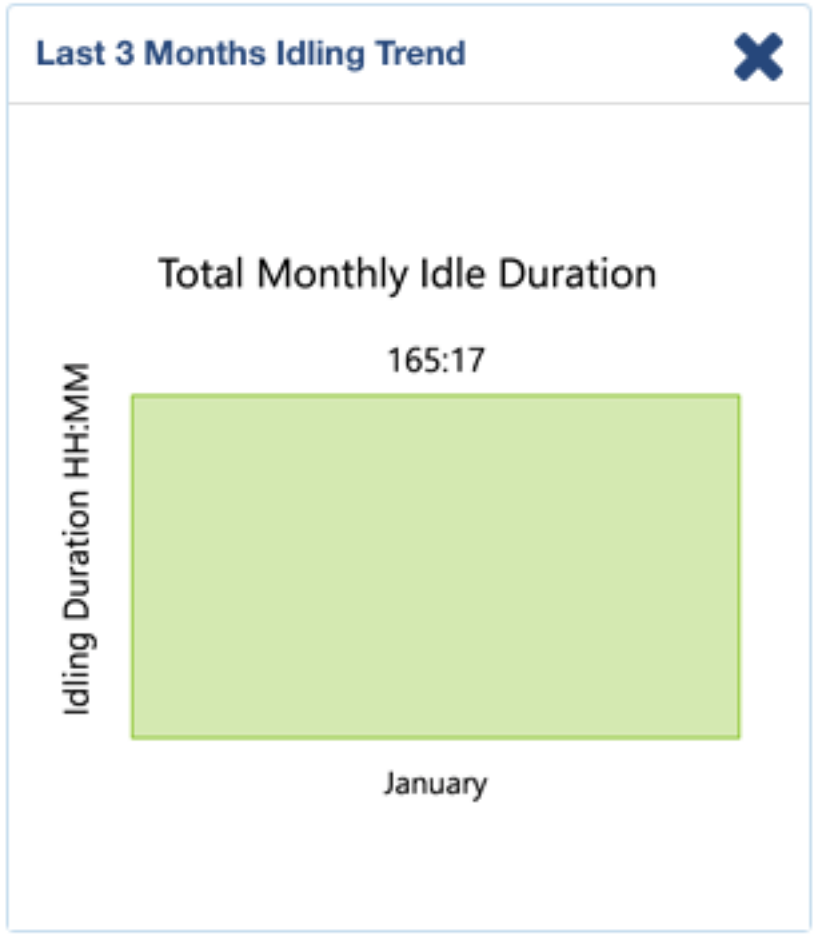
How do we determine idle?

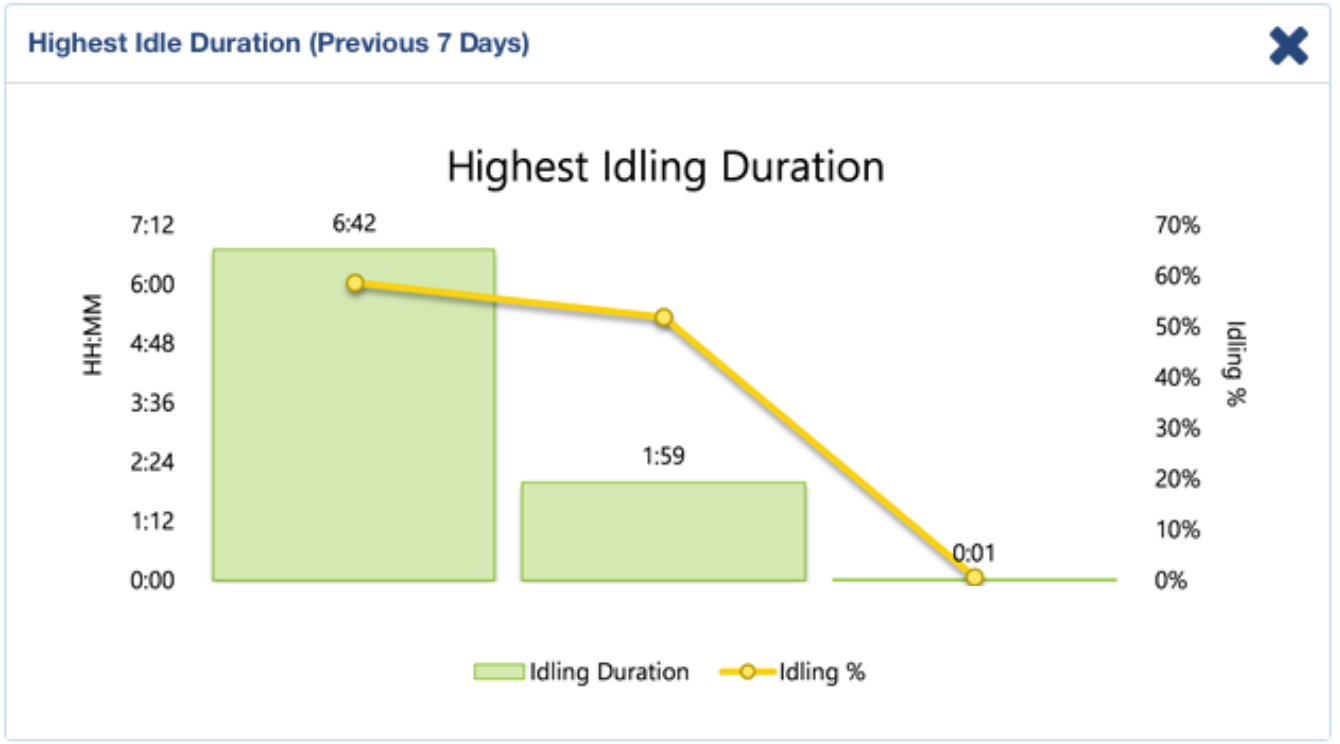


Useful Data

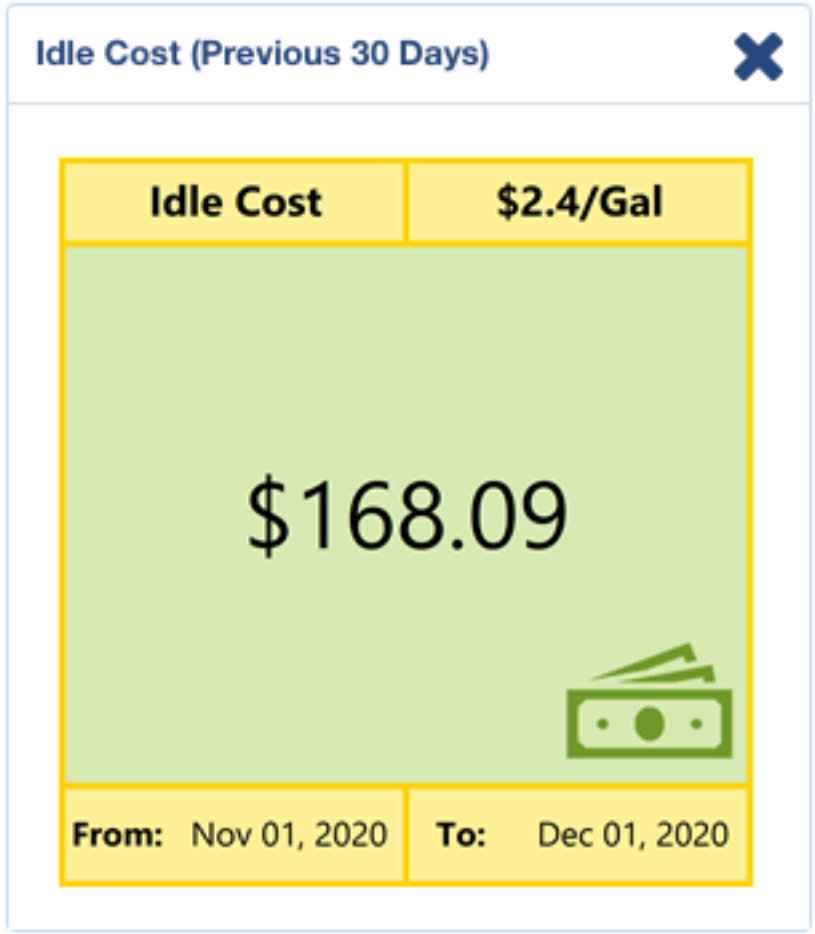

Groups filter
All
mygeotab
Getting Started & Help
Dashboard
Map
Vehicles
Activity
Engine & Maintenance
Zones & Messages
Rules & Groups
Rules
Exceptions
Groups
Administration
Marketplace
Save
Remove
Cancel
Exception Rule Edit
Name
Conditions
Notifications
CONDITIONS
Add engine
Add zone or zone type
Add speed
Add speed limit
Add duration
Add distance
More...
Speed < 3mph and Status Data Diagnostic "PTO Status (0=Disengaged/1=Engaged)" > 0 or Aux1 is true and Ignition is true
ADVANCED CONDITIONS EDITOR
Use the advanced editor below to create custom conditions which combine different aspects of your vehicle such as engine health, vehicle speed and location. The rule you create will be shown using specially formatted syntax and can also be modified to adjust individual values.
And(
IsValueLessThan[value=3mph](
Speed
),
Or(
IsValueMoreThan[value=0](
FilterStatusDataByDiagnostic[diagnostic=aYtBVHGJ2r0-kQ5kRMwu4Ew]
),
Aux1[true]
),
Ignition[true]
)

Idle Reports

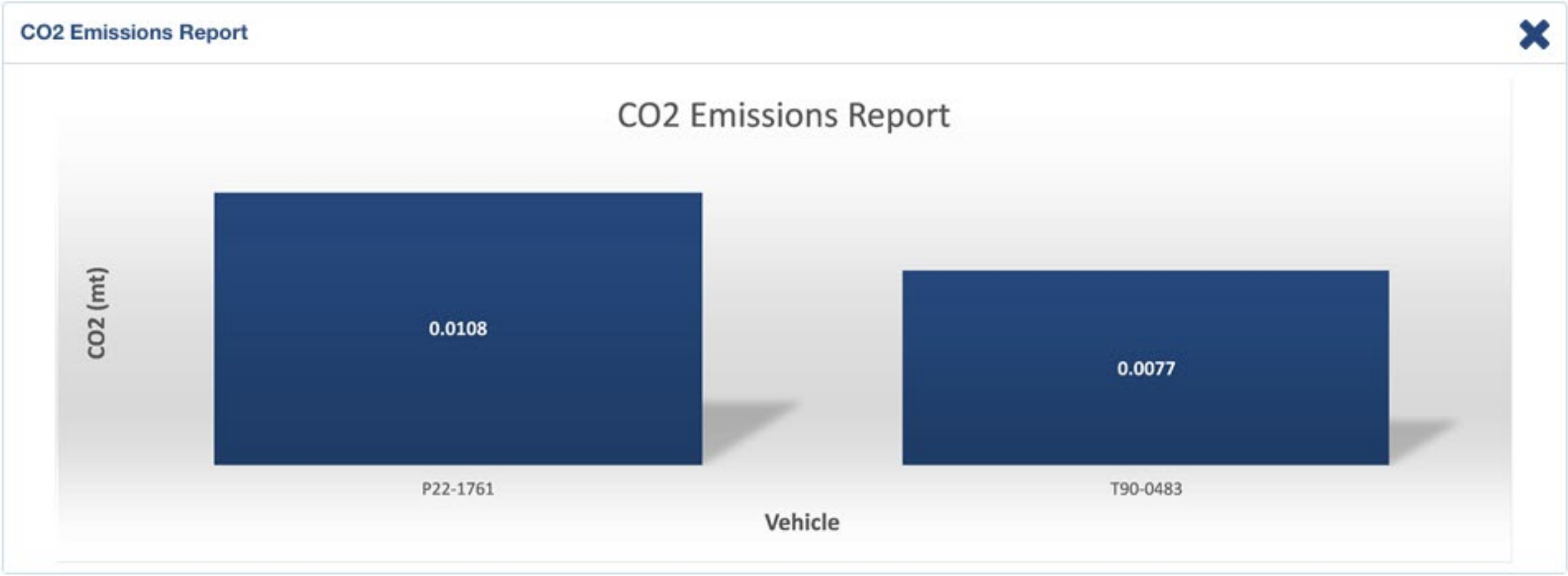




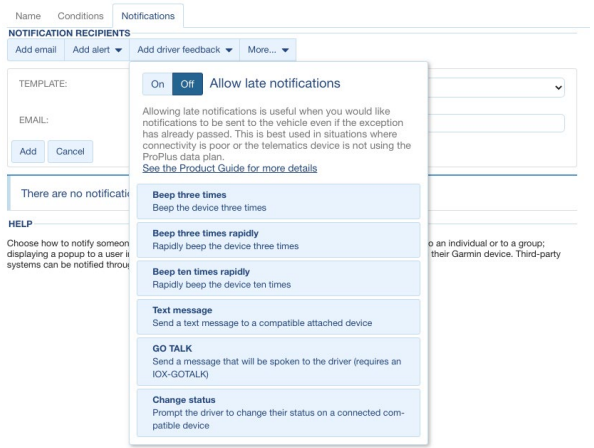
We can show what Idle Costs

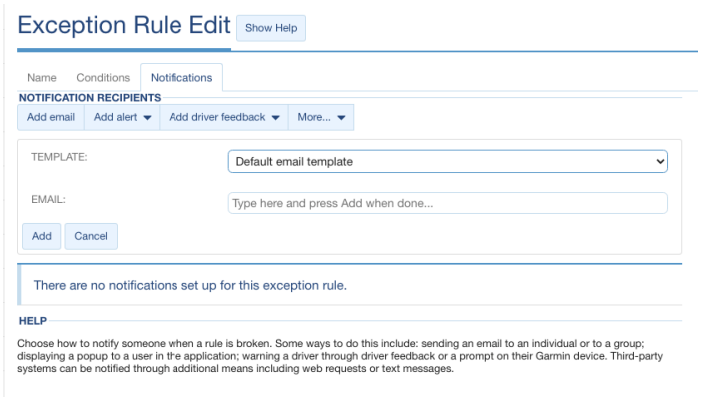


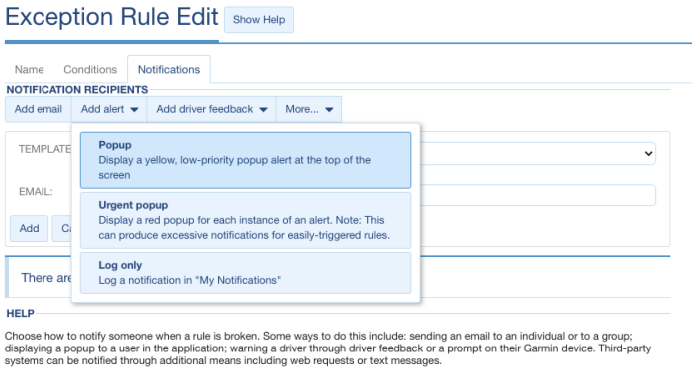
We can calculate GHG (CO2)

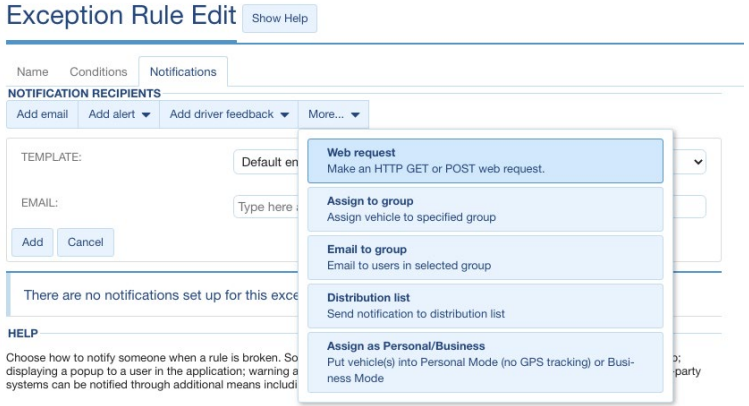


Driver Feedback (Coaching Tools)





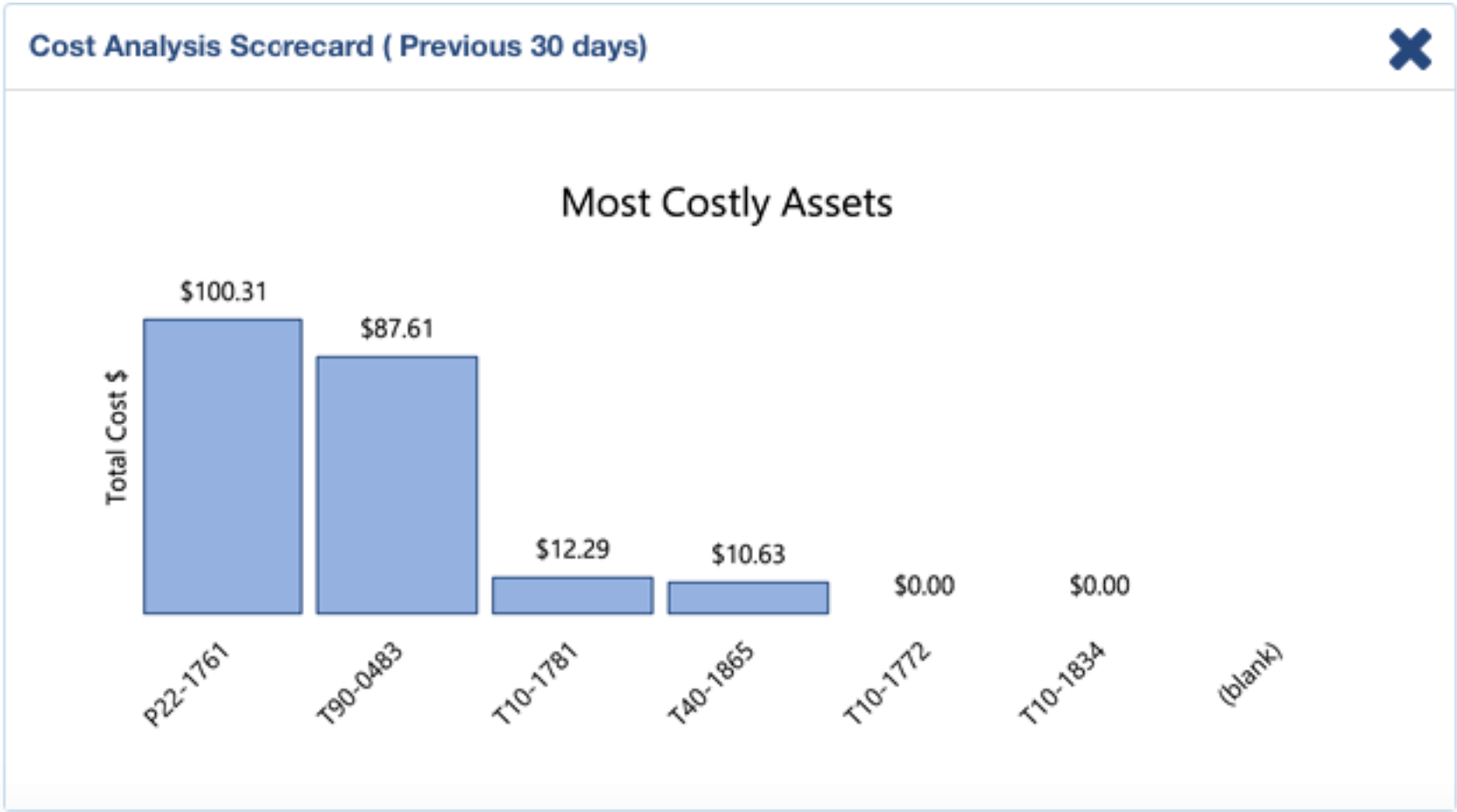




Driver Feedback (Coaching Tools)

Hey!!!
Shut the engine off!!!

Less Idle = Less Wear & Tear



Thank you!

Mike MacComiskey
Advantage Asset Tracking
mike@advtracking.net
816-503-1826
www.advtracking.net

Charlie Mahoney
charlie.mahoney@derivesystems.com
866-617-6493

- Business Development Manager for Derive Efficiency
- Been serving the fleet industry since 2007 promoting “right sizing” calibration parameters for public and private fleets
- More than 20 years ECU experience in providing logical, pragmatic recommendations to increase efficiency while promoting safety and environmental responsibility

DERIVE

Rethinking Idle with Technology

Vehicle Idle – Office on wheels

Idling is a vehicle function for a host of reasons:

- Mobile office
- Powering ancillary tools
  - Computers
  - Emergency lighting
  - Lifesaving equipment
  - Devices to perform services
- Providing shelter (climate)
- Distancing during Pandemic


Great Options

- Conversations are taking shape
- Solutions offered
- Everyone is pitching in
- There’s more work to be done

Mission-specific idle profiles yield savings

Class 5 Bucket

.7 gph – 1.2 gph

- Vehicle – large displacement engine with two key idle modes.
- Accessories – non-standard aftermarket buckets requiring different PTO output
- Environment – often deployed following adverse weather, working 24 hours per day

Class 1 Compact Van

.3 gph - .5 gph

- Vehicle – small displacement engine that is often turbocharged
- Accessories – excessive use of 12V plug-ins
- Environment – Predominately urban use, experiencing high start/stop as well as post-appointment mobile office use

Example findings from diverse fleets – IDLE reduction

Static Optimizations

TESTING RESULTS: 20% to 25% savings depending upon MY

CASE STUDY: Delivered an overall 10.4% total savings to landscaping company

SAVINGS: $540 / year; < 1 year ROI

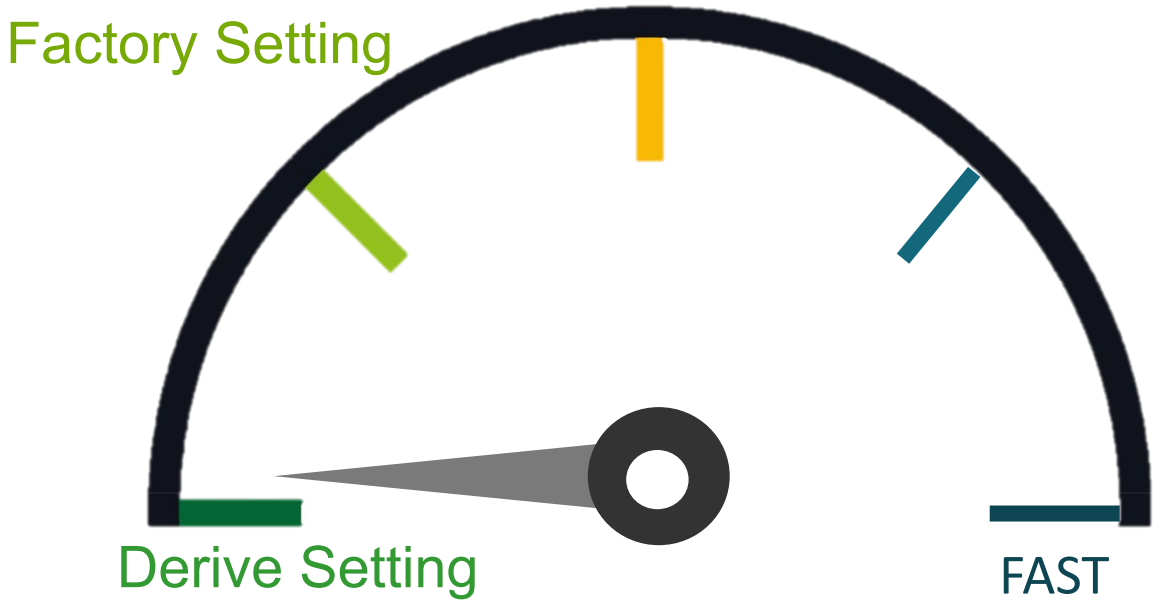
TESTING RESULTS: 12% to 15% savings depending upon MY

CASE STUDY: Delivered an overall 7.2% total savings to a parcel delivery company

SAVINGS: $250 / year; ~ 1 year ROI

How does Derive VQ Optimization work?

1. ECM update.
2. Lower idle revolutions per minute (RPM) by up to 30%.
3. Business as usual.



Case Study 1 – City of Ontario

Fuel Management

Calif. City Reduces Fuel Use With Vehicle Calibration

April 05, 2017 – Government Fleet Magazine

- Fuel Use: 140 Gallons of Month
- Derive Saves: 22.5 Gallons per month
- Idle: 56%
- Annual Savings: $750.60 @ $2.78
- Emissions Reductions: 5300+# lbs

Case Study 2 – NYPD

NYPD / Derive Pilot

Conducted 2016

- Fuel Use: 94 Gallons of Month
- Derive Saves: 9 Gallons per month
- Idle: 60%
- Annual Savings: $255 @ $2.32
- Emissions Reductions: 2100+# lbs

Case Study 3 – City of Port St Lucie

How one Florida PD is saving nearly 12 percent on fuel

The Port St. Lucie Police Department uses a simple software solution from Derive Efficiency to increase fuel efficiency and decrease CO2 output

Jul 26, 2016 – Policeone

- Fuel Use: 91 Gallons of Month
- Derive Saves: 10.45 Gallons per month
- Idle: 76%
- Annual Savings: $275.00 @ $2.20
- Emissions Reductions: 2450+# lbs

Vehicle Support

Derive supports the majority of popular Ford and GM trucks van cut-aways and Law Enforcement vehicles

Questions?

Charlie Mahoney

Business Development Manager

+1 (407) 462-4145

Charlie.Mahoney@derivesystems.com

DERIVE

Nothing to Manage Post-Installation

STEPS TO INSTANT RESULTS

1. Connect Derive's handheld programmer or VQ device into OBDII port.
2. Follow the onscreen prompts and complete the one-time installation in only 10-20 minutes.
3. Experience greater efficiency, compliance and sustainability in your fleet.

DERIVE IS SIMPLE BY DESIGN

Where to buy

GSA Schedule 84

https://www.gsaadvantage.gov/advantage/s/search.do?q=0:2Derive+systems+TeleSwivel&db=0&searchType=0

Derive's Value Proposition

- ✓ 6% Fuel Savings Written Guarantee, Expected 8-12%
- ✓ Simple Installation And Immediate Savings.
- ✓ Nothing to Manage Post-Installation. No Driver Mgmt.
- ✓ OEM Warranty Unaffected, Backstopped by Derive

Derive guarantees 6% savings, at minimum

COMCAST

9.2%

Safelite AutoGlass

8.3%

sears

10.6%

dish NETWORK

7.2%

USIC
UNITED STATES INFRASTRUCTURE CORPORATION

7.1%

ARS RESCUE ROOTER.

8.3%

Convoy Solutions & eNow

Yale Klat
yale.klat@idleair.com
646-481-6684

- Director of Government Relations for IdleAir and eNow
- Involved in joint venture to manufacture all-electric transport refrigeration units (TRUs)
- Prior experience with the Environmental Protection Bureau for the NY State Attorney General and as land use planner for Lake Tahoe
- Bachelor's and Master's Degrees from Cornell University in Environmental Management and JD from the City University New York School of Law

Sustainable Fleet Technology

VIRTUAL CONFERENCE 2020

CONVOY SOLUTIONS

in partnership with

enow "POWERING POSSIBILITIES"

Convoy Solutions & eNow

- Convoy Solutions purchased the IdleAir truck stop electrification network in 2010. Convoy is the leading provider of electrified parking spaces (EPS) for freight
  - More than 3000 electrified parking spaces
  - Over 700 fleet partners and 30,000 driver customers
  - Most recent installation is CLT at Schnyder
    - Thank you Duke Energy
  - Every 100 hours of service = 1 tonne of CO2
  - Over 60 Million gallons of diesel consumption mitigated
  - NOx mitigation protocol, ACR

Egoba private yard in Nuevo Laredo, Mexico

CR England private yard in Laredo, TX

CONVOY SOLUTIONS

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TRU electrification

- TWO types
  - Standby plug-in
    - MDI
  - Zero emissions/all-electric
    - Challenge Dairy
    - Hunts Point
- CARB TRU RULE

Merchants Distributors (MDI)

- MDI installed 36 electric service points in a staging area (with capability of >100). Each service point, with a 480-volt connector, meets the needs of an eTRU that can draw up to 17 kW peak cooling capacity.
- MDI initially saved about 2,600 gallons of diesel fuel per month, a number that has risen to approximately 3,300 gallons per month commensurate with the company's growing eTRU usage. The electrical energy that displaces the diesel averages 18,000 kWh per month. At an average diesel cost of $3.03 a gallon in the Southeastern U.S. and average commercial electric power cost of $0.069 per kWh, MDI's net energy savings average $8,700 each month.
- For an allocated electric service point installed cost of $7,500, the payback is approximately 2.6 years.

Challenge Dairy

- By far the largest annual cost savings comes from eliminating the use of diesel fuel or refrigeration system, which saves almost $17,000 annually in extended (12-hour) duration deliveries.
- Demonstration testing over the course of the 56-week over-the-road demonstration period showed that solar contributed 676 kWh (83%) of the hybrid all-electric TRU power, and the battery contributed 143 kWh (17%).

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Hunts Point

- 750 plus TRUs; Distribution Center is the largest food distribution center in the world, moving 4.5 billion pounds of food annually, nearly all transported by diesel trucks and trailers.
  - Idling 24/7
  - Older TRUs
    - Levels of PM2.5, a harmful air pollutant produced from diesel emissions, in the Hunts Point area measure at 8.5 mg per cubic meter— the highest levels in all the Bronx.
- Demand constraint
- Semi Stationary
- NYSERDA funded pilot project of 4 TRUs

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CA TRU RULE

- TRUCKS
  - Phase in beginning 2024
- TRAILERS (subject to change)
  - 15-minute rule
  - Telematics
  - Infrastructure
- AND THE CARROTS
  - The Clean Off-Road Refrigeration Equipment Voucher
    - $40mm total allocated to first come first serve vouchers
    - $65k per TRU & $3k per plug
  - SB 350
    - Known as Charge-Ready ($342mm over 5-years) for SCE and Fleet-Ready ($236mm over 5-year) for PG&E.

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NYC Fleet

NYC DCAS
Citywide Administrative Services

Keith Kerman
kkerman@dcas.nyc.gov

- Deputy Commissioner at the Department of City Wide Administrative Services & NYC's first Chief Fleet Officer
- Leads fleet safety & sustainability as part of Mayor DiBlasio's Vison Zero and NYC Clean Fleet initiatives
- Implemented some of the nation's leading efforts in shared servicing, telematics, truck side-guards, electric vehicles, solar carports & biofuels
- NYC operates the largest municipal fleet in the US with >30,000 vehicles
- Works daily with NYPD, FDNY, DSNY and over 50 agencies
- In 27th year of public service and has been recognized in NY state and nationally
- 2019 one of six awardees for the Sloan Public Service Award (a.k.a.the Nobel Prize of public service)
- Graduate of Harvard College

NYC DCAS
Citywide Administrative Services

Reducing Idling in Fleet

NYC Fleet

Keith T. Kerman
NYC Chief Fleet Officer
Deputy Commissioner, DCAS
December 2, 2020
NC, North Carolina, Cleantech Center
Sustainable Fleet Technology Conference

NYC DCAS
Citywide Administrative Services

Bill de Blasio, Mayor
Lisette Camilo, Commissioner
Keith T. Kerman, Deputy Commissioner
and Chief Fleet Officer

NYC Fleet Newsletter

February 28, 2020 - Issue 294

Shut It Off! Mayor, Billy Idol Team Up to Stop Vehicle Idling

By: Keith Kerman

At City Hall on February 27, artist Billy Idol joined Mayor de Blasio to launch a **new campaign** against vehicle idling and the harmful air pollution it causes. The campaign was developed by NYC DEP.

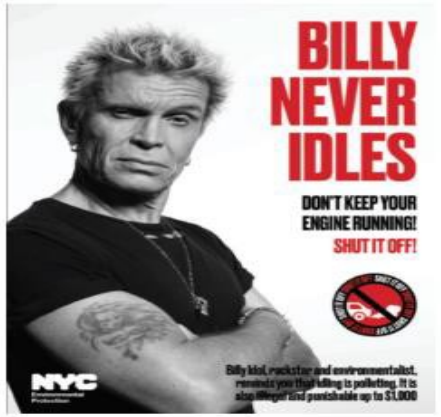
As the crowd chanted "Shut It Off," the mayor and Billy Idol discussed the wasteful and unnecessary environmental impacts from vehicle idling.

Idling uses a lot of fuel, creates as much pollution as driving, and also wears down vehicle engines. Idling for an hour is the equivalent of driving 25 to 30 miles. An idling truck or bus can use up to a gallon of fuel an hour.

If you have to drive, one of the best ways to avoid idling is to drive an electric or hybrid vehicle. NYC operates 8,000 electric and hybrid fleet units which use non-polluting batteries to power vehicles when stationary. We are transitioning to hybrid plug-in ambulances, hybrid police cars, and start-stop technology for waste trucks.

DCAS has also installed telematics on 23,000 fleet units so far. Among many benefits, these tracking units can provide alerts of unneeded idling.

Idling is against the law in NYC. Vehicles may not idle over 3 minutes in general or 1 minute near a school or hospital. As part of today's announcement, Mayor de Blasio and DEP Commissioner Vincent Sapienza encouraged all New Yorkers to report illegal idling through 311 or to file complaints online. There is even a financial reward program available.



Idle Local Law

§2. Section 24-163 of the administrative code of the city of New York is amended by adding new subdivisions f and g to read as follows:

(f) No person shall cause or permit the engine of a motor vehicle, other than a legally authorized emergency motor vehicle, to idle for longer than one minute if such motor vehicle is adjacent, as determined by rule, to any public school under the jurisdiction of the New York city department of education or to any non-public school that provides educational instruction to students in any grade from pre-kindergarten to the twelfth grade level, while parking as defined in section one hundred twenty-nine of the vehicle and traffic law, standing as defined in section one hundred forty-five of the vehicle and traffic law, or stopping as defined in section one hundred forty-seven of the vehicle and traffic law, unless the engine is used to operate a loading, unloading or processing device, and provided that idling of an engine of a school

NYC DCAS
Citywide Administrative Services

Idle Alerts and Reporting through Telematics

Exceptions Summary Report

Created	Nov 18, 2020
From	Nov 16, 2020
To	Nov 18, 2020
Time Zone	America/New_York
Distance Unit	miles

Device	Device Group	Agency	Rule	First Incident
P8346	DPAR-MANHATTAN, CV Eligible, COLLECTION TRUCK, 6 YD, DIESEL/BIODIESEL, HEAVY DUTY	PARKS	Citywide Idling > 3 Minutes	Nov 16, 2020 7:59:37 AM
E54F005	DEP-Green Infrastructure, CV Eligible, GASOLINE, MEDIUM DUTY	DEP	Citywide Idling > 3 Minutes	Nov 16, 2020 5:15:09 AM
E54F005	DEP-Green Infrastructure, CV Eligible, GASOLINE, MEDIUM DUTY	DEP	Citywide Idling > 30 Minutes	Nov 17, 2020 5:49:13 AM
DCAS4077	DCAS Facilities, Non-Commuter, TRUCK, MISC, DIESEL/BIODIESEL, HEAVY DUTY	DCAS	Citywide Idling > 3 Minutes	Nov 18, 2020 7:51:55 AM
DCAS4077	DCAS Facilities, Non-Commuter, TRUCK, MISC, DIESEL/BIODIESEL, HEAVY DUTY	DCAS	Citywide Idling > 30 Minutes	Nov 18, 2020 7:51:55 AM
NYC027	x NYC Fleet x, CV Eligible, CROSSOVER, ELECTRIC, LIGHT DUTY	NYC FLEET	Citywide Idling > 3 Minutes	Nov 16, 2020 5:44:47 AM
NYC049	x NYC Fleet x, Commuter, CROSSOVER, V2V, ELECTRIC, LIGHT DUTY	NYC FLEET	Citywide Idling > 3 Minutes	Nov 16, 2020 7:09:56 AM
NYC049	x NYC Fleet x, Commuter, CROSSOVER, V2V, ELECTRIC, LIGHT DUTY	NYC FLEET	Citywide Idling > 30 Minutes	Nov 16, 2020 1:54:09 PM
CA151	DCA Brooklyn Division, CV Eligible, SEDAN, ELECTRIC/GAS HYBRID, LIGHT DUTY	DCA	Citywide Idling > 3 Minutes	Nov 16, 2020 8:18:18 AM
DCAS2732	DCAS Administration, CV Eligible, UTILITY TRUCK, DIESEL/BIODIESEL, HEAVY DUTY	DCAS	Citywide Idling > 3 Minutes	Nov 16, 2020 8:56:49 AM
CA46	DCA Petroleum Division, CV Eligible, PICKUP, GASOLINE, MEDIUM DUTY	DCA	Citywide Idling > 3 Minutes	Nov 16, 2020 9:16:14 AM
CA46	DCA Petroleum Division, CV Eligible, PICKUP, GASOLINE, MEDIUM DUTY	DCA	Citywide Idling > 30 Minutes	Nov 16, 2020 12:20:50 PM
DCAS3534	DCAS Administration, Non-Commuter, PICKUP, GASOLINE, MEDIUM DUTY	DCAS	Citywide Idling > 3 Minutes	Nov 18, 2020 11:39:05 AM

NYC DCAS
Citywide Administrative Services

APUs for Ambulances

NYC DCAS
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Start-Stop for Sanitation Trucks

NYC DCAS
Citywide Administrative Services

Hybrid Vehicles

NYC DCAS
Citywide Administrative Services

Bill de Blasio, Mayor
Lisette Camilo, Commissioner
Keith T. Kerman, Deputy Commissioner
and Chief Fleet Officer

NYC Fleet Newsletter

July 15, 2020 - Issue 312

Every New NYPD Police Car Is an Electric Hybrid in FY20

By: Keith Kerman

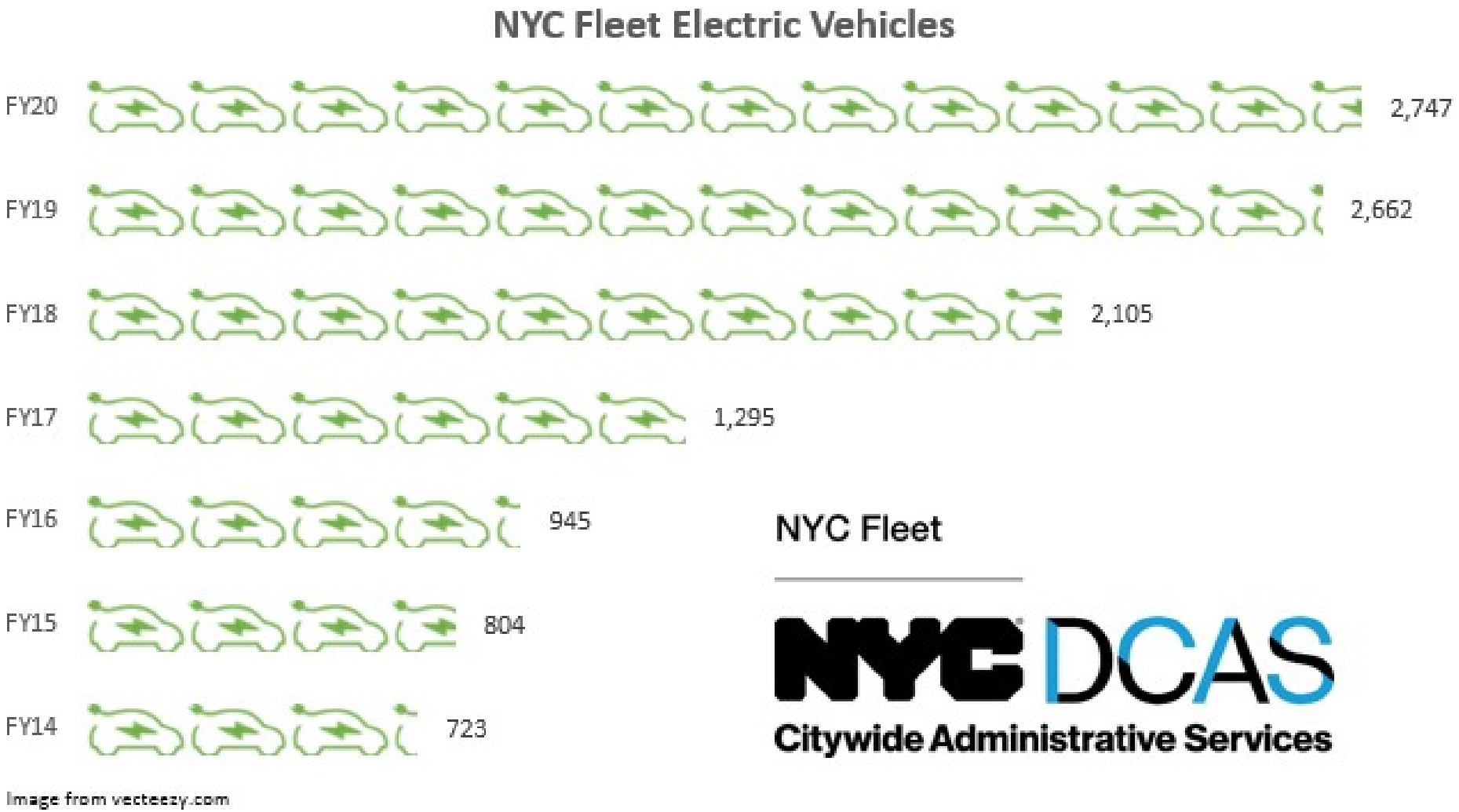
The City we love is enduring extraordinary challenges on many fronts. While these pressing concerns occupy all of our attention, we also want to make and recognize progress wherever we can.

Last summer, NYPD and DCAS announced that NYPD would be transitioning to all hybrid police cars. This transition is a critical component of our NYC Clean Fleet Plan to reduce fuel use 50% by 2025. You can read more about the transition here.

With Fiscal Year 20 now behind us, we can report that every new police car and utility procured this year was in fact hybrid. NYPD received 409 new hybrid police cars, with 374 hybrid sedan Ford Responders and 35 Ford Hybrid Utility Interceptors and Escapes. This is the first time NYPD has procured an entire class of hybrid police cars. Of the 534 total fleet units received by NYPD in FY20, 81% will use some type of fleet alternative, either hybrid-electric or biofuels. The remaining units include police motorcycles, a disabilities accessible mini-van, SWAT trucks, and general support trucks.

NYC DCAS
Citywide Administrative Services

Transition to an All-Electric Fleet



NYC Fleet

NYC DCAS
Citywide Administrative Services

NYC DCAS
Citywide Administrative Services

Mayoral Executive Order 53, 2020

Section 2. Clean Fleet Design and Electrification. The Department of Citywide Administrative Services (DCAS) and NYC Fleet will issue, implement and update a Clean Fleet Transition Plan (CFTP). This plan will be updated at least every two years. The plan will outline alternative fuel, fuel efficiency, and electrification requirements for all City fleet units by type. The plan will also review fuel efficiency and emissions reductions outfitting that is implemented for specific fleet segments only and/or being tested. As part of the plan, the City will report on electrification and charging options for each class of fleet vehicle. The plan will include a schedule for adoption of cleaner vehicles and technologies which will lead to a fully-electric, carbon-neutral fleet by 2040. In addition to City fleet agencies, DCAS will consult with private, non-profit and other public fleets that operate in NYC on this plan. The plan will include a section discussing options for requiring and/or encouraging adoption of these clean fleet improvements with the private fleets the City contracts and regulates. The first CFTP plan aimed at both public and private fleets will be published by January 1, 2021.

NYC DCAS
Citywide Administrative Services

Fully Electric Sanitation

NYC DCAS
Citywide Administrative Services

All Electric Policing

NYC DCAS
Citywide Administrative Services

Reducing Fuel Use

VEHICLE FLEETS AND MAINTENANCE

	Actual		Target	
INDICATORS	FY19	FY20	FY20	FY21
Total Fleet Size	30,755	30,502	30,500	30,250
- Light Duty	13,153	12,703	12,900	12,600
- Medium Duty	4,627	4,628	4,850	4,600
- Heavy Duty	7,568	7,546	7,450	7,500
- Other Vehicles	5,407	5,625	5,300	5,550
Vehicle in-service rate (%)	91%	91%	92%	92%
Daily fleet in-service targets achieved (%)	96%	98%	98%	98%
Purchased vehicles compliant with Local Law 38 (%)	100%	100%	99%	99%
Alternative fuel vehicles	18,942	19,100	19,500	20,000
Alternative fuel vehicles in City fleet (%)	63%	65%	65%	68%
Electric vehicles	2,662	2,747	3,000	3,250
- On-road electric vehicles	2,113	2,174	2,400	2,650
- Off-road electric vehicles	549	573	600	600
Vehicle fuel used (gallons)	28,905,781	26,756,419	28,500,000	28,000,000

NYC DCAS
Citywide Administrative Services

EV Future

NYC DCAS
Citywide Administrative Services

Contact

For more information, go to the NYC Fleet website:
http://www.nyc.gov/html/dcas/html/employees/fleet.shtml

Keith Kerman
Chief Fleet Officer
New York City
Deputy Commissioner,
Department of Citywide Administrative Services

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NYC DCAS
Citywide Administrative Services

DCAS

THANK YOU

NYC DCAS
Citywide Administrative Services

NC STATE UNIVERSITY

SUSTAINABLE FLEET TECHNOLOGY

VIRTUAL CONFERENCE 2020

Session #15: Idle Reduction an Easy Win

December 02, 2020

NC CLEAN ENERGY TECHNOLOGY CENTER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION