



**SMART**  
**EMISSIONS REDUCER**  
GO GREEN WITH THE SAME MACHINE





*"We understand the relationship between people, planet and profit; and that you don't have to sacrifice one to benefit the other. Innovation has always been key in balancing benefit for all three."*

Board of Directors  
Extreme Energy Solutions

## Smart Emissions Reducer

Designed to address harmful, toxic vehicle engine emissions at the source of the problem - uncombusted fuel and acidic blow-by on the production side of the engine while increasing engine efficiency and fuel economy for most gasoline and diesel powered engines.

A simple solution to a very sophisticated challenge: setting the stage for a greener tomorrow.

Since the invention of the SMART Emissions Reducer, we have been able to quantify the positive impact on the environment, on engine efficiencies, and on the vehicle owners who will save thousands of dollars during its life span.

The SER technology is our answer in helping the industry set new standards without compromising performance or value.

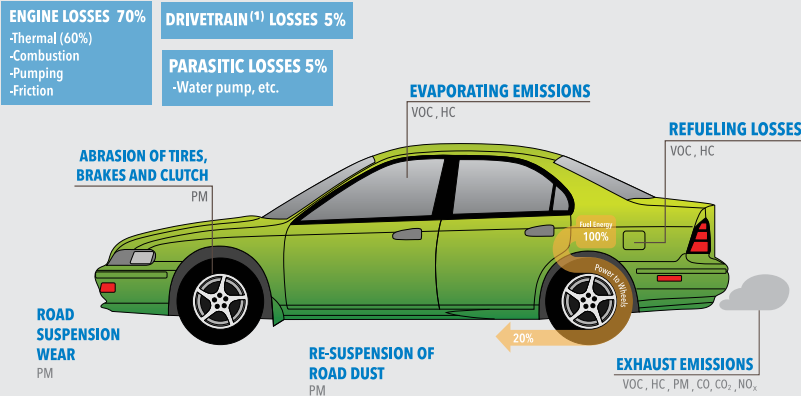
Imagine the impact on people, planet, and profit, if we could find a way to reduce harmful output of engine emissions and increase efficiency effectively?



The SMART Emissions Reducer solves the problem. Lab tested and proven in the field, it has created the most affordable measure to address those environmental concerns.

# Vehicle Emissions and Efficiency

Fossil fuel powered road transport represents the most significant source of transport related air pollution. Each vehicle releases pollutants from a number of sources.



Rolling Resistance 5%  
Wind Resistance 10%  
Braking 5%

(1) The drivetrain of a motor vehicle is the group of components that deliver power to the driving wheels.

This includes the transmission, the axles and the wheels.

HC Hydrocarbons; VOC Volatile Organic Compound; PM Particulate Matter; CO Carbon monoxide; CO<sub>2</sub> Carbon Dioxide; NO<sub>x</sub> Nitrogen oxides.

Source: EEA Report - Explaining road transport emissions - a non-technical guide (2016)

**65%** Reduction in total hydrocarbons

Tested in 2012 at Rousch Laboratories, Livonia, MI

## Lab Tested:

SMART Emissions Reducer has been tested by a number of third parties, putting the device through a battery of protocols proving its form and functionality.

\*Complete test reports available upon request.



**65% reduction** in total hydrocarbons. Gasoline testing.

Rousch Industries



**63.3% reduction** in carbon monoxide. Diesel testing.

Keshi Group



**31 compounds** show a molecular change.

Free-Col Labs

## Field Proven:

SMART Emissions Reducer successfully tested in the field as well as real world conditions, thus demonstrating how the SER can serve a number of vehicle fleets with diverse engine categories.



**42.8% reduction**  
in particulate matter.  
Diesel testing.

Winnebago Cty Hwy Dept., IL



**58.9% reduction**  
in total hydrocarbons.  
Gasoline testing.

City of Rockford, IL

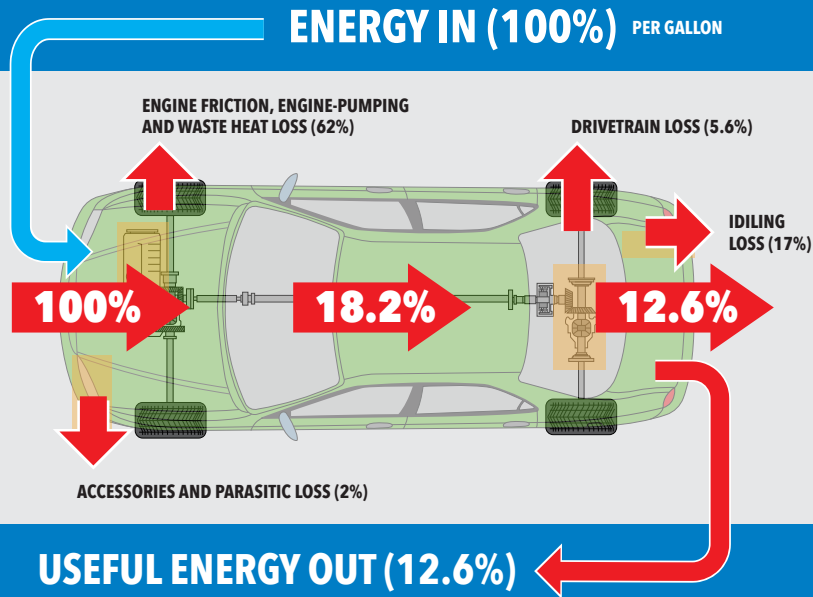


**72% reduction**  
in emissions opacity.  
Diesel testing.

Go-Green, Inc.



# Paths of Energy and Loss



Up to **7%** Better MPG

Tested in 2012 at Roush Laboratories, Livonia, MI

## Lab Tested:

SMART Emissions Reducer has been tested by third party laboratories to measure its influence on engine efficiency and return on investment.



Up to 7.23 increase in MPG.

Roush Industries



Up to 2.5% increase in fuel economy.

Keshi Group



32 compounds show an elevated energy level change.

Free-Col Labs



## Field Proven:

SMART Emissions Reducer took to the streets and was tested in 30, 60 and 90 day intervals in real world conditions, under varying conditions and engine packages; proving ROI.



**10.3% increase**  
in fuel economy.  
Gasoline testing.

Winnebago Cty Hwy Dept., IL



**10% increase**  
in fuel economy.  
Diesel testing.

Go-Green, Inc.



**ROI on purchase**  
of devices.  
6 months.

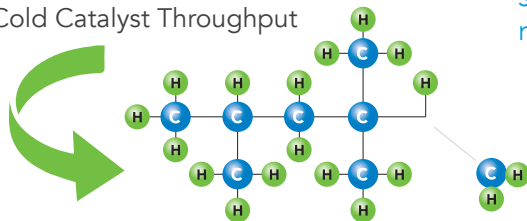
City of Rockford, IL

# The science behind the SER

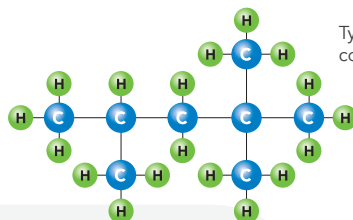
The SMART Emissions Reducer works by making electromechanical changes to hydrocarbon molecules.

This is accomplished by using a cold catalyst system. Dissimilar metals are used to change the electron flow and break down Hydrocarbon chains.

Cold Catalyst Throughput



Composition forming free radicals



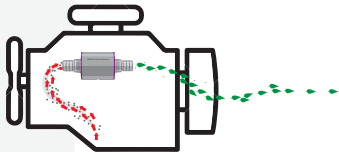
Typical unaltered gasoline composition C<sub>8</sub>H<sub>18</sub>

Carbon atoms, more than other atoms, want to readily attach to other atoms. When released they form their molecular state, they become free radicals, searching to form a new molecule.

Hydrogen is the most common atom. Hydrogen is attracted to other atoms primarily their positive fields to combine in a molecular state. Such as H<sub>2</sub>O, or in our case C<sub>8</sub>H<sub>18</sub>. Gasoline is an 8 chain molecule, while crude oil is a 5-30 chain.



Crankcase emissions are somewhere in between, with extra CO, H<sub>2</sub>O, and Hydrogen atoms to make a gaseous state. This “heavy” mixture is run through the SMART Emissions Reducer. This cold catalytic process breaks up the HC chain and deforms the orbit of the electrons in the hydrocarbon molecules.



We are now dealing with a composition that will more readily burn with oxygen. The burn rate is increased, making for a more efficient engine. This is why many installations show an increase in mileage since the fuel mixture and crankcase emissions are burned more efficiently. We see a drop in tailpipe emissions as well.

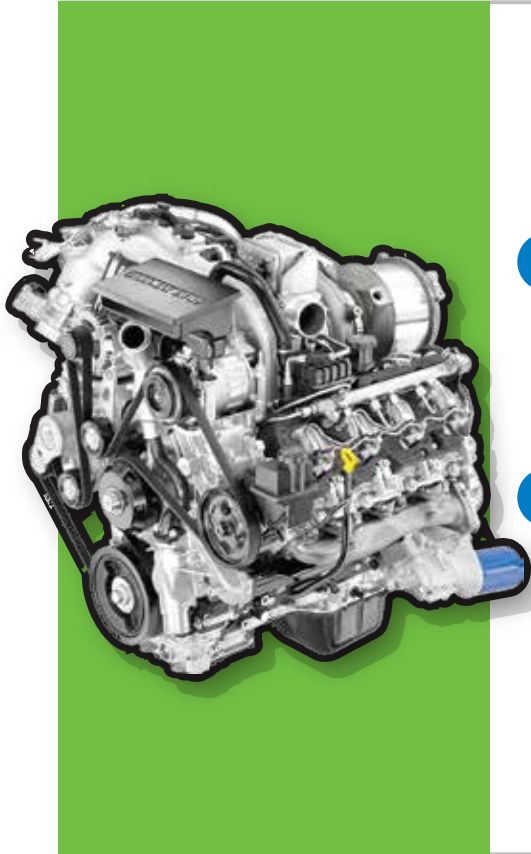
The science behind SMART Emissions Reducer has proven out, on a molecular level, when the device was tested by FreeCol Labs, located in Meadville, PA. Protocols were designed to test the micro-nano level “behind the science” using a mass spectrometer/gas chromatograph for both devices on gasoline and diesel engines.



Tests revealed the SER has major influence on engine hydrocarbons, exhaust gases, acidic by-products, and the device assists in thermo catalytic cracking of these elements, thus improving engine efficiency.

\* Full test reports available upon request.

# How it works



## Question

Why does today's engine need a Smart Emissions Reducer?

## Answer

- 1 As the engine rotates the crankshaft splashes through the oil to provide lubrication to the lower section of the cylinder walls, but it also creates a mist of oil that mixes with the combustion gases that have slipped by the piston rings.
- 2 The misted oil combines with these combustion gases called "blow-by" which contains up to 42 different types of hydro-carbon compounds.

As an analogy, let's consider these compounds as being 42 individual sheets of paper.

If these 42 sheets were placed into a fire as a solid mass it would almost smother the fire, take longer to burn, and would not burn efficiently.

- 3 These mixture of gases are continuously drawn by vacuum via the Positive Crankcase Ventilation (PCV) Valve into the intake charge where they are mixed with air & fuel in an attempt to reduce emissions.
- 4 Unfortunately, mixing these heavy HC blow-by gases with the intake charge reduces the efficiency of the combustion process, and causes carbon to build up around the valves as well as the combustion area thereby reducing fuel efficiency along with fuel economy.
- 5 However, if these hydro-carbon compounds are fed into the fire as an ionized (or even fractured) charge, each of these smaller, ionized bundles of hydro-carbons would burn more efficiently.
- 6 This is accomplished because the SER functions as a low temperature catalyst system breaking down the heavy ends of the blow-by gases into a variety of lighter end hydrocarbons.
- 7 When these light end hydrocarbons are combined with the air and fuel, it promotes a more efficient burn with less harmful emissions.
- 8 This results in improved fuel economy along with reducing tailpipe emissions. Over time, the SER will decarbonize the engine, extending its overall mechanical life.

SMART Emissions Reducer is ready for factory installation in both gasoline and diesel powered engines. Installations performed during assembly line production takes only minutes and Extreme Energy Solutions will code every device installed as required by the engine or vehicle manufacturer.

Incorporation of SER into engine and vehicle packages will assist manufacturers to achieve the following:

- Lesser compliance penalties and gas guzzler tax in relation to CAFE standards
- Lesser compliance penalties and pollution tax in relation to GHG standards
- Green engine packages and vehicle fleet lineup without major R&D investment
- Extend consumer-driven, demanded engines, and vehicle production cycles
- Lesser penalties and taxes passed to consumer through lower MSRP
- Target eco-boomer consumer generation and build brand value
- Maximize cost savings to bottom line for manufacturers
- Re-allocation of resources to long-term R&D product strategy plans





## **Major Benefit**

The SER is an affordable option for engine or vehicle manufacturers in addressing Corporate Average Fuel Economy (CAFE) and Green House Gas Emission Standards (GHG). In some cases has proven to surpass benchmarks.

SMART Emissions Reducer can be applied as an aftermarket retrofit technology for both gasoline and diesel engines.

## Vehicles

Cars  
Light Duty Trucks  
Buses  
Semi's

## Off-Road

Heavy Duty  
Equipment  
Rail  
Marine

## Other

Agriculture  
Generators

The SER has been proven through installations in a number of commercial, government and taxi cab fleets situations around the world.







SMART Emissions Reducer can be installed in the field, at the fleet's location, or during downtime when fleet vehicles are not in use.

Each fleet client receives:

- Complete technical support
- 30-60-90 day benchmark emission testing
- Service Training
- Historical case studies with free ROI analysis
- Proven lab results and statistical analysis

# SER around the world



# SMART Emissions Reducer makes a positive impact around the world



## Labs/Schools of Thought

- A. Roush Industries - Latoria, MI
- B. Keshi Group - Changzhou, China
- C. FreeCol Labs - Meadville, PA
- D. NYC Taxi & Limo Commission - NY
- E. CARB California Air Resources Board - CA
- F. NOVA Analytical Systems - Niagra Falls, NY
- G. Clarkson University - NY
- H. Jensen's Engine Technology - New Holland, PA



## Pilot Programs/Sales

- 1. NYC Taxi Cabs - NY
- 2. County of Winnebago Hwy Dept - Winnebago, IL
- 3. City of Rockford - Rockford, IL
- 4. NYCON - Queens, NY
- 5. Capital Aeroporter - Olympia, WA
- 6. Go Green, Inc. - Accokeek, MD
- 7. Kaiserman - Philadelphia, PA
- 8. NRS Trucking - North Bergen, NJ
- 9. Werner Bus - Phoenixville, PA
- 10. Ajax Turner - Nashville, TN
- 11. American Passenger - San Mateo, CA
- 12. Boone County School District - WV
- 13. Philadelphia Parking Authority - Philadelphia, PA
- 14. Reno Transport - Reno, NV
- 15. Rim of the World Bus - Lake Arrowhead, CA
- 16. NASCO - Amman, Jordan
- 17. CMCT - Amman, Jordan
- 18. State Owned Buses - Karnataka, India
- 19. GAEA - Los Angeles, CA
- 20. Progressive X Prize Comp - Mich Int'l Speedway
- 21. George's Salvage - Newton, NJ
- 22. Jimmy's Transportation - North Bergen, NJ

\*More commercial/government pilot program results available upon request

Along with our excellence in manufacturing, we back our product with superior support. Whether you are an engine/vehicle manufacturer or a fleet client, you will receive the following support and service:

- Technical training including: installation, servicing and field testing
- On-site manufacturer rep support
- Access to tutorial and how-to install video training
- Access to data/hub, test data, examples and former case studies
- 24 hour 1-800- toll free tech support hotline
- Troubleshooting and quality assurance



Extreme Energy Solution prides itself on its SMART Emissions Reducer manufacturing capability that is scalable to the demand of its industry partners.

Having the ability to abide by common industry standards allows for production of minimum orders to just-in-time ordering for high volume installation demands.

**LABS/  
Schools  
of  
Thought**

Roush Industries  
Keshi Group  
Free-Col Labs  
Clarkson University  
CARB

**Media**

Today in America w/Terry Bradshaw  
Cablevision's Neighborhood Journal  
Taxi Insider  
Discovery Channel  
Metro TV  
Natural Awakenings Magazine

**Industry/  
Organizational  
Awards**

Passaic Valley FOP #181 Company of the Year  
World Green Energy Symposium, NOVA Award  
People of Distinction Humanitarian Foundation  
New York City Taxi and Limousine Commission  
SAE Snow Mobile Fuel Economy Challenge





Motorsports Racing has always served Extreme Energy Solutions and the SMART Emissions Reducer as a proving ground and testing platform. The SER has seen plenty of action on the track and continues to make its statement on the dirt or the pavement.





Extreme Energy Solutions founded in 2008, as a third-party research consulting team, has transformed into a leader in the green industry, bringing to market products and technologies that reduce environmental impact and provide ROI.



Extreme Energy Solutions core founders derived from local/regional motorsports auto racing and transferred their expertise in engine performance, engine management, engineering/development, and competitive spirit from the proving grounds of the racing to green tech industry.

Extreme Energy Solutions executives and techs have been able to leverage their experience and knowledge capital by applying the competencies of strength, problem solving and endurance and coupling them with their elevated understanding engine management/performance while lending their expertise to solving industry challenges and providing green tech solutions to various audiences.

# Imagine

A simplistic technology that can have a huge impact on the environment, the people, the economy and the future.



SMART Emissions Reducer  
Providing incremental savings that benefit people, planet and profit - while changing the world one install at a time.

SMART Emissions Reducer powered by Extreme Energy Solutions, is the ideal partnership in advancing SER technology to market.

Extreme Energy Solutions specializes in products and technologies that benefit the environment and understands the process of taking them from concept to production then to market.

Extreme Energy Solutions invites the opportunity in deploying the SER technology

**Engine/Vehicle  
Manufacturers**

**Government/Commercial  
Fleets**

**Distribution/Marketing  
Partners**

Call Us Today: 800-EES-TEAM  
or Visit: [ExtremeEnergySolutions.net](http://ExtremeEnergySolutions.net)



by



**800-EES-TEAM**