#### NEW YORK CITY COUNCIL COMMITTEE on ENVIRONEMNTAL PROTECTION

Testimony of Mark Aronberg Assistant Commissioner New York City Fire Department

June 6, 2013

#### Introduction

Good afternoon Chairman Gennaro and Council Members. My name is Mark Aronberg, and I am the Assistant Commissioner for FDNY Fleet and Technical Services. Thank you for the opportunity to speak with you today regarding Intro 218-A, which requires the FDNY to conduct a year-long pilot to assess idle-reduction technology in our ambulances.

Specifically, the bill requires that FDNY Fleet develop and implement a pilot -for a period of not less than one year, starting no later than January 1, 2014 – "to
ascertain the benefits and reliability of utilizing a verified idle reduction technology in
city ambulances operated by and on behalf of the city of New York." The bill further
requires that this pilot:

employ verified idle reduction technology to power the ambulance's electrical load, diagnostic devices, ancillary electrical equipment, tools and temperature without the need to engage the engine or use another source of power.

Pursuant to the terms of the bill, the FDNY would submit a report to the Mayor and the City Council by July 1, 2015 detailing the findings of the pilot, including "data on actual reduction in vehicular emissions, and a cost-benefit analysis for equipping the entire ambulance fleet with verified idle reduction technology."

I am happy to report that we will be establishing a pilot program for an Auxiliary Power Unit (APU) in our ambulances. As defined by the bill, an APU is:

a device containing an engine certified by the United States environmental protection agency that supplies cooling, heating, and electrical power to trucks and other vehicles while the engine is turned off in order to reduce emissions from such vehicles.

The APU we plan to use will be powered by a lithium ion battery that is charged by shore power — an off-vehicle, stationary power source — the vehicle alternator and/or solar panels on the roof of the ambulance. The battery will be capable of powering all communications equipment as well as the heat and air conditioning required for both the front and rear of the ambulance without idling the vehicle's engine. The advantage of this

system is that, while the unit is sitting at its cross-street location waiting for an assignment, the solar panels will charge the battery. When the vehicle is running, the alternator will charge the battery, or if the vehicle is parked at a station it can be plugged into a shore line.

We are planning to pilot this system in the next group of ambulances we purchase, which we expect to arrive by September. If successful, we will seek funding to include the APUs in the ambulance specification for all ambulances.

While we are not opposed to legislation in this area, we think the approach should be assessed after the pilot's conclusion.

#### Conclusion

The FDNY has made significant progress with our green initiatives and procuring and maintaining an increasingly environmentally friendly fleet of ambulances. As you know, the FDNY is committed to the health and safety of New Yorkers. This includes doing our part to help improve the environment.

I would be happy to answer your questions at this time.

#### Committee on Environmental Protection Thursday, June 6th, 2013 1:00PM

Testimony of Keith Kerman
Deputy Commissioner & Chief Fleet Officer
Department of Citywide Administrative Services

Thank you Council Chairman Gennaro and members of the Committee on Environmental Protection for allowing us to testify today in relation to the proposed preconsidered Intros governing emissions and fuel economy for fleet units of the City and also contractors in areas such as waste services, sight-seeing, and school transport. My name is Keith Kerman, the City's Chief Fleet Officer and a Deputy Commissioner at DCAS. I'm joined today by Rocky DiRico, DSNY, Deputy Commissioner for Support Services; Mark Aronberg, Assistant Fire Commissioner for Fleet Services; Gerry Kelpin, Director of Air and Noise Policy and Enforcement at DEP, and other representatives from City agencies including DOT and DCAS are also here today.

As you know, New York City's fleet is the greenest in the nation. The City currently operates 5,562 hybrid or all electric units. The most common units are the Toyota Prius (2,570) and Ford Hybrid Fusion Sedans and Escape SUVs (1,806). Our hybrid fleet also includes 49 hybrid diesel-electric trucks, with 35 more on order. We operate one of the nation's largest fleets using these now proven technologies.

The City also operates 612 plug-in electric vehicles and equipment units, including 103 Chevrolet Volts and 293 electric carts, a majority of which are operated by NYC Parks. We recently registered contracts for the plug in electric Ford Focus EV and Nissan Leaf EV. As Mayor Bloomberg presented in the State of the City address, our first order of 50 plug-in electric vehicles from these new contracts is now arriving. To support these plug in units, the City currently operates 117 EV charging stations for NYC Fleet units. By the end of the year, we will have added at least 30 more charging stations at agencies including Sanitation, Fire, DEP, Parks, NYPD, and DCAS.

The New York City fleet is also a national leader in biodiesel use and has been working over the last eight years to introduce, test, train, promote, and expand the use of biodiesel in our complex and varied fleet.

New York City operates over 9,000 diesel fleet units and equipment pieces. All of these operate on ultra-low sulfur diesel as required by Local Law 39 of 2005. Currently, over 70% of diesel fuel used by the City fleet is also blended with biodiesel.

The City uses both B5, which is ultra low sulfur diesel blended with 5% pure biodiesel, and B20, which is ultra low sulfur diesel blended with 20% pure biodiesel. The City does not use B10 blends currently. By the end of the year, we expect that over 90% of the diesel fuel used by the City fleet will be blended with biodiesel. In addition, in 2013, Fleet units from Parks, DSNY, DEP and DOT are transitioning to B20 use during the warmer weather months. As we speak, over 80% of Sanitation and Parks trucks are operating on B20.

NYC Fleet has partnered closely on these efforts with the National Biodiesel Board (NBB) which recognized the City nationally in 2011 with its Influence Award for biodiesel leadership. Just two weeks ago, NBB helped train 200 City mechanics in biodiesel equipment maintenance. Each mechanic will be able to attain a National Institute for Automotive Service Excellence (ASE) certification in this area.

In addition to using biodiesel, the City is cleaning emissions directly at the tailpipe. Since the passing of the current fleet local laws in 2005, the City has retrofitted over 2,500 diesel fleet vehicles with diesel emissions reducing equipment.

In total, 41% of the City fleet, over 10,000 vehicles, employs at least one type of alternative fuel or emissions reducing technology. Thanks to these investments, from FY11 to FY12 alone, the City fleet reduced total fuel use by 2.1 million gallons or 7%, from 30 million total gallons to under 28 million gallons. Since 2002, the City has invested \$400 million in sustainable fleet equipment and fuel technology.

The existing Local Laws governing fleet and fuel procurement have been critical drivers of the City's success and leadership in fleet sustainability, and we appreciate the opportunity to work with the City Council to further advance and strengthen these laws. As we do, we want to ensure that the City maintains a reliable and well-functioning fleet serving the public in essential areas including

waste removal, snow plowing, public space and beach maintenance, waste water and sewer operations, and street paving.

At this time, I will address some specific issues in the proposed legislation.

<u>Biodiesel</u>: The City supports a year round B5 standard for the New York City non-emergency on-road fleet and, as discussed, we are actively working now to achieve this.

The City does have some concerns regarding other aspects of the proposed biodiesel requirements and would like to further discuss these with the Council.

The City is currently working to expand B20 use for our non-emergency fleet during the warm weather months. Parks and Sanitation have extensive experience with B20 use during the warm weather months. The City Fleet, however, has more limited experience operationally with blends above B5 during the colder months. There can be cold flow issues with biodiesel use, especially at higher blends.

In addition, while most vehicle manufacturers warranty and support the use of biodiesel blends at B5 or B20, some still do not. Any biodiesel mandate must maintain a waiver option, consistent with previous waiver provisions in these local laws, for manufacturer or operational issues with biodiesel in consideration of our extremely diverse and complex fleet in terms of makes, ages, types and duty cycles. In addition, this waiver option should also be available in cases of disruptions to biodiesel fuel supplies based on market changes or major storm or emergency events.

As I mentioned, the City fleet has been developing its biodiesel program for over 8 years. We have involved our vehicle manufacturers in this effort, reviewed equipment specifications for compatibility, implemented permitting and variance requirements for our in-house fueling tanks with the Fire Department, developed and bid fuel supply contracts for biodiesel, trained our staff, assessed cost impacts, and tested the fuel over years with the makes, types and models of units used in our fleet.

The biodiesel mandate as currently proposed would equally impact some private fleets that are in contract or permitted by the City. Biodiesel blends are not commonly available at retail fuel stations. The City fleet fuels all biodiesel at City owned fuel sites. These private fleets may not have experience or equipment

compatibility with biodiesel or a current ability to estimate cost impacts of biodiesel use. We recommend that the viability of biodiesel use be considered and assessed separately for these private fleets.

Overall, the City is proud of its leadership in biodiesel for the City fleet and we look forward to developing legislation in this area with you.

<u>Diesel emissions control equipment:</u> As mentioned prior, the City in compliance with Local Law 39 has implemented an extensive program to retrofit or replace existing diesel equipment.

The non-emergency diesel on road equipment fleet is approximately 5,600 units. Of these, we estimate there are approximately 4,300 units or 77% that employ level 4 strategies as outlined in Local Law 39 and as would be required by the revised law. There are 1,300 units that either employ Level 1, 2 or 3 emissions strategies or are awaiting imminent replacement. We estimate that 800 of these units can be replaced, or retrofitted, through existing fleet acquisition and contracting plans by 2017.

Of the remaining City fleet units, there are many that can't be viably retrofitted with Level 4 technology, were authorized to implement Level 1 to 3 strategies in accordance with Local Law 39, and yet have well over 4 years of useful life remaining. Many specialized trucks in the City are actively used for 11 to 15 years. Many of these are highly specialized and expensive units and will require years and extensive work to specify, contract, and manufacture.

The implementation goals in the proposed law should be revised from 100% to 90% of the non-emergency on road diesel City fleet by 2017 to enable the City needed flexibility to implement the additional requirements without undue cost, contracting, and operational impacts in specialized areas of the City fleet. The City should be allowed to implement the existing Local Law 39 requirements in relation to the remaining 10% of the on-road diesel equipment fleet.

In addition, as with our discussion of biodiesel, we believe private fleets governed by the current local laws should not be included in these proposed changes, and that a separate review of the cost and operational impacts to those fleets should take place. Improving fuel economy for light duty vehicles: The City fleet has consistently met the fuel economy targets established in Local Law 38 of 2005 as governs newly purchased light duty vehicles. We also support the proposed and revised targets for future years. With the expanded use of plug in electric vehicles citywide, we are confident we can meet the newly proposed targets as proposed in the legislation.

Reporting on use based fuel economy for light duty vehicles: The City is currently undertaking a major upgrade to its fleet and fuel management systems. This includes an upgrade to the City's Fleet Maintenance Control Management System (MCMS), which tracks fleet assets and usage. The City is also introducing automated fuel tracking at its 200 fleet fueling stations, working from older systems already in place at Police and Parks.

The contracts for the fleet and fuel systems are registered and active and the systems are expected to be fully operational by June 30, 2014. The current fleet systems do not have the capacity to reliably produce the reports required in the current draft law. To enable accurate reporting, we require the timetables outlined in this new law to be changed with July 1, 2015 set as the goal date to establish a fleet use baseline, and July 1, 2016 be established as the first year to produce comparative reports.

Thank you again for allowing us to comment on the proposed changes to these fleet local laws. Working together, we are setting the standard for fleet sustainability and we see a great opportunity to advance these efforts with you. Let me now introduce my colleague Fire Assistant Commissioner Mark Aronberg.

# Testimony of Daniel Gianfalla, President of United Metro Energy Corporation Before the New York City Council Environmental Protection Committee June 6, 2013

Good morning Chairman Gennaro and members of the Environmental Protection Committee. I'm Daniel Gianfalla, President of United Metro Energy Corporation. United Metro Energy Corp. supplies and delivers gasoline, ultra-low sulfur diesel fuel, biodiesel, bioheat, heating oil, and natural gas throughout the New York Metropolitan Area from terminals in Greenpoint, Brooklyn; Riverhead, Long Island; and Calverton, Long Island.

We strongly support the Local Law to amend the administrative code of the city of New York, in relation to reducing the emissions of pollutants from vehicles used by or on behalf of the city of New York. This bill, which calls for biodiesel to be used in the City diesel vehicle fleet, would go a long way towards improving air quality across the region by reducing particulate matter that causes asthma and carbon emissions that contribute to climate change.

This legislation is a logical next step for New York City's vehicle fleet because the City has already successfully been using a variety of biodiesel blends in the Parks Department and Department of Sanitation vehicles. United Metro has a great deal of experience with its own fleet in this regard. Currently, all of United Metro's trucks are fueled with Biomax™, our enhanced, custom blended biodiesel and have been since 2006. Our 55-truck fleet uses B20 Biomax™ for eight months and B5/B10 Biomax™ for four months in the winter. By solely using these two grades of biodiesel, United Metro is able to reduce its carbon output by 750,000 pounds annually.

In severe winter weather, a B5/B10 blend allows our vehicles to operate seamlessly. In the State of Minnesota for example, diesel fuel sold October through March is B5 while the rest of the year the State has a B10 mandate in place. We believe that flexibility allowing for a variation in seasonal grades would ensure that a transition to biodiesel blended fuel in City fleet operations will be seamless.

This legislation not only addresses critical environmental concerns but also helps promote job-producing and economy-stimulating green industries such as the home-grown biodiesel industry.

United Metro Energy Corp. is in the late stages of building one of the largest advanced biodiesel production and blending facilities in North America, with a capacity up to 110 million gallons per year, right here in Brooklyn. The facility, which would be the only one of its kind in New York City, will be capable of accepting recycled restaurant grease, vegetable-oil-based feedstock, algae and other advanced feedstocks and then processing it into various blends of biodiesel for distribution in the New York City region.

We would also suggest that the City Council look to require biodiesel in New York City's ferry fleet. United Metro will soon be opening the City's first public biodiesel marine fueling facility for waterborne vessels such as the growing fleet of water taxis and other ferries. The new dock, to be opened in the coming weeks adjacent to our Greenpoint facility, will provide custom blended biodiesel and Ultra Low Sulfur Diesel, to commercial marine vessels.

We support and thank this Committee for your efforts in passing legislation that promotes clean, green biofuels, as well as sensible clean-air policies.

Thank you for your time today.



#### New York State Petroleum Council

A Division of API

Cathy Ann Kenny Associate Director

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#### Statement of Cathy Ann Kenny,

Associate Director, New York State Petroleum Council

#### before

The New York City Council Committee on Environmental Protection

1:00 PM—Committee Hearing Room, 250 Broadway, New York, New York

on

Preconsidered Int. in relation to reducing emissions of pollutants from vehicles used by or on behalf of the City of New York

Good afternoon Chairman Gennaro and members of the Committee. I am Cathy Kenny,

Associate Director of the New York City office of the New York State Petroleum Council. The

Petroleum Council is a trade association that represents major oil and gas companies doing

business in New York. We are a division of the Washington, DC-based American Petroleum

Institute (API). Our members include Amerada Hess Corporation, BP America, Inc., Conoco

Phillips, ExxonMobil Corporation and Shell Oil Company.

We appreciate the opportunity to comment on the Pre-Considered Introduction relative to requiring City agency vehicles to use biodiesel blends in increasing amounts starting on July 1, 2014. My comments are brief and limited to three technical recommendations.

First, the definition of "Biodiesel" in the proposal refers only refers to ASTM D6751 which is a reference to biodiesel as a mono-alkyl ester. While this is the most common reference, another type of biodiesel—renewable biodiesel—a non-ester biodiesel has not been included in the definition. Inasmuch as EPA includes this "green diesel" in its Renewable Fuel Standard we think it is appropriate to include it in the fuel choices allowed by this introduction. EPA specifically uses the term to include potential future fuels. Renewable biodiesel is also eligible for the dollar-a-gallon blender's tax credit. At B5 or less the ASTM standard is D975 and at blends B6 to B20 the standard is D7467.

In addition, with respect to the definition, and this is a minor issue, the bill refers to the "ASTM D6751-09a." It is preferable to refer to ASTM D6751 without the ".09a" since this ".09a" is a reference to the year of the amendments. By a more general reference, that is, just to ASTM

D6751, you would allow for any updates to the ASTM D6751 standard without having to amend the local law.

Second, the bill calls for specific amounts of biodiesel blends and indicates the amount of biodiesel "by weight." This reference should be by volume since the meter used to dispense the fuel is a volumetric one.

Third, the bill does not give the Commissioner authority to issue waivers as other provisions of this section do, namely §24-163.4 e regarding the City's use of low sulfur diesel fuel. We would like to recommend that a waiver provision be included to provide flexibility especially during supply interruptions that typically occur during adverse weather conditions. Our experience with Hurricane Sandy when the industry had to seek various federal, state, and local fuel waivers has demonstrated that the ability to act quickly is extremely important to move product where it is needed.

Finally, some engine manufacturers void warranties at certain biodiesel levels—particularly with levels above B20. With this in mind, language that allows for the requirement to be waived in instances where the manufacturer's warranty would be voided may be advisable.

Thank you.



National Biodiesel Board 605 Clark Avenue P.O. Box 104898 Jefferson City, Missouri 65110 (573) 635-3893 phone

### Testimony of Shelby Neal Submitted to the New York City Council Committee on Environmental Protection June 6, 2013, 1 p.m.

Good morning Chairman Gennaro and members of the committee. I appreciate the opportunity to testify before you today on an important piece of legislation that would largely codify in law existing administrative policies related to use of biodiesel in transportation and space heating applications.

My name is Shelby Neal. I serve as the Director of State Governmental Affairs for the National Biodiesel Board (NBB). The NBB is the trade association that represents the nation's biodiesel production facilities, marketers, and feedstock producers. The association serves as the coordinating body for research and development in the United States.

As you know, biodiesel is a diesel replacement fuel that has been designated as an "Advanced Biofuel" under the federal Renewable Fuels Standard (RFS2) program. The fuel is made from agricultural oils, fats, and waste greases and is refined to meet a specific commercial fuel definition and specification. Biodiesel is one of the best tested alternative fuels in the country and the only alternative fuel to meet all of the testing requirements of the 1990 amendments to the Clean Air Act. It reduces almost all categories of emissions by at least 50 percent. There are currently more than 170 biodiesel plants in the U.S. with a combined production capacity of more than 3 billion gallons.

Biodiesel is primarily marketed as a five percent (B5) blending component with conventional diesel fuel, but is often used in concentrations up to twenty percent (B20). It is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel marketers.

The City of New York has been a leader on clean, alternative fuels and biodiesel issues for years. The City passed and implemented the first citywide uniform standard for Bioheat. In addition, even previous to this policy, the City was the largest municipal user of biodiesel with most vehicles and buildings using low to mid-level biodiesel blends year round. New York City has been a pioneer, leading the way for others. As an industry comprised of environmental entrepreneurs, we have deeply appreciated this leadership and the partnership that has developed between our industry and the City.

The National Biodiesel Board is pleased to support this legislation. While the City is fortunate to have an environmentally conscious City Council, Mayor, and professional staff, there is no guarantee that this will always be the case. As such, we believe codifying in law what are largely existing City practices and policies offers substantial value.

That said, there are two issues that may benefit from further exploration.

First, blends of 20 percent biodiesel (B20) clearly can and are used successfully in cold weather climates from Montana to Maine. However, while B5 is a completely fungible diesel fuel with no material difference in cold flow properties relative to ULSD, B20 can freeze up to 10 degrees faster than the base petroleum fuel. This means some additional management steps would be necessary to utilize these higher blends in cold climates such as the City of New York. Whether these additional management steps would be practical to implement with a fleet the size of the City of New York may be a worthwhile topic of discussion. As a point of reference, it may be useful to review the statewide biodiesel requirement that has been implemented by Minnesota, a state which routinely sees temperatures as low as -35 degrees F in the wintertime. That policy requires B20 in the warm weather months and decreases to B5 in the cold weather months.

Second, we would advise consideration of a narrow exemption for certain specialized types of equipment and for severe market disruptions. On the first point, some equipment may not have been optimized for B20 blends by their respective company's design engineers. In our experience, this would be a very short list of models, but allowing the City to maintain flexibility in this area would seem reasonable. On the latter point, market disruptions, while rare, can occur due to extreme weather and other factors. We would recommend accounting for that potentiality in some way.

In conclusion, I would like to, once again, thank Chairman Gennaro for his leadership on environmental and public health issues. He has made, and continues to make, a major contribution to the development of the renewable, clean fuels industry. We are pleased and honored to be able to support his efforts and this legislation.



#### Written Testimony of Scott Hedderich Submitted to the New York City Council Committee on Environmental Protection June 6, 2013.

Chairman Gennaro and members of the Committee, thank you. I appreciate the opportunity to testify before you today.

My name is Scott Hedderich, I am Director of Corporate Affairs for Renewable Energy Group REG. Renewable Energy Group is a leading North American biodiesel producer with a nationwide distribution and logistics system. For more than a decade, REG has been a reliable supplier of biodiesel which meets or exceeds ASTM quality specifications. Utilizing an integrated value chain model, our company is focused on converting natural fats, oils and greases into advanced biofuels. REG currently has more than 225 million gallons of owned/operated annual production capacity at biorefineries across the country, as well as over 20 terminal locations including 3 in the New York metropolitan area.

I want to commend you, Chairman Gennaro, on the introduction of your legislation regarding emission reduction of pollutants from diesel engines through the use of biodiesel. Simply put, this is a great bill. While there may be some adjustments or fine tuning that might arise as part of the legislative process, this bill moves the city forward with a solid commitment to the environment, a commitment that also supports energy diversity, energy security, and energy independence.

I also want to thank Mayor Bloomberg and his Administration for their commitment to improving the environment of New York and for their aggressive adoption of the use of biodiesel as a strategy to reduce tail pipe emissions. The city of New York has shown tremendous leadership in this area; its leaders as well as the men and women involved in carrying out such programs should be strongly commended.

As the City Council is aware, biodiesel is a diesel replacement fuel that qualifies as an "Advanced Biofuel" under the federal Renewable Fuels Standard (RFS2) program. The fuel is made from agricultural oils, fats, and waste greases and is refined to meet a specific commercial fuel definition and specification. In order to qualify for the RFS2 all biodiesel must meet the ASTM specifications within D6751. Biodiesel is one of the best tested alternative fuels in the country and the only alternative fuel to meet all of the testing requirements of the 1990 amendments to the Clean Air Act<sup>1</sup>.

<sup>&</sup>lt;sup>1</sup> The U.S. EPA has indicated that biodiesel made from soybeans reduces greenhouse gas emissions by 57 percent compared to petroleum. Biodiesel made from waste raw materials (used cooking oil, animal fats)

As I indicated, New York has been a leader in proactively addressing the health and well being of its residents. The PlaNYC document is the embodiment of the Bloomberg Administration's leadership. The document, updated nearly 2 years ago, sets out a well reasoned and thoughtful agenda in a number of areas touching on the lives of New Yorkers. The use of biodiesel plays a significant role in the document's air quality section in meeting the City's goal of reducing PM2.5 emissions to acceptable levels as well as the its goal of reducing the green house gas emissions from government operations by 30% by 2017.

The legislation before the committee today is the logical next step in the City Council's efforts to implement portions of the PlaNYC document. While the City has already taken significant steps in utilizing significant blends of biodiesel in various parts of the city's diesel fleets – first utilizing B5 (and then higher blends) in the Department of Parks and Recreation and then more widely in other city fleets, and again the City should be strongly commended for this – it is important that these actions are codified so that New Yorkers will continue to benefit from the decrease in tail pipe emissions in the years to come. Future generations of New Yorkers deserve access to clean air and a healthy environment. In fact, as the PlaNYC document makes clear, a healthy environment is key to an economically vibrant and growing city.

Implementation of B5 fleet wide is a good first step and mimics actions in states like Minnesota, where B5 is required in all diesel fuel and where B10 use in summer months will likely begin next year, and Illinois where over 80% of the available diesel is B11 and can be up to B20 in the summer months. Implementation of B10 and in later years B20 is the next logical step and we are pleased the legislation moves in that direction.

I have mentioned the impact to the environment of New York, there is also an economic impact to the city. The U.S. biodiesel industry is looking to this market as a significant growth opportunity. The National Biodiesel Board is spending significant resources to educate consumers on the benefits of biodiesel and companies like ours are investing in long-term infrastructure to make biodiesel available year round at competitive prices. Future biodiesel economics are difficult to predict, just as the economics of other products in the energy sector, but looking back over the last two years biodiesel pricing has been favorable compared to oil.

In conclusion, I would like to reiterate our support for this legislation. I would also like thank Chairman Gennaro and the committee for allowing me to testify today, for his efforts in supporting biodiesel and bioheat.

is 86 percent better than petroleum. Biodiesel reduces carbon monoxide emissions by 45 percent and sulfur oxides by 98.5 percent. With respect to pollutants that directly affect human health issues such as respiratory illness and cancer, biodiesel reduces particulate matter emissions by 78.5 percent and hydrocarbons by 90 percent.

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