

Date: February 7, 2012

To: Honorable Chairman Joe A. Martinez
and Members, Board of County Commissioners

Agenda Item No. 3(A)(1)

From: Carlos A. Gimenez
Mayor

Resolution No. R-105-12

Subject: Public Works and Waste Management Department Authorization to Accept and Execute the EPA Clean Diesel Emerging Technologies Funding Assistance Program *Automated Hybrid Hydraulic Refuse Vehicle Project Application*

Recommendation

It is recommended that the Board of County Commissioners (Board) approve the attached resolution ratifying the Mayor's action to apply for, receive, and expend United States Environmental Protection Agency (EPA) FY 2011-12 Clean Diesel Emerging Technologies Funding Assistance Program grant funds in the amount of \$1.5 million for the Automated Hybrid Hydraulic Refuse Vehicle Project in the Public Works and Waste Management Department (PWWM).

Scope

The PWWM will manage and direct the use of grant funds for the *Automated Hybrid Hydraulic Refuse Vehicle Project* under the guidelines and requirements of the award, as deemed by EPA, to replace 15 Refuse Hauling Vehicles, with 15 new, Automated Hydraulic Hybrid Refuse Vehicles.

The trucks will utilize hybrid drive technology to achieve a 40-50 percent reduction in fuel consumption and emissions of particulate matter (PM), nitrogen oxide (NOx), hydrocarbons (HC), and carbon dioxide (CO₂). The vehicle is also designed to reduce brake wear, and improve drivability and overall productivity.

Fiscal Impact/Funding Source

The County requested \$1.5 million in EPA assistance for the purchase of the hybrid drive technology portion for 15 hybrid vehicles. The required local cost share match of 75 percent for the vehicle replacement project (\$3.75 million) is budgeted by the PWWM in the current fiscal year. Administration of the grant will be conducted by staff, at no additional cost, as a function of regular responsibilities.

Track Record/Monitor

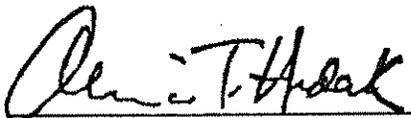
The PWWM will implement and manage project activities funded through the grant agreement. The PWWM will handle the disbursement and expenditure of grant funds, and manage programmatic and fiscal reporting in accordance with project reporting and auditing procedures stipulated by the EPA. The PWWM is committed to incorporating these new Automated Hybrid Hydraulic Vehicles into its garbage fleet, and will work closely with the vehicle manufacturers to achieve the projected long-term benefits of this project.

Background

The PWWM proposed a refuse vehicle replacement project through the Clean Diesel Emerging Technologies Program to address the EPA's National Programmatic Priorities to Maximize Public Health Benefits. The EPA's Strategic Objectives, also contain an

Environmental Justice responsibility to children and elderly residents; those most at risk of developing asthma, and other pulmonary diseases. As the population bounded by major highways, ports, and transportation hubs, continues to increase, so does their exposure to particulate matter caused by diesel exhaust. In an attempt to alleviate the environmental impact on degrading air quality, the proposed program will target routes serving areas disproportionately impacted by diesel emissions, which includes neighborhoods with a high percentage of disadvantaged and at-risk children and elderly residents, and others affected by respiratory illnesses and pulmonary diseases. Over time, reported incidents of asthma, chronic bronchitis, emphysema, and cardiovascular disease, all attributed to poor air quality, can be reduced.

The two-year grant award will support the Department's fleet upgrade using cleaner diesel hybrid vehicle technology. Currently, the PWWM has 6 Automated Hydraulic Hybrid Vehicles in operation. The Automated Hydraulic Hybrid Refuse Vehicles will be used for house-to-house curbside garbage collection. The new vehicles will have an average expected life of seven years and will perform the same function as the current garbage trucks. The current trucks will be retired, as required by the EPA, just prior to their initially scheduled retirement date. The implementation of this project would allow the Department to continue utilizing a new hybrid drive technology, and accelerate the planned conversion of the entire garbage fleet of 230 vehicles.


Deputy Mayor/County Manager

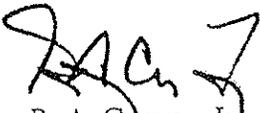


MEMORANDUM

(Revised)

TO: Honorable Chairman Joe A. Martinez
and Members, Board of County Commissioners

DATE: February 7, 2012

FROM: 
R. A. Cuevas, Jr.
County Attorney

SUBJECT: Agenda Item No. 3(A)(1)

Please note any items checked.

- "3-Day Rule" for committees applicable if raised
- 6 weeks required between first reading and public hearing
- 4 weeks notification to municipal officials required prior to public hearing
- Decreases revenues or increases expenditures without balancing budget
- Budget required
- Statement of fiscal impact required
- Ordinance creating a new board requires detailed County Manager's report for public hearing
- No committee review
- Applicable legislation requires more than a majority vote (i.e., 2/3's ____, 3/5's ____, unanimous ____) to approve
- Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 3(A)(1)
2-7-12

RESOLUTION NO. R-105-12

RESOLUTION RATIFYING THE MAYOR OR MAYOR'S DESIGNEE'S ACTION TO APPLY FOR, RECEIVE, AND EXPEND UNITED STATES ENVIRONMENTAL PROTECTION AGENCY FUNDS; AUTHORIZING THE MAYOR OR MAYOR'S DESIGNEE TO EXECUTE SUCH CONTRACTS, AGREEMENTS, MEMORANDA OF UNDERSTANDING, AND AMENDMENTS AFTER APPROVAL BY THE COUNTY ATTORNEY; AUTHORIZING THE MAYOR OR THE MAYOR'S DESIGNEE TO APPLY FOR, RECEIVE, AND EXPEND ADDITIONAL FUNDS THAT MAY BECOME AVAILABLE

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board ratifies the Mayor or Mayor's designee's action to apply for, receive, and expend United States Environmental Protection Agency FY 2011-12 Clean Diesel Emerging Technologies Funding Assistance Program grant funds in the amount of \$1,500,000; authorizes the Mayor or the Mayor's designee to execute such contracts, agreements, Memoranda of Understanding (MOU), and amendments, after approval by the County Attorney, as required by program guidelines; authorizes the Mayor or the Mayor's designee to apply for, receive, and expend additional funds that may become available; and authorizes the Mayor or the Mayor's designee to file and execute any amendments to the application; for and on behalf of the County; and to exercise amendments, modifications, renewal, cancellation, and termination clauses of any contracts and agreements, subject to the approval of the County Attorney's Office.

The foregoing resolution was offered by Commissioner **Sally A. Heyman** who moved its adoption. The motion was seconded by Commissioner **Barbara J. Jordan** and upon being put to a vote, the vote was as follows:

	Joe A. Martinez, Chairman	aye	
	Audrey M. Edmonson, Vice Chairwoman	aye	
Bruno A. Barreiro	aye	Lynda Bell	aye
Esteban L. Bovo, Jr.	aye	Jose "Pepe" Diaz	aye
Sally A. Heyman	aye	Barbara J. Jordan	aye
Jean Monestime	aye	Dennis C. Moss	aye
Rebeca Sosa	aye	Sen. Javier D. Souto	absent
Xavier L. Suarez	aye		

The Chairperson thereupon declared the resolution duly passed and adopted this 7th day of February, 2012. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK



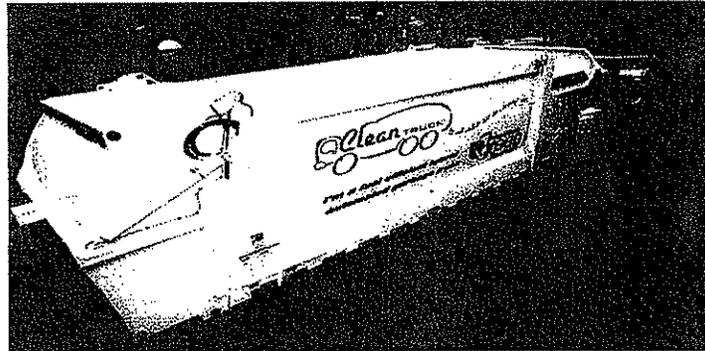
By: **Christopher Agrippa**
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

Thomas P. Abbott

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**Miami-Dade County Department of Solid Waste Management
Automated Hybrid Hydraulic Refuse Vehicle Project
EPA Clean Diesel Emerging Technologies Funding Assistance Program – EPA-OAR-OTAQ-11-02
FINAL – June 24, 2011**



Project Title: Miami-Dade County Solid Waste Management Automated Hybrid Hydraulic Refuse Vehicle Project

Applicant Information

Applicant: Miami-Dade County Department of Solid Waste Management

Address: 2525 NW 62nd Street, Suite 5100, Miami, Florida 33147

Office Phone and Fax Numbers: Office: (305) 514-6661, Fax: (305) 514-6886

Contact Name: Stacey McDuffie, Division Director, Planning and Intergovernmental Affairs

Email Address: asrw2@miamidade.gov; **Website:** <http://www.miamidade.gov/dswm/>

DUNS Number: 131910254

Eligible Entity: Miami-Dade County, a unit of Government as stipulated in Section III-A of the RFP, and in accordance with 42 U.S.C. 16131(3) and CFDA 66.039

Total Project Cost: \$5,250,000

EPA Funds Requested: \$1,500,000

Voluntary Cost Share: \$3,750,000

Target Fleet: Fifteen (15) County Refuse Haulers (Garbage Trucks) to be replaced with Automated Hydraulic Hybrid Refuse Vehicles

Technology: A new hybrid drive technology

Short Project Description: Fifteen (15) 2002 Peterbilt Packers with an approximate tare weight of 35,000 lbs., will be replaced with fifteen (15) new, Automated Hydraulic Hybrid Refuse Vehicles. The trucks will utilize hybrid drive technology to achieve a 45% reduction in fuel consumption and emissions of particulate matter (PM), nitrogen oxide (NOx), hydrocarbons (HC), and carbon dioxide (CO₂).

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Section 1: Project Description and Overall Approach

For more than 50 years, Miami-Dade County's Department of Solid Waste Management (DSWM) has served the Miami-Dade community. Today, we are one of the largest government owned and operated waste collection and disposal system in the southeastern United States. In addition to providing waste collection and recycling services to over 320,000 households in unincorporated Miami-Dade County (MDC) and nine municipalities, the Department owns one of the most technologically advanced waste-to-energy facilities in the world.

The DSWM's mission is "to provide our customers with exceptional waste collection, recycling, and disposal services to protect, preserve and improve our environment and the quality of life in our community". This commitment to service specifically includes an Environmental Justice responsibility to children and elderly residents; those most at risk of developing asthma, and other pulmonary diseases, as the department engages in the collection, movement, recycling, and disposal of waste. As the population bound by major highways, ports, and transportation hubs, continues to increase, so does their exposure to particulate matter caused by diesel exhaust. In an attempt to alleviate the environmental impact on degrading air quality, the DSWM is proposing a refuse vehicle replacement project through the Clean Diesel Emerging Technologies Program. The proposed program will target routes serving areas disproportionately impacted by diesel emissions, which includes neighborhoods with a high percentage of disadvantaged and at-risk children and elderly residents, and others affected by respiratory illnesses and pulmonary diseases. Over time, reported incidents of asthma, chronic bronchitis, emphysema, and cardiovascular disease, all attributed to poor air quality can be reduced.

An emerging technologies application and test plan was submitted for the "Parker Hybrid Hydraulic Technology" for Refuse Vehicles known as the "Runwise E3" on an "Automated Side Loader Chassis" (see attachment). The test plan was submitted directly to Dennis Johnson at the US EPA by Parker (Jarrod Kohout acting on Parker's behalf) on January 25, 2011, along with the "Parker_Runwise Advertisement for the Hybrid Drive Version Test Plan, also on January 25, -2011, along with supporting documentation (Operation & Maintenance Manuals).

It is the intent of the DSWM to replace fifteen (15) Refuse Hauling vehicles with the purchase of fifteen (15) new Automated Hydraulic Hybrid Refuse vehicles. These new vehicles have an average expected life of seven (7) years, and will perform the same function as the Automated Side Loaders. The Automated Side Loaders will be retired prior to their initially scheduled retirement date. Currently, the DSWM has six (6) Automated Hydraulic Hybrid Vehicles in operation. The implementation of this project would allow the department to continue utilizing a new hybrid drive technology, and accelerate the planned conversion of the entire garbage fleet of 220 vehicles.

The new hybrid drive technology is an advanced, hydro-mechanical series drive system designed to significantly reduce fuel consumption and increase productivity in vehicles with high start-and-stop applications. It replaces a vehicle's conventional transmission with a series hybrid drive system that incorporates the variable features of a hydrostatic drive, which is ideal for urban routes, with the efficient performance of a mechanical drive that performs best at highway speeds. Combining this unique hybrid drive system with brake-energy recovery technology provides the ideal solution for severe duty applications. The advanced hydro-mechanical series drive system uses hydraulic pressure to get from house-to-house instead of the normal diesel fuel. This occurs when the operator does not engage the accelerator pedal, and the hydraulic pressure begins to increase. As the operator engages the accelerator pedal, hydraulic pressure begins to decrease, and/or increase depending on the distance traveled between houses. Once the vehicle exceeds 40 mph, it will automatically begin use of the diesel fuel, while the hydraulic tanks regenerate. The hydraulic tanks will be the alternative source of energy for these refuse vehicles along with the new diesel engine technology. The hydraulic pressurized tanks will continue to regenerate while the vehicle is being operated. This system is forecasted to have a long term benefit, and will have an estimated Return on Investment (ROI) in 6 to 7 years.

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The result of this technology is improved 0-25 mph acceleration when compared to typical trucks with 350HP engines and standard automatic transmissions. The DSWM conducted a pilot program which collected performance data monthly to analyze and compare the costs/benefits of this project. The vehicle operated during the pilot project achieved a 45% increase in fuel efficiency over the baseline trucks. With the use of ultra-low sulfur diesel fuel even greater reductions are expected. Beyond reducing fuel consumption, the vehicle is designed to reduce brake wear, and improve drivability and overall productivity. The DSWM will be responsible for the purchase and operation of the vehicles. The frame and cab of the truck will be produced by Autocar. The manufacturers of the hybrid drive technology, Parker Hannifin, will provide maintenance support for their component and the hybrid diesel engine produced by Cummins. More information on the truck manufacturers can be found in Section 5: Staff Expertise and Qualifications.

The Automated Hydraulic Hybrid Refuse Vehicles will be used for house-to-house, curbside refuse collection. The thirty-three (33) cubic yard vehicles will be predominately operated on standard automated refuse collections routes. All vehicles will be required to unload at both transfer stations and landfill sites. It is anticipated that each vehicle will be operated approximately 25,000 to 35,000 miles per year. The vehicles will be integrated into an existing combined manual/automated and rear-loader refuse collection fleet. All vehicles purchased will be owned by the DSWM; equipped with all of the manufacturer's standard equipment; and meet all EPA requirements.

Funds awarded under this program will not be used to fund the costs of emissions reductions that are mandated under Federal, State or local law. The emissions reductions measures to be achieved by this program are solely voluntary and elective.

The timeline for this project falls within the grant project period. Identifying the routes, purchasing the vehicles, training the drivers, and evaluating project results, would be completed within the grant's two-year project period. The Project Schedule is as follows:

Project Schedule/ Timeline					
No.	Task/Activity Description	Start	Complete	Deliverables / Outputs	Due Dates
1	Identify garbage routes	September 1, 2011	September 30, 2011	Route Maps established	September 30, 2011
2	Procure vehicles	September 15, 2011	September 30, 2011	Fifteen (15) Hybrid Trucks purchased	Purchase Order issued on or before September 30, 2011; vehicles to begin arriving by September 30, 2012
3	Train drivers	October 1, 2012	December 31, 2012	Drivers trained and certified	Training drivers subject to arrival of trucks.
4	Evaluate results	January 2012	August 2013	Final Report	August 2013

Testing to be performed is identified in the hybrid drive technology application by Parker Hannifin (see attachment). The objective of the proposed test plan is to scientifically measure, analyze and quantify the emission reduction benefits, mechanical, and fuel economy improvements provided by the Runwise technology, as applied to the Autocar E3 refuse collection truck.

First, Parker Hannifin and the DSWM will work together to gather baseline vehicle performance in the fifteen trucks presently operating on fifteen designated routes. Then the fifteen newly acquired hybrid

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vehicles will replace the previous trucks on the same routes to understand "current route performance" so as to be able to compare vehicle performance of the traditional truck to that of the hybrid vehicles that will be placed into service throughout the award period. Some of these test parameters for comparison will include (but not be limited to):

- Number of Stops
- Route Location / time / distance
- Fuel Consumed
- Engine Speed
- Brake wear
- Emissions
- Accelerator / Brake pedal positions
- Exhaust profiles temperature / PEMS / gravimetric testing

The team will collect technical data from the hybrid vehicles via the use of remote telematic systems to gather data in real time, and will refine testing as required with the review of the United States Environmental Protection Agency. Additionally, the DSWM will collect data through the EJ Ward Fueling System, an approach utilized county-wide to track vehicle fuel and mileage, and the Scalehouse System to measure tons collected per vehicle. The combined information will be evaluated by the DSWM and Parker Hannifin to track and measure progress toward achieving the expected outputs and outcomes. The data obtained will benefit the Emerging Technologies Program by providing a means to allow other solid waste entities nationwide an opportunity to better serve their communities through the implementation of hybrid trucks in sensitive areas.

The DSWM is committed to the sustainability of the project beyond the assistance agreement. If funding is approved, it will allow the DSWM to accelerate its garbage fleet conversion. In addition to any available funding opportunities, the DSWM's Heavy Equipment Replacement Plan has an annual allocation for the purchase of automated hybrid hydraulic vehicles. This allows for ongoing effort in emissions reduction, fuel efficiency, and sustainability for years to come.

Section 2: Environmental Results – Outcomes and Outputs

This proposed project will target the following activities, outputs, and outcomes:

Anticipated Outputs and Outcomes		
Activities	Outputs	Short, medium, and long-term Outcomes
Purchase 15, heavy-duty refuse vehicles using Parker hybrid-hydraulic systems	Replace and retire 15 DSWM trucks	<p>Short-term: 1) Successful vehicle replacement and retirement; 2) Staff trained for new vehicle operation; and 3) Enhanced vehicle performance, efficiency, and time savings for the DSWM; reduced fuel consumption and increased fuel efficiency; improved 0-25 mph acceleration; reduced brake wear, improved electric starter life and drivability.</p> <p>Medium-term: 1) Achieve 45% reduction in fuel consumption; 2) Achieve the following annual emissions reductions: 0.0116 tons of particulate matter (PM), 13.366 tons nitrogen oxides (NOx), 1.0719 tons hydrocarbons (HC), 4.8807 tons carbon monoxide (CO), and 310 tons carbon dioxide (CO₂); and 3) Route cost effectiveness and savings for the DSWM.</p> <p>Long-term: 1) Project becomes a key element in the MDC's promotion of 'Green Corridors' countywide, targeting idle reduction strategies and alternative fuel options for MDC fleet; 2) Promotes the reduction of PM,</p>
Replace and retire 15, 2002 heavy-duty refuse vehicles	Deploy 15 new trucks in selected neighborhoods countywide	

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		NOx, HC, and other non-regulated emissions particularly in vulnerable communities in MDC, and the daily exposure to refuse truck drivers and residents of neighborhoods serviced by the refuse trucks. Lifetime emissions reductions associated with the use of cleaner engines and the reduction of 27,930 gallons of diesel fuel include 172.6829 tons of NOx, 0.1489 tons of PM, 15.2106 tons of HC, 68.6522 tons of CO and 1,685 tons of CO ₂ ; and 3) increase community awareness of the benefits of clean diesel technologies.
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The following is a summary of the Inputs and Outputs from the Diesel Emissions Quantifier Tool:

INPUTS:

On Highway; Refuse Hauler; Class 8a; Quantity: 15; Model Year: 2005; Retrofit Year: 2011; Retrofit Technology: DPF; Regular Diesel (ULSD), 15 ppm; Fuel Volume: 6,000 gal/yr; Vehicle Miles Traveled: 9,000 miles/vehicle/yr; Idling Hours: 200 idle hr/vehicle/yr.

The numbers presented above represent the baseline for the existing trucks. The reductions achieved by replacing the existing trucks with cleaner diesel hybrids that include diesel particulate filters are presented in the following table:

Emissions Reduction Comparisons: Current vs. Hybrid Vehicles						
Action	NO_x (TPY)	PM (TPY)	HC (TPY)	CO (TPY)	CO₂ (TPY)	Diesel Reduced (gallons/yr)
Baseline	14.8568	0.0129	1.0798	4.8849	999	90,000
Reductions after Replacement with 2011 Trucks	12.6951	0.0110	1.0683	4.8789	0	0
Associated Percent Reduction	85.45%	85.00%	98.94%	99.88%	0.00%	0.00%

The emissions would be further reduced by fuel savings realized from the hydraulic hybrid technology which are expected to be 45% over baseline vehicles, based on results from a pilot demonstration. An increase of 45% in fuel efficiency would raise the trucks' miles per gallon (mpg) rating from 1.5 mpg to 2.175 mpg. Such a reduction would translate in-to an annual fuel consumption rate of 4,138 gal. per truck, or a combined annual fuel consumption rate of approximately 62,070 gallons of diesel per year for the group of fifteen. The anticipated emissions reductions resulting from the replacement of the existing diesel trucks with the hydraulic hybrid trucks and accounting for a 45% net increase in fuel efficiency are presented in the following tables.

Emissions Reductions Based on Hybrid Vehicle Replacement						
Action	NO_x (TPY)	PM (TPY)	HC (TPY)	CO (TPY)	CO₂ (TPY)	Diesel Reduced (gallons/yr)
Reductions after Replacement with 2011 Hybrid Trucks with 45% Increase in Fuel Efficiency	13.3660	0.0116	1.0719	4.8807	310	27,930

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Associated Percent Reduction	85.45%	85.00%	98.94%	98.76%	31.03%	31.03%
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Estimated Lifetime Emissions Reductions						
	NO _x (TPY)	PM (TPY)	HC (TPY)	CO (TPY)	CO ₂ (TPY)	Diesel Reduced (gallons/yr)
Lifetime Emissions Reductions	172.6829	0.1489	15.2106	68.6522	1,685	151,802

Section 3: National Programmatic Priorities

Maximizes Public Health Benefits: The goals and outcomes of the proposed project align with and contribute to the following EPA Strategic Objectives under Goal 1: Clean Air and Global Climate Change: 1.1 Healthier Outdoor Air and 1.5 Reduce Greenhouse Gas (GHG) Emissions.

The early retirement of 15 refuse vehicles will enable the introduction of a cleaner diesel technology far ahead of the regular retirement schedule. Other important yet intangible benefits include gaining experience with diesel hydraulic hybrid technology vehicles in a sub-tropical climate, and sending an important message to the community by setting an example that bold steps need to be taken to conserve our valuable resources, and protect the climate and the environment. The use of a 5% blend of biodiesel will further the benefits expected from this project. The Department has also instituted a vehicle idling reduction policy more stringent than current State policy, which is meant to compliment the new hydraulic hybrid project. The impact of this project and subsequent project outcomes will have a profound impact within identified communities, with a reduction of diesel emissions to minorities, the disadvantaged, elderly, youth, and individuals with chronic respiratory conditions.

The overall health and environmental benefits expected from the implementation of this project are significant considering that the anticipated results in lifetime emission reductions, and the placement of trucks on routes which serve children and the elderly; those considered to be the most sensitive to cardiac and respiratory diseases, promote Environmental Justice consideration for these special population groups. Public health authorities have linked diesel exhaust to problems such as asthma, heart disease, and lung cancer. The Centers for Disease Control and Prevention (CDC), reports that almost half of the asthma cases in Florida involve children. Furthermore, in a study, the "Lifetime Asthma and Diagnosis and Asthma Attack Prevalence," are reported higher than the national average in the southern region for children ages 5 to 9. In some cases asthma can be fatal. In fact, the CDC also reports that Florida was ranked 8th in the nation in asthma mortality rates from 2005 to 2008. Given that twenty-one percent (21%) (464,377) of the population in MDC is 14 years or younger, a large number of children are at risk. MDC has an elderly population (65+) of 330,552 residents or thirteen percent (13%). Combined, the two sensitive population groups represent 34.3 percent of the residents of MDC.

The following Health Benefits were estimated using the Diesel Emissions Quantifier Health Benefits Tool:

Health Benefits Results			
County and State	Annual Diesel PM Reduction (tons)	Annual Cost ⁺⁺	Annual Benefits ⁺⁺
Miami-Dade, Florida	0.0110	-	\$15,000
Total	0.0110	\$0	\$15,000

Cost-Effectiveness of Project:

The estimated cost of the project is \$5,250,000 of which \$3,750,000 will be provided by MDC. The Federal funds requested: \$1,500,000

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Total Cost Effectiveness of Project						
Tons Reduced	NO _x	PM	HC	CO	CO ₂	Diesel Reduced (gallons/yr)
Annual (tons/yr)	13.3660	0.0116	1.0719	4.8807	310	27,930
Lifetime (tons)	172.6829	0.1489	15.2106	68.6522	1,685	151,802
Total Cost-Effectiveness (\$/ton)	\$2,026.84	\$2,350,570.85	\$23,010.27	\$5,098.16	\$207.72	-

Areas with High Population Density and Areas with Disproportionate Quantity of Air Pollution: MDC is the 8th largest county in the nation, with a population of 2.5 million according to the U.S. Census of 2010. National Air Quality Standards (NAAQS) for ozone, fine particulates and air quality continue to be a great concern given the rate of population increase, and the fact that mobile vehicles represent the source as the largest contributor to ground-level ozone. This concern has been elevated as a result of the current local National Ambient Air Quality Standards monitoring data, and the potential strengthening of the ground-level ozone and particulate matter standards.

A significant amount of diesel exhaust is produced on the many roads and highways in MDC. The County is traversed by two (2) Interstate Highways (I-95 and I-75); three (3) U.S. Highways (27, 441, and U.S. 1); five (5) State Expressways (SR112, SR836, SR874, SR878 and SR924); and the Florida Turnpike, which experiences increasingly heavy traffic congestion daily. Two of the busiest ports in the Nation (Port of Miami and Miami International Airport), and the Florida East Coast Freight Railroad Yard, are all located in MDC. South Florida is the 'commerce gateway' of the United States, for goods movement (exports and imports) between South America, Central America, and the Caribbean Basin. The goods/freight is dispersed from the ports and terminals in MDC via the highway and railway system, to destinations throughout the United States and Canada. These are all contributing factors to diesel emissions adversely affecting air quality in MDC.

Specific to this project, refuse vehicles operate daily in neighborhoods throughout MDC, a densely populated metropolitan area. According to the Environmental Protection Agency (EPA), Environmental Justice is achieved when everyone regardless of race, culture, or income enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live learn and work. This project has the potential to further environmental justice in our community, for the large numbers of minorities and low income residents who live and work in MDC.

MDC is a diverse geographic area that covers over 2,431 square miles. One of the most culturally diverse counties in the nation, MDC is in essence a majority of minorities. Residents are approximately 57% Hispanic, 20% Black/African American, 21% White, Non-Hispanic, and 2% Asian or American Indian (U.S. Census 2010). Within these categories, a number of cultures and traditions of multiple ethnicities are represented. Miami-Dade's Hispanics are predominately Cuban (52%), Nicaraguan (20%), Puerto Rican (5%), Colombian (5%), and Mexican (4%), with the remaining 14% of Hispanics originating from nearly every other Latin/Central American country. Additionally, Caribbean Americans including Haitians account for approximately 35% of Miami-Dade's African American population. MDC is the largest geographical area, outside of Spain and Latin America, of Spanish-speaking residents (59.25%).

Disproportionately Impacted Areas: The County used a Geographic Information System (G.I.S.) to create maps which illustrate important data sets including: 1) Proximity to major transit hubs, highways, and the seaport; 2) Industrial area locations; 3) Neighborhoods and communities by income level; 4) Population of residents 65 years and older; 5) Location of adult living facilities (including nursing homes,

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adult congregate living facilities, and adult care centers); and 6) Asthma and Chronic Obstructive Pulmonary Disease (COPD) statistics. The maps were evaluated relative to one another and in some cases with data overlays. The information displayed priority areas to place the hybrid refuse collection vehicles to achieve the greatest sustainability benefits, including environmental, social, environmental justice, and economic outcomes. Once the routes and service dispatch locations are identified, public outreach efforts will be enhanced within the area to educate the public.

Use of a Community and Multi-Stakeholder Collaborative Process to Reduce Toxic Emissions:

The fleet will operate along routes within the disproportionately impacted areas identified above. DSWM staff routinely conducts presentations to community organizations, and provides information/exhibit booth materials at community meetings and events. Information on the initiative will be incorporated into existing outreach efforts with homeowners associations, schools, and other community and faith-based organizations. DSWM promotes the proper disposal of household chemicals through the management of household chemical collection centers and events; through an extensive recycling program; and encourages community wide recycling practices, all of which will further reduce toxic emissions in the community.

Certified Engine Configuration/Maximize the Useful life of the Engine/Conserve Diesel Fuel/Utilize Ultra Low Sulfur Diesel: This project emphasizes fuel efficiency; reduced maintenance costs; and the ability to produce lower amounts of pollutants based on the use of the hydraulic tanks, that provide the vehicle with house-to-house assistance instead of the diesel fuel that normally burns through the exhaust. The new technology, cleaner engine/drive-train and the hydro-mechanical series drive system, which is designed to conserve diesel fuel, will be cost effective, long lasting technology, and will have a direct and immediate impact on ambient air quality and the exposure of workers and neighborhood residents to toxic diesel emissions. The expected useful life of the vehicle is seven years. In addition, it will significantly reduce particulate and other emissions at a reasonable cost, making it desirable for entities with large fleets such as MDC. This investment has a potentially large payoff for the public good; particularly for our children and elderly in regards to air quality and health related issues. It is important to note that the County has mandated the use of a 5% blend of biodiesel fuel across its fleet since April 2009, and is currently considering higher percentage blends in conjunction with sustainability criteria. Additionally, the county is creating a process to purchase biodiesel that complies with Environmental Protection Agency's biodiesel protocol which requires a minimum 50% GHG lifecycle reduction.

Section 4: Past Performance – Programmatic Capability and Report on Results – Outcomes and Outputs

MDC has been the recipient of numerous funding awards from several federal agencies including the Environmental Protection Agency, Department of Transportation, and the Department of Homeland Security. Several County departments have received awards from EPA in the past three years, including the Department of Environmental Resources Management (DERM), and the General Services Administration (GSA) for air pollution program funding and shoreline stabilization funding, respectively. DERM, a County department with a vested interest in achieving the goals established for the proposed project, has been the recipient of federal funding assistance agreements for air pollution and ambient air monitoring programs from the Environmental Protection Agency for more than thirty (30) years. The two main programmatic agreements awarded each year, pursuant to the Clean Air Act, are EPA Section 105 and 103 (PM2.5) Grants. The Office of the Agricultural Manager was awarded a National Clean Diesel grant to provide rebates to farmers and growers to replace diesel engines in Irrigation Sets used to water crops. The County has also applied for and received competitive agreements for an Energy Star Power Management Project; an Air Toxics Demonstration Project; an EPA Communities in Motion Project; and an EPA Voluntary Diesel Retrofit Grant Project. Documentation including technical and financial reports, and documentation on achieving the expected outcomes and outputs of those projects was submitted under all of the agreements listed above. The County's finance office and DERM program staff have extensive experience in preparing and submitting required forms, and reports. With DERM serving as the DSWM's technical support the department is confident in its ability to implement this proposed project. Combined, the County has extensive experience in implementing and managing grant projects.

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Section 5: Staff Expertise and Qualifications

MDC employs experienced grant managers and other resources available to successfully manage this grant. The DSWM will handle the expenditure of grant funds and manage programmatic and fiscal reporting in accordance with project reporting and auditing procedures stipulated by the EPA. Daniel Diaz, Fleet Division Director, will be the project manager. He will direct the procurement of new vehicles, implement the project and track and collect project data. Stacey McDuffie, Division Director, Planning and Intergovernmental Affairs, is the DSWM's Grants Coordinator. She will provide the required progress and final reports. Both Mr. Diaz and Ms. McDuffie will ensure that the proposed project goals are successfully achieved from the operational and administrative perspective. The DSWM will also continue to work with the vehicle manufacturers, Cummins, AutoCar and Parker Hannifin. Below are some highlights of their experiences.

- Cummins Inc., a global power leader, is a corporation of complementary business units that design, manufacture, distribute and service engines and related technologies, including fuel systems, controls, air handling, filtration, emission solutions and electrical power generation systems. Headquartered in Columbus, Indiana, (USA) Cummins serves customers in approximately 190 countries and territories through a network of more than 500 company-owned and independent distributor locations and approximately 5,200 dealer locations. Cummins reported net income of \$428 million on sales of \$10.8 billion in 2009.
- AutoCar Truck – AutoCar is focused on building and supporting the most innovative class 8 Low Cab Forward (LCF) trucks in the business. The company is known for industry-leading innovations, including improved ergonomic cabs, integrated body controls, and an unrivaled body-to-chassis interface. AutoCar has exclusive agreements to use Cummins® engines and transmission partners and are rapidly expanding a nationwide service network that now includes Cummins distributorships.
- Parker Hannifin - With annual sales of \$10 billion in fiscal year 2010, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 55,000 people in 46 countries around the world. Parker has increased its annual dividends paid to shareholders for 54 consecutive fiscal years, among the top five longest-running dividend-increase records in the S&P 500 index.

Section 6: Budget Detail – Narrative Description

The total proposed project cost is **\$5,250,000**. DSWM requests **\$1,500,000** in assistance for the purchase of the hybrid drive technology portion for fifteen (15) hybrid vehicles. If funded, the DSWM is committed to the remaining costs of **\$3,750,000**, as a Cost Share match.

This value includes the remaining portion of the truck (body, and hybrid engine). Personnel salary, fringe benefits, travel, office, and printing supplies will be provided by the DSWM, as reporting for the project will be conducted in house as a function of staff's regular responsibilities.

PROJECT BUDGET	EPA Funding	Cost-Share
Personnel	\$0	\$0
TOTAL PERSONNEL	\$0	\$0
Fringe Benefits	\$0	\$0
TOTAL FRINGE BENEFITS	\$0	\$0
Travel		
TOTAL TRAVEL	\$0	\$0

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Equipment Fifteen (15) 2010 AutoCar Xpeditor (ACX64) Automated Side Loader hydraulic hybrid Refuse Hauler trucks, @ \$350,000 each	\$1,500,000	\$3,750,000
TOTAL EQUIPMENT	\$1,500,000	\$3,750,000
Supplies	\$0	\$0
TOTAL SUPPLIES	\$0	\$0
Contractual	\$0	\$0
TOTAL CONTRACTUAL	\$0	\$0
Indirect Charges	\$0	\$0
TOTAL INDIRECT	\$0	\$0
TOTAL FUNDING	\$1,500,000	\$3,750,000
TOTAL PROJECT COST	\$5,250,000	

Section 7: Clear Description of the Target Fleet

The refuse vehicles being replaced are Mack and Caterpillar manufactured engines. Please see the attached U.S. EPA Applicant Fleet Description Spreadsheet that provides a detailed breakdown of the vehicle information.

Section 8: Leveraged Resources

The DSWM intends to provide a cost share beyond that which is provided by the Clean Diesel Emerging Technologies Funding Assistance Program. The DSWM is committed to implementing these new Automated Hybrid Hydraulic Vehicles into its garbage fleet, and will work closely with the vehicle manufacturers, Cummins, AutoCar and Parker Hannifin to successfully implement and achieve long-term benefits of this project.