DCAS Report

Demonstration Project on Renewable Hydrocarbon Diesel

NYC Fleet

NYC DCAS
Citywide Administrative Services

About DCAS

The Department of Citywide Administrative Services (DCAS) provides value-added and effective shared services to support the operations of New York City government. Its commitment to equity, effectiveness, and sustainability guides its work with City agencies on recruiting, hiring, and training employees; providing facilities management for 55 public buildings; acquiring, selling, and leasing City property; purchasing more than $1 billion in supplies and equipment each year; and implementing conservation and safety programs throughout the City's facilities and vehicle fleet.

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About DCAS Fleet

The DCAS Division of Fleet Management is responsible for managing the City of New York's municipal vehicle fleet. This includes providing for the purchase and maintenance of vehicles and the implementation of supportive infrastructure like electric vehicle chargers. As a partner in Mayor Bill de Blasio's historic Vision Zero initiative, the division uses cutting-edge technology and employee training to promote driver safety. It also manages the nation's largest fleet of electric vehicles and utilizes green, alternative fuels to reduce the fleet's carbon footprint.

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Executive Summary

Renewable diesel (RD) or hydrogenation derived renewable diesel (HDRD) is a petroleum-free fuel that is created from renewable feedstocks. The fuel meets the same ASTM specification as petroleum diesel, ASTM D975. Renewable diesel is typically used in a blend of 99% renewable diesel by volume with 1% petroleum diesel, this is referred to as RD99. Because the fuel meets the same ASTM specification as petroleum diesel, the fuel offers the prospect of use with existing vehicle, under-ground storage tank (USTs) and fuel dispensing infrastructure without warranty, operational, maintenance or other concerns. DCAS undertook the demonstration project for renewable diesel to test the validity of these assumptions.

NYC has been using biofuels, focused on biodiesel, since 2005 in fleet. NYC now uses blends of 5 to 20 percent biodiesel successfully in almost all fleet fuel and heating oil. Biodiesel is a separate ASTM specification (D6751 than regular diesel fuel. Biodiesel can have operability issues with existing infrastructure especially in blends over 20%. EPA, State DEC and FDNY also have separate requirements for use of biodiesel in blends over 20%. RD offers the prospect of enabling NYC to complement its existing biodiesel program and achieve 99% percent replacement of petroleum diesel. NYC Fleet would plan to use both biodiesel and RD in combined blends, for example RD80B20.

Because renewable diesel is refined from renewable feedstocks there is a considerable reduction in greenhouse gas emissions, focused on the production process, when compared to traditional diesel. These benefits depend on the specific feedstock used. Examples include animal fat or soybean oil. A table of feedstocks and carbon intensities is attached. In our demonstration project, DCAS required a reduction of over 60% in the carbon intensity of the fuel when compared to diesel. This makes the fuel a key potential component in the Mayor's Clean Fleet Plan of 2015 which calls for reducing Greenhouse Gas (GHG) from municipal fleet emissions 50% by 2025.

Starting May 2016, DCAS has been working with the FDNY Office of Fire Prevention to review any potential safety or compatibility issues with RD and to obtain permits to proceed with this demonstration project. DCAS submitted an extensive report to FDNY on the renewable diesel initiative addressing issues of tank compatibility. This report is attached. FDNY issued a "letter of no objection" to the project in September of 2016. This letter was revised and updated on June 13 and July 27, 2018 to include additional fueling sites. These are attached.

In April of 2018, DCAS signed a Demonstration Project Agreement with Sprague Operating Resources (Sprague) to supply nearly one million gallons of renewable hydrocarbon diesel (RHD) to the City of New York (City) for use as fuel for City vehicles. Sprague holds the existing publicly bid contract to provide diesel fuel for City fleet operations. This agreement followed the Policy Procurement Board (PPB) procedures for demonstration projects. Participating agencies included NYPD, Parks, DSNY, DOT, DEP and DOC (see chart). The demonstration agreement is attached.

Delivery of the fuel began the week ending June 3, 2018 with deliveries to DSNY and Parks. The fuel was supplied by the Renewable Energy Group (REG) which shipped product to Sprague's Mt. Vernon, New York terminal via railroad. The final delivery to City agencies took place the week of October 31, 2018 with a delivery to DSNY. During this period, 956,882 gallons of renewable diesel were delivered and used without issue. A breakdown of usage of the fuel by agency and deliveries is attached.

DCAS Bureau of Quality Assurance (BQA) tested the fuel using ASTM 6866-18 to ascertain the percentage of renewable diesel versus petro-chemical diesel. ASTM6866-18 measures the radioactive decay of carbon 14 isotopes to determine the percent content of biobased carbon in the fuel. Some samples were taken directly from the fuel delivery location, while others were taken from fuel stored in underground storage tanks (UST). All of the samples taken from the fuel distribution location had biogenic carbon content of 99% or 100%. Only one sample rated below this level, this was a sample taken from a UST and had a biogenic carbon content of 95%, likely indicating the presence of residual petroleum diesel in that UST. The supplier, REG, supplied a feedstock verification document, confirming that the feedstock used was consistent with the required and reported carbon intensity benefits.

Agencies reported no operational, maintenance or other concerns with the use of the fuel under this demonstration project. It was noted that RD has not yet been used during winter conditions and that allowance must be made for any future winter implementations. The City paid on average $3.79 per gallon for fuel under this contract.

In public announcements on this project in May

and November 2018, DCAS announced its intentions to expand upon this successful initial project and to bid a long-term contract for RD for fleet fuel. The long-term project will help the City achieve the goal of fifty percent greenhouse gas reduction for the City fleet by 2025. This goal is outlined in the NYC Fleet Plan, attached. DCAS began the public bidding process for this contract in spring 2019.

Demonstration Project Stated Goals

The test goals for this project included:

- Maintenance free operation of participating vehicles
- Maintenance free operation and integration with existing USTs and fuel dispensers
- Limited to no cold weather impacts
- Limited to no compatibility issues with City agency vehicle models
- Confirmation to production cycle and GHG benefits
- Confirmation to tailpipe emissions benefits
- Cost assessment
- Introduction of renewable diesel to the City with a potential to expand to a larger marketplace in the Northeast

Project Results Summary

The goals for this project were largely met with the exception of cold weather impacts which were not addressed due to the project being implemented in the warmer months.

Please see below for specifics of each item:

Maintenance free operation of participating vehicles: There were no reports of vehicles in this pilot requiring extra maintenance or incurring any operational issues as a result of the use of this fuel.

Maintenance free operation and integration with existing (USTs) and fuel dispensers: There were no reports of fueling dispensers or USTs experiencing any issues storing or dispensing this product. The RD fuel also blended without issue with existing ULSD and biodiesel supply in the City tanks at the onset of the project. As mentioned above, because the product meets the same ASTM specification as petroleum diesel, FDNY approved the use of this product at 52 sites, attached.

Limited to no cold weather impacts: Because the demonstration took place from June through October, no cold weather was encountered, so the issue of cold weather impacts was not addressed. DCAS is bidding a 45% RD requirement in its first long term contract for RD for the winter months. This will minimize any potential winter cold weather impacts and enable a transition period for RD in cold weather application. DCAS will also maintain existing ULSD and biodiesel blends contracts for winter use if needed.

Limited to no compatibility issues with City agency vehicle models: NYC operates a wide variety of vehicle types, makes, and model years. RD was implemented widely and not limited to any specific makes, models or types. This included on-road and off-road units. There were no reports of any additional maintenance repair, or out of service issues related to use of this fuel.

Confirmation to production cycle and GHG benefits: REG supplied a product summary document that showed the feedstock(s) used for the demonstration project. The fuel was produced in the Geismar, Louisiana refinery from animal fats. The California Air Resources Board (CARB) rates the carbon intensity (CI) of this fuel at 35.71 gCO2e/MJ, as compared to 94.71 gCO2e/MJ for petroleum diesel delivered to California. DCAS confirmed the pathway for this fuel and corresponded with CARB regarding this feedstock, confirming the environmental benefits of the fuel supplied.

Confirmation to tailpipe emissions benefits: DCAS will arrange to test vehicles running on renewable diesel on the dynamometer lab at DSNY.

Cost assessment: There was a cost difference between renewable diesel and existing fuels such as biodiesel and petroleum diesel. Specifically, the City paid an extra $1.6450 per gallon in addition to the Argus ultra-low sulfur diesel (ULSD) price for NY Harbor. DCAS expects to achieve improved cost performance through expanded implementation of this product, partnering with other public organizations to expand the marketplace for this fuel, and through potential regulatory relief. DCAS is also working to identify all potential market suppliers of RD to establish as much competition for supply of this new and innovative fuel as possible.

The majority of RD is currently sold in California where a low carbon fuels standard (LCFS) provides financial incentives for adoption. The State of Washington introduced a similar policy recently. RD and Biodiesel can also be impacted by federal biofuels policy including the Renewable Fuels Standard and the biofuel tax credits.

Introduction of renewable diesel to New York City with a potential to expand to a larger marketplace in the Northeast: This initial demonstration project served as a successful introduction to the fuel in the City. Other governmental agencies such as the bi-state Port Authority of New York and New Jersey have also used the fuel and there is interest in securing larger supplies for the region. DCAS hosted a Biofuels Forum in Prospect Park in May 2018 to offer vendors an opportunity to present on this emerging fuel to potential public agency adopters. See attached. DCAS will continue efforts to expand market supply and partner with potential adopters of this fuel.

Next Steps

DCAS is in the process of bidding a multi-year contract for renewable diesel fuel (RD) or RHD. DCAS will also examine the possibility of using higher blends of biodiesel fuel, up to B50, as a complement to the renewable diesel initiative.

Attachments:

BQA RD Test results
Feedstock data from vendor REG: product transfer document
Basics of renewable diesel, prepared by DCAS Fleet
Final FDNY Letter of No Objection
Final fuel usage chart
DCAS Press releases
Demonstration contract
Compatibility report on USTs
CARB document on carbon intensity
NYC Clean Fleet Plan
Forum notice

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