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Representing New York's Heating Fuels Industry

May 3, 2022

Testimony before the
Climate Leadership and Community Protection Act
Climate Action Council
Brooklyn, New York Public Hearing

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The New York State Energy Coalition (NYSEC) is a trade association representing the independent retail and wholesale heating fuels and energy marketers in New York City and Nassau and Suffolk counties of New York State – comprising 70% of the state's home heating oil market by volume. NYSEC members live and work in the neighborhoods they serve and are committed to improving the fuel products and appliances for their customers and their communities.

The Home Heating Liquid Fuel Industry Proposes Net-Zero Heating Fuel

NYSEC has embraced the *Net-Zero Providence Resolution* and we are committed to transforming the industry from supplying petroleum-based fuels to clean burning, non-fossil liquid renewables such as biodiesel and renewable diesel by 2050.

In September 2019, the National Energy Fuels Institute (NEFI) hosted the Heating Oil Industry Summit in Providence, RI, at which the industry unanimously resolved to move to a cleaner burning fuel and transition away from conventional heating oil. The *Providence Resolution*¹ resolved to reduce the carbon emissions of home heating systems in line with the state's GHG reduction goals of 40% by 2030 and Net-Zero by 2050. Bioheat® is that future renewable liquid low-carbon heating fuel.

Partnering with New York State to Meet its Carbon Reduction Goals

The New York Climate Leadership and Community Protection Act (CLCPA) sets New York State government apart from other states in addressing climate change in a comprehensive manner, providing for a cleaner environment for future generations and transitioning away from fossil fuels. Our purpose is to inform the panel members as to the availability, success, affordability, and

¹ <https://nefi.com/news-publications/recent-news/heating-oil-industry-commits-net-zero-emissions-2050/>

decarbonization attributes of biofuels (biodiesel and renewable diesel) as fuels that can assist New York in meeting the deep decarbonization targets of the CLCPA.

These comments will touch upon the following points relative to the use of biodiesel and renewable diesel in thermal space heating appliances:

- As renewable replacements for diesel fuel, biodiesel and renewable diesel are made from used cooking oil, animal fats, brown grease, and agricultural byproducts and co-products. The feedstocks used to produce U.S. biodiesel have become increasingly diversified with waste products making up an increasing volume of feedstock used to produce fuel. There is no food-for-fuel issue, as waste oils are primary feedstocks and Palm oil is also not eligible for the U.S EPA Renewable Fuel Standard (RFS), and thus deforestation is not an issue for biodiesel fuel used in the United States under the RFS program.
- As a drop-in replacement fuel for petroleum heating fuel, biodiesel works seamlessly in current home heating appliances, even at high blend volumes.
- The two largest home liquid heating appliance equipment manufacturers, Beckett Corporation and Carlin Corporation, are currently working with Underwriters Laboratories (UL) on a B100 UL-rated home heating appliance protocol and expect to produce B100 UL-rated components in 2023 (see attached letters from both corporations).
- Biodiesel provides an immediate reduction in greenhouse gas (GHG) emissions of up to 80% from petroleum heating oil.
- Biodiesel production and supply is ample to cover the space heating sector needs in New York State with over 3.2 billion gallons of biodiesel domestically-produced each year, with an estimated 6 billion gallons to be produced by 2030 and 15 billion gallons by 2050.
- According to New York State Energy Research & Development Authority (NYSERDA) pricing data, the use of biodiesel is at no extra cost to consumers.
- Preliminary results of a health benefits study by Trinity Consulting, endorsed by the American Lung Association, shows the use of biodiesel in space heating reduced cancer rates and asthma attacks by 85%, as well as a reduction in premature deaths and lost workdays.
- There are 1.4 million homes in New York State that currently use heating oil and biodiesel is a low carbon, renewable liquid fuel available to provide GHG savings and health benefits to them right now.

Background

The space heating sector in New York City began using ultra-low sulfur and renewable liquid fuels (biodiesel) for home heating oil in 2012. That initiative was spearheaded by the home heating oil industry. Since 2000, the industry has invested over \$20 million in research and development to enhance heating appliance efficiency and to develop Bioheat[®], the blend of biodiesel with heating oil, to achieve a cleaner burning home heating fuel. These industry initiatives have helped consumers decrease their consumption of heating oil by 40%, reducing average household use from 1,200 to 700 gallons per year.

While requiring biodiesel use in homes since 2012 (NY Local Law 119-2016), the City of New York has fully embraced its use in the City's own municipal buildings and fleets. In fact, NYC has steadily ramped up the blend levels to as much as 20% in the summer and scaled back to 10% in the winter in its vehicles. The agencies include the FDNY, and the Departments of Sanitation, Parks and Recreation, and Education just to name a few. In addition to biodiesel, the City recently began a pilot program using an 80% renewable diesel/20% biodiesel blend in their fleets, fully replacing petroleum diesel use in heavy duty trucks.

In 2017 and 2021, respectively, at the behest of the state's home heating oil industry, New York State adopted a 5% blending requirement for biodiesel/renewable diesel in heating oil for the New York metropolitan area, which includes New York City, Long Island (Nassau and Suffolk Counties) and Westchester County (Chapter 315 of L. 2017) and made the requirement statewide at a blend level of 20% by 2030 (Chapter 750 of L. 2021). The industry is now advocating for 50% biomass-based biodiesel – biodiesel and renewable diesel – by 2035 and 100% by 2050.

It should also be noted that the home heating industry in Connecticut and Rhode Island both successfully advocated for 50% biomass-based diesel blending laws in their states, and the Vermont Legislature has passed legislation instituting a Clean Heat Standard credit trading system. The Connecticut law (Public Act 21-181) requires a 50% blend by 2035. The Rhode Island laws (Chapters 347 & 348) requires a 50% blend by 2030. The Vermont bill (H.715) passed both houses and is pending gubernatorial action.

The Climate Action Council will play key roles in deciding the future heating source for the state's 1.4 million homes which currently use heating oil. Biodiesel and Renewable Diesel should be included in those fuels. They burn 73% - 80% cleaner across the entire CO₂e GHG spectrum than heating oil (diesel) fuel, according to Argonne National Laboratory, the U.S. Department of Agriculture and Purdue University², and are a gallon-for-gallon replacement for petroleum diesel fuel and heating oil.

Biodiesel and renewable diesel themselves are 100% cleaner than petroleum diesel, except for the fuel used to power the production facilities and to transport the fuel, thus the 20% loss in scoring. Suffice to say, as the power production and on-road sectors become renewable, the 73% - 80% cleaner GHG savings with these biofuels will continue to climb higher.

In addition to burning cleaner, the next best benefit about using Bioheat® (the registered name for biodiesel blended heating fuel) is that there is no need to change the heating system to use the fuel and according to data from NYSERDA, there is no increase in consumer costs with the use of biodiesel. This provides an affordable option for all fuel users which is especially important during these financially challenging times. Thus, the transition is seamless to the consumer. The state can achieve

² CHEN 2018 – Life cycle energy and greenhouse gas emission effects of biodiesel the United States with induced land use change impacts by:

- Systems Assessment Group, Energy Systems Division, Argonne National Laboratory, 9700 S. Cass Avenue, Lemont, IL 60439, United States
- Department of Agricultural Economics, Purdue University, 403 West State Street, West Lafayette, IN 47907, United States
- (S&T)2 Consultants Inc., 11657 Summit Crescent, Delta, BC V4E 2Z2, Canada
- Office of the Chief Economist, United States Department of Agriculture, United States

these GHG savings by requiring that biodiesel/renewable diesel fuel instead of heating oil be delivered to current consumers and as an alternative for new construction.

So, with a simple change in state heating fuel requirements to biodiesel and renewable diesel, the State can experience cleaner burning home heating systems for the 1.4 million homes—18% of the housing stock in New York—that currently consume 1 billion gallons of heating oil annually.

What is Biodiesel?

As renewable, low carbon replacements for petroleum diesel fuel and heating oil, biodiesel and renewable diesel are made from used cooking oil, animal fats, brown (sewer) grease, and agricultural byproducts or co-products.

These biofuels reduce lifecycle greenhouse gases on average 73% - 80%. In addition to significantly lowering greenhouse gas emissions, biodiesel can also significantly reduce harmful criteria pollutant created from the combustion of petroleum. These are pollutants that have been shown to lead to chronic health effects, especially in urban communities.

Emissions Improvements of Biodiesel versus Low Sulfur (LS) and Ultra Low Sulfur (ULS) Heating Oil^{3, 4, 5, 6, 7}

Average Change	PAH	PM	CO	NO _x	SO ₂	CO ₂
Percent	-90 to -95%	86%	Similar to -15%	Similar to 25%	-98% (LS) Similar (ULS)	-73%

Note: PAH-Polycyclic Aromatic Hydrocarbons; PM-Particulate Matter; CO-Carbon Monoxide; NO_x-Nitrogen Oxides; SO₂-Sulfur Dioxide; CO₂-Carbon Dioxide

Feedstocks used to produce U.S. biodiesel have become increasingly diversified, with waste products making up an increasing volume of feedstock used to produce fuel. One of the chief reasons is biodiesel offers an especially effective and efficient outlet for recycling fat-based waste streams. While waste fats and oils can be treated in wastewater treatment plants, it is far more expensive and this process yields far fewer GHG savings, if any at all. Furthermore, by processing excess agricultural co-products such as soybean oil into high quality biodiesel, the industry is not only able to provide a lower carbon fuel, but we help facilitate lower protein costs by providing an additional revenue source for the production of soybean meal. Thus, with biodiesel production and use, there is no food-for-fuel issue. Currently federal law, rules, and regulations prohibit the use of palm oil in biodiesel production, helping further reduce deforestation. We are pleased to note that domestically-produced biodiesel meets all federal standards. In fact, US produced soybeans are so sustainable, they are approved under stringent, EU RED II Compliance scheme⁸.

As a drop-in fuel, Bioheat[®] provides immediacy in reducing GHG emissions and has been effective in states that have biodiesel blending requirements for space heating - New York and Rhode Island, as

³ Macor, A., Pavanello, P., Performance and Emissions of Biodiesel in a Boiler for Residential Heating, *Energy*, vol. 34, 2009.C

⁴ Krishna, C.R., Biodiesel Blends in Space Heating Equipment, Brookhaven National Laboratory, 2001.

⁵ USDA/DOE 1998, Life Cycle Inventory of Biodiesel and Petroleum Diesel for Use in an Urban Bus.

⁶ Lee, S. Win, He, I., Heritage, T., Young B., Laboratory Investigations on the Cold Temperature Combustion and Emissions Performance of Biofuels Blends, 2003.

⁷ https://www.edf.org/sites/default/files/10071_EDF_BottomBarrel_Ch3.pdf at 5. Studies cited showed PM reduction proportional to biodiesel content (e.g., 20% reduction for B20 blend, 50% reduction for B50 blend). To be conservative, NBB estimates the PM reduction from using B100 would be approximately 86%

⁸ <https://ussec.org/european-union-recognizes-ssap-red/>

well as in the Massachusetts Thermal Alternative Portfolio Standard. The same translates to those states with low carbon transportation policies.

At present, heating oil is being delivered in New York at blends as high as 35% (B35) and in Massachusetts at blends as high as 50% (B50), with pilot programs at 100% (B100) in both states. These blend levels have not required any change out of heating system and only minor adjustments to oxygen mix and flame sensors (technical adjustments), nor have they resulted in increased costs to the consumer versus traditional heating oil. This field experience shows that biodiesel is a GHG reduction strategy with a seamless transition for liquid heating fuel customers.

The Transition to Renewable Liquid Fuel: Bioheat®

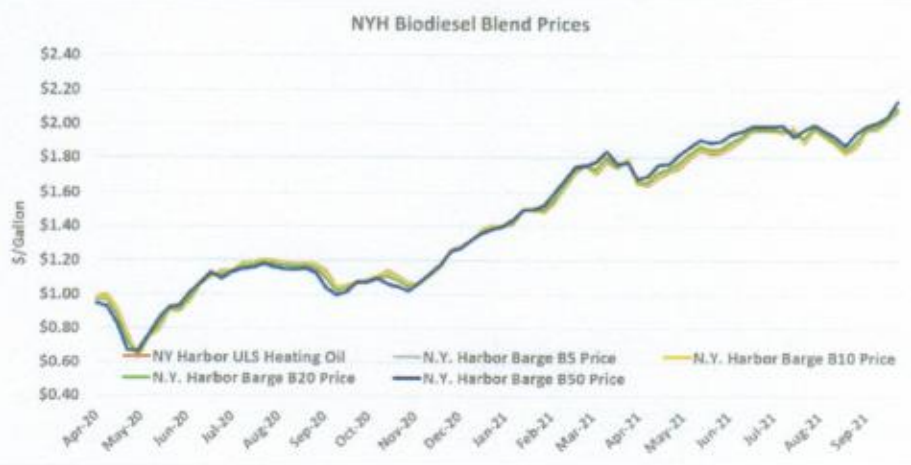
Through the efforts of the National Oilheat Research Alliance (NORA), which was authorized by U.S. Congress in 2000, the heating oil industry, in partnership with the National Biodiesel Board, has a laudable track record of accomplishments to improve the efficiency of equipment and provide a cleaner liquid fuel. NORA is funded by a government sanctioned “check-off” program by which \$0.002 is collected at the wholesale level on every gallon of heating oil sold in the U.S. NBB has contributed millions of dollars for research, development, and educational outreach. This partnership resulted in the development of Bioheat® fuel – ultra-low sulfur heating oil blended with renewable biofuel at levels ranging from B5 to B100.

Because of NORA’s continued leadership and guidance from the NBB, the heating oil industry has proactively pursued all legislative and regulatory opportunities to transition to renewable fuel blends in the Northeast. The industry has supported the enactment of biofuel mandates for heating oil in New York City (B5 increasing to B20 in 2034), Rhode Island (B5), for diesel fuel in Pennsylvania (B2), and the 2008 Clean Energy Biofuels Act in Massachusetts.

Biodiesel is a No Cost Increase Alternative for Current Home Heating Oil Consumers

At the New York State Winter Fuels Outlook Meeting on October 28, 2021, NYSERDA showed the chart below (excerpted from the NYSERDA PowerPoint Presentation) which depicts its tracking of biodiesel pricing. The Authority’s data shows that biodiesel prices track those of diesel fuel, thus proving biodiesel to be an economic and affordable fuel for current heating oil customers. NYSERDA’s Weekly Heating Fuels Report and Dashboard tracks retail pricing and an examination of historical data also shows no discernable price differential in the areas of the state where biodiesel is required versus where it is not.⁹

⁹ <https://www.nyserdera.ny.gov/About/Publications/EA-Reports-and-Studies/Weekly-Heating-Fuels-Report>



- > After accounting for the value of the associated RIN (D4) and the biodiesel tax credit, biodiesel prices are competitive with ultra-low sulfur heating oil, with just slightly higher prices.
 - B5 +\$0.01/gal
 - B20 +\$0.03/gal
 - B50 +\$0.07/gal
- > B100 biodiesel prices are affected by the price of soybeans as the primary feedstock as well as the value of the D4 RIN

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Health Benefits of Using Biodiesel Confirmed in Trinity Consulting Study

Reducing criteria pollutants is more than just an abstract number or percentage -- substantial reductions in criteria pollutants, especially particulate matter (PM), yields important and quantifiable public health benefits.

The health benefits of using biodiesel in place of petroleum heating oil has been studied by Trinity Consulting. Trinity studied census tract areas and the surrounding 5-mile radius, so these results are granular and neighborhood specific. The Trinity Study shows the use of biodiesel in space heating reduces cancer rates by 85% in surrounding areas, as well as providing dramatic reductions in cases of asthma, premature deaths and lost workdays.

Since biodiesel is a drop-in fuel for home heating, these public health benefits begin accruing immediately upon the use of biodiesel in place of petroleum heating fuel. This means the asthma attacks, premature deaths avoided, and workloss days can be reduced every year starting today and for the next 10, 20, 30 or more years it will take the state to deploy deep electrification in this sector. For poor and disadvantaged communities that are heavily reliant on petroleum heating fuels, switching to biodiesel can provide substantial improvements in the health of those communities.

Four communities in New York State were studied: The Bronx, Albany and Buffalo for space heating, and the Port of New York / New Jersey for transportation.

The Bronx (New York) Sotomayor housing development

- Reduction in cancer burden by 20 cases (85% less)
- 16 premature deaths avoided
- 10,848 less asthma attacks
- 2,304 less lost workdays
- 11,889 less restricted activity days
- Equates to a valuation of about \$137M in avoided costs.

¹⁰ NYSERDA New York State Winter Fuels Outlook Meeting on October 29, 2020: FINAL-WinterFuels2020-Master Slide Deck.pdf

Albany (New York)

- Reduced cancer burden by 2 cases (85% less)
- 2 premature deaths avoided
- 65 asthma attacks avoided
- 15 less lost workdays
- 87 less restricted activity days
- Equates to avoided health care costs of \$1.23 million

Buffalo [New York]

- Reduced cancer burden by 29 cases (85% less)
- 8 premature deaths avoided
- 2,901 asthmas attacks avoided
- 1,214 less lost workdays
- 7,206 less restricted activity days
- Equates to avoided health care costs of \$67.54 million

Port Elizabeth – Port of New York / New Jersey

- Reduced cancer burden by 2,516 cases (86% less)
- 116 premature deaths avoided
- 74,862 asthmas attacks avoided
- 33,296 less lost workdays
- 193,804 less restricted activity days
- Equates to avoided health care costs of \$985.74 million

Note: Trinity Consulting is a multi-national firm with 69 offices across the U.S., Canada, United Kingdom, Ireland, Australia and China, and over 40 years of expertise in air dispersion modeling and health risk assessments. The Trinity Study, commissioned in 2020, completed in 2021 and updated in 2022, quantified the local community health benefits of switching from petroleum diesel or distillate to 100% biodiesel in 28 sites across 21 states in the U.S., with a focus on the transportation sector and space heating sector.

Conclusion.

We strongly encourage the Energy Efficiency and Housing Advisory Panel to support the biodiesel blending of heating oil in thermal space heating applications. Biodiesel is a pathway to cleaner emissions for 20% of the state's housing stock with little-to-no investment necessary.

During a meeting previous meeting of the advisory panel, NYSERDA presented the Mitigation Strategy Form on which recommendations to the Climate Action Council would be presented. Attachment A of this document provides the answers to the questions posed in the form relative to the use of biodiesel and renewable diesel for thermal space heating.

Additionally, attached are three information sheets will provide an overview and background on biodiesel and its attributes that we are certain will assist the state in achieving its carbon reduction goals.

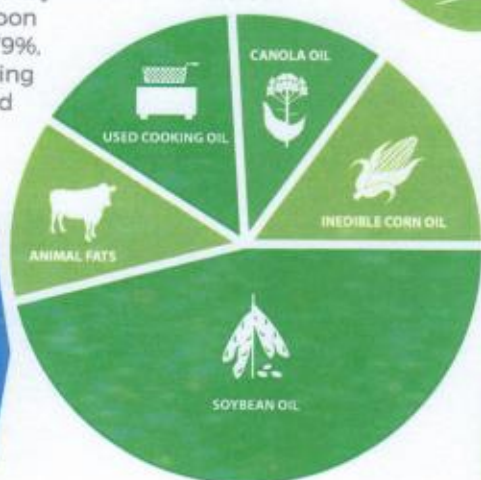
We thank you for your review and consideration of this information and look forward to engaging the New York Climate Action Council and the Energy Efficiency and Housing Advisory Panel as it sets recommendation for regulations to enact the Climate Leadership and Community Protection Act.

BIODIESEL DRIVES SUSTAINABILITY IN FOOD & FUEL SUPPLY LINES

Biodiesel and renewable diesel production improves U.S. food availability and affordability by utilizing byproducts of U.S. food and fuel supply lines.

REDUCING WASTE & EMISSIONS

Biodiesel and renewable diesel are produced from diverse U.S. resources – such as used cooking oil, recycled animal fats and surplus soybean oil – all of which are excess byproducts of food production. These domestically produced, commercially available advanced biofuels reduce carbon emissions by 52%-79%, even when accounting for market-mediated land use change.



52%–79%
REDUCTION IN
CARBON
EMISSIONS

CROPS TO CRUSH

U.S. soybeans are grown primarily for protein meal.

Soybean crops are "crushed" to separate excess oil from the protein-rich meal. Of the U.S. soybean crop's total yield, more than 80% is protein meal and less than 20% is surplus oil.



Palm oil is not an advanced biofuel feedstock under the U.S. Renewable Fuel Standard. U.S. biodiesel and renewable diesel producers do not use palm oil.



BIODIESEL COMPLEMENTS RATHER THAN COMPETES WITH FOOD PRODUCTION

Virtually every stage of U.S. biodiesel and renewable diesel production lowers protein costs, helping to reinforce the international food supply and lower costs.

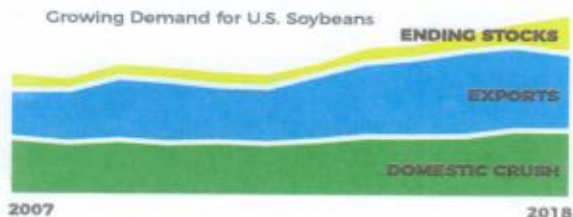
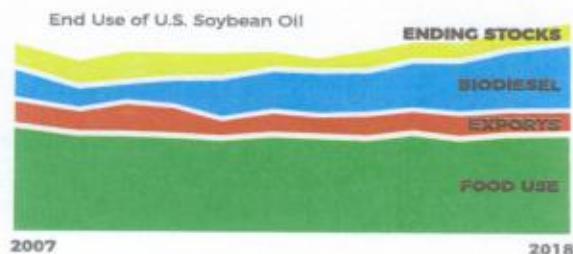
RECYCLING EXCESS OILS

The rendering industry recycles 10 billion pounds of oil and fat and collects 4.4 billion pounds of used cooking oil each year. These excess oils can be further recycled as biodiesel feedstock.



SUPPORTING SOYBEAN DEMAND

Soy-based protein meal is used as animal feed. Excess soybean oil can be used in food production. However, there is a growing global demand for soy-based animal feed and relatively stagnant demand for soybean oil in food production. Biodiesel supports a new market for the growing surplus of excess soybean oil.



Sources: USDA Economic Research Service; North American Renderers Association

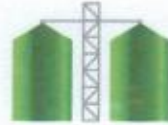


BIODIESEL & RENEWABLE DIESEL

are low-carbon diesel-replacement fuels produced from renewable feedstocks such as used cooking oil, animal fats, inedible corn oil, soybean oil and canola oil.

B BIODIESEL IS...

Produced through esterification or transesterification, a simple process that reacts a fat or oil with a small amount of alcohol (typically methanol) to produce a finished fuel.



A "drop-in" fuel that can be used in all engines and equipment up to 20% and many up to 100%.



Non-toxic, biodegradable, ultra-low sulfur and 0% aromatics.



Better for engines due to higher cetane and improved lubricity.



Made to meet the requirements of ASTM D975 (B5), D7467 (B6-B20), and D6751 (B100).



RD RENEWABLE DIESEL IS...

Produced through hydrotreating, a process similar to a traditional refinery operation. This high-heat, high-pressure process produces a fuel that is chemically indistinguishable from conventional diesel.

A "drop-in" fuel that can be used in all engines and equipment up to 100%.

Ultra-low sulfur and 0% aromatics.

Better for engines due to higher cetane.

Made to meet the requirements of ASTM D975 (all blends).



THE BEST FUEL IS...

A combination of biodiesel and renewable diesel produces a cost-effective full replacement option for petroleum diesel. As a paired fuel, biodiesel and renewable diesel optimize petroleum displacement and cost, as well as particulate matter, carbon and nitrogen oxide reductions.



Up to 79% less carbon emissions.



Up to 79% less carbon emissions.

29% particulate matter reduction.



56% particulate matter reduction.

39% fewer aromatic compounds.



53% fewer aromatic compounds.

23% less carbon monoxide.



30% less carbon monoxide.

9% NOx reduction.



6% NOx reduction.



ABOUT BIODIESEL AND RENEWABLE DIESEL

Source: Impact of biodiesel and renewable diesel on emissions of regulated pollutants and greenhouse gases on a 2000 heavy duty diesel truck. California Air Resources Board, 2013. Effects of biodiesel blends on emissions. National Renewable Energy Laboratory, 2009.

Made from plant-based oils, used cooking oils, and animal fats

Clean-burning ultra-low carbon

Can be used in any diesel engine without modification

Commercially available nationwide

Today's solution for heavy-duty trucking, emergency vehicles, bus fleets, and farm equipment

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