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# Port eyes new fuel to cut Detroit marine industry's pollution. Critics have doubts



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The Great Lakes shipping industry touts the Port of Detroit as a major economic driver for the region, citing the millions of tons of commodities loaded and unloaded annually and the more than 2,000 jobs directly tied to terminal operations.

But community groups and the public authority that promotes the port said there's a negative side effect of that bustling maritime trade: pollution. They are collaborating on a plan they hope will reduce the port's impact on the climate and improve local air quality.

The Detroit/Wayne County Port Authority and Southwest Detroit Environmental Vision aim to zero out the port's carbon emissions by 2040. They said embracing a different fuel — biodiesel — will help reduce the local flooding and heat waves caused by a warming climate and will improve local air quality for portside communities that experience high rates of asthma and other health implications of air pollution.

"We've been asking, what is low-hanging fruit?" said Raquel Garcia, executive director of Southwest Detroit Environmental Vision (SDEV), a clean air advocacy group. "I think that improving the air quality through a really small action while we learn more is so powerful."

But challenges loom for replacing petroleum diesel with plant-based diesel made from vegetable oils, recycled restaurant grease and animal fats. Ships and trucks that move cargo within the port use a considerable amount of fuel, and some Michigan-made biodiesel is shipped to states with tax incentives for it. State legislators are weighing a proposal to create a tax credit that would give an incentive for producing and selling more biodiesel in Michigan.

Biodiesel also causes division among environmental groups, some of which worry the trade-offs of growing more field crops for fuel aren't worth the reductions in greenhouse gas emissions.

Still, the fuel has one major advantage to other climate-friendly options, such as hydrogen or electricity made with renewable sources. It can be used in existing engines and adopted relatively quickly, making it an important first step in decarbonizing the ships, trucks and heavy machinery that

move goods through the port, advocates said. It's also been embraced by a Canadian fleet of Great Lakes ships.

"We are not saying it's the ultimate solution," said Mark Schrupp, executive director of the Detroit/Wayne County Port Authority. "Eventually, we want another fuel that is truly from renewables. If we could generate electricity from the sun and use that as a power source to propel boats, that would be even more carbon saving. We're years and decades away from having that ability. The reason we're pushing biodiesel right now is because it can be done immediately."

## **What port emits now**

The port authority's decarbonization effort started with measuring the Port of Detroit's current carbon emissions. It hired consulting group Tunley Environmental to conduct those measurements and develop the decarbonization plan that was released this year. SDEV organized community meetings so port neighbors could learn about decarbonization options and weigh in on the plan.

The consultants worked with terminal operators to collect data about their operations and used that data to assess each terminal's carbon emissions. Three terminals didn't participate in the study: Cleveland Cliffs, DTE Energy and Marine Pollution Control. The port authority estimated those terminals' carbon emissions using publicly available data and determined steelmaker Cleveland Cliffs was by far the most polluting of all the terminals, releasing about 6,438 tons per year, with DTE's Zug Island coke production facility in second place with approximately 5,055.

In all, the port emits roughly 27,869 metric tons of carbon dioxide annually, according to the study. That's the climate-warming equivalent of about 6,000 passenger vehicles.

Fifty-five percent of the port's emissions come from trucks moving marine goods within 15 miles of the port, while 30% is from ships loading, unloading and moving within 28 miles. The remaining 15% is emitted by terminal owners handling goods.

Ships and trucks operating at the port burn approximately 2.7 million gallons of fuel per year, Schrupp said. That's mostly petroleum diesel, with some other marine fuels. In addition to climate-warming pollutants, petroleum diesel engines also release pollutants such as particulate matter and nitrogen oxides, which contribute to smog formation.

A 2002 study from the U.S. Environmental Protection Agency showed biodiesels, when compared to petroleum diesel in heavy-duty engines, considerably reduce emissions of particulate matter, carbon monoxide and hydrocarbons, but have slightly higher nitrous oxide emissions.

Biodiesels could make a meaningful impact on the emissions that hurt the people who live near major shipping corridors such as southwest Detroit, said Theresa Landrum, a Detroit community organizer who is active with environmental justice groups.

"We have to figure out a way to stop the impact of greenhouse gases on our climate and our health," she said.

Landrum described a demonstration she saw during a SDEV community meeting: Someone showing off the impact of biodiesel lit two oil lanterns. The glass of the lantern that contained biodiesel remained clear, while the glass on the lantern that contained petroleum diesel clouded with black soot.

"You could see right through it," Landrum said of the biodiesel lantern. "We have to look at the impacts and the costs that we deal with because of carbon pollution. We know it's harmful. ... We have to try things that are proven to be cleaner."

The port authority doesn't regulate private terminal operators and can't force them to embrace biofuels, Schrupp said, but it can help secure grant money that will cover some costs of transitioning to plant-based fuel. SDEV also can help connect the companies with grants.

Schrupp said he's recently applied for more than \$120 million in federal and state grants that, if awarded, would support decarbonization efforts and port operations. The port authority was awarded a grant to help one of the port's fuel providers install equipment to sell biodiesel blends.

The Michigan Department of Environment, Great Lakes and Energy has signaled a similar interest in decarbonizing Great Lakes shipping. The department announced on Monday that it was looking for proposals for a strategy to decarbonize Michigan's maritime sector and would grant the top applicant up to \$200,000.

## **Biodiesel climate impact varies**

Biodiesel can be used alone or blended with petroleum diesel, and can be put straight into a regular diesel engine.

The U.S. production and use of biodiesel has grown significantly since 2001, and the country is now an importer of the fuel, according to the U.S. Energy Information Administration. In 2023, the country consumed more than 1.9 billion gallons of fuel and produced about 1.7 billion gallons.

Most of it comes from soybean oil, the EIA found. In its latest breakdown of the oils used to make biofuels, 44% was soybean oil; 33% was waste oils, fats and grease; 15% was corn oil; 5% was canola oil and 3% was recycled feeds and wastes.

The oil used to make biodiesels is an important distinction. The amount of carbon emissions reduction varies widely based on what biodiesel is made from.

According to a March report commissioned by the U.S. Department of Transportation Maritime Administration, powering ships with renewable biodiesel — used cooking oil — would reduce their carbon dioxide emissions 85%. Biodiesel made from fresh soybean oil would cut emissions 40%.

That's because growing soybeans for biodiesel creates some carbon emissions, said Greg Keoleian, co-director of the University of Michigan's Center for Sustainable Systems.

Turning natural land into a farm field releases carbon, so any additional land put into production isn't good for the climate. More pollution is emitted from tractors, combines and other petroleum-consuming farm machinery used to plow fields and plan, spray and harvest soybeans.

Emissions also can happen indirectly, too, Keoleian said, although those impacts are harder to forecast. If a Michigan farmer's soybean oil ends up being used for fuel instead of food, that could mean a Brazilian farmer fills in the gap by growing soybeans on deforested land. It's kicking the canola down the road.

Still, there is a climate benefit to biodiesel even if more land is converted to farming, Keoleian said, citing a 2022 study by Argonne National Laboratory scientists. Using fuel made from soybeans, canola or carinata, an oilseed crop also known as Ethiopian mustard, cut emissions 40%-69% compared with diesel even including emissions associated with farming.

Fuel made from used cooking oil, animal fat or an ethanol byproduct called distillers corn oil is even better, he said, notching greenhouse gas reductions of 79%-86%.

"It is very complex, when you look at all the tradeoffs, and you look at the existing technology and also the opportunities for alternative technology, which includes electrification and hydrogen, which is also being considered for ships," Keoleian said.

The Washington, D.C.-based nonprofit Environmental Integrity Project warned this week that while biofuel plants are less polluting than fossil fuel refineries, they still emit toxic pollutants including hexane, acetaldehyde and formaldehyde.

## **Environmental concerns raised**

Christy McGillivray, legislative and political director for Sierra Club Michigan Chapter, said it's important not to allow biodiesels to delay electrification.

"It's a really fraught topic," McGillivray said. "As a general rule, if it's a fuel we have to burn, we need to be deeply suspicious of the claims that it is decreasing emissions."

Keoleian, who is involved in a regional hydrogen fuel initiative, said using hydrogen or electricity to power port equipment would reduce greenhouse gas emissions even further than biodiesel, so long as the fuel or power is created with clean sources. The Port of Houston is pursuing a plan to reach net-zero carbon emissions by 2050, which includes powering the port with renewable electricity.

The U.S. DOT Marine Administration's report found powering ships with hydrogen or electricity produced with renewable sources would basically zero out the industry's carbon emissions, but major

challenges remain. Sourcing the metals needed to build batteries and generate renewable power are in short supply around the world and renewable-based hydrogen fuel supply chains are in their infancy.

Biodiesel has the advantage of being relatively easy to implement without requiring companies to buy new equipment, the Detroit/Wayne County Port Authority's Schrupp said. That's important in the shipping industry, where vessels can be in use for many decades.

"The reason we're pushing biodiesel right now is because it can be done immediately, without scientific breakthroughs, without changing engines, without all these big things," Schrupp said.

Canadian Steamship Lines has been experimenting with biodiesel for five years. This shipping season, eight of the Montreal-based shipping company's 17 Great Lakes vessels are running on 100% biodiesel. Others are using a mix of biodiesel and petroleum diesel.

Over the years, company testing with different biodiesel determined the fuel didn't hurt engines and was a relatively easy avenue to lower carbon emissions, said Frank Dahan, director of transport services and global fuel strategy for Canadian Steamship Lines.

"For existing fleets in the Great Lakes, this is definitely the fuel of choice," he said, adding that there are regional initiatives supporting biodiesel use and other marine industry decarbonization tactics.

"The question will be, what are we building for our replacement ships?"

The big biodiesel hurdle is that biodiesel now costs more than petroleum diesel, Dahan said. Governments should offer financial incentives for biodiesels, he said.

"It's a financial issue," Dahan said. "We're turning now to government to help us in this initiative."

## **Incentives floated in Legislature**

Michigan has two biodiesel producers, W2 Fuel in Adrian and Thumb BioEnergy in Sanilac. Collectively, they produce 15 million gallons per year, according to the Michigan Advanced Biofuels Coalition, which is supported by soybean industry groups.

Thumb Bioenergy in Sanilac makes all of its biodiesel using restaurant waste oil, said Alex Ritter, vice president of operations. That's the source of biodiesel with the best returns for the climate.

The company pays competitively for used grease and collects it from more than 1,300 restaurants throughout the Lower Peninsula. It brings in about 850,000 gallons of used oil every year, which it turns into about 600,000-630,000 gallons of biodiesel.

Most of that biodiesel leaves Michigan, Ritter said, and is shipped by rail to West Coast states with biodiesel tax incentives. The demand in Michigan is "relatively weak," he said.

A bill circulating in the state Legislature would incentivize the production and sale of biodiesel by creating a two cents per gallon credit for diesel blends that include at least 5% biodiesel and five cents per gallon for blends with at least 10% biodiesel. Producers would get a tax credits of two cents per gallon of biodiesel.

The retailer credit would be capped at \$16 million per year and producer credit would be capped at \$2 million. The program would sunset in 2029.

Rep. John Fitzgerald, D-Wyoming, introduced the legislation and testified in support of it before the House Committee on Tax Policy on May 15, sitting alongside people representing the soybean industry and clean fuels associations.

A tax credit could help expand the biodiesel industry in Michigan and help Michigan trucking and shipping companies reduce their carbon emissions in the near term, he said.

"We know that the country is moving towards a more sustainable, or green, or electrified future in terms of transportation," Fitzgerald said to the committee. "But I have always said, if that's the future we're going towards, where a majority of vehicles on the road may be electric and we want to have a sustainable output at the end of the day, we can do things in the immediate term that help to promote a greener, more clean future."

The legislation does not create incentives for making or selling biodiesel that comes from waste oils. Ritter, of Thumb Biodiesel, is still supportive even if his more-efficient product isn't specifically targeted for incentives.

"I would welcome anything that would pass that would encourage more biodiesel use in Michigan, just so we could get more people asking for it and more distributors to actually want to handle it," Ritter said.

The Sierra Club Michigan Chapter does not have a position on the bill, McGillivray said.

"We need to be really cautious about how we incentivize things like biodiesel, because the real goal is electrification," McGillivray said. "Every day we're not electrifying is a day we're contributing to global warming, and currently we're at a tipping point."

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