Fueling Facts

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CLEAN FUELS MICHIGAN

Fueling Facts

Fueling Facts is a report from Clean Fuels Michigan that provides clear, reliable information about Michigan's clean fuel and vehicle markets. In a fast-changing landscape, Fueling Facts offers trusted insight into key trends, opportunities, and challenges shaping the future of transportation.

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ABOUT CLEAN FUELS MICHIGAN

Clean Fuels Michigan is a statewide trade association for the alternative fuel and electric vehicle industries. We are dedicated to advancing clean fuels in the state that put the world on wheels. Contact us for more information about joining the association or to get involved.

For more information visit:
www.cleanfuelsmi.org

email **info@cleanfuelsmi.org.**

JUST THE FACTS

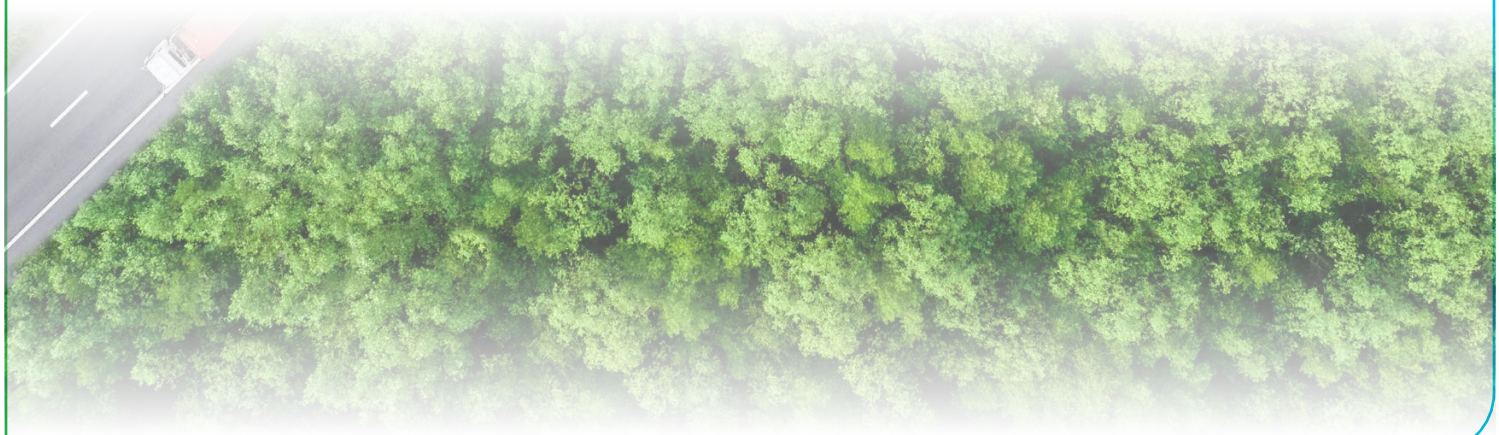
The vehicle fueling market is changing. Vehicle manufacturers are responding to significant improvements in clean fuel technology and the steadily growing global demand for new fueling options. Clean fuel vehicles offer improved performance, enhanced integration with modern communication technology, and a lower total cost of ownership.

The alternative fuels industry is growing across sectors, driven by investment, innovation, and demand.

This report is intended to:

- ***Provide a fact-based, trusted resource for clean mobility information***
- ***Address misinformation and provide a clear view of industry progress***
- ***Provide insight into the development of the alternative fuels market***

This report is a strategic guide. For Michigan, it reinforces the importance of continued investment in advanced fuels and mobility infrastructure. For a national and global audience, it offers an insider perspective into what a balanced, future-ready fuel portfolio looks like: clean, strategic, and innovation-driven.



DATA INSIGHTS

The alternative fuels industry is growing globally and nationally.

Despite headlines suggesting otherwise, the data shows sustained demand for electric vehicles (EVs) and alternative fuels like hydrogen, sustainable aviation fuel (SAF), renewable natural gas (RNG), ethanol, biodiesel, and propane. Sales, investment, and infrastructure are all increasing.

Michigan has a unique and strategic advantage.

No other state combines world-class automotive design, engineering, manufacturing, and innovation capacity like Michigan. Coupled with the state's agricultural industry and natural resources, Michigan is a key player in the alternative fuels industry, with its prominence continuing to grow. The state is naturally well-positioned to lead the clean mobility transition, rather than merely follow it.

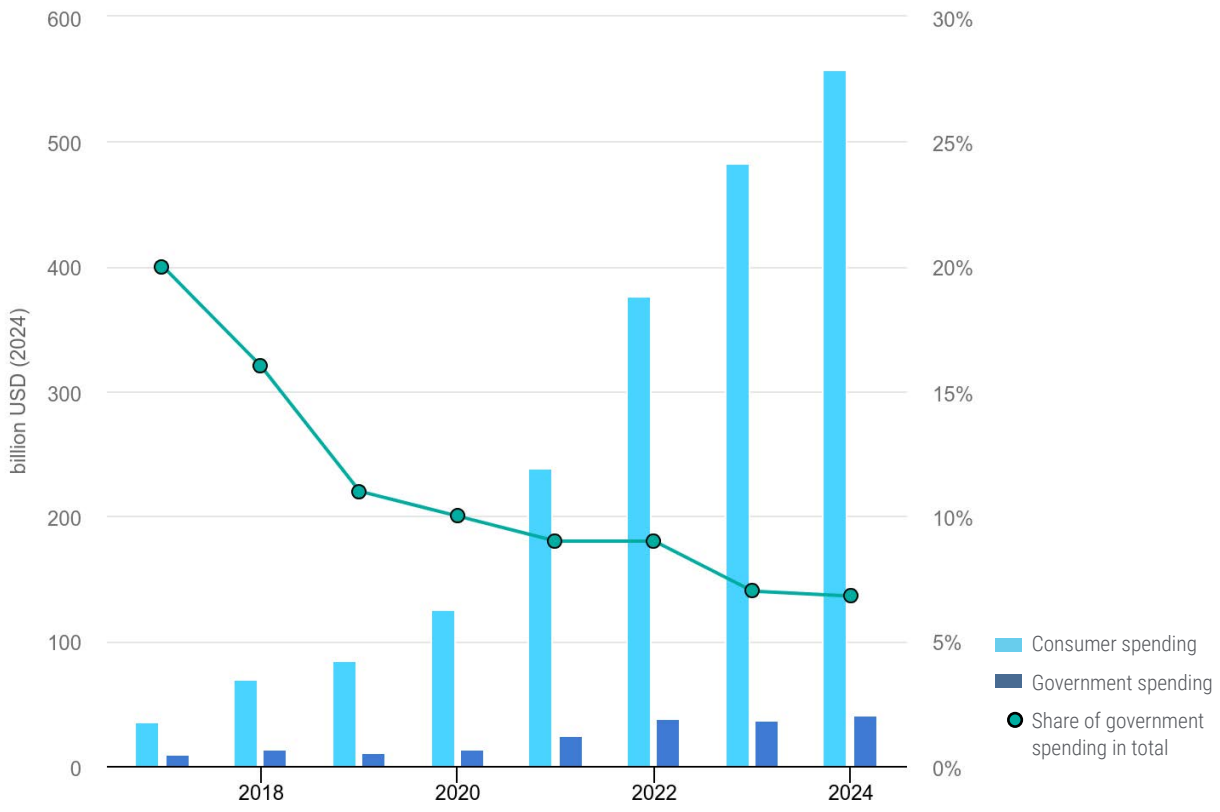
Michigan can lead globally with a balanced, innovation-driven fuel portfolio.

A fuel-diverse strategy built around Michigan's capabilities positions the state to serve national and global logistics, aviation, transit, and other markets. Michigan is home to industry leaders in electric vehicles, biofuels, propane, sustainable aviation fuels, and other innovative fueling sectors.

Policy clarity and investment will accelerate Michigan's clean automotive industry.

The industry continues to advance even amid mixed messages and changing federal policies. Consumer demand for clean fuels is growing, and strategic investment, combined with smart and consistent policy, will unlock even more growth.

GLOBAL CONSUMER AND GOVERNMENT SPENDING ON ELECTRIC CARS, 2017-2024 *Source*



IMPORTANCE FOR MICHIGAN

Michigan is already the global leader in automotive design and manufacturing, and the transition to alternative fuels is an opportunity to expand upon that leadership. Now is the moment to double down on Michigan's unique position as the only place in the world with the full stack of capabilities needed to define the future of transportation: advanced manufacturing, systems engineering, design, supply chain logistics, materials innovation, and a highly skilled workforce.

Regardless of what the vehicle of the future looks like, it should be designed and made in Michigan.

The global mobility market is shifting, and Michigan has too much at stake to be passive. Michigan is more than a legacy auto hub; it's a proving ground for the clean mobility economy. From electric and hydrogen vehicle R&D to battery recycling and biofuel production, Michigan companies and research institutions are shaping the future. The state is home to cutting-edge testbeds, research universities, mobility corridors, and one of the most active ecosystems of startups, OEMs, tiered suppliers, and workforce training programs worldwide.

- **#1 in the U.S. for automotive manufacturing jobs, with over 165,000 Michiganders working in automotive manufacturing.**
- **More than any other state, Michigan accounts for 19% of all U.S. auto production.**
- **96 of the top 100 auto suppliers have a footprint in Michigan.**

The mobility sector is far and away Michigan's largest and most important economic sector.

- **The industry directly and indirectly employs approximately 1.2 million people, accounting for 20% of the state's jobs.**
- **It generates $348 billion in gross economic output. This accounts for approximately 27% of Michigan's total economy.**

OUR COMPETITIVE POSITION: *"If you want to understand where mobility is going and how to invest wisely, look to Michigan."*

MARKET TRENDS | MICHIGAN, NATIONAL & GLOBAL

Electric and alternative fuel vehicles continue to grow, diversify, and gain market share across the U.S., with Michigan positioned to benefit both as a producer and a testbed.

Electric Vehicle Adoption Continues to Grow

EV sales are growing rapidly worldwide. In 2024, global electric car sales exceeded 17 million, and it is expected that one in four vehicles sold in 2025 will be electric.

- China continues to lead the market, with nearly half of all new vehicles sold being electric.
- Europe's EV sales held steady at about 20% market share.

In the U.S., one in ten vehicles sold is electric.

- EV sales have increased by more than 500% since 2017, surpassing 1.2 million in 2024.
- In the first quarter of 2025, over 360,000 EVs were sold, about 10% more than the previous year's period.
- Electric truck sales surged by nearly 80% in 2024, though they still represent only about 2% of global truck sales.
- Electric buses grew by more than 70% year-over-year from 2020 to 2024, with school buses making up around half of the electric bus fleet.

Michigan is also experiencing strong growth in EV adoption.

- More than 111,000 EVs are registered in Michigan.
- As of May 2025, Michigan had approximately 1,546 public charging station locations, including 376 fast-charging sites.
- In 2024, Michigan's EV market share increased by 2.3 percentage points, one of the highest gains in the nation.
- Some school districts, such as Pellston, have already entirely transitioned to electric school buses. Others, such as Jackson, have added more than 20 electric buses.

Increased Access to Fueling Options

- **Renewable Natural Gas (RNG):** The use of RNG in U.S. transportation has increased by over 500% in the last five years.
- **Sustainable Aviation Fuel (SAF):** U.S. SAF production increased from 2,000 barrels per day at the beginning of 2024 to 30,000 barrels per day in early 2025 – a 15-fold increase in one year and growing.
- **Biodiesel and renewable diesel:** Capacity to produce biofuels increased 7% in the U.S. during 2023, reaching 24 billion gallons per year. However, actual production of renewable diesel and biodiesel in Q1 2025 is down significantly from 2024 due to the loss of tax credits.
- **Propane Autogas:** Powers over 22,000 school buses across the U.S., transporting 1.2 million students daily. There are more than 60,000 propane vehicles in the U.S. and more than 28 million worldwide.
- **Ethanol:** U.S. production and consumption of ethanol continues to increase year-over-year, with domestic ethanol production hitting a record 16.22 billion gallons in 2024.
- **Hydrogen:** Global production reached 97 million tons in 2023, a 2.5% increase from 2022.

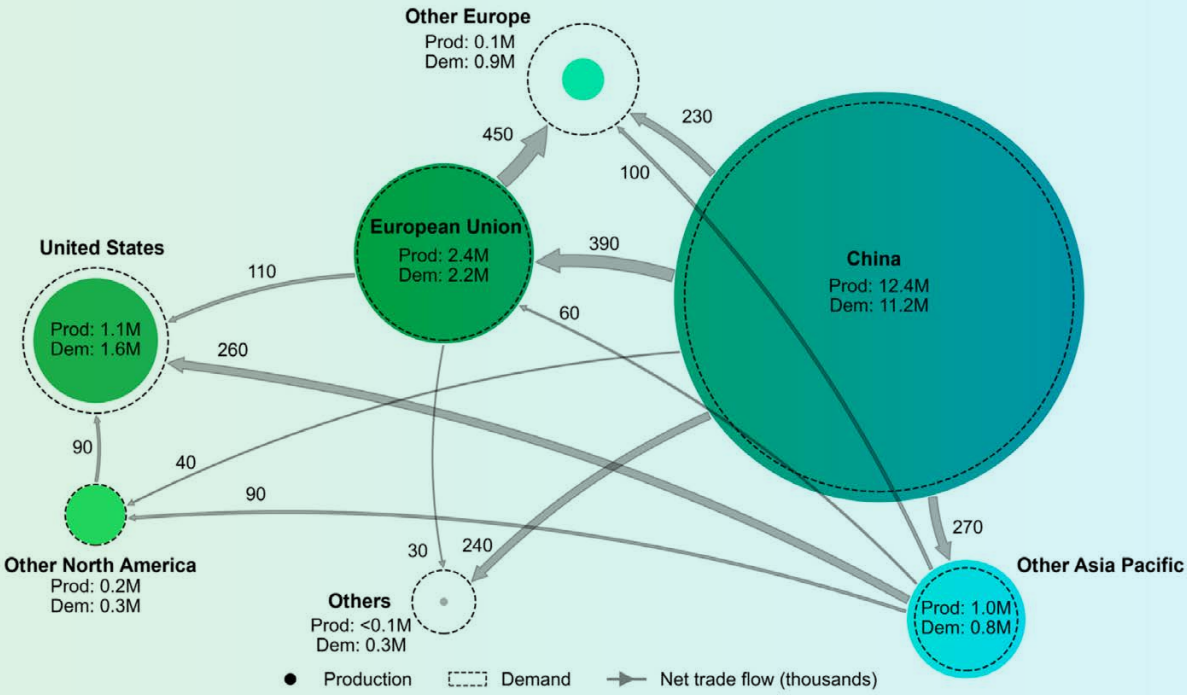
Clean Automotive Manufacturing Presence

The U.S. is a net importer of EVs, with domestic production falling short of demand. China remains the global leader in EV manufacturing, producing over 70% of the world's EVs. However, Michigan is well-positioned to reclaim a strong leadership role in the clean mobility industries thanks to our established manufacturing base and growing clean tech workforce.

- Michigan hosts more than 26 OEM and Tier 1 facilities, including major plants like GM's Orion and Delta Township, Ford's BlueOval Battery Park in Marshall, LG Energy Solution in Holland, and the Our Next Energy (ONE) gigafactory in Van Buren Township.
- Michigan is also advancing hydrogen manufacturing and clean fuel technologies through partnerships with community colleges and companies focused on hydrogen, biofuels, and propane, helping to develop a skilled workforce for this emerging sector.

The time to act on global electric vehicle competitiveness is now.

PRODUCTION, DEMAND AND NET TRADE OF ELECTRIC CARS IN MAJOR GLOBAL MARKETS, 2024 *Source*

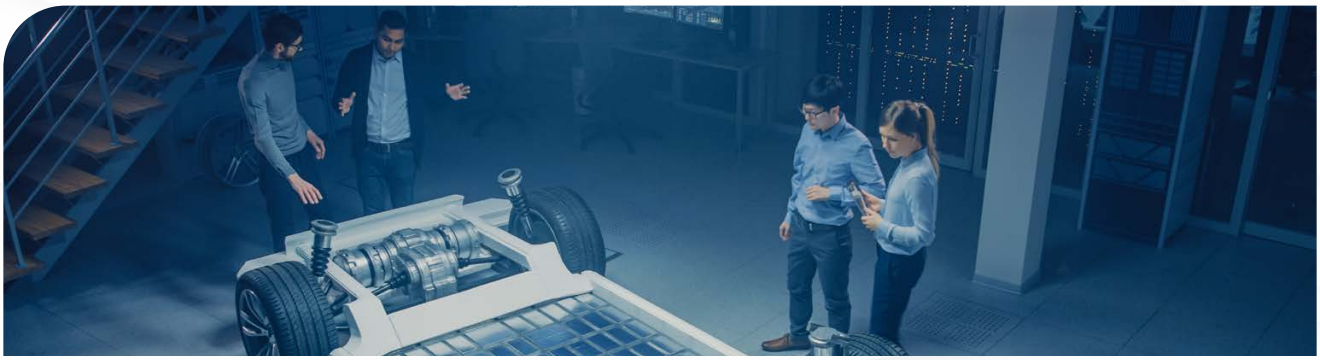


Economic Impact

Michigan's clean mobility sector is transforming how we move and reshaping the state's economy.

- Since 2019, over $20 billion has been invested in EVs, battery production, and alternative fuels across Michigan.
- Michigan's mobility industry generated $348 billion in 2022, more than a quarter of Michigan's gross state product.
- Michigan consumers could save $40 billion by 2040 by adopting clean vehicles that require less maintenance and have lower fueling costs.

These investments create tens of thousands of jobs in fields like battery technology, charging infrastructure, hydrogen components, and clean fuel production.



JOBS AND EMPLOYMENT

From factory floors to engineering labs and charging stations, clean fuel industries create high-quality employment opportunities across Michigan and the United States.

Clean vehicle jobs are growing rapidly, significantly outperforming the overall economy.

There are numerous job opportunities in the clean fuels industry. Job types include but are not limited to:

- EV and battery manufacturing technicians
- Electrical and mechanical engineers
- Charging station installers and maintenance
- Hydrogen fuel system and alternative fuel technicians
- Software developers for vehicle control and data systems
- Biofuel plant operators and engineers

Electric Vehicles and Charging Infrastructure

As EV production and adoption accelerate, so does job creation in manufacturing, software development, installation, and supply chains.

- In 2024, nearly 34,000 Michiganders were employed in the clean vehicles industry, with 15,000 Michiganders working in EV-related roles.
- Employment in the U.S. plug-in hybrid and EV industry has grown 54.5% and 78.8%, respectively, over the past 3 years.
- The expansion of EV and battery manufacturing is expected to generate substantial indirect jobs across the economy, potentially reaching over 931,000 in sectors supporting the EV supply chain, such as raw material extraction and processing, component suppliers, and logistics.
- The growth of charging infrastructure is expected to create more than 160,000 jobs by 2032.

Alternative Fuels

Job growth is also strong across alternative fuel industries, including hydrogen, ethanol, biodiesel, and renewable diesel.

- U.S. employment in the ethanol industry has grown 11% over the past 3 years. Non-ethanol biofuels employment has grown 12.7% over the same period.
- U.S. hydrogen and fuel cell employment has grown 95.3% over 3 years.
- In 2024, the U.S. had 19,604 jobs in the hydrogen industry, with approximately 1,778 (9%) located in Michigan.

Additional job creation is possible from increased focus on domestic production within the automotive, infrastructure, and fueling supply chains.

INDUSTRY DEVELOPMENT

Clean fuels are accelerating an industrial transformation across vehicle platforms, infrastructure, and supply chains.

For Michigan, this isn't just a market opportunity, it's an innovation advantage. From cutting-edge chemistries to next-generation fleet tech, the state can help define how clean transportation is designed, built, and scaled.

Battery Technology and Price

Battery prices drive EV prices. With technological advancement and production at scale, prices are coming down. In 2024, despite the global average battery size increasing slightly, the average battery pack price decreased by more than 25% compared to 2023.

Additionally, ongoing innovations in battery technology, such as solid-state and cell-to-pack architectures, are unlocking safer, lighter, and more energy-dense storage solutions that can enable longer range and faster charging.

Hydrogen Internal Combustion Engines (H2ICE)

H2ICE is emerging as a potential near-term solution for decarbonizing medium- and heavy-duty vehicles, especially in sectors where battery electric options face performance or infrastructure barriers. H2ICE technology uses hydrogen fuel in a modified internal combustion engine, offering lower emissions while leveraging existing engine architecture and manufacturing supply chains. Industry leaders are investing in the development and pilot deployments of H2ICE trucks and equipment. Compared to fuel cell electric vehicles, H2ICE offers a simpler and potentially lower-cost alternative for specific use cases, particularly in legacy fleets and off-road applications. H2ICE faces some of the same challenges as fuel cells, including the current lack of access to hydrogen refueling infrastructure; however, H2ICE is gaining attention as part of a diversified hydrogen strategy.

Clean Fuels in Aviation

The aviation industry is under increasing pressure to reduce emissions, with sustainable aviation fuel (SAF) playing a central role in current decarbonization strategies. SAF can reduce lifecycle greenhouse gas emissions by up to 94% compared to conventional jet fuel, depending on feedstock and production method. While SAF production remains limited, supportive policies and international agreements such as CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) are driving investment. Airlines are entering long-term offtake agreements with SAF producers, and airports, like Detroit Metro Airport, are beginning to accommodate SAF blending and storage. Emerging technologies, such as hydrogen and electric propulsion, are also being developed for short-haul flights.

Infrastructure and Data

Smart infrastructure is advancing rapidly, with pilots of wireless charging technology making EV charging more convenient and accessible. Bidirectional charging is also emerging as a powerful tool for grid management, allowing EVs to both draw power from and supply power back to the grid during peak demand. Meanwhile, leveraging innovative data analytics software can support the optimization of alternative fuel fleets, for example, telematics systems that improve efficiency and maintenance.

A Platform for Broader Innovation

Michigan's clean mobility efforts are driving innovation beyond just transportation. Emerging battery recycling and circular supply chains are helping reduce dependence on imported critical minerals, strengthening domestic manufacturing. Clean fuels also inspire new processes in industries like plastics, adhesives, and metal forming, creating positive ripple effects throughout Michigan's industrial base.

Moreover, Michigan's vibrant network of entrepreneurs and startups is growing rapidly, supported by state programs and partnerships that provide funding, workforce training, and research collaborations. Together, these efforts establish Michigan as a national leader in clean mobility innovation, with benefits reaching far beyond the transportation sector.

GLOSSARY

Alternative Fuels
Fuels other than traditional gasoline and diesel, such as electricity, hydrogen, ethanol, biodiesel, propane, and renewable natural gas.

Biofuels
Fuels made from living things like plants or animal fats. Examples include ethanol (made from corn or sugar) and biodiesel (made from vegetable oils).

Biodiesel
A renewable diesel fuel made from vegetable oils or animal fats that can be used in diesel engines with fewer emissions.

Circular Supply Chain
A system where materials, like batteries or metals, are reused, recycled, and repurposed instead of being discarded, reducing waste and the need for new raw materials.

Clean Fuels
Another term to describe alternative fuels, any fuel that produces less pollution than diesel or gasoline.

Clean Mobility
Transportation methods and technologies that use clean fuels.

Electric Vehicle (EV)
A vehicle powered by an electric motor instead of a gasoline engine.

Fuel Cell
A device that converts hydrogen gas into electricity to power an electric motor, emitting only water as a byproduct.

Gigafactory
A large factory dedicated to making batteries at scale, often to supply electric vehicles.

Hydrogen
A clean fuel that can be used in vehicles, producing only water when used in fuel cells.

Infrastructure
The physical systems needed to support transportation, like roads, bridges, and charging stations for electric vehicles.

OEM (Original Equipment Manufacturer)
Companies that design and build vehicles or key vehicle parts, like Ford, GM, or Tesla.

Plug-in Hybrid Electric Vehicle (PHEV)
A vehicle that runs on electricity (from batteries) and gasoline.

Propane Autogas
A clean-burning fuel used in vehicles, especially school buses.

Renewable Natural Gas (RNG)
Natural gas made from organic waste like landfill materials, wastewater, or animal manure.

Sustainable Aviation Fuel (SAF)
Bio-based or synthetic fuels used to power airplanes, reducing carbon emissions compared to traditional jet fuel.

Telematics
Technology that collects data from vehicles or equipment remotely to monitor performance and improve maintenance.

Tier 1 Supplier
A company that directly supplies parts or systems to vehicle manufacturers (OEMs).

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