

A practical guide to creating a green fleet policy for Class 8 fleets

Easy steps for Class 8 fleet managers to
create a more sustainable fleet operation.



Going green is easier than you think

A green fleet policy is simply a document that outlines the commitments and plans that will help you run a cleaner, more efficient fleet.

It may explain the steps you're taking to reduce emissions, outline your framework for making environmentally sound decisions and identify how you'll measure success.

Your policy can start as small as a single page and grow along with your business.

And with the financial, environmental and social benefits of running a clean fleet, you'll see reduced costs and emissions, improved road safety and happier, healthier employees and drivers.

Many of the measures that you can take are quick and inexpensive to implement, and they can have instantaneous results.

The right telematics solution lets you analyze and visualize the environmental and social impact of your fleet and take the right measures to reduce it. Capture insights into key sustainability metrics such as fuel efficiency, aggressive driving and idling, and create a predictive maintenance program to help meet your fleet's environmental targets.

The best solutions will grow with your fleet and provide you with more value in the long run – even if that future one day involves transitioning away from diesel.

Read on for Class 8 fleet fuel consumption and CO₂ emissions facts, and to learn how to reduce your fleet's environmental impact today.



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CHAPTER 1

The environmental impact of the trucking industry

While the trucking industry has improved vehicle and routing efficiency compared to a few decades ago, freight volumes have increased so fast that greenhouse gas (GHG) emissions have almost doubled in that same time – and that trend is growing. According to the American Trucking Association (ATA), overall freight tonnage will grow more than **25 percent by 2030** to 20.6 billion tons.

It's no surprise that the trucking industry is facing a growing volume of emissions-related legislation at state and federal levels. From California's **Advanced Clean Trucks (ACT)** regulation to the new administration's schedule for the development of fuel efficiency and multi-pollutant emissions standards for medium- and heavy-duty vehicles, the trend is only moving in one direction.

Besides ensuring regulatory compliance, there are many benefits for fleets that implement a holistic green fleet policy. These include:

- Reduced organizational carbon footprint
- Reduced fuel consumption and costs
- Reduced collisions and improved road safety
- Reduced maintenance costs
- Improved driver retention



The numbers:

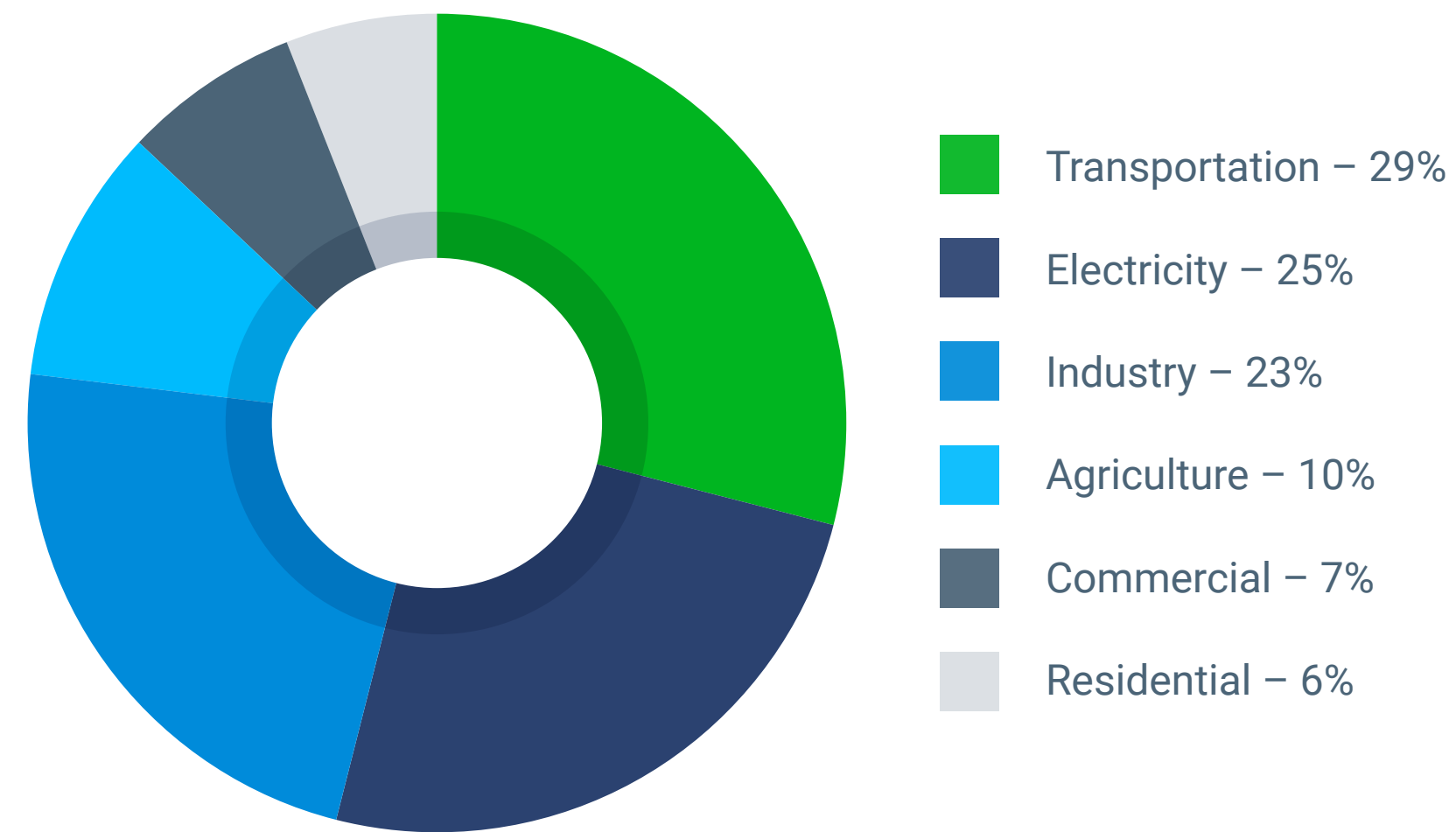
Fleet costs

- Out of the estimated \$1.65 USD per mile it costs fleet owners to run a truck, **a quarter of that goes toward fuel.**
- **With average costs for a new Class 8 truck of \$117,000 in 2018**, four years of fuel consumption costs almost as much as the truck itself.

Environmental

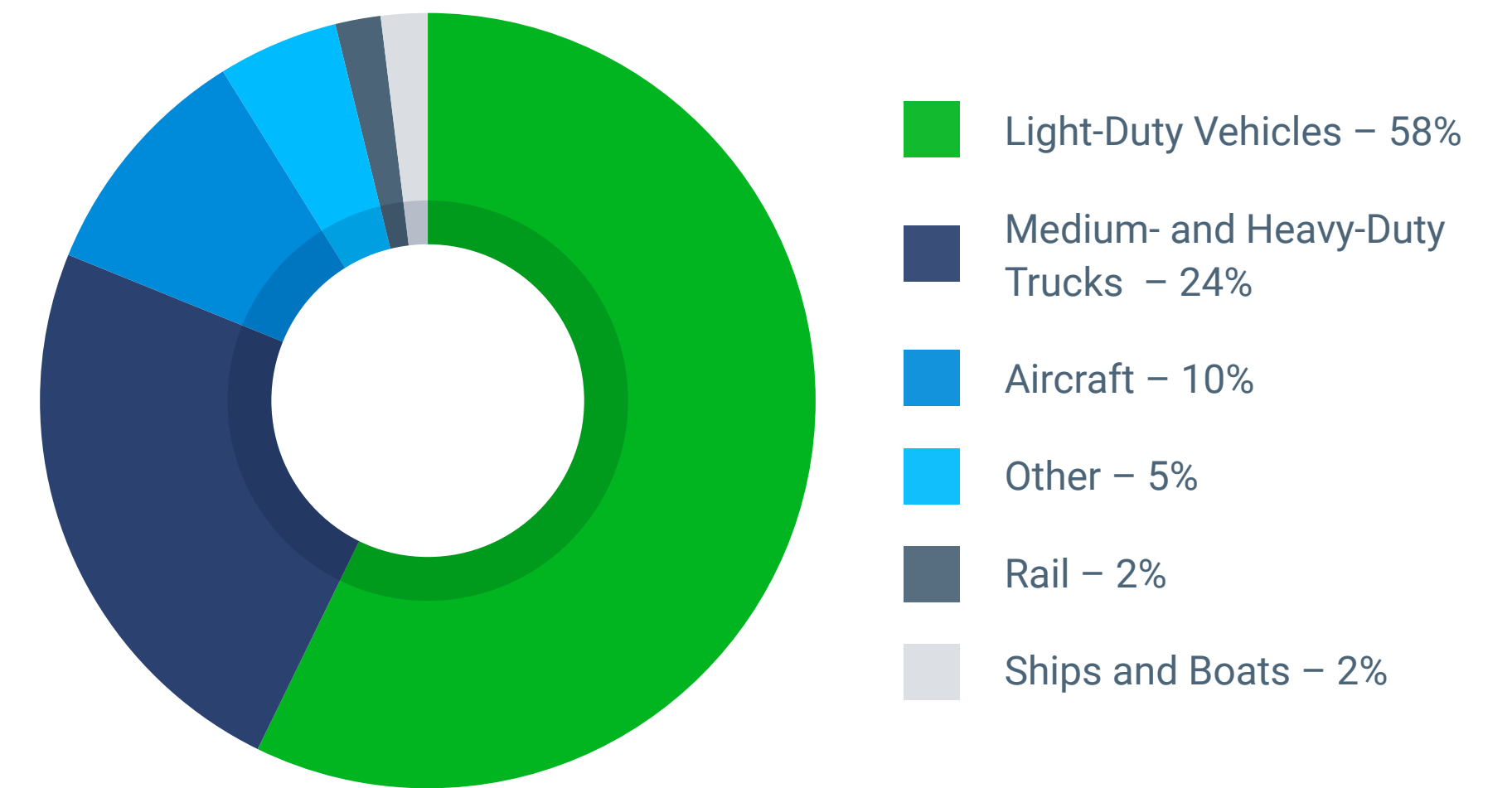
Trucks represent approximately **5% of the global vehicle stock**, but they account for over one-third of global diesel demand due to their high fuel consumption and mileage.

2019 U.S. GHG emissions by sector



In 2019, 29% of U.S. greenhouse gas (GHG) emissions **came from transportation** – the most of any sector, including electricity generation.

2019 U.S. transportation sector GHG emissions by source



The second largest contributors to emissions within transportation are medium- and heavy-duty trucks at 24%.

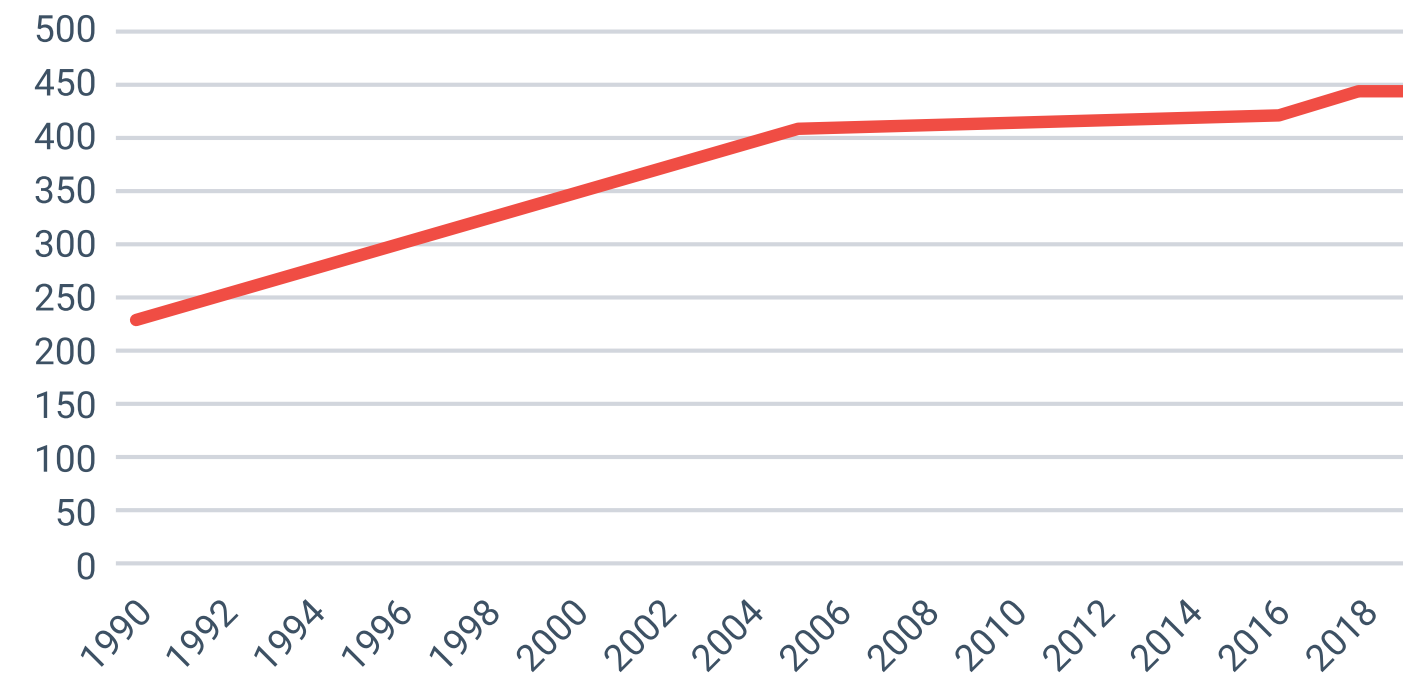
Environmental

**GHG/vehicle mile
(sum of all trucking)**



Trucking emissions per vehicle mile fell sharply from 2005, but have since plateaued.

**Medium- and heavy-duty trucks HGH emissions
(Tg CO₂ Equivalent)**



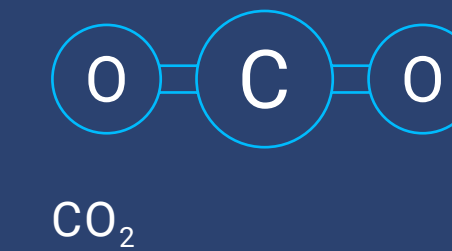
Total CO₂ emissions from medium- and heavy-duty trucks **have increased by 93% between 1990 and 2019** as the trucking industry has grown in volume.

As these statistics indicate, heavy-duty trucking has a measurable impact on climate change. As such, a growing number of fleet managers are recognizing their responsibility to address this concern.

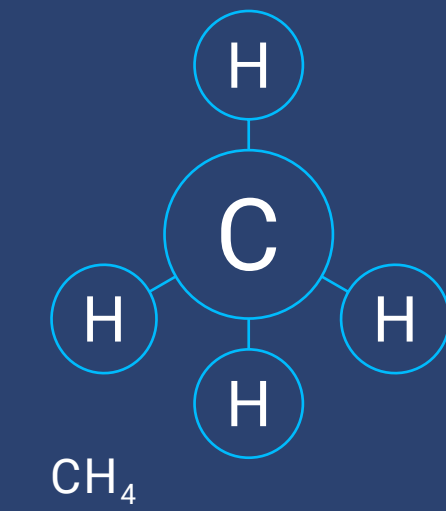
In the next chapter, we look at the immediate actions Class 8 fleets can take to start mitigating their environmental impacts, with the simultaneous benefits of operational cost savings and safer, happier drivers.

Greenhouse gas emissions “**can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years,**” where they have climate-warming effects:

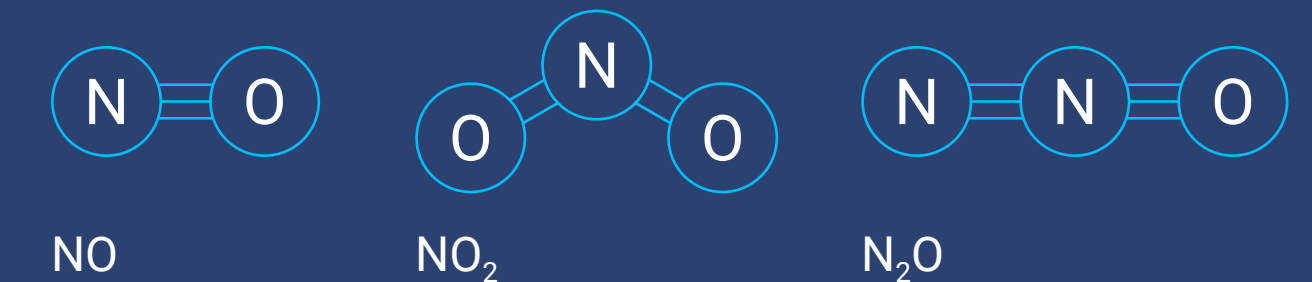
Carbon dioxide



Methane



Nitrogen Oxides



CHAPTER 2

Short-term, low-cost green fleet strategies

Fleets wanting to become more sustainable can focus on initiatives that are quick to action, and that have no – or relatively low – costs to implement. These provide the fleet manager with quick wins that start to lower emissions and reduce fuel spending and other operational costs, while also engaging the wider company in the benefits of sustainability.

Your measurement starts with telematics. You can benchmark data and set realistic goals today, and as you progress in your sustainability journey, identify where you need to make adjustments tomorrow.



Benchmark current performance

The starting point for any green fleet program should be to benchmark your fleet's current performance. This exercise helps you to better understand the current environmental impact of your operations, as well as the costs and inefficiencies associated with them. It also provides indicators for you to measure subsequent improvements against.

Key performance indicators (KPIs) to measure include:

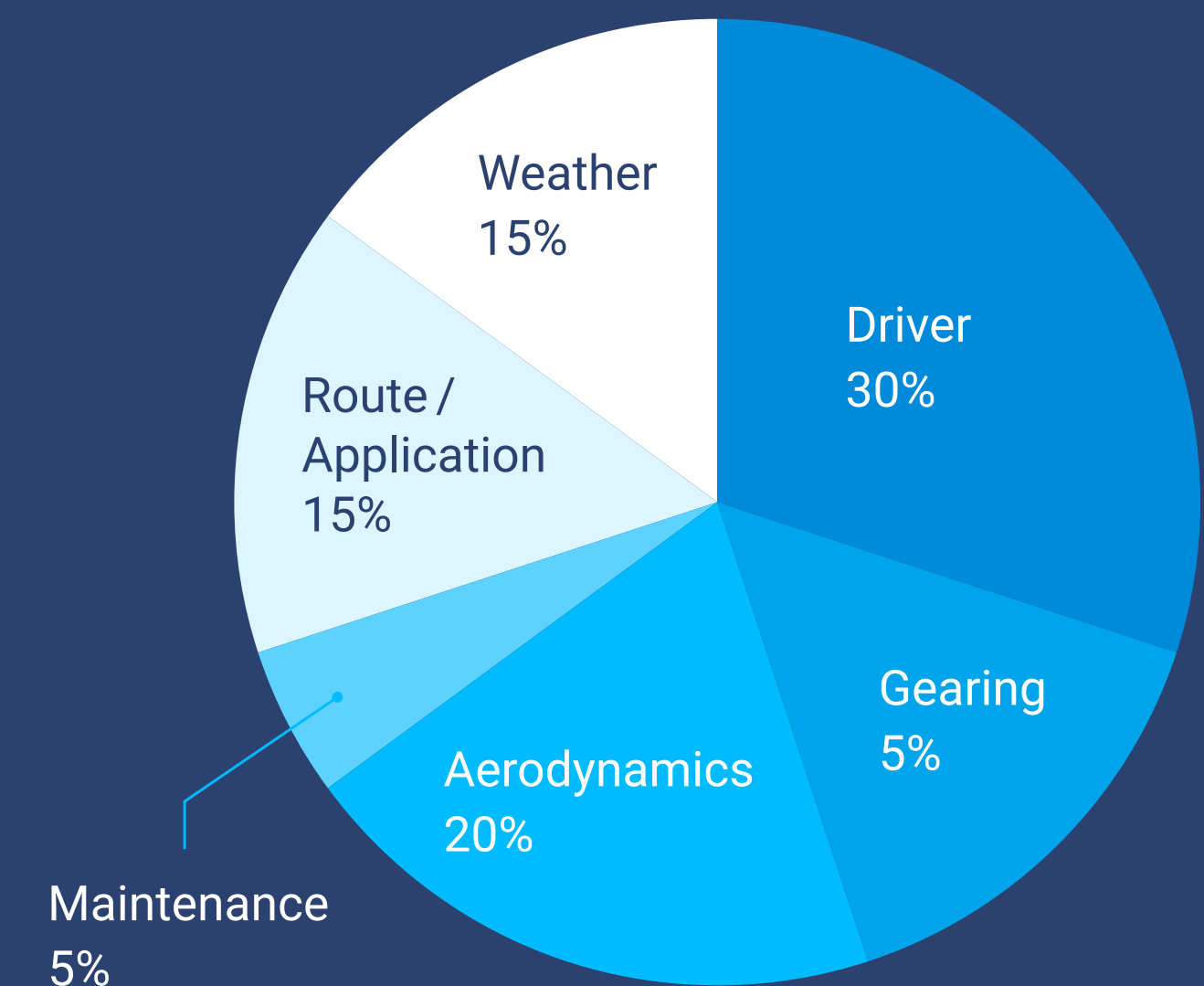
- **Duty cycles** – How much is each vehicle in the fleet being used?
- **Routes** – Are you tracking which routes are the most efficient or which ones are causing issues?
- **Mileage** – How far is each vehicle in your fleet traveling?
- **Fuel costs** – How much are you spending per year on fuel at the vehicle level and the fleet level?
- **Fuel consumption** – Are certain vehicles consuming more fuel than others? Why?
- **Maintenance costs** – Are you tracking preventative maintenance programs to avoid catastrophic engine issues?
- **Vehicle utilization** – Are the vehicles in your fleet being used most effectively? Are individual trucks better suited for different types of shipments?
- **Driver behavior** – Are you tracking the eco-driving habits of each of your drivers? Are you using that data to provide any training needed for your fleet?
- **Emission output** – What are your benchmarks and goals for emissions? What steps can you take to achieve your goals?

Data should ideally be captured over a year, or at least quarterly, to allow for seasonal fluctuations in transportation volume and demands. Also, from a seasonal perspective, road conditions in the winter – or busier traffic patterns in the summer – might affect overall efficiency; the greater the granularity, the more valuable the data for future benchmarking and understanding seasonal fluctuations.

Other examples of data granularity are mileage, fuel and maintenance costs broken down per vehicle where possible. This is where a fleet telematics solution can provide particular value.

85% of the factors affecting fuel economy come from controllable elements that can be measured and managed with telematics software.

- Controllable
- Semi-Controllable
- Uncontrollable



Fleet telematics

You can't manage what you aren't measuring, and that's why implementing a telematics solution should be a core element of your fleet sustainability program. Telematics software provides fleet managers with actionable insights through simple reports and dashboards that prioritize the data that is most pertinent to your fleet's sustainability goals.



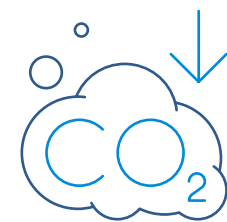
Fleet benchmarking reports allow you to track the Key Performance Indicators (KPIs) that quantify your fleet's environmental impact. Data can be analyzed at the fleet level or the vehicle level. With some telematics providers, you can benchmark your fleet's performance against other fleets with similar duty cycles, compositions, and sustainability objectives. This can uncover opportunities for greater efficiency and strategic savings.



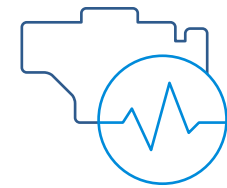
Driver dashboards rate drivers for their eco-driving habits, with KPIs that include hard braking, idling and acceleration. This helps you to identify and reward the drivers that are working hardest to reduce your environmental impact, by providing additional feedback and training to drivers at the other end of the scorecard. Since fuel-efficient driving behaviors also confer less vehicle wear and tear, the side benefit is reduced maintenance costs and vehicle downtime.



GPS tracking and routing enables you to plan the most fuel-efficient, low-mileage routes, and respond in real time to disruptions to get the most efficient use out of your vehicles.



Idling reports let you identify drivers that are idling the most. When idling data is used together with GPS data, fleet managers can pin down specific routes or locations that are leading to excessive idling. For example, a fleet manager can identify an over-congested site or a job that's causing a truck to navigate a particularly busy route.



Vehicle health monitors take remote diagnostic data to detect current vehicle health. Engine error reports can identify engine faults early on, enabling fleet managers to practice a predictive maintenance program, rather than a reactive program. This prevents increased carbon emissions, while also reducing vehicle downtime and maintenance costs.

What the data tells us

In a trial of Class 8 trucks fitted with Geotab GO telematics devices and fuel efficient technology, **the average MPG of the vehicles was improved from between 4.5 and 6.5 MPG to 10.1 MPG.**

If the over 1.7 million trucks in North America achieved the same MPG, the **overall savings would total \$24.3 billion, 9.7 billion gallons of diesel fuel, and 98 million tons of CO₂ annually.**

There can be as much as a **35% difference between your most efficient and least efficient drivers.**

Training and driver monitoring could result in a **10% fuel efficiency increase.**

Heavy-duty vehicles burn half a gallon of diesel per hour (or more) when idling. Even 1 hour of idling per week could cost your business \$85 per truck per year, assuming an average price of \$3.30 per gallon.

Aside from the costs, idling impacts vehicle health, putting extra load and engine hours on your fleet without cause.

Many fleets utilizing MyGeotab telematics can reduce their idling by over 50%.

Reduce inefficiencies

After establishing the baseline performance of your fleet, setting goals for improvement and using telematics data to inform maintenance programs, routing and driver training, you can reduce some of the inefficiencies in your current vehicles and operations.

Here are 9 inexpensive measures that have fast returns on investment.

1

Substitute existing tires for lower rolling resistance tires.

Rolling resistance makes up 30-33% of the total fuel cost of a Class 8 truck.

The cost of the excess fuel consumed due to a tire's rolling resistance outweighs the initial purchase cost by a factor of 3.4.

2

Substitute dual tires for single wide-base tires with lower rolling resistance.

Wide-base tires reduce overall vehicle weight by 1%, have lower rolling resistance, and the potential for reduced maintenance – for an equivalent upfront purchase cost.

3

Perform a right-sizing exercise to evaluate the number of vehicles, routes and the size of the vehicles required to accomplish the fleet's mission.

Considerations such as load, horsepower level, volume and cabin needs can lead to as much as **30% savings in fuel consumption.**

4

Upgrade from API CK-4 lubricants to the more fuel-efficient FA-4 variant of the same grade to add up to an additional 1% in fuel savings.

FA-4 oils offer potential increased fuel efficiency, but are specifically designed for newer vehicles manufactured in 2017 and onwards, where OEM's have approved the use.

7

Transition to synthetic, low-viscosity engine oils that provide a greater fuel efficiency, such as 5W/10W-30. These oils improve oxidation control, shear stability and aeration performance.

Switching from 15W-40 to 5W/10W-30 engine oil can reduce fuel costs by 0.5% to 1.5% for Class 8 vehicles.

While the efficiency gains are modest, it can be implemented across the entire fleet very quickly, doesn't require an up front investment, or any changes in operation or maintenance practices.

Fleets need to balance fuel efficiency with engine durability with their selection of engine oils - when you decrease your oil viscosity you also decrease the protection which can lead to increased friction and wear.

5

Train drivers to maximize the amount of time they are operating within the most efficient powerband of the engine.

8

Maximize the space available for revenue-generating loads with measures like thinner trailer walls and horizontal rods to allow more pallets to stack on top of each other.

Every pound of extra weight requires an engine to work harder, decreasing fuel economy. Similarly, every pound deleted from curb weight can be converted into revenue-generating payload, ultimately reducing the number of trips required.

6

Outfit trucks with features to improve aerodynamics.

9

Implement a maximum speed of 65 mph policy.

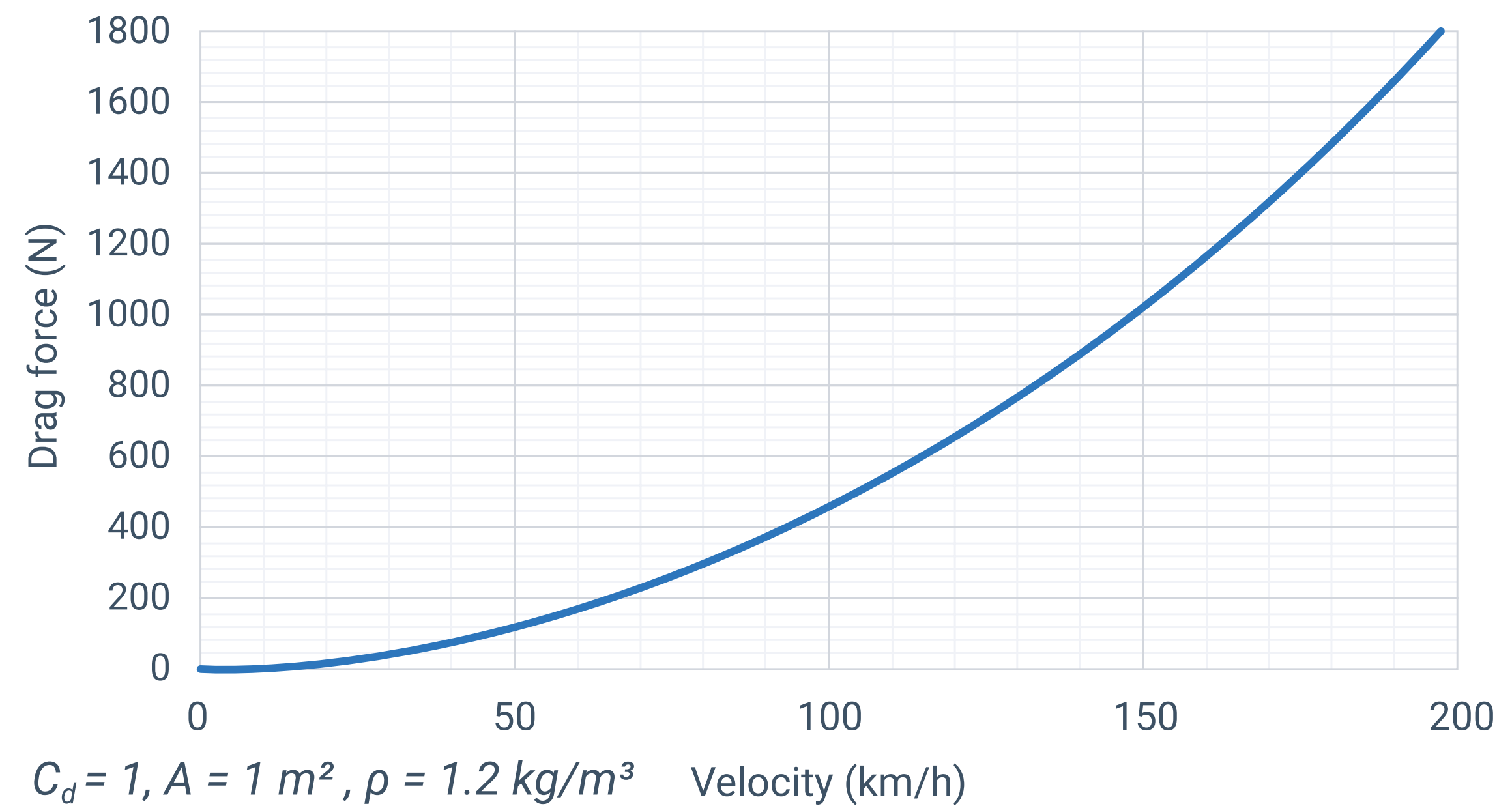
For just one coast-to-coast trip, driving 65 versus 75 miles per hour can lead to hundreds of dollars in fuel savings.

Improve aerodynamics

Aerodynamic drag is especially important at **high travel velocities**. When your fleet runs long hauls, a simple adjustment to features that cause greater drag can result in thousands of dollars in savings over a truck's lifespan. Recent studies show that adding drag-reducing devices to trucks could result in **billions of gallons of fuel savings** across the entire U.S. trucking industry.

Air Resistance

Drag force





Aerodynamic add-ons for trailers

Here are some of the aerodynamic features that can be added to trailers to reduce unnecessary aerodynamic drag.

Fit rear tail fairings/boat tail fairings

Funnel-like panels added to the back of the trailer around the doors that reduce the wake produced by airflow traveling over and around the vehicle. When used together with trailer skirts, **these can reduce the aerodynamic drag by as much as 25%, leading to a 13% decrease in fuel consumption.**

Trailer-mounted gap reducers

Reduce the tractor-to-trailer gap with trailer-mounted gap reducers. **Roughly 20% of aerodynamic drag on a semi-truck occurs at the tractor-trailer gap.**

Trailer aero pieces

Aero pieces can be affixed under the truck, between the two wheels. **Trailers with undercarriage aerodynamic devices consumed 1.43% less fuel than similar units** without the deflectors.

Fit trailer skirts

Fit trailer skirts are affixed to the underside of a trailer to decrease wind resistance. When used together with rear tail fairings, **these can reduce the aerodynamic drag by as much as 25%, leading to a 13% decrease in fuel consumption.**

Aerodynamic wheel covers

Aerodynamic wheel covers reduce drag and turbulence around the wheels. **Tests show fuel savings between 0.7 and 2.5%.** ROI can quickly be achieved even with 0.5% fuel savings.

Aerodynamic add-ons for tractors

This diagram shows some of the aerodynamic features that can be, or are already, integrated into tractors to reduce unnecessary aerodynamic drag. In combination, these features can make a 20% improvement to the drag coefficient (a measure of wind resistance), making a significant impact on fuel consumption and emissions:

Tractor mounted gap reducers

Reduce the tractor-to-trailer gap, where roughly 20% of aerodynamic drag on a semi-truck occurs. **These can decrease fuel consumption by 2 to 3% at a cost of \$300 to \$500.**

Integrated cab roof fairings

Rigid and complex contoured wedge on the rooftop of the cab to direct the airflow from the front of the tractor around the trailer. **These can reduce fuel consumption by 7 to 10% at a cost of \$500 to \$1,000 per unit.**

Aero mirrors

Mirrors, mounting arms and brackets are well-rounded to reduce turbulence and properly direct airflow. **These can improve fuel economy by 1%.**

Aero profile tractor

Lower nose for reduced wind resistance.

Aero bumpers

Integrated with an air dam to direct the airflow around the tractor instead of along the rough underbody.

Fuel tank side fairings

Cover the side gap between the front and rear wheels, reducing turbulence from the cavity and/or the tank.





A road to going green

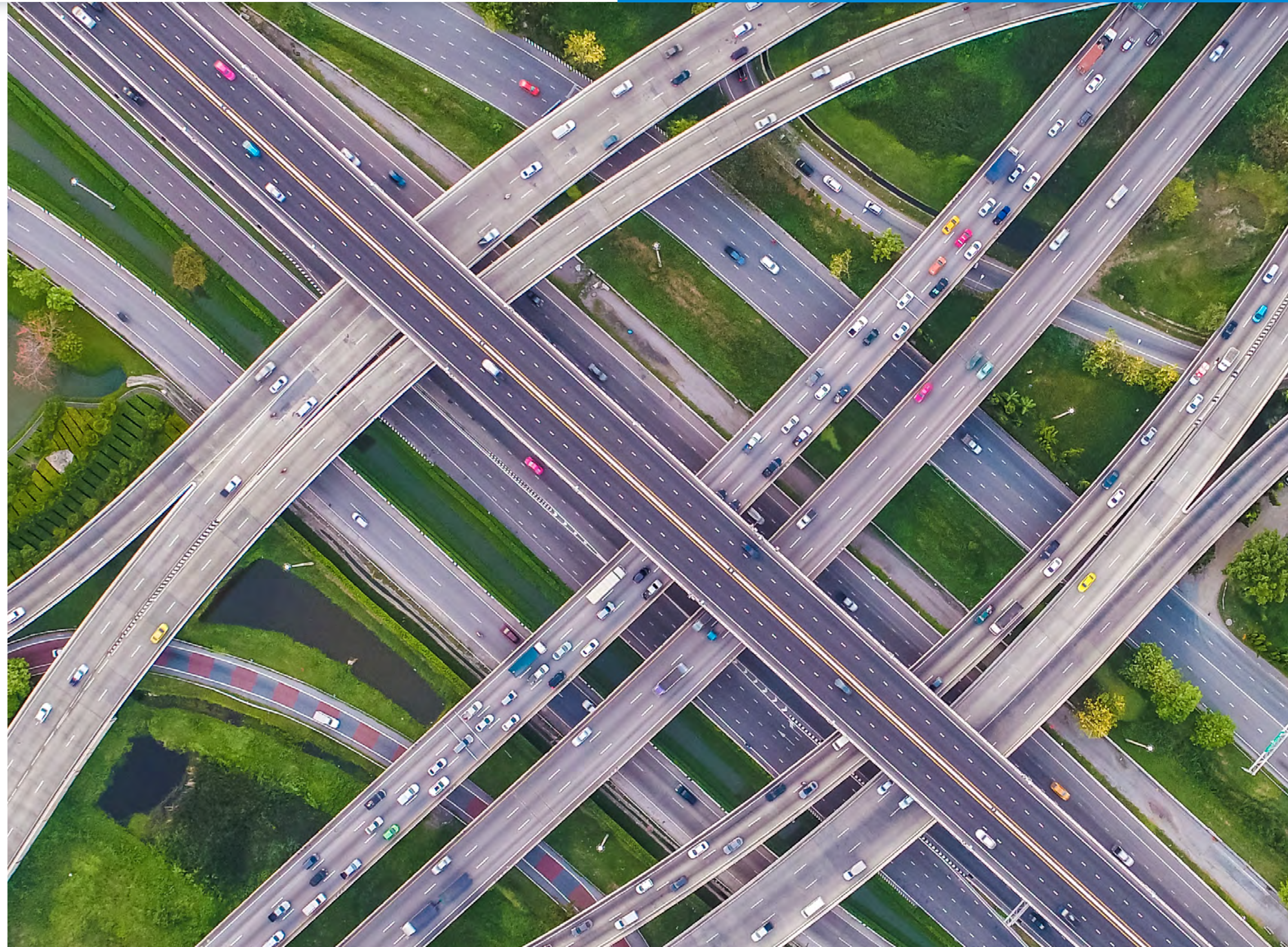
Once these short-term actions have been addressed and your telematics data prove their environmental impact and positive return on investment, fleet managers can turn their attention to long-term strategies like alternative fuels, fleet electrification, new technologies and building an entire culture around sustainability.

CHAPTER 3

Long-term green fleet strategies

Some green fleet strategies involve significant capital investment and large changes to fleet operations before they benefit from long-term cost savings. Other strategies are cost-free but take longer to implement, as they require an investment of management time and energy.

Fleets that investigate these long-term green initiatives today are more prepared for the future of their operations. Alternative drivetrains, technology and legislative pressures are evolving fast, so planning now will prevent you from being caught on the back foot later.





Consider alternative fuels and drivetrains

For heavy-duty vehicle fleets, no one size fits all when it comes to finding an alternative to diesel. No two fleets have exactly the same operating conditions. Factors such as vehicle age and condition, average range, climate, topographies and operating regions all influence which diesel-alternative energy source would be best for your fleet.

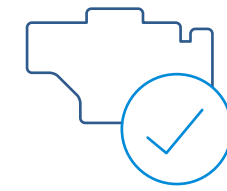
Alternative fuels are one mechanism that fleets can consider to reduce their consumption of petroleum products and related vehicle emissions. Meanwhile, alternative drivetrains such as natural gas, battery electric vehicles (BEV) and hydrogen fuel cell electric vehicles (FCEV) are becoming increasingly attractive solutions for some fleets.

In this chapter, we review the pros and cons of each of the main diesel-alternative technologies to help you to identify which might be best suited to your unique operating requirements.

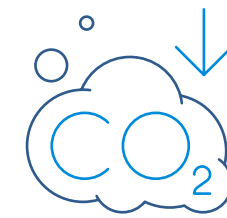
Biodiesel blends

Biodiesel is generally manufactured from vegetable oils, animal fats, or recycled restaurant grease, and has physical properties similar to conventional diesel. Biodiesel is available in its pure form (B100), as well as blended with petroleum-based diesel, from 2 percent (B2) to 30 percent (B30) ratios.

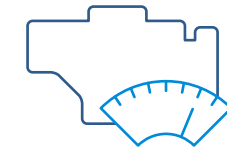
Advantages



No engine modification is needed to transition to a biodiesel blend. Most engine manufacturers support using biodiesel blends up to B20, and a few new engines can support up to B30.



Reduces a vehicle's life cycle GHG emissions because CO₂ released from biodiesel combustion is offset by the feedstocks used to produce the fuel.



Improves engine performance as it improves fuel lubricity and raises the cetane number of the fuel.

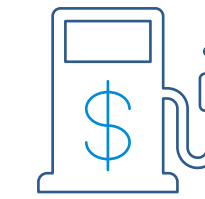


In its pure form, biodiesel is safer than diesel to handle, store and transport.

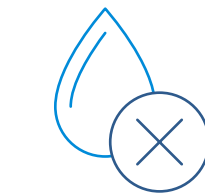


Produced in the U.S., which means the use of this fuel source improves national energy security.

Disadvantages



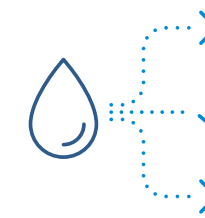
Biodiesel typically costs more at the pump than diesel.



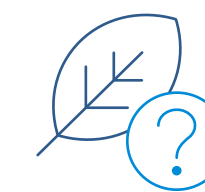
Higher blends of biodiesel can gel in cold weather. This can be countered by blending with winterized diesel in the colder months.



Low quality biodiesel can clog filters and damage some engines over time. Today, fuel quality specifications help facilitate higher quality biodiesel production.



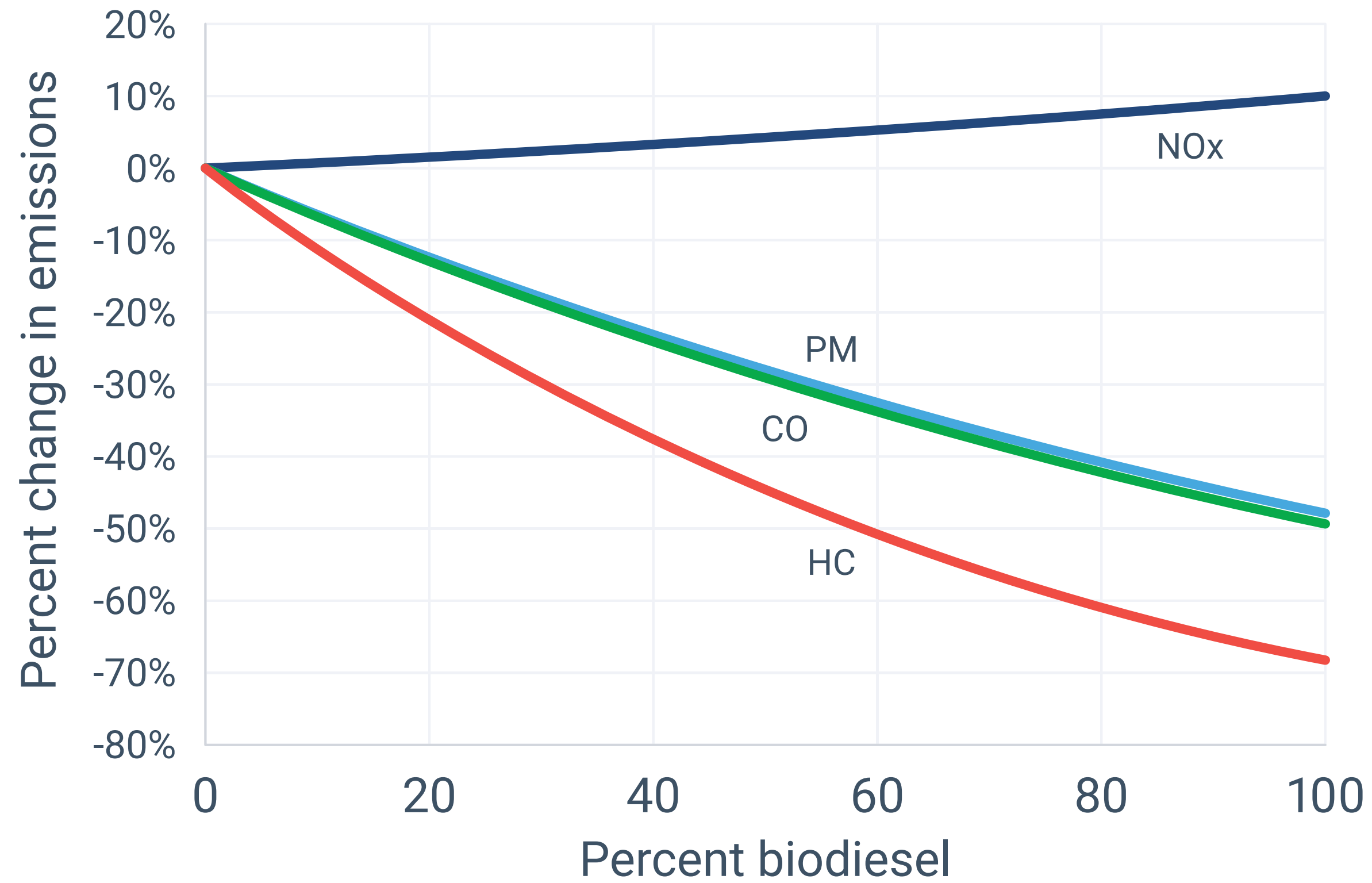
It's not distributed as widely as petroleum diesel, making it less suitable for fleets that run long distances.



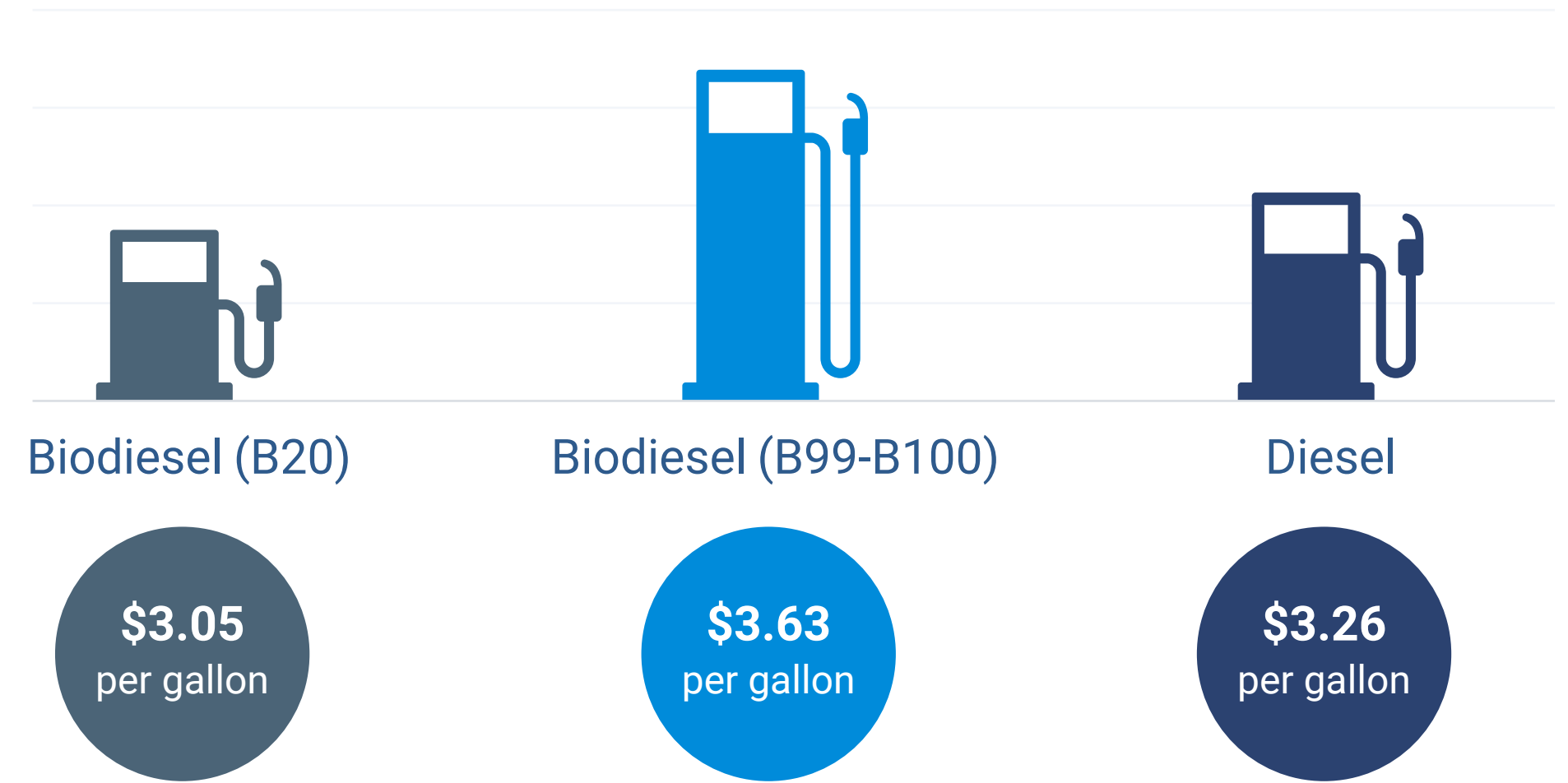
Biodiesel and its social/environmental effects are highly dependent on the source of production. There are low- and high-impact ways to source biodiesel.

Biodiesel blends

Average emissions impact of biodiesel for heavy-duty highway engines



National average price between July 1 and July 15, 2021



Liquified and compressed natural gas

Compressed natural gas (CNG) and liquified natural gas (LNG) are both considered alternative fuels under the Energy Policy Act of 1992.

Natural gas vehicles (NGVs) are particularly suitable for port drayage, city refuse haulers and local delivery trucks, since these fleets tend to operate in closer proximity to a refueling station. They are now available from a range of Original Equipment Manufacturers (OEMs), or trucks can be retrofitted.

LNG, which is supercooled to -260 F to transform the gas into a liquid, has an increased energy density compared to CNG. This makes it more suitable for longer-range applications in heavy-duty trucking.

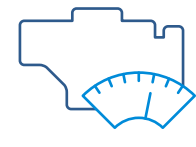
Advantages



Greater price stability compared to conventional diesel fuel.



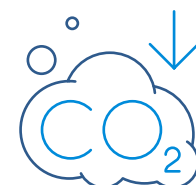
Widespread distribution infrastructure compared to other alternative fuels.



Horsepower, acceleration and cruise speed of NGVs are comparable with those of equivalent conventionally fueled vehicles.



The U.S. has large reserves of natural gas, resulting in less dependence on foreign fuel.



NGVs may have lower emissions* compared to diesel vehicles.

** This depends on the source of the natural gas. If it's from fracking, the accumulation of fugitive emissions can make natural gas have a higher GHG footprint than diesel. If it's renewable natural gas, it is much lower.*

Disadvantages



If on-site gas fueling infrastructure is necessary, upfront costs can be prohibitive.



Limited fueling infrastructure compared to conventional diesel, making fueling a challenge for fleets with irregular, long-distance routes.



Maintenance costs are slightly higher than for diesel, but this is generally balanced by the lower costs of fuel.



Upfront cost of the trucks is currently much greater when compared to diesel counterparts. Future fuel cost savings can offset the higher purchase price.



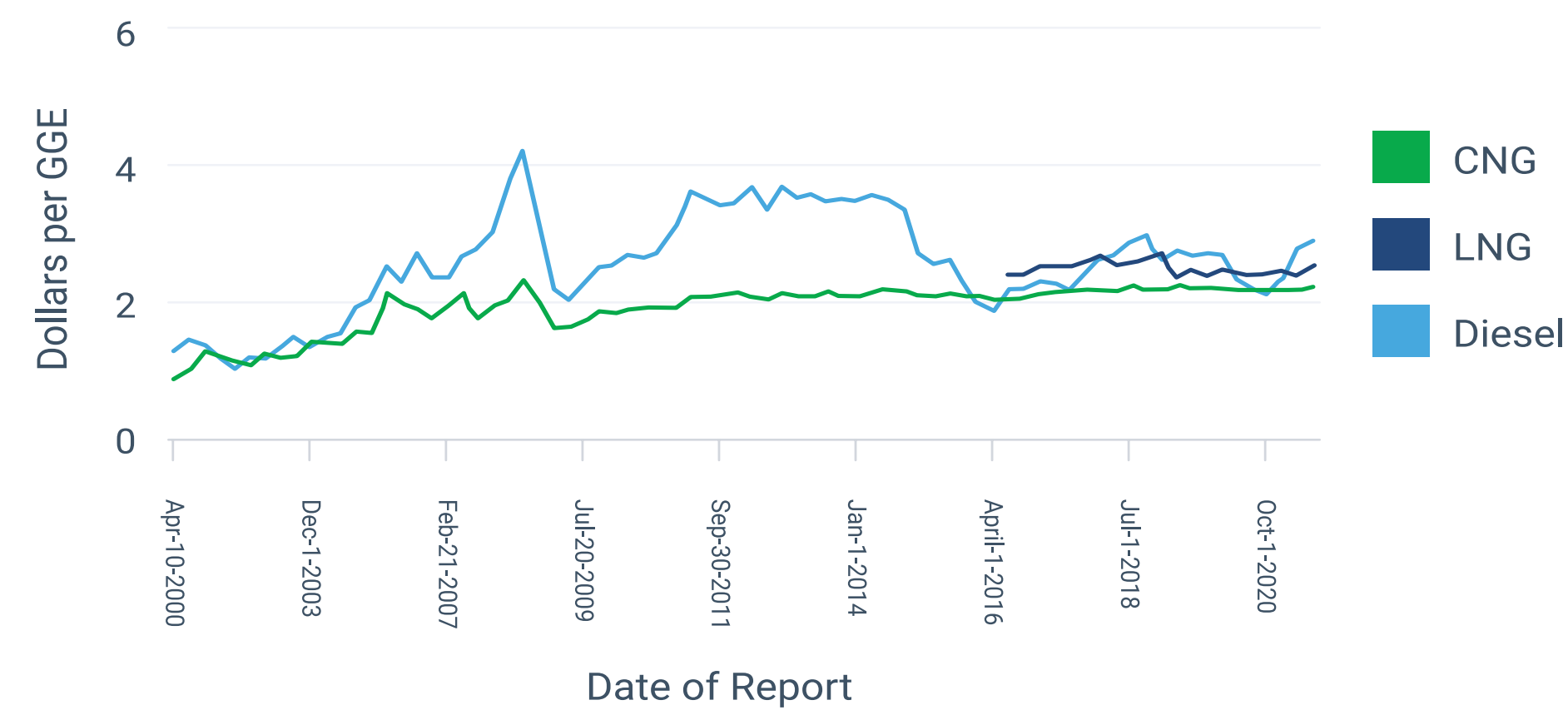
They are still fossil fuels and aren't a renewable energy source.

Liquified and compressed natural gas

National average price between July 1 and July 15, 2021



Average retail fuel prices in the United States



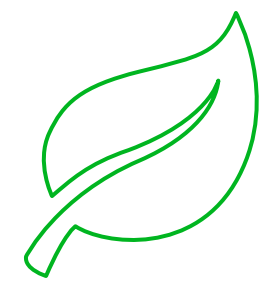
14% less GHG emissions than diesel.

95% less NO_x. These gases can be harmful to human health and the environment, and are one of the primary contributors to the formation of ground-level ozone.

Virtually no particulate matter, the harmful microscopic component of air pollution that penetrates deeply into the lungs.

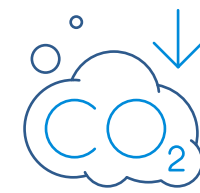
Renewable natural gas

Renewable natural gas (RNG) is typically derived from biogas, produced from decomposing organic waste from landfills, agricultural waste and wastewater from treatment facilities. RNG is chemically identical to fossil fuel natural gas, so it can be used in the same vehicles, or blended with fossil fuel natural gas to reduce GHG emissions.



RNG from landfill achieves a life-cycle **GHG emission reduction as high as 93%** when it replaces diesel fuel.

Advantages



RNG produces **fewer GHG emissions** than diesel fuel, reducing the carbon footprint of your fleet operations.

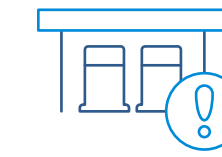


In some cases, RNG can be eligible for credit thanks to avoided life-cycle emissions.

Disadvantages



RNG is expensive compared to other energy sources.



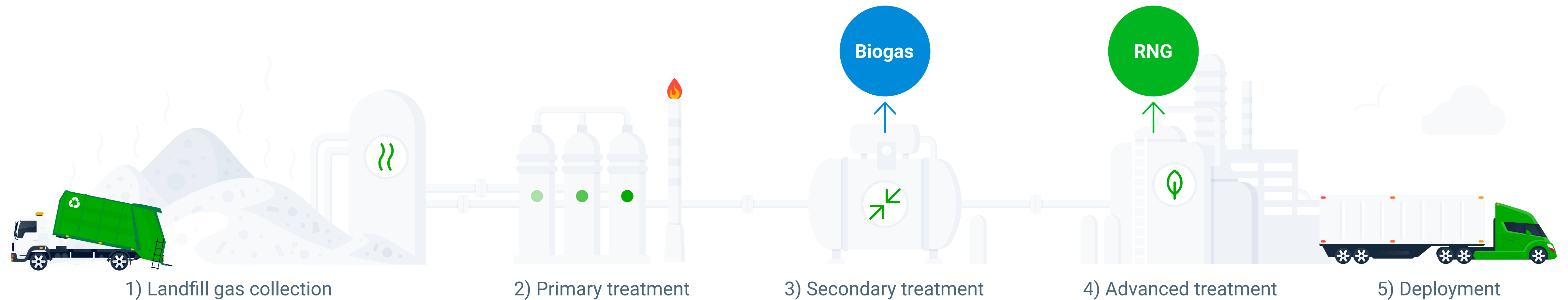
Limited refueling locations in comparison to CNG or LNG. Most are associated with landfill facilities, making it most suitable as a fuel source for refuse fleets that can empty their loads and refuel at the same site.



The total amount of RNG available is limited, since it is a byproduct of finite waste streams. This will prevent mass adoption of RNG.



If on-site gas fueling infrastructure is necessary, upfront costs can be prohibitively expensive.



Electrification

Although the electric truck market is still in its infancy, the world's largest manufacturers have made it clear that they see electrification as an increasingly important element of the freight transportation industry. Most of the major OEMs and several start-ups have launched – or are preparing to launch – new models.

For this ebook, as it pertains to Class 8 trucks, we'll look at the potential advantages and disadvantages of different types of electric vehicles as more fleets will have the opportunity to consider electrification as part of their long-term green fleet strategy.

Advantages



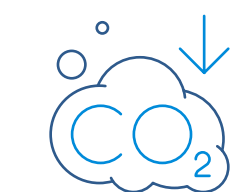
With upfront purchase costs falling, there is the potential for a reduced total cost of ownership (TCO) over the lifespan of the truck **in the near future***, due to the lower operating costs and 'fuel' costs.



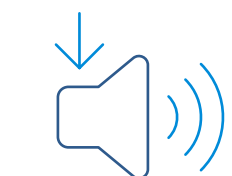
Reduced maintenance requirements and costs compared to internal combustion engines (ICE), with fewer moving parts to replace and reduced wear and tear.



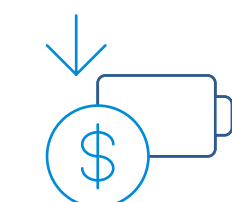
Zero tailpipe emissions, improving urban air quality and public health.



24% of transportation GHG emissions come from medium- and heavy-duty trucks, so as diesel drivetrains give way to electric, the resulting fall in GHG emissions will be considerable.



Reduced noise pollution with no combustion engine means a more comfortable work environment and quieter roads.



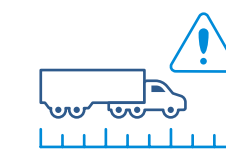
Battery prices are dropping. **In 2010, prices averaged \$1,200 per kWh. Today, they're approximately \$132 per kWh**, and they're projected to continue dropping.

* The National Renewable Energy Laboratory (NREL) found battery-electric and fuel-cell electric trucks could be economically competitive with conventional diesel trucks as early as 2025.

Disadvantages



Upfront costs of electric trucks are currently much higher than for conventional trucks, but with advancements in battery technology, **prices are falling** and performance is improving just as quickly.



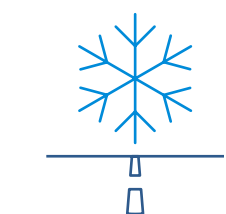
Reduced mileage range compared to diesel counterparts, but with **67% of freight** moving less than 250 miles, this is within the operating range of many of the models hitting the market.



Long charging time due to the large size of batteries required, with most taking well over two hours to fully recharge from empty on the fastest available charging system.



Reduced carrying capacity due to the weight of the batteries, meaning some trips will hit maximum weight restrictions with the need for more EVs to do the same work as their conventional alternatives. If a solid-state battery can be commercialized, **these promise to be lighter** and have more energy density.



Lower mileage range in extreme high and low temperatures, due to the heavier use of auxiliary systems to heat or cool the cab.



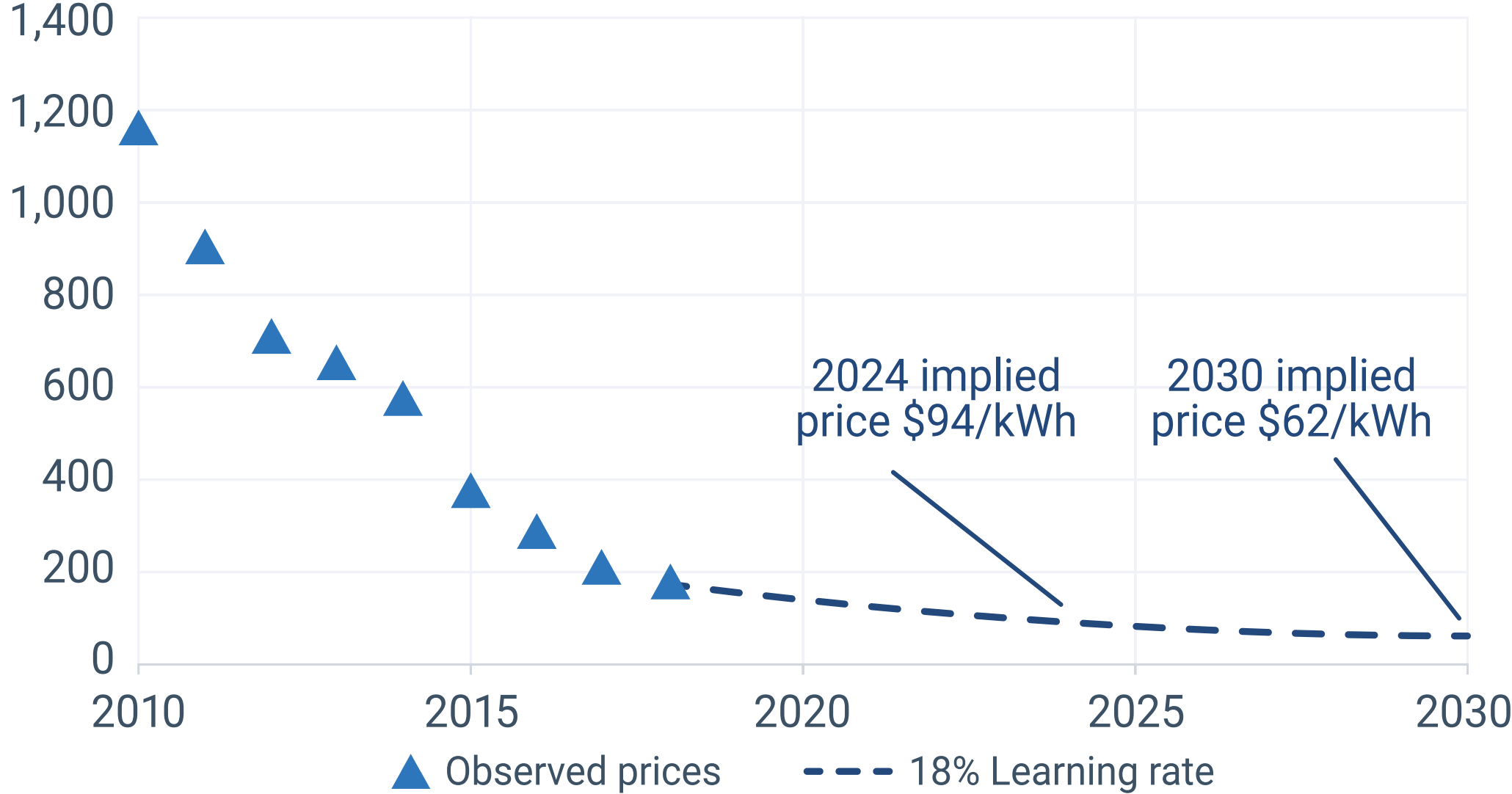
Current lack of charging infrastructure makes it more suitable for low-mileage, depot-based operations.

Electrification

Battery electric vehicles

Battery electric vehicles (BEVs) rely on onboard battery storage to provide the electricity used to power one or more electric motors.

Lithium-ion battery pack price (real 2018 \$/kWh)

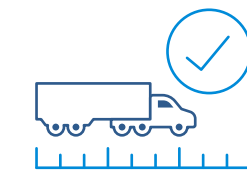


Fuel cell electric vehicles

Fuel cell electric vehicles (FCEVs) operate similarly to BEVs by utilizing an electric motor as opposed to a combustion engine. However, their energy is generated onboard the vehicle via electricity produced by a hydrogen fuel cell, rather than stored in batteries, and cannot be charged via the electrical grid. The electricity generated by the fuel cell charges a small storage battery, which powers one or more electrical motors.



Advantages



Compared to pure BEVs, FCEVs offer **greater mileage and faster refuel time**, making them more suitable for **long-haul trucking**.



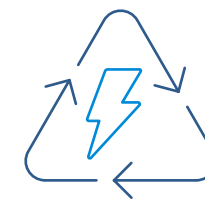
FCEVs have no GHG tailpipe emissions, producing only water vapor and heat.



Less carrying capacity loss compared to BEVs, due to the smaller battery used in the hydrogen fuel cell configuration.



The TCO of FCEVs is **currently lower** than for BEVs, due to the capital expense of the larger batteries required for BEV trucks.

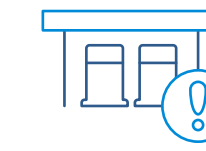


Hydrogen can have a very low to zero lifecycle carbon intensity, if derived from water through electrolysis using renewable electricity (green hydrogen).



Can help to reduce U.S. dependence on foreign oil, since hydrogen can be produced from entirely domestic sources.

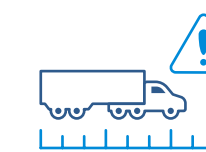
Disadvantages



Current lack of fueling infrastructure to make hydrogen sufficiently available to support widespread adoption.



Currently, FCEVs have a higher initial purchase cost compared to diesel counterparts, but prices are falling fast as technology advances.



Trucks currently carry hydrogen gas, which is voluminous and lowers the potential mileage of the vehicle. If it could be used in its liquid form, this would double the mileage range.



Fuel cell systems are not yet as durable as ICEs, although durability is increasing quickly as the technology develops.



The lifecycle emissions of using hydrogen is highly dependent on how it is produced, and may offer little to no climate benefit, such as with gray hydrogen extracted from natural gas through steam reforming.

Did you know?

A Class 8 truck with a **100-kilogram hydrogen tank can be fueled about 15 times faster** than charging a 1-2 megawatt-hour battery.

The TCO for a hydrogen FCEV long-haul truck (multi-shift, weight-limited Class 8 sleeper) is **expected to be 25% lower compared to pure BEVs by 2025**.

New emissions-reduction technologies

CO₂ capture and reuse

Researchers have **developed a new technology** that could cut trucks' CO₂ emissions by almost 90%, without any energy penalty. It involves capturing the CO₂ that is created in the exhaust system and then converting it into a liquid, which is stored in the vehicle. The liquid CO₂ is then delivered to a service station, where it's turned back into fuel.

One mobile CO₂ capture company is gearing up to install its first devices on commercial trucks at the start of 2022. Their technology isolates carbon dioxide from the exhaust by making it cooler and dryer, then passing it over a porous mineral-like substance that selectively absorbs the CO₂. After the CO₂ is captured, it is then released by applying heat, much of which comes from the hot exhaust itself.

The company is building the CO₂ collection network that will then enable fleets to sell the pure CO₂ captured from their trucks' exhausts to an end market that includes greenhouses and beverage carbonators.

Electrified parking spaces

Most drivers remain in their vehicles during their rest periods and continue to run their engines to provide power to heat or cool their cab. Long-haul trucks rest-stop idle for an average of 1,800 hours per year. This is expensive, puts additional stress on the engines and is environmentally polluting. Researchers **have calculated** that rest-stop idling costs the U.S. trucking industry about \$3 billion per year in wasted fuel.

Electrified parking spaces (EPS) allow drivers to turn off their engines and plug in to a power pedestal to access grid power for their heating, ventilation and cooling (HVAC) requirements. This reduces engine wear and tear and results in no vehicle emissions. Electrification is either single-system, where HVAC is provided directly to the truck, or dual-system, where power is provided to the vehicle's own auxiliary HVAC system.

The U.S. government subsidizes the creation of EPS through their Diesel Emissions Reduction Act (DERA) funding program to reduce exhaust emissions.

While a heavy-duty fleet commonly represents the greatest source of an organization's carbon emissions, the weight of responsibility to reduce its carbon footprint shouldn't sit with fleet managers alone. In the following section, we look at how an organization can instill a culture of sustainability throughout the organization, flowing from top to bottom and up again.



Create a culture of sustainability for your business

If your green fleet policy is to be a true success, it should not be a standalone element within your organization. Instead, it should be part of a greater organizational sustainability strategy, which is entwined into the core of the business.

The change in mindset must start with senior management “walking the walk” and taking a fundamental role in displaying the importance of sustainability.

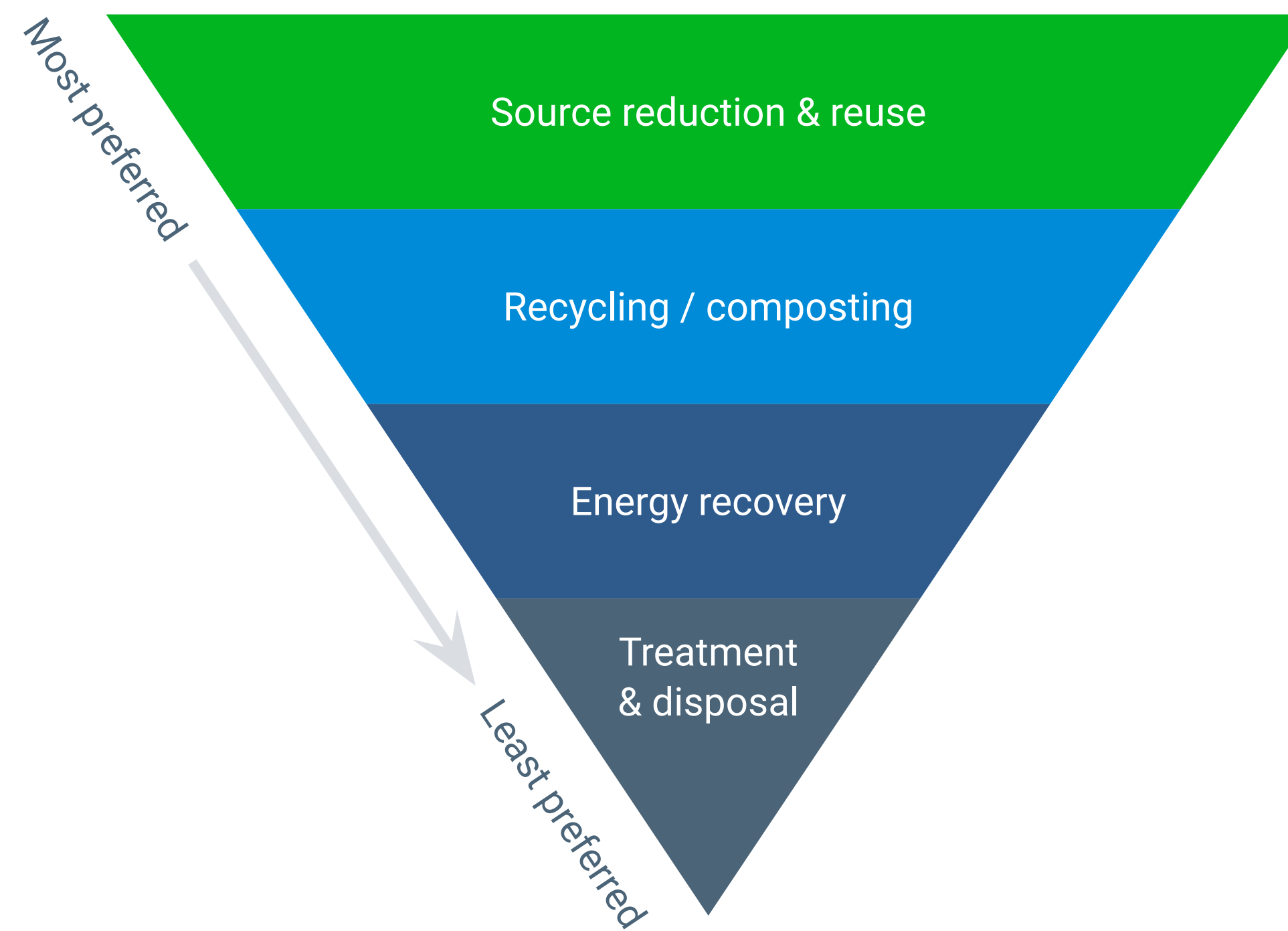
Sustainability should be considered across all areas of the business. Here are six ways to build sustainability into everyday operations.

76% of Americans expect companies to take action against climate change.

1

Application of the waste hierarchy, focusing on reducing waste and preventing pollution.

Waste management hierarchy



2

Applying sustainable procurement strategies for all business areas, from offices through to warehouses and fleet operations.



3

Creating an energy management plan for usage throughout the organization, from HVAC and lighting, to staff transport and beyond.



4

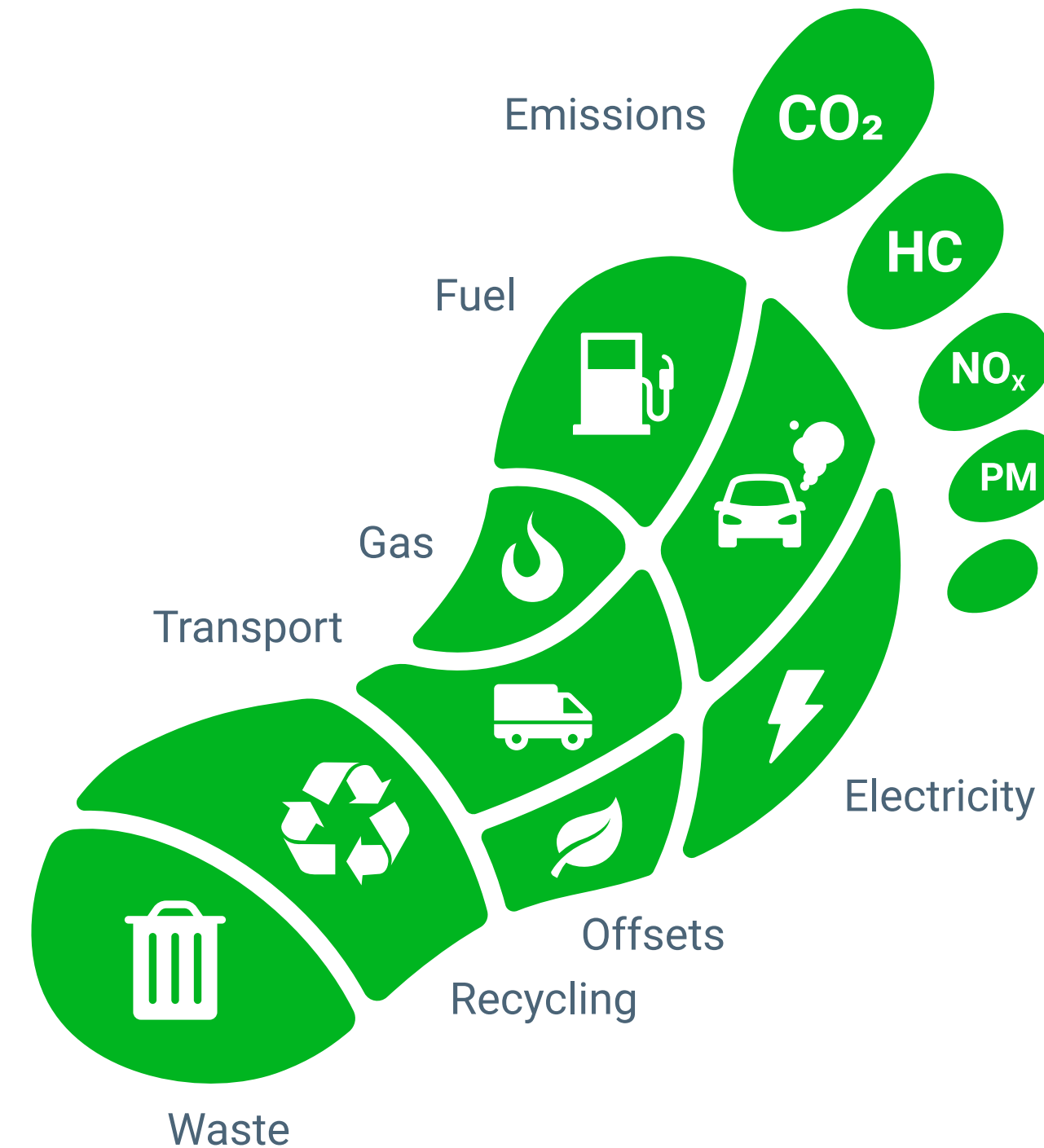
Measurement of the organizational GHG emissions that the company:

- Produces directly (scope 1 emissions)
- Makes indirectly, such as from the electricity and gas that it uses to heat the business premises (scope 2 emissions)
- Is indirectly responsible for, up and down its value chain. From buying products from its suppliers to what happens to its products when customers use them (scope 3 emissions)



5

Taking environmental considerations into account when making investment decisions, including company pensions.



6

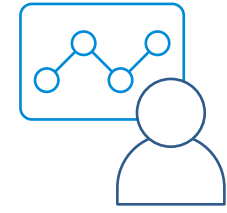
Establishing a sustainability team built from all levels of the organization, empowering employees to be a part of the solution and giving them a voice.



Engage staff in sustainability

Principally, fleet managers will think of their drivers – and drivers certainly have the greatest impact on fleet sustainability. But it’s also important to engage and incentivize the middle management team, dispatchers and maintenance teams. They all have a part to play in sustainability performance.

Staff engagement strategies can include:



Training

Your organization’s sustainability objectives, together with the specific practices and requirements relevant to each job role should be included in both induction and ongoing training programs.

This will help employees know exactly what is expected from them, and this will also help to build engagement throughout the organization. Your telematics software will highlight those drivers that need additional eco-driving training, based on KPIs such as harsh driving, acceleration and cornering, fuel efficiency and idling time.



Competitions

Using eco-driving data from your fleet telematics solution, you will be able to set several criteria against which to measure and rank your drivers’ performance. You can then create a title such as “Green Driver of the Month” to encourage friendly competition.

Care should be taken to level the playing field, ensuring that drivers of older vehicles, or those that drive more fuel-demanding routes, aren’t unfairly disadvantaged. This can be mitigated by grouping drivers by duty cycle or vehicle type.



Rewards

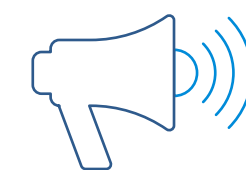
As well as providing recognition of your most sustainable employees, sustainability indicators can be added to staff bonus programs. Small rewards can also be provided to any employees who have provided practical suggestions to improve the organization’s sustainability performance.



Feedback mechanisms

It is important that all members of staff are given the opportunity to provide suggestions for how organizational sustainability goals can be met. Drivers will often have deep insight into existing inefficiencies in fleet practices, and they may have innovative ideas to improve them.

Feedback boxes are one such mechanism, but suggestions can also be sought at individual staff progress meetings, and by creating a “Green Team” that consists of a mix of drivers, maintenance, dispatchers and management.



Informing staff of sustainability achievements

Create notice boards to promote the sustainability program, showing your KPIs and progress. These can also be used to showcase staff members who have won your sustainability competitions, such as “Green Driver of the Month”, or “Sustainability Champion of the Month.”

Geotab can help fleets meet their sustainability goals

Our advanced telematics technology and solutions make it possible for organizations to minimize their environmental footprint by helping them reduce fuel consumption, lower CO₂ emissions, optimize routing, reduce idling and aggressive driving, and maintain optimal vehicle performance.

Real cost savings and emission reduction trends can be easily viewed with MyGeotab, our award-winning solution with pre-built sustainability dashboards, enabling you to track and report on the fleet's progress towards its sustainability goals.

Geotab was ranked #1 commercial telematics provider worldwide by ABI Research for the second consecutive year. With our expertise in telematics, we can support you in your sustainability journey.

If you'd like to learn how Geotab can support your green efforts, please email Stephen White, Senior Business Development Manager, Heavy Commercial Vehicles at: stephenwhite@geotab.com.





About Geotab

Geotab is advancing security, connecting commercial vehicles to the internet and providing web-based analytics to help customers better manage their fleets. Geotab's open platform and Marketplace, offering hundreds of third-party solution options, allows both small and large businesses to automate operations by integrating vehicle data with their other data assets.

As an IoT hub, the in-vehicle device provides additional functionality through IOX Add-Ons. Processing billions of data points a day, Geotab leverages data analytics and machine learning to help customers improve productivity, optimize fleets through the reduction of fuel consumption, enhance driver safety, and achieve strong compliance to regulatory changes.

Geotab's products are represented and sold worldwide through Authorized Geotab Resellers. To learn more, please visit www.geotab.com and follow us @GEOTAB and on LinkedIn.

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