No matter your industry, one thing is common: the ever-present challenge of balancing operational efficiency with financial costs. While this can often seem a daunting task, there are underlying ties between cost and performance that, alongside the right expert insights, can help to focus your business’s direction for the future ahead.

At the heart of this is the concept of Total Cost of Operations (TCO), which Shell defines as the total amount spent on a vehicle or equipment, encompassing acquisition costs, operation fees over the asset’s entire lifespan, and the potential business ramifications of productivity losses or extra costs during downtime. As it suggests, TCO demonstrates the importance of looking beyond absolute price and instead viewing financial and operational drivers as interrelated, both short- and longer-term.

And with fuel potentially accounting for up to a quarter of business costs in some industries, it is no surprise that fuel choice — alongside proper housekeeping practices — is a growing area of focus for those looking to control the TCO equation and improve overall efficiency [1]. With this in mind, it’s key for decision-makers to transition further toward fuel choices that are situated within the wider context of the TCO framework.

Whether you are just departing on this journey, or are keen to accelerate your current activities, the following selection of carefully curated articles, offers cross-sector insights that can help you navigate the obstacles that TCO and efficiency often present. From a deep dive into the role that injection systems can have on performance to an analysis of how to use biofuels effectively, we are confident that these articles will better equip you to improve your bottom line.

Fortunately, this journey need not be undertaken alone. Whether your primary focus is efficiency gains, maintaining profitability, or differentiating in a competitive market, a contributor to success in any of these areas is collaborating with the correct partners. And this is exactly where we, at Shell Commercial Fuels, are able to offer expert direction. Having been at the forefront of fuels technology for over a century, we see our role as more than a fuels supplier. Rather, we aspire to be an energy partner to our customers, for today and tomorrow. A partner who is keen on being at your side as you work to achieve your business ambitions.

I hope you will enjoy reading the following articles as much as we enjoyed creating them and that they are able to provide you with the insights needed to maximise the value from your operations.

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1. This survey commissioned by Shell Commercial Fuels and conducted by independent research firm Edelman Intelligence, polled 300 fuel decision-makers in the construction sector in 10 countries (Germany, Hong Kong, Indonesia, Malaysia, Netherlands, Philippines, Singapore, South Africa, Thailand, Turkey).
FARMS UNDER PRESSURE: HOW CAN FUEL PROTECT PROFITS, COME RAIN OR SHINE?

Around the world, farmers are talking about how rising equipment costs are adding to the pressure they already feel, working in an industry so transformed by globalisation.

In Germany, a farmer will tell you how two harvesters now cost what five did back in the 90s. In America, another discusses the challenge of still paying off tractors years after buying them. Equipment upgrades requiring expensive new parts are humbling farm managers in China.

And yet, Shell’s latest global research shows nearly half of all farmers don’t prioritise maintaining and protecting the equipment they have currently. It is only when equipment breaks down that they realise the effect on their operation. As a result, eight out of 10 farmers are forced to spend hard-earned money repairing broken and unreliable machines.

Farming is a capital-intensive business. Aside from the cost of the land, particularly in developed nations, buying workhorse vehicles like tractors or harvesters can be hugely impactful. For static machinery on dairy or wheat farms, or custom-made equipment, the required investment can be even higher.

Keeping up with constantly changing regulations, new technology, extreme weather and rising energy costs make turning a profit even more difficult. Farmers are rarely cash-rich and some are diversifying into niche markets or sharing equipment with new Uber-like models.

In this environment, valuable assets have to perform well – for as long as possible. For a large four-wheel-drive tractor and cab costs over US $75,000 to buy, and is used for 100 days a year, it needs to last 25 years to earn its keep. On top of that, it needs to be in peak condition to handle the long, gruelling days out in the fields.

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When it comes to equipment that is used more frequently, and static machinery that runs daily, maintenance is even more crucial. For machines that are customised to fit into specific building types or serve a specific purpose – replacing these assets can lead to enormous expense. In short, farmers need agricultural machinery that runs effectively and efficiently on any terrain, comes with reliable longevity as critical, as availability.

The question then is: How can farm owners and managers get the best possible performance out of their machines?

Part of the answer comes down to using high-quality fuel with performance-enhancing additives. For example, Shell’s latest Diesel with DYNAMIX Technology is specially designed to help clean up and protect your engine from performance-robbing carbon deposits. Cleaned up and maintained injectors are then able to enhance both engine efficiency and fuel economy, improving your bottom line.

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A reliable fuel supply is paramount in peak seasons.

Added to this, farmers need the right support and partnerships to help them bridge this knowledge gap and provide the necessary support to ensure their equipment works as hard as they do. On-top of providing superior fuels, a reliable fuel supply is paramount in peak seasons. Farmers are also increasingly looking to reliable partners with long-standing expertise in the agriculture sector. And with a deep understanding of the trends and opportunities likely to impact farmers’ businesses, from evolving energy options to digital tools and integrated business solutions.
CONSTRUCTION COMPANIES CAN REDUCE THEIR OPERATING COSTS BY 10% OR MORE EACH MONTH BY MANAGING FUEL USAGE EFFECTIVELY.

One study of road construction sites found that 25% more dust and particulates in the air than were present before work began. This makes it more important than ever that the operating conditions for construction equipment—including ongoing maintenance, fuel type and lubrication—are suitably optimised to enable reliable performance of injectors and engines. Furthermore, though the age and standard of engine technologies vary globally, the industry has experienced a general level of advancement in the sophistication and intricacy of engine components. While these systems undoubtedly have a higher performance potential, they are also more susceptible to dirt and contaminants. Consequently, they require a greater standard of protection, not only to ensure optimum efficiency, but also avoid the unplanned (and often high) costs associated with engine failure, injector replacement, and the emergency rental of equipment.

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Taking care of your fuel injectors, therefore, is an investment in fleet and business performance, as clean injectors are less likely to clog or fail.

The results quickly became clear. “We have never seen injector carbon deposits as light as these, and which you can just wipe off,” said Liew Yun Len, the company’s chief mechanic. Historically, the company used to spend tens of thousands of dollars a year—on a large area for forward-looking companies.

We no longer believe all diesel is the same,” says Malbumi’s owner, Mr Edward Ang. “Shell FuelSave Diesel with Dynaflex Technology makes a difference for us.”

Advanced additive fuels are not designed to prevent wear to an injector; but also work to clean up deposits already present in the engine. Furthermore, they may contain components designed to increase the corrosion resistance and durability of the fuel, mitigating against the corrosion or fouling effect of water that can be introduced during fuel storage.

The use of fuels containing these cleaning additives can increase the volumetric efficiency of fuel injectors by up to 5%.

No matter the age of your vehicle, when it runs on regular diesel, carbon deposits build up over time. Whichever fuel-cleaning additives are specially formulated to tackle carbon deposits as well as other contaminants such as particulate matter, corrosive particles, water, and—in the case of biodiesel—microorganism. The use of fuels containing these cleaning additives can increase the volumetric efficiency of fuel injectors by up to 5% [2].

The big bottom-line impact managers can make by paying more attention to the smallest components in the heart of their vehicles

A fuel injector is an electronically controlled valve. Supplied with fuel by the vehicle’s fuel pump, the injector pressurises the fuel and sprays it as a fine mist, mixed with air, into the cylinder, which is then heated up by the piston stroke. The high temperatures cause the fuel to ignite, powering the engine.

When injectors get dagged or clogged, the whole engine runs at suboptimum efficiency and could even malfunction. According to one study, the presence of corrosion deposits reduced the engine efficiency by 26% [2]. This cut the amount of energy that is transmitted to the wheels and increased fuel consumption.

According to one study, the presence of corrosion deposits reduced the injection efficiency by 26%.

Today’s fuel injectors in modern engines are more efficient than ever. One recently developed injector claims to offer a 10% improvement in fuel efficiency over similar models [3]. But the more efficient injectors are, the more it matters that they be kept in good condition in order to deliver the engine performance they have been designed for.

So how can construction-site and equipment managers make the most of their fuel injectors and engines in order to increase equipment utilisation and overall site efficiency?

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PUSHING THE LIMITS OF FUEL EFFICIENCY FOR TRUCKS

The role of diesel heavy trucks is key, though a growing number of new heavy-duty vehicles run on alternative fuels, the average lifespan of a conventional truck is 12 years, meaning there will continue to be plenty of diesel vehicles on the roads over the coming years [3]. On top of this, the world Markit report suggests that advancements in the diesel engine will allow it to remain cost competitive until at least 2040 [8]. The evolution of existing fuel technologies is enabling improvements in engine cleanliness, engine efficiency and fuel economy, all of which add up to the much sought-after total cost of ownership (TCO) and CO2 emissions reduction for commercial fleets [7].

With this in mind, if the industry wants to hit its increasingly tighter targets – on fuel efficiency, running costs and carbon footprint – it must look to examples such as the Starship Project as inspiration for how we can best optimise these diesel-powered vehicles. In fact, the Starship Project is one of the most interesting examples of existing technologies for our fleets now: one vehicle; two basic principles; three transport modes, more efficient and lower carbon for tomorrow.

The Starship truck

used a 100% carbonless fuel,
featuring a streamlined and aerodynamic shape to help cut wind resistance

In the case of the Starship truck, the engine efficiency improvements were achieved through a combination of advanced engine controls and automated transmission systems, improved engine and pulley power.

The Starship truck’s remarkable journey

confirms the opportunity in front of fleet operators to identify truck efficiency. An opportunity that requires fleet managers to meet the increasingly demanding goals that the transport industry of the future will encounter, such as lowering TCO and reducing carbon footprint.

Meanwhile, an automated system sensed when the tire pressure was low, then self-inflated as required, thereby reducing rolling resistance. Together, these two innovations helped keep the forces of resistance off the back of the truck, and full-length side skirts were also implemented to reduce wind resistance. Meanwhile, an automated system sensed when the tire pressure was low, then self-inflated as required, thereby reducing rolling resistance.

The Starship Project


The truck’s fuel efficiency was maximised through modifications using currently available technologies

How Today’s technology can help meet tomorrow’s goals

For those companies whose business and performance depends on a heavy-duty fleet, success relies on identifying the factors that are reducing efficiency and effectively targeting them, such as in the case of the Starship Project.

This could include vehicle-duty, both wheel resistance and rolling resistance, which slows a vehicle down and reduces efficiency. To combat this, the Starship truck used a 100% carbon-free fuel with a streamlined and aerodynamic shape to help cut wind resistance. A gap closure system, based on tire rolls off the back of the trailer, and full-length side skirts were also implemented to reduce wind resistance.

A MORE EFFICIENT FLEET IS POSSIBLE EVEN TODAY

Which brings us back to Bob Shave, who first entertained the idea of creating a super-aerodynamic, hyper-fuel-efficient Class 8 truck alongside Shell, not only because of how inefficient he thought large trucks were, but because he saw the potential improvements that could be made for future success. And he believed they could be implemented right now.

That is not to say every truck can be as easily equipped as the Starship truck. But what is clear is that increased vehicle efficiency is attainable for today’s fleet operators and its greater efficiency can go a long way to meeting the increasingly demanding goals that the transport industry of the future will encounter, such as lowering TCO and reducing carbon footprint. To get ahead of the curve, the technologies that are available today should be viewed by fleet operators as genuine enablers for their business, with regards to performance and profitability.

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A 2.48 times improvement in freight tonne efficiency

That truck was the vehicle at the centre of the Starship Project – a hyper-fuel-efficient Class 8 truck, co-engineered by AirFlow Truck Company and Shell – powered not by an alternative fuel, but by diesel [4]. Equally notably, the truck’s fuel efficiency was maximised through modifications using currently available technologies.

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**SHELL COMMERCIAL FUELS IN COLLABORATION WITH SANDEEP KAR, CHIEF STRATEGY OFFICER OF FLEET COMPLETE**

**HOW TO STAY COMPETITIVE IN THE DIGITAL-FLEET AGE**

"Technology is really changing the way fleets manage their assets. In the past, it was about 'what can I do with this truck?' Now it's about 'what can this truck do for me?'" This is the opinion of Sandeep Kar, Chief Strategy Officer of digitalisation specialist Fleet Complete, as he explains the impact of digital technology on modern fleets.

"Data-driven technology enables fleets to react in real-time to maintain returns on investment, realise efficiencies, cut their operating costs, and help them lead, lower CO2 emissions. And with fuel accounting for 23% of these total fleet costs [1], finding ways to optimise fuel consumption – by unlocking its full potential – has been a big part of the drive to increase efficiency through data."

**Did you know?** This need for greater education around data is common to other sectors too. 69% of decision-makers in the mining industry suggest a lack of staff understanding of technology and the ability to interpret data, poses a concern around using Industry 4.0 technology [2].

**WHY DATA BOTH HELPS AND CHALLENGES Fleets**

The first step is identifying the issues at hand. When fleet managers were asked what their key challenge would be in the next three years, the most common response by far (52% of respondents) was reducing their total cost of ownership and fleet costs [1], finding ways to optimise fuel consumption – by unlocking its full potential – has been a big part of the drive to increase efficiency through data.

The same fleet-management software can also help drive practice intelligent planning, choosing the optimum route to cut distance, avoid congestion and meet delivery times. One recent UK government study cites research suggesting that this approach can cut fuel use by as much as 10%-15% [3].

**DATA AND PREDICTIVE MAINTENANCE**

There are other data – particularly data from connected sensors on the vehicle – to spot developing problems and to fix them before they cause down time. According to a recent study, predictive maintenance can cut unplanned downtime by 14% and knowledge of what’s fitting in, cost-saving, course of maintenance, your vehicle in peak operating condition, you also help keep fuel consumption down and power output up.

Of course, maintenance doesn’t happen in a vacuum. There’s little point in improving your fleet for efficiency and cost saving with inefficient fuel. Digitalisation can help companies improve, optimise the value of choosing premium fuel, by giving them the factual insight and market analysis to help them optimise for lower fuel consumption.

52% of businesses say they would benefit from better understanding how much emissions their fleet causes and how they can vary. This is where Shell, the knowledge you can gain help reap optimal benefits from the technology and fuel you employ today. Furthermore, this can also help prepare your fleet for future technologies – such as the new IRU and urban regulations – which poses a significant competitive edge to those who embrace and master them.

**An easier early win (in the journey toward decarbonisation) will be to increase investment in aerodynamics, telematics and digital freight matching to reduce fuel consumption and increase operating efficiencies, through effective utilisation, thereby lowering carbon emissions [13].**

The total challenge for fleet managers is piecing the connected nature of digitisation and more tangible daily contributions and costs, such as fuel choice. Once the dots are joined between these factors, the impact of digitalisation and embracing digitisation no longer seems like a choice, but rather a necessity.
WHY HOUSEKEEPING MATTERS: Laying the Foundation for Optimum Fuel Efficiency and Reduced Costs

This article builds on the research paper published in 2019 by Shell Commercial Fuels on the construction industry, titled “Making Fuel Work for Your Bottom Line.” The research was a global survey conducted with 500 fuel decision makers.

From embracing new technologies to addressing environmental challenges, the construction industry has a lot of moving parts. However, a recent survey by Shell Commercial Fuels showed that, while there are many factors driving the top priority today and into the near future, still remains improving operating efficiency [1].

And it is no wonder why, efficiency is arguably the most significant to success, whether that’s measured in deadlines met, emissions lowered, or costs reduced. But what should construction companies be doing in order to achieve efficiency?

Dig a little deeper and it becomes apparent that fuel plays a heavily invested consumable – is not being properly managed. In addition to fuel accounting for 20% of operating costs, according to this report of research 44% of companies say fuel choice has also contributed to unplanned downtime [1]. At first glance, these two statistics don’t seem to add up. How can fuel, an important financial factor, also cause so many productivity issues?

Another fact that statistic is the mix and suddenly becomes a clearer play when added. Only 41% of construction companies say they manage their fuel very effectively, using the repeat training – ultimately enabling construction companies make the most of their fuel investment on site.

SECURE STORAGE

41% of construction companies admitted that fuel storage contributes to breakdowns [1]. The reason being, fuel arriving on site is viewed by some as the end of the process, when in reality, it’s just the beginning. The adage “out of sight, out of mind” should hold true here. In fact, the opposite approach needs to be taken. There’s little point in purchasing high-quality, high-grade, non-filtered fuel, to only limit its performance and increase costs and lower efficiency through poor storage practices.

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CHOOSING YOUR TANK

To combat this, there must be given to the type of tank the fuel is stored in and how this impacts fuel quality, equipment efficiency and overall business performance. Since, when diesel is not stored properly, it starts to deteriorate. So consider tanks made of compatible materials, clean, rust-controlled fuel tanks that will not leach into diesel and cause impurities to develop.

MANAGING THE ELEMENTS

To comply with fuel storage regulations and to avoid safety risks, tanks may not be located near non-designated buildings, but must sit outdoors. This brings its own issues, since tanks are constantly exposed to the elements. To reduce oxidation caused by contact with oxygen, light and temperature, tanks should be tightly sealed to reduce water and oil exposure. They should also be located away from heat and out of direct sunlight; diesel has a tendency to age at higher temperatures. Potential combination of humidity in case of extreme temperature changes should also be monitored.

EFFECTIVE HANDLING

The risk of contamination is not eliminated even after effective storage practices are accounted for. Contamination must be complemented by safe handling procedures. Indeed, 60% agree that it is important to understand the impact of both [1].

PREVENTING CONTAMINATION

Mistake from the surrounding atmosphere is a key concern for diesel. Being driven that fuel, water droplets will settle on the bottom of the tank and can increase the likelihood of ageing and bacterial growth, especially if the diesel contains biocides. In fact, in a water content of above just 0.05% can reduce the life of diesel injectors by as much as half [2]. For this reason planned tank maintenance is important to make sure the tank clean and dry and to prevent fouling. Breakdowns are often located in dirty or dusty environments. The issue is not just the fuel. Maintenance problems can vary, e.g. breathers that prevent contamination and special care during refueling.

A water content of above just 0.05% can reduce the life of diesel injectors by as much as half.

EFFECTIVE FUEL MANAGEMENT

3 TOP TIPS FOR IMPLEMENTING EFFECTIVE FUEL MANAGEMENT

1. Implement regular staff training around fuel housekeeping best practices, emphasizing the efficiency and performance consequences of poor fuel storage and handling.

2. Seek out fuel experts, such as Shell Commercial Fuels, who can supplement your current operations with extensive industry expertise and knowledge, to help you implement the right fuel management strategy for your business.

3. Choose advanced additivated diesel, with efficiency, defusing and anti corrosion benefits, that can – when combined with proper fuel housekeeping – improve performance and reliability of equipment, and reduce total cost of ownership.

ADVANCING TRANSPORT ENERGY EFFICIENCY

ROAD TRANSPORT ENERGY USE IN THE PAST 30 YEARS HAS DOUBLED

As populations grow, energy and transport challenges are advancing the development of more efficient vehicles and alternative energy sources.

INNOVATIONS GREAT AND SMALL

BRINGING HYDROGEN TO THE HIGHWAY

As the European Union working with the government and EU member states to create a network of around 2,000 hydrogen fueling stations across the country by 2030, the SHELL CONCEPT CAR is a hyper-fuel mileage vehicle that maximises the benefits of today’s technology to produce less ‘tail gas’ even in the most urban city.

And more than 1/4 of the world’s energy use

THE SHELL CONCEPT CAR

NEXT-GENERATION HYPER-FUEL MILEAGE TRUCK

Shell Lubricants and AirFlow Truck Company have developed a new hydrogen-fueled tractor (680 horsepower), Starship, which recorded a 2.48 times improvement in freight tonne efficiency over the average Class 8 diesel truck. To find out more about Shell’s role in shaping the future of transport visit: www.shell.com/energy-and-innovation/the-energy-future/future-transport.

To reduce fuel use in transport, the road freight industry, according to independent research firm Edelman, accounts for around 10% of global transport energy-related CO2 emissions [2]. This ultra-compact prototype vehicle is among the first hydrogen-fueled vehicles to enter commercial service. For this reason planned tank maintenance is important to make sure the tanks clean and dry and to prevent fouling. Breakdowns are often located in dirty or dusty environments. The issue is not just the fuel. Maintenance problems can vary, e.g. breathers that prevent contamination and special care during refueling.
IS EFFECTIVE MAINTENANCE THE KEY TO UNLOCKING THE POSSIBILITIES OF INDUSTRY 4.0 IN MINING?

Rapid advances in technology are challenging the way the mining industry operates. By 2030, it is predicted that 24% towards autonomous equipment. There are several reasons for this shift, including the need to improve production rates, modernize equipment, and address environmental concerns. The mining industry must adapt to these changes to remain competitive and sustainable.

**Collaboration and Partnership – A Way Forward for Effective Maintenance**

In this vein, attention to machinery technologies can bring long-term saving opportunities that new investment will pay off in terms of Total Cost of Ownership (TCO) [1].

So, while 70% of companies are now using at least one Industry 4.0 technology to improve productivity and operational efficiency, there is a need for widespread adoption. Just one in three direct
equipment is under stress and susceptible to remain competitive companies must make a clear transition to Industry 4.0 [2].

**The average European heavy commercial vehicle is on the road for twelve years.**

How can commercial fleets respond to legislative and consumer pressure to be more sustainable now, with their current vehicle?

Here are eight tips we learnt developing the SmartTruck and working with other OEMs which you can apply to your fleet to help reduce emissions today.

Add sustainably sourced biofuels to your standard fuel. But do only in consultation with your fuel supplier, who can help you do this safely and effectively.

The modern fleet manager is facing a powerless in the face of demands, to reduce emissions. With the right combination of improved practices, modern technologies and premium consumables, you can cut your emissions and your fuel consumption right now.

And that isn’t just for good for the environment, it helps your bottom line too.

**EIGHT STEPS TOWARDS LOWERING EMISSIONS**

1. **Cut Rolling Resistance:** Just a single bump in the road at 100 mph can add 6 kg to the load and increase fuel consumption with the latest plan routes, maximise utilisation rates, cut trailer tails and reducing the gap

2. **Reduce Drag:** Use lightweight materials for axles, trailer tails and reducing the gap between trailer and tractor can all help reduce drag and improve fuel efficiency.

3. **Use Vehicle Automation:** Outlining even simple things such as optimal gear changes to operate the engine in most efficient range helps to improve fuel efficiency and reduce emissions.

4. **Switch to Integrated Fleet Management:** Plan routes, maximise utilisation rates, use high tech apps and fleet management tools to maximise utilisation rates, cutting and eliminate empty miles.

5. **Maximise Utilisation Rates:** Use high tech apps and fleet management tools to maximise utilisation rates, cutting and eliminate empty miles.

6. **Use Sustainable Fuels:** Add sustainably sourced biofuels to your standard fuel. But do only in consultation with your fuel supplier, who can help you do this safely and effectively.

7. **Tailor Driving Styles:** Use information from the truck’s telematics and other systems to help coach drivers to be more fuel efficient in their driving styles.

**With the right combination of improved practices, modern technologies and premium consumables, you can cut your emissions and your fuel consumption right now.**

In most major markets, public concern about direct and indirect environmental impacts has significantly overtaken the last year. And this shift is likely to have an impact on commercial fleets’ ability to reduce drag and improve fuel efficiency.

In 2018, the European Social Survey found that a third of Europeans want the EU to increase taxes on food fuels [3]. And a 2018 survey by Narliner found that 68% of Europeans now say they prefer sustainable companies [2].

This shift in public opinion poses a challenge to fleet managers. The average European heavy commercial vehicle is on the road for twelve years [2]. The industry is looking for ways to make their fleets more sustainable and cut emissions, using existing – and even older – technology.

Rather than investing in new technologies across the board, 83% are choosing to ‘sweet’ existing assets.

Bridge this knowledge gap by effectively communicating the importance of maintenance will be key to progressing the industry. However, it is also evident that current machinery must be equipped to optimise both its performance and remaining lifespan.

**Current machinery must be equipped to optimise both its performance and remaining lifespan**

By creating more profit-oriented operators through paying more attention to important variables such as fuel choice, that cost concerns and protects new high-value industry 4.0 equipment. And for those considering making the leap to Industry 4.0, it ensures lower TCO of current machinery to make investment into these new fields possible.

Amid a lot of understandable uncertainty, there is a clear sentiment among the mining industry – if they do not need to be made in a rush. Fortunately, Shell is armed with technical experts worldwide, and it is well placed to collaborate and navigate this change with customers.

1. Industry 4.0 technologies are defined as technologies that support the digitisation and automation of operations (e.g. sensor, equipment, robotics, cloud-based or fog data-based technologies).

2. This survey, commissioned by Shell Lubricants and conducted by YouGov, used 312 interviews with mining equipment purchasers. Influence the purchase in 10 mines/energy mines across different job roles (7 operators, 7 maintenance personnel, 7 general managers, and 7 production managers in the UK) from March to April 2018. For more information, please visit www.shell-lubricants.com.

3. Total Cost of Ownership (TCO) is defined by Shell as the total amount spent on industrial equipment, including capital investment and operation over its entire lifecycle, including costs of breakdown during equipment downtime.

**THE EFFICIENCY BRIEFING SHELL.COM/COMMERCIALFUELS**


The continually growing need for energy – to support population and economic growth, while improving standards of living – is demanding more from fuel and technology choices. As society moves toward a greater awareness – and adoption – of environmentally sustainable options, alternative fuels are becoming a more widely considered choice also for commercial fleet and equipment operations. Any alternative, however, must meet existing fuel specifications to ensure operations are not compromised. With this balance between performance and sustainability key, many sectors are looking at biodiesel as another means of fueling their operations.

Biodiesel, or FAME (Fatty Acid Methyl Ester), is a type of diesel fuel that is made from vegetable oil such as rapeseed, soybean, coconut or palm oil, rather than fossil crude oil and can be used in neat form or as a blend component at different ratios with conventional fossil diesel. Higher quality biodiesel is different to those with bio-components (from vegetable oil such as rapeseed, coconut or palm oil, rather than fossil crude oil and can be used in neat form or as a blend component at different ratios with conventional fossil diesel).

A consideration when using biodiesel can be its lower oxidation stability compared to fossil diesel and its susceptibility to microbial growth. Lower oxidation stability can lead to corrosion whereas microbial growth can cause blocking of lines and fuel lines, bringing operational challenges, downtime and higher operating costs. A viable solution is Shell FuelSave Diesel with DYNAFLEX Technology [1], which is designed to help keep fuel more stable in presence of bio-components, thus increasing vehicle and equipment reliability [2]. Its formula promotes good water separation and helps keep fuel more stable in presence of bio-components, thus increasing vehicle and equipment reliability [2]. University tests have shown a longer range of fuel storage depending on size of vehicle and type of operation.

Another challenge is the fuel dilution (fuel mixing with water) that causes the biodiesel to affect the life and performance of the engine [3]. This also is another concern, as the biodiesel may increase the oxidation, which prematurely ages the oil and can cause engine deposits, putting issues and a cost, impact productivity and bottomline. Consequently, it is important to ensure proper engine oil performance in these areas to help manage TCO.

As a technology leader, Shell has been evaluating biodiesel’s impacts and developing lubricants to meet customers’ evolving needs. Shell Rimula and Shell Tellus engine oils are globally compatible with biodiesel.

Heavy duty fleet or equipment operators who use products with bio-content, particularly at levels higher than 10%, need to be aware that some properties of biodiesel are different to those of fossil diesel. This warrants certain changes in the way fuels with higher bio-concentrations are stored and handled.

In addition to using high-quality fuels and lubricants suitable for bi-fuel applications, proper storage and handling is important to smooth operations, especially when biodiesel is used especially at higher concentrations of more than 10%.

With over 30 years of research and development, Shell has long-standing experience in how to store, blend and handle biodiesel to supply customers around the world. Shell draws knowledge from its own biodiesel research and collaboration with leading biotechnology companies and academic institutions to fuel innovation in this space.

1. DYNAFLEX technology is DYNAFLEX formulation on our name for our latest generation of advanced formulations for gasoline and diesel fuels. See www.shell.com/commercialfuels for more information.

2. Compared to regular fuel oil without fuel treatment formulas. Related energy use may vary according to vehicle, driving conditions and driving age. Finally, Shell fuel and engine customers have shown a change of fuel storage depending on size of vehicle and type of operation.

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TOP TIPS TO PREPARE YOUR FLEET FOR THE NEW ERA OF MOBILITY

1. LOOK FOR ALTERNATIVES

Alternative fuels are becoming more viable options. The future points largely toward electrified vehicles. While the range has been seen as a drawback, charging station infrastructure is expanding rapidly to help tackle this concern. There are other lower-emission fuel alternatives available too, including hydrogen fuel cell vehicles and (gas-to-liquid) GTL fuel. It’s important to understand the options available to make an informed decision about what’s best for your fleet.

2. KNOW YOUR COMPETITION

Only by knowing what’s happening in your industry, can you plan effectively for the days ahead. This can be done on a formal basis via special company-industry, industry-chamber, trade shows, are a great way to stay in touch with the latest developments.

3. PLAN FOR ECONOMIC CHALLENGES

Fleet managers should aim to forecast possible economic scenarios to avoid unforeseen pitfalls. For example, import/export tariffs, which could affect the prices of vehicles, parts and fuel are among the possible challenges that fleets could face in the future.

Educatating staff so they are ready and able to adopt will be key to prepare for this transformation.

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