

# RELEASING THE POTENTIAL OF SUSTAINABLE BUSINESS DECISIONS WITH BIO-LUBES

SHELL  
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SOLUTIONS





# WHAT STEPS SHOULD BUSINESS TAKE TO ADVANCE SUSTAINABLE OPERATIONS?

Around the world, the shift towards more sustainable business practices is underway. In many countries, new regulations and standards are changing how companies retain and strengthen both their license to operate and competitive edge. Added to this, public consensus on the need to improve the environmental impact of industry is rapidly growing.

Six out of ten people believe that addressing climate change is more important to them than it was as recently as 2020<sup>1</sup>. Also, there is a push for accountability among business leaders. Two-thirds of people believe CEOs should take the lead on change, rather than waiting for governments to impose change on them<sup>1</sup>.

This means that avoiding pollution, decarbonising operations and ensuring worker safety are three of the most pressing issues across every industry. Sustainability now has a keen impact on how businesses demonstrate their license to operate, along with their ability to pursue new opportunities. The challenge is that companies still face pressure to increase the speed and quality of their output. Cost and performance also remain priorities across every sector.

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Four in ten CEOs say they have been able to **drive revenue growth through sustainable practices**

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However, the definition of success is evolving. Many B2B companies are already realising the benefits of improving their environmental impact. Four in ten CEOs say they have been able to drive revenue growth through sustainable practices, with 35% highlighting their ability to make cost reductions<sup>2</sup>. Taking the lead on this issue and getting ahead of legislation is not only providing companies with a license to operate; it is giving them a competitive advantage.

Viewing trust and credibility within their communities as critical to their future success, businesses are also shaping their strategies around areas such as sustainability. In an international survey of C-suite executives, 69% of leaders say they have a comprehensive, organisation-wide strategy in place for making a profit while positively contributing to society<sup>3</sup>.

Within these strategies, businesses need to understand the positive changes they can make across their operations. For example, the potential of Environmentally Acceptable Lubricants (EALs) is often overlooked. A simple switch in this area can unlock long-term benefits and is one of the many ways that companies can maintain their license to operate and equipment performance.

In this paper, we will explore the trends in regulation, legislation and sustainability driving change across six industries: Agriculture; Mining; Forestry; Power; Construction; and Marine. Based on our first-hand insight, we look at challenges and opportunities within each of these industries, as well as some practical steps companies can take to advance sustainability goals, and why EALs should be a part of the strategy to reduce their impact on the environment.

**Emma Mallinson**  
Shell Naturelle  
Global Brand Manager

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# THE CRITICAL ROLE OF SUSTAINABILITY IN THE OFF-ROAD INDUSTRY



## The UN's Sustainable Development Goals (SDGs) are influencing the sourcing, distribution and consumption of resources

The implementation of the United Nation's Sustainable Development Goals (SDGs) at a global level is resulting in sustainability becoming embedded across industries and the off-road equipment sector, which includes power generation, marine, agriculture, construction, forestry and mining. Over 60 countries have already committed to net zero targets for 2050. In particular, SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (responsible production and consumption) and SDG 13 (climate action) will drive investments in more innovative products, technologies and sustainable outcome-driven delivery

and service models. As a primary focus, emission legislation aimed at reducing diesel consumption, NO<sub>x</sub> and CO<sub>2</sub> will become increasingly stringent.

In this respect, the US and Europe are leading from a regulatory standpoint, but China is introducing a rapid transformation program across its industries to implement smart solutions that will lead to more sustainable outcomes. The impact of this legislation at a global level will result in new, cleaner technologies being deployed across sectors.

**Environmentally Acceptable Lubricants (EALs) will become an important component in addressing sustainability requirements in the off-road sector**

Legislation pertaining to life on land (SDG 15), and life below water (SDG 14) will follow the trend towards stricter environmental standards.

For example, Vessel General Permit (VGP) 2013 implemented by the US Environmental Protection Agency (EPA) mandates the use of EALs for marine vessels over 75 feet in length in US waters<sup>4</sup>. European countries, on the other hand, have opted for a voluntary Ecolabel program that specifies standards for lubricant formulations to ensure ecological compliance<sup>5</sup>. These schemes have resulted in a higher uptake of EALs in marine applications.

Key regulatory frameworks that are designed to protect oceans such as MARPOL (International convention for the prevention of pollution from ships) developed by the International

Maritime Organization (IMO) have implemented stringent regulations for the discharge of oil in the ocean especially in protected areas. The IMO recommends the use of EALs in polar waters and hence sustainable lubricants will play a key role in ocean sustainability strategy. New marine regulations are in various stages of approval across Latin America, Asia Pacific and North America; their implementation will further drive the adoption of EALs.

**Resources will be sourced and supplied sustainably in circular business models and in an intelligent, connected, and responsive digital framework**

Sustainability will become much more than an environmental consideration; it will be a core fabric of industry that will generate additional value or increase resilience to risks.

For example, 1 litre of mineral oil spilt in the environment can contaminate over 1 million litres of water, which costs \$40 to \$60 per litre to clean-up while the retrieval cost for biodegradable oil is \$1 per litre<sup>6</sup>. This means that the damage of spillage is not only done to a company’s reputation but also to its bottom line.

Biodegradable oil also has a significantly lower carbon footprint when it is produced from renewable sources, whilst mineral oils are petroleum based and produced from finite resources. If these biodegradable oils are also sourced locally, this in turn has a positive impact on the supply chain and minimizes the usage of resources such as water and energy. This is critical because sustainability is increasingly seen as a holistic goal and the benefits are assessed as the sum total of outcomes across the product life cycle.

Along similar lines, solutions that are implemented to reduce emissions also have positive spillover effects for a business. For example, introducing efficiency solutions that improve the performance of assets reduces emission levels, but also indirectly reduces the consumption of fuels and maintenance, which lowers operating costs. These are often digital technologies that provide infrastructure for more flexible, intelligent, connected and responsive systems.

**Operational excellence coupled with best-in-class product stewardship built on strong sustainability principles will extend across the supply chain**

Beyond the tangible outcomes of implementing sustainability initiatives, a key benefit is the positive brand association that customers have with companies that showcase strong sustainability credentials. This leads to increased brand loyalty and competitive advantage for organisations.

**75% of Gen Z are willing to pay more for brands that are more sustainable**

Research by Frost & Sullivan shows that sustainability and environmental awareness is high among Gen Z

(born after 2000) and 75% of those surveyed are willing to pay more for brands that are more sustainable. According to Harvard Public Opinion data, 66% of Gen Z view climate change as a “crisis [that] demands urgent action.”

Many companies are now mandating that suppliers or potential partners also adhere to more sustainable practices to ensure that their sustainability index is favourable. For example, in the power generation industry, which is a key consumer of lubricants, ENEL (a leading European power generator) has introduced 3 major sustainability criteria for evaluating its suppliers including: utilization of renewable energy for production and business-related activities, sustainability attestation across the production value

chain, and administering circular economy principles with a focus on use of recycled materials that will ensure the reduction of waste. Over 200 suppliers that constitute more than 60% of ENEL’s expenditure are involved in this initiative<sup>7</sup>.

Leading electrical solutions provider Schneider Electric (SE) has implemented a sustainable supply chain initiative called the Zero Carbon Project to enable the net-zero transition. SE has partnered with its top 1,000 suppliers (who represent 70% of its carbon emissions) to halve their CO<sub>2</sub> footprint by 2025. SE will provide the suppliers with tools and resources to assess their CO<sub>2</sub> footprint and set goals to reduce these. The overall objective of SE is to reduce its value chain emissions by 35% by 2030<sup>8</sup>.

**Stricter environmental legislation and the increasing awareness of the benefits of sustainability by businesses will drive the growth of bio lubricants**

From a bio lubricants standpoint, policy makers especially in Europe and North America mandate or strongly incentivize their use. The marine, agriculture and forestry sectors are leading adopters of EALs due to the immediate impact spills or improper disposal have on the environment, whilst mining and power generation industries are increasingly exploring their use.

These regulations combined with an increasing awareness of business and society on the wider benefits of sustainability will drive the healthy growth of the bio lubricant industry in the next decade.

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# DRIVING SUSTAINABILITY IN MINING: CHOICES THAT ADD UP

## IMPROVING OPERATIONAL SUSTAINABILITY CAN CONTRIBUTE TO COMPETITIVE ADVANTAGE

63% of mining executives view license to operate as the biggest risk facing their business<sup>9</sup>.

11 of the top 30 companies have implemented plans to hit net-zero emissions<sup>10</sup>. Others are following.



Efforts to decarbonise and reduce environmental impact are accelerating focus on end-to-end supply chain.

## EQUIPMENT OPERATORS FACE OBSTACLES TO REACHING SUSTAINABILITY TARGETS:

- Balancing high output and low environmental impact.
  - Ensuring equipment reliability and performance
    - 🕒 24/7 operations
    - ❄️ Harsh conditions
  - Balancing short-term cost savings with long-term value.
  - Reducing risks of operating in sensitive environments.
- Preventing water and soil pollution is a priority.**

## NEW TECHNOLOGIES PRESENT OPPORTUNITIES FOR SUSTAINABILITY:



Autonomous vehicles: fuel efficiency, productivity and safety.



Alternative fuel technologies are advancing.



Renewable power, like solar and wind, can power operations.

## LUBRICANTS CAN MAKE A DIFFERENCE TO:

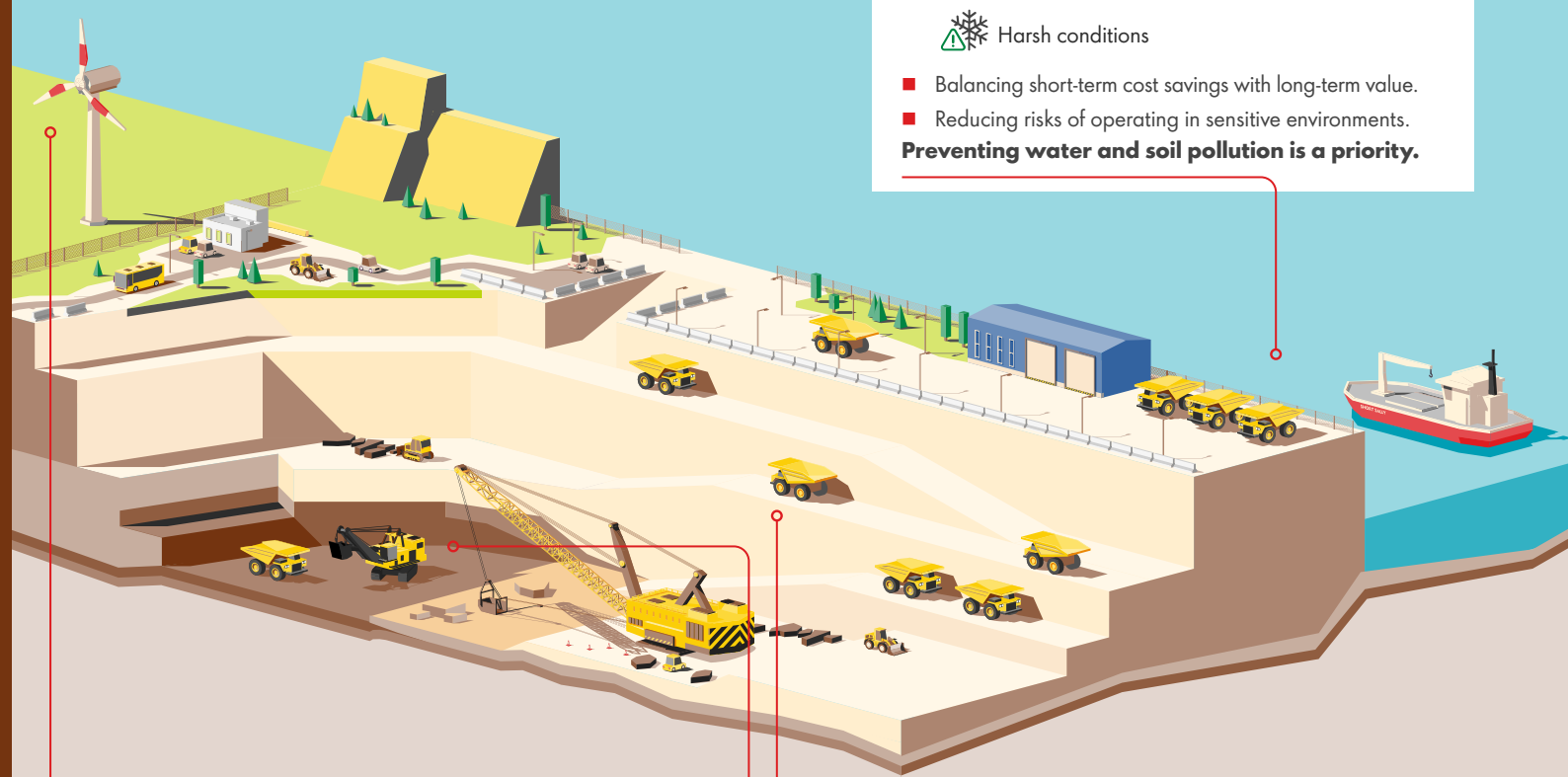
**Equipment performance** – improving efficiency while reducing emissions;

**Equipment life** – protecting critical components to keep vehicles running; and

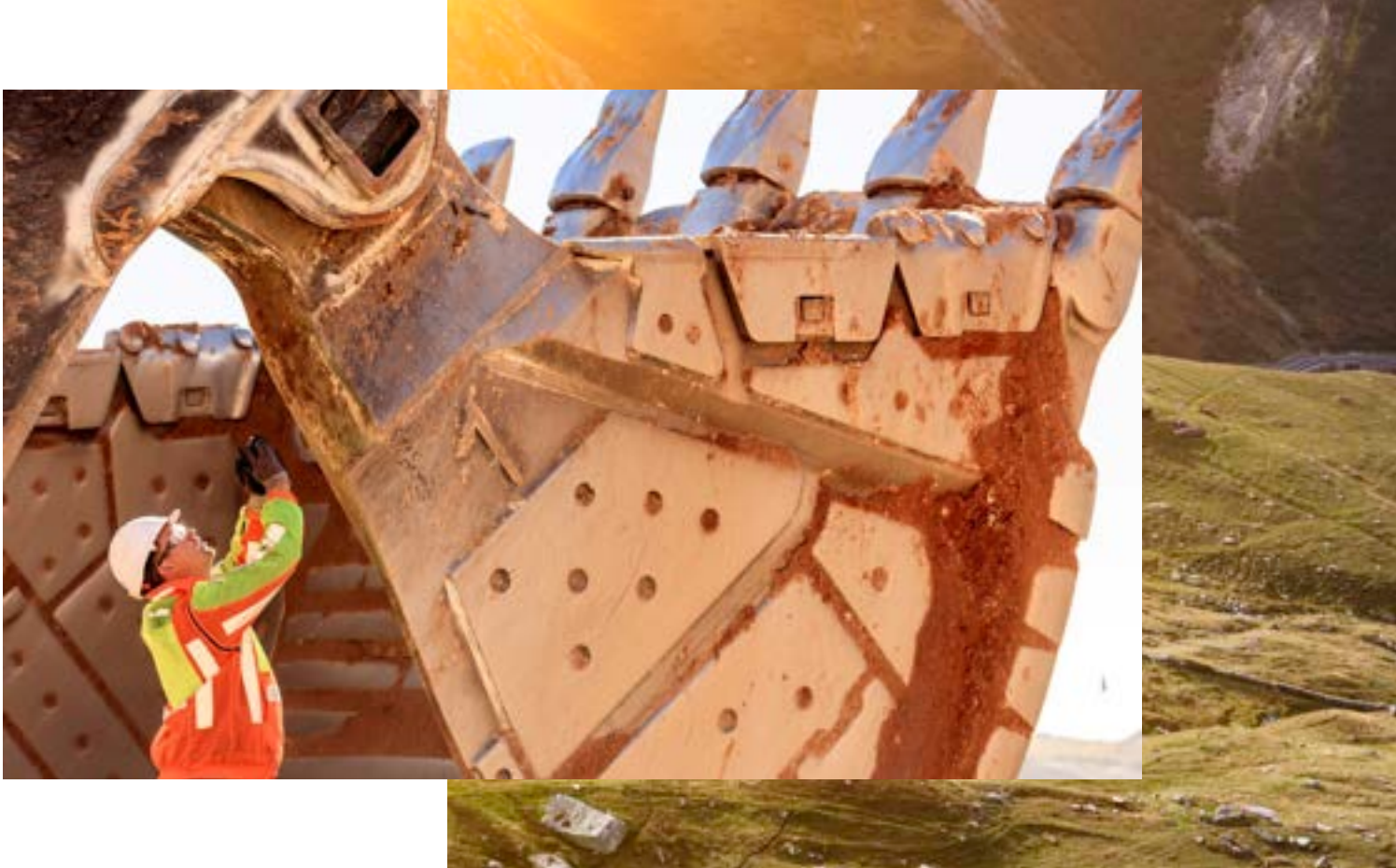
**Sustainability goals** – reducing environmental impact.

## SHELL NATURELLE DELIVERS:

- **Protection for plants and animals**  
Readily biodegradable<sup>11</sup>, low aquatic ecotoxicity<sup>12</sup>, no bioaccumulation
- **Lower carbon intensity**  
High bioderived content, solar-powered manufacturing<sup>13</sup>
- **Reduced oil usage and waste**  
Hydraulic fluids can offer longer oil drain intervals<sup>14</sup>
- **More sustainable packaging**  
Containers made with up to 40% PCR help reduce plastic waste<sup>15</sup>
- **Carbon-neutral<sup>16</sup> lubricants**  
By protecting and restoring nature



# DRIVING DECARBONISATION IN MINING



**There is no escaping it. The mining industry has a huge task ahead of it to implement more sustainable ways of working and meet climate change goals. Currently, mining accounts for up to 4% of total global energy consumption<sup>17</sup>, while being responsible for up to 7% of Greenhouse Gas (GHG) emissions worldwide<sup>18</sup>. And its wider impact throughout the value chain is also under scrutiny.**

However, mining companies are working to change this situation and decarbonise their operations. At the highest level, they recognise the demand for transformation that is filtering through supply chains.

## **Using sustainability to drive competitive advantage**

Six out of ten mining executives cite license to operate (LTO) as the biggest risk facing their business<sup>19</sup>. They know that maintaining and strengthening their license to operate

will be critical in renewing existing business and winning new contracts. In some cases, it will be the difference between being eligible to bid or being disqualified completely.

So, businesses are looking to adapt and use sustainability to drive competitive advantage. Out of the top 30 mining companies, 11 have already implemented plans to achieve a net-zero emissions future<sup>20</sup>. Others are already following, which will likely see the industry push harder and faster for sustainability gains as they aim to

get ahead of legislation and each other. In fact, the focus of efforts to decarbonise mining operations has already shifted to explore how the end-to-end supply chain can contribute to improving environmental impact.

## **Balancing performance and sustainability targets**

Mining companies face a range of challenges that will affect the pace of change. And top of that list is performance.



Operators cannot simply switch to more sustainable practices; with KPIs based around availability and output, they must find the right balance between high output and low environmental impact. They also need to ensure equipment runs smoothly and reliably, through 24/7 operations in the harshest of conditions.

Often sustainability is introduced alongside new machinery and technology, but mines must look for ways to work as efficiently as they can with even their oldest equipment. This feeds into the need to balance short-term savings with long-term value. There has to be a business case for upgrades and improvements – and sustainability is becoming a part of that calculation. For example, preventing environmental damage such as water and soil pollution is a growing priority for sites. And this means that risk reduction (especially when operating in sensitive environments) is now part of the conversation when assessing transformation requirements.

Businesses are also beginning to understand the opportunities that technology offers them to balance sustainability and performance. They are exploring how renewable energy – including solar and wind – can power operations at their plants. They are discovering the benefits that autonomous vehicles bring, including greater fuel efficiency, productivity, and safety. Leaders are also looking at making a wider impact, putting pressure on suppliers to decarbonise while aiming to reduce the emissions created throughout their value chain.

### How biodegradable lubricants can help

As part of efforts to decarbonise the wider supply chain, lubricants have a role to play in supporting the mining industry's push for sustainable practices. Alongside products such as alternative fuels, they can help companies achieve a balance that improves environmental impact without the need for a drop in output.

They also make sure that machines deliver strong returns on investment by protecting critical components. Not only does this help reduce downtime, but it extends equipment lifetime – further reducing operating costs, overall emissions, and the carbon footprint of replacement parts.

With biodegradable lubricants, sites can push their sustainability gains further and strengthen their license to operate. For example, in the case of spills of conventional lubricants,

companies can face huge financial and reputational cost. But, readily biodegradable lubricants<sup>11</sup> that offer low aquatic ecotoxicity<sup>12</sup> and no bioaccumulation vastly reduce the potential damage – along with the cost of clean-up and any reputational harm.

Additionally, the low carbon intensity of manufacturing Shell Naturelle EALs (supported by solar power<sup>13</sup>) and the fact they are carbon neutral<sup>16</sup>, makes them an effective way for mining companies to demonstrate the sustainability of their supply chains.

When every contribution to cutting the industry's CO<sub>2</sub> emissions counts, biodegradable lubricants are part of an array of tools that sites can use to achieve decarbonisation.



*Bio lubricants can reduce the carbon footprint of operations and achieve the goal of reducing emissions. In order to reduce carbon emissions, we are now making efforts to switch to bio lubricants as far as possible.*

Mining Senior Manager, China





# HOW CLEANER CONSTRUCTION CAN BUILD A SUSTAINABLE FUTURE

## BALANCING SOARING DEMAND WITH REDUCED ENVIRONMENTAL IMPACT IS CRUCIAL

By 2050, nearly **70%** of the global population will live in cities<sup>21</sup>.





The global construction industry is expected to grow by **35%** to 2030<sup>22</sup>.

Green building innovation is gaining pace. The global green building materials market is set to reach **\$425.4 billion** by 2027<sup>23</sup>.

To date, 100 companies, 28 cities, 6 states & regions have signed the WGBC's Net Zero Carbon Buildings Commitment<sup>24</sup>.



### OPERATORS FACE MULTIPLE CHALLENGES:

-  Deadlines are tight, so productivity is key
-  Standards and regulations are evolving rapidly
-  Pressure to use fewer resources without compromising performance
-  Operating near woodland, farmland, waterways or underground requires careful environmental management

### SHELL NATURELLE DELIVERS:

- **Protection for soil and groundwater**  
Readily biodegradable<sup>11</sup>, low aquatic ecotoxicity<sup>12</sup>, no bioaccumulation
- **Lower carbon intensity**  
High bioderived content, solar-powered manufacturing<sup>13</sup>
- **Reduced oil usage and waste**  
Hydraulic fluids can offer longer oil drain intervals<sup>14</sup>
- **More sustainable packaging**  
Containers made with up to 40% PCR help reduce plastic waste<sup>15</sup>
- **Carbon-neutral<sup>16</sup> lubricants**  
By protecting and restoring nature





# BUILDING A MORE SUSTAINABLE FUTURE

**Even before the COVID-19 pandemic, the construction industry faced several major challenges. Despite struggling to improve productivity and profitability, it is an industry that has been relatively slow to digitalise and take advantage of new data-led technologies.**

Additionally, construction companies have found it difficult to keep up with demand due to dwindling workforces.<sup>25</sup> And the demand is clearly rising, with the industry predicted to expand by 35% over the next decade.<sup>26</sup>

Now, the industry faces a delicate balancing act: how to meet demand and drive profitability while improving its environmental impact. This will not be easy and will involve new approaches to urban planning and construction – especially in cities around the world.

The need for effective and sustainable construction in our cities is only going to increase. Currently, 55% of the

world's population live in cities – and that is set to rise to almost seven in ten people by 2050.<sup>27</sup> Another crucial factor caused by the rising density of cities is that the amount of land consumed to meet this demand outpaces the actual population growth by up to 50%.<sup>27</sup>

This represents an unsustainable use of land and natural resources, further adding to the challenge of how construction firms can provide the infrastructure needed in urban areas while improving their impact on the environment. Within this, construction waste is a major issue to tackle, with the industry responsible for producing one-third of all waste.<sup>28</sup>

Another consideration for companies is how they build sustainability into their projects and drive a positive transformation throughout the value chain. After all, cities already account for two-thirds of energy consumption and more than 70% of GHG emissions.<sup>27</sup>

Along with these broader industry trends, construction firms face a range of operational challenges. Project deadlines remain as tight as ever, making productivity vital – all while adapting to rapidly evolving standards and regulations. The focus on sustainability means that companies are under immense pressure to do more with less, reducing the resources they use without compromising on performance.

Another element for many companies is the need to reduce their local environmental impact and protect the ecosystems they operate near. Projects taking place near woodland, farmland and waterways require careful management – with mismanagement not only causing damage to a company’s reputation but also to its license to operate.

Fortunately, with the need for transformation across the industry comes huge opportunity.

New technologies are driving productivity, with modern equipment improving the

efficiency of projects. This is also having a positive impact on sustainability

in construction. Innovation in this area is advancing rapidly, with the green building materials market set to reach \$425.4 billion by 2027.<sup>23</sup> Day-to-day operations are becoming more sustainable as well, with new ways to reduce GHG emissions from vehicles helping companies to decarbonise their fleets. Crucially, these emerging solutions provide the ability to improve environmental impact without compromising on performance. For example, OEM investment in alternative fuels and the development of powerful telematics systems enable companies to optimise fuel and equipment efficiency – balancing productivity and sustainability.

These examples demonstrate how moves to become more sustainable cannot simply focus on individual areas. Companies must explore solutions throughout every aspect of their operations to achieve their environmental targets and gain a competitive advantage in an industry set for huge growth in the coming decades.

## How biodegradable lubricants support equipment performance and sustainability targets

One area that can have a positive impact on performance and decarbonisation in the construction industry is lubricants. They can prove an effective tool for helping companies to do more with less – achieving that difficult balance between sustainability and productivity.

When it comes to performance, lubricants play a role in driving equipment efficiency and, all-important,

reliability. They also help increase the overall efficiency of operations by keeping equipment running smoothly. In protecting critical components, they prevent breakdowns – increasing productivity while reducing TCO.

Beyond conventional lubricants, there are also ways for construction companies to further enhance their sustainability credentials.

Using EALs provides an effective way for companies operating near environmentally sensitive areas to manage their impact on local ecosystems. With low ecotoxicity and no bioaccumulation, they offer greater protection for soil and groundwater than conventional lubricants. This means that spills are far less damaging – both to the environment and to the company involved, helping them avoid harm to their reputation and license to operate.

Beyond this, some EALs, such as Shell Naturelle, can contribute to voluntary emissions targets – with a formulation containing a high percentage of renewable and sustainably sourced bio-derived materials<sup>29</sup>, more sustainable packaging<sup>30</sup>, and unavoidable emissions being offset to make it a carbon neutral brand<sup>16</sup>.

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The green building materials market is set to reach **\$425.4 billion by 2027**

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*Typically, construction companies have been deemed as not being very environmentally responsible. One of the major benefits is being able to have that discussion in the marketplace that we are doing things that are environmentally responsible.*

Construction Senior Manager, USA








# SOWING THE SEEDS OF SUSTAINABILITY IN FARMING & FORESTRY

## FINDING THE PATH TO SUSTAINABLE PRODUCTION HAS NEVER BEEN MORE CRUCIAL




- **By 2050, rising population will mean:**
  - more than 2 billion more people to feed<sup>31</sup>
  - overall food demand increased by more than 60%<sup>31</sup>
  - quadruple the demand for wood<sup>32</sup>
- **Rising prosperity is also changing tastes, boosting demand for**
  - Animal-based products, fruit & vegetables<sup>33</sup>
  - sustainable building materials<sup>32</sup>
  - wood and paper-based goods and packaging<sup>32</sup>
  - wood for bioenergy<sup>32</sup>
- **Meeting this ever-growing demand requires increased productivity with more efficient and responsible operations**



## FARMERS & FORESTRY CONTRACTORS ARE UNDER PRESSURE TO:

- Maximise yields and lower total cost of ownership, while minimising environmental impact
- Protect sensitive ecosystems, limiting pollution of
  -  Soil
  -  Water
  -  Air
- Reduce carbon footprint
- Use fewer resources, more efficiently
- Ensure equipment availability during peak planting and harvesting seasons
- Keep up with rapidly changing standards and regulations

## NEW TECHNOLOGIES ARE CREATING OPPORTUNITIES TO DECARBONISE EQUIPMENT OPERATIONS:

-  Technology advances are improving machinery precision, efficiency and reliability
-  Alternative fuels for farming and forestry equipment are advancing
-  Connected and data-driven technologies can improve equipment management and efficiency

## ENVIRONMENTALLY ACCEPTABLE LUBRICANTS (EALS) CAN SUPPORT PRODUCTIVITY & SUSTAINABILITY

- **Equipment performance**
  - Wear and corrosion protection for vital components
  - Supporting fuel efficient equipment operation
- **Environmental protection**
  - Helping reduce impact of accidental leak or spillage<sup>34</sup>
  - Reducing carbon footprint – through energy efficiency & carbon-neutral<sup>16</sup> products
  - Ensuring compliance with environmental legislation

## SHELL NATURELLE DELIVERS:

- **Protection for sensitive ecosystems**  
Readily biodegradable<sup>11</sup>, low aquatic ecotoxicity<sup>12</sup>, no bioaccumulation
- **Lower carbon intensity**  
High bioderived content, solar-powered manufacturing<sup>13</sup>
- **Reduced oil usage and waste**  
Hydraulic fluids can offer longer oil drain intervals<sup>14</sup>
- **More sustainable packaging**  
Containers made with up to 40% PCR help reduce plastic waste<sup>15</sup>
- **Carbon-neutral<sup>16</sup> lubricants**  
By protecting and restoring nature





# PLANTING THE ROOTS FOR CARBON-NEUTRAL FARMING AND FORESTRY

**The sustainable use of land – and any natural resources contained within it – is a vital element in achieving a net-zero emission future.**

For both the agriculture and forestry industries, doing more with less as the need for resources grows while improving their environmental impact is a tough but important challenge to overcome.

In agriculture, creating a food future that operates sustainably at scale is critical. Overall food demand is set to rise by more than 60%<sup>31</sup>, with the global population predicted to rise by 2 billion by 2050<sup>35</sup>. The situation is also more complex than simply looking for ways to ramp up farming output. Global tastes are changing, leading to increased demand for animal-based products, fruit & vegetables<sup>33</sup>.

This only adds to the sustainability challenge for farmers, with meat and dairy production generating 14.5% of global man-made GHG emissions every year<sup>36</sup>. It leaves the agriculture industry looking for new ways to meet rising demand with ever-more efficient and responsible farming practices.

Forestry companies also face a huge challenge to operate productively and sustainably across environmentally sensitive sites. A lot is at stake, with the total value of the world's forests estimated to be roughly \$150 trillion.<sup>37</sup> Added to that is the fact that forests also provide the greatest source of carbon storage – accounting for as much as 90% of emissions captured globally.<sup>37</sup> Protecting local environments is an essential way for operators to comply with regulations, strengthen their license to operate and become certified by global organisations such

as the Forest Stewardship Council (FSC) and The Program for the Endorsement of Forest Certification (PECF).

Both industries face immense pressure to operate more sustainably and improve their environmental impact. Protecting natural resources and local ecosystems is vital – especially for farmers, who need to look after soil and waterways as part of their operations. While doing this, however, companies still need to maximise their output in a way that does not undermine their sustainability efforts and weaken their license to operate. Ultimately, they must show they can reduce their carbon footprint without compromising performance – using fewer resources more efficiently.

One route open to companies in both industries is the decarbonisation of the machinery they use for day-to-day



operations. Advances in technology are swiftly improving the efficiency and reliability of equipment, helping operators to work more productively and sustainably. Within this, alternative fuels are driving better fuel economy and lower CO<sub>2</sub> emissions while data-driven services are enabling companies to manage their equipment more efficiently – contributing to improved output and reduced consumption of resources.

How agriculture and forestry companies manage the efficiency of their equipment is just one piece of the puzzle. However, it highlights how exploring their entire supply chain can offer routes to improved environmental impact – and how these can lead to wider productivity and sustainability gains.

### **How biodegradable lubricants support equipment performance and sustainability targets**

As companies work to increase equipment efficiency, lubrication is an area that can contribute to improvements in performance as well as reductions in GHG emissions. It is a positive example of one element within wider operations that can help meet sustainability targets without compromising output.

Lubricants are essential for protecting a variety of critical components in each piece of equipment and, by doing this effectively, companies can deliver improved reliability. This then enables them to drive the performance of their machinery – reducing downtime by increasing maintenance intervals and preventing breakdowns. As well as improving the productivity of equipment, effective lubricants give operators the ability to achieve more with less. For example, through greater energy efficiency, they provide better fuel economy – leading to a reduced carbon footprint.

Energy efficiency is far from the only way for lubricants to help companies deliver on their sustainable ambitions. Using biodegradable lubricants such as Shell Naturelle enables operators to further improve their environmental impact through elements such as carbon-neutral products<sup>16</sup> and reduced plastic waste.<sup>15</sup>

Also, alongside providing greater equipment efficiency, some EALs offer the ability to lower the consumption (and subsequent waste) of oils by extending ODIs.<sup>14</sup>

More importantly, for companies in both agriculture and forestry, EALs provide greater protection for sensitive environments than conventional lubricants. Readily biodegradable<sup>11</sup>, with low aquatic ecotoxicity<sup>12</sup> and no bioaccumulation, they reduce the impact of leaks and spills (along with the cost of clean-up). For farmers, this means avoiding damage to soil and

water – preventing issues with crops and helping to maximise yields. For those in forestry, it protects the local ecosystems (including plant and wildlife) and helps companies to meet

the certification requirements for the FSC and PEFC, both of which require the use of biodegradable lubricants.

Both industries have a range of challenges to overcome if they are to meet their sustainability goals. While not the top priority for many, biodegradable lubricants are an important part of an ongoing process to decarbonise end-to-end supply chains. They are also an example of how companies can drive growth responsibly, improving their environmental impact without compromising performance.

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### **EALs provide greater protection for sensitive environments than conventional lubricants**

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*Environmental protection policies are being tightened year by year, which could see us replace mineral lubricants with environmentally friendly, biodegradable lubricants, which have no impact on the environment and ecology.*

Agriculture and Forestry Senior Manager, China



# SHAPING A SUSTAINABLE ENERGY FUTURE WITH RELIABLE WIND POWER

## WIND POWER IS ON THE RISE<sup>38</sup>

### ■ 2020 was a record year for wind power, despite COVID-19

- 93 GW of new capacity installed
- a 53% YoY increase
- global cumulative wind power capacity reached 743 GW

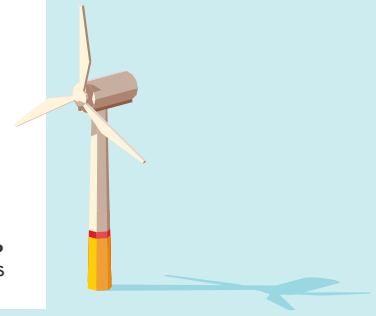
### ■ Current capacity avoids over 1.1 billion tonnes of CO<sub>2</sub> annually - equivalent to South America's annual carbon emissions

### ■ Offshore wind is gaining share. By 2025:

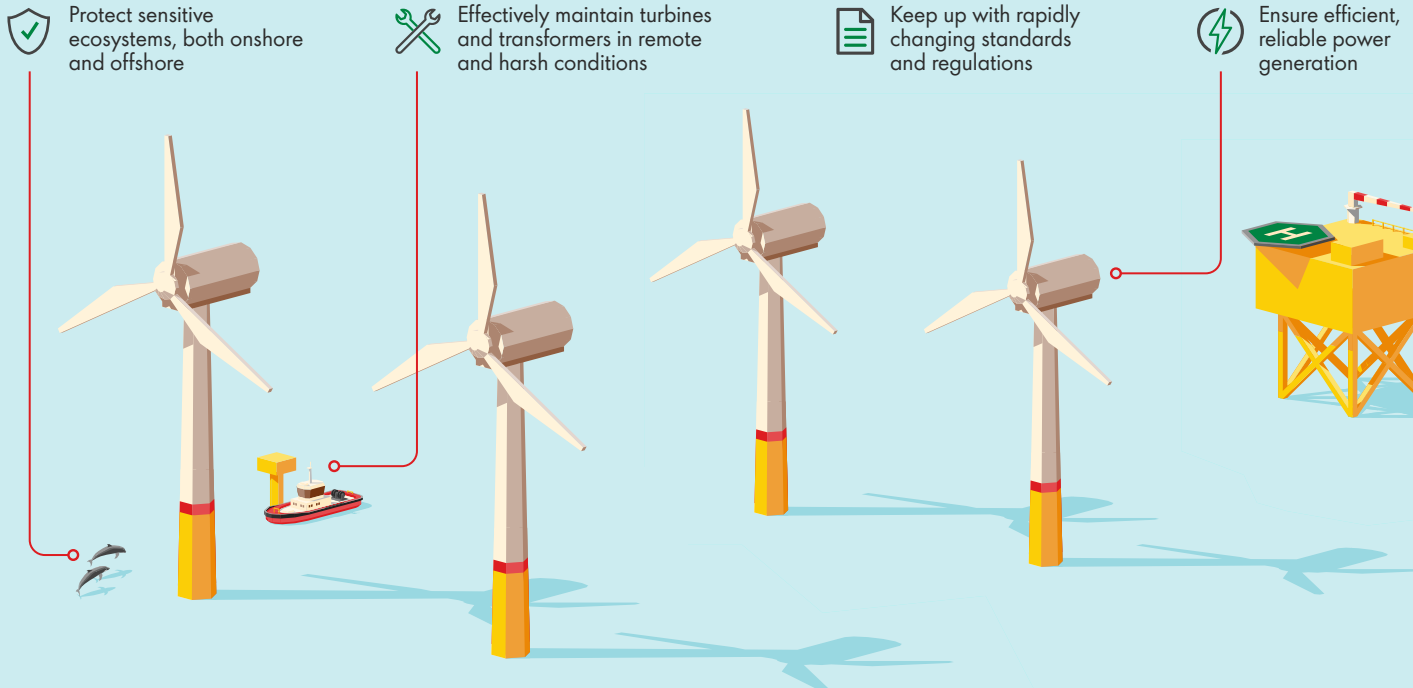
- annual installations set to quadruple
- 21% of new wind installations will be offshore (vs 6.5% in 2020)

## BUT THERE IS MORE TO BE DONE

### ■ Wind's share of the global power mix must increase from 6% today to 30+% by 2050<sup>38</sup> to achieve Paris Agreement targets



## OPERATORS ARE UNDER PRESSURE TO:



## ENVIRONMENTALLY ACCEPTABLE LUBRICANTS (EALS) CAN SUPPORT PRODUCTIVITY & SUSTAINABILITY TARGETS

### ■ Equipment performance

- Wear and corrosion protection for vital equipment components
- Supporting reliable equipment operation

### ■ Environmental protection

- Helping reduce impact of accidental leak or spillage<sup>34</sup>
- Ensuring compliance with environmental legislation

## SHELL NATURELLE DELIVERS:

- **Protection for wildlife and ecosystems**  
Readily biodegradable<sup>11</sup>, low aquatic ecotoxicity<sup>12</sup>, no bioaccumulation
- **Lower carbon intensity**  
High bioderived content, solar-powered manufacturing<sup>13</sup>
- **More sustainable packaging**  
Containers made with up to 40% PCR help reduce plastic waste<sup>15</sup>
- **Carbon-neutral<sup>16</sup> lubricants**  
By protecting and restoring nature



# POWERING SUSTAINABILITY WITH RELIABLE WIND ENERGY



**The need for more sustainable sources of power has been clear for a while. In 2016, roughly two-thirds of global GHG emissions were linked to processes producing energy for heating, electricity, transport, and industry.<sup>39</sup>**

Since then, major steps have been taken to decarbonise the energy supply chain, with renewables leading the way in reducing emissions.

As a result, in 2020, CO<sub>2</sub> emissions in the power sector dropped by 3.3% - the largest reduction on record.<sup>40</sup> Even accounting for lower demand due to the COVID-19 pandemic<sup>41</sup>, the growing use of renewable sources was the driving factor behind the fall in emissions. In fact, renewables provided 29% of global electricity generation in 2020 while increasing their contribution to emission reduction in the power sector by 50%.<sup>40</sup>

And, across the EU, renewables surpassed fossil fuels as the primary power source for the first time in 2020.<sup>42</sup>

This transformation is echoed by the advances in wind power over the last 12 months. Again, despite the global pandemic, 2020 was a record-breaking year for the wind industry. It saw the installation of 93 GW of new capacity – a 53% year-on-year increase on the 60.8 GW of capacity added in 2019.<sup>38</sup> This was driven largely by markets in the US and China, which accounted for close to three-quarters of new installations.

The record increase means there is now 743 GW of wind power capacity globally<sup>38</sup>. In real terms, this means that wind power is currently helping to avoid more than 1.1 billion tons of CO<sub>2</sub> emissions around the world, which is equivalent to the annual carbon emissions across the whole

of South America.<sup>37</sup> Within this, offshore wind power is making rapid progress. Annual installations are set to quadruple by 2025, meaning that 21% of new capacity will be offshore compared to 6.5% in 2020.<sup>38</sup>

However, there is still much more to achieve. To achieve net-zero emissions and meet Paris Agreement targets, global growth in wind power needs to triple over the next decade.

The industry also needs to increase its share of the worldwide power mix – rising from its current level of 6% to more than 30% by 2050.<sup>38</sup> This means adding new capacity at an average of 180 GW each year over the next decade, then achieving an increase of 280 GW a year beyond 2030.

The need for further growth in wind power installations highlights the wider challenge that operators face beyond the ability to provide capacity.



They are already under pressure to deliver efficient and reliable power – with little margin for error as demand continues to rise. This means that they must be able to provide effective maintenance of the wind turbines, often in remote and harsh conditions (especially for those managing offshore facilities).

On top of this, operators need to show they can protect the sensitive ecosystems that exist around their installations – both onshore and offshore. Providing net-zero emissions energy is a critical target to hit. But, if it is achieved at the expense of the local environment, companies will suffer major reputational damage and risk harming their license to operate.

### **How biodegradable lubricants support performance and sustainability targets**

To deliver reliable wind power across a rapidly growing global installation estate will require high levels of output from turbines and reliable transformer operations to transmit power to the grid. EALs will play a role in delivering that, contributing to operators' productivity goals and ensuring compliance with environmental regulations and standards, from installation to operation. Whether in the wind farm installation equipment, the transformers, or the turbines themselves, EALs designed for each specific application can help protect critical equipment, reducing the risk of unplanned downtime. This then enables operators to drive the reliability and overall performance of their equipment.

Biodegradable lubricants also offer an effective way for operators to meet their sustainability targets, by providing greater protection for an installation's local environment (onshore and offshore). For example, Shell Naturelle products are readily biodegradable<sup>11</sup> while featuring low aquatic ecotoxicity<sup>12</sup> and no bioaccumulation, thereby reducing the impact should an accidental leak or spillage occur – avoiding harm to wildlife and ecosystems.<sup>34</sup>

EALs can also help operators to meet voluntary decarbonisation targets, as part of their wider sustainability efforts. For instance, the use of solar power in the Shell Naturelle production process<sup>13</sup> lowers the carbon intensity of manufacturing<sup>43</sup>. In addition to this,

the combination of reductions in plastic waste and use of carbon-neutral products enables operators to further reduce their environmental impact. Altogether, EALs help them to strengthen their license to operate and reach the ambitious net-zero targets the industry needs to achieve.

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Biodegradable lubricants offer an effective way for operators to meet their sustainability targets, **by providing greater protection for an installation's local environment (onshore and offshore)**

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*If you are using bio-lubes and there is a spillage, then the cleaning cost or environmental cost becomes that much lower.*

Power Senior Manager, India



# SETTING A COURSE TOWARDS MORE SUSTAINABLE SHIPPING

## OCEAN TRAFFIC IS INCREASING

- World trading fleet now exceeds 60,000 vessels<sup>44</sup>
- Maritime trade is expected to grow by 3.4% to 2024<sup>45</sup>
- Offshore wind installations are set to quadruple by 2025<sup>38</sup>  
Specialist vessels play a crucial role

## PRESSURE TO DECARBONISE SHIPPING IS GROWING

- Shipping accounts for about 2.7% of CO<sub>2</sub> emissions<sup>46</sup>
- International Maritime Organization (IMO) ambition: 70% reduction in carbon intensity by 2050<sup>47</sup>
- As multinationals aim to decarbonise their supply chain, shipping operators are being pushed to act

## EFFORTS TO REDUCE ENVIRONMENTAL IMPACT ARE INCREASING

- The US EPA's Vessel General Permit (VGP) mandates the use of Environmentally Acceptable Lubricants (EALs) in all oil-to-water interfaces for vessels in US waters<sup>48</sup>
- EALs are strongly preferred in Europe and recommended in Australia<sup>49</sup>



## SHIP OPERATORS ARE UNDER PRESSURE TO:

-  Protect sensitive marine ecosystems
-  Uphold high health & safety standards
-  Find low-cost sustainability solutions
-  Ensure reliability of critical equipment components in harsh saltwater conditions
-  Reduce carbon emissions
-  Keep up with rapidly changing standards and regulations



## SUSTAINABILITY REPRESENTS A \$1 TRILLION OPPORTUNITY IN THE MARINE INDUSTRY<sup>50</sup>

Environmentally acceptable lubricants (EALs) can support productivity & sustainability targets.

- **Equipment performance**
  - Wear and corrosion protection for vital equipment components
  - Supporting efficient equipment operation
- **Environmental protection**
  - Helping reduce impact of accidental leak or spillage<sup>34</sup>
  - Ensuring compliance with environmental legislation

## SHELL NATURELLE PRODUCTS HAVE BEEN TRUSTED IN MARINE FOR MORE THAN 25 YEARS

- **Protection for sensitive ecosystems**  
Readily biodegradable<sup>11</sup>, low aquatic ecotoxicity<sup>12</sup>, no bioaccumulation
- **Lower carbon intensity**  
High bioderived content, solar-powered manufacturing<sup>13</sup>
- **Reduced oil usage and waste**  
Hydraulic fluids can offer longer oil drain intervals<sup>14</sup>
- **More sustainable packaging**  
Containers made with up to 40% PCR help reduce plastic waste<sup>15</sup>





# SAILING TOWARDS A ZERO-EMISSIONS FUTURE WITH SUSTAINABLE SHIPPING

**The shipping industry faces a huge challenge to decarbonise its operations and meet the targets set out in the Paris Agreement.**

Despite providing the transport with the lowest environmental footprint per ton, the industry still has a significant environmental impact.<sup>51</sup> In fact, shipping accounts for 2.7% of global CO<sub>2</sub> emissions – and that is before considering the wider impact on marine environments.<sup>46</sup>

This situation leaves the industry with a serious sustainability problem to solve. To change this course, the International Maritime Organization (IMO) aims to achieve around 70% reduction in carbon intensity by 2050.<sup>47</sup> Companies are also facing pressure to operate more sustainably from their customers, including major global brands that are working to decarbonise their entire supply chains. For example, Google has committed

to carbon-neutral shipping by 2021<sup>50</sup>, along with other first movers who are pushing marine operators to strengthen their license to operate through sustainability.

Much of the focus is currently on adopting alternative fuels to tackle the largest contributor to a ship's CO<sub>2</sub> footprint. However, the industry is also exploring the various routes to sustainability – including the Global Maritime Forum's aim to have commercially viable zero-emission vehicles (ZEVs) on deep sea shipping routes by 2030<sup>52</sup>.

One element of wider decarbonisation efforts that companies cannot overlook is the use of EALs. In many regions, they are an essential part of maintaining license to operate. In others, they are a requirement, with legislation mandating their use. The Vessel General Permit (VGP) is an example of this in action, requiring vessels longer than 79 feet

that travel through US waters to use lubricants that are biodegradable while having low ecotoxicity and no bioaccumulation in their oil-to-water interfaces.

This demonstrates the need for companies to look beyond the fuels they use for sustainability gains. It is especially critical for specialist vessels that carry and operate heavy machinery (such as those used for offshore wind installations). By using biodegradable lubricants, vessels are not only able to improve equipment protection and reduce GHG emissions, but they also strengthen their license to operate around the world by showing their commitment to protecting marine environments and sensitive ecosystems.

# THE IMPORTANCE OF ECOLABELS WHEN CHOOSING EALS

**Global environmental regulations are swiftly adapting to the need for more sustainable and responsible business practices.**

For example, there is a growing demand for biodegradable lubricants for use in environmentally sensitive areas because of regulation mandating their use – especially for total loss applications.

As these regulations evolve, companies across all industries need to be confident that the lubricants they use are fully compliant. However, with so many different standards in force around the world and a wide variety of products to choose from, it can be a challenge to make the right choice.

Ultimately, to be certified as EALs, products must comply with strict environmental criteria and meet minimum technical performance standards. These requirements are set out by regulation and approvals bodies within each respective country – and often differ between regions.

This is where environmental initiatives like the EU Ecolabel make a huge difference. Providing peace of mind during the purchasing process, ecolabels help operators to quickly and confidently identify products that:

- meet set criteria;
- have a lower environmental impact;
- have third-party endorsements and validation.

They also offer an effective way for companies to demonstrate their compliance, strengthening their license to operate and ability to win new business. The growing interest in EALs is evidenced by the 31% increase in EU Ecolabel licenses awarded to lubricants from September 2020 to March 2021.<sup>53</sup>

However, it is important to remember that not every ecolabel is the same. Here are three elements to look out for when choosing products branded with different ecolabels:



## 1 Approval criteria

Not all ecolabels share the same approval criteria. While many have mandatory standards for aquatic ecotoxicity, biodegradability and bioaccumulation, there are others that do not. It is important for companies to know which ecolabels best suit their specific needs.



## 2 Product lifecycle

Not all ecolabels look at the full lifecycle of the product as part of its certification process. This can make a difference to how strict the approval criteria are and reduce the environmental benefit of different products. Companies also need to know how this aligns with legislation relevant to the countries they operate in.



## 3 Global recognition

Not all ecolabels are globally recognised. While standards like the EU Ecolabel and the EPA VGP are widely implemented, others like China Environmental Labelling are country-specific. It is essential for operators to understand where an ecolabel applies and how it relates to local variations in regulation.



# CONCLUSION

**As we have seen throughout this paper, there is a common thread among businesses when it comes to pursuing more sustainable operations. Regardless of their location, their customers, or the unique challenges they face, they all identify license to operate as a primary motivation for improving their environmental impact.**

## Releasing the potential for more sustainable operations

There is an understanding that business cannot go on as it is now. Transformation is needed. Even if sustainability is not an operational priority for companies today, they know it soon will be. They know that the ability to renew existing contracts and win new business depends on it more and more. They know that, if they do not find a way to demonstrate their ability to avoid, reduce and offset CO<sub>2</sub> emissions, their competitors surely will.

The barrier for many businesses (and their leaders), however, is not having a clear route to sustainability. In many cases, the destination itself can seem unclear – it can be hard to visualise what a net-zero future looks like, let

alone how to manage the many complexities involved in getting there.

One challenge that companies across all six industries face is the need to maintain or even improve performance, while advancing sustainability ambitions. For many businesses, sustainability comes second to performance. But the right lubricants can help with both:

### 1. Maintenance savings

Pairing quality lubricants with proactive oil condition monitoring can help reduce downtime, reduce maintenance costs, and thereby improve overall performance. And longer oil drain intervals (ODIs) help

reduce the amount of oil and filters that are disposed, cutting costs and reducing environmental impact.

### 2. Reducing environmental impact

Carbon neutral lubricants<sup>16</sup>, like Shell Naturelle, can help:

- original equipment manufacturers (OEMs) who want lower-carbon alternatives for their current and future technology
- industrial customers who want to extend machinery life while reducing their overall net carbon footprint.<sup>54</sup>

### 3. Reputational protection

Safety and environmental impact are vital elements in strengthening license to operate. A single spill can often be a huge setback to a company – incurring fines and becoming ineligible to bid for certain contracts. The cost of EALs like Shell Naturelle, that minimise the environmental impact of a spill, is a small price to pay in comparison.



### An Optimistic Outlook

Another crucial element behind the move to more sustainable operations is legislation. Many businesses – despite seeing license to operate as a priority – are still less willing to implement new environmentally-friendly processes and products where it is not mandatory.

To meet the targets set out in the Paris Agreement, world governments are well aware that they need to play their part. Legislation to enforce environmental protection varies considerably worldwide, but it is all gradually converging on the same goal - encouraging industries to prioritise sustainability. The road ahead may require some compromise, resetting the ideas of what businesses can achieve, and at what environmental cost. But there is cause for optimism.

Biodegradable lubricants already offer companies a solution to balance productivity and environmental protection, with performance levels comparable with conventional fluids. But as legislation continues to tighten, it is likely that growing demand will propel a surge in technological progress – producing EALs that outperform today's conventional lubricants.



As legislation continues to tighten, it is likely that growing demand will propel a surge in technological progress **producing EALs that outperform today's conventional lubricants**

An example of this in action is in food production. More than 20 years ago, food greases were low performance products. The introduction of strict legislation fuelled demand and propelled development, to a point where there are now a wide range of sustainable products that offer strong performance, sometimes even better than conventional food greases. EALs for industry are set to follow this same journey. With evolving

legislation, advancing technology and greater education, the outlook is bright. A proactive approach to embracing EALs will help companies build their reputation as a forward-thinking, responsible business.

**Shell**  
**Naturelle**

### SERVICES

#### Shell LubeAnalyst

Oil and equipment monitoring service

#### Shell LubeCoach

Lubrication training

#### Shell LubeAdvisor

Expert advice from the Shell technical teams

#### Shell LubeMatch

Find the right oil for your vehicle or equipment



Find out more by visiting  
[www.shell.com/naturelle](http://www.shell.com/naturelle)





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