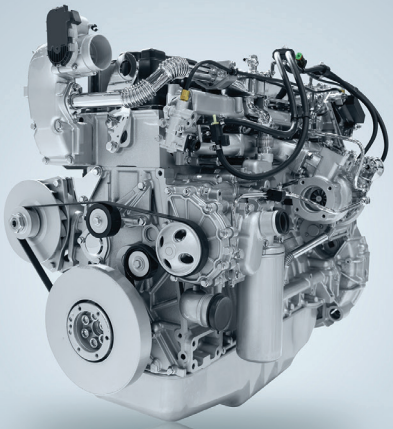
Commercial vehicle engine oils: targeting needs, not specifications



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As commercial vehicle markets evolve, traditional engine oil specifications are no longer sufficient to meet diverse operator demands. This article explores how a needs-based approach, grounded in real-world conditions, fleet segmentation, and regional challenges, can deliver greater value, improved performance, and stronger customer trust across both mature and emerging markets.

Shaping products and services around user needs is the foundation of any successful enterprise and the lubricant industry is no exception. Although industry specifications have an important role to play in quality assurance, some have barely changed for decades, so meeting a specification should not be the primary objective. Developing a portfolio of Commercial Vehicle (CV) engine oils through meaningful user segmentation will reap far greater rewards in domestic and export markets.

Tailoring product profiles effectively means gaining a deep understanding of the target market. The priorities of European heavy, medium and light CV fleets may focus on fuel economy and oil drain intervals or could lean towards wear protection, engine reliability and resale value, dependent upon vehicle duty cycles. In contrast, the needs of growing fleets across the Global South will be influenced more by the challenges of local driving conditions, variable fuel quality and lubricant costs, as well as their level of confidence in marketing claims.

Targeting needs, not specifications, results in more satisfied customers who know they are getting the best possible value from their engine oil.

Static specs

Since 2004, when Facebook was being launched by a then-unknown Harvard student, many things have changed beyond recognition, but the prevailing industry specifications for heavy duty engine oils, ACEA E6 for European on-road and API CI-4 for emerging markets, are still very familiar faces.

ACEA E8 was released in 2022 for improved oxidation control and compatibility with newer exhaust aftertreatment systems, but the differences versus E6 were relatively minor and today, around 40% of the European on-road CV parc requires E6 or E8.

The API CI-4 specification, introduced even earlier, in 2002, is currently required by around 35% of the global commercial vehicle parc. The rapid growth of Chinese CV OEMs in this marketplace, coupled with their tendency to rely on industry specifications, suggests that API CI-4 will remain an important baseline for emerging markets.

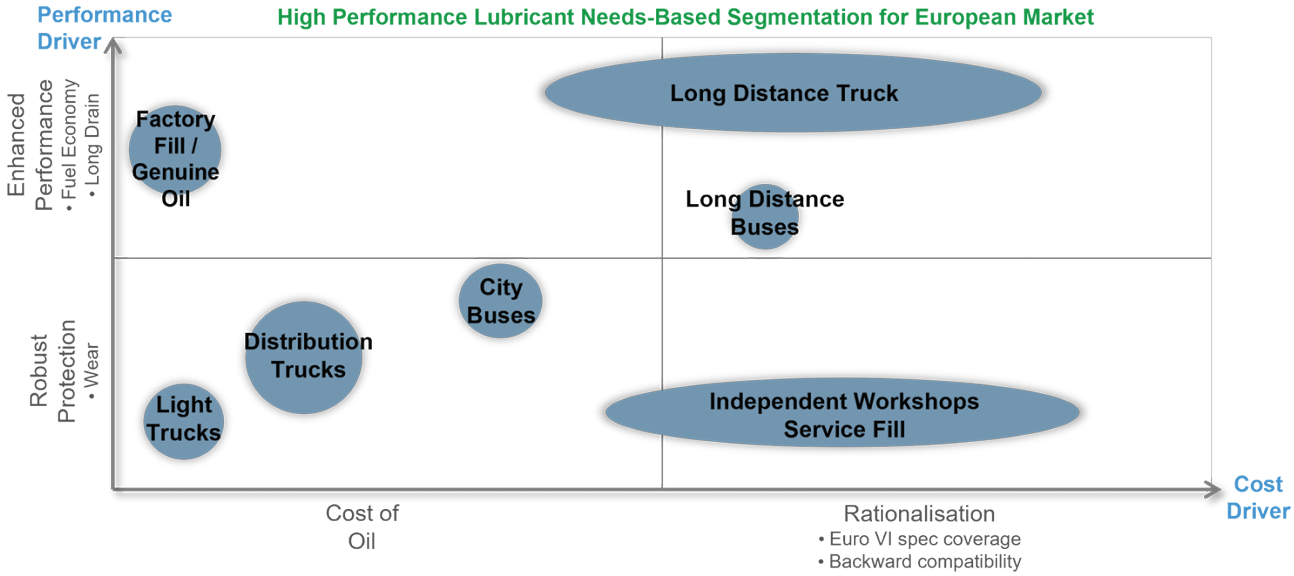

Figure 1: *High performance lubricant needs-based segmentation for the European market.*

Dynamic markets

While these core specifications have remained largely static, markets are dynamic entities where user needs will evolve. Treating any market as a homogeneous space that can be served by meeting a single industry specification will overlook significant opportunities.

Within Europe's CV engine oil market for example, needs-based segmentation that looks at cost versus performance drivers highlights the difference in priorities between different user groups, particularly when comparing heavy and light/medium duty fleets.

European Heavy Commercial Vehicle (HCV) priorities

For HCVs such as long-distance trucks and buses, with high mileages and more time spent running at constant speeds, the biggest engine oil requirements are fuel economy and longer drain intervals, although wear protection naturally remains important.

These long-haul vehicles are also more likely to be covered by existing or extended warranties and to be serviced by OEM-franchised workshops that use OEM-approved ultra-low viscosity oils that go beyond ACEA E6/E8 to deliver a specific balance of performance.

Industry specifications have begun to pivot towards the needs of this segment. The 2024 edition of the ACEA Sequences brought in the new F01 category which allowed the use of oils with lower high temperature high shear to support fuel economy requirements.

European Light and Medium Commercial Vehicle (L/MCV) priorities

At the other end of this European segmentation are L/MCV fleets and city buses. Covering shorter distances of around 50-100 km per day, the start-stop style operation of these vehicles on often-congested urban roads will subject their engines to higher rpms and temperatures.

For these operators, reliability is the biggest prize; fewer breakdowns mean happier customers. They are also keen to maximise each vehicle's working life and its eventual resale value. Their engine oil requirements therefore lean towards strong wear protection and oxidation resistance, rather than the HCV focus on fuel economy and drain intervals. These user priorities should not be considered in isolation but in the context of vehicle age and maintenance approaches.

Ageing European CV parc

While long-haul HCVs are often younger, L/MCV operators tend to run smaller fleets comprised of older vehicles bought from larger operators and will keep them for longer to bring down the total cost of ownership.

The UK currently has the youngest CV fleet in Europe, averaging around 8 years old. In France, the average is 9 years and in Germany 10 years, running right up to 23 years in Greece. Across much of the continent, average vehicle age continues to rise.

For the 80% of the L/MCV parc that is already outside warranty, operators prefer to seek value-for-money servicing from independent workshops, which in turn aim to minimise inventory costs by rationalising their lubricants. To manage risk, the engine oil used by such workshops must meet or exceed the needs of all these out-of-warranty L/MCVs; products with Euro VI specification coverage and backward compatibility are ideal.

In accounting for vehicle type, duty cycle, age and maintenance, tailored product profiles that meet the performance and value needs of different European users through segmentation can significantly increase the relevance of engine oil portfolios. Treating Europe as a single-space market with a sole focus on meeting ACEA E6/E8 means opportunities will be overlooked.

Emerging market priorities

Switching approach from meeting specs to meeting needs applies equally to export markets. These are not insignificant in size and reflect the gradual migration of lubricant demand from North to South. Demand is evenly split above and below the 36th North Parallel at present, but forecast regional shrinkage and growth means that by 2040, around 64% of global demand is anticipated to come from the Global South. This dramatic shift to emerging markets includes India, Brazil, Saudi, Thailand and Turkey.

Treating the Global South as a single market that can be served simply by meeting the API CI-4 specification is again counter-productive, although segmenting these markets requires a different approach. User needs across emerging markets are primarily shaped by the regional challenges that operators face.

Market-relevant drain intervals

API CI-4 and associated OEM specifications typically claim maximum oil drain intervals of 80,000 kilometres, under standard conditions. However, these distances can be sliced to half or even a third of that when conditions are less favourable. This includes extreme climates: low temperatures can impact the effectiveness of engine oil wear protection while excess heat can affect its thermal and oxidation stability. Huge temperature swings, as one might encounter in Saudi, demand strong performance at both extremes.

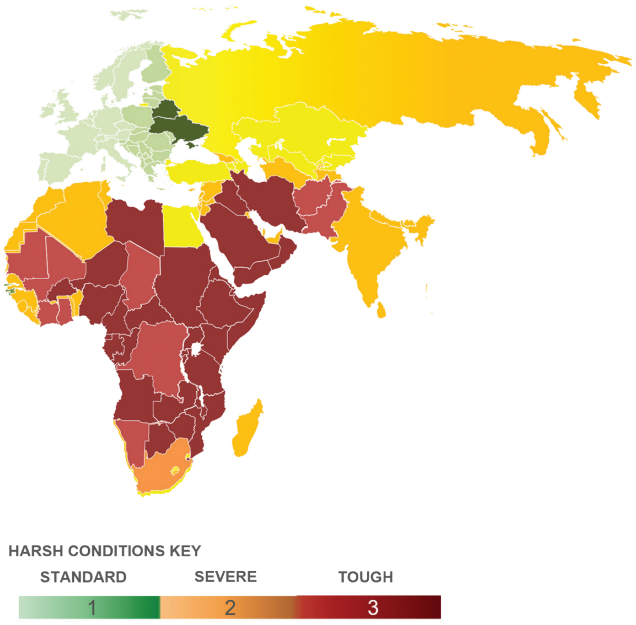

Figure 2: *Map showing varying levels of harsh conditions by country.*

Environmental factors from rainfall and humidity to potential contaminants like dust and sand, can also increase the harshness of driving conditions, as do poor quality road surfaces.

High altitude driving will place added stress on combustion engines due to the lower levels of available oxygen, exacerbated by significant changes in altitude. The Turkish road network, for example, features a degree of altitude change matched by few other locations in the world.

Fuel quality can vary remarkably across emerging markets, with differing levels of sulphur and biofuel content; in Indonesia, levels of Fatty Acid Methyl Esters now approach 50% in diesel fuel, further increasing the burden placed on engine oils.

Finally, the propensity for operators in emerging markets to overload vehicles will magnify the impact of harsh conditions.

Emerging market user needs

Afton's research shows that fleets are extremely conscious of the driving conditions in their region and actively try to manage the detrimental impact of these on the engine oil by reducing servicing intervals. Their approach is often empirical as demonstrated by this comment: 'Although I buy oil for 40,000 kilometres, I change it every 15,000 kilometres; I don't trust 100% of the claims'. This sentiment is widespread among emerging market operators, who recognise the

importance of engine oil but remain unconvinced that products tested in Europe are wholly relevant for the conditions that their vehicles encounter daily.

Real world reassurance

Segmentation by needs is still a positive step forward because meeting the API CI-4 specification is merely a minimum standard. However, meeting user needs is only truly successful if user trust can be won. For emerging markets, regional field trials using real vehicles provide proof for operators that the fluids considered suitable for their market will deliver promised performance under local driving conditions.

A field trial run by Afton in southern China, using trucks deliberately overloaded to reflect the realities of operating in that market, showed that fleets are likely to be replacing engine oil more frequently than necessary. When used oil was tested after 16,000km, a typical drain interval, its wear performance was still equivalent to that of fresh oil. Fleets in cost-sensitive markets could be extracting greater value from lubricants that are differentiated to meet user needs and backed up with relevant testing to prove claims.

Conclusion: moving the target

These two examples highlight how developing, testing and marketing products based on user needs, whether for mature or emerging markets, will be more beneficial than simply targeting a specification. When accompanied by robust evidence from relevant field trials, a tailored portfolio of engine oils will give service providers and users the reassurance to extract maximum value from their engine oil without compromising on reliability or efficiency.

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