

With the next target for emissions legislators declared as CO₂ (carbon dioxide), you'd expect any fuel that might make a serious difference to be attractive. Truck makers can hardly be accused of dragging their heels in this department: although a mixed picture, most already have a portfolio of alternative propulsion offerings.

But it's a tough gig. While diesel isn't cheap, trucks makers have bent over backwards with heavy oil engines to accommodate the successive Euro emissions levels. They've achieved spectacular reductions that many believed impossible when we set out on Euro 1 in 1992. But, despite upholding diesel fuel consumption and even demonstrating improvements, OEMs are finding policy- and law-makers vilifying the fuel itself.

A growing negative view of diesel from bodies such as TfL (Transport for London) is now being fuelled by VW's meltdown in Wolfsburg. It couldn't have come at a worse time – just when diesel had risen to the challenge of Euro 6, it gets a rap not of its own making. So, is this the beginning of the end for diesel? And even if it's a slow burn, is the hour now nigh for the alternatives?

Scania's sales and marketing vice president for trucks Christopher Podgorski believes there are four drivers for sustainable transport: congestion, air pollution, energy security and climate change. While it's true that too much of the world's oil supplies come from politically unstable regions, he concludes that the first three are governed by local rules and market forces. "That makes climate change the biggest challenge, by far," he says.

Agreed, but the sustainability of the planet and a dependence on CO₂ still seems somewhat remote. Why? Partly because it's not easy to imagine CO₂ in

CARBON CUTTING

Chassis costs and infrastructure issues continue to dog alternative fuels, but the technologies are forging ahead and legislators must be watching. Ian Norwell reports from Scania's Södertälje HQ



tonnes, and what that means for the environment. Back to chemistry O levels and GCSEs then: at NTP (normal temperature and pressure), a tonne of CO₂ occupies a sphere 10 metres in diameter. But even if that helps, the warming element of greenhouse gases (GHG) can also be hard to grasp.

ENVIRONMENTAL IMPERATIVE

"A drop of 6°C in average global temperatures would take us back to the conditions that prevailed in the last ice age," advises Podgorski. "But an increase of 6°C would make large parts of the developed world uninhabitable." And there's no doubt what's driving the

potential swings. GHG production per capita peaks at a staggering 45 tonnes per annum (USA) and the average across all nations, developed and non, is five tonnes.

That figure needs to be just two tonnes to meet the internationally agreed 2050 target. So there's work to do. It might be preferable to be driven to alternative fuels by legislators or market forces. If Mother Nature is behind the wheel, it's going to be a rougher ride.

Scania has always been a player in green trucks, but at its 'Take Co2ntrol' event in October the firm wheeled out its newest and biggest range of



you took it with a standard diesel unit, fuel savings of 18% are claimed on typical urban operation. Go for biofuel on the 9-litre engine and you would win a 92% reduction in CO₂, making quite a combo.

This hybrid powertrain can be ordered with P or G cabs, and the basic engine is Scania's 9-litre in-line five-cylinder unit delivering 320bhp. In execution, this modular powertrain includes an electric motor sitting between the engine and a modified Opticruise AMT (automated manual transmission), and delivering 130kW (174bhp) and 1,050 Nm of torque.

HYBRID THINKING

Usable battery capacity is 1.2kWh – a moderate output based on a balance between battery life and driving range. "We chose not to maximise the driving distance in electric-only mode, and were satisfied with two kilometres on flat ground at 15 tonnes," comments Magnus Höglund, Scania's specialist responsible for alternative fuels and powertrains. "We

believe customers place the highest value on long battery life."

This approach may go towards addressing the issue of battery costs.

That led DAF, for example, to provide its hybrid truck as a lease-only unit, and not a direct

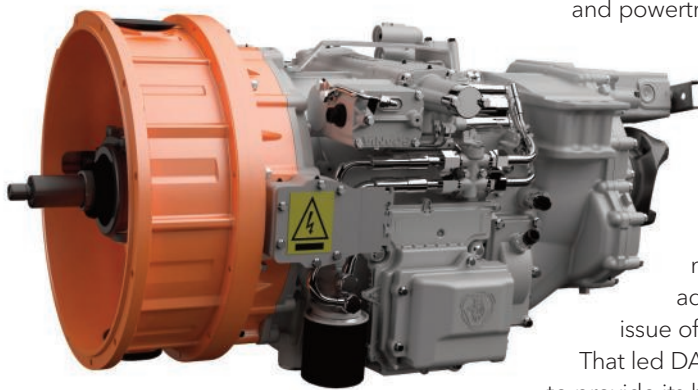
purchase. But by limiting the battery charge and discharge rates, Scania achieves an extended battery lifetime, which solves that problem. The total hybrid packaging amounts to 790kg, with 220kg accounted for by the battery. There's a 26-tonne version, too, so this technology has come a long way.

But this vehicle was not alone at Scania's Take Co2ntrl demonstration – with others running on natural gas, biogas, HVO, biodiesel or bioethanol offering 20%, 90%, 90%, 66%, and 90% CO₂ reductions respectively. Clearly, fleet managers who have been despairing at making further meaningful CO₂ cuts on diesel-powered chassis, may soon have somewhere to go. And with liquid options that don't need either cryogenic or pressurised storage, there are attractive contenders.

But there's no silver bullet. In the hunt for CO₂ cuts, the transport industry needs a three-pronged trident. Alternative fuels are part of the equation that includes smarter transport (cutting empty running), vehicle optimisation (the right truck for the job) and getting drivers to be better at what they do.

That said, while there remain no breakthroughs in alternative fuels – in terms of availability or storage, or, for that matter, high chassis prices – the tide does seem to be running in their favour. On the one hand, CNG/LNG (compressed and liquefied natural gas) is increasingly referred to as 'diesel-like' in performance, with torque levels that almost match diesel. And on the other, with local authorities and councils wanting noise reduction (egged on by the European quiet truck PIEK initiative) they're likely to find the silent running of Scania's hybrid P320 attractive.

Certainly, once one operator takes a few into a fleet, there will be added momentum in the form of competition for contracts. So, if legislators formulating CO₂ limits for heavy vehicles at 'Euro 7' care to look at what's increasingly achievable with alternatively-fuelled vehicles, how about another approach? They might want to consider forcing a percentage on large fleets as a mechanism for cutting CO₂. There is, as we know, more than one way to skin a cat. **TE**



alternative powertrains yet. Among its most interesting anti-CO₂ options was a hybrid city truck that folded several winning features into a single chassis. A P320 Euro 6, it can be driven in electric-only mode, or with renewable FAME (fatty acid methyl esters) or HVO (hydrogenated vegetable oil) biofuels. If