

One size does not fit all

I very much doubt that back in the 1890's, Rudolf Diesel would have ever imagined the success and longevity of the compression ignition, internal combustion engine he invented and that bears his name. Primarily due to its efficiency, the diesel engine has proven to be the lifeblood of the commercial road transport industry for the best part of 100 years now, replacing petrol engines in trucks from the 1920's on. In a truck, the diesel engine truly has been the "one size fits all" solution.

In more recent times the diesel engine has copped its fair share of criticism for its not so clean tail pipe emissions. However, this is simply not the case. When fitted with modern exhaust after-treatment systems complying to Euro V, or VI, emission standards, current diesel engines are as "clean" as any equivalent petrol or gas engine. There has also been a lot of recent talk about the impending demise of the diesel truck engine, to be replaced, if you believe the "expert" reports, by electric motors. This is also far from reality for the commercial road transport industry.

There is simply no current viable replacement for all diesel powered trucks. Battery electric trucks may be suited to metro distribution operations where the routes are known, the distance travelled is less than the battery range (likely to be around the 100km – 150km mark, at least in the short term) and the truck returns back to its base for recharging at the end of its shift. Hybrid technologies will continue to be added to diesel engines to improve overall efficiencies, but these are best suited to stop-start truck operations and will offer little efficiency gains if used in intra, or interstate truck operations. Renewable diesel fuels will have their part to play in reducing our reliance on fossil fuels, will lower our carbon footprint and could be used in longer distance road transport operations. While the only potential replacement power source for high GCM line-haul diesel powered trucks is shaping up to be hydrogen fuel cells powering electric motors. However the energy density (the amount of stored fuel power) of hydrogen is low compared to diesel, there is no refuelling network in Australia and hydrogen is difficult and expensive to transport from the source where it is generated to where it will be used (refuelling stations around our vast nation). As a point of interest, Australia's very own Commonwealth Scientific and Industrial Research Organisation (CSIRO) is leading the world in hydrogen gas storage and transport technologies, however even with these developments, the transport of hydrogen lags well behind that of liquid hydrocarbon fuels like diesel. And CSIRO's work is still some way off from being a commercial reality. The other problem with these alternative power technologies is that they are currently expensive and while costs will no doubt fall over time, the present reality is that the higher up-front vehicle purchase costs and/or higher fuel costs, results in an increased cost of ownership and that is a hit on bottom line for a transport company.

So what will power the trucks of the future? The simple answer is a whole range of technologies that will include, current diesel (particularly for long haul, remote area, road transport) and natural gas will be the fossil fuel options. Synthetic and bio diesel as well as methane gas are the likely renewable hydrocarbon front runners. Battery electric and hydraulic hybrid energy regeneration technologies will be seen supplementing traditional diesel engines to improve efficiencies. While plug-in battery-electric and hydrogen-electric power are the front running zero emission technologies.

Some things are very clear, unlike the last 100 years where diesel powered trucks have ruled almost exclusively, the foreseeable future will see a vast array of different propulsion and fuel solutions applying to the road freight transport industry. In the future, one size will not fit all. The other given is that Truck Industry Council members, the truck OEM's, will continue to offer the best and most appropriate technologies to Australian transport operators, ensuring that they have a choice of world class vehicles and technologies that will best address their road transport business requirements.

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