



Clean v Green + Paris

this significant development could reduce operating costs and put pressure on government to liberalise mass and volume limits, so there should be an upside for operators.

Let's consider Guy's main message: Clean is not necessarily Green, as the relevant gases are different. In line with that, emission

rules only regulate clean gas emissions (mainly particulates and NOx), while green rules are needed to regulate green gas emissions (mainly CO₂).

The US has already introduced such a Green Rule, called GHG 14. It applies fuel economy improvement rates for heavy-duty vocational trucks and prime movers

ARTSA recently heard from Guy Macklan about the difference between 'clean' and 'green' engines. Recently retired from the role of Engineering Manager at Penske Power Systems (formerly MTU Detroit Diesel), Guy's knowledge and experience are second to none.

Chart 1 shows the progress made in cleaning up diesel engine emissions in the US during the 20 years between 1990 and 2010. The US EPA limits for particulates PM – microscopic carbon particles – are now 1/60th of the 1990 limits. The Nitrous Oxide (NOx) limits are now 1/30th of the 1990 limits. The US has no plans to introduce tighter 'clean' standards. The US is now focusing on fuel economy – that is, reduction in greenhouse gas emissions.

The US EPA limits are relevant in Australia because they are an acceptable standard to satisfy the current Australian emission rule ADR 80/03, as are European and Japanese limits. ADR 80/03 accepts US EPA 2007, Euro V and JIS 2005+ standards.

Yet, the Australian government is now actively considering introducing ADR 80/04, which would require Euro VI, US EPA 2010 or JIS 2009+ limits. This next step would add further technical complexity to trucks without any benefits to the operator community, just as the last step (ADR 80/03) did.

The political winds are shifting. The Paris agreement regarding greenhouse gas reduction should change our thinking and drive change in our industry. Fortunately,

Chart 1: USA EPA diesel emissions limits 1990–2010, courtesy of Guy Macklan

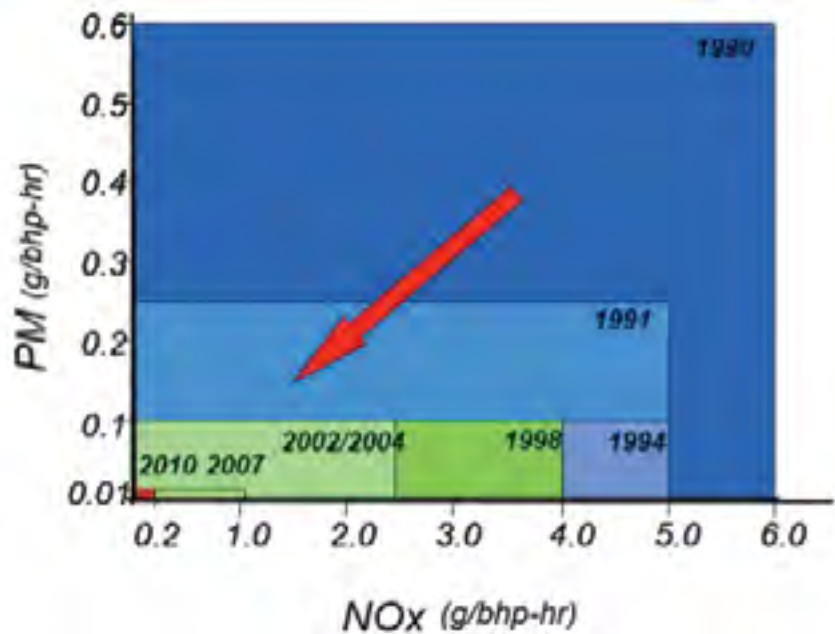
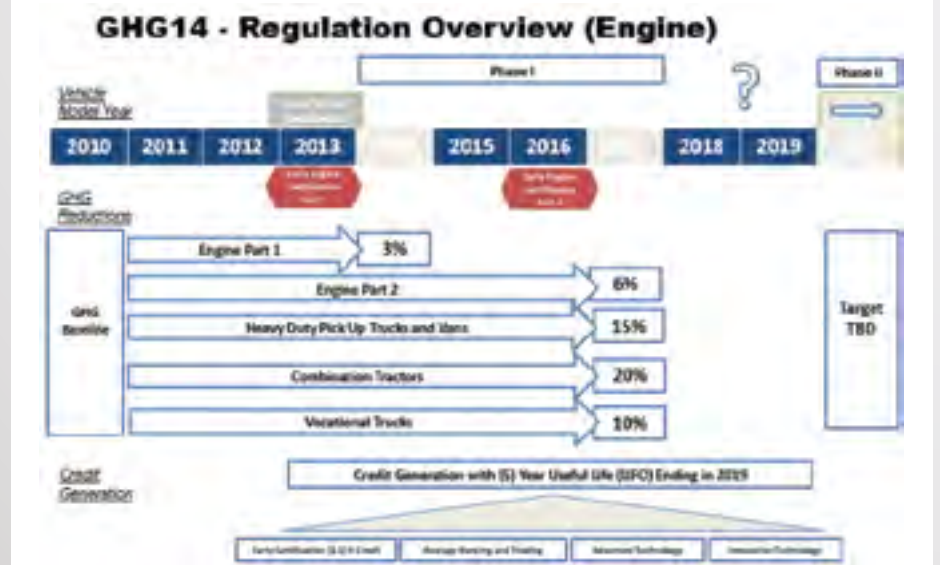


Chart 2: Overview of the GHG14 Rule, courtesy of Guy Macklan



starting from 2014 and proceeding to more stringent improvement rates in the 2018 model year. The significant development will require reductions in engine CO₂ emissions (grams/ton-mile), fuel economy of vehicles (gallons/ton-mile) and leakage from air conditioning systems. Individual certification is required for chassis, engine and air conditioning systems. The rule allows averaging by truck and trailer manufacturers of fuel efficiency improvements over the range of vehicles they produce each year – it does not apply to vehicle owners or to individual vehicles. Owners can still select options even though they may be detrimental to fuel efficiency. The vehicle manufacturers must implement continuous improvement of average fuel efficiency.

Chart 2, an overview of the GHG14 Rule, shows that substantial improvements of about 20 per cent in fuel economy measured on a ton-mile basis are required. This will spur weight reduction; the development and application of low rolling resistance tyres; truck and trailer aerodynamic enhancements; lower speed limiter settings; hybrid motor-generators on the tailshaft that can both propel and regenerate; as well as engine developments including turbocharger improvements, variable-speed water pumps, lubrication improvements and updated engine electronics.

The last item, updated engine electronics is also relevant to the current scandal concerning VW's diesel emission certification. There is a clear trade-off between Clean v Green that influences engine set-points and power, pollution emissions and fuel economy.

Europe has been considering a fuel economy rule for heavy vehicles for a number of years, but it is proving too hard to reach an agreement. It is possible that US manufacturers will get a market lead from the Green Rule introduction, just as

they did when the Californian black smoke limits forced the use of electronic control of the fuel injection system.

Enlightened regulation can bring benefits to all players. Climate change is a serious problem that we are obligated to respond to. Australian heavy trucks release 19.5 million tonnes of CO₂ annually. The average fuel economy is ~ 57 l/100km. Diesel fuel will remain the pre-eminent fuel source for the next decade.

The Australian industry should aim to

reduce total diesel fuel usage by five per cent p.a. despite the rising freight task, which is growing at around three per cent p.a. So what should our industry do? The key is that operators must benefit significantly from fuel-efficiency developments. Guy's main point is that Clean is not Green. It is time to focus on Green.

Peter Hart

Chairman, Australian Road Transport Suppliers' Association (ARTSA)

MY ACTION POINTS

1. Introduce voluntary accreditation module based on the US Smartway scheme that requires participants ('the Accreditation Group') to share knowledge, fuel economy, performance experience and benchmark fuel economy. Publish annual benchmark data to provide reference levels and create a performance ranking.
2. Lower registration charges for vehicles less than six years old based upon compliance-plate date.
3. Liberalise rules for high-productivity vehicles. Allow 30m B-doubles and B-triples on all double lane roads.
4. Train every driver about economic driving. Industry associations should develop a video that teaches drivers about economy-driving techniques. Require all heavy drivers to see the video and answer a short test paper.
5. Demonstrate efficient technologies and set up an industry fund to pay for demonstration projects to promote fuel-efficiency improvements using Australian-made equipment. Fund to be open to proposals from Accreditation Group members.
6. Introduce regulations that promote fuel efficiency, identify fuel wastage hotspots and have government and industry co-operate to reduce time wastage at these locations. This could involve introducing truck priority lanes for the Accreditation Group.
7. Abandon the introduction of ADR 80/04 so that vehicle manufacturers have some flexibility to optimise fuel economy engine set-points.
8. Mandate fuel-efficient truck operational conditions. This might result in speed limiters being set to 95 km/h.
9. Apply advanced planning techniques to promote fuel-efficient logistics. Introduce a national freight forwarding market scheme that allows operators to tender for loads without special arrangements.
10. Have the Transport Certification Agency (TCA) assess the potential for advanced route planning to reduce fuel usage around metropolitan areas. Implement demonstration projects.