

## Zemo Partnership response to: “Consultation on a Green Paper on a New Road Vehicle CO2 Emissions Regulatory Framework for the United Kingdom”

Zemo Partnership (previously the Low Carbon Vehicle Partnership) is a public-private partnership established in 2003 by UK Government. Our original mission was to accelerate the shift to lower carbon vehicles and fuels within the road sector, and to create opportunities for UK business. With the Net Zero target now legislated in UK our revised focus is on clear steps to accelerate the move to zero emission mobility in the UK, whilst continuing to focus on UK business opportunities. From personal transport to freight, fleet, fuels and the infrastructure to enable them, we are determined to create a shift in the way people think about mobility – and steer them towards a future of zero emissions, sustainable transport that’s better for all, whilst minimising the impact of the existing vehicles and fuels.

Around 240 organisations are engaged from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others. Zemo is a not-for-profit, independent partnership, jointly funded by government and our members, whose breadth of backgrounds and perspectives make us unique.

### This Response

Two virtual workshops for Zemo members were held in the week of 6<sup>th</sup> September to promote and discuss this consultation and its proposals. The workshops sought to draw out the range of views on key barriers and opportunities to the proposed framework and to gather member feedback on the specific questions raised. At each workshop the DfT presented the consultation and the key questions to be addressed. A “MIRO” online white board was utilised to capture the resulting comments.

This submission draws on many of the member contributions to those workshops, and has been reviewed by the Zemo Partnership secretariat in isolation. As such, it does not necessarily represent the specific position of any one member or group of members given the diverse views articulated within the workshops.

The MIRO board and comments made (unattributed) can be made available for review and discussion with the DfT team should this be of benefit.

## Executive Summary

Whilst outside the scope of the consultation but common to both Zemo workshops, members expressed a desire to consider CO<sub>2</sub> and greenhouse gas (GHG) emissions from all aspects of the vehicle and fuel life cycles and encouraged DfT to consider this further in future policy whilst continuing a technology neutral approach.

The first workshop focussed on the definition of Significant Zero Emission Capability (SZEC). At this point, it should be noted that Zemo Secretariat are working directly with the OZEV team in relation to SZEC and for that reason are not providing a specific secretariat response to this element of the consultation. However, member views have been captured and collated in a later section of this document. The MIRO board for the first and second workshop is also available to the DfT on request.

As a high level summary, members broadly supported the need for additional metrics to the CO<sub>2</sub> g/km target, to ensure SZEC is robustly delivered, and they focussed on EV range as the most obvious measure. There were specific comments regarding a requirement to keep the test process aligned to Europe and to ensure that any metrics applied are simple and accessible to consumers/drivers. The views expressed supported treating cars and vans separately given the much greater variation of van applications. Members supported the need for improved consumer information and incentivisation/encouragement to ensure the “capability” of any SZEC classified vehicle is fully utilised (e.g. PHEVs are plugged in as much as possible), in order for SZEC to deliver the maximum zero emission miles and GHG reduction possible.

The second workshop focussed on the regulatory framework aspects of the green paper (ZEV mandate), the applicability to other vehicle sectors and very briefly on the more detailed aspects of derogations, exemptions, credits and targets.

Based on views expressed in the second workshop, members broadly supported the principle of a ZEV mandate operating in conjunction with CO<sub>2</sub> targets, albeit with a general caveat of the “devil being in the detail”. Examples of the detail included the setting of an appropriate trajectory in terms of phase out dates and the definition of clear target thresholds. Exact figures for these areas were not discussed during the workshop.

Opinion was split on whether CO<sub>2</sub> targets should be ramped down at the same time as ZEV mandate thresholds are being increased. Some members felt this would provide the fastest route to tailpipe emission reduction whilst others were concerned that this would lead to investment being spread too thinly in industry rather than being focused on a specific area such as electrification.

There was general agreement on the potential for earlier implementation in specific sectors and applications that are easier to electrify and offer the greatest benefit in terms of air quality and CO<sub>2</sub> emissions i.e. taxis, buses, mopeds, etc.

Divergence from European standards and regulation was raised as a concern, particularly with regard to heavy duty vehicles where there is a greater reliance on European manufactured vehicles. With this in mind, members discussed that any framework implemented makes use of existing test and certification processes but with potentially a more sophisticated use of the data derived from them in the case of the UK.

Whilst a ZEV mandate has the potential to give a clear direction to vehicle manufacturers, members felt it was necessary for this to be supported by similarly clear communication to the individual consumer and fleets to purchase the vehicles produced.

Finally, some members also suggested that targets should be set for the energy sector and for the supporting (EV) infrastructure that is required by road transport to achieve net zero, particularly for rural communities and local implementation.

Having been less involved in the development of the wider green paper, Zemo are in position to offer a secretariat position in this area.

Zemo supports the ambition to move towards a ZEV mandate within a carefully planned framework and with a nuanced approach that understands and recognises the rate of development across sectors. Zemo proposes that this should be combined with CO<sub>2</sub> targets that become more aggressive but remain achievable over time, in order to accelerate the transition to zero tailpipe emissions. The clear communication of phase out dates and target thresholds is critical to success, removing ambiguity and uncertainty. To help mitigate the potential cliff edge effect that can be associated with a phase out date approach, Zemo proposes that a series of review dates are introduced to assess progress towards the end target. This is particularly important in sectors such as HGVs where the technology solutions are not yet understood.

It should be emphasised, however, that achieving zero tailpipe emissions in isolation is no guarantee of achieving net zero GHG emissions and, conversely, a combustion-engine vehicle using fully renewable fuel can already be close to net zero or even achieve net negative GHG emissions. The transition must, therefore, also take into account where the fuels and energy are sourced from and their respective pathways, particularly for heavy duty vehicles for which electrification is unlikely to be the only solution. So, whilst the boundary of this consultation is limited to tank-to-wheel (tailpipe) emissions, consideration should also be given towards well-to-tank emissions, and ultimately life cycle and resource impact considerations, including any consequential loss and gain across sectors.

Lastly, whilst outside the scope of this consultation, with the successful transition to zero tailpipe emissions for new vehicles, a large IC engine-based fleet will still remain on the roads for a significant period of time. In this regard, the new vehicle framework introduction should be supported by measures such as the adoption of increasing levels of renewable fuels to quickly decarbonise both the legacy fleet and any road transport sectors that fall outside of the framework.

## Significant Zero Emission Capability

**Q1 – What metric, or combination of metrics should be used to set eligibility for cars and vans between 2030 and 2035?**

**Q2 – For your chosen metric, what threshold should new cars and vans be required to meet from 2030?**

**Q3 – What other requirements could be introduced, if any, to maximise zero emission capability?**

**Q4 – What would the impact be on different sectors of industry and society in setting an SZEC requirement, using evidence where possible?**

Responses from our membership recognise that there needs to be an ambition for gCO<sub>2</sub>/km to move beyond just tailpipe, progressing through well-to-tank and moving towards full life cycle analysis (LCA assessment) otherwise emissions are displaced elsewhere, where they are not measured or counted (e.g. manufacturing).

A number of members proposed that the thresholds for new metrics should become proportionately more stringent, but should reflect GVW/GTW/GCW in commercial vehicles as well as the complexity of the market [2030–2035 transition].

Public acceptance and understanding has been cited as critically important to success. Metrics should therefore be simple to understand so that drivers are able to respond positively and in the spirit of the regulation. This is regarded as an opportunity to build trust and transparency with industry and the public through clear definition and terms of reference.

*“CO<sub>2</sub> is now well-understood by the consumer and is driving fleet emissions downwards” .*

*“We need to ensure that opportunities to reduce other emissions are not overlooked” .*

Workshop participants raised the issue of metrics in the context of a wider CO<sub>2</sub> regulatory framework and that this determines what can continue to be sold beyond 2030 – noting that this is not about consumer choice on this particular occasion and therefore needs to be as simple as possible for what is a limited period of time.

Consideration of feasibility and recognition that this is a time limited action which is part of a wider approach to decarbonise road transport as quickly as possible, was touched upon in the discussion. With the short transition period associated with 2030–2035, diverting investment to improve SZEC specific technologies with additional resource and incentives could negatively impact zero emission development.

Responses raised several concerns of deviating from EU standards, particularly as the EU is currently reviewing LD (Light Duty) CO<sub>2</sub> and Euro 7 standards. This raised a further concern that this may adversely affect the market offerings and availability in the UK, whilst also impacting manufacture and supply chains in the UK.

In principle, there was support for a proportionate increase in the minimum absolute EV range, e.g. 30 km in 2030 to 80 km in 2034, and some calls for ‘a percentage of overall range’ metric according to vehicle type and use. It was however felt that this approach could conflict with issues of clarity and should be tempered by the potential to create complex ‘temporary’ conditions for PHEV markets.

Of more significance for members was the monitoring of PHEV use and the operation of PHEV vehicles in order to ensure that their use maximises the benefit of the EV technology and ZE capability. For example, the test certificate gives EV range and energy consumption which can be coupled with a capacity to track percentage of distance in zero emission mode. There was certainly an expressed desire to take learning from the TNO experiences with company car taxation encouraging PHEVs, essentially highlighting that there is a disconnect between taxation and operation that should be addressed in this case i.e. if you issue a business fuel card but have no means to reimburse charging cost, the behaviour encouraged is adverse to the capability and benefits of the technology.

Members also expressed that as a threshold and/or percentage for zero emissions capability is set, that there is clarity that ‘zero means zero’ and so zero emissions criteria should represent a significant range in truly zero tailpipe emission modes. This will mean that WLTP/WLTC value is key and it is imperative that this value is robust, representative and trusted. Once again, members views broadly consider this as a (relatively short) time limited transition period and expressed a desire to keep the metrics simple and easily understandable across industry, public and authority stakeholders. The underlying considerations expressed are to ensure that the limit is stringent enough to have an impact and deliver genuine GHG reductions (via ZE miles). Members emphasised the need to ensure that the metric falls within existing type approval processes and doesn't increase testing complexity / administrative burden.

Important points were raised in relation to the longevity of batteries and the meaningful datum point where battery performance is measured for SZEC i.e. will SZEC be maintained for 5-7 years into battery life? And/or will SZEC range/battery health be monitored?

Few indicative or suggested figures for absolute SZEC range were put forward by the membership or workshop participants but discussion certainly favoured a range that avoided the unintended consequence of vehicles carrying unnecessarily large battery packs.

For HEV, CO<sub>2</sub> g/km was considered appropriate until 2030, as long as NO<sub>x</sub> emissions continue to be limited as per type approval limits. For PHEV, a CO<sub>2</sub> g/km plus EV range measure was discussed with air quality emission limits during the engine operating periods. It was further noted that for vans g/tonne/km is potentially a more appropriate measure based on GVW or payload.

A small number of members suggested an indicative EV range fell between 50km and 75km as a SZEC provision.

*“This does raise the question as to whether there should be a maximum SZEC range before BEV becomes the default option”.*

*"There are going to be some very complex incentives on OEMs indeed when this is considered in relation to the wider green paper proposals - especially if options 1 and 2 are implemented together".*

There were views that expressed a preference for omitting an end date for ICE vehicles in favour of implementing increasingly stringent requirements overall, on both vehicles and fuel combinations, effectively allowing OEMs across sectors to respond accordingly; determined by having the right metrics in place to support the fastest decarbonisation possible and remain technology agnostic.

As to how this would play out, views suggested that targets should become more stringent as a 'ramp up' to zero tailpipe emissions with a caveat around feasibility and/or viability- as manufacturers are unlikely to develop new models that will only be saleable for a short period so there may be a tipping point at which making the limit more stringent effectively results in only fully zero emission vehicles being available for sale ahead of 2035 (phase-out).

Increasing EV range and/or reducing CO<sub>2</sub> g/km was viewed positively, in principle, as a way forward – but expressed caution as to how many 'steps' may be required in the implementation of reductions i.e. 2030, 2033 and then phased out by 2035. It was felt that this would likely place constraints on resource and would need to be balanced with the requirement for a period of sales stability in order to recover investment.

Views were expressed in response to public-facing communication of such requirements (SZEC) and the requirement for public-facing metrics. 'Capability' was often referred to as "range" with no members suggesting a different definition of what 'capability' should mean.

*"If the goal is to get to a metric for vehicles with significant zero emissions capability, then a combination of CO<sub>2</sub> g/km (which is a known metric) and a definition of the zero emissions capability (range) seems logical. "*

It was suggested that this would allow for a proportionate increase in EV range and decrease in CO<sub>2</sub> tailpipe g/km to be communicated effectively.

There was general agreement that WLTP must allow for CO<sub>2</sub> and EV range to be measured repeatably and consistently, with a desire expressed to set up a framework to include LCA factors, so that gCO<sub>2e</sub>/km over an assumed lifetime of the vehicle can be determined. As with WLTP, members felt that these metrics and communicated figures need to be clear and representative.

It has been widely and frequently raised that PHEV ZE range capability is one significant factor, but the use of that capability remains an issue that needs resolving. Even with a large EV range, a PHEV could be used purely in an ICE mode. So, it was suggested that there should be some encouragement to ensure that such vehicles are charged regularly. It was suggested that mandatory monitoring and reporting of the use of ZE capability could be coupled with monitoring and reporting of fuel consumption by 2030. This would allow for monitoring of actual ICE and electric use and facilitate fiscal levers to maximise benefits of ZE capability. This

suggestion was in response to the possibility of excessive CO<sub>2</sub> emissions from large engines if only one metric (CO<sub>2</sub>) was used, which in turn raised a further question over whether there should also be a "cap" on the charge sustaining CO<sub>2</sub> figure (already given by the test process), or a consideration of including the CO<sub>2</sub> figure from the charge sustaining test in the OEM fleet average: Noting that this would be consistent with the ICE CO<sub>2</sub> fleet average targets in 2030 or earlier.

Based on the views of the workshop participants, members broadly support the suggestion of a zero emission range metric in addition to CO<sub>2</sub>. It was noted that a more nuanced/sophisticated approach would be advantageous given the complexity of the market and the rate/pace of change across sectors. An approach that more closely matches vehicle categories to typical duty cycles according to their likely readiness for ZEV technologies was proposed. Members also emphasised the importance of where the energy comes from i.e. zero tailpipe is not sufficient, Well-to-Tank (WTT) emissions must be net zero too and a full Well-to-Wheel approach should be taken to minimise GHG in the transition to fully net zero solutions.

Furthermore, a positive response to the idea that following the light duty vehicle example, adding earlier dates for "significant zero emission capability" could also be useful, particularly at the boundary between light duty (N1 vans) and smaller (N2) HGVs.

*"There is also a good case for interim milestone targets to be set to ensure product availability for early adopters, cost saving innovations to be developed and a phased roll-out of charging/fuelling infrastructure nuanced for vehicle categories, e.g. 10% by 202x, 50% by 203x."*

It was expressed that it is essential for vans to have SZEC flexibility and measurement/monitoring so the consumer (end user) can understand the impact of payload on range, etc. This may also facilitate the more rapid decarbonisation of the current parc; 'the builders van'.

*"This is much more likely to be less pronounced for passenger cars, certainly from a consumer perspective. With this in mind, it was expressed that once BEV range exceeds a real-world 500+ kilometres (obviously assumes EV technology rather than alternatives), SZEC will become less prevalent."*

It was noted that improvements may need to be made to reduce disparities between categories (e.g. M1/N1), this should not be a consideration in the actual SZEC definition but should be continuously addressed in the development of the test cycle procedures.

In order to monitor SZEC, PHEV ZE capability and use there is a desire to see more standardised measures and monitoring conducted centrally by the government not the manufacturers or automotive bodies. Comments such as "They have shown they can't be trusted i.e. VW" indicate the challenge facing manufacturers using the legislated test information. Whilst this is not directly in scope for this consultation, participants felt that to make SZEC requirements effective in the real world, measurement and monitoring are key enforcement options. Similarly, the reporting of real-world EV/FCEV performance was also proposed (e.g. impact on range of harsh but valid RDE cycles or payload and temperature). Mechanisms such as OBFCM data reporting already exist and could be used but need independent oversight and reporting.

Whilst there is an acceptance that this consultation focuses on the regulation of vehicle supply, views were expressed that there are numerous ways in which PHEVs can be incentivised to be used appropriately. Geofencing, VED adjustments, fines for driving on ICE when in clean air zones and pricing signals were all quoted.

As vans may also have very different duty cycles, intensive use, refrigerated storage demanding high power, largely urban (well suited to BEV) and inter-urban less so, it was felt that this additional complexity should be recognised in any target setting. However, this was expressed alongside the need to ensure that treating vans differently shouldn't create a loophole for manufacturers and consumers i.e. the rise of the popularity of pick-ups amongst the general public. (M1/N1).

There was a suggestion that vehicles larger than M1 (and indeed possibly smaller) could be segmented by use case, allowing for variation in vehicle sizes, load capabilities etc, and to consider wider practical considerations around realistic zero emissions range based on vehicle size & packaging as well as real world use.

It was suggested that the framework should ensure that financial incentives are in place for commercial PHEVs, offering clear segmentation from private/company passenger cars, so that they are more likely to be plugged in throughout their [longer] legacy period. It has also been noted that EU regulations treat cars and vans differently and that trucks are currently poorly covered in these aspects.

Workshop participants acknowledged that a shift to PHEV/REEV vehicles are likely to be a useful stepping stone for consumers and SMEs that are hesitant or resistant to adopt full EV primarily because of range/charging anxiety concerns. It was noted by a number of participants that this could partly help to improve consumer confidence in charging and demonstrating the range that can be achieved (to a reasonable degree), with full EV transition becoming more acceptable during that 2030-2035 period if consumers become more accustomed to electric vehicles as early as possible.

*"Further confidence may come from RDE and could include checks that the CO2 and EV range are comparable to lab tests.....In order to clean up the transition between Cars and small vans (M1/N1 class 1) they could be treated the same, but with larger vans assigned different CO2 limits."*

However, caution was expressed against setting conditions where mass is added to vehicles in order to move to more 'favourable' CO2 targets. Payload efficiency becomes important as van emissions are considered on a per payload tonne km basis as this would disadvantage PHEVs that are rarely charged so effectively operate as a less efficient ICE vehicle.

Consistently, responses favoured incentivising mass reduction and disincentivising excess mass (including large batteries).



*“Across sectors, this framework proposes the same end date ambitions but we must recognise in the short term, that the starting point is different in terms of today’s supply and demand so different sectors are on different trajectories.”*

A further issue in response to SZEC capability was raised regarding the EV infrastructure being able to keep pace with vehicle supply and demand as well as possible changing usage patterns. It was felt that the interim use of PHEVs to mitigate for any shortfall in infrastructure build up may enable a more rapid electrification of miles than a ‘BEV only’ (all or nothing) approach.

*“What happens when we reach Zero at tailpipe?”*

In order to continue to improve EV efficiency a need to develop measures that drive continuous improvement in EV/FCEV efficiency was described (this is currently achieved by the CO<sub>2</sub> measure for ICE-powered cars). As an example, targeting energy efficiency may be an appropriate next or additional step i.e. with phase in of kWh/km targets post 2030.

In summary, workshop participants communicated broad support for the approach of an additional range metric for SZEC, and supported some early incentives to stimulate the appropriate use of ZE capability and to maximise the opportunity for a transition to zero tailpipe emissions more widely. Participants discussed complementary policies as a useful response/enabler, identifying incentives and fiscal levers as needed to ensure that the benefits of ZE capability are maximised.

## Possible Future Frameworks

**Q5 - Do you have any comments regarding Option 1, to replicate the current regulatory framework, albeit with strengthened targets, to meet our wider carbon reduction targets and phase out dates?**

**Q6 - Do you have any comments regarding Option 2, to introduce a ZEV Mandate or sales target alongside a CO2 regulation?**

**Q7 - Do you have any views on the government's initial preference for the regulatory approach set out in Option 2?**

The introduction of a ZEV mandate was generally supported by members engaged in the workshop as it is expected to positively drive the ZEV market, more quickly towards 2035, effectively changing perceptions and accelerating adoption amongst consumers.

There was further recognition that both a ZEV mandate and CO2 targets are required plus potentially more granular specific sector/category targets, e.g. all mopeds to become EV much earlier than N2/N3. There was a desire that this should be supported by more stringent measures applied to NOx & air quality as well as CO2. The risk that tailpipe CO2 targets alone will not deliver the trajectory or flexibility was also discussed. It remains difficult to quantify the risk of not achieving the CO2 reductions needed but it was felt that history has shown voluntary agreements and single point CO2 targets do not deliver the reductions at the pace needed for the current climate emergency.

Responses were also positive in that a ZEV mandate will likely reduce uncertainties and encourage ZEV development, cost reduction, and infrastructure investment. However, percentage and indeed proportionate ZEV targets would need careful consideration to match achievable technology and sales while mandating an appropriately aggressive trajectory to 2035.

A risk was identified that a strict framework, solely based on tailpipe CO2 set at 0g/kWh, g/km, g/ton-km, will rule out other vehicle options that have an equivalent or better WTW CO2 profile. However, this was noted as being out of scope of the consultation.

Participants highlighted that planning & investment cycles for delivery of new vehicle models and technologies through to the mid-late 2020s have already started, so new metrics and regulation will need to acknowledge this and be timed appropriately i.e. don't set a new target for next year.

It was also regularly noted that any support for regulation is highly dependent on the detail, this being likely to appear in future consultation rounds. CO2 regulations have delivered significant carbon reductions to date according to member views, although the performance has been mixed over the last few years and confused by significant changes to test protocols and market disruptions.

In order to maintain and accelerate CO2 reductions, it was felt that there is a need to acknowledge the short timescale for transitioning to 2030 and 2035 targets and ensure transitional technologies are not unnecessarily excluded. The rapid increase of PHEV models (as well as BEVs) indicate that certainly for the next few years, that technology will play a major role in the transition to zero tailpipe emissions.

**Q8 – Are there alternative approaches that could deliver on the government's carbon budget and 2030/2035 commitments?**

**Q9 – Do you have any views on how either, or both, of the options could be implemented?**

**Q10 – Do you have any further comments or evidence which could inform the development of the new framework?**

The role of lower carbon fuels is specifically excluded from the consultation, on the basis of a zero tailpipe emissions focus, however Zemo members continue to emphasise that an aggressive decarbonisation of fuels in the road transport sector is both a complementary measure to the electrification agenda and also a highly effective and arguably less disruptive approach to delivering the carbon budgets commitment in the time frames considered. Zemo and its membership will continue to work with Government to deliver the maximum GHG savings from this opportunity.

Workshop participants suggested the use of an EV range capability metric combined with monitoring of any IC engine use in a PHEV, may be a complementary approach for ZEV mandates within some sectors, effectively creating a zero emission mileage (ZEM) mandate.

*“What about the existing second hand fleet surely this is a factor in the overall carbon budget? Will there be a scrappage scheme/incentives to buy new or (even better) used ZEV’s. What about low income households?”*

Support was evident for turning over the fleet more rapidly, in combination with ZEV requirements, to increase ZEV uptake in the second hand market and “pull through” in the sectors where the used market is developing slowly. It was recognised that often the factors influencing used vehicle choice are different to new vehicles, so further work and targeted used market measures should be considered

For the heavy duty sector, if the basis of a tailpipe CO2 regulation is retained, then it was felt a mechanism to credit manufacturers for biofuel capability could incentivise continued expansion of biomethane HGV availability.

A question was raised over matching credits to vehicle size or capability, *“Should credits be sized to vehicle e.g. small BEV gives small credit and large one a full credit – to avoid a “cygnet” compliance approach”*

## Stringency of CO2 target

**Q11 – If deploying a combined ZEV Mandate and CO2 regulatory framework, how should the CO2 element be set?**

**Q12: Should the focus be on delivering the largest possible CO<sub>2</sub> savings, or the quickest possible switch to zero emission mobility?**

**Q13: How do we ensure that the target allows for sufficient supply of low and zero emission vehicles; supports investment in the UK; and delivers our carbon reduction commitments?**

**Q14: Should the new regulatory framework include exemptions or modified targets for certain specialist vehicles and/or niche and small volume manufacturers?**

The focus on maximum CO2 savings was regarded as heavily dependent on vehicle type and weight, with a need for wider use cases to be considered. For example, towing for business and leisure in situations where a BEV isn't currently practical.

Views were expressed that care needs to be taken to avoid a single focus on exclusively tailpipe CO2 savings and to ensure that wider GHG emissions are considered.

The potential impact of auxiliary power units on ZE capability was also discussed. Whilst the consultation is focused on primary 'tailpipe' emissions, it was felt that ZE capability should extend to the whole vehicle.

In the case of the heaviest HGVs, it was recognised that the vast majority of vehicle supply is from outside UK, and there is a belief that alignment with EU regulations is central to adequate vehicle supply and availability. Underpinning this is a desire to reduce GHG (CO<sub>2</sub>). Zero emission technology was described as widely embraced for urban areas, but there is a recognition that the transition for other sectors such as long haul may take some time .

Although out of scope, workshop participants felt that vehicle regulation should be considered alongside a need to ensure that net-zero electricity supply/grid matches or exceeds the target for ZE vehicles.

The general opinion of those that took part in the workshops is that the goal should be the largest CO2 reductions as fast as possible, in the most cost effective manner, on a total WTW CO2 basis. This came with a caveat that placing the wrong product on the market and adopted for the wrong use should be avoided i.e. the wrong ZE vehicle being selected for the use it is intended to satisfy such as a large SUV with a large battery when a small city car is required. This is also typically known as the right vehicle for the right journey.

Some participants suggested that where it is considered valid to have exemptions for low volume/niche manufacturers, targets should become more stringent over time from a defined

baseline (current) and such manufacturers should be set ambitious but achievable improvement targets.

It was also highlighted that some niche manufacturers will struggle to develop multiple solutions, typically purchase powertrains as a complete unit and will want clarity about what the framework means for them. It was suggested that some won't have budgets for an interim SZEC step and will likely jump straight to a ZE solution. So, stability and clarity were described as being key, with a reminder that RDE CO2 emissions should be within x% of lab-based WLTP emissions.

It was felt that smaller manufacturers should be part of the policy development, although Government should work closely with them to make sure that there is fairness in the system. It was proposed that any ZEV mandate created should encourage niche EV manufacturers to form and make sure that they are able to benefit fully by selling their excess credits.

*"[There are] many UK 'niche' manufacturers who have a legacy of using (relatively cheap & easy to adapt) OEM ICE powertrains, but lack skills and experience with ZEV/SZEC vehicles, and very limited staff & budgets to develop new products. Many need a period of sales stability to remain a viable business beyond 2030. Can a wider ZEV mandate facilitate the cascade of ZE technologies to small volume/niche manufacturers."*

Participants expressed interest in the above as a viable workaround as long as this was regulated and not left to large manufacturers to control. Another suggestion to work around small volume/niche manufacturers was to consider a lower % of EV vehicles within the mandate during the 2030-35 timeframe for manufacturers producing in very small (<1000 units) volumes.

It was highlighted that consideration should be given to towing needs, both commercial and leisure as electric vehicles to date are often not homologated for towing or towbar limits are far too low compared to ICE variants, whilst towing has significant impact on the overall range of an EV.

There was a representation for special consideration for specialist (utility) vehicles although it was noted that even heavy vehicles on fixed duty cycle applications (e.g. bin lorries) are now EV capable, with some views that there should be no exemptions at all for small manufacturers or niche vehicles.

*"The ZE mandate sets the conditions where no manufacturer should be producing ICE vehicles where there is no explicit need to do so. Allowing exemption will permit some high polluting, high price-point manufacturers to circumvent the ban on ICE sales by producing a custom vehicle; this is not in the spirit of the regulations."*

Conversely, some respondents felt that there is likely to be a need to incentivise technology development in niche applications which have high power requirements and large mass.

It was felt that exemptions may be inevitable (at least in medium term) for emergency, military and off-highway vehicles. It was recognised as important that manufacturers in these sectors are not penalised for supplying these vehicles, more that incentivisation and support in these

sectors would facilitate migration to ZE technologies. It was also highlighted that the UK has a valuable low-volume sector of specialist vehicles for leisure, utilities, etc. These largely niche, low volume producers were regarded as requiring longer transition times and that it is necessary to ensure that innovation can still occur in this sector with other low-carbon options.

However, there was a clear message that exemption should be afforded only if there is a very clear case that developing an interim version ahead of releasing a fully zero emission version would not be economic, and more time is needed to develop a fully zero emission version. It was felt that there is certainly an opportunity for further consultation with niche volume manufacturers to obtain their input on what they would see as viable.

The view was held that the case for small volume derogation and/or exemption is becoming weaker as the rate of technological progress increases and as meeting ICE emission regulations becomes more complicated, a shift to EV becomes the most viable route in niche lightweight vehicle (L-category) sectors.

## Credit Levels & Banking and Trading

Q15 – Should credits be awarded to vehicles that meet the SZEC definition?

Q16 – If so, should this be a fixed number of credits, or should there be a sliding scale that recognises the difference in CO2 efficiency of various SZEC-compliant vehicles?

Q17 – Should this be considered within the new framework?

Q18 – If so, over what timeframe should they remain usable and should credits and debits be treated the same or differently?

Q19 – Within the trading element of the new scheme, should there be limits on the number of certificates/grams of CO2 that can be bought or sold?

Q20 – Should such a market cover the whole of road transport or should there be some constraints imposed on trading across manufacturing sectors (e.g. cars and Heavy Duty Vehicles)?

Responses were dominated by a need to ensure that credits weren't simply a mechanism to allow wealthy/high price-point manufacturers to buy their way out of meeting strict emissions targets.

The possibility to “split the allocation” for a PHEV whereby the EV range generates a partial ZEV credit and the charge sustaining (ICE mode) CO2 contributes to fleet average, was discussed as having the potential to encourage increased EV capability and simultaneously discourage high CO2 ICE operation, this being a particular risk with PHEVs when using the “weighted” average figure only. It was suggested that all the data for such an approach is available via the existing test and certification process.

Participants emphasised the need to be careful about banking credits in most sectors to avoid “slip” of the target. However, in the case of HGVs, it was felt that it may be appropriate to bank against specific specialist applications. It was suggested that any such banking activity should include a mandate for zero carbon fuel use. Time bounding of credits was agreed as required to ensure that a long term slippage of the 100% zero emission time line does not occur.

The view was expressed that for HGVs, any ZEV mandate or sales target should be carefully assigned to individual vehicle subgroups, reflecting the maturity of the technology solutions present in each subsector.

## Level of Fines for Non-Compliance

### **Q21 – How, and at what level, should fines be set in the new UK regulatory framework and should this vary for different vehicle types?**

There were discussions around the setting and enforcement of fines for the OEM and/or the owner/user. Who will set and collect these fines and what might the detail look like was regarded as a point for further consultation. The contributions received made clear that fines will need to be effective and would likely need to be proportionate to vehicle price-points.

An alternative suggestion focused on setting a fixed figure for each credit missed and then multiplied by the manufacturer fleet size. It was felt important that the fine is considerably higher than the trading value in order to make sure manufacturers are incentivised to try to buy credits from those manufacturers that are exceeding their targets.

It was highlighted that small volume manufacturers are faced with scale challenges related to battery costs amongst other things. Buying cheaper, off the shelf batteries from another company may remove the USP of manufacturer's vehicle. Also, small volume manufacturers without parent companies were described as finding it much harder to dilute their CO2 emissions over a limited fleet size.

The general view expressed was that that fines should avoid becoming a mechanism for high price-point manufacturers and customers to avoid ZE capability.

## Real World Emissions

### **Q22: Would there be benefits in seeking to ensure any CO2 targets in the new UK regulatory framework take into account real-world emissions data alongside the lab-tested WLTP CO2 emissions figures? If so, how might the two be linked?**

Due to time constraints, the workshop discussions did not extend into this area.

However, an understanding of the relationship between test results and real world values and using that to inform the limits was proposed by some participants as a practical mechanism for alleviating issues attached to exemption.



## Extending the Framework to All vehicles

**Q23 – For vehicle sub-categories that are not yet covered by VECTO, how could a ZEV Mandate/sales target be extended before VECTO is adapted?**

**Q24 – Do you consider that there would be unintended consequences of establishing a ZEV Mandate for certain vehicle sub-categories before a CO<sub>2</sub>-based regulation?**

**Q25 – Do you have any views on imposing a CO<sub>2</sub> regulation on vehicle types that are not yet covered by a CO<sub>2</sub> test procedure, or existing regulation, particularly in light of the planned future phase out consultation for new non-zero emission buses?**

Once again, due to time constraints, the workshop discussions did not extend into this area in any great level of detail.

However, Zemo has extensive experience in developing standards for use in policy, including but not limited to zero emission buses and clean vehicle schemes. Zemo fully supports using the existing regulations and tests where they are available, but VECTO does not yet cover many applications and legislation tends to lag technology by some degree time wise. Zemo would therefore encourage the UK in adopting bespoke ZEV approaches for particular applications as an interim to regional or worldwide regulatory systems. The experience and success of both the bus and RCV (refuse collection vehicle) markets driven by Zemo and its partners, clearly demonstrates the benefit of a collaborative approach to such challenges and the ability of the UK to “lead the way”.

The benefit of ZEV testing is that there is no debate of the appropriate emission level against the target. However, a critical aspect currently missing from VECTO is the determination of range and energy consumption for ZEVs. This is crucial for market acceptance and Zemo would urge Government to ensure UK require within regulation, robust and repeatable range and energy data for every vehicle. In the case of buses, the UK already has a universally accepted process (driven by grant structures) which provides all the data required.

The process for updating VECTO to include new technologies in the current 9 subgroups has been very slow. Extending VECTO to reflect the full spectrum of technologies is key and extending VECTO to represent new vehicle segments probably requires considerable lead time. Zemo would encourage the DfT to engage with the VECTO process and to “have a voice at the table”. Zemo would be please to discussed this directly with the department.

For HGV, the inclusion of full battery electric and fuel cell vehicles in VECTO is required to ensure that efficiency is considered even when there is zero tailpipe CO<sub>2</sub>. At the moment, there is a very blurry view of what BEV and FCEV efficiency really might be in HGV applications and this information is key.

Finally, it is important although out of scope for this document, that further consultations take account of well to tank emissions, particularly for hydrogen. Mandating ZE tailpipe emissions should not result in higher well-to-wheel (WTW) emissions.

## **Q26 – Should the preferred regulatory approach be extended to all L-category vehicles or should the diversity of the sector (motorbikes, mopeds, motorised tricycles, quadbikes, motorised quadricycles etc) necessitate different approaches?**

This was strongly supported by at one workshop participant in particular, based on the view that the state of the art is at a stage where L1 and L3e-A1 vehicles are (with the grant) directly cost- and capability-competitive with IC engine equivalents. One leading business has seen a significant increase in the number of fleets taking on zero-emission vehicles for deliveries.

*“If they can cope with the huge demands placed on vehicles for fleet use, then there is a strong inference that EV L-Category Vehicles can cope with other use case scenarios (private and commercial use). The state of the art is advancing at a pace where there is likely to be little need for petrol to be part of the mix after 2030; indeed, it would make sense to eliminate ICE from the product mix on a gradual basis up to that date. E.g. from 2024, mandated phase out of petrol L1. EV currently represents 30%+ of the market in L1. From 2026, mandated phase out of L3e-A1. From 2028, mandated phase out of L3e-A2 and from 2030, mandated phase out of ICE L3. This can be expanded to allow other L-cat vehicles can follow a similar and consistent trajectory. The ZEV Mandate (i.e. option 2) could be crafted in this way to set the conditions for L-cat vehicles, on an accelerated basis. An incentivisation structure would further enhance this process. “*

There were significant discussion points raised during the workshop that was dominated by the view that the rate of progress in this sector largely meant that a ZEV mandate would most likely be met by a number of manufacturers in advance of 2030. Wider views also suggested that this is one of the easiest categories to electrify. However, it was noted that this sector is heavily populated by niche and small volume manufacturers for whom the cost of electrification may be prohibitive. It was felt such manufacturers are certainly unlikely to adopt complex PHEV technologies, so attention should be paid to helping and incentivising these manufacturers to migrate directly to EV technology in an affordable manner.

Discussions also took place around manufacturers of larger vehicles proposing to expand into the L-category sector as it may contribute to a lowering of fleet average GHG emissions.

## Additional Issues for Consideration

One mechanism raised by members was an ICE scrappage scheme. There is a further question as to whether this should operate across sectors in order to encourage the adoption of lower mass vehicles with higher payload efficiency and lower gross vehicle weights. In short, there should be no incentive to increase vehicle mass, particularly in order to facilitate derogation or exemption.

Incentives should be targeted at zero (tailpipe) emission vehicles only and options for derogation and exemption should be mitigated through credit trading 'scale or index' to stimulate investment for ZEV small volume manufacturers.

The scope for such incentives to be used, however, is likely to be quite limited as many are small volume and (although growing at pace) represent a small percentage of the vehicle market and indeed legacy vehicle parc. Ongoing engineering innovations in light-weighting of chassis and body materials are also very likely to assist in the general product mass reduction amplifying any weight penalties from ZE technology deployment (especially batteries).

Providing meaningful powertrain and payload efficiency improvement opportunities, particularly to the early-adopter community of ZE vehicles, would, Zemo believe, be a good way of supporting the business case and thus accelerating uptake.

Close attention should also be paid to wider, life-cycle impacts to ensure, for example, that renewable energy is widely used in vehicle and battery production, that precious metal and other resource impacts are managed sustainably and that end-of-life recycling and disposal options are in place.

Zemo members have suggested that there should be a linked piece of work to investigate lifetime expectations of EVs and batteries with this built into overall responsibilities throughout the regulatory framework future consultations. Provision of an additional regulatory framework should also extend to recycling and end-of-life.

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