

## OICA comments on EFV-08-04

### Parameter: Regulated Pollutants

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**Reference Document:**

EFV 07-03: Regulated Pollutants

The existing practices for approval of the vehicles include Type Approval (TA) and Conformity of Production (COP).

As per the suggestions received from the experts in the 7<sup>th</sup> IG EFV meeting, TA value demonstrates the capability of design. COP procedure demonstrates the fulfillment of production volumes to meet the limit values and in service conformity demonstrates the capability of maintaining the emission levels during normal usage. Therefore, at the first step of application of EFV concept, ~~COP cert.~~ values should only be considered. (COP value are too difficult to handle in reality ... time / variation etc.) The averaging of the values of the pollutants from the tested vehicle should be done and then average value is to be compared with the values in the table. E.g.: As per Bharat Stage-IV regulations in India, three vehicles should be tested for mass emissions. If three vehicles are tested as per COP procedure, the average of the corresponding pollutants from the three tests to be calculated, (such as Average CO, Average HC.... etc.), then that average is to be compared with the values in the table.

**This is very burdensome and would mean that an EFV rating would not be available immediately on Type Approval but only after mass production starts.. Given that emissions are only a part of the overall rating (1/4 or 1/3 depending if recyclability is in or out).**

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This assessment includes type of fuel, thereby the separate parameter type of fuel need not be considered. Here, the notion is not to just assess on meeting the current regulated norms, but additional marks are rewarded to the vehicle meeting the **future norms**. (Critical : What is the future norm ? – worldwide applicable benchmark ?? - Future norms in some part of the world would be old in others ...) The approach suggested is in-line with the current and future legislative norms. So the vehicle meeting the future norms will definitely be given extra marks.

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The Current European Test procedure should be followed for testing the Vehicles along with the New European Driving Cycle or the World Harmonized Driving Cycle and the Test procedure for the evaluation of passenger vehicle under WLTP can lead to common methodology for the measurement of Regulated Pollutants.

Maximum score for Petrol, Diesel, CNG, and LPG vehicle is 100. However for all categories of **Hydrogen and Electric vehicles, 100% score is given**. (Very shallow/not acceptable = Giving adv. to H2 and electr.veh-s. The opposite of 'techn. neutrality') Hydrogen being the ideal fuel for vehicles with nearly zero emission. Electric vehicles are also rewarded with 100 marks irrespective of vehicle category because of its zero emissions from Tank to Wheel.

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Only Tank to Wheel (TTW) emissions are considered for the regulated pollutants **because the emission of pollutants during the vehicle manufacturing is very much less (but this does not mean, the energy chain to provide the fuel can be ignored = extremely argueable w. regard to nuc. power )** as compared to emissions emitted by vehicle during its use throughout the **life**. It is applicable to Hydrogen and electric vehicles, thereby comparing them with Gasoline and Diesel vehicles on the same platform neglecting Well to Tank (WTT) CO, HC, Nox emissions. **Otherwise, the regional differentiation for producing the vehicles, producing electricity and production of gasoline/diesel/hydrogen are so high (exactly therefore (it is highly complex) it can not be accepted, that elec-vehicles e.g. are given such an advanatge ... = score 100 straight away.)** that the concrete base for the comparison of different vehicles could not be framed. **The same criteria apply to all vehicles (no discrimination of fuel type or vehicle size to stay technology neutral). The specific fuel needs are already considered**

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Comment [WPS1]: This applies also to CO2

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The vehicle scoring 100 marks will be straightway called as Low Pollution vehicles. This is challenging for the passenger vehicle manufacturers to proceed towards achieving the future norms.

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Sr. No.	Vehicle Type	Emission standard For CO, HC, NOx, PM, PN						Emission standard For CO, HC, NOx, PM, PN
		SI Engine: Idling CO+ Evaporative Emissions CI Engine: Full load + Free Acceleration Smoke						
	Sr. No.	Fuel Type	Emission level before	Emission level before	current Emission level	Latest Emission level		
1							100	
2							100	
3	1	Electric / Hydrogen					100	
4	2	Petrol / Blends of Petrol, LPG, CNG	z	y	x		100	
5	3	Diesel / Biodiesel/Blends	z	y	x		100	
6		/Biodiesel/Blends	1305 < RM ≤ 1760	15	35	55	85	
7		Petrol / Blends of Petrol, LPG, CNG	RM > 1760	10	30	45	70	
8		Diesel / Biodiesel/Blends	RM > 1760	10	30	45	70	

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In the 7<sup>th</sup> Informal Group meeting, few experts suggested that the vehicle with the fitment of advanced emission control devices should be rewarded with High Scores. Though, this is very difficult to achieve, it totally depends upon the manufacturer to use the After Treatment Devices or not, because it will surely increase the cost of vehicle. Also the disposal of these (all ??) devices is very critical (= sweeping statement !!) which will again add up in the cost of vehicle. Hence, it will not be appropriate to give the additional marks to the vehicle fitted with emission control devices (= totally inconsequent !!).

Deleted: It is secondary to motivate them to use the 'After treatment devices' as the reductions in the pollutants can occur by mere optimization of the fuel injection system, ECU, combustion process, downsizing.

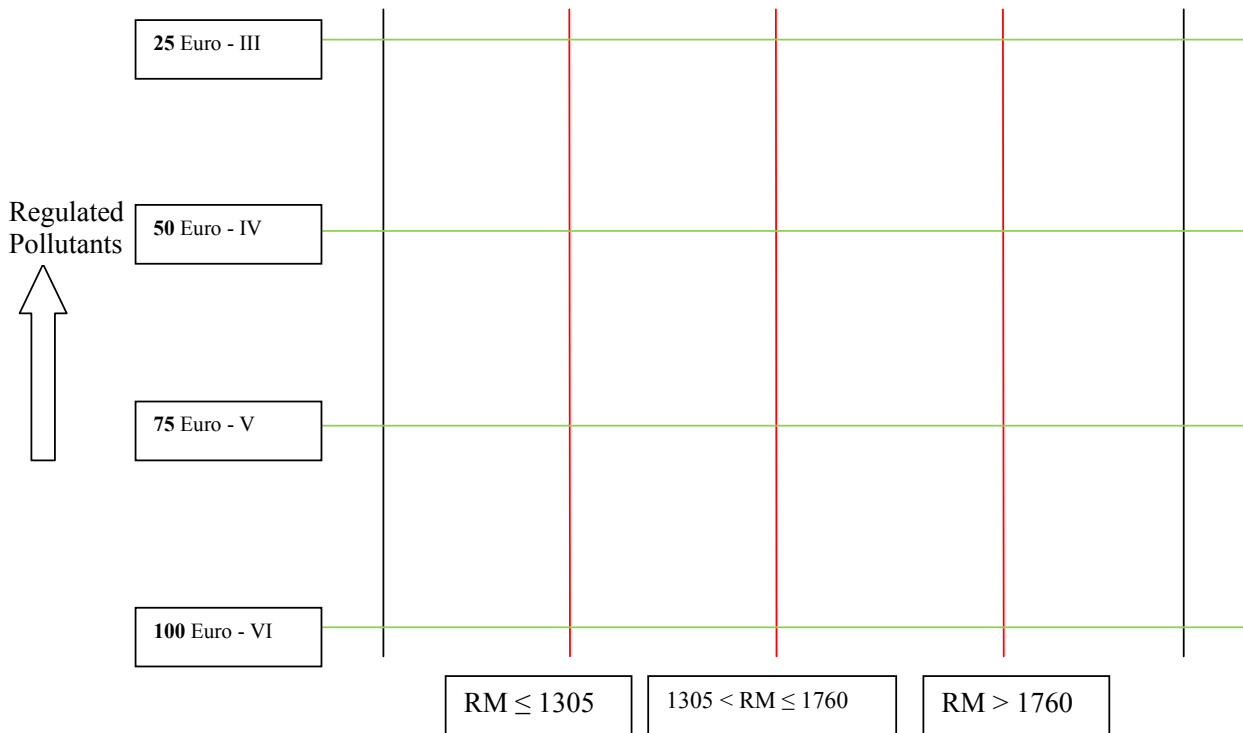
Comment [WPS2]: The assessment of what is 50% is dependent on the region.

Deleted: From the above tables, it is clear that the Passenger cars following the lower norms are scoring fewer marks. While the vehicles following present norms are scoring nearby 50 % marks. This shows that the current norms and future norms are consolidated to define the rating criteria. The best vehicle in the world Toyota Prius has got the score of 55 for regulated pollutants. The Present and future technology will be lying from the mid to the top ratings, while the older technology has been automatically shifted to lower ratings.

**Other Approach:**

This approach is purely based on the regulatory norms. The existing regulations as well as future regulations are consolidated to formulate the approach. The European regulatory norm Euro – III for passenger car is taken as a base line (Critical, because the value of Euro 3 differs from region to region ...). Below this norm, no or zero score will be given to the vehicle. The Euro – VI has given the full 100 score. (WHAT is the procedure, when Euro 7 comes along ? – Transient, planned ?)

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The passenger car, irrespective of its reference mass and operating fuel has been weighted by the chart shown above. The passenger car complying Euro – VI norms will be rated as 100, Euro – V as 75, Euro – IV as 50% and Euro – III as 25 %. Below this norm, the weightage will be zero. From the above two approaches, the best suitable approach can be finalized and developed as a self-explanatory document.

The approaches stated above are technology neutral (NO !! The first one is certainly highly bias !!) as the rating is totally based on the emission norms the vehicle is following. Present as well as future regulations are incorporated so as to make the rating not the complex one. The testing procedure as per the World Harmonized Test Cycles WLTP can be adopted for this evaluation which is based on common fuel quality.

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<b>5</b>	<b>Diesel /Biodiesel/Blends</b>	<b>15</b>	<b>35</b>	<b>55</b>	<b>85</b>
<b>6</b>	<b>Petrol / Blends of Petrol, LPG, CNG</b>	<b>10</b>	<b>30</b>	<b>45</b>	<b>70</b>
<b>7</b>	<b>Diesel /Biodiesel/Blends</b>	<b>10</b>	<b>30</b>	<b>45</b>	<b>70</b>