

The reason why Japanese proposal Stage3 has []

JASIC

3rd~5th September 2012
56th GRB meeting
Geneva

Reason of Japan proposal have []

Informal document GRB-56-21
 (56th GRB, 3-5 September 2012,
 agenda item 3(b))
 Unit: dB(A)

		Stage 1	Stage 2		Stage 3 ³	
		2 years after entry into force of ECE R51.03	4 years after stage 1	6 years after stage 1	[4] years after stage 2	[6] years after stage 2
M1	PMR ≤ 120 kW/t	72	70	-	[68]	-
	120 < PMR ≤ 160 kW/t	73	-	71	[70]	-
	PMR > 160 kW/t	75	73	-	[72]	-
M2	GVW ≤ 2.5 ton	72	70	-	[69]	-
	2.5 ton < GVW ≤ 3.5 ton	74	72	-	[71]	-
	3.5 ton < GVW	75	-	73	-	[71]
M3	P ≤ 135 kW	76	-	74	-	[73]
	135 < P ≤ 250 kW	79	-	78	-	[76]
	P > 250 kW	80	-	78	-	[76]
N1	GVW ≤ 2.5 ton and PMR(GVW) ¹ ≤ 35kW/t	74	-	72	-	[70]
	GVW ≤ 2.5 ton and 35kW/t < PMR(GVW) ¹	72	70	-	[68]	-
	2.5 ton < GVW ≤ 3.5 ton	74	72	-	[71]	-
N2	P ≤ 135 kW	77	-	76	-	[73]
	P > 135 kW	78	-	77	-	[75]
N3	P ≤ 250 kW	80	-	78	-	[76]
	P > 250 kW	82	-	80 ²	-	[78]

1 "PMR(GVW)" means PMR calculated by using the maximum authorized vehicle mass.

2 Entry-into-force date of N3 with an engine power exceeding 250 kW for stage 2 is 8 years after stage 1.

3 Limit values and entry-into-force dates of "Stage 3" shall be reviewed and fixed until the entry-into-force date of "Stage 2".

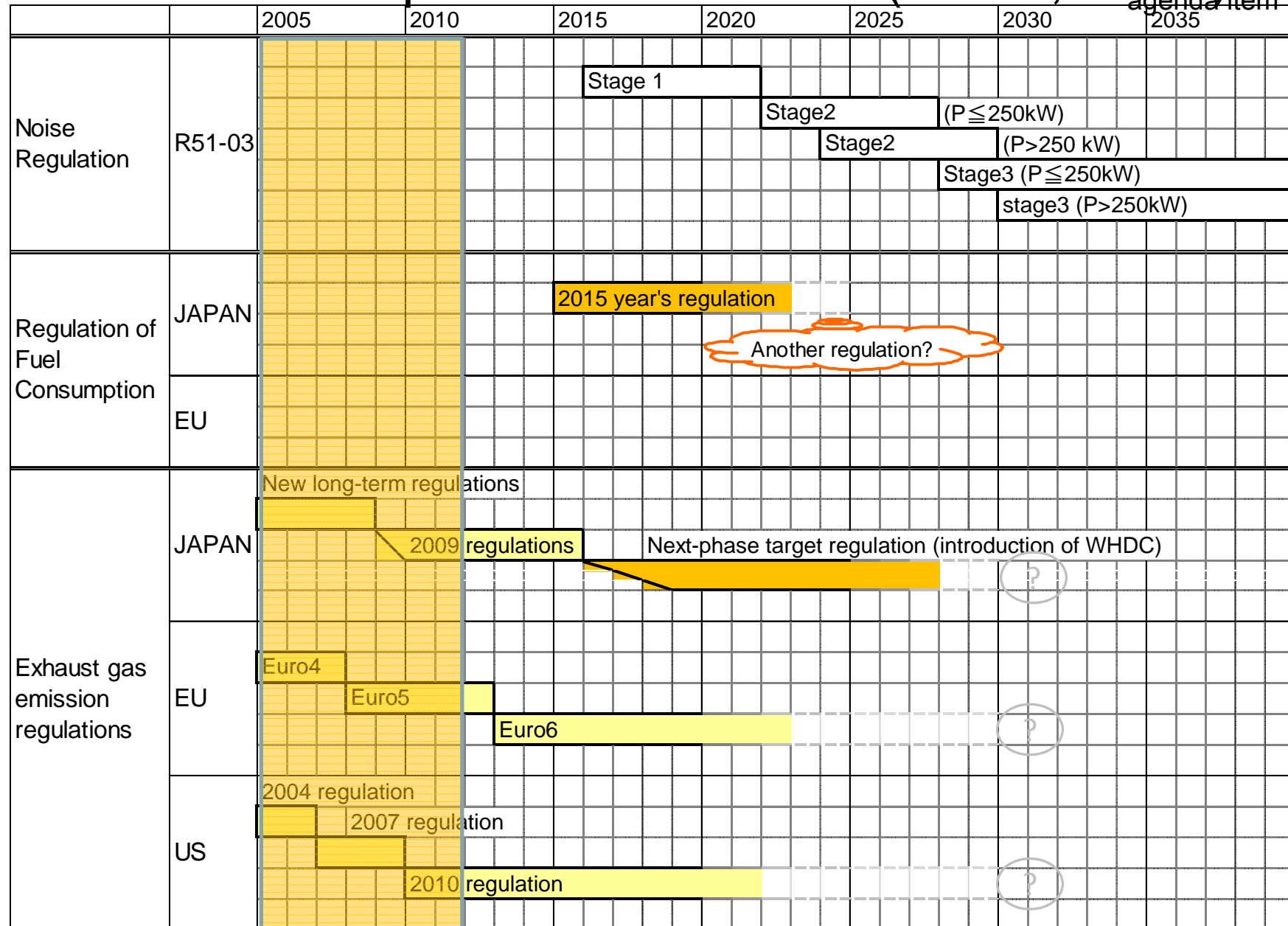
History and schedule of regulations on Noise, Fuel consumption and Emission (M1, N1)

Informal document GRB-56-21
 56th GRB, 3-5 September 2012,
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		2005	2010	2015	2020	2025	2030	2035			
Noise Regulation	R51-03				Stage 1						
						Stage2	(M1:except 120 < PMR <160 kW/t, N1:except GWW<2.5ton and PMR<35kw/t)				
							Stage2	(M1:120 < PMR <160 kW/t, N1:GWW<2.5ton and PMR<35kw/t)			
								Stage3	(M1:all, N1:except GWW<2.5ton and stage3 (N1:GWW<2.5ton and PMR<35kw/t)		
Regulation of Fuel Consumption	JAPAN	2010 year's regulation			2015 year's regulation	2020 year's regulation					
	EU	CO2 130g/km regulation			CO2 95g/km regulation		?				
Exhaust gas emission regulations	JAPAN	New long-term regulation			2009 regulation						
	EU	Euro4	Euro5	Euro6			?				
	US	2004 regulation	2007 regulation	2010 regulation			?				

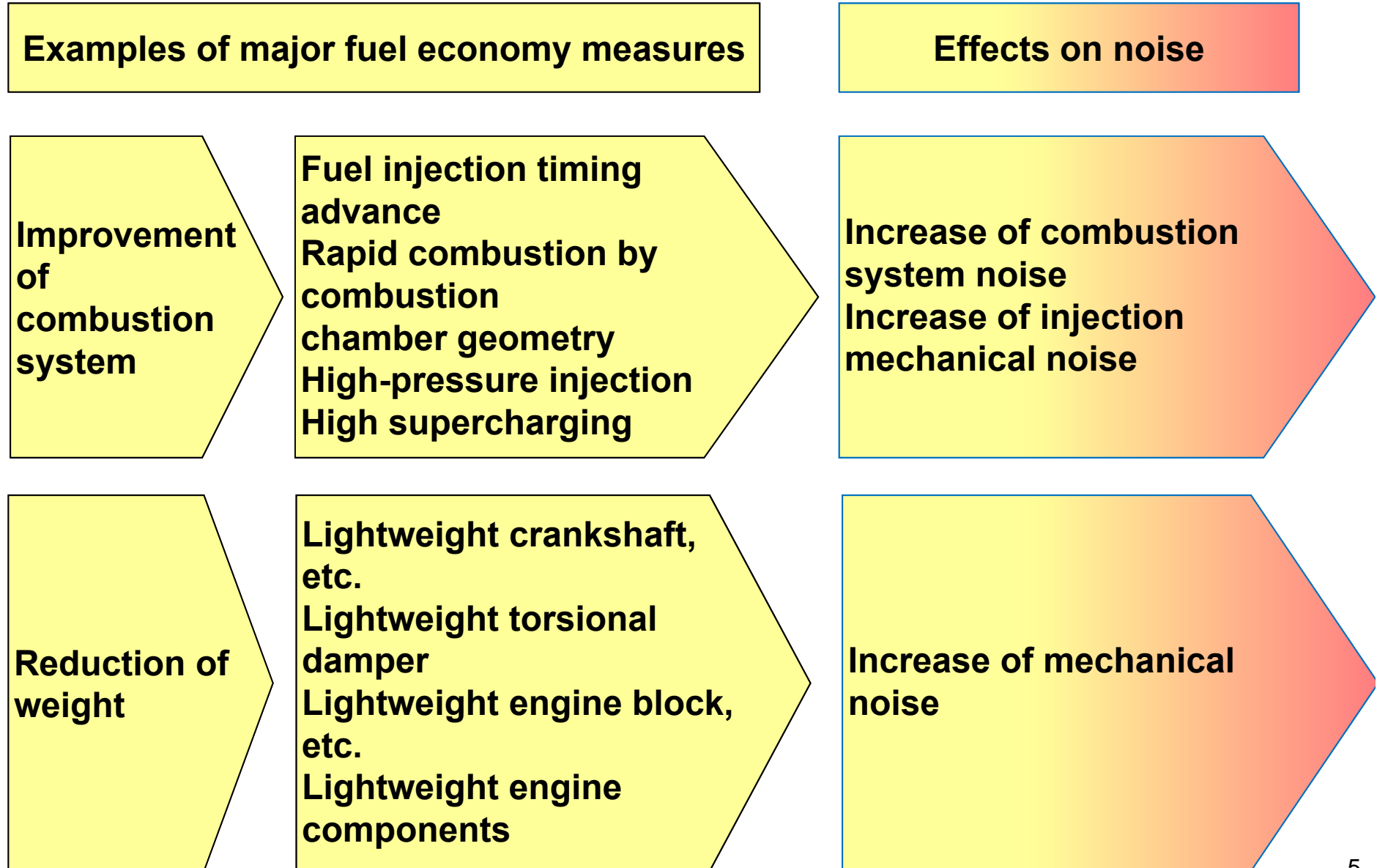
History and projection of regulations on Noise, Fuel consumption and Emission (M2N2, M3N3)

Informal document GRB-56-21
 56th GRB 315 September 2012,
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Effects of Major Fuel Economy Measures on Noise

Internal Document GRB-56-21
(56th GRB, 3-5 September 2012,
agenda item 3(b))



Major measures against engine noise

Informal document GRB-56-21
 (56th GRB, 3-5 September 2012,
 agenda item 3(b))

: Weight increase

: Proper control in conflict with fuel economy

Head cover floating

Electronically controlled high-pressure common rail + pilot injection control system

Highly rigid cylinder block

Electronically controlled variable nozzle turbocharger + intercooler

Head cover

Block side cover

Head rear cover



Measure against standing wave at crank pulley cover

Measure against standing wave under common rail

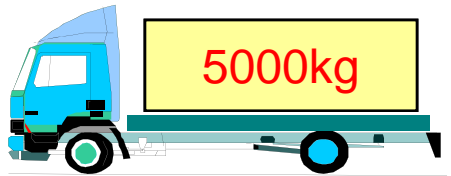
Vibration damping steel sheet oil pan

Timing gear specs optimization

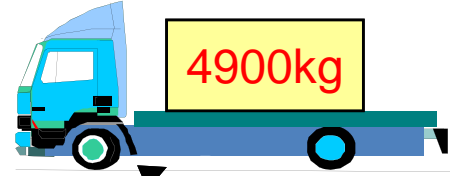
Oil pan cover

Measure against standing wave at back of ECU

Narrower gear backlash



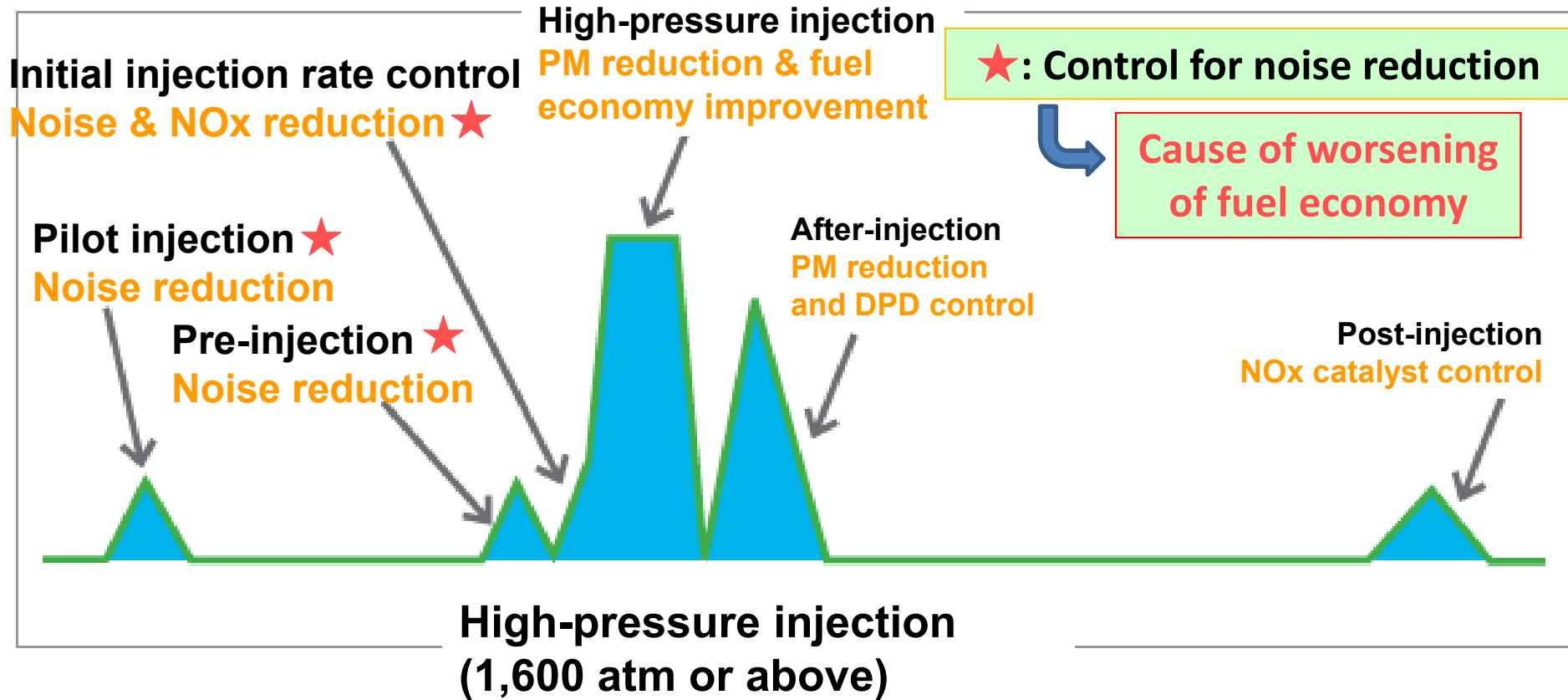
The more vehicle weight, the less payload. (No efficiency)



Increase 100kg by noise measurement

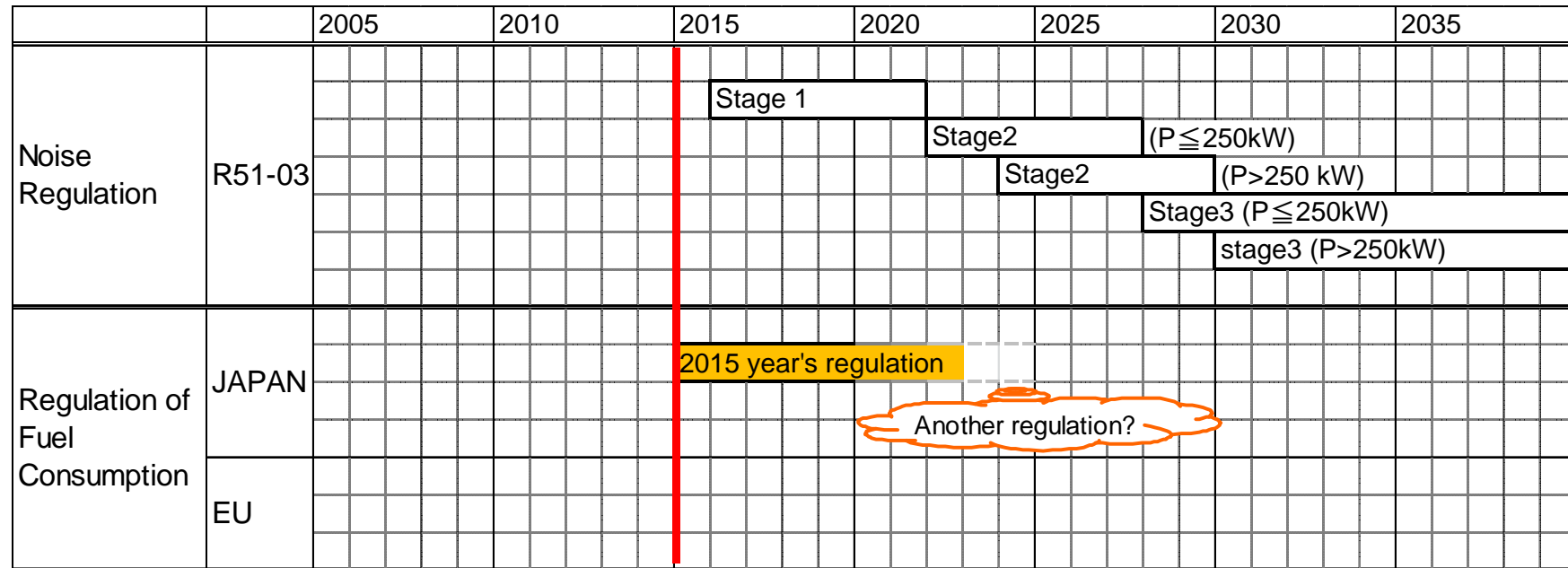
Measure against noise by injection control

Informal document GRB-56-21
(56th GRB, 3-5 September 2012,
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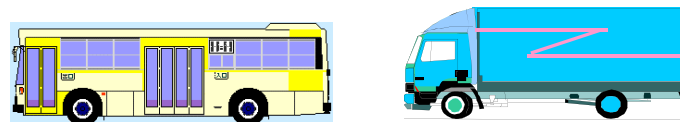


History and projection of regulations on Noise, Fuel consumption and Emission (M2N2, M3N3)

Informal document GRB-56-21
 56th GRB 35 September 2012,
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 Time by which all vehicles must be in compliance



All vehicles of HDV meet the FE regulation

History and projection of regulations on Noise, Fuel consumption and Emission GRB 56-21

*M1, N1

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		2005	2010	2015	2020	2025	2030	2035	
Noise Regulation	R51-03				Stage 1				
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					Stage 2	(M1:120 < PMR <160 kW/t, N1:GWW<2.5ton and PMR<35kw/t)			
					Stage 3	(M1:all, N1:except GWW<2.5ton and stage3 (N1:GWW<2.5ton and PMR<35kw/t)			
Regulation of Fuel Consumption	JAPAN	2010 year's regulation			2015 regulation	2020 year's regulation			
	EU	CO2 130g/km			CO2 95g/km regulation	?			

Timing of consideration to limit values of Stage 3

*M2N2, M3N3

		2005	2010	2015	2020	2025	2030	2035
Noise Regulation	R51-03				Stage 1			
					Stage 2	(P ≤ 250kW)		
					Stage 2	(P > 250 kW)		
					Stage 3	(P ≤ 250kW)		
					stage3 (P > 250kW)			
Regulation of Fuel	JAPAN				2015 regulation	Another regulation?		

Conclusion

Informal document GRB-56-21
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- In general, there is a contradiction between measures to reduce automotive noise and technical measures to meet the fuel consumption/CO₂ regulations.
- It is necessary to take into consideration trends and technologies related to other regulations in discussing noise limit values and when to introduce such limit values.
- The limit values for Stage 3, which will come into force in no less than 10 years, need to be based on the capability of Stage 1-compliant vehicles as well as on the contents of the future fuel regulation to be developed from now on, and should be discussed so that they can be defined at the time of introduction of Stage 2 when the contents of the fuel consumption/CO₂ regulation are predicted to be finalized.