

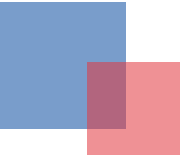
Regional Meeting on Strengthening the capacity of ESCAP member States to harmonize standards on **weights, dimensions and emissions** of road vehicles for facilitation of transport along the Asian Highway network



Recommendations on harmonized Emissions standards for road freight vehicles

September 19, 2019

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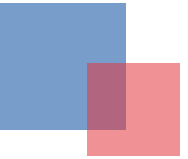


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1. INTRODUCTION

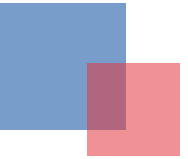


□ Background

- Carbon dioxide (CO₂) emissions in road freight transport sector
 - 75% of the entire field of transportation
 - CO₂ emissions in the Asia-Pacific region account for 23 per cent of the global emission
- Necessity of harmonized standards on emissions of freight vehicles
 - Significant differences in the level of emission standards of member countries
 - can be used as a reason to deny access of foreign vehicles to national roads
 - Need to reduce GHGs emissions by gradual strengthening exhaust gas regulations

□ Objective

- developing and recommending regional standards on emissions of freight vehicles so as to achieve inter- and intra-regional transport operational connectivity



□ Approach for determining recommendations

- more than simply considering economic impacts and efficiency
 - pursuing a clear and declarative goal justified in terms of protecting the environment in a global crisis
- Recommendations will not be semi-permanent but must be gradually strengthened in steps
- Target vehicle type: heavy-duty diesel vehicle

□ Advantages of using Euro standard

- The most well-known emissions standard and used by many countries and manufacturers
- Each version (Euro I, II...VI) serves as milestones for GHGs reduction → a practical and explicit standard
- No need to make additional efforts in developing a new regional standard
- The future AH standards can be updated according to the existing higher Euro standard versions

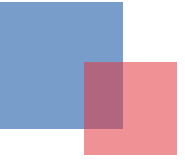
2. RECOMMENDED STANDARDS

Review on existing standards



Country	Reference	Equivalent to Euro standards
Afghanistan	Euro III	Euro III
Armenia	EAEU Technical Regulations TP TC 018/2011(referring to United Nations Regulations No.49(revision 5))	Euro V
Azerbaijan	Euro IV	Euro IV
Bangladesh	Euro I & United Nations Regulations No.49. (revision2)	Euro II
Bhutan	National	incompatible to Euro standard series
Cambodia	National	incompatible to Euro standard series
China	China V	Euro V
Democratic People's Republic of Korea	..	N/A
Georgia	Euro VI	Euro VI
India	Bharat Stage-IV(Based on Euro IV)	Euro IV
Indonesia	National, Euro IV, United Nations Regulations No.49 (revision 3)	Euro IV
Islamic Republic of Iran	Euro IV	Euro IV
Japan	National	Euro VI
Kazakhstan	EAEU Technical Regulations TP TC 018/2011(referring to United Nations Regulations No.49(revision 5))	Euro V
Kyrgyzstan	EAEU Technical Regulations TP TC 018/2011(referring to United Nations Regulations No.49(revision 5))	Euro V
Lao People's Democratic Republic	National	incompatible to Euro standard series
Malaysia	Euro I, II	Euro II
Mongolia	-	N/A
Myanmar	AFAGIT Protocol 4	incompatible to Euro standard series
Nepal	Euro III	Euro III
Pakistan	PAK-II(Euro II, United Nations Regulations No. 49)	Euro II
Philippines	Euro II	Euro II
Republic of Korea	National and Euro VI	Euro VI
Russian Federation	EAEU Technical Regulations TP TC 018/2011(referring to United Nations Regulations No.49(revision 5))	Euro VI
Singapore	Euro IV, V, VI	Euro VI
Sri Lanka	National	incompatible to Euro standard series
Tajikistan	Euro 3	Euro 3 (light-duty vehicle)
Thailand	United Nations Regulations No.49(revision 5); Euro III	Euro III
Turkey	Euro VI	Euro VI
Turkmenistan	-	N/A
Uzbekistan	United Nations Regulations No, 49	Euro V
Viet Nam	Euro IV	Euro IV

Review on existing standards



□ conformance with Euro standards of Member States

- Euro II : Bangladesh, Malaysia, Pakistan, Philippines (4)
- Euro III : Afghanistan, Nepal, Thailand (3)
- Euro IV : Azerbaijan, India, Indonesia, Islamic Republic of Iran, Viet Nam (5)
- Euro V, VI : Armenia, China, Georgia, Japan, Kazakhstan, Kyrgyzstan, Republic of Korea, Russian Federation, Singapore, Turkey, Uzbekistan (11)
- National standard: Bhutan, Cambodia, Lao People's Democratic Republic, Mongolia, Myanmar, Sri Lanka (6)
- Euro standard on light-duty vehicle only: Tajikistan (1)
- Not Available: Democratic People's Republic of Korea, and Turkmenistan (2)

Review on existing standards



□ Emission Standards in 6 Countries with Highest Road Freight Volume

- Japan uses its own standard which is equivalent to Euro VI but has a much higher standard on CO than Euro VI.
- These countries started using either Euro or a standard equivalent to ECE Regulation No. 49 since 2000s, have been gradually raising their standards, and are now using standards higher than Euro IV.

[Emission Standards in 6 Countries with Highest Road Freight Volume]

Country	Year	Test	CO	HC	NOx	PM	PN	Reference
			g/kwh					
Republic of Korea	2014	WHSC	1.5	0.13	0.40	0.01	8.0x10 ¹¹	Euro VI
		WHTC	4.0	0.16	0.46	0.01	6.0x10 ¹¹	
Japan	2016	WHTC	2.22	0.17 ¹⁾	0.4	0.01	..	National
China	2017	ESC & ELR	1.5	0.46	2.0	0.02	..	China V
		ETC	4.0	0.55	2.0	0.03	..	
India	2010	ESC	1.5	0.46	3.5	0.02	..	BS IV
		ETC	4.0	0.55	3.5	0.03	..	
Turkey	2015	WHSC	1.5	0.13	0.40	0.01	8.0x10 ¹¹	Euro VI
Russia	2018	ESC & ELR	1.5	0.46	2.0	0.02	..	Euro V

Source: DieselNet<<https://www.dieselnet.com/standards/#asia>>[accessed 4 September 2018]

Notes 1) non-methane hydrocarbons

Review on existing standards



□ EU Emission Standards for Heavy-Duty Diesel Engines

- The CO standard remains the same from Euro IV to Euro VI while HC, NOx, and PM standards are continuously increasing.
- The HC and NOx standards are significantly fortified when upgrading from Euro V to Euro VI.

[EU Emission Standards for Heavy-Duty Diesel Engines: Steady-State Testing]

Stage	Date	Test	CO	HC	NOx	PM	PN	Smoke	
			g/kWh					1/kWh	1/m
Euro I	1992, ≤ 85 kW	ECE R-49	4.5	1.1	8.0	0.612			
	1992, > 85 kW		4.5	1.1	8.0	0.36			
Euro II	1996.10		4.0	1.1	7.0	0.25			
	1998.10		4.0	1.1	7.0	0.15			
Euro III	1999.10 EEV only	ESC & ELR	1.5	0.25	2.0	0.02		0.15	
	2000.10		2.1	0.66	5.0	0.10 ¹⁾		0.8	
Euro IV	2005.10		1.5	0.46	3.5	0.02		0.5	
Euro V	2008.10		1.5	0.46	2.0	0.02		0.5	
Euro VI	2013.01		WHSC	1.5	0.13	0.40	0.01	8.0x10 ¹¹	

Source: DieselNet<<https://www.dieselnet.com/standards/#asia>>[accessed 4 September 2018]

Notes 1) PM=10.13 g/kWh for engines < 0.75 dm³ swept volume per cylinder and a rated power speed > 3,000 min⁻¹



□ Recommended standards on emissions of a freight road vehicle

- 16 out of 32 countries including six countries with highest road freight volume use higher standards than Euro IV.
- Countries with standards lower than Euro III most likely have plans to upgrade their standards.
- Thus, **Euro IV** is recommended for the AH standards on emissions to lead the gradual upgrade to Euro V and Euro VI in the future.
- For the countries with standards lower than Euro III, action plans should be established.
 - Grace period may be given or higher standards may be implemented on new vehicle productions or new imports and gradually increased to greater number of vehicles.
 - Adjacent countries with different levels of standard will need to develop detailed procedures through cooperation.
 - Also, based on in-depth discussions and mutual understanding, ESCAP and AH member countries will need efforts to continuously upgrade the emission standards in the future.

THANK YOU

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