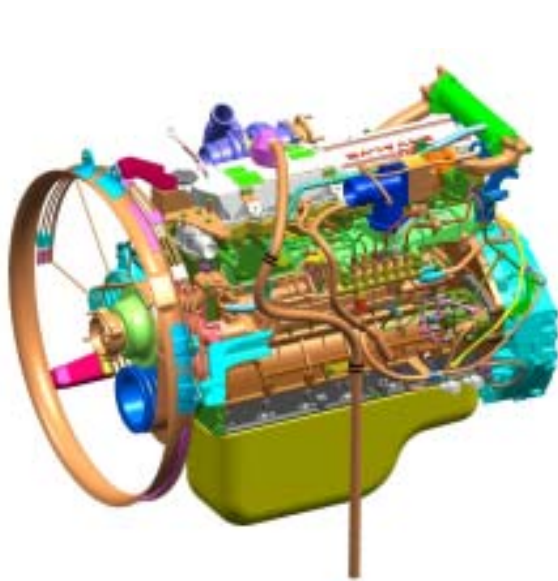


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# ISUZU INDUSTRIAL DIESEL ENGINE 4JJ1X/4 · 6HK1X/6WG1X Tier3



ISUZU MOTORS LIMITED  
Off-highway Powertrain Operation Dept. Planning  
& Service Group



HITACHI CONSTRUCTION MACHINERY CO.,Ltd  
Technical Training Center  
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## **Tier-3 Engine major specification and Maintenance point**

### **1.High pressure fuel injection control by common rail system.**

**Prohibit teardown and re-adjustment of injector.**

**Prohibit re-use of injector pipe and high pressure fuel pipe.**

**Must be keep ISUZU fuel requirement.**

**Keep observe strictly the maintenance schedule.**

### **2.Electronic control module.**

**notice : A battery cable must be disconnect at the time of welding work for ECM protection.**

### **3.Cooled EGR**

**Must be keep ISUZU fuel requirement.**

**Must be keep ISUZU Engine oil requirement and maintenance.**

**Observe engine strictly of Maintenance.**

# Off-Road Future Emission Regulation

**Off-Road Future Emission Regulation**

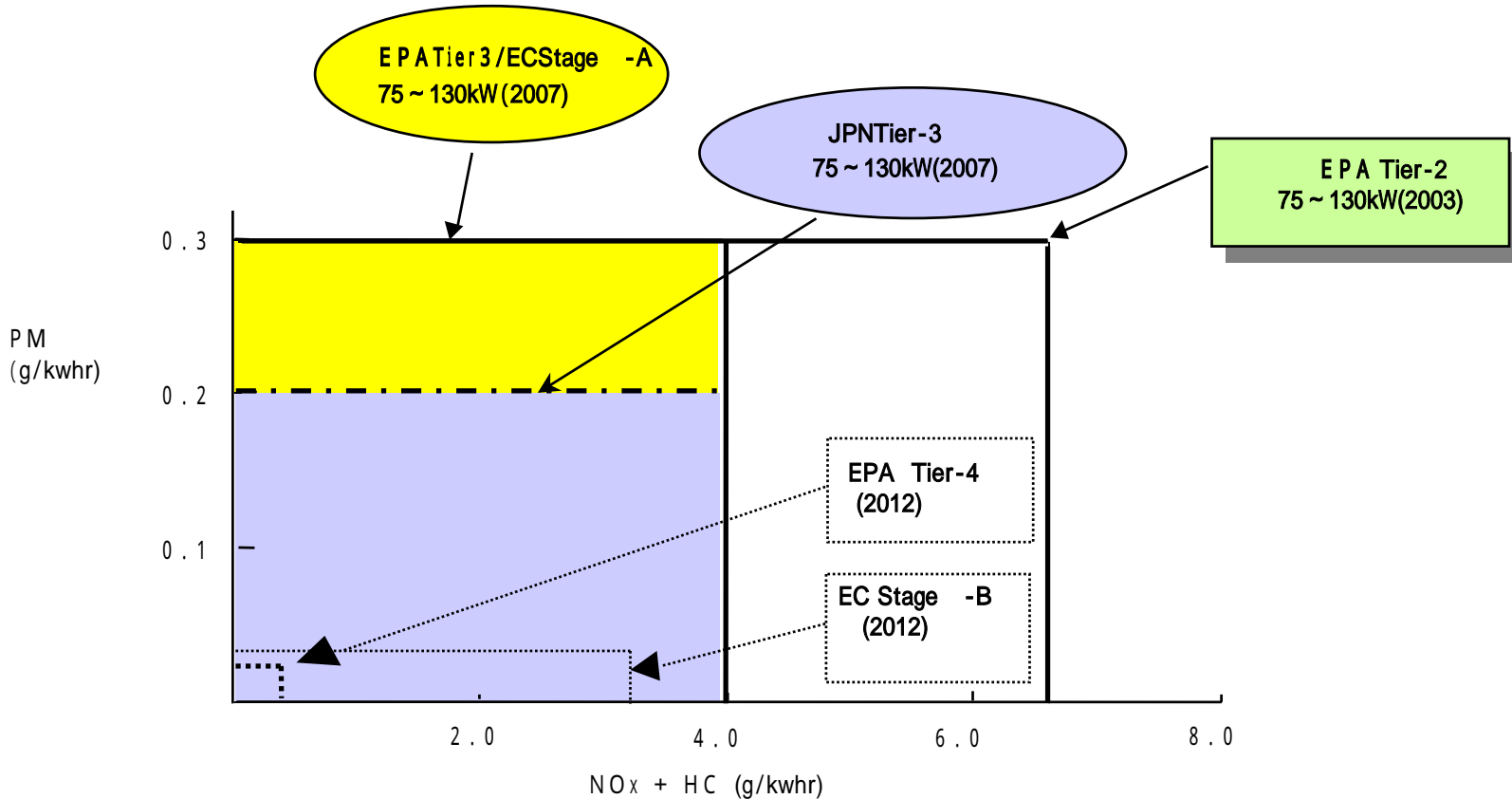
	CLASS	ENGINE	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
EPA	450 - 560 kW (600 - 750hp)	-		Tier2	NOx+HC 6.4 CO 3.5 PM 0.2			Tier3	NOx+HC 4.0 CO 3.5 PM 0.2				Merim Tier4					
	225 - 450 kW (300 - 600hp)	6W,6S	Tier2					Tier3							Merim Tier4	Nox+NMHC 4.0 CO 3.5 PM 0.03		
	130 - 225 kW (175 - 300hp)	6H			Tier2	NOx+HC 6.6 CO 3.5 / PM 0.2		Tier3					Merim Tier4					
	75 - 130 kW (100 - 175hp)	4H			Tier2	NOx+HC 6.6 CO 5.0 / PM 0.3			Tier3	NOx+HC 4.0 CO 5.0 / PM 0.3				interim Tier4	Nox+NM HC 4.0 CO 5.0 / PM 0.03			
	37 - 75 kW (50 - 100hp)	4J,4LE				Tier2	NOx+HC 7.5 CO 5.0 / PM 0.4			Tier3	NOx+HC 4.7 CO 5.0 / PM 0.4			56kw		interim Tier4	NOx + HC 4.7 CO 5.0 / PM 0.03	
EC	130 - 560 kW	6W,6S,6H		Stage2	NOx 6.0 / HC 1.0 CO 3.5 / PM 0.2			Stage3-A	NOx+HC 4.0 CO 3.5 / PM 0.2				Stage3-B	NOx+HC 4.0 CO 3.5 / PM 0.025				
	75 - 130 kW	4H			Stage2	NOx 6.0 / HC 1.0 CO 5.0 / PM 0.3			Stage3-A	NOx+HC 4.0 CO 5.0 / PM 0.3			Stage3-B	NOx+HC 4.0 CO 5.0 / PM 0.025				
	37 - 75 kW	4J,4LE				Stage2	NOx 7.0 / HC 1.3 CO 5.0 / PM 0.4			Stage3-A	NOx+HC 4.7 CO 5.0 / PM 0.4			Stage3-B	neary same as EPA			
	19 - 37 kW	L		Stage2	NOx 8.0 / HC 1.5 CO 5.5 / PM 0.8				Stage3-A	NOx+HC 7.5 CO 5.5 / PM 0.6				No proposal as Stage3-B				
JPN	130 - 560 kW	6W,6S,6H			NOx 6.0 / HC 1.0 CO 3.5 / PM 0.2	Tier-2		Tier-3	NOx 3.6 / HC 0.4 CO 3.5 / PM 0.17				Tier-4 After treatment (DPF) basis					
	75 - 130 kW	4H			NOx 6.0 / HC 1.0 CO 5.0 / PM 0.3	Tier-2		Tier-3	NOx 3.6 / HC 0.4 CO 5.0 / PM 0.2									
	56 - 75 kW	4J							Tier-3	NOx 4.0 / HC 0.7 CO 5.0 / PM 0.25								
	37 - 56 kW	4LE			NOx 7.0 / HC 1.3 CO 5.0 / PM 0.4	Tier-2			Tier-3	NOx 4.0 / HC 0.7 CO 5.0 / PM 0.3								
	19 - 37 kW	L			NOx 8.0 / HC 1.5 CO 5.5 / PM 0.8	Tier-2			Tier-3	Nox 6.0 / HC 1.0 CO 5.0 / PM 0.4								

**LOW NOISE REQUIREMENT of EC STAGE-III**

From 2006, EC stage-III request new noise level regulation to Construction equipment.

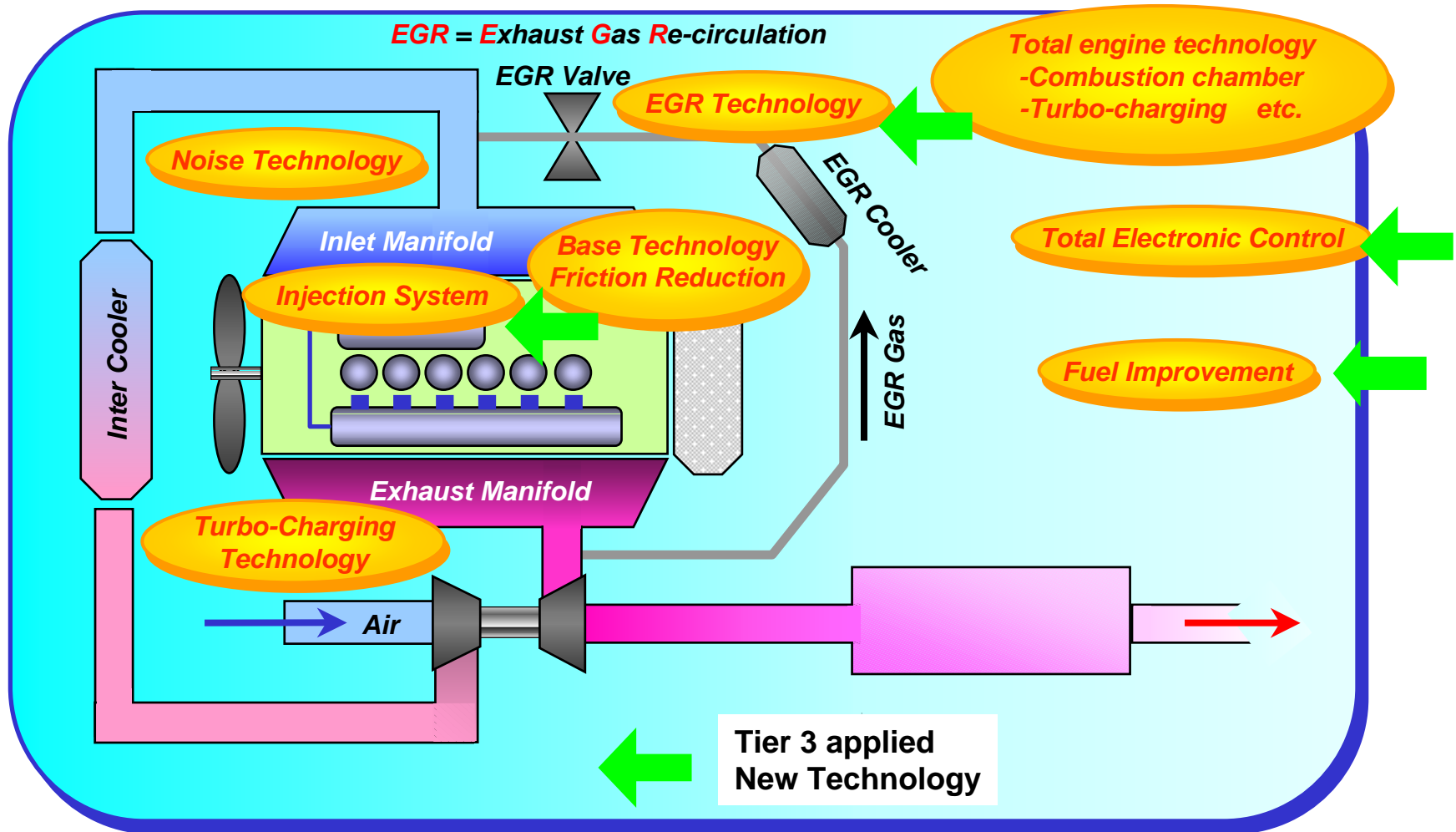
And Isuzu is developing next stage engines include lower noise level for customer's application.

# Tier3 Emission Regulation (75 ~ 130kW)

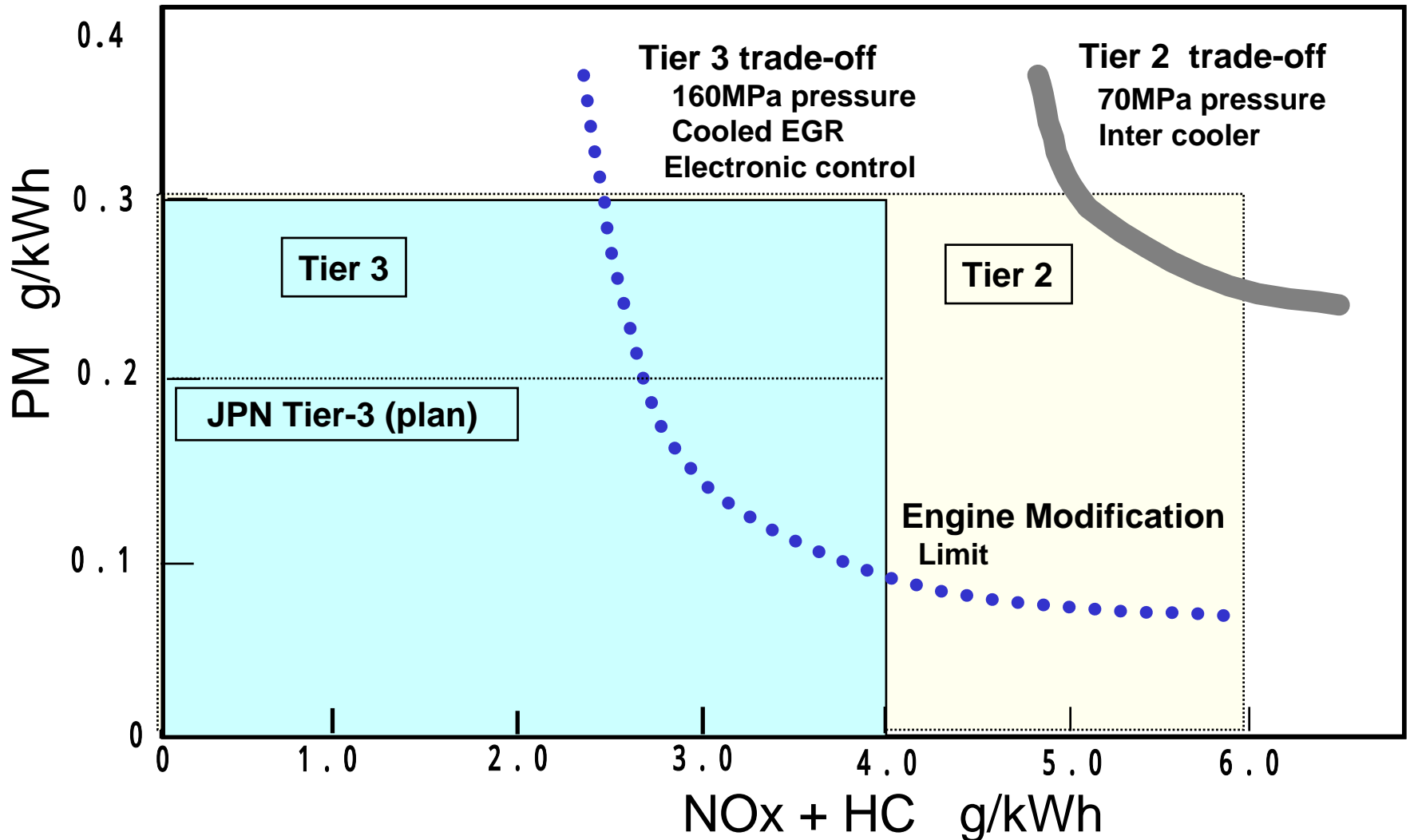


**NOx + HC: 40% reduction, PM: Same with Tier-2 from Y2006  
 JPN Government Proposal: PM 30% lower than EPA, EC T-3**

## Key Technologies of Diesel Engine



# Applied Technologies and Emission Level(75 ~ 130kW)



## Engine Model for Zaxis-1 and Zaxis-3

### ZX120 ~ ZX180

ZX-1 4BG1TC (Mechanical Controlled)

ZX-3 4JJ1X (Electronic Controlled, Common Rail, EGR)

### ZX200 ~ ZX270

ZX-1 6BG1TC (Mechanical Controlled)

ZX-3 4HK1X (Electronic Controlled, Common Rail, EGR)

### ZX330, ZX350

ZX-1 6HK1TC (Mechanical Controlled)

ZX-3 6HK1X (Electronic Controlled, Common Rail, EGR)

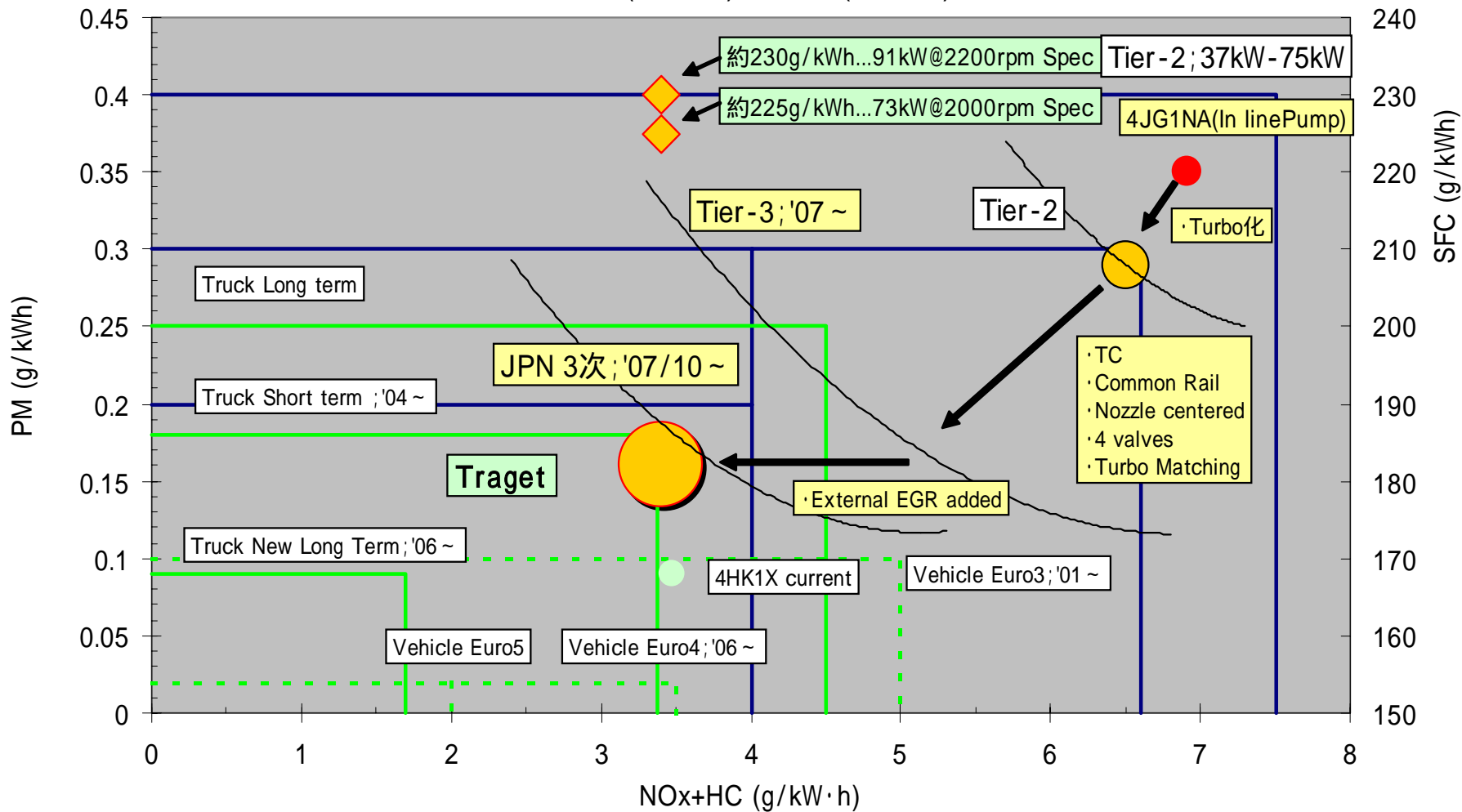
### ZX450 ~ ZX870

ZX-1 6WG1T/TC (Mechanical Controlled)

ZX-3 6WG1X (Electronic Controlled, Common Rail, EGR)



## 75kW(100HP)-130kW(175HP)



**4JJ1X Exhaust Emission and Fuel Consumption**

# 4HK1X Emission and Fuel Consumption(130kW ~ )

