Yan XIN, Transportation Program, Energy Fouincation China, November 15, 2018

Non-Road Mobile Sources Emissions Control in China

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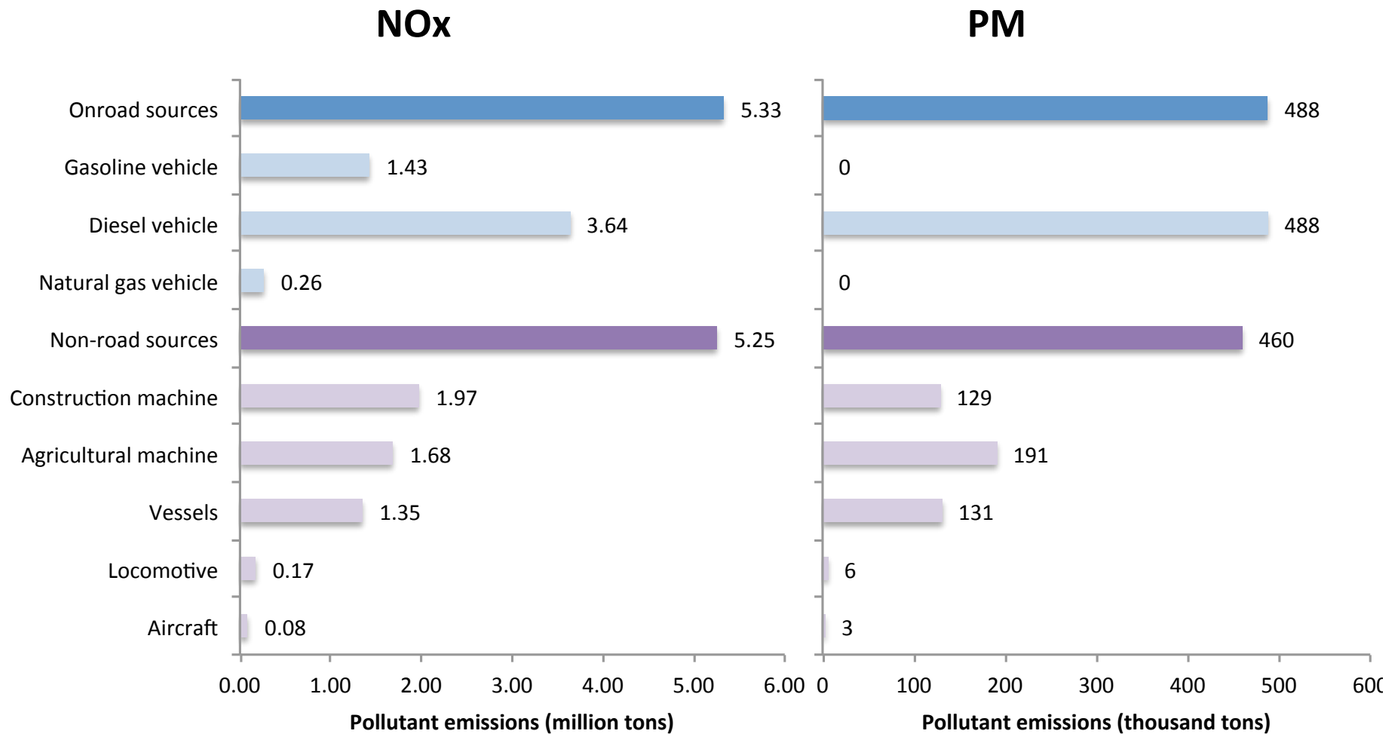
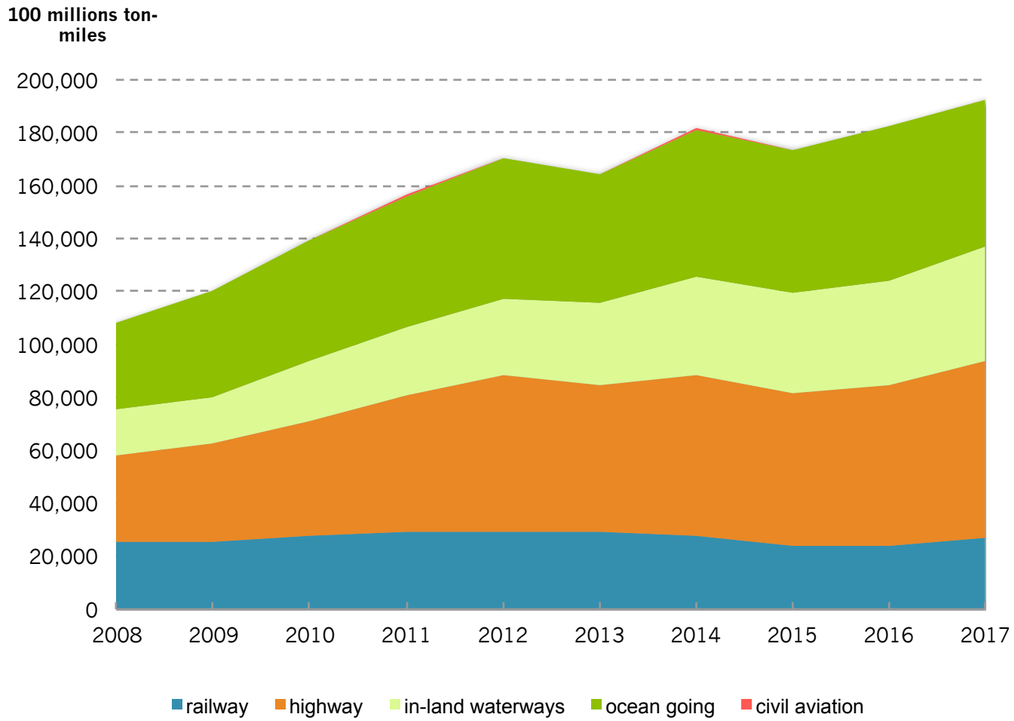
Non-road is emerging as significant new pollutant source

Pollutant emissions by mobile source categories (2017)



The development trend of rail, highway, waterway, aviation and pipe in terms of ton-mileage



Data sources: Transportation Industry Statistics 2017
China Vehicle Environmental Management Annual Report 2018

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The non-road regulations are lagging behind its on-road counterpart

The enforcement of mobile source emissions standards

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
LDV	Compression ignition	China II		China III					China IV					China V		China VI	
	Spark ignition	China II		China III					China IV					China V		China VI	
	Gas spark ignition	China II		China III					China IV					China V		China VI	
HDV	Compression ignition	China II		China III					China IV					China V		China VI	
	Spark ignition	China II		China III					China IV					China V		China VI	
	Gas spark ignition	China II		China III			China IV		China V					China VI			
Motorcycle	Two-wheel and moped	China II			China III						China IV						
	three-wheel	China II			China III						China IV						
Nonroad	Diesel		China I		China II						China III						
	Gasoline		China I				China II										
	Vessel														China I		

Data sources: China Vehicle Environmental Management Annual Report 2018

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Air pollution is critical driving force to improve the non-road regulation

- 2013 Five-year Air Pollution Prevention and Control Action Plan
- 2016 Clean Air Law revision
- 2018 Three-year Action Plan to restore blue skies

The production/ sale

- Emission standards
- Emissions information disclosure

The in-use emissions

- Low emission zone

Fuel quality

- Normal diesel fuel standards
- Marine fuel standards

Retrofit & replacement

- Retrofit program

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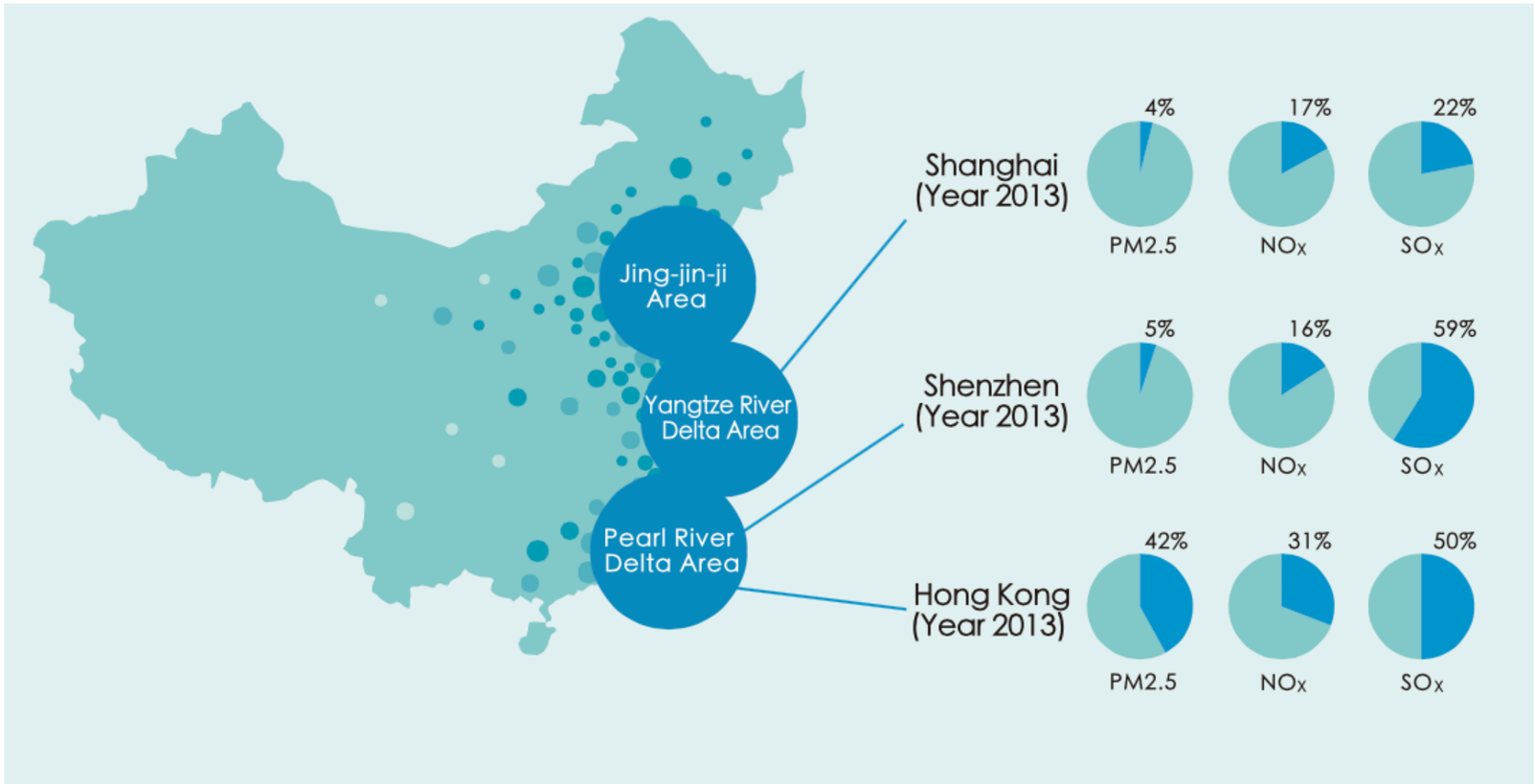
Vessel emissions are outstanding in coastal cities, e.p. in the south

The contribution of shipping to local air pollutants' emissions in 2013



Sources: The Energy Foundation

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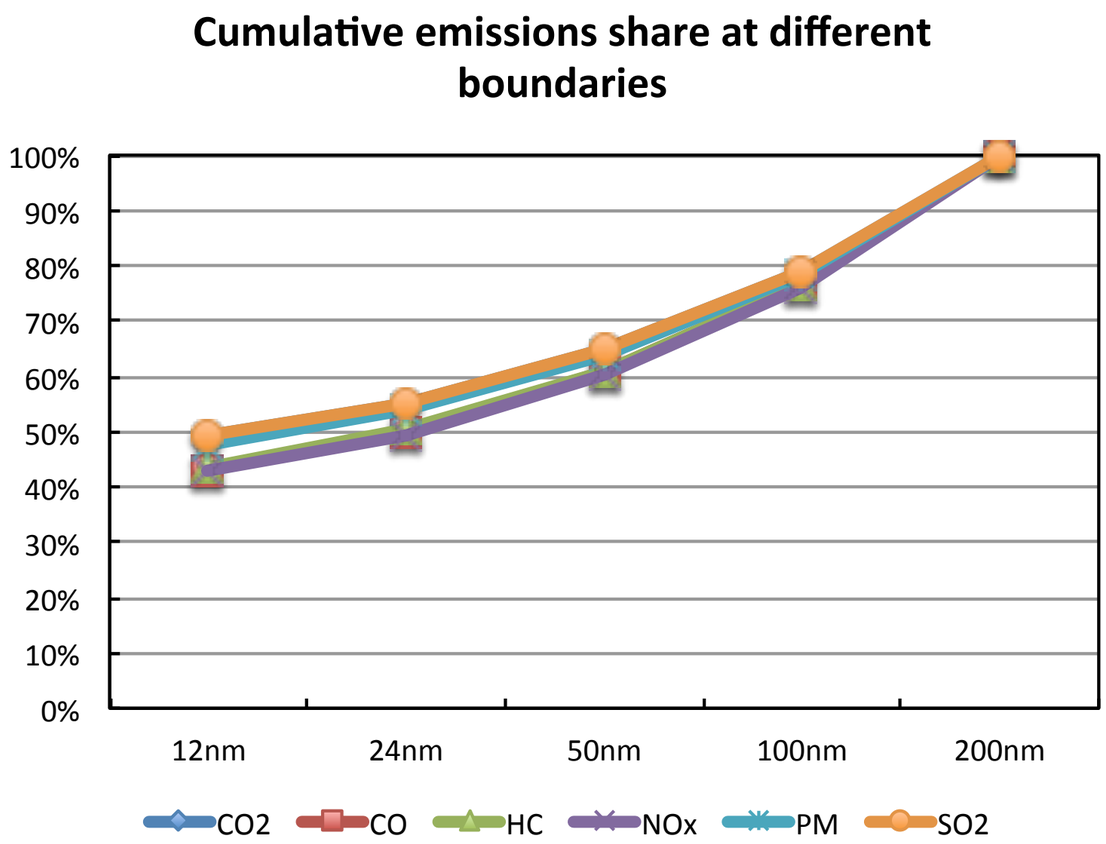
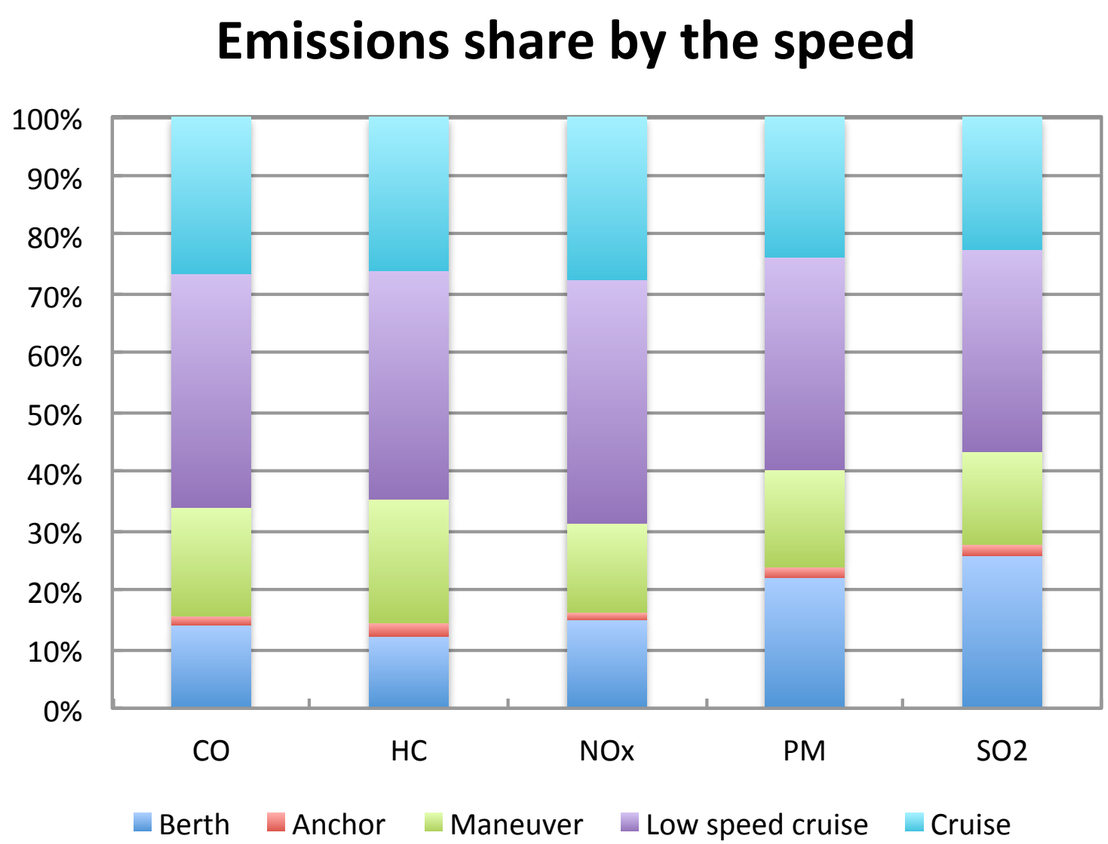
Half of vessel emissions are within 12nm





Data sources: Vehicle Emission Control Center

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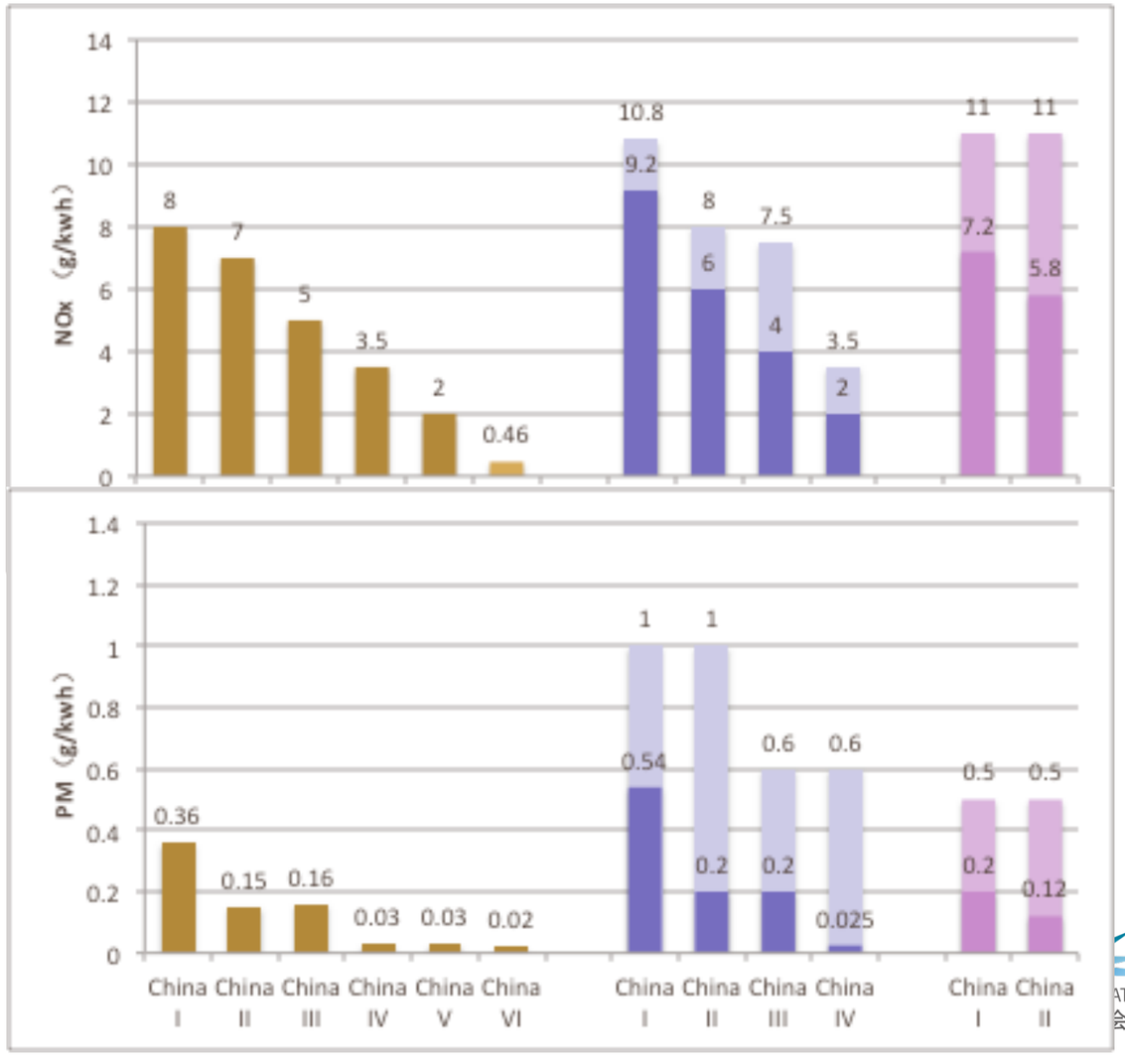
The Vessel Emissions Standards will be more stringent than IMO Tier II

Enforcement date	2018/7/1 phase I
	2021/7/1 phase II

Comparison of emissions limits for IMO Tier II and China II

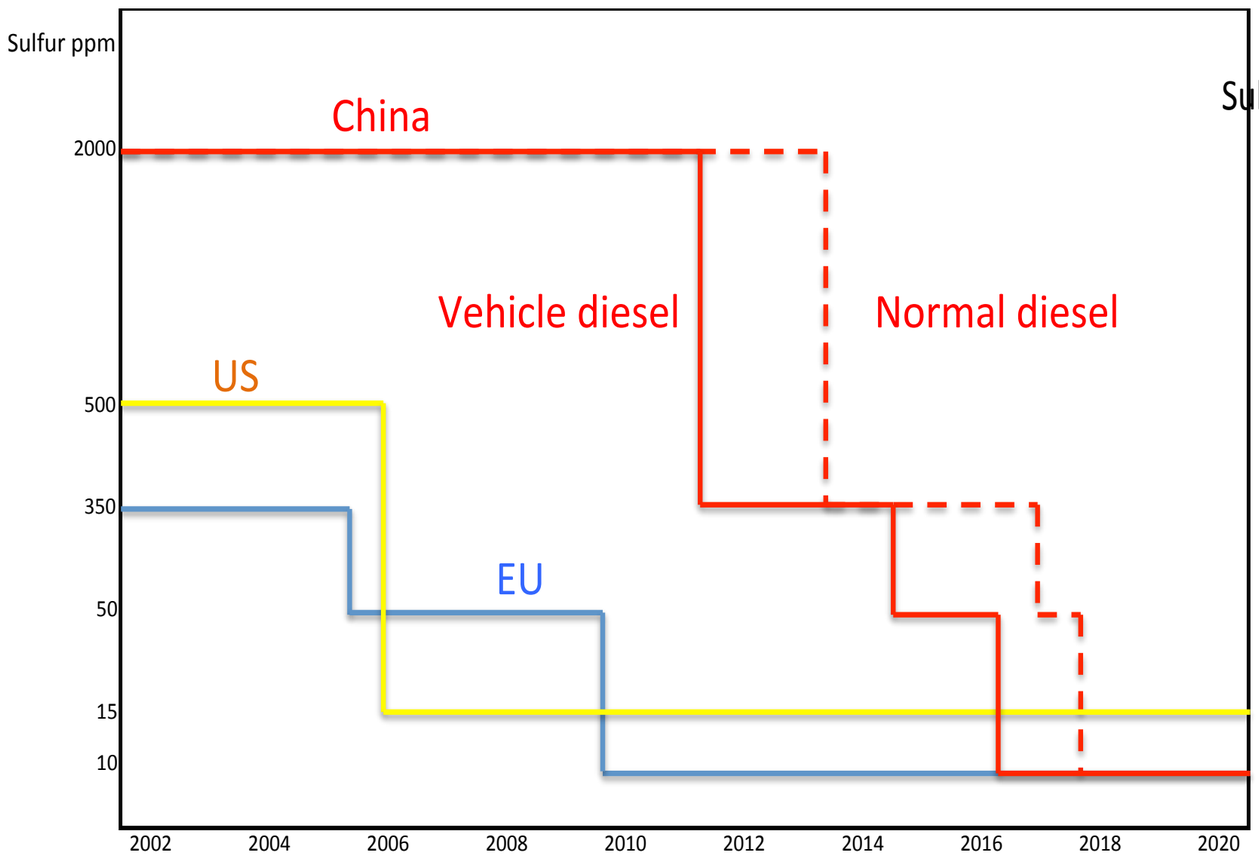
IMO Tier II	China II			
NO_X	功率 P（kW）	CO（g/kW.h）	HC+NO_X（g/kW.h）	PM（g/kW.h）
8.18～9.75	〔2.5L≤SV＜5L〕	5.0	7.2	0.20
8.98～9.75	〔5L≤SV＜15L〕	5.0	7.8	0.27
8.98～9.75	P＜3300 〔15L≤SV＜20L〕	5.0	8.7	0.50
8.98～9.75	〔20L≤SV＜25L〕	5.0	9.8	0.50
10.1～11.1	〔25L≤SV＜30L〕	5.0	11.0	0.50

Comparison of emissions limits for HDV, non-road equipment and vessel

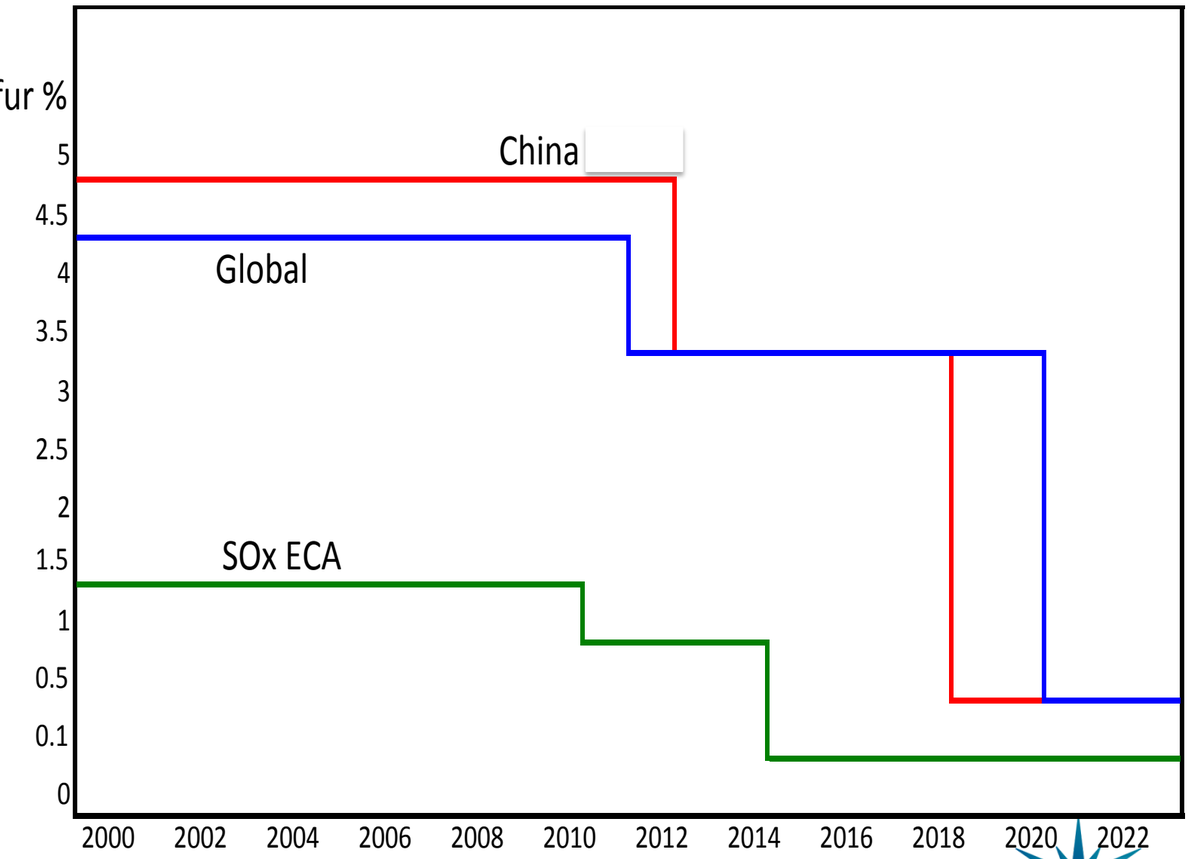


The fuel quality standards have improved significantly

The progress of diesel desulfurization



Global comparison of marine fuel sulfur content



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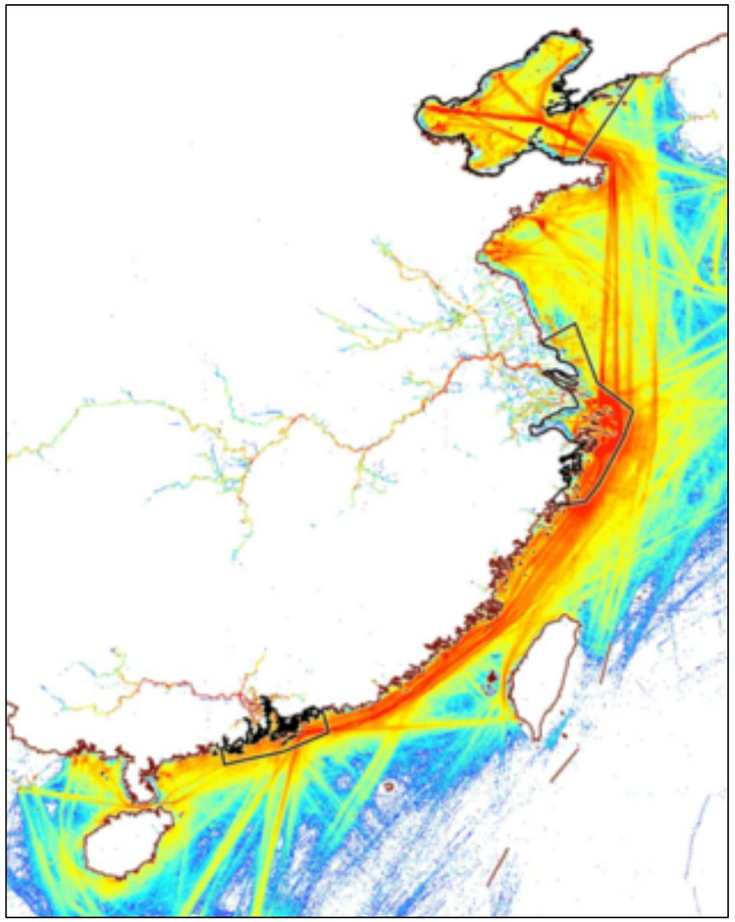
China’s domestic Emissions Control Area policy improves air quality in ports



Data sources: Transportation Planning Research Institute

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Incentive programs accelerate standardization and clean transition

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Barriers and challenges

Enforcement

Effectiveness

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Suggestions for future work and collaboration

- Possible collaboration in IMO ECA application
- Collaborative incentive program for clean vessels
- Enhanced communication in emissions inventory and air quality monitoring programs

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Building a sustainable future

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