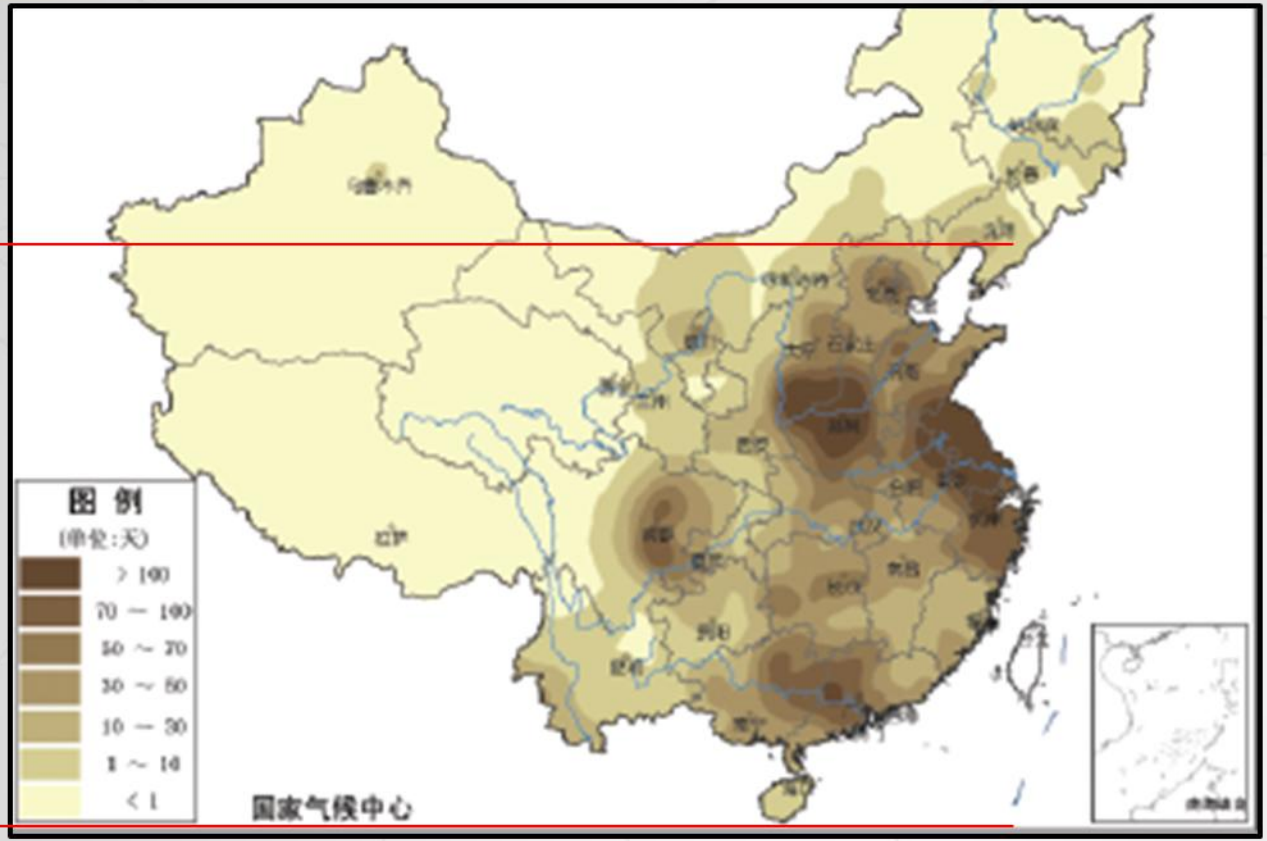
Practices of Green Port in China

Speaker: Prof. Peng Chuansheng

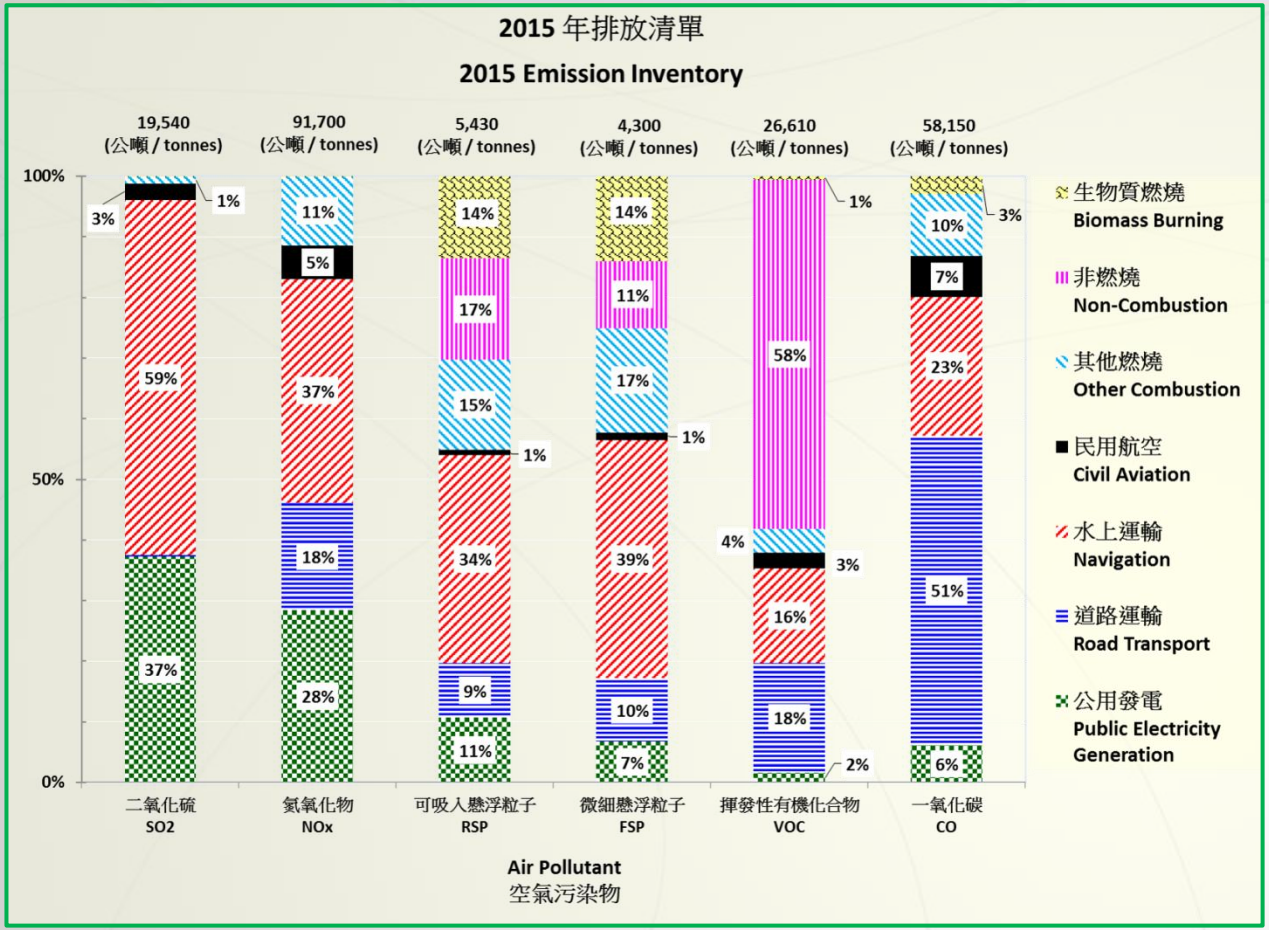
China Waterborne Transport Research Institute

Contents

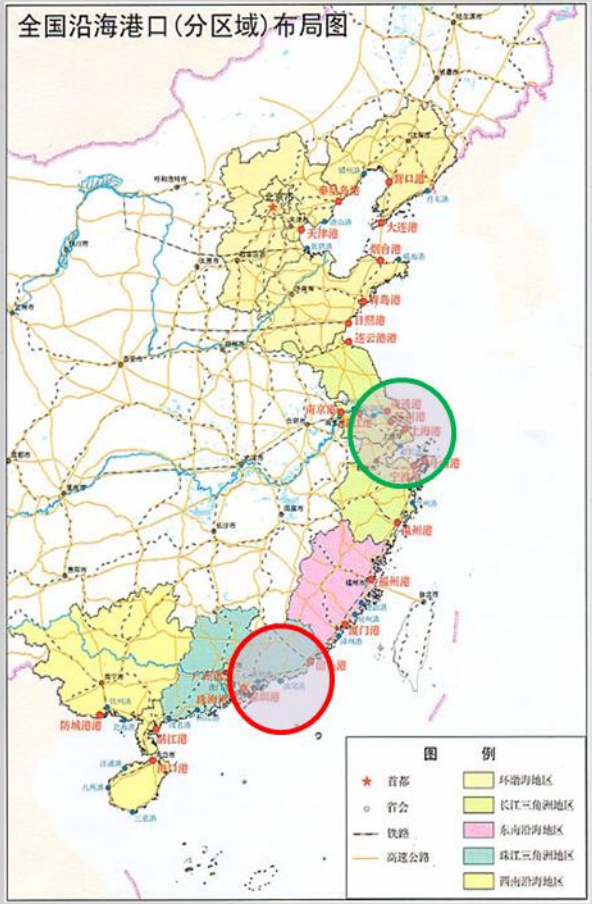
Pressure and responsibility (days of hazy weather)



Pressure and responsibility (HK)



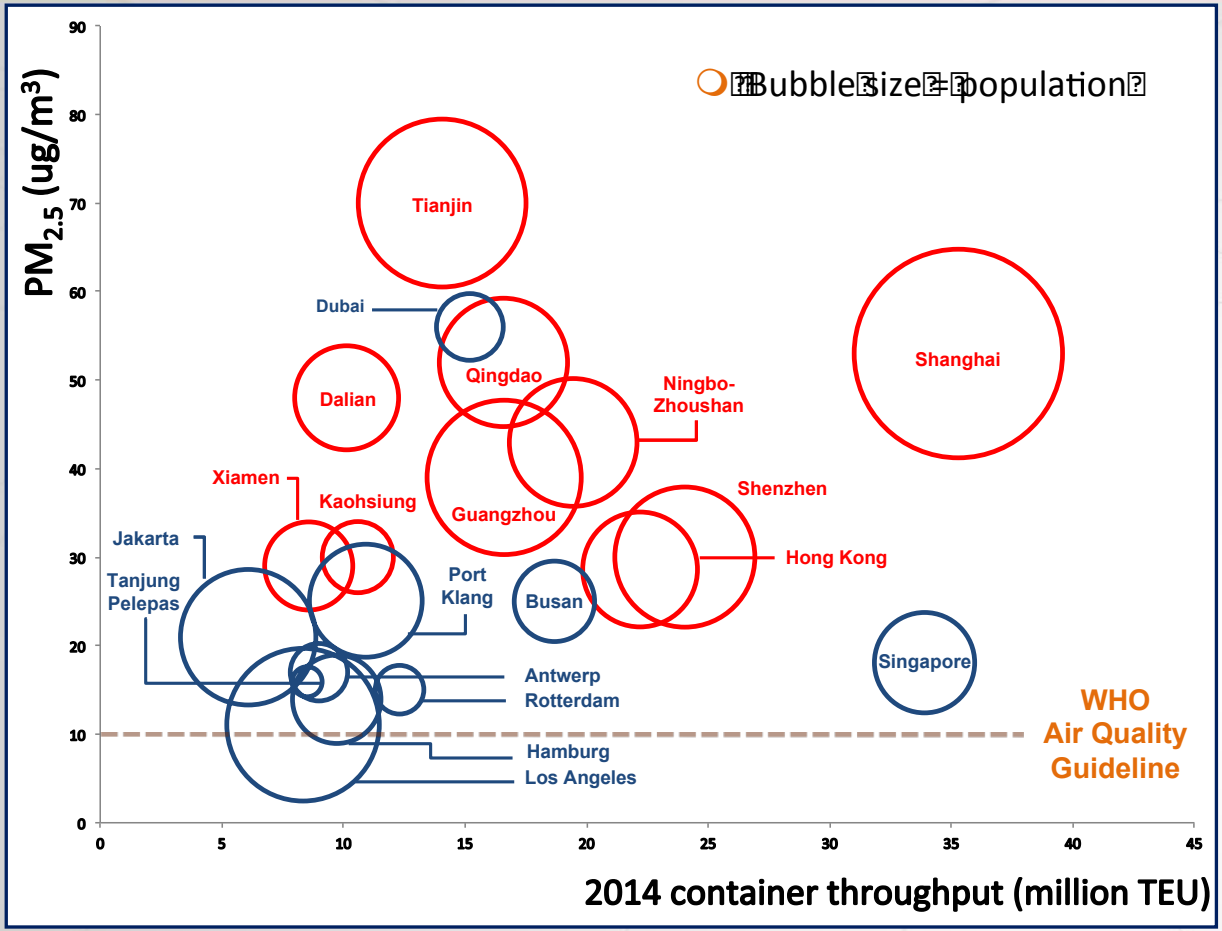
Pressure and responsibility



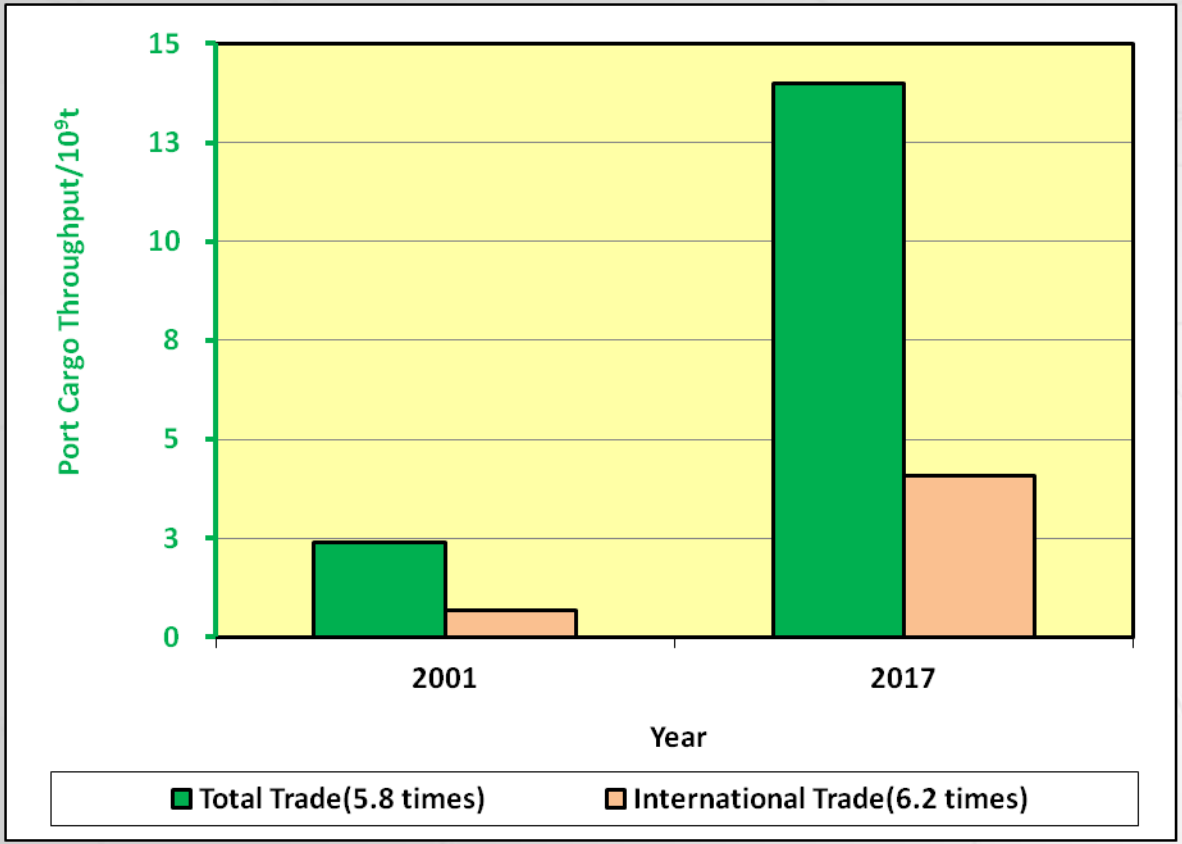
Port of Shanghai in 2010 Source: City Environment Monitoring Centre	
Pollutant	Share
SO_2	12.0%
NO_x	9.0%
$PM_{2.5}$	5.3%

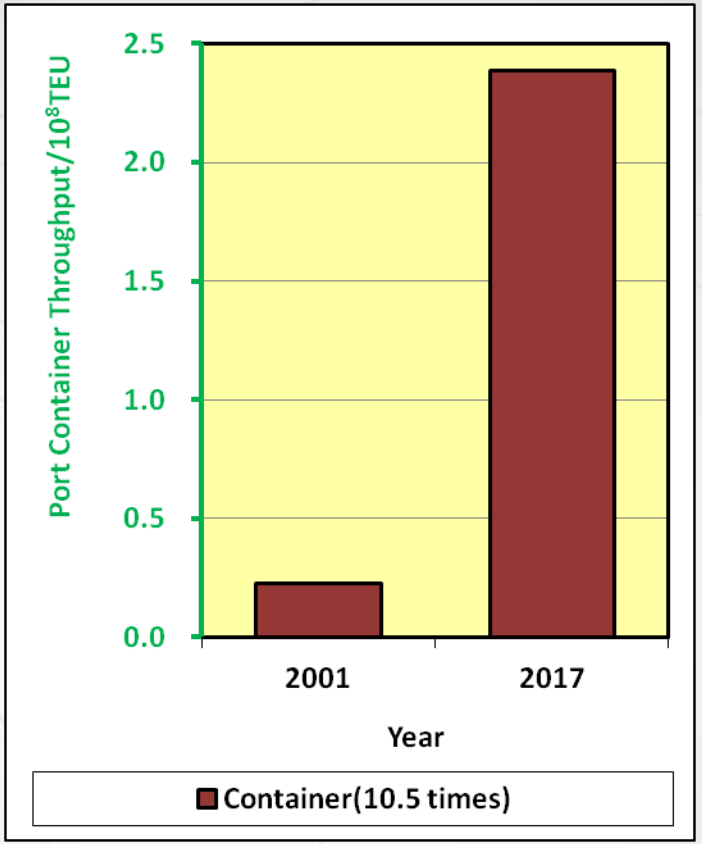
Port of Shenzhen in 2013 Source: City Environment Protection Bureau	
Pollutant	Share
SO_2	66.1%
NO_x	14.1%
$PM_{2.5}$	5.8%

Pressure and responsibility



Pressure and responsibility





Contents

Policy system concerned

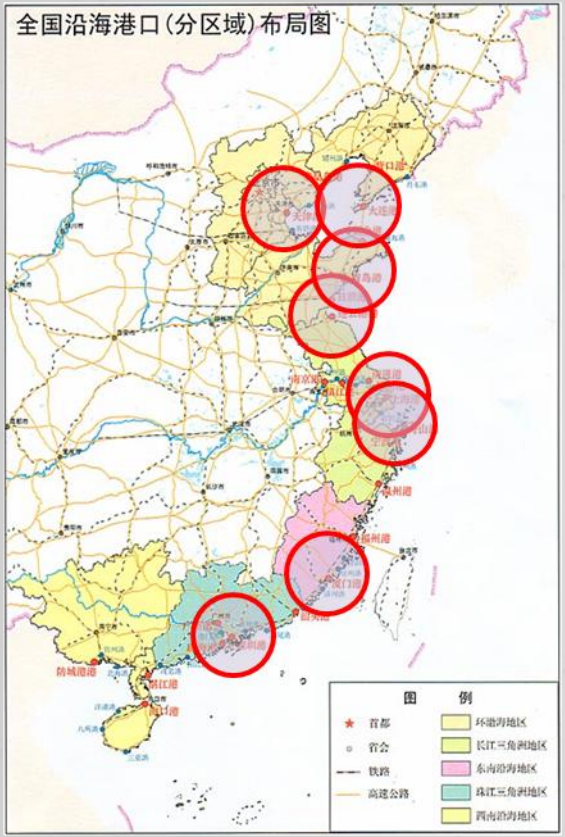
Administrative Levels		Examples
Guide	Administrative Enforcement	Port handling in severe haze weather, and transporting coal into port by truck are prohibited
	Economic incentive	Financial incentives for building shore power system in terminal , building new LNG-fuelled ship and so on
	Standard	Technical Code of Shore-to-ship Power Supply System
Normative document		Action Plan of Ship and Port Pollution Prevention and Control (2015-2020)
		Instruction on Using Electricity Instead of Other Energy
		Instruction on Promoting the Application of Liquefied Natural Gas in Waterborne Transport Sector
		Implementation plan of ship emission control area in Pearl River Delta, Yangtze River Delta and Bohai Rim
Regulation		Regulations on the Prevention and Control of Marine Pollution and Marine Environment
Law		Law of the Prevention and Control of Atmospheric Pollution
		Law of Conserving Energy

Selected practices of green port in China

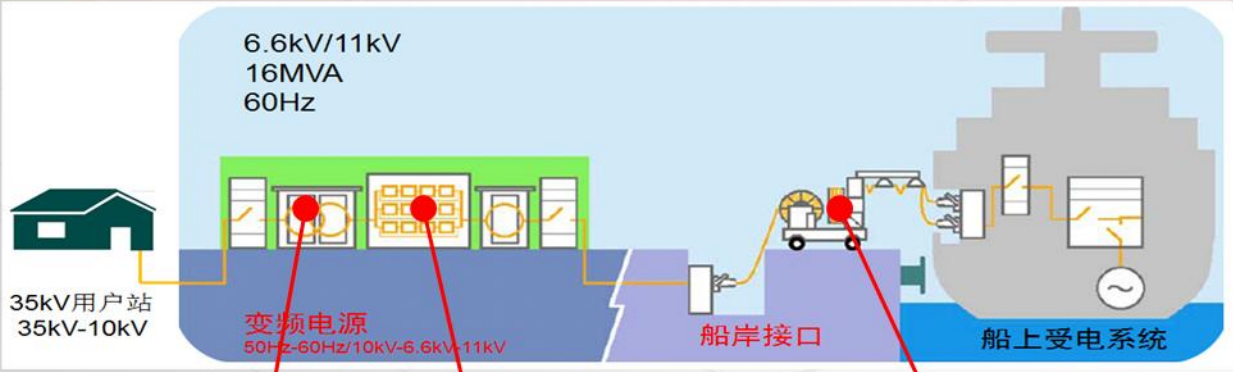
No	Practices
1	Cranes power converted from diesel to electric
2	Shore power system for ship at berth
3	Ship emission control areas
4	LNG fueled vessel and port equipment
5	All electric automatic container terminal
6	Dust suppression in dry bulk terminal
7	Oil-gas recovery system in oil terminal
8	Geothermal(air or water) heat pump system
9	Treatment of waste water
10	Green port grade evaluation standard

1. Cranes power converted from diesel to electric (2300+RTG）

2. Shore power system for ship at berth

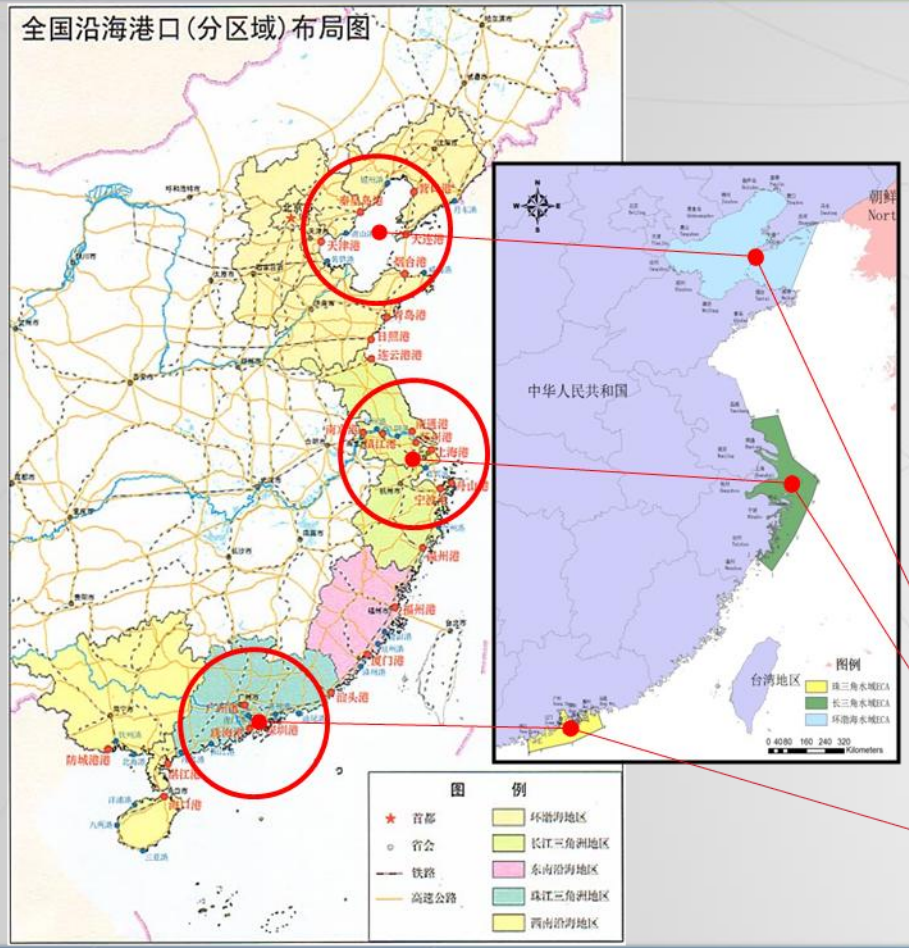


2. Shore power system for ship at berth (Shanghai Wusongkou Cruise Terminal)



2. Shore power system for ship at berth

3. Ship emission control areas



Start Date	Management Objects	Control Requirement
Jan 1, 2017	Ships at berth in core ports in ECAs	Using fuel with less than 0.5% sulfur content or equivalent alternative measures
Jan 1, 2018	Ships at berth in all ports in ECAs	
Jan 1, 2019	Ships inside of ECAs	

ECA		Start in core ports
Circum-Bohai-Sea		Jan. 1, 2017
Yangtze River Delta		Apr. 1, 2016
Pearl River Delta	Shenzhen	Oct. 1, 2016
	Others	Jan. 1, 2017

3. Ship emission control areas

SO_2 concentration in January 2017 : 56% ↓

SO_2 concentration in April-December 2016: 23% ↓

SO_2 concentration in April-December 2016: 52%↓

SO_2 concentration between October 2016 and June 2016: 38%↓

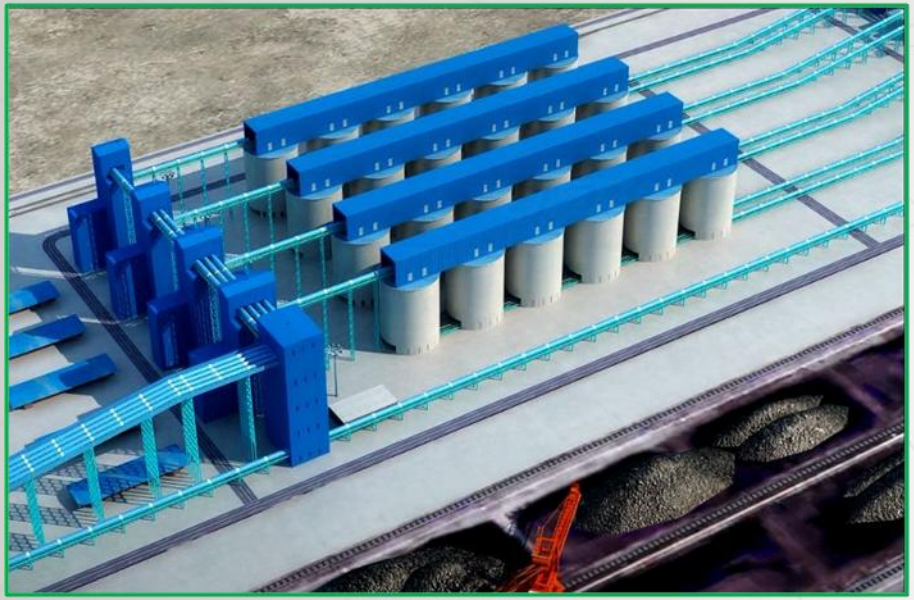
4. LNG fueled vessel and port equipment（Zhanjiang、Lianyungang）

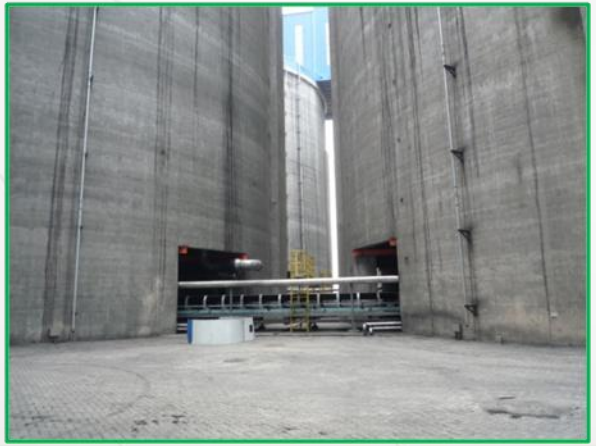
5. All electric automatic container terminal (Xiamen)

5. All electric automatic container terminal （Port of Qingdao & Shanghai）

6. Dust suppression in dry bulk terminal (Qinghuangdao、Rizhao)

6. Dust suppression in dry bulk terminal (Port of Huanghua)





7. Oil-gas recovery system in oil terminal (Port of Shanghai & Ningbo Zhoushan)

8. Geothermal(air or water) heat pump system

9. Treatment of Waste Water

9. Treatment of Waste Water

10. Green port grade evaluation standard

Goal: Unify understanding of green port

Standardize green port evaluation

Promote transformation of port development

Principle: Philosophy is the foundation

Action is the key

Management is the guarantee

Aim is effect

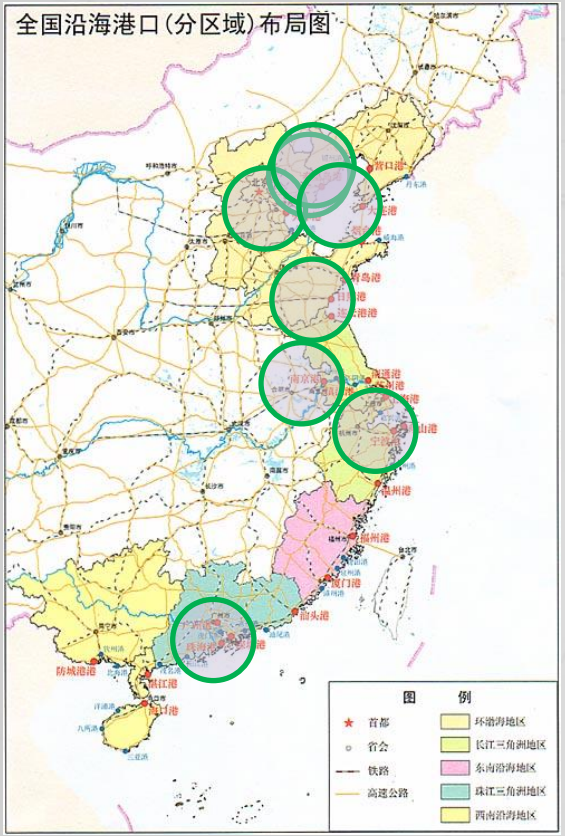
10. Green port grade evaluation standard

Item	Score Weight	Sub item	Indicator
Philosophy	0.10	Strategy	Strategy Planning
			Funding
			Work Plan
		Culture	Enterprise Culture
			Education Training
			Promotional Activities
Action	0.40	Environment Protection	Pollution Control
			Comprehensive Utilization
			Ecological Protection
		Energy Saving	Main Equipment
			Operation Technology
			Auxiliary Facilities
		Low Carbon	Fuel Replacement
			Renewable Energy Sources

10. Green port grade evaluation standard

Item	Score Weight	Sub item	Indicator
Management	0.15	System	Management Organization
			Audit and Verification
		mechanism	Objective Assessment
			Statistical Monitoring
			Incentive and Constraint
Effect	0.35	Effect	Environment Protection and Zoology
			Resource Saving and Low Carbon
		Level	Environment Protection and Zoology
			Resource Saving and Low Carbon

10. Green port grade evaluation standard



	Terminals (4-star green port)
1	Iron ore terminal in Port of Dalian
2	The 7th company terminal in Port of Qinhuangdao
3	The 6th company terminal in Port of Qinhuangdao
4	The 1st coal company terminal in Port of Rizhao
5	Pacific international container terminal in Port of Tianjin
6	Longtan container terminal in Port of Nanjing
7	The 2nd container terminal in Beilun in Port of Ningbo Zhoushan
8	Shekou container terminal in Port of Shenzhen

Contents

Action Plan of Ship and Port Pollution Prevention and Control

No	Aspect	Contents
1	Regulation improvement	Regulation, Standard
2	Structure adjustment	Energy consumption
3	Demonstration project	Shore power, Oil-gas recovery, Dust prevention
4	Administration Strengthen	Ship pollutant receiving disposal, Dust prevention, Oil-gas recovery, Shore power supply, Environmental monitoring network
5	Management Optimization	Emission control areas, Multimodal transportation, Water-water transport transfer
6	Emergency Response	Emergency capacity building plans
7	Technology development	Refined and crude oil terminal oil-gas recovery

The existed shore power supply systems in China by the end of July 2016

About 1278 and 292 with power capacity more than 200kVA

Berth Type	Number
Container	31
Bulk	89
Ro-Ro	20
Cruise	1
Others	151

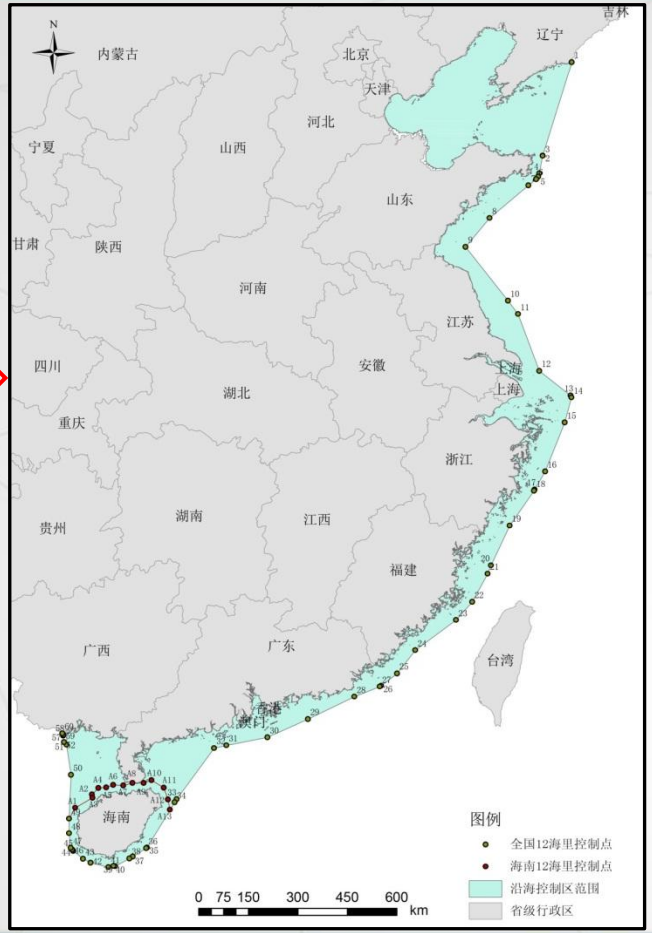
Location	Number
Coastal Berth	133
Inland River Berth	159

Voltage	Number
High	29
Low	263

The Construction Plan of Shore Power Supply Systems by the end of 2020

Total	Berth type	Number
493	Container	277
	Ro-Ro	77
	Cruise	9
	Passenger(3000DWT+Ship)	29
	Bulk(50000DWT+Ship)	101
State subsidy scheme: 1.15bRMB during 2016-2018		

Expending scope of ship emission control area



Improving control requirements of ship emission control

Draft plan for comment:

① Ship inside Chinese coastal territorial sea and inner water should use 0.5% sulphur content marine fuel oil from 2019

② Ship at berth should use 0.1% sulphur content marine fuel oil from 2020

③ Ships inside water area surrounding Hainan island should use 0.1% sulphur content marine fuel oil from 2020

④ The Chinese ship built after July 1, 2021 should meet the phase II of NO_x control requirement of Chinese standard.

⑤ For Chinese public service ship, container ship, ro-ro ship and more than 3000dwt passenger ship, if its biggest engine power is more than 500kW and can not meet the phase II of NO_x control requirement of Chinese standard, it should use shore power when it is at berth which can supply shore power from 2022.

Prof. Peng Chuansheng
China Waterborne Transport Research Institute
8 Xitucheng Road
Beijing, 100088
Tel: 86-10-65290315
Email: pengcs@wti.ac.cn

THANKS