



上海港与资源节约型环境友好型港口建设 The Shanghai Port & the Resource-Saving and Environment-Friendly Port Construction

报告人：肖 风
Reporter Xiao Feng



上海市交通港航发展研究中心

Shanghai Transport and Port Development Research Center

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The Recent Planning for Resource-saving and Environment-friendly Port Construction

2009年2月26日，交通运输部关于印发“资源节约型环境友好型公路水路交通发展政策”的通知（交科教发〔2009〕80号），其中针对“两型港口”建设提出以下要求：
26th, Sep., 2009, The Ministry of Transport published the notification of “The Resource-saving and Environment-friendly land way and waterway transport development policy”, the requirements for port s were listed as follows:

一、交通部关于“两型港口”的指导意见

▶ Guidance of Resource-saving and Environment-friendly Port Construction (Ministry of Transport)

1、资源节约型、环境友好型港口基本方针 The Principles

- ▶ 坚持发展速度和结构质量效益相统一。
- ▶ Insist on the Synchronous of the speed of development and the structure, quality and efficiency
- ▶ 坚持将节约资源与保护环境贯穿于港口行业的全过程。
- ▶ Insist on the principles of resources saving and environment protection throughout the development of port industry
- ▶ 坚持政府引导和市场调节相结合。
- ▶ Insist on the combination of guidance of government and adjustment of Market
- ▶ 坚持发挥科技创新的引领作用。
- ▶ Insist on the leading role of technological innovation

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2、资源节约型、环境友好型港口发展的主要指标

Main Index

- ▶ 按照国家建设资源节约型、环境友好型社会的总体要求，结合交通运输发展的特点，到2020年资源节约型、环境友好港口发展的主要指标（与2005年相比）是：
 - 港口单位长度生产用泊位完成的货物吞吐量提高50%左右，土地和岸线资源集约利用取得显著成效。
- ▶ The port shoreline length use efficiency should increase by 50%, achieve remarkable results in intensive use of land and shoreline resources.
 - 海洋和内河营运船舶单位运输周转量能耗均下降20%左右，港口生产单位吞吐量综合能耗下降10%左右，能源利用效率显著提高。
- ▶ The energy consumption of ship turnover rate in Marine and inland transport should decrease by 20%, the energy consumption of port throughput should decrease 10%, significantly improve energy efficiency.
 - 港口粉尘综合防治率达到70%，港口污水综合处理率达到100%，内河水域、重点海域的船舶污水接收处理率和船舶垃圾接收处理率均达到100%，主要污染物排放量显著下降。
- ▶ Port particular matter should reduce by 70%; port waste water treatment ratio should reached 100%; Ship waste water and garbage receive ratio should arrive 100%.

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3、资源节约型、环境友好型港口发展的主要政策

Main Policy

- ▶ 调整水路交通基础设施结构。
- ▶ Adjust the waterway transportation infrastructure structure
- ▶ 调整水路运输业结构。
- ▶ To Adjust the frame of water transport industry
- ▶ 促进综合运输体系建设。
- ▶ To Promote the construction of integrated transport system
- ▶ 节约使用集约利用港口岸线资源。
- ▶ Intensive use port coastline resources
- ▶ 发展交通运输循环经济。
- ▶ To Develop the sustainable transport system
- ▶ 大力减少车船污染排放。
- ▶ To reduce the pollutant emission of vehicles and ships
- ▶ 提高船舶溢油防控能力。
- ▶ To increase the prevention and control capabilities of oil spill
- ▶ 提高港口防污染处置能力。
- ▶ To increase the port anti-pollution ability

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二、上海港口发展概况 Overview of Shanghai Port Development

1. 上海港历史变迁 Historical Changes of Shanghai Port

- ▶ 上海港是一个历史悠久的港口。早在宋朝时期，上海港就已初步形成并逐步成为本地区的主要外贸口岸。元朝、明朝与清朝期间，港口又继续有所发展。1843年11月17日上海港正式对外开放。1931年港口货物吞吐量达1398万吨(含内港吞吐量)，进出口船舶吨位名列世界第7位。
- ▶ Shanghai Harbor has long history. Early in the Song Dynasty, Shanghai Port had been initially formed and gradually became the major foreign trade port. During the Yuan Dynasty, the Ming Dynasty and Qing Dynasty, the port continued to be developed. 17th, November, 1843, Shanghai port was officially opened. In 1931, total throughput reached 13.98 million tons (including the inner port throughput), ranked 7th in the world.
- ▶ 上世纪80年代，上海港重建了十六铺客运码头，新建了共青码头、朱家门煤码头、宝山码头和关港码头，建起了7个集装箱专用码头泊位，更新、新增主要机械1200台，使占港口吞吐量70%以上的各类主要货种，如集装箱、煤炭、木材、散杂货等19项主要装卸工艺达到了国际先进水平。从1984年起，上海港连年货物吞吐量超过1亿吨，成为世界上屈指可数的亿吨大港之一，1987年货物吞吐量居世界第4位。
- ▶ In the 1980s, the reconstruction of the Shiliupu Ferry wharf, the Gongqing wharf, the Zhujiamen coal wharf, the Baoshan wharf and the Guangang wharf had been done, seven container berths had been built. Since 1984, the throughput of Shanghai Port exceeded 10 billion tons, and ranked 4th in the world in 1987.
- ▶ 2000年以后，上海港将进一步加强和完善已有的各项生产和管理设施，除继续重点开发建设外高桥新港区外，还将逐步解决能通过和容纳吃水深度为12.5米的船舶的深水航道和深水泊位问题，使上海港进一步成为高效率、综合性、多功能、国际性的现代化枢纽港。
- ▶ After 2000, Shanghai Port has further strengthened and improved the facilities, in addition to continue to focusing on the development and construction of Waigaoqiao new port areas, the deep channel for 12.5m draft depth ship and deep water berths had also been solved step by step, which make Shanghai Port become a highly efficient, integrated, multi-functional, international modern port.

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2. 港口吞吐量发展

Throughput Increment of Shanghai Port

- ▶ 上海是“城以港兴，港为城用”的城市，港口在城市的经济发展、贸易往来和对外交流中发挥着重要的作用。

The close relationship between “Port and City” in Shanghai.

- ▶ 2010年，上海港货物吞吐量完成6.5亿吨，连续六年保持世界第一。

The cargo throughput of Shanghai Port was 650 million ton in 2010, ranked world 1st, already six times in a row.

- ▶ 2010年，集装箱吞吐量完成2906.9万标准箱，首次超过新加坡港口跃居世界第一。

The container throughput of Shanghai Port was 29 million TEU in 2010, ranked world 1st.

- ▶ 2010年，洋山深水港区集装箱吞吐量达到1010万TEU，首次突破1000万TEU。

The container throughput of Yangshan port was 10.1 million TEU in 2010, the first time for over-10 million TEUs.

- ▶ 2011年，上海全港货物吞吐量7.3亿吨，集装箱吞吐量3173.9万TEU。

The cargo throughput of Shanghai Port was 730 million ton, and the container throughput was 32 TEU in 2011.

- ▶ 2011年集装箱水水中转共完成1301.2万TEU，比2010年增长18.04%；铁水联运完成10.29万TEU，比2010年增长43.1%。

In 2011, 13 million TEU was completed by water-water transit, which was 18.04% higher than in 2010; 103 thousand TEU was completed by train-water transit in 2011, which was 43.1% higher than in 2010.

- ▶ 2011年度，完成引航7万艘次，同比增长3.1%；其中2011年1月份引航6千艘次，创单月历史最高记录。

In 2011, 70000 ships pilot was completed, which was 3.1% higher than before. In January 2011, 6000 ships was piloted, breaking the single-month record.

- ▶ 2011年度，洋山港区共完成集装箱吞吐量1309.86万标准箱，同比上升29.6%；全年累计靠泊船舶13569艘次，所开辟的远洋航线遍布全球，每月航班密度已达398班。

In 2011, Yangshan port completed a total container throughput of 13 million TEUs, which was 29.6% higher year-on-year. The number of annual total berthing ships is 13,569 ships, and the monthly shipping density is 398.

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3. 上海国际航运中心建设

Construction of Shanghai international Shipping Center

(1) 优化现代航运集疏运体系

To optimize the modern shipping collection and distribution system

- ▶ 继续推进洋山深水港区四期、临港新城东港区一期、吴淞口国际邮轮码头一期项目

Yangshan port (Phase IV), Lingang port (Phase I), Wusong international cruise (Phase I) construction

- ▶ 进一步优化内河航道等级结构，完善赵家沟、杭申线等高等级内河航道及配套内河港区建设

Inland channel classification and construction

(2) 发展现代航运服务体系

To develop the modern shipping service system

- ▶ 创建、集聚航运服务机构

Shipping service Organization

- ▶ 实施《船舶交易管理规定》

Ship Trade management regulation

- ▶ 出台无船承运人保证金责任保险制度

Insurance regulation

- ▶ 提升口岸服务环境

Enhance Service environment

- ▶ 提高港航信息化水平

Raise Informationalization level

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(3) 探索建立国际航运发展综合试验区

To explore and establish pilot area for international shipping center construction

- ▶ 加强国际航运综合试验区内涵研究

Pilot area research

- ▶ 创新特殊监管区监管模式

Special monitoring model

- ▶ 推进启运港退税政策试点

Tax refund Pilot area

- ▶ 深化落实洋山保税港区航运企业免征营业税政策

Tax free policy in Yangshan Bonded Port

(4) 促进和规范邮轮产业发展

To promote and regulate the cruise industry development

- ▶ 完成吴淞口国际邮轮码头一期泊位建设

Completion of the Wusongkou international cruise terminal berth construction

- ▶ 落实境外大型邮轮沿海港口多点挂靠政策

Implement the multi-point anchored policy for foreign cruise

- ▶ 开展邮轮产业发展相关政策研究

The cruise industry policy research

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三、上海港“两型港口”建设

The Resource-saving and Environment-friendly Port Construction

1. 前期相关工作 The Previous related work

生态港建设对策研究（2007-2009）

Eco-Port Research

- ▶ 上海“生态港口”建设针对上海港不同类型港区制定相应的综合评价指标体系（生态—经济—社会）；

Eco-Port evaluation index system (Ecology-Economic-Society)

- ▶ 通过港区环境（如空气质量、土壤质量、水体健康等）的监测，以及港口建设、运营污染、产业链分析，了解上海生态港建设所面临的薄弱环节；

To identify weak point of Shanghai Port for Eco-Port objective;

To monitor port environment quality (Air quality, soil quality and water quality etc.);

To investigate pollution and industry chain and other related items.

- ▶ 严格遵循上海港不同功能类型和地域环境来制定相应的工作要求和重点；对已建和规划建设的港口，按照建设期和运营期的不同，制定相应的生态建设要求和策略；

Eco-Port construction strategy (construction and operation period)

- ▶ 制定改善港口生态功能的规划和要素配置原则。

Eco-Port promotion and planning

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FEBRUARY
23
ThursdayDAY 2
Ports & Our Communities

环太平洋清洁空气协作国际会议 (2006-2012)

Pacific Ports Clean Air Collaborative

- 由上海港、洛杉矶港务局发起，国际上超过25家港口单位加入。

Initiated by the Shanghai Port and Los Angeles Port, more than 25 ports joined in.

- 2006年12月，第一届会议在美国洛杉矶举行，会议的议题为“港口运营过程中大气污染挑战和解决方案”。

In December, 2006, based on the existing “sister-port” planning, the Los Angeles Port and Shanghai Port, together with the USEPA and MARAD, sponsored the first PPCAC Conference, providing a way to discuss challenges and solutions on air pollution emission from port operations.

- 2008年10月，第二届会议在中国上海举行，会议的议题为“港口发展与全球气候变化”。

In October, 2008, Shanghai Port held the second conference in Shanghai, China, focusing on Climate Change.

- 2012年2月，第三届会议在美国洛杉矶举行，会议的议题为“港口可持续发展的挑战”。

In February, 2012, Los Angeles Port held the third conference in San Pedro, focusing on Challenges for a Sustainable Future.



February 21
Early Check In
& Welcome Mixer
5:00-7:00 P.M.

FEBRUARY
24
Friday

MORNING

8:00 - 9:30 Farewell Buffet Breakfast

9:45 Walk to Berth 31 for boat tour

10:00 - 12:00 Boat Tour - Join us aboard the Mauretania for a tour of the harbor



February 22-24, 2012

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上海港大气污染物排放现状调查及对策研究（2011-2012）

The background investigation and strategy research of Shanghai Port air pollutants emissions

- 上海港船舶、港口机械及集疏运车为港口主要污染物排放源，其主要排放物为颗粒物、NO_x、SO₂、CO、温室气体CO₂、N₂O等。

The main source of air pollution are ships, vehicles and port equipments.

The major pollutants are particulate matter, NO_x、SO₂、CO、CO₂、N₂O and etc.

- 远洋船是所有污染物的首要来源，其排放的颗粒物、NO_x和SO₂贡献率较大。

Ocean vessels are the primary source of all pollutants, and the particulate matter, NO_x and SO₂ accounts high contribution rate.

- 进出主要港区航道的NO_x排放相对其他航道污染较重。其中，黄浦江航道由于穿越市区且扩散条件较其他航道差，其污染物排放对上海市区的空气质量影响更为显著。

The NO_x emission are higher in Main channel than other branch channels.

As the Huangpu river cross through the downtown city and its serious diffusion conditions, the polluted impact on shanghai urban air quality are more significant.

- 船舶对本市主要污染物总量的贡献主要集中在SO₂以及NO_x。

The major pollutants emission contribution of ship mainly focused on SO₂and NO_x.

- 洋山港区的环境空气质量特点与市区明显不同。在混合和海洋气流中，SO₂和NO₂主要来源于船舶的重油燃烧。

SO₂ and NO₂ mainly derived from Ship heavy oil combustion in Yangshan port.

2. 现阶段主要进展 The Current work and Achievements

1. 船用岸电系统 (AMP)

- ▶ 岸基船用供电系统 (Shore-side AMP): 2010年7月6日, 由上海市副市长沈俊、交通运输部副部长徐祖远正式启动由上海国际港务(集团)振东集装箱码头分公司研制成功的全球首台移动式岸基船用供电系统。该系统将陆基10KV电压和50HZ电频变频变压到船用440V电压和60HZ电频, 船舶到港后可关闭柴油发电机, 由岸上提供电源, 环保又节能。截止2011年底, 已为船舶供电5次, 每年可减少温室气体排放。

Till 2011, AMP in Zhendong Company has already supplied for ships for 5 times, this was expected to reduce Greenhouse gas emission significantly.

- ▶ 电缆铺设船用供电系统 (Cable Laying AMP): 上海国际港务(集团)外六期码头建设期间在码头上铺上船用供电电缆, 船舶到岸后可直接接驳岸电系统。

Cable laying on the port when Port construction, have not been used yet.

2. RTG油改电-杜绝废气与噪音污染 [Electric RTG](#)

- ▶ 目前，上海港区共有RTG台471台，能耗大，形成较大污染。由[上海国际港务（集团）振东集装箱码头分公司](#)自主专利技术RTG油改电方案-高空滑线轮胎吊供电方式，能够实现轮胎吊单箱能耗节省49.4%，大大降低废气污染和噪音污染。目前上海港外高桥港区已有205台RTG进行油改电改造，其余RTG也都将进行节能改造。

[49.4% energy saving for each RTG, reduced the air pollution and noise pollution. So far, 205 RTG are supplied by electricity.](#)

3. 混合动力RTG [Hybrid RTG](#)

- ▶ 平均节油率达到30%以上，节能效果显著，降低了噪声排放，在[洋山三期码头](#)配置了混合动力RTG 71台，已节约能源折合标准煤4592吨，减少CO2排放9645吨。

[More than 30% fuel saving.](#)

[So far, there are 71 Hybrid RTGs in Yangshan port \(period III\), which could reduce CO2 emission by about 9645t per year.](#)

[节能减排，精心打造两型港口](#)

4. 高杆节能灯 [High pole yard energy-saving lamps](#)

- ▶ **上海国际港务（集团）振东集装箱码头分公司**通过抑制电网谐波干扰，稳定工作电压，提高功率因素，优化能耗组合，可达到20%以上的节能率的预期目标。同时可有效降低能耗又延长照明设备寿命。

[More than 20% energy saving, long service life of lamp systems](#)

5. LED堆场照明系统推广 [LED yard lighting system](#)

- ▶ **上海国际港务（集团）盛东集装箱码头分公司**将港区堆场照明灯高压钠灯改为LED灯，耗电量少，使用寿命长，绿色环保，年可节约24吨标煤。

[Less power consumption, long service life of lamp systems, saving 24 tons of standard coal per year.](#)

3. 暨将开展工作

The Recent Planning for Resource-saving and Environment-friendly Port Construction

(1) 基本原则

The Basic Principles

- ▶ 坚持节约资源、持续发展。提升港口适应国际竞争和国内经济社会发展的能力。

Resources saving and sustainable development.

To promote the ability of port for adaption to international competition and domestic economic and social development

- ▶ 坚持科技支撑、政策保障。推广使用新能源、替代能源利用技术和节能减排新技术。

Technological support and legal security.

To employ alternative energy technology and energy saving technology.

- ▶ 坚持实事求是、循序渐进。科学合理地确定上海港发展的阶段性目标和实现路径。

Practical and realistic, step-by-step.

To determine the milestones of the Shanghai Port development scientifically and reasonably .

(2) 总体目标

Overall Aim

- ▶ 上海港公共装卸码头及年装卸吞吐量在100万吨以上的企业专用码头，通过前期准备和实施三个“三年行动计划”。

Three Year Plan: Public ports and Enterprise ports (>1 million ton throughput per year)

- ▶ 到2015年和2020年，港口生产单位吞吐量**综合能耗**比2010年分别**下降5%和8%**；港口生产单位吞吐量**CO₂排放**比2005年分别下降**10%和12%**；SO₂、NO_x排放量显著下降。

Till 2015 and 2020, the throughput of port production unit energy consumption compared to 2010 decreased by 5% and 8%; port production unit throughput CO₂ emissions decreased by 10% and 12% compared to 2005; SO₂, NO_x emissions are significantly cutted.

- ▶ 到2015年，轮胎式集装箱门式起重机（RTG）实施“油改电”、混合动力等节能减排改造达到**100%**。

Till 2015, All Diesel RTG should be replaced with Electric and Hybrid RTG.

- ▶ 到2020年，在国际邮轮码头、主要客运码头以及30%大型集装箱码头和散货码头**实现靠港船舶使用岸电**；港口**粉尘综合防治率达到70%**；港口**污水综合处理率达到100%**；到港船舶**污水和垃圾接收率均达到100%**。

Till 2020, the International Cruise Terminal, the main Ferry Terminal and 30% large-scale container terminal and bulk terminal port should use AMP system; port particular matter should reduce by 70%; port waste water treatment ratio should reached 100%; Ship waste water and garbage receive ratio should arrive 100%.

节能减排，精心打造两型港口

(3) 评价指标体系

Evaluation index system

资源节约型指标 (Resource-Saving index)

序号 No.	指标 Index	单位 Unit	目标 Target	说明 Explanation
1	港口生产单位吞吐量综合能耗 Port throughput unit overall energy consumption	万吨标煤/万吨 Ton standard coal/ton	到2015年, 能耗比2010年降低5%; 到2020年, 能耗比2010年降低8% Till 2015, reduce 5% compared to 2010; Till 2020, reduce 8% compared 2010	约束性 Obligation
2	靠港船舶使用岸电率 AMP use ratio	(%)	到2020年, 国际邮轮码头、主要客运码头以及30%大型集装箱码头和散货码头使用岸电 Till 2020, the International Cruise Terminal, the main Ferry Terminal and 30% large-scale container terminal and bulk terminal port should use AMP system	参考性 Recommend
3	岸线使用效能 Coastline use efficiency	万吨/米 10000ton/m	与2005年相比, 2020年上海港单位长度生产性泊位完成的货物吞吐量提高50% Till 2020, increase 50% than 2005	约束性 Obligation

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环境友好型指标 (Environment-Friendly index)

序号 No.	指标 Index	单位 Unit	目标 Target	说明 Explanation
1	SO ₂ 、NO _x 削减量比率 SO ₂ 、NO _x reduce ratio		显著下降 decrease significantly	
2	港口生产单位吞吐量CO ₂ 排放 CO ₂ emission per throughput	(%)	到2015年，排放比 2005年降低10%； Till 2015, decrease 10% compared 2005 到2020年，排放比 2005年降低12% Till 2020, decrease 12% compared 2005	约束性 Obligation
3	RTG节能减排改造率 RTG Transform ratio	(%)	到2015年，完成 100% Till 2015, complete 100%	约束性 Obligation
4	粉尘综合防治率 Particular matter reduce ratio	(%)	70%	约束性 Obligation
5	污水综合处理率 Waste water treatment ratio	(%)	100%	约束性 Obligation
6	船舶污水和船舶垃圾接收率 Ship waste water and garbage receive ratio	(%)	100%	约束性 Obligation

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(4) 阶段目标

Stage Targets

- ▶ 第一阶段：启动阶段 Starting stage（2011年）。启动港口生产单位吞吐量综合能耗限额标准制订前期调研，建立排放统计制度，开展现状调查，建立大气污染排放物排放清单、完善排放统计指标和核算技术，提出“两型”港口主要评价指标，确定环保目标。着手开展岸线使用效能评价工作。

Stage I: Starting stage (2011) Preliminary research (port throughput integrated production unit energy consumption limits) and survey (air pollution emissions inventories) --- Propose port main index system and the environmental protection objectives --- Initiated coastline use efficiency evaluation.

- ▶ 第二阶段：推进阶段 Developing stage（2012年—2014年）。大力推广集装箱码头轮胎式集装箱门式起重机（RTG）“油改电”，到2014年末，RTG“油改电”、混合动力等节能减排改造基本完成。

Stage II: Developing stage (2012—2014), all RTG in Shanghai ports are replaced with electric RTG or hybrid RTG.

- ▶ 第三阶段：深化阶段 Deeping stage（2015年—2017年）。节约使用、集约利用港口岸线资源，加强老港区技术改造工作，提高老港区生产能力、技术水平，发展集约化、专业化、现代化港区，提高老港区岸线资源利用效率。

Stage III: Deeping stage（2015—2017）to use the port coastline resources economically and intensively --- to strengthen the technological transformation of the old port --- to promote the capacity and technical level old port --- to develop the intensive, professional and modern Port --- to enhance Port coastline use efficiency.

- ▶ 第四阶段：完善阶段 Maturity stage（2018年—2020年）。完善港口岸线使用、交通运输节能等法规制度，健全行业环境质量、能源利用监测网络，完善行业能源消耗统计报告和分析制度。建立具有上海港特点的“两型”港口规范标准体系，全面实施港口节能减排、环境保护评价、考核机制。

Stage IV: Maturity stage（2018—2020）to improve the port coastline conservation and related laws and regulations --- to improve industry environmental quality --- energy use monitoring network, and industry energy consumption statistical reports and analysis system --- to establish port standards system --- to implement the port of energy saving --- environmental protection mechanism.

(5) 重点任务

Major objects

- ▶ 优化集疏运体系

To optimize the freight collection and distribution system

- ▶ 逐步提高设备燃料效率

To improve the efficiency of energy use continually

- ▶ 大力推广节能减排技术

To promote the energy saving technology

- ▶ 加强污染排放监测和节能减排管理

To monitor the pollution emissions and Manage the energy savings system

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(6) 保障措施

Methods

- ▶ 强化政策扶持，完善组织保障

To strengthen Policy Support and Management

- ▶ 开展试点示范，引领良性发展

To develop the Pilot Demonstration

- ▶ 依托科技创新，加快生产转型

To relying on Scientific and Technological Innovation

- ▶ 加强技术引进，借鉴先进经验

To study the Advanced Experience

- ▶ 加大人才建设，提高整体素质

To increase the Personnel Development

- ▶ 健全法规标准，推进体系建设

To improve Rules and Regulations Construction

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An aerial photograph of a massive container port. The foreground and middle ground are filled with hundreds of red gantry cranes and thousands of colorful shipping containers (blue, red, green, yellow) stacked in neat rows. Several large container ships are docked at the quay. In the background, there are hills, a body of water, and a bridge. The sky is clear and blue.

Thank You!