



Development of Infrastructure Sectors in China: Status quo & Trends

中国基础设施行业发展: 现状与趋势

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The popular story of Zhou Zhenglong, the peasant taking a fake photo of tiger, reveals to observers of China an astonishing *innovation* ability of local officials driven by their own desire....

“正龙拍虎”给中国观察者的启示：地方官员为了实现自身目的，有可能做出让世人惊叹的“创新”.....

Agenda 议程

- **Government regulation and reform policies. Local vs State Government**
政府监管及改革政策：中央及地方政府层面
- **Current infrastructure industry in China: competitive landscape, key players**
中国基础设施行业现状：竞争格局及主要公司
- **Tariff and price-setting mechanism of infrastructure** 基础设施服务价格及定价机制
- **Typical bidding processes and contractual issues** 典型竞标程序与特许经营合同问题
- **Prospects under the latest Economic Stimulus Plan** 最新经济刺激计划下的前景

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Paper presented in the PPPs Symposium
Organised by HKU CICID (28-02-2009)

discussion scope: types of infrastructure

讨论的范围：基础设施类型

- **water: water supply, wastewater treatment, water reuse, and desalination**
城市水务：供水、污水处理、中水回用、海水淡化
- **solid Waste: municipal solid waste (MSW), hazardous solid waste (Industry or medical)**
固体废弃物：生活垃圾、危险废物
- **city gas** 城市燃气
- **rail transportation** 轨道交通
 - urban rail transportation (metro & light rail) 城市地铁、轻轨
 - railway 铁路
- **Road** 公路
- **Airport** 机场
- **Seaport** 港口

reform policies of infrastructure differ from sector to sector
基础设施改革政策和力度随各行业而异...

高 high

Openness of the sector
行业开放度

qualitative analysis



Source: Jumbo research

but the same is that regulatory policy of sectors is not clear, in addition to lack of systematic improvement of regulation ...

但共同之处是行业监管政策仍显模糊，缺乏系统改进举措...

- China's infrastructure presently have a common feature— **slack regulation of industry**, but which should be strictly regulated in terms of economics theory 中国基础设施行业现状的一个共同特征是**松懈的行业监管**，而从经济学属性看，基础设施正是需要严格监管的行业
- The **regulatory system** to curb the capital power **has not been set up in time** while the marketization reform featuring absorbing private capital was promoted rapidly. That has caused total effectiveness of the reform undermined. 以资本进入（招商引资）为主要特征的市场化改革在基础设施行业推进迅速，但约束资本力量的**监管体系没有及时建立**，已影响到改革的总体成效
- Similar to China's overall reform process, the easier parts of infrastructure reform (i.e. opening market) have been completed except from rail industry. The reform has inevitably **reached critical phase to tackle with fundamental system design** 类似于中国总体的改革进程，基础设施改革中方便和能够改革的部分（比方说开放市场），除了铁路行业外基本都已经改了；改革现在到了**触及根本性制度设计的关键阶段**
- Mr. Deng Xiaoping's famous philosophy of reform, "**cross the river by suring about stones at the bottom**", influences Chinese selection of reform path 现在回头来看，中国在开展行业改革的时候并没有想清楚最终希望得到的基础设施行业结构是什么。一言以蔽之，中国体制改革在制度设计未完成之前，即开始启航。其改革决策背后的思维源头可以追溯至邓公 "**摸着石头过河**" 的改革哲学

... for instance, reform of municipal utility was designed systematically, promoted strongly, but has currently been thrown into dilemma...例如，市政公用行业的改革相对比较系统，政府推动有力，但目前也遇到很多困难

- **MOC launched marketization reform in China's municipal utility sectors at the end of 2002** 建设部在2002年底启动了中国市政公用事业的市场化改革
- **PPP mechanism was consequently introduced into China's municipal utility** 公私合营 (PPP) 由此被引入中国公用事业
- **4 years later, over 70% green-land WWTPs in China used some PPP mechanism*; and 35% for existing WWTPs** 四年之后，中国超过70%的新建污水厂和35%的存量污水厂运用了PPP机制
- **However, most of regime remain unchanged, including cost auditing, tariff regulation, responsibility scope & boundary of regulatory agencies. Reform met a great deal of resistance from conservative wing, which has made a lot of noise and already slow down some key reform projects. ...officials' subtle shift of wording from “marketization reform” to “introducing market mechanism”** 但是包括成本监审、价格监管、监管机构责任边界划分等几乎维持原样；在保守势力的噪音中，深化改革遇到很大阻力，一些项目已经停顿下来...官员们的措辞已经微妙地从“市场化改革”转变为“引进市场机制”

*Source: *The Unbearable Weight For Wastewater Treatment Plants*, Dr. FU Tao, China Water Net

...Articulation and implementation of regulatory policy: problems facing central & local governments **监管政策制订与执行：中央政府与地方政府的难题...**

- **Key to China's infrastructure regulation is not de-regulation but how fast the regime react to the market opening and changes of operation mechanism.** 中国基础设施监管问题的关键并非该不该放松管制的问题，而是监管体制没有因应市场开放和运行机制变化，而及时作出相应改变，监管体制改革进程严重滞后。
- **Central government is the draftsman of regulation policies, but make no decision for sector like railway, together with unclear regulation and no guidance for urban infrastructure.** 中央政府是监管政策的制订者，对部分行业改革犹豫不决（如铁路），对城市基础设施（如水务、燃气、固废、城轨等）缺乏明晰的监管改革指导，导致地方政府不满意和无所适从
- **Local government undertakes investment responsibility of most of urban infrastructure, with simple understanding of regulation equal to stable supply of services, but ignoring cost, service quality and market structure** 地方政府承担着大量城市基础设施的投资责任，对监管的理解是确保基础设施公共服务不中断，对成本收益、服务质量提升、市场结构优化等监管改进无暇顾及

各级政府对基础设施投资责任

investment responsibility assumed by governments of different levels

中央政府承担 assumed by central gov	中央/地方共担 shared by central & local gov	地方政府承担 assumed by local gov
•干线铁路 railway	•公路 toll road	•城市水务 water
	•机场 airport	•城市轨道交通 urban rail
	•部省合资铁路 JV rails by MOR&Provinces	•固废处理 solid waste
		•港口 seaport
		•城市燃气 city gas

What drives local government to open the infrastructure market for private investors is the pressure of inadequate fiscal resources ... 地方政府向私人资本开放基础设施投资市场的动力主要源自财政资金短缺窘境形成的压力

融资仍是地方政府最核心驱动因素 **capital is still the most important driver of local gov**



减轻财政负担及克服政府融资难题
Attract non-governmental capital



地方政府开放基础设施投资市场的三大考量因素

Three factors of local government's evaluation when opening infra. market



Develop governmental regulation

改进公共行政管理理念和政府监管



改善公用事业的运营和服务质量
Improve service quality

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China's infrastructure market as a whole has been opened for private investors except for some special sector 除了极个别行业，中国基础设施的市场大门总体上已经向私人资本打开



- Private investors are practically not allowed to invest in railway, three pivotal airports and ports due to some reasons. 铁路，部分枢纽机场及港口的投资市场，出于种种原因，仍旧向私人资本封闭
- Traditional pattern of SOEs monopoly operate has been broke down 传统的国有垄断的投资运营格局被打破
- Regional operation will give way to integration of country-wide players 区域分割运营的历史状态正在改变，开始出现跨区域整合的全国性投资运营商

... However, competition landscape and development strategy vary so much between different sectors... ...但是，在基础设施的各个领域内，竞争格局和发展策略又呈现出很大的差异

行业 sector	国有企业 SOE	国有控股企业 SHE	国内民营 Local Private Investor	外商企业 Foreign Investor
水务 water	卐卐卐卐, 卐	卐卐, 卐	卐, 卐	卐卐卐, 卐
固废 Solid waste	卐卐卐卐, 卐	卐卐卐, 卐	卐, 卐	卐卐, 卐
城市燃气 City gas	卐卐卐卐, 卐	卐卐, 卐	卐卐卐, 卐	卐卐卐, 卐
收费公路 Toll road	卐卐卐卐, 卐	卐卐, 卐	卐, 卐	卐, 卐
城市轨道交通 Urban rail	卐卐卐卐, 卐	—	—	卐, 卐
铁路 railway	卐卐卐卐, 卐	卐, 卐	—	—
机场、港口 Port & airport	卐卐卐卐, 卐	卐卐卐, 卐	卐, 卐	卐卐, 卐

Source: Jumbo research

图例 legend

卐: minor market share
 卐卐卐卐: major market share

卐: localization development strategy
 卐: trans-regional development strategy

... international players are still most competitive group among their cousins...基础设施各行业涌现出不同背景的投资运营商，国际性公司仍是整体实力最富竞争力的...

• 内资公司 local players

Water—Beijing Capital, Shenzhen Water, Sound Group/Epure, Beijing Holding Water, Tianjin Capital, China Water Investment, General Water, Guozhen EPT, Golden State Water, Bio-Treat Tech, Asian Environment, Asian Water, Golden Trust/Datong, Kangda Environ, Tongfa Water

Solid Waste—Shanghai Environment Group, TEDA Environment, Chongqing Sanfeng, Hangzhou Jinjiang, Wenzhou Weiming, Cugu Environmental, Sound Group/Eguard, Shenzhen Hanyang, China Science General Energy&Envir, Golden State Waste

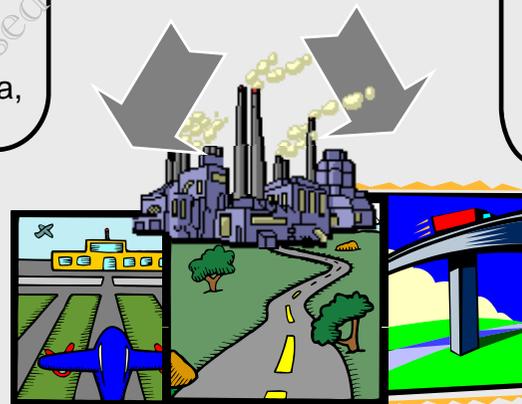
Gas—Xiniao Gas, Dazhong Public Utility, Tongda Gas

Road—Shandong Highway, CCCG, GeZhouBa, MCC-CETC, Midway Infra, SUCG, Tengda Construction, Standard Investment, Yueda Investment

Airport—Capital Airport Holding, Xiamen Airport, Hainan Airline

Port—Shanghai IPG, Cosco Ports, CS Terminals

Investors
投资者



• 外资公司 foreign players

Water—Veolia Water, Sino-French, Berlin Wasser, China Water Limited, Semicom, Hyfflux, Ranhill, China Water Affair, Everbright Environmental

Solid Waste—VES, Suiz, Impregilo, Covanta Energy, Sembcorp Industry, Everbright Environmental

Gas—Towngas, China Gas Holding, CR Gas

Road—RoadKing Infra, NWS Holding, Hopewell Holding

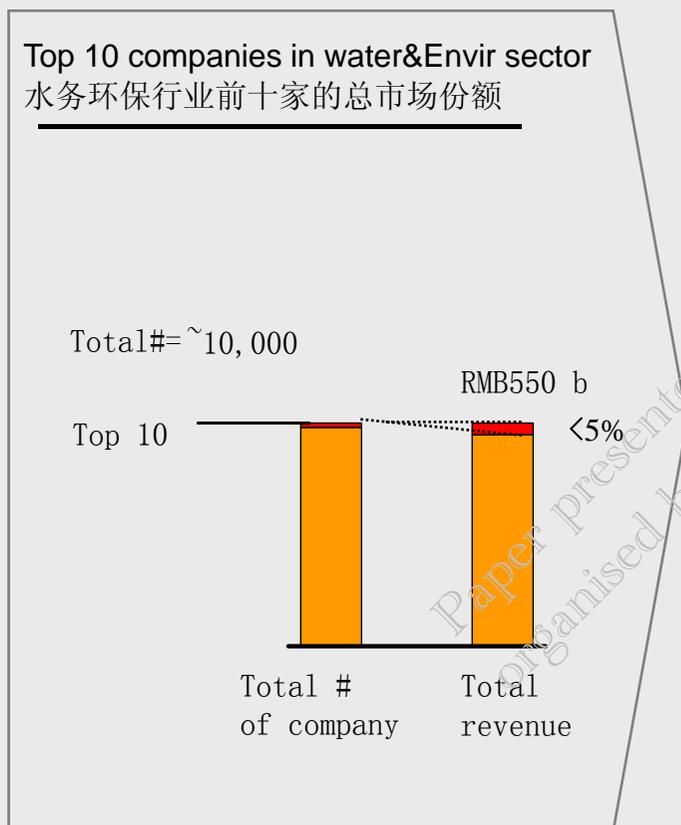
Urban Rail—MTR

Airport—Fraport AG, Changi Airport, AAHK

Port—Hutchison Port Holding, APM Terminals(Maersk)

Infrastructure 基础设施项目

...Some sectors of infrastructure, such as environmental, have a lower concentration ratio due to fledgling development phase and/or nature & characters of the sector ...
由于历史原因和行业特性，某些基础设施行业的集中度不高...



- The top 10 companies in the sector of water & envir possess market share less than 5%, verified the fact that it's a highly dispersed market. 水务环保行业前十家企业的市场份额不超过5%，说明这是一个高度分散的行业
- Trans-regional integration and development only happened 6-7 years ago. 跨区域的整合与发展只有最近6-7年的历史
- The sectors of city gas, toll road, seaport and airport similarly imply integration opportunities. 城市燃气、收费公路和港口、机场等尽管并未如水务环保行业分散，但同样存在行业集中度低，蕴涵行业整合机会的现象

Source: 11th FYP of Environmental Industry of China, Jumbo research

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tariff and price-setting mechanism differ from sector to sector in infrastructure

基础设施各行业服务/产品价格与定价机制各不相同

行业 sector	Tariff payer	Price-setting	price adjustment method	Self-liquidating Ratio
供水 water supply	end-user	Cost plus	Public hearing + government approval	★★★★
污水处理 wastewater	government	bidded or negotiated	Price adjustment fomular	★★★★
固废 solid waste	Government+ Grid operator (electr.)	bidded or negotiated	Price adjustment fomular	★★★★
城市燃气 city gas	end-user	Cost plus	Public hearing + government approval	★★★★★
收费公路 toll road	User (passenger/driver)	predefined by gov or negotiated	Application + government approval	★★★★★
城市轨道交通 urban rail	passenger+ Government subsid.	predefined by gov	Public hearing + government approval	★
铁路 railway	passenger+ Government subsid.	predefined by gov	Public hearing + government approval	★★
港口 port	User (container lines)	Market pricing	Negotiated or market-oriented	★★★★

图例 legend

★ : low
 ★★★★★ : high

Source: Jumbo research

The government capacity and expertise in price auditing practice is quite poor , which might result in risks for regulator and regulatee both. 中国基础设施的成本监审能力弱，对监管者和被监管者都构成风险

- Historically, background of state-owned infrastructure operators in China undermines the necessity of formal regulatory system and effective cost auditing procedure.
- Prevailing financial misstatement challenges further the government capacity of cost auditing to infrastructure operators.
- Economic regulation regime of infrastructure and capacity and expertise of government entities in China have not been build up in time after the government launched privatization process in the sector years ago.
- The lack of effective cost audit and regulatory regime does not only hurt the interest of users and public sector, but also that of private sector in most of time because the government rely on more its political judgment not the rational audit results and legal provisions.
- China authority has been aware of seriousness of the issue, the capacity building and improvement concerning cost auditing is underway.

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Regulatory laws issued by MOC and local governments rule that operators of utility should be awarded concession rights by means of public bidding 建设部或部分地方政府的特许经营法规规定基础设施/公用事业须采用招标方式选定特许经营者

**《市政公用事业特许经营管理办法》(建设部126号令)
Regulatory Rule on Municipal Utility Concession, MoC**

第八条提出市政公用事业特许经营项目，报直辖市、市、县人民政府批准后，向社会公开发布招标条件，受理投标

Clause 8,municipal utility should **open for public bidding** to select an operator after project schemes approved by government of municipality, city or county.

**《北京市城市基础设施特许经营条例》
Beijing Municipal Ordinance of Urban Infrastructure Concession**

第十一条 实施机关按照实施方案，通过招标等公平竞争方式确定特许经营者并为之签订特许经营协议。

Clause 11, Executing entities award concessionaire the rights of operation **by means of public bidding or others fair competition procedure**, and sign concession agreement with the concessionaire

**《深圳市公用事业特许经营条例》
Shenzhen Municipal Ordinance of Utility Concession**

第八条 市政府应当采取**招标、拍卖等公平竞争的方式**.....将某项公用事业的特许经营权.....授予符合条件的申请人。

第九条 通过**招标、拍卖**等方式不能确定经营者的，市政府也可以采取**招募**方式确定经营者

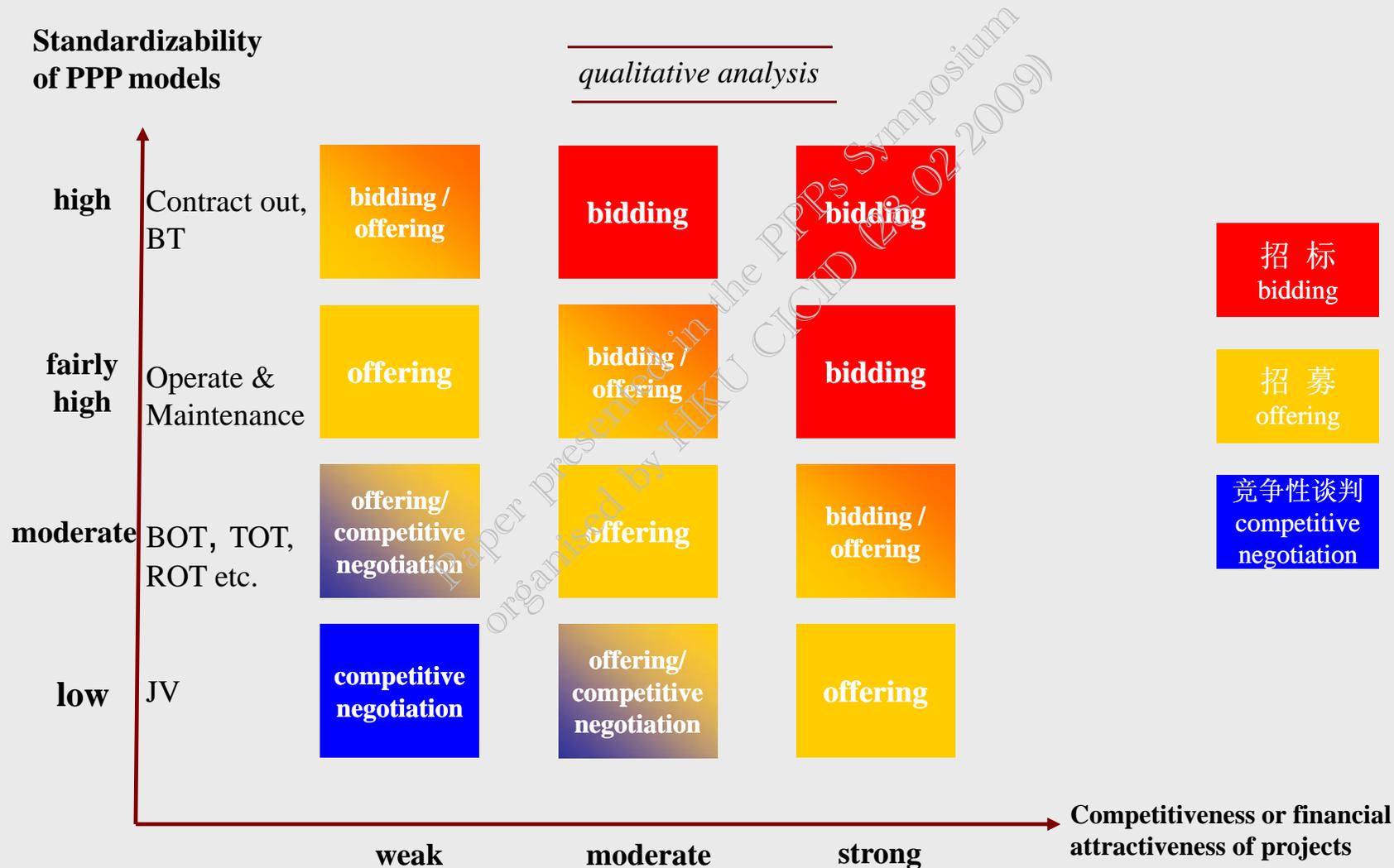
Clause 8, Municipal authority should award the concession right.....to qualified applicant.....**by means of public bidding or auction**.....

Clause 9, After failing to select a qualified operator by means of bidding or auction, municipal authority might select the concessionaire **by offering**

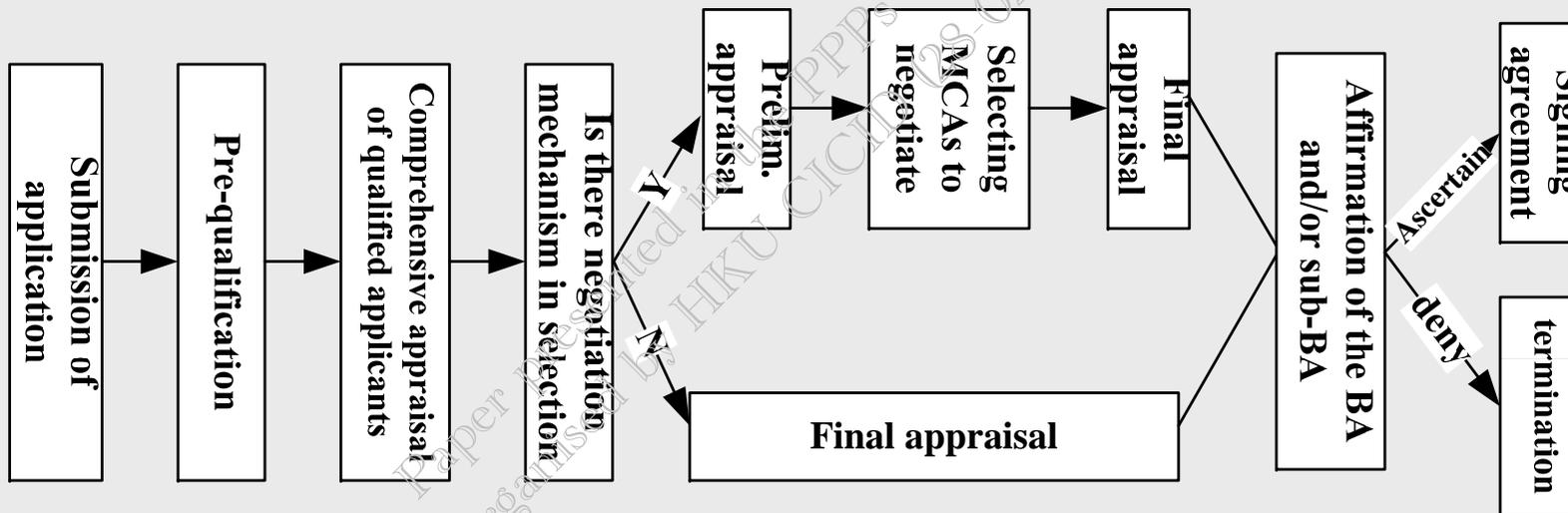
Existing “Tendering & bidding law” of PRC is incompatible with nature of infrastructure PPP procurement... 现行招标投标法的相关规定对基础设施PPP模式采购不具兼容性...

- Procurement of PPP projects differ from that of engineering works and its related goods and services as the former in most case comprises **financing** and **long-term operation** but the later doesn't. PPP项目的采购/招标与工程及工程相关的货物与服务的采购/招标具有很大差异，前者往往包含后者不涉及的**融资**及**长期运营管理**等采购内容。
- Indiscriminate application of **public bidding methodology regarding engineering work/goods/services** to PPP procurement results in forced irregular manipulation or fraud. 在不详加区分的情况下，容易出现几年前国内在PPP项目运作中生搬硬套**工程/货物/一般服务采购招标的方法学**，导致违法或不合理现象频现，严重影响项目运作成效。
- Jumbo has proposed to central government authority and was acknowledged that procurement of infrastructure PPP projects should be ruled by a special regulation. 我们已经建议国家有关部门**另行制定适合基础设施及公用事业的公私合作项目（PPP）**的采购及招标活动特点的**采购办法和实施细则**。

Jumbo's practices in mainland China support that infrastructure PPP projects should adopt some more appropriate competitive procedures to select private operators ... 实践显示基础设施PPP项目应可以有更切合实际情况的公开竞争程序来选择私营投资人...



Typical tendering and bidding procedure for selection of infra PPP investors 典型的基础设施PPP投资人招标遴选程序



special attention should be paid to some critical issues in relevant agreements of infrastructure investment ...基础设施项目投资相关法律协议的若干重要问题...

- **Market/buyer's risks allocation mechanism:** minimum supply quantity, minimum purchasing quantity, assured traffic flow; conditional limitation on approval of competitive projects
- **Exculsive right:** specific concession area, period, content of rights; obligation of governments to clear the way of obstacles for concessionaire when needed
- **Limitation of equity/project transfer:**
 - 1) pay attention to clauses concerning limitation of transfer of equity of SPV or project assets
 - 2) 3-5 years of freeze period is common
- **Limitation of project facility securing for project financing**
- **Asset disposal at the end of concession period:**
- **Tariff/ Price adjustment mechanism:** 1) formula of adjustment ; 2) application + public hearing + gov. approval; 3) negotiation

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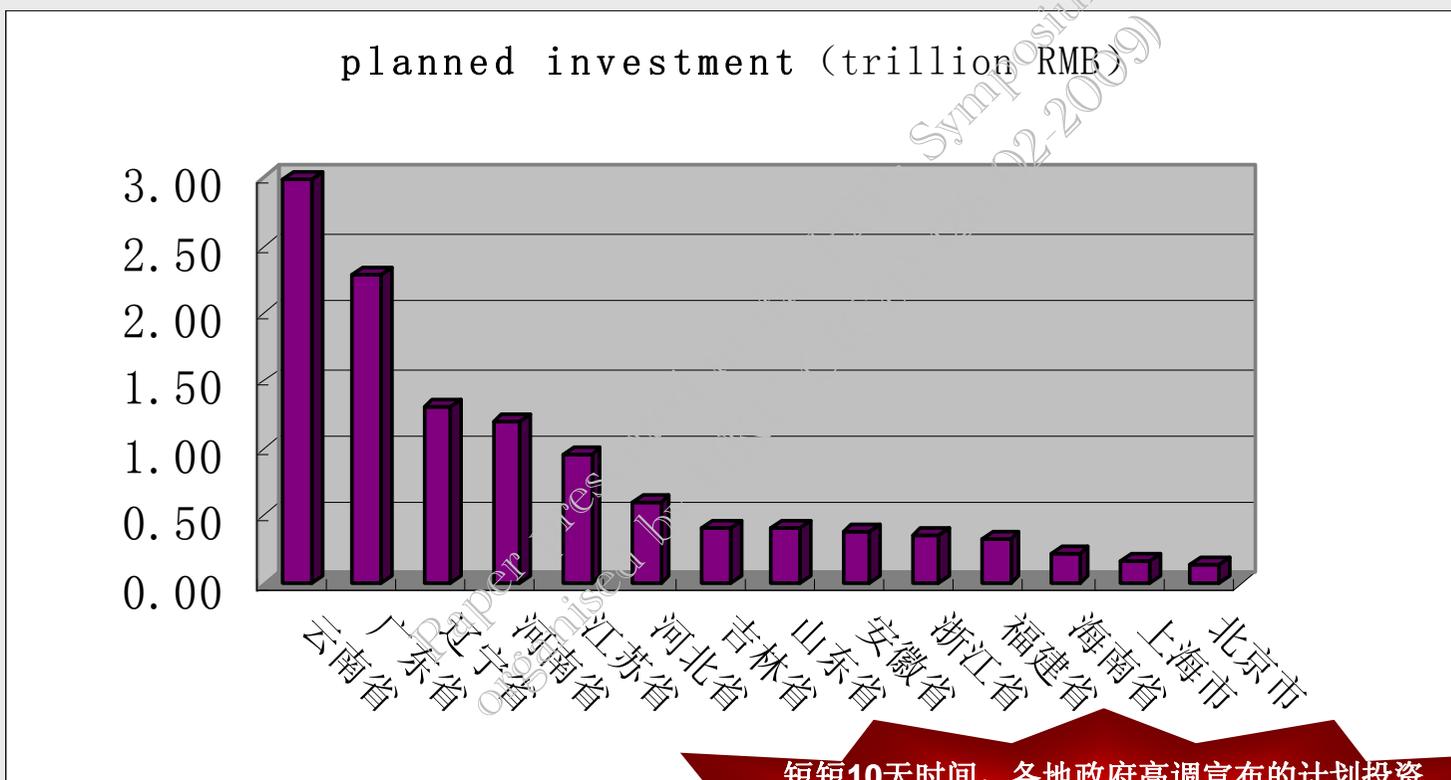
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无论您获得什么重大消息，除了看它上面有什么之外，最好还去了解一下它的下面是什么

Not only look at the upper part of any BIG news, but also pay attention to the lower part of it.

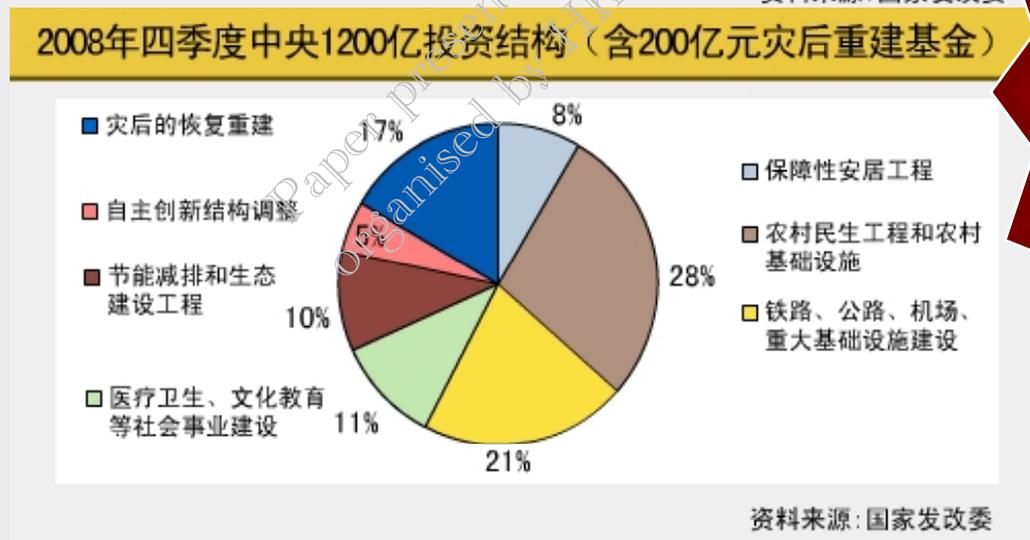
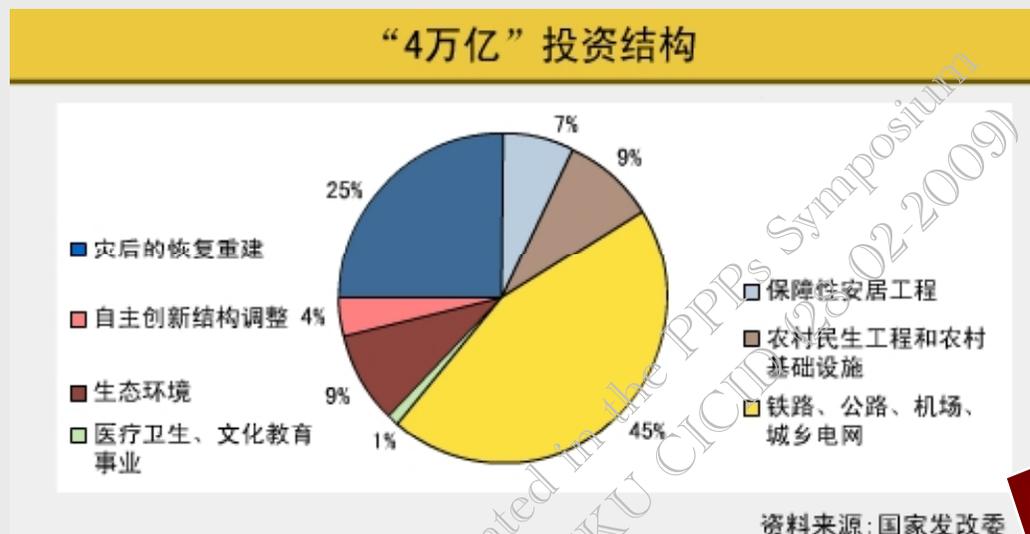
The figures of planned investment announced by local governments increased sharply... 中国地方政府宣布的计划投资金额日长夜长...



短短10天时间，各地政府高调宣布的计划投资金额达到惊人的18亿人民币 Announced investment figures of local governments increased rapidly to 18 trillion RMB within 10 days

...composition of mega investment of 4 trillion

...四万亿投资的构成



**四万亿投资重点倾向交通基础设施
Investment of 4 trillion will cover mainly the traffic sectors.**

The focus of ESP is infrastructure investment, especially of transport sector, but the key question is how local governments jointly fund this mega ESP as required? 经济刺激计划的重点投向是基础设施，尤其是交通基础设施，但地方政府的配套资金如何落实？

- Whether transport infrastructure, i.e. highway, railway, is over-invested in China is highly controversial itself. 交通基础设施本身是否存在过量投资问题，极富争议性。
- Where will local government find the required supporting fund for 4 trillion economic stimulus investment plan? 地方政府资金从何而来?
 - local fiscal resource?** collapsed LUR and RE market
 - loan from commercial banks?** decision independence & bankable
 - private investors?** ready for PPP? HK-Zhuhai-Macau Bridge Story
 - ESP: mega market** or just a **mirage** for infra investors?
- **Conclusion:** local authority might finally turn to private capital to fuel its investment plan

Thanks for Your Attention! Q & A...

感谢关注！问答...

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