

Instruments and obstacles on the way to sustainable mobility



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September 25th,
2014
Capital University
of Economics and
Business
Beijing



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第四届中欧社会生态与法律比较论坛
The 4th China-EU Social Ecological and Legal Forum

2014年9月25日-26日

Beijing September 25-26, 2014

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First of all **sustainable mobility is a matter of climate change** mitigation to secure the existence of mankind but simultaneously also the regional livelihood and development

首先，可持续的机动化可减缓气候变化带来的问题，从而以确保人类的生存，但同时也保证地区性的民生与发展。

Great decisive conference **2015 in Paris.**

2015年在巴黎召开的重大决定性会议

IPCC 2014 Fifth Assessment Report (AR5)

Least common denominator: to **act massively** and to **act now**

Otherwise **irreversible changes**

2014年政府间气候变化专门委员会第五次评估报告(AR5)

最低限度共识：最大程度地去行动并从当下开始行动，否则将发生不可逆转的变化

24 years have not been used to act significantly and things even worsened

过去的**24年**都未有重大的行动以致环境的恶化



Time is not on our side 时间对我们不利

Also Global trade union leaders:
世界贸易组织领导人也认为:

There is nothing more important than the dangers of a
warming planet

没有什么比地球变暖的危险更重要

No jobs on a dead planet

在一个没有生机的地球上不会有各种工作

"class war": world's poorest people paying the highest price
for the carbon production of the richest

“阶级战争”:世界上最贫穷的人为最富裕人的碳排放支付的
最高价格

The just transition must start now

公平的交易必须从现在开始



Unfortunately no progress in implementation of necessary principle of “**Common but differentiated responsibility**” (CBDR)
遗憾的是，在实现必要的“共同但有区别的责任”原则 (CBDR)上没有任何进展。

In Europe the comprehension of the necessity of a fair global solution worsened in relation to the time of Copenhagen
在欧洲，对公平的全球解决方案之必要性的理解比哥本哈根时代更坏

Ongoing institutional changes at the newly appointed European Commission to prevent further initiatives in the field of environment
正在进行机构改革的新任欧洲委员会在环境领域采取进一步的行动



Transport sector: key role in decarbonization of final energy use

交通部门：终端用能脱碳利用中的关键角色

Responsible globally for about 27 % of final energy use

可靠的全球终端能源消耗为**27%**左右

passenger and freight traffic are expected to rise sharply until 2050, →CO₂ emissions in this sector could double

到**2050**年，客运和货运预计将大幅上升□二氧化碳排放量在交通部门可能会翻番

Implementation of low-carbon technologies relatively more difficult in the transport sector

在交通部门实施低碳技术相对更加困难

But mitigation measures have to integrate the transport sector

但缓解措施必须被整合进交通运输部门

In the field of transport: European climate policy relatively worst performance - especially also in Austria

在交通领域：欧洲的气候政策也相对表现最差，特别是在奥地利

Also no strenght in the German “energy turn around”
同样，“能源逆转”在德国也没有优势

→ instruments have to be sharpened on all levels

- **obligatory aims**
- **compliance by fiscal consequences** (like in the field of public debts in Europe).
- 所有的手段应在各个层面得到高效利用
- 强制性的目标
- 合规的经济影响(如欧洲的公共债务)。



Unsuccessful stories in the field of transport in Europe

欧洲交通运输领域的失败

Regulation of addition of **biofuels** : adverse implications

增加生物质燃料的管理：不利影响

Relative CO₂ average **emission limits** for new cars at 130 g CO₂/km is loose
对新车二氧化碳相对平均排放量限制在**130克/公里**是宽松的。

Efficiency targets can not tackle absolute quantity targets: **rebound effect**
能效指标不能解决绝对数量目标的问题：反弹效果

Emission trade does not embrace transportation (Emission trade with absolute emission limits (caps) basically could work in somehow ideal markets; but the European reality: adverse effects and windfall profits for business).

排放贸易不包括交通运输（绝对的排放贸易限制通常可在某些理想的市场实现。但欧洲现实是：负面影响和商业暴利）。

Hybrid cars altogether have high resource use.

混合动力汽车可以高效的使用资源。

E-mobility can be a part of a solution but note source of energy production.

电动车可以成为解决方案的一部分，但需注意产能问题。

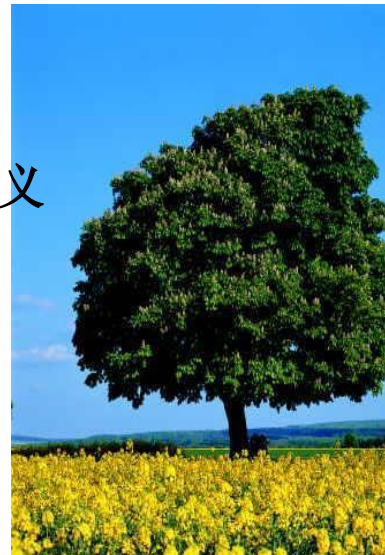


→THE MAIN LINE FOR SUSTAINABLE MOBILITY REMAINS THE MASSIVE DEVELOPMENT OF PUBLIC TRANSPORT starting in the cities.

可持续机动性的主线仍是公共交通在城市的巨大发展。

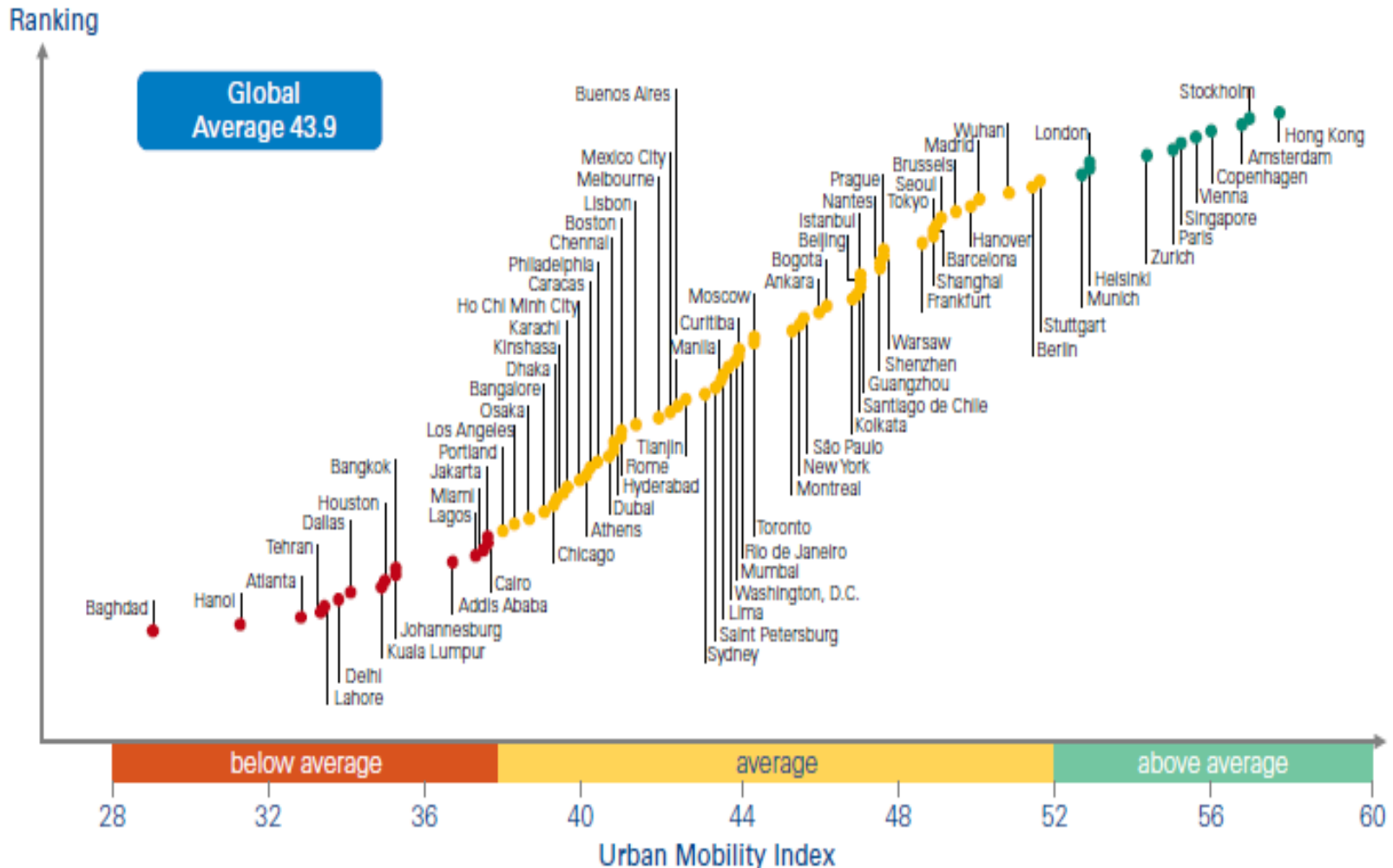
the wellknown causation scheme of **structure-conduct(behaviour)-performance** in public transport means: attractive structures → people will use public traffic.

著名的"结构-行为(行为)-绩效"因果关系公式在公共交通领域的含义是：具有吸引力的交通方式□人们会使用公共交通。



Urban (sustainable) mobility index

Figure 6: Arthur D. Little' Urban Mobility Index 2.0



Source: Arthur D. Little Urban Mobility Index 2.0; UITP is independent of this index, which does not necessarily reflect its opinion; 100 index points for city that would achieve best performance on each criteria.



High potentials of improvements in European cities and city regions 欧洲城市和城市地区的改进潜力很大

Also in the (allegedly) high performing city like Vienna: high potentials of improvements
(据称)例如在维也纳的表现即为高潜力的改进

Negative example of European (and American) development : SUBURBANISATION (urban sprawl)
with negative consequences to land use, transport and social segregation.

欧洲(和美国)发展的负面例子:**SUBURBANISATION(城市扩张)**伴随着土地利用、交通和社会隔离的负面影响

。

In China this tendency is in the beginning phase and still could be avoided.

在中国，这种趋势尚处于开始阶段还是可以避免的。



Urban- rural paradoxes in motorization (car/population) 机动化中的城市-农村悖论(汽车/人口)

In Austria:

Highest motorization rates in rural areas with a bad public transport system

→ makes rural people poorer because of high costs of cars.

在奥地利:

农村地区的机动化比率最高但却有着最糟糕的公共交通系统

□因为使用汽车的成本高, 使得让农村的人口更贫穷。

In China:

Motorization in urban areas is much higher in China

– because of income dependency of demand for cars.

- although in rural areas cars could have more benefits

在中国:

机动化在中国城市地区要高得多

——原因在于高收入带来的对汽车的需求。

——虽然在农村地区使用汽车可能有更多的好处。



Spatial planning matters

空间规划问题

Urban areas: responsible for 70 % global energy-related CO2 emissions

城市地区：需对全球能源相关的70%二氧化碳排放量负责

Biggest share of future urban growth is expected in small to medium sized towns and cities in developing countries

未来城市增长最大份额预计将在发展中国家的中小型城镇

majority of urban infrastructures are just being built → decisive opportunity,
大多数城市基础设施仅在建设中·决定性的机会

Not technology but planning matters

for avoiding urban sprawl and for changing behaviour

避免城市扩张和改变行为，并非技术而是规划问题



Historical Chinese characteristics in the field of transport 1

历史上具有中国特色的交通运输领域 1

The unique **Chinese history** basically was **based (also) on solutions for transport (water)** which had been optimized (ELVIN)

独特的中国历史(也)基本上是基于解决交通运输(水运)的优化方案(ELVIN)

Current tremendous export performance in China **based also on systematic use of a special paradigm of transport, the container** with competitive advantages

目前，中国巨大的出口贸易也是基于大规模使用的特殊交通运输模式，具有竞争优势的集装箱。



Historical Chinese characteristics in the field of transport 2

历史上具有中国特色的交通运输领域 2

Modern **containers are not really high tech** but grounded on the intermodality of transport - need for organization, regulation and coherence
现代化的集装箱并非高科技，它多式联运为依托，需要组织、监管和连贯性。

High speed of construction of **high speed train routes** shows potentials
飞速建设的高速列车路线显示出巨大潜力。

(Geographical) **“Chinese characteristics“ of higher density of population** potentially promote higher efficiency of public transport
(地理学意义上)更高密度的人口这一“中国特色”可能促使公共交通的效率更高。



Historical Chinese characteristics in the field of transport 3

历史上具有中国特色的交通运输领域 3

China has always been very **successful in disseminating innovation**.
中国一直是非常成功的在传播创新。

China within long periods accumulated “**social capital**” to solve organizational societal problems for huge number of people
中国长期以来积累“社会资本”用于解决大量人口的结构性问题。

Also currently innovative solutions for sustainable transport mainly are not technological but societal → China: **high potential to achieve new paradigms**

同样，可持续交通目前的创新性解决方案主要不是技术，而是社会 □ 中国：具有实现新范式巨大潜力



Singapore, Los Angeles or Switzerland as benchmark?

以新加坡、洛杉矶和瑞士作为基准?

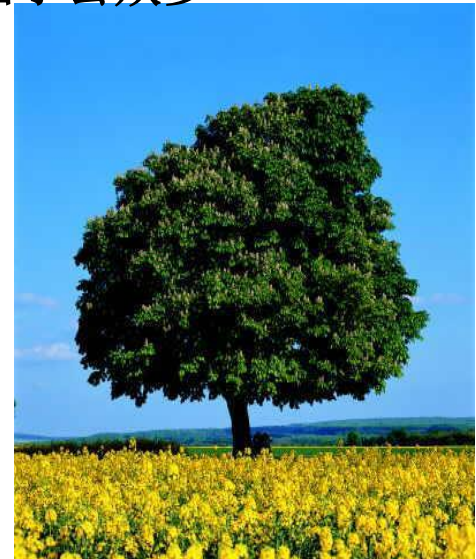
When objections: Hong Kong or Singapore are single city entities...
...look at **Switzerland**: good public transportation system also in peripheral regions

当反对意见出现时：香港或新加坡是单一的城市...

...看看瑞士：良好的公共交通系统也出现在城市外围地区

The story behind the example of Switzerland is **participation** of people: In Switzerland a comprehensive system of public transportation was implemented by participation in the last decades

瑞士作为典范的故事背景是公众参与：在瑞士，过去几十年由于公众参与，一个全面的公共交通系统才能够运行。



Can the west transform to sustainable mobility?

Can China learn from impasses of motorization in the west?

西方可以向可持续机动化转变么？

中国能从西方机动化的僵局中学习到什么吗？

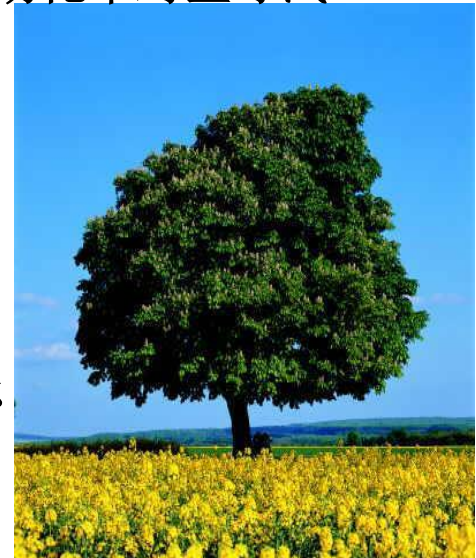
Motorization rate (number of cars in % of population) in China altogether still is relatively low: About 10 % - in EU about 50 %

中国约为**10%**的机动化率(汽车数量比人口数量)仍然整体相对较低，而欧盟的机动化率约为**50%**。

But the **rate of change** in China is tremendous, and the huge **potential** to 50 % motorization rate is an **overwhelming incentive for global car industry**

但是其在中国变化的速度是惊人的，中国**50%**的巨大潜在性机动化率对全球汽车行业来说是一种势不可挡的刺激。

But in China basically the reason to improve air quality is coinciding stronger with the global issues- increasing pressure of the national livelihood probably could trigger China as first country to transform to sustainability
但在中国改善空气质量的原因通常与全球性问题的紧密性更强——增加国民生计的压力可能会引发中国第一个向可持续发展转变的国家。



Long-term goal almost zero emission transportation

长期目标几乎零排放交通工具

The necessary innovative solutions for sustainable transport require **strong regulations AND implementation, monitoring and control.**

可持续交通所必需的创新性解决方案需要强有力的法规与执行，监测与管理。

What should be the long-term goal for cities but for almost zero emission transport?

城市几近零排放的交通运输应当以何为长期目标呢？

Examples of **short-term measures** e. g.:

短期应对措施的例子如下：

- Implementation of **mobility management** on the levels of plants communities, villages, districts and so on.
- 实施机动化管理要以植物、社区、村庄、地区等为参照基础。
- Implementation of high taxation of advertisements for cars
- 对汽车广告征收较高的税



Oligopolistic obstacles for basic innovation

寡头垄断为基础创新障碍

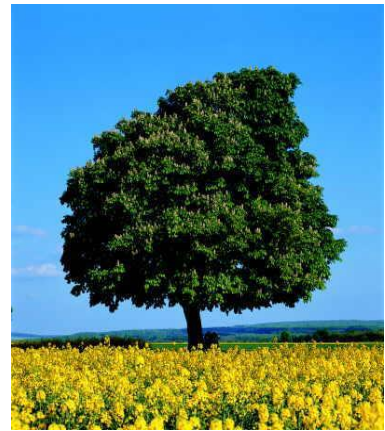
Firstly the growth rate of fossil car production has to be reduced globally (“degrowth” of fossil car production) + transformation to sustainable transport
首先，全球化石能源型汽车产量的增长率会减少(化石汽车生产的“退行生长”)+向可持续交通的转变

But is this giant aim realistic at an ongoing capital accumulation in the car industry?
但这个巨大的目标是汽车行业实现持续的资本积累吗?

•When strongest oligopolies are locked in unsustainable technology and see huge potential on the Chinese markets?
当寡头最强锁在不可持续的技术和看到中国市场巨大的潜力吗?

•When Chinese companies lose market shares against oligopolistic competitors?
当中国企业失去市场份额时还是寡头垄断竞争对手吗?

•When Chinese companies see the way out in consolidation
- what will be left from the “free market”?
当中国企业在合并时会看到出路——“自由市场”会剩下什么?



Intermodality matters

多式联运的问题

Public transportation is an interactive system. It requires systemic views, planning and not only short-term solutions to improve the efficiency of intermodal transportation systems.

公共交通是一个互动的系统。它不仅仅需要短期解决方案，提高多式联运交通系统的效率，还需要系统性视域和规划。

Also fares in personal transport have to reflect intermodality to be attractive (e.g. compound train-bus tickets).

在个人交通工具票价也反映(如通道间要有吸引力。复合**train-bus**门票)。

Privatisation in an interactive system could hardly have optimal performance.

私有化在多式联运系统中几乎不可能达到最理想的状态。

Public transportation in times of climate change has become definitely part of the Commons (Ostrom)

公共交通在气候变化时代已成为公有物不可或缺的一部分
(奥斯特罗姆)



Advertising and the socio-ecologic transformation

广告宣传与社会生态转型

- Highly imprinting the individual in western societies, beginning with children
在西方国家对个体的早期教育十分重视，从儿童做起。
- Interaction of “big corporate” and “big media”. Media increasingly financed by advertising. New media like Google aggravate this phenomenon.
大公司与大媒体的融合，媒体越来越得到广告的资金，新兴媒体诸如谷歌使这一现象更显著。
- Form of advertising is blockading the transformation towards sustainability
广告形式封锁了迈向可持续发展的转型。
- Advertising important in the globalisation of unsustainable consumer styles
广告在非可持续的全球化消费方式中起着重要作用
- by strongly influencing the preferences,
强烈影响的偏好
- wasting of resources
浪费资源
- for protection of market power and so decreasing possibilities for fundamental innovations “lock-ins”.
保护市场支配力与降低掣肘根本性改革的可能性。



Advertising广告

- Commercial advertising is a result of oligopolisation. Because products often do not differentiate marketing by constructing brand images is made
商业广告即是垄断的结果，因为产品为了树立产品形象而无法进行有差别区别营销。
- At the same time this strengthens oligopolisation in establishing by “entry barriers” and outkicking small and medium enterprises (SME).
同时，这些优势垄断寡头设立了“门槛”，将中小型企业拒之门外。
- The consequence is the reduction of the role of consumer sovereignty
结果是消费者的权利和作用被减损。
- China could avoid still undesirable developments by regulation
•中国可以通过规制来避免这些不理想的发展路径。



Advertisingsolutions 广告缺陷的矫正方法

- The ban of commercial advertisement would be optimal.
禁止商业广告是首选。
- But also step by step measures of strong regulations. See the successes in the advertisement for cigarettes in USA and EU.
但是，要逐步建立强有力的规制措施。可参考美国和欧盟推销烟草的成功经验。
- Stopovers can be the *Ban of advertising in public spaces*,
•中途截留可用于在公众场合禁止做广告
- The *control of advertising on the Internet*,
•对网络广告进行控制
- The end the commercialization of childhood.*
杜绝儿童商业化
- In the neoliberal era taxes on advertising had been abolished or reduced. They could/SHOULD be AGAIN a relevant source for public budgets.
•在新自由时代，广告税收已被取消或被降低



Some special points: **More Binding impact assessment of laws**
一些特殊建议：使影响评价法律更具有拘束力

- Prices currently only partly reflect social and ecological needs, and do not cover many costs → Harms are “externalized”.
当前价格仅部分地反映了社会和生态需求，没有包括很多方面的成本，损害被“外在化”了。
- For the **internalization of costs**, for “right” prices some regulation is necessary, at least taxes, e. g. **carbon taxes**.
为了是策划年根本内在化，对价格进行合理规范是必要的。
- → Law drafts (and laws) should be subjected more to a comprehensive economic, social and ecological **impact assessment** to consider future values, benefits and harms.
- 法律法规应当进行更全面的经济、社会和生态影响评价，兼顾未来值、利益和损害后果。



Conclusion

It is well-known that Confucius mentioned three methods to learn (wisdom): by reflection, imitation, and experience, the last one would be the bitterest. Environmental laws and their implementation could be assigned to the first ones.

众所周知，孔子说，学习分为三种境界：知之、好之、乐之。最后一种境界是最难的。环境法律及其实施可以归于前两种境界。

It always seems impossible until its done.
(Nelson Mandela)

