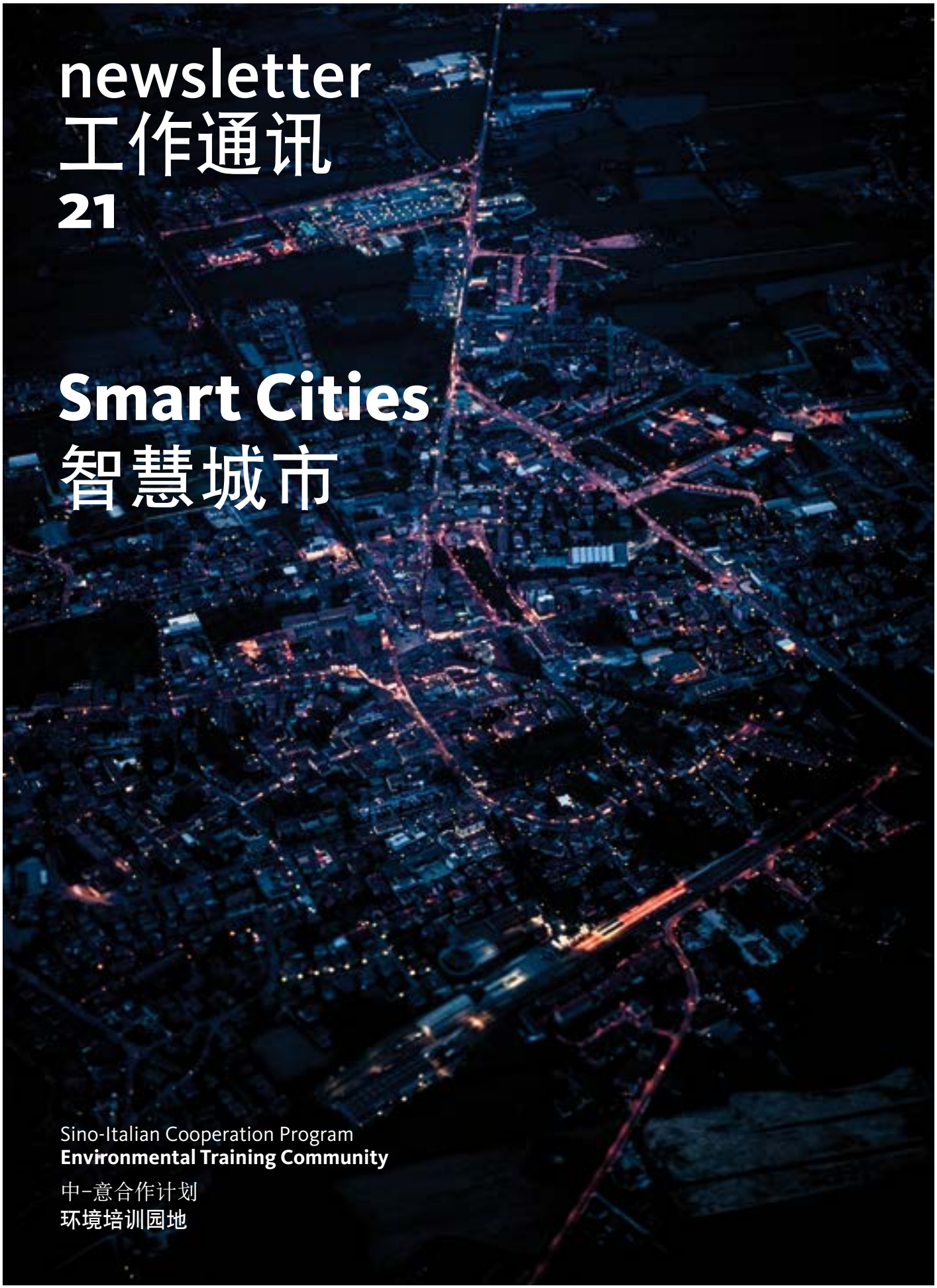

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MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

Venice International University

AGRINNOVA

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工作通讯电子版

editorial
编者寄语

Given the expected rise in urban populations in China and the world, all city governments should be active in implementing all possible tools to improve urban life and promote their citizens' well being. The Beijing Municipality has been working on this issue for many years. In this process, Beijing is always open and ready to learn the lessons and experience of European cities in dealing with environmental problems.
Since 2003, 2-4 trainee groups from the city government have traveled to Italy each year to attend training sessions on different subjects. Up until now, 475 people have participated in 27 sessions of in-depth and subject-specific training courses.
The training programs have covered various aspects of environmental protection and sustainable development, such as environmental legislation and policies, air quality management, vehicle emission control, water pollution control, low-carbon economy, intelligent transportation and solid waste management - topics that are all very useful for the development of a green and smart city. These carefully arranged training courses provide informative lectures and opportunities for site visits, discussions and the exchange of views. Thanks to these, the professionals of Beijing EPB and its subordinates, Italian scholars, experts and environmental managers were able to talk face-to-face, hold in-depth discussions and learn from each other.
Each session of subject-specific training opened a window for my colleagues to attain a better understanding of the environmental management system and Italian and EU policies. From these we have learnt environmental management tools, concepts and techniques regarding the total pollutants Cap and Trade, emissions inventory, new standards for vehicle emission, quality fuel management and intelligent transportation. These have been in practice in Italy and other EU countries for many years and are now being applied progressively in Beijing. By referring to the managerial experiences of Italy and other EU countries, Beijing will surely have its environmental management system and pollution control measures improved.
While my colleagues took part in the training course, they also enjoyed the opportunity to visit many Italian cities and were deeply impressed by the extensive history and profound culture and art of Rome, Venice, Florence and Milan, which more than once made them marvel at the glorious Italian and European culture. Moreover, they are very grateful for the hospitality and meticulous arrangements made by the training team at Venice International University. The Sino-Italian Cooperation Program on Environmental Training has offered a platform for further exchanges and cooperation between the two countries in the field of environmental protection, and has built a cultural bridge between China and Italy. We are honored to be members of this platform, and look forward to maintaining and enhancing this exchange and cooperation mechanism, creating a win-win development with mutual benefits.
I hope that the Sino-Italian Cooperation and exchange on environmental protection will continue to make great achievements.

Chen Tian, Director General of Beijing Municipal Environmental Protection Bureau

由于中国和全球范围内城市化人口的不断增长，各国政府积极实施各种可能的方法和措施以改善城市生活质量提高人民的生活水平。北京市政府多年来致力于此。在这个过程中，北京非常积极并开放的学习欧洲城市在解决城市环境问题方面的经验和教训。
2003年以来，北京市环保系统每年派出2-4个培训团组，赴威尼斯参加不同专题的培训。截止今天，北京市环保系统已累计有475人次赴意大利参加了27期高级专题培训。
培训的专题涉及了环境保护和可持续发展的各个方面，包括环境立法及政策、空气质量管理、机动车污染防治、水污染防治、低碳经济、智能交通、固体废弃物管理等等，这些专题对于绿色和智慧城市的发展非常有帮助。这些精心安排的培训课程提供了内容丰富的讲座和现场考察、研讨交流机会，我们的专业人员得以与意大利的学者、专家和环境管理者密切接触、深入讨论，互相学习。
每一期的专题培训，都为我的同事们打开了一扇了解意大利和欧盟环境管理制度、政策和技术的窗口，从中我们学习了解到意大利和欧盟实践多年的污染物总量控制与排放交易、污染物排放清单、机动车排放新标准、燃油品质管理、智能交通理念等环境管理手段、理念和技术已经陆续在北京得到应用。意大利及其它欧盟国家的经验和教训为我们完善北京市的环境管理制度和污染治理措施提供了有益的支持。
同时，通过培训，我的同事们还得到机会，访问了意大利的多个城市，他们被罗马、威尼斯、佛罗伦萨、米兰这些城市散发出的浓厚的历史、文化和艺术气息深深吸引，常常由衷地赞叹灿烂的意大利和欧洲文化。威尼斯国际大学培训团队周到细致的安排总是给他们宾至如归的感觉。中意合作环境管理培训的平台既加强了中意双方在环境保护领域的交流与合作，又搭建了中意文化交流的桥梁纽带，我们非常荣幸能够参与其中，并希望这种互利共赢的交流合作机制能够继续保持和不断深化。
祝愿中意环境保护的合作交流不断取得新的更大成绩。

北京市环境保护局 陈添局长

World Energy Outlook Special Report 2013

The International Energy Agency (IEA) recently published the World Energy Outlook Special Report 2013, entitled "Redrawing the Energy Climate Map". The report analyzes the global CO_2 emissions trend and reveals that the world is not on track to limit the global temperature increase of 2°C compared to pre-industrial levels. The current trend is more likely to result in a temperature increase of between 3.6 °C and 5.3°C instead.
At the same time, the IEA stresses the fact that the energy sector accounts for nearly two-thirds of global greenhouse-gas emissions. Since the agreements on climate change are currently at a

standstill, it would be possible to start acting immediately on the energy sector in order to keep climate goals alive while international negotiations continue.
In particular, the report suggests four energy policies that could be applied worldwide without harming economic growth:
_ enforcing specific energy efficiency measures in buildings, industry and transport, which would account for nearly half the emission reductions in 2020;
_ limiting the use of the least efficient coal-fired power plants, with the additional benefit of improving local air quality;
_ reducing the methane losses connected with the upstream oil and gas industry;
_ implementing a partial phase-out of fossil fuel consumption subsidies.
These policies presented by the new IEA report could lead to greenhouse-gas emissions 8% (3.1 Gt CO_2-equivalent) lower in 2020 than the level otherwise expected.
The suggested actions have been selected among those most likely to deliver significant emission reductions by 2020, relying solely on existing technologies and already successfully adopted in several countries.
The report also demonstrates that the energy sector, in its own interest, needs to immediately address the many risks implicit in climate change in order to avoid higher costs later, as the need to curb emissions becomes imperative.

世界能源展望专题报告

国际能源机构（IEA）最近公布题为“重绘能源气候图”2013《世界能源展望》报告。
报告分析了全球二氧化碳的排放趋势，为实现全球气温升幅不超过两摄氏度的目标蒙上了阴影。人类目前所走的路径可能导致全球温度上升3.6至5.3摄氏度。
该报告同时指出能源行业占全球温室气体排放的三分之二强。由于气候变化的协议谈判停滞不前，因此建议在能源行业率先行动，以便随着气候谈判的推进，气候目标仍然有望实现。报告并就此提出了四项政策建议，以有效遏制温室气体排放。这四项建议包括：
——增加建筑、工业及运输等方面的能源效率，这部分减排量相当于温室气体排放量降低一半；
——限制效率低下的燃煤电厂的兴建和使用；此举同时有益于对空气质量改善
——在抽取石油和天然气时，减少甲烷的外溢，
——同时逐步减少对化石燃料的补贴。
通过实施国际能源署提出的建议措施，即：采用已经在一些国家中成功应用的成熟技术，即可实现到2020年减少8%的温室气体排放（相当于减排了3.1Gt 二氧化碳当量）。
报告还表明，能源行业从其行业自身发展的角度，应立即采取措施解决对气候变化所带来的许多风险，以避免将来付出的高昂减排代价。

中国发布新空气污染行动计划

2013年9月中旬中国政府发布了有史以来最严厉的措施以遏制空气污染——《空气污染的国家行动计划》。
行动计划确定了中国所有的338个县级城市的具体行动目标。与2012年相比，到2017可吸入颗粒物浓度（直径10微米或更小）必须至少下降百分之十。
在一些关键地区设定了更为严格的目标。与2012相比，到2017年，北京、天津和河北省的$PM_{2.5}$（颗粒直径小于2.5微米，能深入渗透到肺部）浓度必须降低约百分之二十五。长江三角洲地区的削减目标是百分之二十左右；珠江三角洲地区削减约百分之十五。
35项措施包括将污染物削减到可控范围内（如挥发性有机化合物），

New China's Action Plan for Air Pollution

In mid-September 2013, China's government released the toughest-ever measures to combat airborne pollution: the National Action Plan for Air Pollution. The action plan sets specific goals for all of China's 338 county-level cities.
By 2017, the concentration of breathable suspended particles (with a diameter of 10 microns or less) must fall by at least 10 percent compared to 2012.
Tougher objectives have been set for a number of key areas. The regions of Beijing, Tianjin and Hebei province must reduce the concentration of $PM_{2.5}$ (particles smaller than 2.5 microns in

diameter, which can penetrate deep into the lungs) by about 25 percent by 2017, compared to the 2012 level. The target for the Yangtze River Delta region is around 20 percent, and roughly 15 percent for the Pearl River Delta region.
Major measures among the plan's 35 items involve bringing pollutants (such as volatile organic compounds) under control, achieving negative coal consumption in several regions, accelerating the process of monitoring and disclosing $PM_{2.5}$ readings, extending monitoring from 119 to all 338 county-level cities before 2015 and banning heavily-polluting motor vehicles from the streets by 2017.
Experts and officials said the plan may have an adverse effect on some industries, but will also favor many others, such as encouraging industries like steel and coal to grow in a much healthier mode.
The action plan is deemed the toughest ever, not just because of the stringent targets it sets, but also because of its performance assessment system for which the Organization Department of China's Communist Party will be involved in environmental action plans for the first time.
The department has the power to appoint or dismiss officials. If local governments fail to reach their allocated targets, it may affect the positions and political futures of the officials involved.

China Starts Carbon Trading in Shenzhen

China's first pilot carbon trading scheme was launched in the southern mega city of Shenzhen in June 2013. The scheme is set to cap emissions for 635 carbon-intensive companies, accounting for about 40 percent of the city's carbon emissions. Under the trading program, those that emit below their quotas are able to sell the excess to other emitters or even investors for profit.
China's state-owned energy giant PetroChina and privately run power plant Hanergy were the two largest buyers in the first group under the scheme. Eight deals, or 21,112 ton carbon quotas, were traded on the launch day of the market, with prices ranging from 28 to 32 yuan (5.2 U.S. dollars) per ton.

在一些地区实现煤炭消费负增长，加快监测和披露PM $_{2.5}$监测结果的进程，到2015年前将119个监测城市扩大到338个县级市，到2017年前禁止污染严重汽车驶入街道。
一些专家和政府官员表示，该计划尽管可能会对某些行业造成不利影响，但对钢铁和煤炭等行业，必定会产生良好效果，会促进这些行业进一步健康发展。
行动计划被认为是有史以来最严格的，不仅仅是因为它设置严格的目标，而且还因为中央组织部将参与到行动计划执行情况的考评工作中。这在环境保护领域尚属首次。
中央组织部负责领导干部的任免。如果地方政府没有完成所下达的目标任务，将会对其官员的任职和升迁直接造成影响。

中国在深圳开启碳交易

中国第一个碳交易试点计划于2013年6月在南部大城市深圳启动。该方案涵盖635家碳排放强度较大的企业，约占该城市碳排放总量的百分之四十。根据该计划，排放量低于配额的企业可以将其剩余排放额度出售给其他的企业，或者卖给相关投资者赚取利润。
在该计划下，中国国有能源巨头中石油和民营电厂汉能是两个最大的买家。在推出市场交易的首日共交易了8笔，交易额达21112吨碳配额，价格在每吨28元到32元（约5.2美元）之间。
作为中国最高的经济规划机构国家发展和改革委员会，还批准在另外六个地区开展碳排放交易，包括北京，天津，上海，重庆，湖北和广东。专家和政府官员对试点方案纷纷表示称赞，认为该方案是在全国建立碳排放交易市场的里程碑。
中国已承诺到2020年，单位GDP二氧化碳排放量将在2005年的基础上减少百分之四十至四十五。

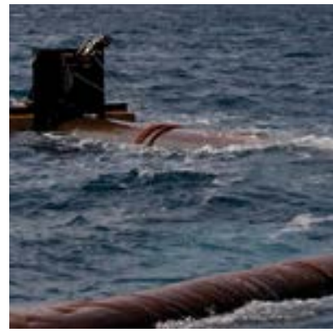
China's National Development and Reform Commission, the top economic planning agency, also approved pilot carbon emission trading schemes in six other areas: Beijing, Tianjin, Shanghai, Chongqing, Hubei and Guangdong.
Experts and government officials hailed the pilot schemes as a landmark step for China in building a nationwide carbon emission trading market.
The country has pledged to reduce carbon dioxide emissions by 40 to 45 percent per unit of GDP by 2020, compared to 2005.

Power from the Sea's Waves: First Pilot System to be Installed in Italy

Italy's Enel Green Power, the world leader in renewable energy generation, together with 40South Energy and a group of highly innovative companies operating in the field of marine energy at the international level, recently commenced the installation and commission of the first R115 generator, with a nominal capacity of 150 kW and an installed capacity of about 100 kW, generating electricity from the energy produced by the sea's waves near the Tuscan islands.
The new generator ensures full integration into the marine environment and ease of maintenance and, according to initial estimates, will enable the generation of about 220 MWh per year: enough to meet the needs of over 80 households. The generation of marine energy is an especially effective solution in cases where it is difficult to connect to the electricity distribution grid, as is the case, for example, on islands.
The installation of the submarine assembly will be completed in a few weeks by 40South Energy.
The company will also provide ordinary and extraordinary maintenance services.
After testing and assessment of the performance of the system in the marine environment by the partners, the companies plan to strengthen their collaboration on the international stage.
In fact, in addition to the sale of the first R115 generator and technological cooperation on testing, the agreement among the companies includes the possibility of installing more generators in different marine environments.

海浪发电：在意大利建立的第一套示范系统

意大利Enel绿色电力公司是可再生能源发电领域的世界领导者。
该公司与40 South能量公司及一批具有国际水平的、从事海洋能源的高新技术企业，最近成功安装了第一台R115发电机，该机的标称容量为150千瓦，装机容量约100千瓦，将利用托斯卡纳群岛附近的海浪能来发电。
新发电机将充分融入海洋环境，并便于维修。据初步估计，年发电量将达约220兆瓦，足以满足80多户的用电需求。在电网不覆盖的地区，例如在海岛上，海洋能发电是一个特别有效的解决方案。
40 South公司负责在几周内完成该设备的海下安装。该公司还将提供常规和特殊维修服务。
在合作伙伴对该系统在海洋环境下的测试和评估完成后，这些公司计划进一步加强在国际平台上的合作。事实上，这些企业之间的协议不仅包括第一台R 115发电机的成功销售和在测试方面的技术合作，而且还包括力争在不同的海洋环境下安装更多的发电机。



Smart Cities: the Way Forward for Post-Industrial Cities
智慧城市: 后工业化国家的发展出路

Gabor Heves,
Environmental Policy Directorate
The Regional Environmental Center for Central and Eastern Europe
中-东欧区域环境中心环境政策司

城市工业化和快速发展所带来的负面影响在世界范围内是显而易见的。正当中国城市进入快速现代化的阶段，欧洲和北美城市已经进入后工业化时代，进入缓慢增长或滞增长阶段。随着人口总数保持稳定（或者有时出现下降），欧洲确定的总体目标是全面改善居民生活质量，即：通过运用最新科技成果，增强经济竞争力，获得高质量的生活环境。同时，以质量为导向的城市应该降低能源消耗和二氧化碳排放、减少外部威胁带来的易损性。所有这些要求催生了一个新的概念，并更多地被人们描述为“智慧城市”。

智慧城市的概念和要素

在普通公众常用的语言里，“智能手机”这个词已越来越被大家所熟悉。它的意思是“把我们生活中不同领域的信息和通讯技术集合在一起”。而“智慧城市”的概念就是以类似的方式将信息和通讯技术(ICTs)集合运用到我们的城市环境中，包括基础设施网络（水管网、电网）、建筑或者交通系统中。不过，与数字城市、智能城市的传统定义相比，“智慧城市”的概念要更完整些。智慧城市的目标是：充分挖掘新型通讯技术所带来的经济收益，同时提高社会和环境质量。简而言之，智慧城市是广泛依靠数字通讯技术的可持续发展城市。

智慧城市从三个方面提高了投资和创新的速度：提高了城市居民的生活质量；增强了经济竞争力；并提高了环境的可持续性。作为一个基本原则，就是将曾经相互孤立的城市基础建设系统，利用现代智能技术进行集合处理。这里的关键词是“集合”。一个很好的例子就是智能电网：将供电网与建筑物（如：屋顶光电系统）和交通系统（如：电动车）集合在一起。

通过这种整合，它满足了所有的三个主要因素：

The adverse effects of industrialization and the fast growth of cities are apparent all over the world. While Chinese cities are mainly in this fast-growing modernization phase, European and North American cities are already in the slow or no growth, post-industrial phase. With population levels stabilizing (or sometimes even shrinking), the overall goal in Europe now is to improve the general quality of life. The aim is to increase the economic competitiveness and the quality of living by using the latest technologies. At the same time, these quality-oriented cities should reduce energy consumption, CO_2 emissions and vulnerability to external threats. All these indicate the emergence of a new concept, which is now increasingly described by the term “Smart Cities”.

Concept and Elements of Smart Cities

In the public terminology, most people are now familiar with terms such as “smart phones”, indicating the integration of information and communication technologies into different fields of our lives. In fact, a Smart City is similar in this regard in that it integrates information and communication technologies (ICTs) into the fabric of our urban environment, such as infrastructure networks (e.g. water networks or electric grids), buildings or transport systems. However, the concept of a Smart City goes one step beyond the traditional definition of a “digital city” or “intelligent city”. The aim of a Smart City is to exploit the economic benefits of new communication technologies, while at the same time increasing social and environmental quality. In short, a Smart City is a sustainable city that relies extensively on digital communication technologies.

Smart Cities accelerate the rate of investments and innovation in three main areas: increasing the quality of life of city-dwellers; enhancing economic competitiveness; and improving environmental sustainability. As an underlying principle, these elements are tackled in a comprehensive way by integrating smart technologies into traditionally isolated urban infrastructure systems. The keyword here is “integration”. Smart electric grids are a good example of this: they integrate the power network with buildings (e.g. rooftop photovoltaic systems) and transport

(e.g. electric vehicles). This integration satisfies all three main elements: it increases quality of life (by increasing security of supply and offering cost savings), enhances economic competitiveness (by optimizing the overall system and lowering investment costs) and improves environmental sustainability (by integrating large volumes of intermittent renewable energy sources into the power system).
To accelerate the process of transition towards a Smart City, there is a need for a range of incentives. The EU's "Smart Cities Stakeholder Platform" describes these as "markets" and "enablers". On the demand side, first a market has to be created by assisting the adoption of innovations. Then, the market of these new innovations should be expanded, supported by green procurement procedures. On the "enabling" side, the incentives can include: cintegrated city planning; 2) financing; 3) technological standards and interoperability; 4) training; and 5) stakeholder involvement.

The Main Driving Forces

The concept of Smart Cities is propelled by a number of driving forces: technological innovations as the baseline, the need to solve urban problems, and governmental policy initiatives. The technological innovations of the past 20 years have brought a number of applications to the market that can turn almost everything in a modern city into "smart"; from sewage networks through to low-energy buildings and public transport systems. While the aim of technology providers is to create business, on the customer side the aim of municipal governments is to lower the overall investment costs by acquiring integrated systems that best match their needs.
Recognizing the different interests of technology providers and city representatives, the European Commission has started a new initiative called the "European Innovation Partnership for Smart Cities and Communities", which aims to create strategic partnerships between industry and cities. Its most recent phase began in 2012 and has an annual budget of EUR 365 million. This money is largely spent on easily replicable large-scale lighthouse projects.
An important pillar of this partnership is the so-called "EU Smart Cities Stakeholder Platform". It is primarily an online space, with the aim to bring together the expertise of various interest groups to identify the most promising smart city technologies and to recommend them for further development, financing and implementation. At present, more than 150 such technological innovations have been collected through the website. The best ones are selected and grouped into integrated technology clusters by the volunteering experts who meet in thematic working groups twice a year. At present there are four thematic working groups: 1) Energy efficiency and buildings; 2) Energy supply and networks; 3) Mobility and transport; and 4) ICT for Smart Cities. The entire online content, as well as participation

提高生活质量（通过增加供应和节约成本）、提高经济竞争力（系统优化、降低投资成本）、并增强环境可持续性（将大量的、间歇性的可再生能源整合在供电系统中）。为了加快向智慧城市转型，需要采取一系列激励措施。欧盟的“智慧城市利益相关者平台”将其描述为“市场”和“推动者”两个方面。在需求一侧，通过扶持运用创新技术，催生需求。然后在绿色采购的推动下，这些新的创新技术市场得到不断扩大。在“推动者”一侧，激励措施包括：1) 整合城市规划；2) 提供融资；3) 制定技术标准，并且标准间具备相互协调性；4) 开展培训；5) 让利益相关者充分参与。

主要驱动力

智慧城市的概念有以下几方面的主要驱动力：技术创新、亟待解决的城市发展问题和政府所采取的激励政策。过去二十年来的技术创新已经在市场中得到了大量运用，几乎将现代城市的各个方面都改造得非常“智能”，从污水管网、低能耗建筑到公交系统。尽管技术供应商的目的是为了做生意赚钱；但从客户角度来说，市政府通过采购一体化系统服务，不仅可以降低投资成本，而且可以获得更好的服务。
在充分认识到技术提供商和城市代表者之间的不同利益夙求，欧盟委员会已经启动了一个新计划，即：“智慧城市和社区的欧洲创新型伙伴关系”，旨在工业企业界与城市之间建立起战略伙伴关系。该项目始于2012年，年度预算为3.65亿欧元。这笔资金主要是用于支持可推广、可复制的大型灯塔项目上。
伙伴项目的一个很重要的支柱是“欧盟智慧城市利益相关方平台”。该平台基本上是一个在线服务项目，其宗旨是帮助各种不同需求的群体寻找到最有希望的智慧城市技术，并进行进一步技术开发、融资和运用。目前在网上已有超过150项创新型技术，由志愿专家将这些技术分成不同的组别，每年召开二次专题工作组会议。目前已经有4个专题工作组：1) 能效和建筑; 2) 能源供应和网络; 3) 运输与交通; 4) 智慧城市的信息通讯技术。所有这些线上的内容，包括参与工作组、参加年度工作会议等，向中国技术提供者和城市管理部门全部开放。

欧洲案例

毫无疑问，哥本哈根（丹麦）可能是欧洲“最智慧”的城市，并获得了这方面的诸多奖项。该城市的目标是成为世界上第一个碳中和的大城市。事实上，它在这方面已经做出了很多成绩：40%的居民用自行车出行；大量使用可再生能源，并且能源利用率很高。例如：哥本哈根大区的供热计划就是一个最佳、优化的方案：利用了燃气、热电联产、以及生活垃圾发电等等。

阿姆斯特丹（荷兰）是欧洲另一个领先城市。这里不仅宜居，而且干净、高效，适合生活和做生意。当地居民70%以上的出行方式都是健康和节能的：骑自行车和步行。事实上，在非机动车交通运输领域里，该城市已经获得了几项获奖创新技术的支持。例如：“城市交通运输数据公开计划”，作为该计划的一部分，当地政府将所有交通即时数据向市民公开，以方便市民选取最佳出行方式。这些数据包括停车位数量、最佳步行线路、为骑自行车者提供最新交通信息等。

还开发了一些智能手机应用程序，例如：“象当地人一样骑自行车旅游”，以帮助游客骑自行车游览城市。

在城市规划方面另一个世界领先城市是奥地利维也纳。由市长亲自挂帅的“智能城市维也纳”计划，将进一步提高该城市的生活质量标准和环境可持续性。这个计划的特点是在公共部门和私人企业之间建立起一个广泛联盟，包括市政公用事业部门、研究机构、跨国技术提供商、公司、大学和私人咨询专家等。在路线图和行动计划中，列出了大量的节能、交通运输、商业开发和提高生活质量等领域的创新型技术。而这一切是在广泛征求各利益相关方意见取得共识后才确定的。

在与私人企业合作方面，巴塞罗那市（西班牙）正在尝试一些新的解决方案，以提高其城市服务水平。例如：“按灯付费模式”，即：市政府根据服务商所提供的实际光强（流明）而不是按照照明设施来付费。另一个例子是通过当地能源供应商和消费者之间的能源交易，在该城市一部分街区，包括2000栋公共建筑，实现了能源的自给自足。通过对2000栋公共建筑进行实时数据采集分析与优化，大大降低了公共建筑的能源消耗。在气候变化的时代，这个城市面临着水资源日益缺乏的困难；而有时又走向另一个极端，即：过多降雨。为了调节这种水资源的波动，该城市建立了雨水收集与和存储系统。

伦敦（英国）在利用智慧创新技术方面也树立了榜样。伦敦是世界上第一个引入征收拥堵费的首都城市；之后很多城市纷纷效仿。伦敦的公交系统非常复杂，并且一直得到不断发展完善。最近一次改进是发展和完善了城市自行车系统。在电子政府、公众获取信息（600多套）、为企业创业提供便利条件等方面，伦敦也遥遥领先。

结论

这些小例子表明智慧城市包括有许多方面。如何利用这些创新概念，取决于当地的具体情况。越来越多的欧洲城市都在不同程度上运用了这些概念——无论其位于北方或南方、无论其大与小、富裕或贫穷。从更广泛的视角来看，智慧城市的概念既为发达国家也为新兴国家都提供了机会。欧洲城市的经验和创新解决方案，也为中国的决策者和利益相关方提供了有益的帮助。一个快速学习曲线将会带来显著的时间和成本节约。

Examples from Europe

Copenhagen (Denmark) is probably the “smartest” European city and has already won a number of prizes. It aims to be the world’s first major city to become carbon neutral, and it is already well on its way: 40% of urban commuters use their bicycles and the city is already very much renewables-based and energy-efficient. For example, the Greater Copenhagen region has implemented a heat plan for the optimal and integrated use of gas, district heating, combined heat and power, and energy from waste.

Amsterdam (The Netherlands), another top-ranking European city, is not only a pleasant place to be, but also a clean and efficient city to live and do business in. As much as 70% of local mobility is health and energy friendly: cycling and walking. In fact, non-motorised forms of mobility are supported by a number of award-winning innovations, such as the city’s Open Data Program for Transport and Mobility. As part of this program the local authorities make all their traffic-related real-time data public, helping citizens to choose the most optimal form of transportation. Data covers, for example, parking place availability, route planning for walkers or live traffic updates for cyclists. A number of smart phone apps have been developed, such as “Bike like a local”, helping tourists to cycle across the city.

Another world leader in progressive urban planning is the city of Vienna in Austria. Its high living standards and environmental sustainability were recently further strengthened by the establishment of the “Smart City Vienna” initiative, under the patronage of the city mayor. This program is run by a wide coalition of public and private entities, such as the municipality, public utilities companies, research institutes, multinational technology provider companies, universities and private consultants. A large number of innovations in energy saving, mobility, business development and quality of life are outlined in a roadmap and action plan, which are based on a wide consensus as a result of extensive stakeholder involvement.

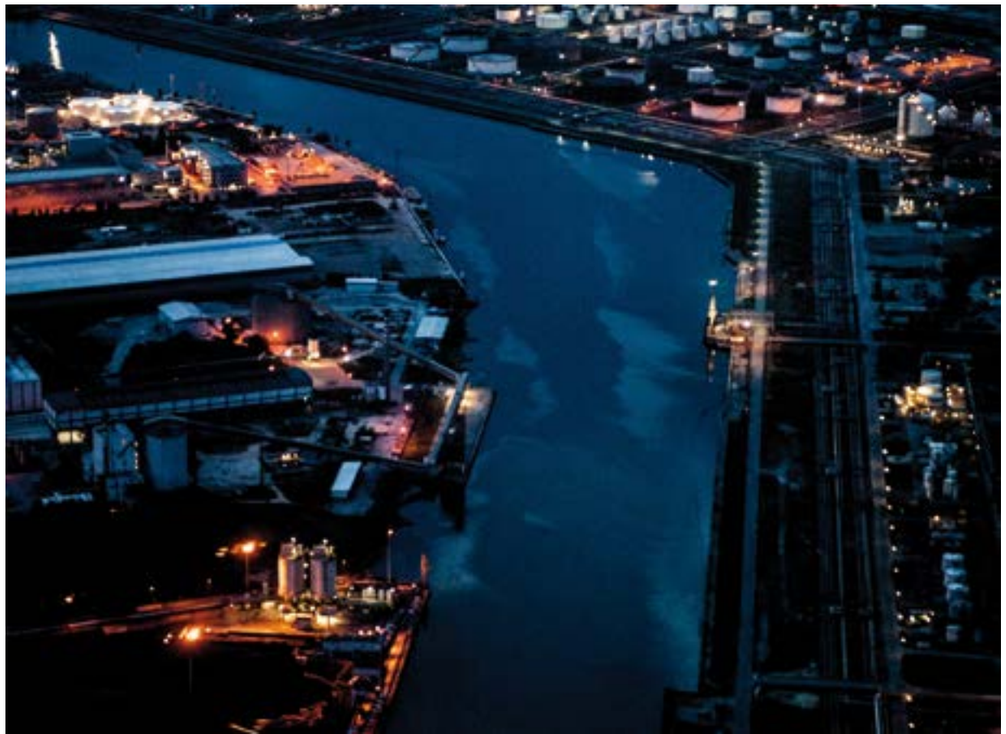
In cooperation with private companies, the city of Barcelona (Spain) is experimenting with a number of solutions to improve its city services. Examples include the “pay per light” model, whereby the city pays the service provider for the actual light intensity (lumens) instead of the lighting infrastructure.

As another example, through a sophisticated system of energy trading of local energy producers and consumers, the city is creating energy self-sufficient city blocks. Energy use of public buildings is also optimized by a real-time data collection and analysis system, covering 2000 public buildings. In these times of climate change, the city faces an increased lack of water, or sometimes the other extreme, excessive rainfall. To even out these fluctuations, a rainwater collection and storage system has been built.

The city of London (UK) is also exemplary in a number of smart innovations. It was the world’s first capital to introduce the congestion charging system, which has since been replicated in many other cities around the world. Its public transport system is very sophisticated, and is constantly being developed. The latest addition is its city bike system. London also ranks high in fields such as e-governance, the public availability of data sets (more than 600!), and as an attractive business location favouring start-up companies.

Conclusions

This small set of examples shows that a Smart City has many elements, and exactly how innovative concepts are applied depends on the local circumstances. More and more European cities are applying these concepts – be they from the north or south, big or small, rich or poor. On an even wider scale, the concept of Smart Cities offers advantages both for developed and emerging countries. Experiences and innovative solutions from European cities could also provide assistance to Chinese policy makers and stakeholders. A faster learning curve will then result in significant savings in time and costs.



Development and Trends of Smart Cities in China
中国智慧城市的发展现状以及趋势

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随着住建部的智慧城市试点，物联网、云计算、下一代互联网等新技术将在城市发展中得到广泛应用，城市智能水平将不断提高。为了支持智慧城市迅速发展，各地方给予了多项政策支持。在中国已有22个大中城市规划文件中，明确提出建设智慧城市。其中，北京、上海、广州、深圳、杭州、南京、宁波、武汉、厦门等地方已制定或实施智慧城市发展的专项规划。本文将从中国智慧城市发展意义、现状以及趋势做一简要分析。

中国建设智慧城市的重要意义

有利于提升城镇化的质量。提高城镇发展水平和质量是中国目前经济内在的要求。城镇化价值的提升，表现在以下五个方面：一是城镇化成为转变经济发展的基本推动力量；二是国民生活质量成为城市内涵式发展和包容性增长的核心；三是文化软实力成为提升城市综合竞争力的重要标志；四是化解交通堵塞、教育资源不足、环境污染、能源匮乏等城市难题成为城市管理者的重要目标；五是构建现代社会治理模式，实现城市社会服务管理创新。这些对城市的信息化水平提出了越来越高的要求，智慧城市可以通过整合先进信息技术与先进管理理念，实现城市管理、城市服务、城市运营的多赢，从而契合了这一轮城市发展的需求。

有利于各部门合作和交流。烟囱式开发是指各领域应用在开发的时候覆盖了自顶向下的“感、传、知、用”各个环节，各领域应用之间缺少信息和设备的共用共享。烟囱式开发一方面带来了重复建设，另一方面也造成了各个应用系统之间的数据隔离和信息孤岛。典型的案例是“开宝马的住经济适用房”，如果建立了保障性住房系统和车管系统之间的信息关联，从技术上就可以防止这种现象。

With the promotion of the pilot cities for China's smart cities project, initiated by the Ministry of Housing & Urban-Rural Development, the Internet of Things, cloud computation, next-generation network and other new technologies will be widely applied to urban development, and the intellectualization of cities will be increasingly enhanced. In order to support the rapid development of smart cities, local governments have formulated supporting policies. In China, 22 large and medium cities have explicitly proposed to transform their cities into smart cities in their planning documents. Among them, Beijing, Shanghai, Guangzhou, Shenzhen, Hangzhou, Nanjing, Ningbo, Wuhan and Xiamen have worked out or have been executing their respective plans for developing smart cities. This document will make a brief analysis on the significance, present situation and trends of smart city development in China.

Significance of Smart City Development in China

Helps to Improve the Quality of Urbanization. To improve the level and quality of urban development is an economically inherent requirement in our country. The improvement of urbanization is expressed in the following five aspects: firstly, urbanization becomes the basic driving force to transform the development of the economy; secondly, quality of life is the core in the connotative development and inclusive growth of cities; thirdly, the soft power of culture becomes an important indicator to improve comprehensive competitiveness within a city; fourthly, it is important for urban management to solve urban problems such as traffic congestion, insufficient educational resources, environmental pollution, shortage of energy etc.; and fifthly, to build up the modern social management mode and implement the innovation of urban and social service management. All of these aspects have raised higher requirements than before for urban informatization. Smart cities may integrate advanced information technologies and advanced management concepts to realize multiple-wins in urban management, urban services and urban operations in order to meet the demands of this round of urban development.

Advantageous for the Cooperation and Exchange between Various Sectors. The “stove-piped development” means that in the course of development

有利于提高城市管理效率。和传统的城市“他治”模式相比，智慧城市使得城市管理出现“自治”特征。在智慧交通中，出行者根据拥堵情况和停车位情况，自行决定是否出行和出行的方式这种模式下，避免开车进入拥堵地段的决策是出行者自己做出的，每个人都是交通秩序的维护者。这种方式显然比诸如“尾号限行”这种行政方式更加有效。城市管理的机制使得行政命令变成被管理者的自主选择，实现“自己管理自己”。自治模式体现了新公共管理所追求的，政府从“划桨”变成“掌舵”，公共服务的提供模式转变为政府主持、公民自治。

中国智慧城市中的智慧领域

中国通过智慧城市建设，加快信息技术在构建现代产业体系中的深度运用，实现传统产业的智慧化提升以及新兴产业的跨越式发展，全面提升传统产业的层次和能级。

智慧政务

智慧政务有利于转变政府职能，从“管理主导型”向“服务主导型”转变，提高效率，精简机构，提高政府透明度及政务公开。

_ 数字化城市管理系统：数字化城市管理系统是对城市运行情况进行全方位监督和管理的综合管理系统，整合应用了多项数字城市技术，实现了精确精细、敏捷高效、全时段、全方位覆盖的城市管理模式。譬如2004年北京东城区建成了“万米单元网格管理法”和“城市部件管理法”，使城市管理的区域精细化，管理部件的内容数字化、管理事件的处置精确化，创建了管理和监督职能相分离的新型城市管理体制。2005年7月建设部确定第一批10个数字城管建设试点城市（城区），随后公布了三批51座试点城市（城区）。从2005年到2009年间，建设部先后出台了7个数字城管建设运行标准，并出台了《数字城管模式建设导则（试行）》，总结了数字城管系统建设包含“组织体系、制度体系、信息系统、基础数据、专业队伍”等五个方面的内容。

_ 政府应急平台。其一，应急。譬如深圳市兼容了110（公安）、119（消防）、122（交警）等专业指挥中心，应急指挥系统采用应急指挥中心集中统一接警，根据不同的警情分类、分级处警的业务模式，通过应急指挥系统，深圳实现接处警系统的实时、准确、高效，保证报警受理在任何情况下不间断。其二，救灾。智慧应急系统使得智慧的预案具有较强的预见性、针对性，能对风险做出准确的预计和分析，并做好人员速散、物资分配、救援和生产恢复计划，利用物联网、互联网和计算机系统准确分析灾情进展，分析救灾物质需求数量和投放地点，察看应急物资储备和补给供应情况。

_ 电子政务。政府机构应用现代信息和通信技术，将管理和服务通过网络技术进行集成，在互联网和无线网络上实现政府组织结构和工作流程的优化重组，超越时间、空间与部门分隔的限制，全方位地向社会提供优质、规范、透明、符合国际水准的管理和服务。譬如通过政务热线可以将公众对政府各部门的服务请求进行集中统一的受理和回复。可通过语音、视频、WEB、WAP、短/彩信、传真、邮件等多种途径为公众用户提供服务，实现了从窗口式服务向电子化服务的转变，提升了政府部门的公众形象。

智慧产业

_ 智慧景区。游客或用户在任何时间，地点通过咨询平台、手机等便可查看信息或咨询、旅游、商务会议，将景区旅游、学习、工作、咨询等等融合一体，最终形成以公众服务为核心的一体化景区数字中心。譬如2012年12月秦皇岛被评为全国33个国家智慧旅游试点城市后，从硬件资源层（共享智慧城市数据中心硬件资源，通过云计算模式进行部署）、智慧旅游云平台（建立规范旅游资源数据库，制定数据标准）、服务层（提供面向旅客公众服务、面对旅游企业管理服务及面向管理部门的综合管理服务）、网络层、终端层等五个方面进行建设。

_ 智慧物流。传统的物流行业业务系统对客户关系管理，车辆调度、定位、跟踪等工作很难做到定向有效的客户服务。随各种信息化技术的成熟与广泛应用，数字物流提供“一站式”综合信息化服务。待运送的货物和空闲车辆的信息，以货架的形式展现给最终用户，使企业得到最及时的帮助。国家层面非常支持智慧物流的发展，近年来国务院出台了《物流业调整和振兴规划》和《国务院办公厅关于促进物流业健康发展政策措

the applications in various fields cover different links from top to bottom, including “Perception, Communication, Cognition, Utilization”, but information and equipment are not shared so much between various applications. The stove-piped development brings repeated construction on one hand, and causes data isolation and information islanding between various application systems as well. A typical example is “a person owning a BMW car who lives in economical housing”. If an information link is created between the government-subsidized housing system and the vehicle management system, such a phenomenon can be technologically avoided.

Help to Enhance Urban Management Efficiency. Compared with the traditional “heteronomy” model, smart cities allow urban management to be characterized by “autonomy”. In the intelligent traffic system, travelers can, according to the congestion and parking spaces available, decide whether or not to travel and which way to go. The decision on how to navigate the congested area is made by the travelers themselves; each individual is responsible for the good traffic order. Obviously this is more effective than any administrative restriction such as “traffic control by tail numbers”. The urban management system transforms administrative orders into independent selection, which helps to implement “self-management”. Autonomous management transforms the management role of governments from “oarsman” to “helmsman” and changes the mode of public service provisioning into citizen autonomy under the control of government.

Smart Aspects within Smart Cities in China

Our country will resort to the construction of smart cities to speed up the heavy application of information technologies in establishing the modern industrial system, realize the intellectualization and improvement of traditional industries and the leapfrog development of emerging industries, and improve the development levels and grades of traditional industries.

Intelligent Public Administration

Intelligent public administration helps to transform the function of governments from a “governance-oriented type” to a “service-oriented type” so as to improve efficiency, simplify the organizational structure, increase government transparency and make government affairs public.

_ Digitalized urban management system. The digitalized urban management system is a comprehensive management system helping to implement omnibearing supervision and management according to the city’s operation. It is integrated with several digitalized urban management technologies and implements the precise, elaborate, quick-to-respond, highly efficient, full-time and omnibearing urban management model. In 2004, for example, Dongcheng District of Beijing developed and executed the “10,000-meter grid management procedures” and the “municipal components management procedures” to divide the urban management area into many small sub-areas, offer management components with digitalized content and ensure management events are handled more accurately, which therefore helped to establish a new urban management system separating the management functions from the supervised ones. In July 2005, the Ministry of Construction confirmed the first group of pilot cities/districts (10 in total) for digitalized urban management construction and subsequently announced another three groups of pilot cities/districts (total 51). From 2005 to 2009, the Ministry of Construction successfully put into place seven digitalized urban management construction & operation standards, published the *Guidelines on Construction of Digitalized Urban Management Mode (Interim)*, in which the ministry concluded that the construction of digitalized urban management system contains five aspects: organization system, institutional system, information system, data base and professional team.

_ Government Emergency Platform. One of its functions is emergency response. For example, the government emergency platform of the City in Shenzhen is integrated with command centers for 110 (for public security), 119 (for fire fighting) and 122 (for traffic police). The emergency command system adopts the operating mode of using the emergency command center to receive alarms and classifying various types of alarms for response. By using the emergency command system, Shenzhen can receive and respond to all alarms in real-time and in a precise and highly efficient manner, guaranteeing that all the alarms are received and solved smoothly under any circumstances. The second function is for disaster relief. The intelligent emergency system ensures the intelligent disaster countermeasures have relatively strong predictability and pertinence and it enables the government to predict and analyze the risks exactly and work out proper plans for personnel evacuation, material distribution and rescue and production restoration. It is helpful to use the Internet of Things, the Internet and computer systems to analyze a disaster situation exactly, analyze the scale and drop-off points for disaster relief supplies and to monitor the preparation, supplementation and supply details of disaster relief supplies.

_ E-government. Governmental organizations utilize modern information and communication technologies and network technologies to integrate governance and services and to reorganize and optimize the organizational structure and workflow of the government over the Internet and wireless network beyond time, spatial and departmental restrictions so as to provide society as a whole with high-quality, normalized and transparent management and services complying with the international standard.

施的意见》，这两项政策都强调加强物流新技术的自主研发，从国家宏观层面强调了发挥地理信息系统等关键信息技术在物流信息化中的作用。
_ 智慧巡检。利用数字化、信息化的措施来解决运营部门在运营巡检管理中监督困难的问题。针对施工工程的管理、日常运行、故障发现及上报处理流程等，通过手机现场拍照录像，进展、故障及GPS坐标上报，GIS地图服务，处理等手段，辅助运营人员来进行监督管理，从而提高运营管理的效率。譬如徐州市启动了市政设施信息化巡查系统，巡查员如果发现道路桥梁等市政设施存在安全隐患，只需用装载智能系统的手机拍照后上传给市政设施巡查平台，指挥中心可以第一时间通知相关责任处置人，并对病害的处理情况进行跟踪。

智慧民生

_ 智慧交通。譬如重庆市利用电子车牌、驾驶员卡、电子牌照构成“重庆交通信息卡”，有效解决车辆自动识别和动态监测，逐步实现精准管理、路网动态监车、车流统计与分析以及各种交通税费的动态稽征等功能。
_ 智慧教育。譬如黄冈市智慧教育以智慧教育云平台为基础，覆盖了从个人、班级、校级到区域的教育资源与信息平台建设，解决了黄冈市教育系统中师生互动、学校资源库建设与区域资源共享与教育管理等问题。
_ 智慧环保。譬如太湖蓝藻环境监测系统以物联网为平台，基于GIS实现对水污染源不间断进行数据和视频监测，相关人员及时掌握各污染源分布和污染物排放，第一时间干预处理。
_ 智慧医疗。个人健康管理的服务平台可以为终端用户和医疗机构之间搭建起沟通的桥梁。平台的一侧整合现有的医疗资源，提供专业医疗健康服务；另一侧是终端用户，他们可灵活地通过无线或有线的方式接入，实时获得各种医疗服务。

中国智慧城市发展实施路径和特色

创新推进智慧城市建设

这类城市将建设智慧城市作为提高城市管理能力和综合竞争实力的重要途径。如“十二五”期间，北京市全面启动“智慧城市建设工程”。智

For example, various governmental departments use the e-government hotlines to receive and reply to various public enquiries. Voice, video, WEB, WAP, messages/multimedia messages, fax, email and many other channels may be used to provide services to the public subscribers. It transforms the service mode from window services to electronic services and improves the public image of governmental departments.

Intelligent Industries

_ Intelligent Tourist Spot. Through the intelligent tourist spot service system, tourists or users of the intelligent system can, at any time and place, use the inquiry platform or mobile phone to enquire into tourist spot-related information for consultation, traveling and commercial meetings. This system is integrated with touristic traveling, learning and consultation functions. An integrated digitalized tourist spot service center is formed for the purpose of offering the public associated services. For example, after being nominated as one of the 33 national pilot smart cities for tourism in December 2012, Qinhuangdao has constructed its intelligent tourist spot service system with five layers: a hardware resource layer (with hardware resources deployed to share the data center of the smart city by using cloud computation technology), an intelligent cloud traveling platform (with a normalized traveling resource database created and standard data worked out), a service layer (used to provide public services for travelers and offer comprehensive management services for traveling service enterprises and traveling service authorities), a network layer and a terminal layer.
_ Intelligent Logistics. It is very difficult for the traditional logistics system to implement effective customer-oriented services in the area of customer relationship management, vehicle dispatching, positioning, tracking and similar work. As various information technologies develop and are widely applied, the digitalized logistics system can offer “one-stop” informatization services. It can display information on goods to be shipped and on idle vehicles for the final users by means of a “shelf” and give enterprises timely assistance. Our central government gives great support to the development of intelligent logistics. In recent years, the State Council launched the *Adjustment and Revitalization Plan for the Logistics Sector and Suggestions of the General Office of the State Council on Policies and Measures for Further Promotion of Healthy Development of the Logistics Sector*. Both policies emphasized the importance of independently developing information technologies for logistic management and the use of key information technologies such as a geographic information system in the informatization of the logistics sector.
_ Intelligent Tour-inspection. This uses digitalization and informatization measures to solve supervision problems encountered during tour-inspection management by the

operational departments. To assist the operator to supervise and manage project construction processes and daily operations and to discover and report failures thereof, mobile phones are used to record the progress and failures and GPS and GIS services are used for reporting the findings. For example, Xuzhou City has launched the informatized tour inspection system for municipal facilities. If a tour inspector finds any hidden safety risk in any municipal facility such as a highway, bridge and so on, he or she only needs to use a mobile phone with the intelligent system installed to take a photo and upload it to the municipal facility tour inspection platform while the commanding center can notify the appointed person of the reported safety risk and follow up on how the safety risk is being handled.

Intelligent Livelihood System

_ Intelligent Traffic System. For example, the Municipality of Chongqing is using the “Traffic Information Card of Chongqing” which is composed of electronic vehicle license plates, driver cards and electronic licenses that can effectively implement automatic identification and dynamic monitoring of vehicles and gradually implement precise management, dynamic vehicle tracking, traffic volume statistics and analysis, as well as the dynamic supervision of various traffic taxes and chargers.
_ Intelligent Education. For example, Huanggang’s intelligent education system utilizes the intelligent education cloud platform to establish an education resource & information platform covering individuals, classes, grades and regions, which supports the resolution of teacher-student interaction difficulties in the Huanggang education system and solves the problems of the school resources database construction, regional resource sharing and education management.
_ Intelligent Environmental Protection. For example, the Tai Lake Blue Algae Monitoring System uses the Internet of Things as its platform and GIS as a basis to implement on-line data and video monitoring of water pollution sources. By using this system, the relevant working staff can access the real-time data on the distribution of various pollution sources and the discharging data of pollutants for immediate treatment.
_ Intelligent Medical Treatment. An individual health management & service platform can establish an exchanging bridge between terminal users and medical institutions. The information on the available healthcare resources is integrated into a platform for the provision of professional services, which can be accessed by terminal users via wireless or wired network.

Implementation of Smart City Development and Characteristics in China

Innovation Promotes Construction of Smart Cities

These cities regard the construction of smart cities as an important path to enhance urban management ability and comprehensive competitiveness. For example, Beijing launched the “Smart City Project” during the “Twelfth Five-Year Plan” period. The core objective of Smart Beijing is to achieve intellectualization in the following four areas: firstly, the management of the legal person and the operation of enterprises in accordance with laws and regulations; secondly, the digital life of citizens; thirdly, the integrated governmental services; and fourthly, the intellectualized city operation.
To achieve the above targets, many projects are being carried out, including the construction of infrastructures such as a broadband system, the intellectualized operation of the city, citizens’ living network focusing on social management innovation, the operation of enterprise networks and integrated government services. For example, Beijing is planning to establish a “1+1+16” framework, one municipality-level cloud of government affairs and 16 districts or counties and key areas. With regard to the digitalized life of the citizen, Dongcheng District has established an urban management grid further divided into smaller social network sectors that cover, the information about the people, their housing, issues to be addressed and the organizations they belong to, etc.
The Municipality of Shanghai is focusing on promoting “five activities”: one of which is “intelligent municipality management”, which is in high demand by a super metropolis such as Shanghai. The system focuses on traffic, land planning, environmental protection and other fields to improve the urban operation & service levels and emergency response abilities. For example, Shanghai had implemented the urbanized regional grid management for 400 km^2-wide suburban areas by the end of 2012. The second of the activities is “digitalized livelihood”. In fields closely related to the livelihood of citizens and by constructing digitalized education, digitalized health, digitalized community and similar projects, these activities aim to improve quality of life, through the establishment of an electronic health records system for citizens, which covers basic personal information and main health service records. The third of the activities is “E-government”. This makes governmental information more public and strengthens online administrative examination and approval, enabling the orderly and open utilization of information. For example, in 2013 Shanghai is constructing the comprehensive 12345 citizen service hotline offering consultation, compliance and many other functions. The fourth of the activities is “E-commerce”. It broadens the application and depth of e-commerce proactively and promotes the integrated flow of goods, materials, cash and information to support the construction of the “Four Centers” and the development of strategic emerging industries and high-end service industries. For example, from 2010, an investment of RMB 10 million Yuan was planned to encourage over 10,200

medium/small enterprises to apply e-commerce. The fifth of the activities is the “merger for improvement”. It promotes an in-depth informatization and industrialization merger, virtual manufacturing, quick manufacturing and high-end manufacturing supporting the transformation and upgrade of traditional industries. For example, Shanghai Electric Group Co. Ltd. has utilized information technologies to promote its independent research and development and manufacturing and to improve the intellectualization level of its equipment.

Developing Intellectualized Industry as a Core Task

The key for the cooperation between Wuhan Urban Circle and IBM is to use leading global software technologies, the platform and management experience of IBM to perfect the software and information service environment, speed up the development of the information service industry, service outsourcing, the Internet of Things, cloud computation and other similar intelligent industries, and promote the informatization construction and the coordinative and integrated construction of the comprehensive urban circle so as to realize the strategic objective of speeding up Wuhan’s energy-saving and environmentally friendly society.
Kunshan is well known for its high and new technology industries, with the production yields of 1/2 of global notebook computers and 1/8 of global digital cameras. On this basis, Kunshan has actively developed software service outsourcing, the Internet of Things, cloud computation, mobile Internet and other emerging strategic industries. The Internet of Things industry aims at constructing the Zhouzhuang Sensor Base to be bigger and stronger, building the Kunshan IT Technology Innovation Public Service Platform and taking the lead to carry out the application of the Internet of Things in the field of urban management.
Focusing on constructing six large intelligent industry bases, Ningbo will speed up the development of intelligent industries. The six large bases respectively are: the Network Data Base, Software Research, the Development & Promotion Base, Intellectualized Equipment & Product Research, the Development and Manufacturing Base, the Intelligent Service Demonstration & Promotion Base, the Intelligent Agriculture Demonstration & Promotion Base and the Intelligent Enterprise Headquarters Base.

Using Intellectualized Infrastructures and Demonstration Areas as a Path

Centering on building an innovative and energetic new-generation information technology industry system, the Municipality of Shanghai is carrying out eight special projects mainly for enterprises: cloud computation, the Internet of Things, TD-LTE, high-end software, integrated circuit, next-generation network (NGN), Internet of Vehicles and information services,

慧北京的内涵目标主要是解决四个主体的智慧化，一是法人，企业法律运营；二是自然人，市民数字生活；三是政府整合服务；四是城市智能运行。北京的智慧城市建设主要包括宽带泛在基础设施建设、城市智能运行、以社会管理创新为重点的市民生活网络、企业网络运营、政府整合服务等五个方面。譬如北京市在政务领域规划建设“1+1+16”框架，一个市级的政务云，16个区县和重点领域。在市民数字生活方面，东城区创造城市管理网格化，实现社会管理进一步精细化。
上海市重点推进“五大行动”：一是“智能城管”行动。适应上海特大型城市数字化、智能化、精细化管理的需求，聚焦交通、规划土地、环保等领域，全面提升城市运行服务水平和应急处置能力。如到2012年底完成400平方公里的郊区城市化区域网格化管理拓展。二是“数字惠民”行动。围绕与市民生活密切相关领域，通过数字教育、数字健康、数字社区等工程的建设，改善市民生活质量。如建设市民电子健康档案，涵盖个人基本信息和主要卫生服务记录。 三是“电子政务”行动。深化政府信息公开和网上行政审批，加强信息有序开放利用。如2013年上海市正在建设涵盖咨询、投诉、办事等各类功能的统一的12345市民服务综合热线。四是 “电子商务”行动。积极拓展电子商务应用的广度与深度，促进商流、物流、资金流、信息流的“四流一体”，支撑 “四个中心”建设及战略性新兴产业、高端服务业的发展。如从2010年起，每年安排1000万元，推动10200多家中小企业应用电子商务。五是“融合强业”行动。推动信息化与工业化深度融合，推进虚拟制造、敏捷制造和高端制造，促进传统产业转型升级。如上海电气通过信息技术促进自主研发制造，提高装备智能化水平。

以发展智慧产业为核心

_ 武汉城市圈与IBM合作的重点是，利用IBM全球领先的软件工程技术、平台、管理经验等，完善软件与信息服务发展环境，加快信息服务业、服务外包、物联网、云计算等智慧产业的发展，推进信息化建设，促进城市圈的综合协调和一体化建设，从而实现加快构建武汉两型社会的战略目标。
_ 昆山高新技术产业发达，生产了全球1/2的笔记本电脑和1/8的数码相机，以此为基础积极培育软

件服务外包、物联网、云计算、移动互联等战略性新兴产业。在物联网产业做大做强周庄传感器特色产业基地，建立昆山物联网技术创新公共服务平台，并在城市管理领域率先开展物联网示范应用。
_ 宁波将以建设6大智慧产业基地为重点，加快推进智慧产业发展。6大基地分别为：网络数据基地、软件研发推广产业基地、智慧装备和产品研发与制造基地、智慧服务业示范推广基地、智慧农业示范推广基地、智慧企业总部基地等。

以智慧基础设施和示范区为路径

上海市围绕构建创新活跃的新一代信息技术产业体系，以企业为主体，重点实施云计算、物联网、TD-LTE、高端软件、集成电路、下一代网络（NGN）、车联网、信息服务8个专项，加强技术研发，推进示范应用，加快产业发展。
南昌提出把打造“数字南昌”作为智慧城市建设的突破重点，通过实施数字南昌综合指挥调度平台、智能交通系统、市政府应急系统、“数字城运”、“数字城管”等重大工程，提升城市运行监测和城市公共信息服务水平。
广州市把打造天河智慧城、南沙智慧岛，建设珠江新城、中新广州知识城和广州新城等智慧城市示范区，带动全市智慧城市建设。

以发展智慧人文和智慧生活为目标

成都提出要提高城市居民素质，完善创新人才

的培养、引进和使用机制，以智慧的人文为构建智慧城市提供坚实的智慧源泉。重庆提出要以生态环境、卫生服务、医疗保健、社会保障等为重点建设智慧城市，提高市民的健康水平和生活质量，打造“健康重庆”。

完善中国智慧城市建设的体系

中国智慧城市建设虽然取得了一些进展，但尚存在不少问题，亟需在以下方面获得改进。

建立健全信息网络安全机制和体系

在互联网时代，中国缺乏先进技术和产业主导权，信息网络安全问题很容易暴露出来。在以物联网、云计算为代表的新一代信息技术支撑的信息网络时代，安全问题更为突出，潜在威胁更大。有必要从保障国家安全高度规划信息网络安全，整合当前分散的信息安全管理机制，建立高效的信息网络安全保障体系。

建立健全协调机构和机制

从地方的智慧城市规划来看，一般是信息化主管部门主导。在一些地方，城市规划建设部门也开始规划建设智慧城市。单一部门所主导的智慧城市都会面临诸多困难。由于智慧城市建设涉及面非常广泛，包括信息通信产业管理、城市交通、医疗卫生、教育、社区管理服务等诸多领域，有必要建立一个综合统筹机制。譬如通过国家信息化领导小组，设立智慧城市建设管理办公室，定期或不定期举行跨部门协调会议，解决项目建设、业务协同的问题。

建立智慧城市与新一代信息技术产业衔接机制

作为战略性新兴产业的一部分，国家已经为新一代信息技术制定了比较具体的战略部署，如国务院发布的《关于加快培育和发展战略性新兴产业的决定》以及《十二五国家战略性新兴产业发展规划》。

但是智慧城市尚处于地方政府的自发阶段，没有被纳入国家层面的发展规划，与新一代信息技术的结合还不够紧密。今后应该从总体上加强智慧城市建设与新一代信息技术创新发展的关联性，从政策优惠、试点示范等方面给予更有力的支持。

strengthening research and development of technologies, promoting experimental application and speeding up the development of industries. Nanchang proposes to construct “Digital Nanchang” as a major breakthrough for the construction of smart cities and will attempt to complete the overall commanding & dispatching center of Digital Nanchang, the intelligent traffic system, the emergency response system of the municipal government, the “Digital Urban Transportation”, the “Digital Urban Management” and other important projects to improve the urban operation & monitoring and public information service levels. Guangzhou is building up Tianhe Intellectualized City, Nansha Intellectualized Island, New Zhujiang Town, Sino-Singapore Guangzhou Intellectual Town and New Guangzhou Town and other demonstration districts in order for the intellectualized city to drive the construction of the smart city.

Developing Intelligentized Life and Culture as Objectives

Chengdu has proposed to improve the qualifications of its residents and complete the system for introducing and hiring talented people. Chongqing has proposed to construct a smart city focusing on the ecological environment, health-related services, medical treatment and public security, improving the health and living quality of citizens and creating a “Healthy Chongqing”.

Perfect the Smart City Construction System of China

Although the smart city construction of our country has made some progress, there are still some issues that need improvement in the following areas.

Establish and Perfect Information & Network Safety Mechanism and System

In this Internet era, due to the lack of the advanced and leading technologies, problems regarding information and network security could easily come along. As the information & network age is supported by a new generation of information technology, represented by the Internet of Things and cloud computation, such security problems are becoming more severe and their hidden risks are becoming even higher. It is necessary to plan information and network security at the national level and integrate the dispersed information to establish a highly efficient information & network security guarantee system.

Establish a Well-functioning Coordination Mechanism

In general, the smart city plans of various regions are proposed and led by the authority responsible for informatization. In some regions, local urban planning & construction departments are also authorized to schedule the construction of their

smart cities. Obviously, smart city construction led by a single department will encounter many difficulties since the construction of a smart city covers a wide range of aspects, including information and communication management, urban traffic, medical treatment and sanitation, education, community management and many other fields. Therefore, it is necessary to establish an integrated coordination system. For example, it is necessary to set up a smart city construction management office led by the national informatization team and hold regular or irregular coordination meetings among departments to solve problems that occurred during project construction.

Establish a Mechanism to Link Smart Cities and New-generation Information Technology Industries

As part of a strategic emerging industry, China has already launched a detailed strategic plan for new-generation information technologies. For example, the State Council has released the *Decision on Speeding up Cultivation and Development of Strategic Emerging Industries and the Twelfth Five-Year Plan for Development of National Strategic Emerging Industries*. However, smart city construction is presently in the spontaneous development stage of regional governments, and was not included in the national-level development plan; moreover, it is not sufficiently linked with the new generation of information technologies. In the future, we should, as a whole, strengthen the correlation between the construction of smart cities and the innovative development of new-generation information technologies, while providing more support to areas of preferential policies, demonstration projects and so on.

Smart Cities
智慧城市

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We often use words or acronyms without fully understanding their significance, especially their technical and scientific significance. Such terms frequently become part of our day-to-day vocabulary even though many of us have no precise knowledge of the relative implications. In relation to urban themes and the transformation of the territory and the city it might be worthwhile to first of all analyze what we really mean by the expression "*smart cities*". To simplify, it may be useful to make a comparison with familiar objects - instruments we are used to dealing with every day - such as mobile phones.
It may seem wholly evident and intuitive that the difference between a normal mobile phone and a smartphone lies in the fact that the latter not only serves to make calls but also boasts many other interconnected functions, making it possible to receive emails, manage software, write, take pictures and record video clips, watch television or listen to the radio, record conversations, do numeric calculations and browse the Internet, in order to take advantage of all the services available when one is online: from shopping to finding information, from using social networks, reading a book or playing games. This is possible precisely because a smartphone is more than it appears at first glance, in other words, a device used for a basic activity; a phone. It is an instrument that combines many other devices necessary to conduct a great variety of everyday activities. In the final analysis it is a *complex system of infrastructures that are united in a single mechanism, connected and coordinated in order to make it possible to use functions that were once separate*. If we apply this definition to the city, the exact meaning of the term smart city immediately becomes clear. There are many who also use the term "wired city", but it may become easier to understand these places if we distinguish them, by antithesis, from normal cities that are not recognized as intelligent but, on the contrary, as places characterized by a stupid and wasteful, inhospitable and unecological and, in the final analysis, an unethical way of life.
How could it be that the cities we live in, that we were born in and work in, are inhospitable, unintelligent and even harmful - an obstacle to our everyday life? It can and does happen and it is not hard to understand why. For instance, if we were forced, after having been deprived of a smartphone, to continue carrying dozens of devices

我们经常会使用一些词语或者相类似的同义词，但其实我们并没有搞清楚其真实的含义，特别是其技术和科学的内涵。随着这些词语的频繁使用，天长日久我们已经完全搞不清楚其准确的科学定义。在提及城市、辖区领土变化等主题之前，我们有必要首先弄清楚“智慧城市”这个词的准确含义。为了言简意赅，用一个我们日常使用的物品——手机来做个比喻，也许会更容易理解些。
普通移动电话和智能手机的区别是非常清晰和直观的：后者不仅具备电话的功能，而且还拥有许多互联网功能，利用它可以接收电子邮件、管理软件、写字、拍照和录制视频片段、看电视或听收音机、录音、数值计算、浏览互联网从而利用所有在线服务：包括购物和查找信息、使用社会网络、读书、玩游戏等等。这个比喻相对比较准确：智能电话不仅是一部只能用于通话的电话；智能电话集合了许多其它设备的功能，可以处理很多日常事务。用更为精确的语言来表达，智能电话是一种复杂的设施，它将很多曾经独立运行的功能集合并协调在一个复杂的系统内。如果我们把这个定义推广用来描绘城市，智能城市的概念就变得很清晰了。许多人也使用“有线”城市这个术语，如果仅为了将这类城市与一般普通城市区别开来，那么用这个称呼是可以的；但如果将这些城市最终变成愚蠢的、铺张浪费的、不宜居住的、不生态的，并最终发展成为一种丧失道德水准的城市，则这种城市绝对不是智慧城市。
我们生长和生活的城市怎么变成一种不宜居住的、不智慧的、甚至有害的城市，并变成了我们日常生活的障碍呢？但这种情况在现实生活中确实发生了，很难理解造成这种后果的原因。
例如：如果我们被剥夺了智能手机，取而代之地继续使用数十台不一定是过时、但互不联网的设备，如：手机、电脑、照相机、录音机、收音

- not necessarily obsolete ones but nevertheless not interconnected - such as a phone, computer, camera, tape recorder, radio, calculator, video camera, books, an agenda, a chessboard and a map, then all this would fill a hypothetical backpack which we would have to carry on our backs and wear ourselves out. This is what happens today, in a large majority of cases all over the world, with gradients of greater or lesser discomfort, and greater or lesser inhabitability, to the inhabitants of cities whose devices and infrastructures are not interconnected, because they are built and managed separately, at different points in time, without a general strategy shared by the institutions that govern the city. It is a matter of urban contexts - some of them important - where what immediately strikes not just the inhabitants but unfortunately also occasional visitors, is the absence of a real design dimension aimed at building an interconnected web of services for the community. In the present age, the reason we live “badly” or, at best, not as well as we could in cities is definitely due to the fact that these cities are modern and pre-modern from a structural point of view, yet we are still using predominantly mechanical instruments whilst every activity is dominated by electronics. In fact, generationally we are victims of a shift in time, a community living in an environment that moves faster than our ability to change. This is the cause of our daily distress.

A city may, on the contrary, be defined as “intelligent” if it allows a good quality of life, efficient services and correct use of available resources in relation to the needs of its inhabitants. An ideal situation would be where different needs are met through a system of infrastructures that are interconnected in terms of mobility, connectivity, services, logistics, use and production of energy. In any intelligent city, systems for the decontamination of water, sewage, garbage handling, transport and distribution of electricity are interconnected. Moreover, in such contexts – which are incidentally completely virtual today – such activities are built into a system of infrastructures conceived to facilitate their maintenance and to reduce the energy consumption of every device so as to avoid, or at least to reduce, the dispersion of available resources. In fact, an intelligent city reduces waste and dead or unproductive time in order to allow its inhabitants to make the most of their free time. It is a place where children, adults and the aged can live together serenely and on an equal footing, where there are no privileges and where everyone is able to live a dignified and decent life. There is no gender discrimination and everyone is free to take advantage of the opportunities associated with living in a community.

It is obviously easy to build a city in which all parts are coherent when the project is defined in advance and conceived in a synchronic manner. It is more complex to transform a city or make it efficient when it has been built over time without a predefined plan or program, due to changes linked not only to technologies but also to habits

机、计算器、摄像机、书籍、棋盘、地图等，然后将所有这些设备统统装入一个背包中背负起来，这样我们必定会被累跨的。这个虚拟的情景就是我们当代大部分城市的真实写照，只是其不舒适程度各不相同、可居住性状况各异而已。究其原因，主要是各类设施设备的建设年代不同、管理各异，而政府部门又缺乏一个综合协调的发展战略。各城市大体情况都差不多，只是有些城市在某些方面表现得更为突出些。没有相互连接的社区服务网、没有真正意义上的城市统筹规划与设计，这种纷乱现象不仅让当地居民而且也让外地游客感觉很不方便。我们生活得这样“糟糕”、或至少不应该这样差的原因是：从结构角度来看，我们的城市已经进入了现代或“预现代”阶段，但我们却还在主要依靠那些机械设备，而与其相关的各项活动却已经电子化了。事实上，我们已成为时代变革的受害者，我们的能力已经跟不上我们所生活的社区环境。这是我们造成生活深感压力的原因。

相反，一个城市如果被定义为“智慧”城市，那么就意味着这个城市能够提供良好的生活质量、高效的服务、具备满足居民需求的各种资源。理想的情况是通过一套基础设施建设，可以满足交通、服务、后勤、能源供应和使用等各方面的需求。在智慧城市里，饮用水供应、污水处理、垃圾收集运输与处理处置等，都是相互联网的。此外，在这种城市中， 由于实现了一体化和系统化，在设备维护、减少能源消耗、避免资源浪费等方面都发挥了非常好的作用。事实上，智慧城市减少或避免了时间浪费，从而确保市民最大程度地利用好可自由支配的时间。在这里，儿童、成年人和老年人都可以和谐和平等地生活在一起，没有特权，每个人都能过上有尊严的、体面的生活，没有性别歧视，可以充分享受生活在这里所提供的每一个机会。

如果能够事先确定项目、并同步实施，这样建设起来的城市显然可以更充分地实现城市内各部分功能的内在联系。相比之下，在事先没有制定综合方案、规划的情况下，进行城市改造、或提高城市效率是一件很复杂的事情，这种变化不仅与技术相关，而且与改变人们的习惯及言行举止有着密切的关系。但无论如何，这绝不是接受不宜居城市的理由。

当今许多城市都标榜着突显当地特色而进行大拆大建，最终老百姓只能忍受着居住在这种城市里的各种不便与痛苦。事实上，许多当今城市是不宜居的，因为人们每天都遭受着污染的空气、拥堵的交通状况，经受着不合理、不符合逻辑的活动安排，缺失符合生态理念的、快速智能的公共交通系统和由于缺乏协调而导致不同地区所提供的漫不经心的服务。与这种情况完全相反，在智能城市里，人们可以更容易地生活。在城市交通枢纽处都装配了有效的停车系统，有毛细管发达的、可靠的、互连驳接的公共交通网络。如果工作地点距离住所不太遥远，如果在一定半径内都有绿色空间和公共服务，如果人类活动产生的二氧化碳和温室气体排放能够减少到最低限度，如果所有的废物都能够收集、处置、并变为资源，如果能够回收和再利用水、原材料，如果能够合理利用能源资源，那么在这样的城市里人们就可以过上自然的、现代化的生活了。所有这一切都不可能偶然发生，而是需要开展有针对性的、严肃认真的科学研究。只有这样才能验证和实现上海2010世博会所提出的口号： “更好的城市，更好的生活”。从来没有一个比它更充满智慧和更及时的口号了！

and behaviours. In any case, this difficulty is not an excuse to accept the inhabitable conditions that many cities flaunt with disarming resignation, counting on a spirit of local identity and thus on the suffering and forbearance of its inhabitants. In fact, many present-day metropolises are inhospitable first and foremost because people’s lives are tested every day due to atmospheric pollution, traffic, illogical separation and distribution of activities, the absence of an ecological, fast and intelligent public transport system and insufficient haphazard services due to the lack of coordination between operators in different areas. Alternatively, in an intelligent city, people’s lives can be made easier when the road terminals or junctions at the city entrances feature efficient parking systems, there is an efficient capillary public transport network and there are reliable interconnected transport systems. If workplaces are not too distant from homes, if green spaces and public services are within reach, if carbon dioxide and greenhouse gases produced by human activities are reduced to a minimum, if everything that is disposed of is utilized for other purposes in an orderly manner via selective collection, if one is able to recycle and reuse water, materials and every other available source of energy, then the city achieves a natural approach to contemporary living. None of this happens by chance; it all requires conscious and serious research to verify and realize the felicitous slogan of the Universal Expo of Shanghai 2010: “Better city, better life”. Never has a slogan been so intelligent and timely.

Air Quality and Mobility: the “World City Environmental Target” Study Program

空气质量与交通运输：“世界城市环境目标”研究项目

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The world is experiencing a significant urbanization process: nowadays more than 50 percent of the global population lives in cities and by 2030 the world will have almost 5 billion city residents[1] (about 60 percent of the global population). These concentrations of people and activity are exerting increasing stress on the natural environment, with impacts at urban, regional and global levels. In recent decades, air pollution has become one of the biggest problems in megacities. Air pollution has serious impacts on public health, causes urban and regional haze, and significantly contributes to climate change. Several cities worldwide have initiated a thorough commitment to enhance air quality. To this aim, they can efficiently address the abatement of the emissions through a creative redefinition of well-consolidated paradigms, integrating different disciplines that had previously been used separately.
This paper presents the results of the first year of the “World City Environmental Target” Study Program, the first part of a multi-year study program pursued through the Sino-Italian Cooperation Program for Environmental Protection, launched by the Italian Ministry for the Environment, Land and Sea and the Chinese Ministry of Environmental Protection, and aimed at providing strategic advice to Beijing Municipal Government through the implementation of a city environmental roadmap.
The multi-year study program aims at improving the quality of life for citizens through the transformation of urban spaces, whilst respecting the environment. Several world capitals are acting towards the implementation of urban sustainability principles and can, therefore, provide important case studies for defining the multi-year plan for Beijing.
The aim of this study is to investigate the trends over time of air pollution and related parameters (i.e. number of private vehicles, use of public transport, city morphology evolution, city density, etc.) and to analyze and compare the environmental policies (i.e. sharing of information through smart technologies) of a group of selected world cities over the last decades to intercept new variables and to establish a new model for development in Beijing.

Data Analysis and Cities Actions

The cities analyzed (New York, Los Angeles, Tokyo, Seoul, Milan, London, Paris) have been chosen with the

当今世界正在深度推进城市化进程：当前已经有50%的世界人口居住在城市里，到2030年世界城市人口将达到50亿[1]（约占世界人口的60%）。如此高的城市人口密度和城市活动给自然环境带来越来越大的压力；事实上不仅对城市，而且对区域乃至全球都带来巨大压力。在最近几十年里，空气污染已成为各大城市面临的最大问题之一。空气污染严重影响公众健康，造成城市和区域出现雾霾，并对气候变化作出不小的贡献。世界上许多城市作出承诺将下定决心改善空气质量。为了实现这个目的，它们将整合以前相对独立的各学科专家来共同开展研究，并创造性地建立起一套减排模式以有效控制和削减空气污染，实现改善空气质量的目标。
本文介绍了“世界城市环保目标”研究项目的第一年研究成果。该项目是《中意环保合作计划》下的一个多年研究项目，由意大利环境、领土与海洋部和中国环境保护部共同支持。希望通过构建城市环保路线图，向北京市政府提出战略性政策建议。该研究项目将在尊重自然环境的同时，通过改变城市空间格局来提高公众生活质量。世界上有一批首都城市在遵循城市可持续发展的原则，将为本项目研究提供重要的案例经验。本项目的研究目的是调查空气污染变化趋势、确定相关参数（即私家车的数量、公共交通使用情况、城市形态演变、城市人口密度等），并对一些世界城市过去几十年的环境政策（通过智能技术的信息共享）进行比较分析，为北京市量身定做确定一批相关参数，并建立起北京发展的新模型。

数据分析与城市行动

按照下列指标选择了一批城市（纽约、洛杉矶、东京、首尔、米兰、伦敦和巴黎）：这些城市分布于不同的地理区域，是世界上人口密度最大的

城市，经历了强劲的经济和城市扩张，有着长期治理空气污染的经验，特别它们所采取的政策措施有着很强的借鉴意义。
尽管在一些世界城市的人口与经济同步增长，但其空气污染物浓度在过去20年里出现显著下降，下降的原因很可能部分得益于多种污染物的削减，也有可能是由污染物自身的特点所决定的。
为了搞清楚减少空气污染的主要因素，课题组对可能引起变化的相关参数进行了分析，并对这些城市在交通运输、空气污染方面所采取的措施行动进行了分析研究。
所比较的参数包括：
_ 综合性参数，包括人口、国内生产总值(GDP)或者城市生产总值(GMP)；
_ 城市形态结构；
_ 交通运输数据(机动车保有量、私人交通工具分享状况)；
_ 能源消耗分担，按来源；
_ 过去30年的空气污染物浓度变化趋势。
关于交通运输和削减空气污染有关的行动，课题组有针对性地研究了各城市的相关战略措施，包括改善公共交通网络（如：公共汽车，铁路，地铁）、减少私家车的使用（如：划定低排放区，征收停车费）、增加轻松出行系统比例（包括：共享自行车、人行道和自行车道网络）、以及改善机动车排放状况（如：制定机动车排放标准，绿色车队）等等。
在研究过程中，我们注意到由于城市特点不同，每个城市所采取的减排措施也各异。例如，由于东京人口密度较高，因此所采取的主要措施是整合和扩大铁路和地铁运输系统；而洛杉矶的地域分布较广，主要依靠私家车运输，因此洛杉矶一直实行严格的车辆尾气排放管理，鼓励技术进步和改善交通管理系统。虽然每个城市的问题、可用资源及其前景不同，但对于复杂的环境问题，都需要采取全面的、综合性的战略措施才能奏效。

国际研讨会“世界城市的空气质量和交通运输”

在“世界城市环保目标”研究项目实施的第一年中，在2012年10月23日举办了题为“世界城市空气质量和交通运输：经验、教训和目标”国际研讨会。与会代表共同探讨了世界城市污染现状、主要运输方式和趋势，分析了所采取政策行动后产生的影响。对世界城市的经验和案例进行了比较和研究，以期总结经验教训，并确定近期关键环境保护目标。
意大利环境、领土和海洋部的马特利（Massimo Martinelli）先生和北京市环保局的史捍民先生共同主持本次研讨会。他们都分别对正在执行的《中意环境保护合作计划》给予高度评价。两位领导的主旨发言之后，邀请了一批在空气质量和可持续交通领域造诣很深的知名国际专家作报告，介绍世界其他城市情况，并总结案例经验。在大会第一节里，来自于Politecnico di Milano的Fabio Casiroli、意大利环境部顾问Ivo Allegrini和来自热那亚市的Gianluca Saba 都分别指出城市交通运输系统是城市管理中很重要的内容。在大会的第二节中，伦敦运输部的Liz Halsted、Agenzia Mobilità AmbienteTerritorio的 Silvia Moroni，博洛尼亚市的 Cleto Carlini、和北京市环保局的卢建茹（音译，Lu Jianru）共同分析了伦敦、米兰、热那亚和北京等城市在改善空气质量和可持续交通方面采取的措施、行动及其所产生的影响。
本次研讨会为与会代表提供了一个交流的平台，开启了世界城市管理和“空气质量与交通运输”主题的全球智库。更重要的是为制定《北京空气治理行动方案》提供新的动力支持。

following criteria: they are distributed over different geographical regions, are some of the most densely populated cities in the world, have faced strong economical and urban development in the past and have long-term experience in fighting air pollution with specific policies and measures.
Despite the increased population and economic development in world cities, most of the pollutant concentrations have significantly decreased in the last 20 years. Some of the causes of these reductions are common to more than one pollutant, others depend on their particular characteristics.
In order to understand the dynamics of air pollution reduction, parameters related to its variations have been analyzed, and the cities' actions with regard to mobility and air pollution have been studied.
The parameters that have been compared are:
_ general features, such as population, Gross Domestic Product (GDP) or Gross Metropolitan Product (GMP);
_ cities' morphological structures;
_ mobility data (number of vehicles and the shared use of private transport);
_ energy consumption split, by sources;
_ air pollutant concentrations trends over the last 30 years.
With regard to actions related to mobility and air pollution, strategies to enhance public transportation networks (i.e. bus, railway, subway), to discourage the use of private vehicles (i.e. low emission zones, parking charges), to increase soft mobility share (i.e. bike sharing, pedestrian and bicycles networks) and to improve vehicles emissions performances (i.e. vehicles emission standards, green fleets) have been studied in detail.
In developing this comparative work, it has emerged that, depending on their individual characteristics, each city has focused its efforts on reducing air pollution using different strategies: for example, Tokyo, due to its high density, has mainly worked on the integration and expansion of its railway and subway systems, while Los Angeles, with its widely dispersed urban fabric that relies on private transport, has applied strict regulations on vehicle emissions, incentivized technology improvement and traffic management systems.
While each city's problems, resources and outlook are unique, the need for a holistic approach to the complex environmental problem is universal.

International Workshop "Air Quality & Mobility in World Cities"

Within the context of the first year of the "World City Environmental Target" Study Program, on the 23rd of October 2012, the International Workshop "Air Quality & Mobility in World Cities: Experiences, Lessons Learnt and Targets" was organized to discuss the current status of air pollution in world cities, the main transportation modes and trends over time, analyzing the impact of acts and policies put into action. World cities' experiences and case studies were illustrated and compared, with the aim of identifying the most important lessons learnt and key environmental targets for the near future.
The workshop was inaugurated by Mr. Massimo Martinelli from the Italian Ministry for the Environment, Land and Sea and Mr. Shi Hanmin from the Beijing Environmental Protection Bureau, who highlighted the goals and achievements of the Sino-Italian Cooperation Program for Environmental Protection.
Besides keynote speakers from the Municipality of Beijing and the Italian Ministry of Environment, a number of international experts with recognized expertise in the air quality and sustainable mobility sectors presented case studies and experiences on addressing the issue in other world cities. During the first session, Mr. Fabio Casiroli from Politecnico di Milano, Mr. Ivo Allegrini, the Italian ministry consultant for the environment, and Mr. Gianluca Saba from the Genoa Municipality, highlighted important topics regarding urban mobility and air quality in city management. During the second session, Ms. Liz Halsted from Transport for London, Ms. Silvia Moroni from Agenzia Mobilità Ambiente Territorio, Mr. Cleto Carlini from Bologna Municipality and Ms. Lu Jianru from the Beijing Environmental Protection Bureau analyzed the impact of acts and policies regarding air pollution and mobility in London, Milan, Bologna and Beijing.
The International Workshop was organized with the objective of exchanging experiences and opening a global think-tank on world cities and on the topic of "Air Quality and Mobility", Moreover, it enabled new input into the development of the Beijing Action Plan.

Beijing Action Plan

Both the workshop and the Year 1 Study Program have provided a set of priority actions to improve Beijing's air quality, based on the experience of world cities and focusing mainly on the transport sector: the study of new paradigms and the definition of experimental research techniques led to the final goal of developing a holistic environmental action plan for Beijing.
Based on the actions undertaken by world cities, the action plan is a comprehensive program of integrated actions needed for the reduction of air pollution in Beijing. It encompasses 28 priority actions, organized into 10 measures and grouped in turn into three key thematic sectors (industry, buildings and transport). As the First Year Study Program focused mainly on the transport sector, this part is richest in information. Going into detail with regard to industry, the action plan states that it is necessary to rethink most pollutant activities' locations, to "clean" the fuel used and to enhance regulations and control systems of emissions. Regarding the transport system, it is fundamental to develop public transport and to discourage the use of private vehicles. A trip made using public transport should be more convenient, both in terms of costs and time. To this purpose, priority actions are enhancing the integration of different means of public transport (i.e. timetables, tickets, etc.) and the communication systems (i.e. signalling, smart

北京行动方案

基于世界各大城市的经验，本次研讨会和第一年的研究成果提出了一系列改善北京空气质量的优先行动建议，其中以交通领域的建议为主。从各国的经验模式以及技术发展水平来看，只有制定一整套完整的、综合性的环境保护行动方案才有可能实现改善空气质量的最终目标。
根据世界各大城市的经验，我们为北京市建议的行动计划是一个全面的、综合性的空气污染治理行动计划。该计划包括28个优先行动，组织成10套措施、集中在三个关键领域（工业，建筑和交通）。第一年研究项目的领域主要集中在交通运输行业，因此这一部分的信息量相对大些。在工业领域，行动计划提出有必要重新考虑污染物产生的具体地点、清洁所用燃料、并出台更严格的对策和控制要求。在交通运输行业，建议大力发展公交运输系统、减少私家车使用至关重要。采用公交车出行一定要方便、高效、省钱。为了实现这个目标，

and info mobility, etc.). Moreover, a trip made using public transport has to be comfortable: the stops should be well distributed within the city area, the time to reach each stop should not exceed 10 minutes (by foot) and overcrowding must be avoided. For these reasons it is necessary to expand the public transport network and increase its frequency.
The spread of mixed private/public transport systems, such as carsharing and carpooling, has to be fostered. At the same time, it is important to boost soft mobility, expanding the cycling network, implementing bike sharing systems and making walking pleasant by improving the condition of the streets. Having a good public and soft mobility system will make it possible to start discouraging private transport use through localized congestion and payment parking programs. An efficient traffic management system should be designed and implemented to support and optimize the operation of public transport and the management of road regulatory devices (i.e. traffic lights, etc.). The improvement of the existing systems must begin in the first phase of the application of the action plan. During the process of shifting modal sharing from private to public transport, it is necessary to implement actions to enhance both private and public vehicle performance regarding emissions. Regulations, controls and incentives are the key strategies to replace polluting modes of transport and increase the spread of cleaner fuels. Finally, public participation in decision-making and communication campaigns are the tools for understanding public opinion and to spread awareness regarding sustainability in the transport sector.
With regard to the building sector, heating and cooling systems should be improved, developing district heating and cooling networks, enhancing regulations and control systems and putting great effort into fostering the use of natural gas. Many world cities have already developed heating and cooling systems, for instance Seoul metropolitan transmission network links 16 district heating plants for the purpose of increasing the energy-use efficiency of each plant and providing a continuous supply to the customer. It supplies 10,604 GWh to 832,000 households and 1,661 customers of commercial and public buildings. Additionally, some world cities developed regulations on domestic heating control systems: the domestic plants are controlled on an annual basis through the issuing of a compliance coupon. Milan is taking this approach with its “Blue label” system: domestic heating plants have to be controlled yearly and the control company must issue a label. Another very effective way to decrease the concentration of pollution into the air in cities is by switching the fuel to natural gas. This would be an important step for the building sector in Beijing, since the use of very polluting fuels (i.e. coal) still accounts for a large portion of the total energy demand. What emerges for the study is that there is no single strategy in reducing air pollution; the right mix of policy measures is needed to improve air quality.

Note
1 http://www.unfpa.org/swp/2007/english/introduction.html

要优先考虑将各种公共交通方式（例如：时间衔接、车票通用等）和信号系统整合起来。此外，利用公交出行还必须保证舒适：车站点位在城市里要分配合理、在各站之间的步行距离不应该超过10分钟；而且必须避免车内拥挤。为此，需要扩大公交系统网络覆盖面、提高车辆频次。私家、公交混合型方式，如：共享私家车、提供租车服务等形式值得倡导。与此同时，有必要发展轻松式交通系统，扩大循环网络，实现自行车共享，并改善道路条件以提高公众散步的“幸福感”。良好的公共系统、配套上轻松式交通系统，而且再加上道路拥堵、征收较高的停车费等因素，则有可能减少私家车的使用。应设计并实施高效交通管理系统、优化公交运行管理和管理道路设备系统（如：信号灯等）。行动计划建议首先对现有系统进行改造。在从私家车向公交系统过渡的过程中，有必要对私家车和公交车提出更高的排放要求。制定政策法规、采取控制与激励并举的措施具有战略意义，不仅可以取代带来污染的交通运输方式，而且还可以推动清洁燃料的应用。最后，让公众充分参与决策过程、组织开展宣讲活动，这些对于了解民意、提高对可持续交通的认识，具有积极意义。在建筑行业，应对供热和制冷系统加以改进，发展区域供热和制冷网络，加强法规和控制系统，并努力推动天然气应用。世界上许多城市已经研制成建筑供热和制冷系统，比如：首尔区域网为16个小区提供供热，提高了每套设备的能源利用效率，而且实现了持续为客户供应能源的服务。这套系统为83.2万户居民、1661栋商业和居民楼提供了10,604 GWh电力。此外，世界上一些发达城市对室内供暖系统提出明确规定：每年对室内供热设施进行控制者可获得签发的优惠券。米兰就采用了这种方法，建立了“蓝标签”系统，即：每年对家庭供热设施必须进行控制，控制公司必须签发蓝标。另一种降低城市空气污染的有效方式就是用天然气作为替代燃料。这对北京建筑业来说将迈出非常重要的一步，因为目前北京使用的燃料（例如煤）污染排放非常高，占总能源需求的很大一部分。
通过研究发现没有任何一项单一的政策可以有效削减空气污染，而只有综合施策才能够真正改善空气质量。

注释
1 http://www.unfpa.org/swp/2007/english/introduction.html

Fig. 1: Cities Population Density
图1: 城市人口密度

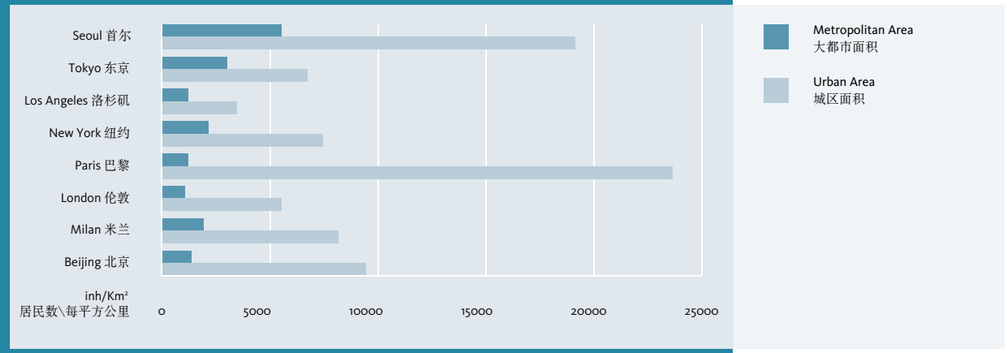


Fig. 2: Use of Private Transport
图2: 私家车使用情况

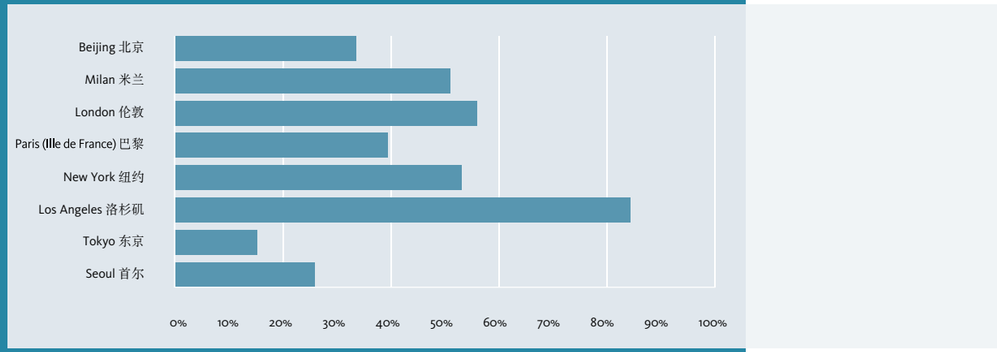


Fig. 3: Energy Consumption Split Comparison
图3: 能源消费种类对比

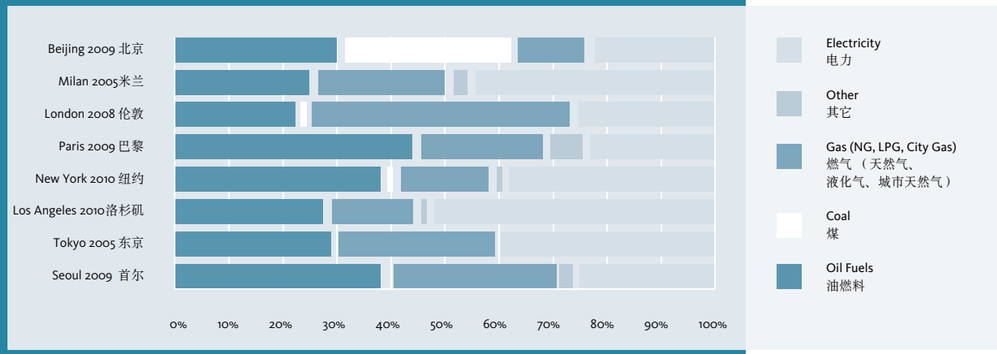
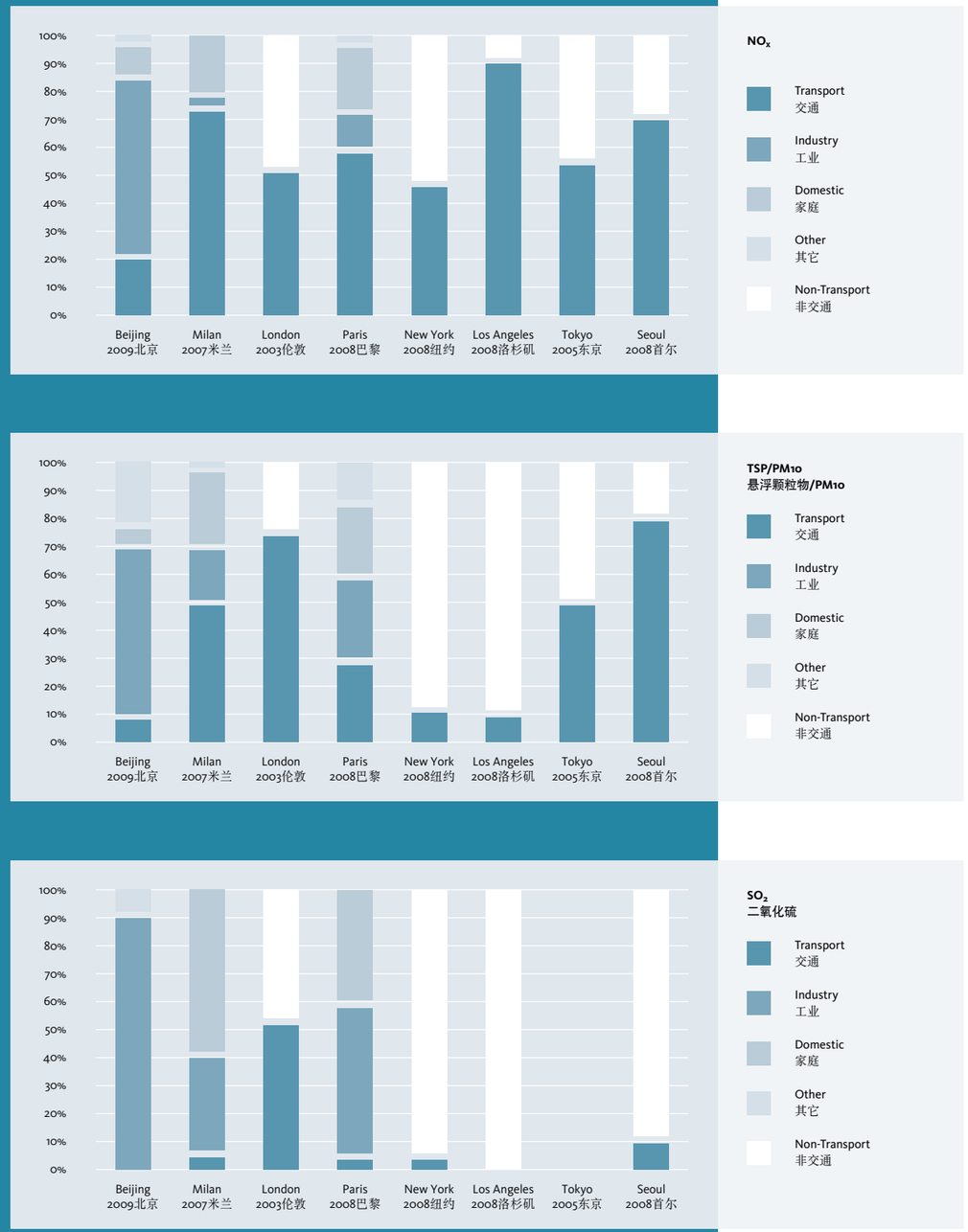


Fig. 4: Pollutants Emissions Splits in World Cities
图4: 世界城市污染物排放来源情况



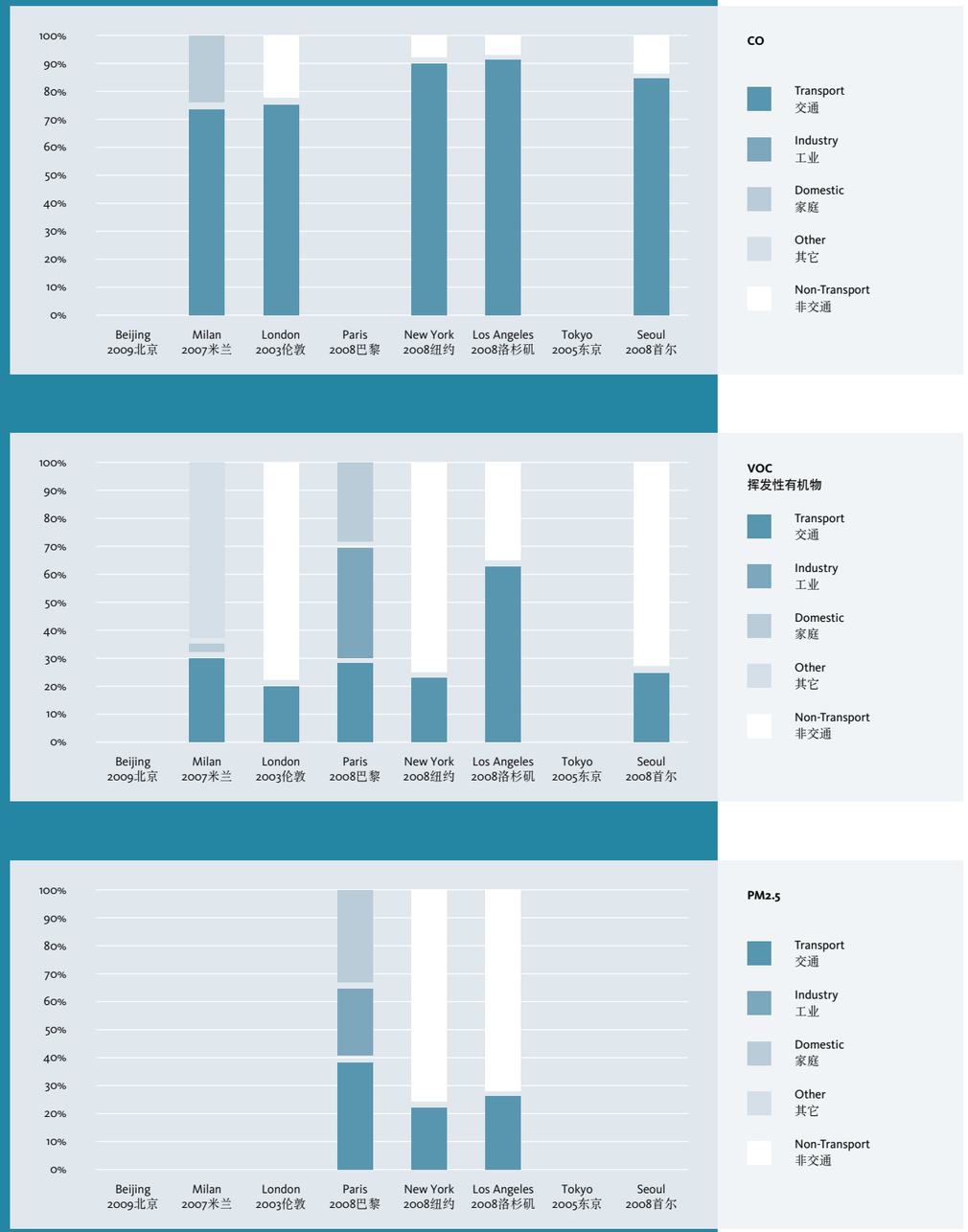
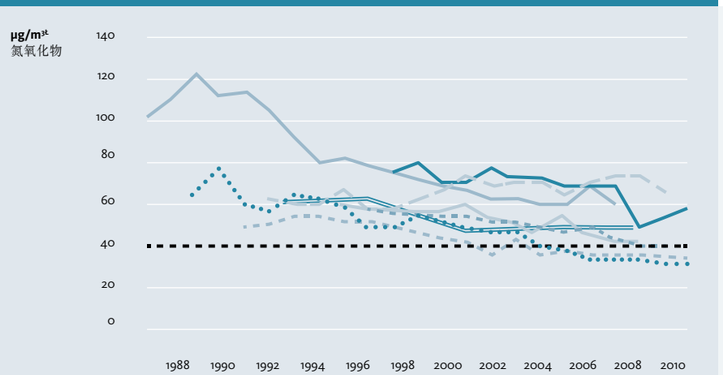
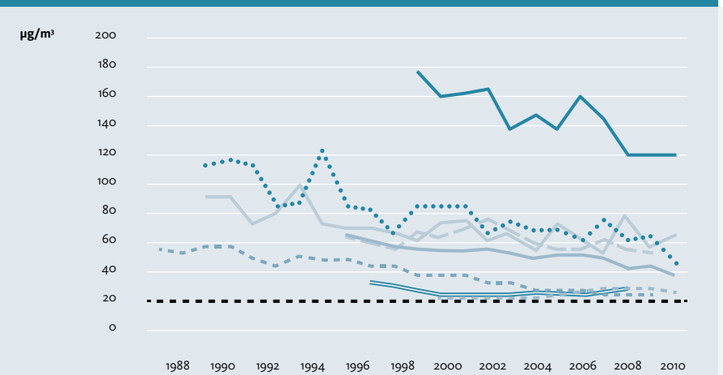


Fig. 5: Air Pollution Trends over Time
图5: 污染物排放变化趋势



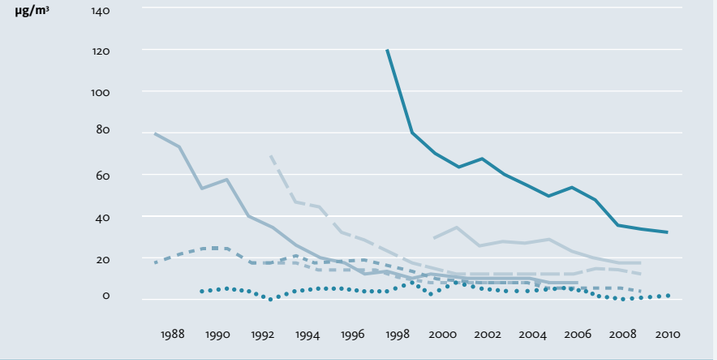
NO_x
氮氧化物

- Beijing 北京
- Tokyo 东京
- Milan 米兰
- Paris (Ille de France) 巴黎
- New York 纽约
- Seoul 首尔
- London 伦敦
- Los Angeles 洛杉矶
- WHO limit 世界卫生组织限值



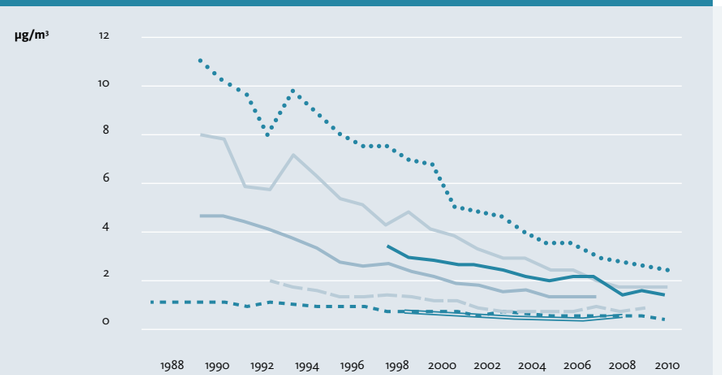
TSP/PM10
总悬浮颗粒/PM10

- Beijing 北京
- Tokyo (SPM) 东京
- Milan 米兰
- Paris (Ille de France) 巴黎
- New York (2nd max 24h) 纽约
- Seoul 首尔
- London 伦敦
- Los Angeles (2nd max 24h) 洛杉矶
- WHO limit 世界卫生组织限值



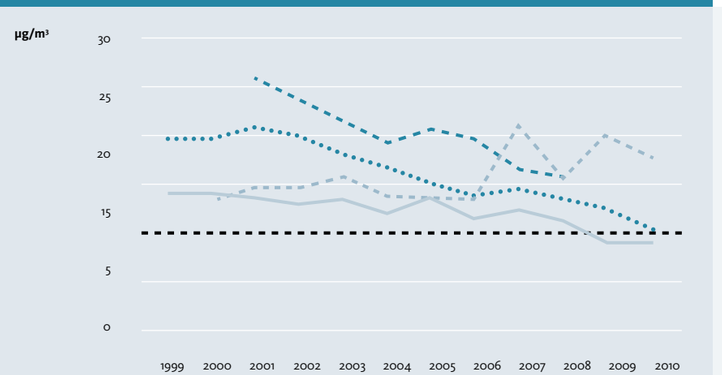
SO_2
二氧化硫

- Beijing 北京
- Tokyo 东京
- Milan 米兰
- Paris (Ille de France) 巴黎
- New York 纽约
- Seoul 首尔
- London 伦敦
- Los Angeles 洛杉矶



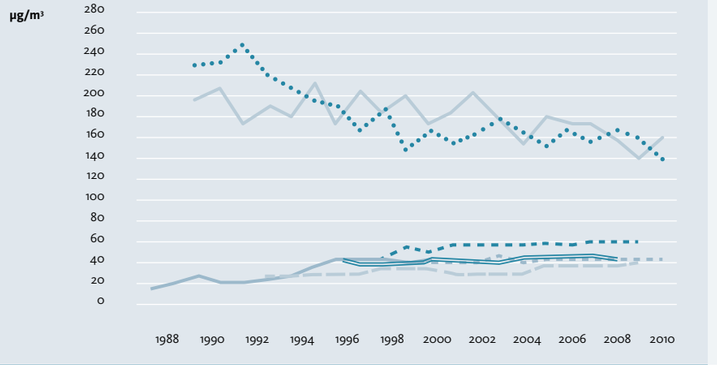
CO
一氧化碳

- Beijing 北京
- Tokyo (SPM) 东京
- Milan 米兰
- Paris (Ille de France) 巴黎
- New York (2nd max 24h) 纽约
- Seoul 首尔
- London 伦敦
- Los Angeles (2nd max 24h) 洛杉矶



PM2.5

- Tokyo (SPM) 东京
- Paris (Ille de France) 巴黎
- New York (2nd max 24h) 纽约
- Los Angeles 洛杉矶
- WHO limit 世界卫生组织限值



O_2
臭氧

- Beijing 北京
- Tokyo (O_3) 东京
- Milan 米兰
- Paris (Ille de France) 巴黎
- New York (4^{th} max) 纽约
- Seoul 首尔
- London 伦敦
- Los Angeles (4^{th} max) 洛杉矶

Table 1: Beijing Action Plan
表1：北京行动方案

Sector / 行业领域		Measure / 措施		Action / 行动	
1	**Industry / 工业**	IND-A	Facilities Relocation / 设施搬迁	IND-A1	Moving Industrial Facilities outside the City / 将工业设施搬迁出城市
		IND-B	Industy Fuels “Cleaning” / 工业燃料 “清洗”	IND-B1	“Cleaning” the Fuel Used for Industrial Activities / 推动工业染料清洁化
		IND-C	Regulations Enhancement / 完善政策法规	IND-C1	Enhancing Regulations and Control Systems on Emissions / 完善污染物排放的政策法规和控制体系
2	**Buildings / 建筑**	BLD-A	Heating and Cooling Systems Enhancement / 改进加热和制冷系统	BLD-A1	Developing Heating and Cooling Networks / 发展供热和制冷网络
				BLD-A2	Enhancing Regulations and Control Systems on Heating / 改进供热法规和控制系统
				BLD-A3	Shift to Natural Gas / 改用天然气
3	**Transport / 交通运输**	TRA-A	Private Transport Enhancement / 改进私人运输系统	TRA-A1	Enhancing Regulation on EURO Standard / 提高尾气排放标准EURO
				TRA-A2	Annual Check of Exhaust Gases / 对轿车尾气排放每年进行检测
				TRA-A3	Economic Incentives Strategy / 经济激励战略
				TRA-A4	“Cleaning” the Diesel Fuel / “清洁” 柴油
				TRA-A5	Introduction Car Pooling Incentives / 引入共享轿车激励机制
				TRA-A6	Implementing Car Sharing Systems / 实施轿车租用服务系统
				TRA-A7	Facilitating Freight / 促进货物运输
		TRA-B	Public Transport Improvement / 改进公共交通运输	TRA-B1	Easier Interchange / 改善换乘条件
				TRA-B2	Enhancing and Integrating Subway and Railway System / 提高和整合地铁和铁路系统
				TRA-B3	Improving Bus System / 改进公交车系统
				TRA-B4	Developing Tram System / 发展电车系统
				TRA-B5	Shift of Buses Fleet toward Sustainability / 推进公交车更具可持续性
		TRA-C	Soft Mobility Enhancement / 改善轻便交通系统	TRA-C1	Enhancement and Extension of the Cycling Network / 改进和扩大自行车覆盖网络
				TRA-C2	Introducing Bike Sharing System / 引入自行车共享系统
				TRA-C3	Making Walking Count / 改善步行条件
		TRA-D	Communication Strategy / 改进沟通交流战略	TRA-D1	Public Participation in Decision Making / 公众参与决策环节
				TRA-D2	Launch of Communication Campaigns / 组织公众参与活动
		TRA-E	Management and Alert Systems / 管理和警示系统	TRA-E1	Implementing Traffic Management System / 执行交通管理系统
				TRA-E2	Implementing Advanced Alert System / 执行提前警示系统
				TRA-E3	Implementing Info-Mobility System / 执行信息–运输系统
		TRA-F	Localized Challenges / 本地化挑战	TRA-F1	Implementing Congestion Charge Program / 征收拥堵费
				TRA-F2	Implementing Parking Change Programs / 征收停车费

Clean Air Actions for Beautiful Beijing
开展清洁空气行动 建设美丽北京

Song Qiang, Ming Dengli
Beijing Municipal Environmental Protection Bureau
北京市环境保护局 宋强 明登历

1. Social, Economic and Environmental Background information on Beijing

Beijing, the capital of China, with a total territory of 16400 km², is situated in the northwest of the Northern China Plains. With mountain ranges enclosing the city in three directions, Beijing possesses a typical "dustpan-shaped" topography. It has a temperate semi-humid continental monsoon climate that is characterized by limited precipitation, which makes the diffusion of air pollutants difficult.

For more than a decade, Beijing has experienced rapid social and economic development. Specifically, from 1998 to 2012, its GDP increased by 6.5 times, increasing from RMB 237.5 billion Yuan in 1998 to RMB 1.78 trillion Yuan in 2012. The permanent residential population has increased by 66%; from 12.45 million in 1998 to 20.69 million in 2012. The amount of vehicles has increased by 2.85 times, from 1.35 million in 1998 to 5.2 million in 2012. Total energy consumption has increased by 90%, as reflected in the increase of standard coal use from 38.08 million tons in 1998 to 72.5 million tons in 2012 (Figure 1).

In the face of environmental pressure resulting from the rapid urban development since 1998, the Beijing Municipal Government (BMG) has placed great emphasis on the improvement of air quality, implemented air pollution control measures consisting of 16 consecutive phases and Clean Air Action Plans for three years in a row, and managed to improve air quality markedly. Seizing the opportunity to prepare and host the 2008 Olympic Games, BMG put forward the "Green Olympics" concept. After the 2008 Olympic Games, Beijing set a "Green Beijing" target, and a "Green Beijing" action plan was published. In doing so, it fully implemented the principles of solving environmental problems in the process of developing and promoting sustainability in Beijing through environmental protection.

From 1998 to 2012, the annual average concentration of major air pollutants saw an overall decrease. Specifically, the concentration of SO_2 fell from 120 μg/m³ in 1998 to 28 μg/m³ in 2012 - a drop of 76.7%. The concentration of NO_2 fell from 66 μg/m³ in 1998 to 52 μg/m³ in 2012 - down 29.7%.The concentration of PM_{10} fell from 188 μg/m³ in 1998 to 109 μg/m³ in 2012 - a decrease of 47.2% (Figure 2).

1. 北京社会经济及环境背景情况

北京是中国的首都，面积16400km²。北京地处华北平原西北部，三面环山，地形呈典型的"簸箕状"特征，属于温带大陆性半湿润季风气候，干旱少雨，不利于空气污染物的扩散。

十几年来，北京经济社会快速发展，从1998年到2012年，全市地区生产总值（GDP）增长了6.5倍，从1998年的2375亿元增长到2012年的1.78万亿元；常住人口增长了66%，从1998年的1245万增长到2012年的2069万；机动车保有量增长了2.85倍，从1998年的135万辆增长到2012年的520万辆；能源消耗增加了90%，由1998年的3808万吨标准煤增长到2012年的7250万吨标准煤（图1）。

面对城市快速发展带来的环境压力，1998年以来，北京市政府将改善空气质量作为全市的一项重点工作，连续实施了16个阶段大气污染控制措施、3个年度的清洁空气行动计划，实现了空气质量的显著改善。特别是以筹办和举办2008年奥运会为契机，提出了"绿色奥运"理念。奥运会后，北京市又提出了建设"绿色北京"的目标，制定了"绿色北京"行动计划，坚持在发展中解决环境问题，以环境保护促进城市可持续发展。1998年到2012年，空气中主要污染物年均浓度全面下降，二氧化硫（SO_2）浓度由1998年的120微克/立方米下降到2012年的28微克/立方米，下降了76.7%；二氧化氮（NO_2）浓度由1998年的66微克/立方米下降到2012年的52微克/立方米，下降了29.7%；可吸入颗粒物（PM_{10}）浓度由1998年的188微克/立方米下降到2012年的109微克/立方米，下降了47.2%（图2）。

2. 继续改善空气质量面临巨大挑战

2011秋季和2012年冬季，中国华北等地区多次出现雾霾天气，引起全国人民乃至国际社会的高度关注。2013年1月，北京出现了4次因雾霾引起的持续

Fig. 1: Social and Economic Development of Beijing from 1998 to 2012
图1: 1998-2012年北京社会经济发展情况

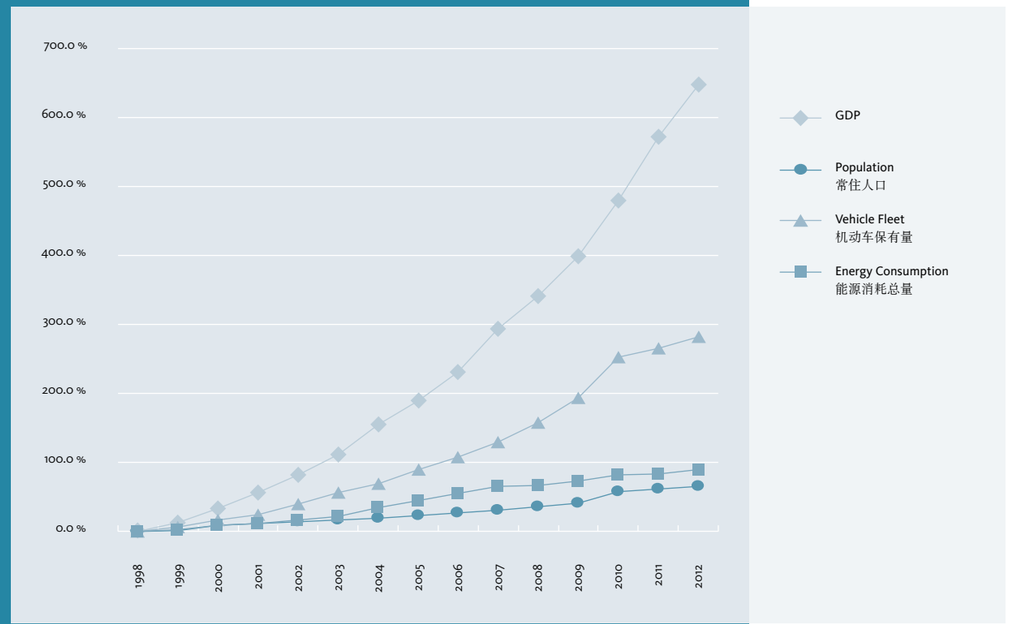


Fig. 2: Air Quality Improvement in Beijing from 1998 to 2012
图2: 1998—2012 北京空气质量改善情况

2. Great Challenges for Further Improvement of Air Quality

In the autumn of 2011 and the winter of 2012, North China experienced thick fog and haze more than once, which drew the attention of both China and the international community. Later, in January 2013, Beijing experienced four persistent, heavy pollution episodes resulting from haze. In view of the severe pollution in Beijing, it is urgent that the city adopts effective measures to prevent air pollution and improve air quality while it strives to build a Beautiful Beijing.

In 2012, the Chinese Ministry of Environmental Protection promulgated new national ambient air quality standards, which tightened the limits on the concentration of NO_2, PM_{10} and other pollutants, including new pollutants like $PM_{2.5}$ and O_3 in the system. The annual average concentration and daily concentration of $PM_{2.5}$ was set at 35μg/m³ and 75μg/m³ respectively. To meet the requirements of the new standards, Beijing needs to solve the problem of $PM_{2.5}$, which is currently the most difficult pollutant and also the greatest concern to the general public.

In recent years, Beijing EPB has organized and launched a number of scientific study projects, conducted monitoring and assessment of the composition and causes of $PM_{2.5}$ in the air, and concluded that heavy $PM_{2.5}$ pollution in Beijing is attributed to five major causes. Firstly, the background concentration of $PM_{2.5}$ in North China, of which Beijing is a part, stays at a relatively high level. Secondly, the total emission of the local atmospheric pollutants stays at a high level. Thirdly, pollutant transportation from neighboring areas has a big impact on Beijing's air quality. Fourthly, the geographical features and climate of Beijing are not favorable for air pollutant dispersion. Finally, the self-purification capacity of the air in the ecological system is weak, and the environmental carrying capacity is inadequate.

In general, the air pollution represented by $PM_{2.5}$ in Beijing is an issue concerning the economical development pattern and lifestyles in nature. The extensive mode of development that prevailed

重污染过程，污染形势十分严峻。如何采取有力措施防治大气污染，改善空气质量，成为建设美丽北京迫在眉睫的任务。

2012年，中国国家环境保护部发布了国家空气质量新标准，一方面加严了NO_2、PM_{10}等污染物的浓度限值，同时增加了$PM_{2.5}$、臭氧（O_3）等新的污染物，$PM_{2.5}$的年均浓度、日均浓度分别设定为35微克/立方米、75微克/立方米。$PM_{2.5}$是北京达到国家新的空气质量标准最困难的一项指标，同时也是最受公众关注的污染物指标。

北京市环保局近年来组织开展了多项科学研究课题，对空气中$PM_{2.5}$的组成及来源进行了监测和评估。北京市$PM_{2.5}$污染较重有五个方面的原因：一是北京所在的华北地区$PM_{2.5}$背景浓度总体处于较高水平；二是本地的大气污染物排放总量居高不下；三是周边污染传输对北京影响显著；四是地理气象条件不利，五是生态系统的空气自净功能较弱，环境承载力不足。

北京面临的以$PM_{2.5}$为典型特征的空气污染，本质上是经济发展方式和生活方式问题。过去几十年粗放的发展方式付出了很大的资源环境代价，发达国家城市上百年期间陆续出现的环境问题，现阶段在北京集中出现。同时，随着人民生活水平提高，汽车、空调等大功率电器走进千家万户，生活性能耗越来越高，带来的直接和间接污染问题越来越突出。

降低$PM_{2.5}$污染、持续改善空气质量，对于北京市来说，将是一个长期、艰巨的过程。

3. 北京 2013-2017清洁空气行动计划

中国中央政府和北京市政府高度重视治理大气污染问题，2013年6月中旬，中央政府审议通过了全

in past decades has sacrificed resources and the environment. Consequently, the environmental problems that were encountered by developed countries during previous centuries are now being experienced in Beijing. Meanwhile, the improvement of living standards and the mass use of vehicles and high-powered home appliances such as air conditioners has increased rapidly, which has led to rising daily residential energy consumption and increasingly serious direct and indirect pollution. Therefore, to decrease $PM_{2.5}$ pollution and to keep improving air quality, Beijing has a long way to go.

3. Beijing 2013-2017 Clean Air Action Plan

The Central Government of China and the Municipal Government of Beijing have attached great importance to air pollution control. According to the National Air Pollution Prevention Action Plan, deliberated and approved by the central government, the top priority of air pollution control nationwide is the Beijing-Tianjin-Hebei area, with the focus on Beijing. Beijing needs to lower the concentration of $PM_{2.5}$ to 60 μg/m³ by 2017, which means a drop of 25% from 2012.
Following these guidelines, Beijing has studied and developed the Beijing 2013-2017 Clean Air Action Plan. It is guided by the strategy of building an ecological civilization, one that aims to safeguard human health and focuses on $PM_{2.5}$ pollution control. It also combines governmental guidance and market rules, targeting both total pollutant emission reduction and air quality improvement, and attaches great importance to accelerating the transformation of economic development patterns. In addition, it lays emphasis on the optimization of the working mechanism for air pollution prevention, integrating "government guidance, enterprises' actions and public participation," and adopts legal, economic, scientific and administrative measures comprehensively, to actively promote the synergy emission reduction of multiple pollutants and strive to achieve environmental benefits, economic returns and social benefits simultaneously.
The Beijing 2013-2017 Clean Air Action Plan is comprised of eight pollution reduction programs; six supporting programs and three public participation campaigns.

3.1 Eight pollution reduction programs

These programs include programs on pollution reduction from the front side to reduce added emissions from new sources, programs to reduce pollution emissions from existing sources, and programs for pollution load reduction and ecological construction projects centering on the expansion of environmental capacity.

3.1.1 Control Pollution Sources

Optimizing urban spaces and land use layout, implementing reasonable control of the population and the vehicle fleet volume, as well as adopting measures such as rigorous industrial admittance

国大气污染防治行动计划，明确提出全国大气污染防治的重点是京津冀、京津冀的重点是北京，要求北京市到2017年要将PM2.5浓度控制在60微克/立方米左右，比2012年下降25%以上。
北京市在此框架下研究制订了北京市2013-2017年清洁空气行动计划，主要思路是以生态文明建设为统领，以保障市民健康为出发点，以防治$PM_{2.5}$污染为重点，坚持政府调控与市场调节相结合，污染物总量减排与空气质量改善相匹配，着力加快转变经济发展方式，着力完善“政府主导、企业施治、公众行动”的大气污染防治工作机制，综合运用法律、经济、科技和行政手段，积极推进多种污染物协同减排，努力实现环境效益、经济效益、社会效益共赢。
北京市2013-2017年清洁空气行动计划包括八大污染减排工程、六大保障措施、三大全民参与行动。

3.1 八大污染减排工程

主要包括控制污染“增量”的源头控制减排工程，削减污染“存量”的减排工程，以及扩大环境容量的生态建设工程。

3.1.1 控制污染源头

通过优化城市空间和土地利用布局，合理控制人口和机动车规模，以及严格产业准入等措施，减少新增污染源，缓解社会经济发展对资源和环境带来的压力。

3.1.2 调整能源结构

坚持能源清洁化战略，到2017年，将全市燃煤总量比2012年削减13 00万吨，外调电比例达到70%左右，天然气用量达到240亿立方米，从源头上减少燃煤污染。

3.1.3 调整机动车结构

优化机动车结构，使其更加“节能化、清洁化”，力争到2017年车用燃油总量比2012年降低5%，减少污染排放。同时继续大力发展公共交通，2015年全市轨道交通运营里程达到660公里，2017年中心城区公交出行比例力争达到52%。计划到2016年实施第六阶段排放标准和油品标准，对非道路动力机械执行更加严格的排放标准。2017年底前淘汰100万辆老旧机动车。积极推广新能源车，到2017年底，

全市新能源和清洁能源汽车达到20万辆。

3.1.4 调整产业结构

继续优化产业结构，大力发展生产性服务业，到2017年，第三产业比重达到79%；淘汰压缩污染产能，整治小型污染企业，到2017年，调整退出1200家小型污染企业。推行清洁生产，组织企业开展清洁生产审核。

3.1.5 开展末端污染治理

制订更加严格的低硫煤等产品的质量标准，修订锅炉、建材等重点行业大气污染物排放标准，加严污染物排放限值。要求保留的锅炉、电厂燃煤机组进行除尘及脱硝治理，要求建材、石化、汽车制造等行业开展污染治理技术改造，大幅度降低氮氧化物及挥发性有机物等污染物排放。

3.1.6 推动城市精细化管理

严格控制施工扬尘污染、道路扬尘污染、露天烧烤、餐饮油烟等污染。严格在用车和油品质量监管，完善小客车分区域、分时段限行政策，引导降低使用强度。严格执法监管，加大执法处罚力度。提高环境监测和监管能力。

3.1.7 加强生态环境建设

在北京的平原地区实施百万亩造林工程，加强城乡绿化美化建设，到2017年全市林木绿化率达到60%以上。加大永定河、潮白河、北运河水系综合治理及清洁小流域建设力度，到2017年新增水域面积1000公顷、清洁小流域170条。加快废弃矿山的生态修复。

3.1.8 完善空气重污染应急方案

修订完善北京现有的空气重污染应急方案，考虑实施机动车单双号限行等更加严格的应急措施。

3.2 六大保障措施

包括法规创新、政策创新、科技创新以及制度创新等方面的保障措施。

3.2.1 完善法规规章

推动《北京市大气污染防治条例》尽快出台，重点在污染物排放总量控制、区域限批、排污许

policies, reducing new pollution sources, and mitigating stress posed by social and economic development on resources and the environment.

3.1.2 Adjustment of Energy Structure

Adhering to a clean energy strategy to lower coal consumption in Beijing, namely, to reduce coal consumption by 13 million tons from 2012 to 2017, increase the proportion of external electricity to 70%, and increase the use of natural gas to 24 billion m³, cutting source pollution and reducing coal-fired pollution.

3.1.3 Adjustment of Vehicle Fleet Structure

Optimizing the structure of vehicle fleets and making them "more energy efficient and cleaner," and striving to reduce the total amount of automotive fuel - from 2012 to 2017 - by 5%, thereby reducing pollutant emissions. In the meantime, vigorously developing public transportation, increasing the mileage of rail transit to 660 km by 2015 and increasing the use of public transportation to 52% in downtown areas by 2017. Additionally, planning to implement a phase-six (equivalent to Euro VI) emission standard and petrol standard by 2016 and imposing stricter emission standards on non-road motor machinery.
By the end of 2017, the phasing out of 1 million old and outmoded motor vehicles; actively promoting the use of alternative energy vehicles and increasing the number of alternative energy and clean energy vehicles to 200, 000 by the end of 2017.

3.1.4 Adjustment of Industrial Structure

Continual optimization of industrial structures, vigorously developing the productive service industry, and increasing the proportion of the tertiary industry to 79% by 2017; eliminating and reducing pollutant production capacity, regulating small scale polluting enterprises, and transforming and shutting down 1,200 small scale polluting enterprises by 2017; promoting cleaner production and calling on enterprises to conduct a cleaner production audit.

3.1.5 End-of-pipe Pollution Control

Enacting stricter quality standards for low-sulphur coal and other products, revising the air pollutants emission standard for boilers, building materials and other key sectors, and imposing stricter limitations for pollutant discharge. Recommending that the remaining boilers and coal-fired units of power plants to go through dust removal and denitrification treatment, and instructing building material, petrochemical and automobile manufacturing industries to carry out pollution control technical renovation, to achieve significant reductions in nitrogen oxides (NOx) and volatile organic compounds (VOC) emissions.

3.1.6 Promote More Stringent City Management
Imposing rigorous control over dust-raising in construction sites, roads, open-air barbeques, cooking oil fumes and other kinds of activities. Imposing strict supervision of in-use vehicles and the quality of fuel oil, improving area-specific and time-specific traffic control of passenger cars, and discouraging the use of such vehicles; adhering to strict law enforcement and supervision, and intensifying law enforcement and punishment; improving the capacity for environmental monitoring and supervision.

3.1.7 Enhancing Eco-system Construction
In the plain areas of Beijing, implementing a 1 million mu (about 600,000 hectares) tree-planting program, strengthening the construction of greener and more beautiful urban and rural areas, and increasing the proportion of the urban greening coverage rate to over 60% by 2017. Exerting greater efforts in the comprehensive control of Yongding River, Chaobai River, the North Canal River System and the construction of clean small watersheds, and adding 1,000 hectares of a new water area, and clean 170 small watersheds by 2017; accelerating the ecological restoration of abandoned mines.

3.1.8 Optimize Heavy Air Pollution Episodes Emergency Response Actions
Revising and optimizing the existing emergency response plan on heavy air pollution episodes, and assessing the possibility of implementing odd-and-even license plate rules and even stricter emergency response measures.

3.2 Six Supporting Programs
These include setting innovative regulations, policies, technologies and institutional arrangements.

3.2.1 Optimize Laws and Regulations
Accelerating the promulgation of the Beijing Air Pollution Prevention and Control Ordinance, with an emphasis on control of total pollutant quantity emission, regional restricted approval, pollution emission permits, emissions trading, heavier penalties etc., and formulating rigorous and practicable regulations.

3.2.2 Innovative Economic Incentive Rules
in respect to pricing and taxation policies, setting prices for the consumption of water, electricity and other resources for enterprises, studying and optimizing differentiated and stepped resource pricing policies, and providing guidance for the rapid adjustment and transformation and orderly shutdown of enterprises with high-energy consumption and heavy pollution. With respect to market-based mechanism, the study and optimization of policy support for the use of electric heating, ground source heat pumps, solar energy etc. In the meantime, promoting emissions trading, green credit and green securities, and prohibiting enterprises that violate environmental laws from getting loans and seeking finance by enlisting on the stock market; increasing financial input and - through rewards, allowance, and subsidies on interest payments - encouraging the investment of social funds in air pollution control.

3.2.3 Enhance Scientific and Technical Support
Organizing and carrying out studies on the contributing factors of air pollution, regular patterns of pollutant transition and transportation, source apportionment and the impact of $PM_{2.5}$ on human health; encouraging R & D and the application of pollution control and energy-saving technologies; opening up to international exchange and cooperation to introduce advanced international pollution control management experiences and technologies.

3.3 Three Public Participation Campaigns
Air pollution prevention and air quality improvement are responsibilities shared within society. Mobilizing all companies and citizens to adopt green and environmentally friendly production modes and lifestyles, and encouraging everyone to care for the environment and to contribute to environmental improvement.

3.3.1 Highlight Social Responsibilities of Enterprises
Encouraging enterprises to take the initiative to undertake social responsibilities, strictly complying with environmental protection laws and regulations, and ensuring the stable and smooth operation of pollution prevention facilities and up-to-standard emission of pollutants.

3.3.2 Encourage the Public to Conduct Supervision
Releasing environmental information in a timely manner, encouraging media and non-governmental environmental organizations to engage in environmental protection public benefit publicity, law publicity, and conducting supervision over the performance of enterprises in pollution control and implementation of the Clean Air Action Plan.

3.3.3 Encourage the Public to Participate in Pollution Reduction Programs
A campaign to launch “Contributing Your Efforts to Beautiful Beijing” that involves the long-term participation of the general public, promoting environmental protection, and encouraging the public to make every possible effort to adopt green and low-carbon lifestyles; making relevant channels available so that the general public will be able to present their suggestions for air pollution control.
“The strong pass of the enemy is like a wall of iron, yet with firm strides, we are conquering its summit.” In spite of the difficulties, the future sky of Beijing will surely be cleaner and more beautiful, with the concerted efforts and the participation of Beijing citizens.

可、排污交易、加大处罚力度等方面，制订严格的、可操作的规定。

3.2.2 创新经济政策
在价格税费政策方面，制定水、电等资源类产品企业消耗定额，研究完善差别化、阶梯式的资源价格政策，引导高耗能、重污染企业加快调整转型、有序退出。在市场手段方面，研究完善电采暖、地源热泵、太阳能利用等支持鼓励政策。推进排污权交易、绿色信贷和绿色证券，严格限制环境违法企业的贷款和上市融资。加大财政投入，以奖励、补贴和贴息的形式，带动社会资金，支持大气污染治理。

3.2.3 强化科技支撑
组织开展大气污染成因、传输规律、来源解析，以及$PM_{2.5}$对人体健康的影响等方面的研究。鼓励污染治理和节能技术的研发及应用。加强国际交流合作，引进先进的国际管理经验和治理技术。

3.3 三大全民参与行动
防治大气污染、改善空气质量是全社会的共同责任。动员全社会践行绿色环保的生产、生活方式，形成“保护环境、人人有责，改善环境、人人行动”的新风尚。

3.3.1 强调企业社会责任
倡导企业自觉承担社会责任，严格遵守环保法律法规，确保污染防治设施正常运行，污染物稳定达标排放。

3.3.2 鼓励公众参与监督
及时发布环境信息，鼓励媒体和环保非政府组织开展环保公益宣传、法制宣传，监督企业污染治理和清洁空气行动计划的实施。

3.3.3 倡议公众加入减排行动
策划举办以“为美丽北京加油”为主题的长期性公众参与活动，以传播环保知识、引导公众从我做起，推动形成绿色、低碳的生活方式。建立渠道，鼓励公众为大气污染治理出谋划策。
雄关漫道真如铁，而今迈步从头越！相信在全体北京市民的共同努力和参与下，北京一定会有一个更加清洁美好的明天。

Sustainable Mobility for Smart Cities
智慧城市的可持续交通

Fabio Maria Ciuffini
Engineer, Planner, Researcher, Designer of Alternative Transport Systems
工程师、规划师、替代交通体系设计师

“可持续发展是一个变化的过程。在这个过程中，资源开发、投资方向、技术发展和制度变迁都相互协调，并且为了实现一个共同目标，即：满足当代和未来人类的需要和愿望”。
换句话说，可持续发展既满足当代人的需求，又不以牺牲后代人满足其需求的能力为代价。它是一种道德原则，在过去四分之一世纪以来，人们一直围绕它进行科学与政治方面的辩论。时至今日，部分理念已经得到应用。
在工业化国家中，人们的日常需求比以往得到了更好的保证。食品、服装、文化、卫生、服务，安全和健康保健等方面都有一定程度的提高；尽管人口和城市土地面积持续增长，但未造成不可再生资源的同比消耗。此外，超过一半以上的世界人口居住在城市，其复杂性导致了在城市里出现人口大量流动性。
有一点非常肯定，即：人员流动、能源消耗、污染物和二氧化碳排放等都发生在城市里。
然而，在城市未来需求以及生活质量方面，只有城市交通系统是不可能随着时间的推移而改善的。事实上，在市区范围内人们的平均移动速度在明显降低，城市变得越来越拥挤，大量时间浪费在旅途上；空气、噪声污染不断加剧。这些情况愈演愈烈，不断发出警告，并最终成为越来越紧迫的问题。
正如我们将会看到的，城市发展与交通系统的表现形式密切相关；城市发展会逐渐阻碍城市的流动性，并最终破坏城市中央与城市外围间的联系，破坏邻里间及城市中的正常活动。此外，人员流动无处不在。越来越多的是私人汽车和摩托车，而公交车、有轨电车、地铁和市郊列车却少而又少。这种现象日趋严重，变得不可逆，并最终势必会造成城市的“不可持续”发展。我们从先辈继承了流动性合理、可宜居的城市，但很可能

“Sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations”. In other words, sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. It is an ethical principle, which has fueled the scientific and political debate in the last quarter century and which has been applied only partially.
In industrialized countries, most of today’s needs are better ensured than in the past. Food, clothing, access to culture, general hygiene conditions, the provision of services, safety and health care are certainly improved, without proportionally increasing the consumption of non-renewable resources, despite the growth in population and territorial urban dimension. Moreover, more than half the world’s population lives in cities and their complexity entails an increase in displacement demand.
However, it is possible to demonstrate that it is in cities where the most displacement, energy consumption, pollutants and CO_2 emissions occur. There at least one aspect of a city’s future needs and quality of life that is unlikely to improve with time, and that is mobility.
In fact, the average travel speed in the urban context is significantly decreased, there is more congestion and lost time, air and noise pollution which causes a phenomenon of constant aggravation, generating alarm and now constituting a real emergency.
The development of the city – that, as we shall see, is closely related to the forms in which mobility is expressed - gradually hinders the possibility of movement, damaging the links between the central and the most peripheral parts of the city, and between various neighborhoods and urban activities. In addition, mobility as it stands almost everywhere - many private cars and motorcycles, few buses and almost no trams, metros or suburban trains - is gradually and irreversibly deforming our cities in a manner that is “not sustainable”. Very often, those who have inherited livable cities in terms of mobility, risk making them uninhabitable to future generations.
Understanding the “non-sustainability” of the current

state of mobility and blocking the regressive phenomena to avoid the emergence of new imbalances means asking the following questions: What cultural and political measures can be taken, which characteristics would allow mobility to be sustainable, how can one measure the deviation between these characteristics and the situation of each city, and what should be done now to reverse the situation and have sustainable mobility?
Let us consider something that is not obvious, or at least not in the recent past: urban planning and transport cannot be held in different spheres in either disciplinary action or decision-making, but they constitute, together with the environmental sphere, a “unicum”.
Modern cities exist because there are motorized vehicles operating in an urban dimension - unthinkable when one circulated only by foot or bicycle. The urban configuration and the distribution of the various functions in this area depend on the mobility and on the transport infrastructures. Moreover, the form of the city depends also on the type of mobility that is established. Motorized mobility is produced by a mixture of transport systems divided into two major groups: collective transport - trains, subways, trams, buses, etc. and private cars and motorcycles: also known as the public-private modal split. A city’s characteristics change and influence the modal split. This can be better understood by describing two opposite modes of a city’s development, presented below.
The first typology, in order of time, is characterized by development driven by the axes of public transport (the railway and today’s metro system). In these cases, where the modal distribution favors mass transit - with subways and suburban trains that pick up the majority of the demand - the city is developed according to the axes of the railway network, and this network “copies” the configuration. This pertains to all great European cities of the 1800s. The mobility system of these cities is based on the collective transport system being continuously updated and enhanced. Significant examples are Paris, London and even New York, where a very high proportion of people are moving by these means, but also other smaller cities in which there is an efficient network of subways and where, previously, there were efficient tram networks (eg. Lisbon). In these cities, the population and, consequently, the transport demand are concentrated around the transport network. The displacements follow those axes, while energy consumption per person remains low.
The other development schema in urban growth is car oriented, where private mobility is almost the only transport mode. In this second model the city’s growth takes place on the assumption that mobility and accessibility are basically guaranteed thanks only to the car. Unfortunately, this approach is widely accepted by all today, even by public opinion and many town and regional planners.
In these cities, the road network is highly branched

在我们手上将这些城市变得使我们的后代无法居住。
充分理解目前交通系统存在的不可持续性，避免恶性循环导致出现更多问题，需要认真思考并回答以下问题： 可以采取哪些文化和政治措施? 可持续交通应具备哪些特点? 当具体城市实际情况与这些特征出现偏差时，应该如何判断? 一旦出现这些情况该如何逆转以确保交通系统的可持续性?
让我们来考虑一个问题，至少在近期值得思考: 在学科划分或者决策过程中，不能将城市规划孤立看待，城市规划应该是环境保护工作的组成部分。
因为有机动车辆在城市里运行，才有了现代城市的存在。只通过步行或骑自行车在城市里穿行，是完全不可想象的。城市结构和各种功能的分布取决于其城市交通系统和运输基础设施。此外，城市的形态也与其交通形式密不可分。机动车运输系统分为两大类：公共交通工具和私人交通工具。前者包括火车、地铁、电车，公共汽车等；后者包括私家车和摩托车等，即混合型交通系统模式。一个城市的特征可以改变和和影响其交通系统模式。通过以下关于不同城市所采取截然相反的交通系统模式的介绍，可以更好地理解这个观点:
以时间为顺序，第一种类型城市是以公共交通为轴线（铁路和今天的地铁系统）来推动发展的。在这种情况下城市分布模式青睐于公共运输系统，地铁和市郊列车解决了公众的主要需求，城市也因此而依交通轴而建。交通网决定了城市的形态，这种情况适用于18世纪的欧洲大城市。这些城市的交通系统主要依靠公共交通工具，并且这种以公共交通为主的模式得到了不断发展提高。例如：巴黎、伦敦、纽约等，采用公共交通出行的人群占据了很高的比例。还有些小城市曾经建立了高效的电车系统（里斯本），现在也建立了高效的地铁网络；这些城市的公众及交通需求则集中在公交网络中。人们出行主要依靠沿轴线的交通系统，因此这里的人均能源消耗一直保持较低水平。城市发展的另一种模式是以汽车为导向，私家车几乎是唯一的出行工具。这种类型城市的发展完全得益于私家车这种方便的交通工具。不幸的是这种模式被当今社会以及地区规划

and only the peripheral links are free of congestion phenomena. These phenomena increase progressively closer to the city center. These cities are always in a condition of unstable equilibrium. They are in a state of perpetual territorial expansion even in the absence of population growth and in search of an operating area for a transport system that has low area efficiency and therefore a strong deconstructing effect.
While the central areas continue to lose more and more permanent residents, the city invades the countryside and large areas of urban fringe (neither country nor city) are created. The cities then turn into an amorphous mass, without the hierarchy that is created in the presence of strong public transport axes, and with high energy consumption and rising costs. How could it happen? The municipalities of these cities have established a real “car culture”, defined as a unique, irreplaceable and universal means of transport and the inconvenience caused by this is considered an almost inevitable natural phenomenon, rather than the consequence of bad economic choices and planning, without considering the delayed effects. The cities designed and grown in such a way are totally dependent on the car, according to the classic definition of Newman & Kenworthy. They could not survive even for a day if for some reason the car system should collapse.
The symbol of this urban culture based on such reason is Los Angeles, as well as many other American and European cities, such as Rome and most Italian cities.
In cities that have tried to follow this “car only” paradigm, the use of the public transport is marginal and, consequently, so is the demand for it. Moreover, public transport cannot attract significant traffic volumes and so becomes non-sustainable economically. Therefore it is reduced to a minimum, but with significant costs to the community.
The main consequence is the lack of any effective alternative to private transport, generating conditions of strong inequality among citizens, depending on their income, age, physical condition, possessions, ability or otherwise with regard to driving a motorized vehicle. Disparities also occur according to their location within the city. The opposite is not true! Let’s make a statement for those who care about the future of car and motorcycle manufacturers and their employees.
In a city oriented towards public transport, no one has ever challenged or prevented the spread of cars and private motorized mobility.
In these cities, even if the motorization level is lower, there are still adequate numbers of private cars and other car services used in a semi-collective way. Therefore every citizen has more transport options and access to and from every part of the city and given equal opportunity, regardless of income, age, physical condition, possessions, or the ability to drive a motorized vehicle. Every citizen is guaranteed equal conditions, accessibility and is not dependent on a car. It is easy to

专家广泛接受。在这些城市中公路网络高度密集。只有外环路无堵塞现象，越接近市中心交通拥堵现象越严重。这些城市总是处于一种不稳定平衡状态，即使在人口无增长的情况下也总是在无节制地进行道路扩建，造成土地利用效率低，而且建设破坏程度高。
随着市中心常住人口越来越少，城市开始向农村地区扩张，形成了大面积城乡结合部（既不是城市也不是农村）。这类城市的形态变得不确定，也没有了依公交轴线而建的层次感，而且其能源消耗高，成本上升。这是如何发生的呢？这些城市都完全建立在“汽车文化”上，汽车成为其独特的、不可替代的和普遍存在的交通方式，由此带来的不便捷性与其说是由于糟糕的经济决策和城市规划造成的，还不如说几乎是不可避免的。这类城市完全依赖于汽车，根据纽曼和肯沃斯的经典定义，如果某一天汽车系统出了问题，这里的市民们可能连一天都无法生存。属于这种城市文化的地区包括很多美国和欧洲城市，如洛杉矶、罗马以及大部分意大利城市等。
在以“车为唯一交通工具”的城市里，公共交通的使用是很边缘化的，结果导致对公共交通的需求也很低。又由于公共交通不能吸引大量乘客，从经济角度上来看公共交通也显得不可持续。因此，在将公共交通设施降低到最少的程度，其运行成本则会明显增高。
这种现象造成了私人交通工具的不可替代性；并且由于公民的收入水平、身体状况、财产情况、以及驾驶机动车能力等因素，造成公民间更大的不平等。所处城市位置不同，拥有交通工具的状况也各异。但反过来，这个说法却不成立！有一句话一定要向那些关心汽车、机动车制造商及其员工未来的人们说清楚，即：在任何一个重视公共交通的城市中，没有人质疑或反对发展私人轿车或私人机动车。
在这些城市中，即使机动车普及水平较低，但仍然有足够数量的私人轿车，并以一种半集体的方式来使用这些私家车和其他汽车服务。因此，每个公民可以有更多的出行方式选择，并且无论其收入、年龄、财产情况以及驾驶机动车能力，都可享有平等的机会。这样，每个公民都获得了平等的机会，并且不需要完全依靠私人轿车。在这些城市中，道路上的小轿车明显减少，而公共交

通则明显多些，因此其交通条件更为可持续些！
有一点必须立即澄清：电动汽车似乎是推进可持续发展的伟大救世主；但其实电动车不能以任何方式解决拥堵问题、影响城市的形态、解决全球二氧化碳排放的问题。只有发展公共交通、车道分驶，才是实现可持续交通的唯一出路。
这里需要强调：我不想质疑每个人拥有汽车的权利或快乐。事实上，如果行驶顺畅的话，并且能够负担得起，汽车可变成一种不可或缺的、最佳的交通工具。在我们看来，这种权利是与生俱来的；在城市里如果没有汽车或摩托车，就无法工作、购物及娱乐。总之，我们并不质疑汽车拥有权的合理性；而是想强调汽车更应当在方便的条件下来使用。可持续交通旨在提高公共-私人交通工具间的合理分配使用，而并不是要剥夺任何人的任何权利；恰恰相反，可持续交通更强调给公众提供便利条件。
需求分为不同种类：一种需求叫做“满足基本要求的需求”，如：去上班、学习、购物、或就医等；另一种需求叫做“想要型需求”，如：开车或骑摩托车兜风。对于最基本的“需求”，特别是重复性的“基本需求”，私人轿车就显得特别昂贵，从心理学角度分析，这属于人们承担不起的负担。在这种情况下，如果公共交通方便、并具有竞争力，公众则会更多地选择公共交通。对“当前用户倾向”分析的结果也充分证实了这个结论。
今天，私人轿车的使用正在下降。纽曼和肯沃西理论并不赞成“下降”这种说法...“这可能只是由于当前经济危机和燃料价格导致的... 也可能是某种更深层次的东西，并注定要改变我们当前的交通系统?”“汽车使用峰值”的概念正在放缓，伴随而来的是“石油生产达到峰值”。
我们希望行政管理部门以及公民个人对公共交通也有相同的理解。这将是一个不错的选择，而且是免费的。越来越多的人认识到，可持续交通是一种既方便又可持续的发展方向，大大减少对不可再生资源的消耗。普及可持续交通，至少对于满足基本需求来说是一种现代的、有竞争性的交通方式，对个人和社区来说都是低成本交通工具。
对各种交通体系进行成本分析是非常重要的：很多人都误以为有轨电车或地铁对公共财政的压力很大。其实这种现象存在于发展无序、设计人员忽视留出足够空间的城市。在这种情况下，无法实现分道行驶的快速公共交通，而建造地铁又显得太过昂贵。
今天，在许多欧洲城市，推动公共运输系统、修建地下隧道和车站，意味着高昂的费用。如果我们的目标不仅是控制公共支出，同时也是为了避免过多的私人支出，那么公共交通所带来的效益就不仅包括较少的个人支出，而且还带来了方便高效的公众出行条件。从这个角度来看，建设公共交通是划算的。这一点是得到验证的，而且我认为也是值得为其投资的。
可以建立起一种包括经济计量与交通运输模式的计算模型，以便测算与“最优”程度之间的偏差，并评估实现它的成本。当然，在一种特定的空间、时间、能源结构和环境范围内，最终是由政治家和决策者来定义什么是“最佳”的。从私人开支转变为公共消费，政治家们需要相关方给予支持。对于那些正在制定规划、处于发展壮大、并考虑改善交通条件的地区，建立公共交通系统是非常必须的，而且从经济上也是承担得起的。从可持续发展的角度来看，公共交通无论在社会、经济以及环境方面都是具有积极意义的。只有聚焦公民需求、为市区所有居民提供平等的交通条件，对行人、自行车、公交等公共交通系统给以优先权，公众才有可能充分利用公共交通系统出行。这样可以确保无论采取公共交通或者是私家车出行，公众都可以在平等的条件下，以可持续的方式享有在任何时间、前往城市中任何地方的权利。在从家到单位、到各种服务场所及购物中心之间，建设发达的公共交通体系则显得更为有意义。

show that in these cities with few cars on the road and more public transport, there are much better conditions for sustainable mobility.
One thing should be clarified immediately: the electric car, which appears to be the great savior of a sustainable future, does not in any way solve the problem of congestion, influence the form of the city, or solve the problem of CO_2 production globally. The future of sustainable mobility essentially lies in a policy designed to increase the allocation of public transport, possibly with segregated lanes.
Let us, however, underline one thing: we do not want to question the right or the pleasure for each of us to own a car, which is, however operated, an increasingly competitive tool and the best method and “design” available today for anyone who can afford it. In contrast, it is argued that this right can be considered “obligatory”, and that without a car or a motorcycle no one is able to work, shop, have fun or, in short, live in a city. We are not questioning the ownership of the car, but rather its use in situations where it proves to be inconvenient.
Sustainable mobility aims to improve the modal allocation of public-private transportation and does not want to take anything away from anyone, but rather give something to everybody.
The demand requirements are not always the same: there are displacements classified as “needs” that meet basic requirements – such as going to work, studying, shopping or caretaking - and others classified as “wants” that satisfy desires, such as getting around by car or motorbike for the sheer pleasure of it. For all movements of “need”, especially if repetitive, private mobility becomes very expensive and becomes an unbearable psychological burden. When it is available and competitive, citizens choose public transport. Any current analysis of users’ propensities confirms these concepts.
Today, the use of the private car is decreasing. We would like to underline that the Newman and Kenworthy thesis argues against this decline... “it may just be a situation linked to the current economic crisis and the increase in the price of fuel... or it could be the sign of something deeper, destined to change in the face of our transportation systems? The concept of “peak car use” is slowing, alongside “peak oil production”.
We can only hope that similar considerations will be made by public authorities, as well as by individual citizens, and this would be a great choice, and free of charge. The growing knowledge that this new mobility is both convenient and sustainable and reduces the consumption of non-renewable resources will ensure - at least for displacements classified as “needs” - the universal availability of a modern and competitive means of transport at a lower cost for the individual and for the community.
It is important to also analyze the costs of these systems: there is a common misconception that trams and subways weigh too heavily on public budgets and this is certainly true where a city has grown badly and planners have forgotten to allow space for the future creation of fast public transport in segregated lanes, while avoiding underground solutions.
In many European cities today, to realize a collective transport system means dealing with very high expenses for the construction of tunnels and underground stations. If the goal is not only to contain public expenditure but also to avoid excessive private expenditure, it can be shown that with the cost savings to citizens living in a city with a structured competitive system of mass public transport, the construction of a massive network of subways could be financed. That is demonstrable and I think it is important to spend the extra money to do it.
It is possible to develop econometric, localization and transport models that could easily measure the deviation from “optimum” and assess the costs to achieve it.
Of course it is up to politicians and opinion makers to define this “optimum”, with all decisions for planning in a unified form of space, time, energy and environment. Naturally it remains a political problem to shift private expenditure towards public consumption and in this sense help from politicians is expected. In any case, it is all necessary, but also affordable, even in cities that are growing and looking for a definitive layout (planning locations for housing, productive services and areas) and considering the transport needs as well. Within the perspective of sustainability, it becomes very convenient socially, economically and environmentally.
Only in this way, by focusing on the needs of citizens and providing an equitable distribution of urban public areas for all inhabitants of the city, giving priority to pedestrians, cyclists, public transport and sustainable mobility, will everyone have the possibility of moving around via a transport system and a balanced infrastructure. Therefore, it will ensure that everyone has, in a sustainable manner, the right of access, under equal conditions, to move at any time from any part of the city to another, by private or collective means, but also to have virtual access from home to services, work and shops.

VIU training program echo from participants
威尼斯国际大学培训计划 学员回音

This section is written by the Chinese participants in the trainings in Italy. We hope hereby to provide the Newsletter readers with an authentic flavour of the training experience.

“学员回音”由在意大利参加培训的中方学员们供稿的。希望通过刊登学员们的“回音”，能够让“培训园地”的广大读者们多少有些“身临其境”的感受。

Chinese Ministry of Science and Technology
High-Technology and Science Parks for Sustainable Development

Italy, May 18-30, 2013
26 participants

The 2013 Sino-Italian sustainable development and environmental management advanced training program, High-Technology and Science Parks for Sustainable Development, was held in Italy from May 18 - 30. During the 12-day training course, trainees from Guangdong, Fujian, Zhejiang, Shandong and Heilongjiang Province, etc., traveled thousands of kilometers and attended eight lectures and six site visits in Turin, Venice and Rome respectively.

Lecture topics mainly covered sustainable development strategy planning, legislation and policies of science and technology and innovation from the EU and Italy, and high technology and science park development and planning both at national and regional levels. Site visits focused on the development of technology and science parks, including ecological construction and energy management, innovation and business incubators, case studies and best practices, etc.

The whole training program was dynamic, with a combination of theory and practice.

中国科学技术部
可持续发展的高新技术与科技园

意大利，2013年5月18日至30日
26人参加

中意环境管理和可持续发展高级培训班2013年的“高技术与科技园可持续发展能力建设” 主题培训于5月18日至5月30日在意大利举行。来自广东、福建、浙江、山东和黑龙江等地的代表一行在历时12天的学习参观期间，行程数千公里，分别在都灵、威尼斯和罗马等地接受了8次集中授课、6次实地考察。内容主要包括欧盟及意大利可持续发展领域的战略规划、立法和科技政策与创新，高技术与科技园区的发展政策和规划、生态建设和能源管理，园区的科技创新与企业孵化器等，理论和实践相结合，充实而丰富。

Venice International University, which is the Italian executive unit of the program, made careful arrangements and preparations prior to the training. The trainees not only heard lectures from governors, experts and business representatives from the Italian Agency for Innovation, the Italian Ministry for the Environment, Land and Sea, Enel and others, they also visited the Turin Environmental Park, Vimercate, Luigi Danieli, Kilometro Rosso and VEGA Science and Technology Parks. Based on their own working experience, Italian lecturers illustrated the system of green innovation policies and regional roles, development and management of science and technology parks and incubator-innovation factories, mobility management and Internet application, as well as the latest technologies. These included solar energy technology, biomedical technology, nano surface treatment technology and industrial wastewater and residential sewage treatment technology. Chinese trainees had in-depth exchanges and discussions with Italian lecturers on the actual conditions in China. Overall, the training achieved good outcomes.

Through the training, the participants further enhanced their awareness of the importance of protecting the environment, supporting green innovation and promoting sustainable development. Furthermore, they gained a preliminary understanding of policies, laws and regulations related to the above fields in Italy and the EU, as well as experiences and achievements that support green innovation.

The trainees confirmed that the training helped them to open a broad field of vision and expand their thinking. In addition, they were impressed by Italian historical building maintenance and renovation at the science and technology park near Rome. Finally, the trainees expressed that after they go back to their work they will: (1) improve the existing policy system of innovation and start to construct green science and technology parks with reference to the Italian experiences. These experiences include various incentive policies to mobilize the enthusiasm of enterprises and personal investment in environmental protection; and (2) integrate best practices from Italian technology and science parks, such as good ecological environment for research and fewer and more efficient management teams. Through creating the platform and establishing the incubator and fund, they can strengthen the synergies between scientific research institutions and enterprises. The trainees also suggested that, in the future, the training should also include more about the Sino-Italian cooperation programs that have been carried out in the field, sharing knowledge, technology, and successful experiences.

此次培训的意方执行单位是意大利威尼斯国际大学，事先对整个培训内容进行了精心的安排和准备，将专题讲座、案例分析与实地考察进行了有机结合。代表团成员在意期间不仅聆听到了来自意大利创新署、意大利环境、国土与海洋部、意大利国家电力公司等意大利官员、专家学者及企业代表的讲课，还实地参观了都灵环境科技园、Vimercate、Luigi Danieli、Kilometro Rosso和VEGA科技园等。意方人士从自身的工作实际出发，讲解了绿色创新体系政策及区域性集中的作用、科技园区的建设和管理、园区的创业孵化器－－创新工厂、以及新型太阳能技术、生物医药技术、纳米表面处理技术和工业废水和居民污水处理技术、园区通勤管理和移动互联网应用、创新与可持续发展—－工业生态案例等内容，中国学员们也结合中国国情与意方展开了深入的交流和讨论。培训取得了良好的效果，受到了学员们的一致好评。

通过此次培训，学员们进一步提高了对保护环境、支持绿色创新和可持续发展重要性的认识;初步了解了意大利和欧盟对环境保护方面的政策、法规及相关规定，了解了意大利支持绿色创新的有关政策和实践所取得的经验与成就。通过学习参观，团员们开阔了视野，拓宽了思路，尤其对意大利历史建筑的维护和改造成科技园印象深刻。培训结束后，学员们纷纷表示培训收获很大，要在今后的工作中：(1) 完善现有的创新政策体系，构建绿色创新科技园，借鉴意大利运用的各种激励性政策，调动企业和个人环保投资的积极性，让不同参与者发挥不同作用。(2) 吸收意大利各类园区的创建及管理经验，如良好的研究生态环境，人数少而效率高的管理团队，通过搭建平台 ,建立孵化器，建立基金等方式加强科研机构与企业的协同发展。并希望在今后的培训中，能更多了解中意合作已开展的领域，共享知识和技术的传播，分享成功经验。

Beijing Municipal Environmental Protection Bureau and Shanghai Municipal Environmental Protection Bureau Eco-city

Italy, June 2-13, 2013

41 participants

From June 2-13, 2013, 41 environmental officials and technicians from the Beijing Environmental Protection Bureau and Shanghai Environmental Protection Bureau participated in the Eco-city Advanced Training Program within the framework of the Sino-Italian Environmental Cooperation Program. Thanks to the detailed organization of VIU and Turin University's AGROINNOVA, the participants visited IMELS, Siena Province, Venice International University and Turin University, and listened to 10 lectures on EU eco-city principles, Italian sustainable development policy, eco-city assessment and indicators, smart strategy for eco-city development, sustainable waste management, water quality monitoring and management, eco-building, rural ecology, etc.

Meanwhile, the site visits to Veritas waste treatment plant, Veritas wastewater plant, Tifs Ingegneria Eco-building, the island of Certosa, and SMAT drinking water plant were organized. The trip, which covered Rome, Siena, Venice and Turin, was not only a fruitful training trip, but also an intensive cultural tour.

The organizer painstakingly arranged lectures, handouts and traveling schedules, putting special care into every detail. A lot of valuable theoretical knowledge and practices were provided through the lectures and site visits. The participants were very impressed by the dedicated lecturers and staff and their dynamic introductions. In response, the participants listened to the lectures very carefully and actively interacted with the lecturers.

Throughout the training, the participants became acquainted with the policies, legislation, strategies, practices and technologies of eco-cities within the EU and Italy, and were very inspired. For instance, we learned that the authorities, officials and general public in Italy all have high environmental consciousness, and give priority to implementing environmental principles. Great emphasis has been put on the environmental management and supervision of medium and small businesses in Italy, which results in a very specific and human-oriented environmental management system.

When visiting the environmental infrastructures, participants were also very impressed by the good maintenance and appropriate management of the system.

After the training, we will continue to learn the latest information on eco-cities in the EU through the Sino-Italian Advanced Training website. For the next step, we suggest that both the extensiveness and intensiveness of the course be looked at and balanced better in future training sessions. The time and opportunity for communication during the site visits could be improved upon. We sincerely hope that the advanced environmental training program will be further improved upon and that the collaboration on environmental protection between China and Italy be further strengthened.

北京市环境保护局和上海市环境保护局 生态城市

意大利，2013年6月2日至13日

41人参加

2013年6月2日至13日，来自北京、上海两市环境保护局的41名环境管理和技术人员参加了中意环保高级培训计划“生态城市高级培训班”。经过本次培训主办方威尼斯国际大学和都灵大学农业环境能力创新中心的精心组织下，在为期12天的培训中，学员们先后赴意大利环境领土与海洋部、锡耶纳省政府、威尼斯国际大学和都灵大学，聆听了10场讲座，包含欧洲生态城市原则、意大利可持续发展政策、生态城市评价与指标体系、生态城市发展中的智能化策略、可持续固体废物管理、水资源管理、生态建筑、农村生态发展等。此外，主办方还组织学员赴Veritas废物综合处理厂、Veritas废水综合处理厂、帕多瓦Tifs Ingegneria生态建筑、切尔托萨岛公园、SMAT饮用水处理厂进行了实地考察。通过本次培训，学员们不仅学习和体验到了意大利在生态城市方面的主要举措和经验，还有机会前往罗马、锡耶纳、威尼斯和都灵，可以说既是一次成果丰硕的学习之旅，也是一次内涵丰富的文化之旅。主办方精心策划讲座、预备教材、安排行程，每一环节都考虑得周到细致，教学内容非常丰富，既有理论知识、也有实践案例。来自政府、学校、企业的老师们认真负责、教学生动务实。实地参观安排紧凑，接待单位准备充分，体现了对培训的重视。中方学员们也全程参与、认真听讲，并积极与教师进行互动。

通过培训，学员们对欧盟和意大利在生态城市方面的政策法规、战略、实践及相关技术有了一定的认识，并引起了大家的思考。学员们充分感受到，在意大利，无论是政府、官员和公众，都具有高度的环保意识，并且把环境保护作为优先领域坚定不移的执行。同时，意大利的环保工作非常注重面向小型企业，进行精细化管理。意大利在中小企业环保管理方面的做法也非常值得我们认真研究和借鉴。通过参观意大利的环保基础设施，学员们对于意大利在环保设施方面的运行维护和细致管理方面的工作印象深刻。参观的几个设施虽然建成时间不短，但系统维护良好、运行相当正常，不断的发挥着环境污染处理的长期效益，这方面的经验值得我们借鉴。回国以后，我们将会通过中意培训项目的网络平台，继续关注和学习有关欧洲在生态城市发展方面的知识和最新信息。学员们也建议今后的培训能够把培训内容的广泛性和专业性进行更合理的平衡，增加考察现场交流讨论的时间和便利度。希望通过不断的完善，中意环保高级培训项目能办得更好，中意环保合作能不断加强和拓展。

NDRC Capacity Building on Climate Change

June 16-27, 2013
38 participants

Climate change is an issue of constant concern not only for China but also for all countries worldwide. Lectures and site visits featured in the NDRC course held in June 2013 explored the policies and actions to mitigate the effects of climate change and the adaptation measures applied in the EU, Italy and other countries.
The policies guiding the EU in tackling climate change were presented by Alessandra Barreca, from the University of Siena, who delineated the European legislative framework and offered some thoughts regarding present and future policies.
The adaptation issue was addressed by Sergio Castellari from the Euro-Mediterranean Center for Climate Change (CMCC), who stressed the fact that some changes in climate patterns are already perceptible and, whatever the cause – natural or anthropic – adapt we must. Europe can already provide some interesting examples with regard to this issue and one of them is the city of Venice, which provided the participants with a readily accessible and highly interesting case study.
The focus then moved to mitigation strategies and economic issues. Special attention was given to energy production and use, since most of the greenhouse gas emissions can be connected with these two main sectors. The application of energy policies at the local level was also investigated through the case studies of Venice and Turin, which both applied their own Sustainable Energy Action Plans.
One day was entirely devoted to emission trading and the carbon market. Ignazio Musu, president of the TEN Center, gave an introductory lecture on the topic, which served as a basis for the sessions that followed, guided by an expert from the ENEL Foundation. To better understand the practice of the EU ETS system, the participants visited the Italcementi Cement Production Plant in Calusco d'Adda (Bergamo), an advanced industrial installation that applies the most recent technologies to reduce its energy consumption and greenhouse gas emissions.

国家发改委气候变化能力建设

2013年6月12日-27日
38 位学员

气候变化问题不仅对中国、而且得到全世界的高度关注。在2013年6月份为中国国家发改委组织的专题培训课程中，重点介绍了意大利和其他国家在减缓气候变化影响方面所制定的政策、采取的行动和适应措施。
锡耶纳大学的Alessandra Barreca教授介绍了欧盟应对气候变化所制定的政策、法律框架，并提出了当前和未来的政策建议。来自于CMCC的Sergio Castellari 讲解了适应性的问题。他强调气候变化的趋势已经很明确，无论其原因是自然形成、还是人类活动造成，但有一点是非常明确地，即：我们必须设法适应。欧洲在这方面已经进行了有意义的尝试，意大利威尼斯在适应性方面为学员们提供了很好的案例。
培训还围绕减缓战略与经济发展进行。由于温室气体排放主要与能源生产和能源利用密切相关，因此在培训中对能源生产与利用进行了重点讲解。威尼斯和都灵两城市都制定了当地的《可持续能源行动计划》。通过对这两个城市的具体案例介绍，学员们对地方运用能源政策有了进一步了解。
本期培训还专门安排了一天来讲解碳排放交易和碳市场。TEN中心主任Ignazio Musu教授对该议题进行了综合性介绍，为随后的ENEL基金会专家的授课奠定基础。为了帮助学员更好地了解欧盟的排放交易机制，还组织学员们参观了位于Calusco d'Adda (Bergamo)的水泥厂。该企业采用了最先进的技术来降低能源消耗和减少温室气体排放。

MOST Innovation of Enterprises and Green Technologies

June 29 – July 11, 2013

25 participants

Environmentally friendly management and production processes have always been the focus of the courses organized in cooperation with MOST. The role of industry in the development of a sustainable society is of key importance in China, as air, soil and water pollution brought on by the industrial sector can cause very dangerous effects to human health.

Innovation of production technologies to make them greener, as well as environmentally friendly strategies and pollution control, could have a dual benefit for enterprises: whilst they help to reduce the impact on the environment, they could also lead to a cut in production costs through achieving a better public image.

During the 13-day stay in Italy, plenty of site visits were organized in order to give the participants a firsthand look at how the industrial sector works as well as innovations to improve energy efficiency and reduce pollution.

The delegation was hosted by companies manufacturing end-use goods in various production activities (coffee, plastic tubes, mechanical parts for cars, furniture, electrical motors, inverters and steam generators) as well as a high-efficiency power plant.

Lectures focused mainly on the tools that companies can use to calculate and consequently reduce their emissions, waste, energy consumption and the like, such as Life Cycle Assessment (LCA).

Given the huge impact that energy production has on the environment, one day was devoted to introducing the most advanced technological innovations in this field.

科技部企业创新和绿色技术培训班

2013年6月29日-7月11日

25 位学员

在与中国科技部的合作中，环境友好的生产工艺和管理一直是重要的合作内容。由于生产企业造成了空气、土壤和水污染，对人体健康造成危害，因此在建设可持续社会进程中，企业将发挥至关重要的作用。

创新生产技术更加绿色化、制定环境友好的战略和控制措施对于企业来说是双赢的：一方面有益于企业降低其对环境的影响，提升其在客户心目中的形象；另一方面，还可以降低生产成本。

在为期13天的意大利培训中，为学员们还安排了大量的现场参观以获得第一手材料，从而充分了解意大利生产行业是如何进行科技创新、提高能源利用效率、并降低污染排放。

由生产终端产品的企业（咖啡、塑料管、汽车机械零部件、家具、电动机、变流器和蒸汽发电机）和一家高效发电厂承担了接待本期代表团的任务。

在培训中还向学员们介绍了企业所采用的生命周期评估计算工具，以期最终实现降低污染物、废物排放，并降低能源耗。

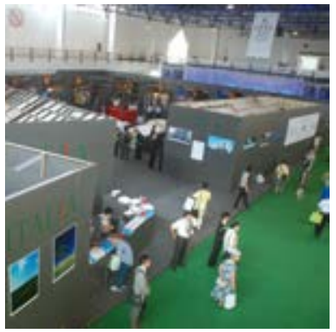
考虑到能源生产对环境所带来的巨大影响，本期培训还专门安排了一天向学员们介绍该领域最新技术创新情况。

Dr Massimo Martinelli Receives the Chinese Government Friendship Award

The award ceremony of the "2013 Chinese Government Friendship Award" was held at the Great Hall of the People, in Beijing, on 29 September 2013. As one of the winners, Dr. Massimo Martinelli from the Italian Ministry for the Environment, Land and Sea received the certificate and medal from Vice-Premier Ma Kai for his outstanding contribution to China's environmental protection and sustainable development through the Sino-Italian Cooperation Program for Environmental Protection.

"The foreign experts in China are close friends of the Chinese people. They set up a bridge for communication between China and other countries and contribute as an important force for China's development," Ma said at the ceremony. "The Chinese people will always remember their contribution to China's development and progress".

The Friendship Award is the highest honour assigned to foreign experts by the State Council of China. This year, 50 foreign experts from 20 countries have been awarded for their contributions to China's economic and social progress. The regulations on the Friendship Award state candidates should have transferred new technology and expertise to help China solve some key problems or fill a gap in technology and management; they have advised and enabled Chinese enterprises to achieve breakthroughs in development or made remarkable contributions in the fields of teaching, academic studies, publication and publicity overseas.



马特奈力（音译，Massimo Martinelli）博士荣获中国政府友谊奖

"2013中国政府友谊奖"颁奖仪式于2013年9月29日在北京人民大会堂举行。中国国家领导人国务院副总理马凯同志向意大利环境、领土和海洋部马特奈力博士颁发了证书和奖牌，感谢他长期以来积极推动"中意环境保护合作计划"，并为中国的环境保护事业和可持续发展做出突出贡献。

马副总理在颁奖仪式上说，"在中国的外国专家是中国人民的亲密朋友。他们建立起沟通的桥梁，是促进中国进一步发展的重要力量"，"中国人民将永远记住他们为中国的发展和进步所作出的杰出贡献"。

"友谊奖"是中国政府颁发的最高荣誉奖。今年来自20个国家共50名外国专家凭借其对中国经济和社会发展所作出的突出贡献而获得该奖项。

根据"友谊奖"的相关规定，获奖候选人应在推动新技术转让以帮助中国切实解决关键问题，或者填补了中国技术和管理方面的空白；他们建议或帮助中国企业在教书育人，学术研究，文稿出版和海外宣传等领域作出了卓越的贡献。

Ten-year Support of Environmental Protection: FIAT Partners with Beijing Public Transport for a Green Capital

Fiat Power Train Industrial and Beijing Public Transport Holdings Ltd (BPT) held a grand ceremony at the Italian Embassy in Beijing on 25 June 2013, celebrating the handover of 1,200 environmentally friendly CNG engines and ten years of successful partnership.

Investing in public transport is a strategic choice and part of the ongoing development of Beijing into a World City, providing the best transportation solution for citizens. Over 4,000 CNG and advanced diesel engines have been delivered to BPT in the last 10 years.

In 2003, a technology transfer cooperation project was launched under the framework of the Sino-Italian Cooperation Program for Environmental Protection, aiming at supporting Beijing in building a sustainable transportation system, by providing 300 CNG engines to Beijing Municipality. This experience resulted in the purchase of more than 1,000 engines in 2008, and FPT Industrial contributed and assisted Beijing Municipality to achieve super low emissions in the heart of central Beijing during the Olympic Games. Five years

十载支持中国环境保护事业：菲亚特动力科技携手北京公交共创绿色首都

菲亚特动力科技（FPT）和北京公共交通控股公司（BPT）于2013年6月25日在意大利驻华大使馆举行盛大仪式，庆祝1200台环保友好发动机交货仪式和成功合作十周年。

向公众提供最优的交通服务，投资于公共交通是一个战略选择；也是北京迈向世界级城市的重要组成部分。在过去的10年中，向北京公共交通控股公司提供了4000台天然气和先进柴油发动机。

2003年在《中意合作环保合作计划》下，启动了旨在推动北京建设可持续交通系统的技术转让合作项目，并向北京市提供了300台天燃气发动机。

该技术合作直接催生了2008年向FPT采购1000台发动机。

在2008年奥运会期间，FPT成功帮助北京在市中心成功实现了超低排放的目标。五年后，FPT又向北京提供了用于公交车上的1200台天燃气发动机，这标志着10年合作伙伴关系迈向新的阶段。

第十三届中国国际环保展览会：意大利全面展示最佳环境保护技术

由中国环境保护部主办的第十三届中国国际环保展览会（CIEPEC）于2013年7月23-26日在北京举行。它是中国最著名的环境展览，也是世界范围环保技术、产品和服务的盛会。

来自20多个国家、超过500家参展商参加了展览。CIEPEC已成为交流先进环保创新技术、寻求商业合作机会、获得中国环境保护市场第一手信息的最重要平台。

此外，本届展览得到了意大利环境、领土和海洋部的支持，专门搭建的意大利展馆最受参观者欢迎。由意大利对外贸易委员会具体负责参展组织工作。意大利组织了28家企业参加本次展览。这些企业都非常有实力，而且有兴趣向中国展示其竞争力强劲的产品和技术。本届展览和意大利展馆在加强意大利和中国企业之间的交流与合作发挥了积极作用，充分展示了欧盟和意大利在该领域的最佳实践和设备，包括水和空气污染治理、污染土壤修复、可再生能源等领域的设备和技术以及在能力建设方面取得的经验和成果。

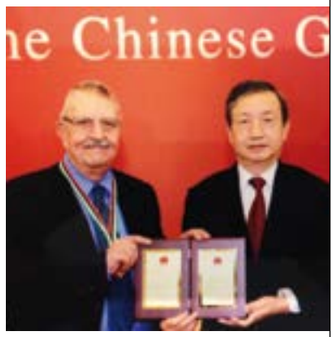
later, FPT Industrial is now providing the Beijing bus-fleet with another 1,200 CNG engines, which marks a profound new milestone for this 10-year partnership.

CIEPEC 2013: Italy Showcases its Best Practices for Environmental Protection

The 13th China International Environmental Protection Exhibition & Conference（CIEPEC）sponsored by the Ministry of Environmental Protection, was held in Beijing from 23-26 July.
It is the most prestigious environmental show in China, as well as a world famous event for environmental technologies, products and services.
Over 500 exhibitors from more than 20 countries participated in the exhibition. CIEPEC is regarded as the best platform to exchange leading-edge environmental innovations, explore business development opportunities and obtain first-hand information on the environmental market in China.
Additionally, this edition was supported by the Italian Ministry for the Environment, Land and Sea, through the Italian Pavilion, organized by the Italian Trade Commission, which was one of the most visited pavilions this year.
The Italian delegation included a group of 28 experienced companies interested in presenting to the Chinese market their competitive products and technologies.
CIEPEC and the Italian Pavilion proved to be a valuable showcase and bonding link between Italian and Chinese operators, who displayed best practices and equipment from the EU and Italy in sectors like water and air pollution treatment, contaminated soil recovery, renewable energy and capacity building.

Study Tour in Italy for Pilot Project of Guiyang Electroplating Industrial Park

The study tour for the Pilot Project of Guiyang Electroplating Industrial Park was held in Italy from 23-27 September.
The delegation included staff from the Chinese Ministry of Environmental Protection, the Foreign Economic Cooperation Office of the Ministry of Environmental Protection, Guizhou Provincial Environmental Protection Bureau, and Guizhou University.



The main objective of the study tour was to experience cleaner European production and electroplating wastewater/solid/gas treatment technology, which could assist in the planning and design of the Guiyang electroplating industrial park.
During the study tour, key technical issues in the electroplating industrial park were discussed with the Italian company's supervisor and experts, including technology and approaches on cleaner production and wastewater /solid/gas treatment and prevention measures for environmental risks.
The study tour provided the members of the delegation with a better understanding of zero emission pollutants within Italy's electroplating enterprises, including rinsing water recycling methods, wastewater/solid/gas treatment at STC (such as heavy metal recovery technology), and low-cost wastewater treatment technology.
Solutions such as the improved utilization rate of rinsing water, the on-line monitoring system for environmental risk management, centralized pollution control and below-standard emissions are being considered for the design of the Guiyang electroplating industrial park, which might become a case study for sustainable development of this sector in China.

中意合作示范项目——贵阳电镀工业园代表团赴意考察

贵阳电镀工业园示范项目代表团于是9月23-27日赴意大利进行考察。考察团包括来自中国环境保护部、环境保护部对外合作中心，贵州省环境保护局和贵州大学的代表。

考察的主要目的是学习了解欧盟清洁生产、电镀废水、废气、废渣的处理技术和先进管理理念，以期对贵阳电镀工业园的设计、规划有所启发。

考察期间，代表团与意大利专家和管理人员就电镀工业园区的关键技术问题进行了交流讨论，包括清洁生产、废水、废气、废渣的处理以及环境风险防范措施等。

通过本次考察，代表团对意大利电镀企业污染物零排放工艺有了全面了解，包括电镀水回收利用，废水、废气、废渣中的重金属回收技术，低成本废水处理技术等。

在未来的贵阳电镀工业园中，将考虑运用意大利电镀水回收利用、环境风险管理在线监测系统、低于标准的污染物排放技术等。这将使该工业园成为中国在该领域可持续发展的示范园区。

what's ON at VIU
威尼斯国际大学快讯

From October to December 2013 a large number of training activities have been scheduled: eight training courses in Italy, three training sessions in Beijing (CASS, MOST, Beijing EPB), one in Shanghai (Shanghai EPB) and, for the first time, one in Chengdu. The Chengdu session is the first training course to include the Chinese Ministry of Industry and Information Technology (MIIT) which joined the SICP in July. The first MIIT delegation is expected to arrive in Italy in December to address the issue of energy efficiency in the industrial sector.
The CASS session in Beijing opens the 2013-2014 Training Program with a new focus on eco cities, clean energy, environment & health, and green growth. There have been major requests and interest from the Chinese partners to focus on the issue of air pollution for the 2014 edition of the Sino-Italian Advanced Training Program. Air quality turns out to be a great concern at the levels of both central government (Ministry of the Environmental Protection) and the local governments (municipalities of Beijing and Shanghai).
In October, at the Tsinghua School of Environment in Beijing during the week of training activities in China, VIU, the University of Siena, the ENEL Foundation and Tsinghua held a joint workshop on Emission Trading Schemes (ETS). The workshop aimed to compare the European and Chinese perspectives on linking the EU Emission Trading Scheme (EU ETS) with other existing emission trading schemes. The workshop is part of an ongoing research project carried out by the Environmental Legal Team of the University of Siena, in cooperation with Tsinghua Law School and funded by the Enel Foundation.
An international workshop on *Food Security, Food Safety, and Greening the Green Revolution* will be held at VIU on December 12-13. The workshop aims to explore the increasingly important issue of food security within the wider challenge of creating sustainable and productive agriculture in a world where there is not only an increasing demand for food quantity (food security) but also for food quality (food safety). The initiative is coordinated by Prof. Bruna Zolin of Venice's Ca' Foscari University, and many VIU member universities and other important institutions with whom VIU collaborates will participate - among them, Agroinnova of the University of Turin, the EU Commission and FAO.

2013年10月至12月期间，安排了一批培训任务：在意大利组织8期培训、北京组织3期培训（中国社会科学院、科技部、北京市环保局）、上海一期（上海环保局），并首次在成都举办一期培训。今年7月份中国工业与信息化部加入了《中-意环保合作计划》，并在成都组织第一期培训。工信部的第一个代表团将于12月访问意大利，围绕工业领域提高能效等问题与各有关方进行交流。
2013-2014年中国社会科学院在北京组织的培训班主题确定为生态城市、清洁能源、环境与健康、和绿色增长。 在《中-意高级培训计划》下，更多的中方合作伙伴则希望在2014年的培训中增加关于空气污染防治的有关内容。当前，空气质量问题是中央政府（环境保护部）以及地方政府（包括北京市、上海市）都高度关注的议题。
在10月份清华环境学院培训班期间，威尼斯国际大学、锡耶纳大学、ENEL基金会和清华大学共同举办了“二氧化碳排放交易研讨会”。在研讨会上，代表们交流了“欧盟二氧化碳排放交易计划”以及其他“交易计划”的执行情况，并对欧盟和中国的排放交易情况进行了对比研究。该研讨会是正在执行的、多方合作的科研项目下的活动。项目合作方包括锡耶纳大学和清华大学法学院，由ENEL基金提供资金支持。
12月12-13日在威尼斯国际大学将召开“粮食安全、食品安全、和绿色革命的绿色化国际研讨会”。在可持续发展、农业生产面临越来越多挑战，人们不仅对食品数量、而且对食品质量提出更高要求的背景下，本次研讨会将围绕食品安全这一日益重要的议题进行交流与讨论。研讨会由威尼斯Ca' Foscari大学的卓琳（Bruna Zolin）教授发起，威尼斯国际大学的成员院校、以及都灵大学农业技术创新中心、欧盟委员会、世界粮农组织等威尼斯国际大学的合作伙伴都将应邀参加本次研讨会。

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