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工作通讯
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Air Pollution and Health Protection
空气污染与健康保护

Sino-Italian Cooperation Program
Environmental Training Community
中-意合作计划
环境培训园地

2014 Quadrimestrale Poste Italiane S.p.A. Spedizione in Abbonamento Postale – 70% DCB Venezia

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E DELLA TUTELA DEL TERRITORIO E DEL MARE

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工作通讯电子版

editorial
编者寄语

Since the 11th Five-Year Plan (2006-2010), China has increased the intensity of its air pollution prevention work. Traditional pollutant concentrations, like SO_2 and PM_{10}, have dropped continuously and some urban air environment quality indexes have been improved to some extent. However, the air environmental situation is still very severe. During the 12th Five-Year Plan, China will be still in the middle and later periods of industrialization and the accelerated development stage of urbanization; energy consumption and motor vehicle inventory will grow fast; the environmental problems arising in more than 100 years of industrialization of developed countries will appear in China intensively, showing obvious structural, condensed and compound characteristics. The old environmental problems remain unsolved and new environmental problems are coming increasingly to the fore. There is still a large gap between environmental quality improvement and public expectation.
Facing the new trend and new problems, the Chinese government put a high priority on immediate action and officially issued the "Air Pollution Prevention And Control Action Plan" (hereinafter referred to as The Ten Air Regulations), putting forward 10 regulations with 35 sub-measures in September 2013. The parties concerned successively formulated the enforcement regulations for implementing the Ten Air Regulations in Beijing, Tianjin, Hebei and surrounding areas and set up air pollution prevention coordination mechanisms in Beijing, Tianjin, Hebei and surrounding areas and in the Yangtze River and Pearl River Deltas. They further set up a national air pollution prevention inter-ministerial coordination mechanism. These are the programmatic blueprints for China to promote air pollution prevention work and major initiatives to explore new environmental protection paths. This fired the "starting gun" to declare war on $PM_{2.5}$ pollution and initiated whole society action for the purpose of air pollution prevention.
Solving environmental problems requires a constant strengthening of international exchanges and cooperation, in order to learn from each other and help with each others' needs. Italy has a rich practical experience and an excellent research record in the field of air pollution prevention. We believe that Sino-Italian cooperation will further help to build up the capacity of Chinese administrations at all levels and assist environmental protection institutions in the prevention and controlling of air pollution. Our dream of a China with clear blue skies and white clouds will surely be realised.
With its focus on air pollution prevention, this issue will introduce the Air Pollution Prevention Action Plan newly promulgated in China and outline in detail related implementation cases, and present the policies, measures taken and current examples from the European Union and Italy in terms of air pollution prevention, which will help towards deepening environmental protection cooperation between the two countries and have a positive significance in enhancing China's own ability to bring air pollution under control.

Li Lei,
Deputy Director General of the Pollution Prevention and Control Department,
Ministry of Environmental Protection of China

"十一五"以来，我国加大了大气污染防治工作力度，空气中SO2和PM10等常规污染物浓度持续下降，城市的部分大气环境质量指标有所改善。但是，大气环境形势依将十分严峻，"十二五"时期我国仍将处于工业化中后期和城镇化加速发展的阶段，能源消费和机动车保有量会快速增长，发达国家一两百年工业化过程中分阶段出现的环境问题，在我国近30多年的快速发展中集中显现，呈现明显的结构型、压缩型、复合型特点。
老的环境问题尚未得到解决，新的环境问题日益凸显，环境质量改善与公众期待仍有较大差距。
面对新形势新问题，中国政府给予了高度关注，并于2013年9月，正式发布了《大气污染防治行动计划》（以下简称《大气十条》），提出十条35项措施。有关方面还相继制定了京津冀及周边地区落实《大气十条》的实施细则，建立了京津冀及周边地区、长三角、珠三角大气污染防治协作机制和全国大气污染防治部际协调机制。
这是我国推进大气污染防治工作的纲领性文件，也是探索环境保护新路的重大举措，打响了向PM2.5污染宣战的"发令枪"，掀起了以防治大气污染为目标的全社会行动。
解决环境问题需要不断加强国际交流与合作，需要相互借鉴、取长补短、互通有无。意大利大气污染防治领域有着丰富的实践经验和优秀的理论成果。我们相信，中意环保合作将会进一步提升中国各级政府、环保部门治理大气污染的能力和水平；将会进一步吹亮向污染宣战的号角，为打好大气污染防治战役保驾护航，蓝天白云装扮美丽中国的梦想也一定能够实现。
本期通讯将聚焦大气污染防治问题，详细介绍中国新出台的《大气污染防治行动计划》以及相关的实施案例，并对欧盟及意大利在大气污染防治方面的政策、措施、实例进行介绍，有助于加深两国的环保合作，对提高中国治理大气污染的能力有积极意义。

李蕾，
环境保护部污染防治司 副司长

news and events
新闻和事件

2030 Framework for Climate and Energy Policies

On October 23, 2014, EU leaders met in Brussels and agreed a domestic 2030 greenhouse gas reduction target of at least 40% compared to 1990 together with the other main principles defining the 2030 policy framework for climate and energy, with the aim of making the European Union's economy and energy system more competitive, secure and sustainable.
The EU is currently making good progress towards meeting its climate and energy targets for 2020, but an integrated policy framework for the period up to 2030 was needed to ensure regulatory certainty for investors, a coordinated approach among Member States, and to drive continued progress towards a low-carbon economy.
The core of the framework is the binding target to reduce EU domestic greenhouse gas emissions by at least 40% below the 1990 level by 2030. This target will ensure that the EU is on the right cost-effective track towards meeting its objective of cutting emissions by at least 80% by 2050. By setting its target for 2030, the EU will also be able to engage actively in next year's negotiations in Paris over a new international climate agreement, that should take effect in 2020.

2030气候变化与能源政策框架

2014年10月23日，欧盟领导人齐聚布鲁塞尔，就2030年各成员国温室气体减排目标达成共识，即：与1990相比至少削减40%温室气体排放量；会议还讨论通过2030年气候变化与能源政策框架原则，其核心是推动欧盟经济和能源系统更具竞争性、更安全和更可持续发展。
在实现2020年气候和能源控制目标方面，欧盟取得良好进展；但还需要制定综合性政策框架，确保到2030年具有稳定投资环境，成员国之间政策具有一致性，从而实现持续推动构建低碳经济。
政策框架核心是确定约束性减排指标，确保到2030年各成员国能够在1990年温室气体排放量的基础上削减40%。该目标可确保欧盟在合理成本—效益轨道上逐步实现2050年削减80%温室气体的总目标。确定2030年减排目标，使得欧盟可以更加积极主动地参与明年将在巴黎举行的新国际气候公约谈判。按计划该公约将于2020年生效。

为实现40%总体减排目标，与2005年相比，欧盟排放交易系统（EU ETS）内的行业需要削减43%; EU ETS外的行业需要削减30%。新政策框架还要求对EU ETS进行改革和加强。到2030年温室气体削减43%，意味着从2021年起每年削减2.2%；与实现2020年削减目标所确定的每年1.74% 削减量相比，实现新目标所要求的减排速度大为提高。
欧盟还对另外两个关键领域减排目标达成一致，即：可再生能源所占市场比例达到27%，能源利用效率提高27%。前者只对欧盟整体具有约束力；后者为“自选动作”。有预测到2020年能源利用效率可提高30%。
最后，2030年政策框架提出在各国制定行动计划基础上，要建立起新的治理结构，以确保实现具有竞争性、安全和可持续能源行业发展，并建立一套进步程度评价指标体系。欧盟委员会同意建立可靠、透明的治理体系以帮助欧盟实现其既定能源政策目标。

中国共产党确定依法治国蓝图

中国共产党在召开为期1周的重要会议后，为世界第二大经济体确定了依法治国的蓝图。中国共产党第十八届中央委员会第四次全体会议，于2014年10月20-23日在北京举行。中央全会以“依法治国”为主题在

To achieve the overall 40% target, the sectors covered by the EU emissions trading system (EU ETS) would have to reduce their emissions by 43% compared to 2005, while emissions from sectors outside the EU ETS would need to be cut by 30% below their 2005 level. The new framework will also entail a reform and strengthening of the EU ETS. A 43% greenhouse gas reduction target in 2030

means a sharper decline in the ETS cap, which will decrease by 2.2% annually from 2021 onwards, in place of the previous 1.74% rate up to 2020.
In addition to the greenhouse gas target, the objectives for two other key sectors were agreed. Two 27% targets were set for the renewable energy market share and for the increase in energy efficiency. The former would be binding only on the EU as a whole. The latter would be optional, although it could be raised to 30% by a review in 2020.
Finally the 2030 framework proposed a new governance structure based on national plans for competitive, secure and sustainable energy as well as a set of key indicators for assessing progress over time. The European Council agreed that a reliable and transparent governance

中国共产党93年的历史上是首次，会议审议通过了《中共中央关于全面推进依法治国若干重大问题的决定》（以下简称《决定》）。这份规划执政党依法治国路线图的纲领性文件提出，全面推进依法治国的总目标是建设中国特色社会主义法治体系，建设社会主义法治国家。《决定》指出，全面推进依法治国，必须坚持党的领导、人民当家作主、依法治国有机统一，坚定不移走中国特色社会主义法治道路，坚决维护宪法法律权威，依法维护人民权益、维护社会公平正义、维护国家安全稳定，为实现“两个一百年”奋斗目标、实现中华民族伟大复兴的中国梦提供有力法治保障。

《决定》明确了全面推进依法治国的重大任务，这就是：完善以宪法为核心的中国特色社会主义法律体系，加强宪法实施；深入推进依法行政，加快建设法治政府；保证公正司法，提高司法公信力；增强全民法治观念，推进法治社会建设；加强法治工作队伍建设；加强和改进党对全面推进依法治国的领导。《决定》提出，法律是治国之重器，良法是善治之前提。建设中国特色社会主义法治体系，必须坚持立法先行，发挥立法的引领和推动作用；要完善确保依法独立公正行

system should be developed to help ensure that the EU meets its energy policy goals.

CPC Sets New Blueprint for Rule of Law

The Communist Party of China (CPC) established a new blueprint for the rule of law in the world's second largest economy during a key meeting this week, promising sweeping judicial reforms while hailing the overarching role of the Constitution in the country's legal system.

The Fourth Plenary Session of the 18th CPC Central Committee was held in Beijing from Oct. 20 to 23. According to a communiqué issued after the meeting, the overall target of the CPC's current drive to advance the rule of law is to establish a system serving "the socialist rule of law with Chinese characteristics" and build a country under "the socialist rule of law".

China will work to build a law-abiding government, and will ensure the leadership of the CPC is at the forefront of "the socialist rule of law with Chinese characteristics," the communiqué read. It also pledged to rule the country in accordance with the Constitution.

This is the first time a plenary session of the CPC Central Committee has taken the rule of law as its central theme.

According to the communiqué, the four-day meeting adopted a decision from the CPC Central Committee on "major issues concerning comprehensively advancing the rule of law". The carefully-worded Communiqué promised legal reforms that are aimed at giving judges more independence and limiting local officials' influence over courts and cases.

According to the communiqué, they will develop a system in which officials will be given demerits or held accountable if they are found interfering in judicial cases. Officials will be criticized in public notices if they influence judicial activities or meddle in a particular case, it said, adding that judicial injustice can inflict "lethal damage" to social justice.

Another encouraging feature of the CPC's plan this week to advance the rule of law is its recurrent reference to the Constitution as the "core" of the country's socialist system of laws.

"To realize the rule of law, the country should be ruled in line with the Constitution," the document reads.

The words mirrored a speech of Xi Jinping in late 2012 when he stressed that "no organization or individual has the special right to overstep the Constitution or the law, and any violation of the Constitution and the law must be investigated."

The communiqué also highlighted once again that the country will ensure the CPC's leading role in its quest toward the rule of law, citing the Party's leadership "the most fundamental guarantor" of the process.

使审判权和检察权的制度；推进严格司法，坚持以事实为根据、以法律为准绳，推进以审判为中心的诉讼制度改革，实行办案质量终身负责制和错案责任倒查问责制。

中共中央总书记习近平曾在2012年指出：任何组织或者个人，都不得有超越宪法和法律的特权。一切违反宪法和法律的行为，都必须予以追究。

《决定》强调，党的领导是中国特色社会主义最本质的特征，是社会主义法治最根本的保证。把党的领导贯彻到依法治国全过程和各方面，是我国社会主义法治建设的一条基本经验。

Production and Consumption Systems Need a Fundamental Rethink

The Environmental Indicator Report 2014 was published last October by the European Environment Agency. The report analyses the EU's production-consumption systems and looks at more sustainable ways of satisfying our needs with the transition to a green economy.

The report's launch coincided with the Global Green Growth Forum held in Copenhagen 20-21 October, where business leaders and decision makers discussed how changing production and consumption patterns can bring about green growth.

As the report points out, around half of certain pressures from EU consumption are exerted outside the EU, including land use, water use and some air pollutant emissions, partly because consumer goods are increasingly produced abroad. Europe's impact on those foreign countries can be positive, for example in providing many jobs and generating a significant portion of their national income. But this globalized impact can have some negative side-effects such

需要对生产和消费模式进行彻底重新思考

10月份欧盟环境署发布了《2014环境指数报告》。报告对欧盟的生产、消费系统进行分析，并提出向绿色经济转型，以更可持续的方式满足当前人们的需求。

报告发布时间与10月20-21日在哥本哈根召开的“全球绿色增长论坛”不期而遇。在论坛上，商界领袖与制定政策者们共同讨论如何通过改变生产和消费方式来推动绿色增长。

正如报告指出，欧盟消费者对环境所造成的压力一半以上转移到了欧盟区域以外，包括土地利用、水资源使用、空气污染物等等；究其原因可部分归咎于这些消费品越来越多地由境外企业生产。当然在这个过程中，欧盟对生产国带来了积极的影响，如：提供就业机会、增加国家收入等；但这种全球化也同时带来了负面影响：造成食品价值链中大量粮食浪费、助推廉价衣物浪费、提高欧盟家庭电力消耗（尽管家电产品能效得到大幅提高）等。而且由于这些趋势所带来的环境和社会影响已经超出欧盟边界，欧盟管理政策很难发挥作用，对消费者来说几

as large amounts of food waste across the whole food value chain, surging consumption of cheap clothes and increasing electricity consumption by European households, despite increase in the use of energy-efficient appliances. Moreover, because the environmental and social effects of these trends are often exerted beyond Europe's borders, they are difficult for European policy to influence and remain largely invisible to consumers.
The EU is also highly dependent on the rest of the world for raw materials, which are eight times as much (by weight) as the goods that are exported. The extraction and transport of these materials puts significant environmental pressure on the global environment.
For these reasons Hans Bruyninckx, EEA Executive Director, presenting the report, noted that the way we live and how we produce things has a substantial impact beyond our borders. In the past Europe has largely focused on policies to make European production more eco-efficient, but in a globalised world it is increasingly important that we fundamentally re-think how we consume and produce, to encourage true sustainability throughout the whole lifecycle of products.
The research also highlights some positive societal trends that show the potential for production and consumption systems to become more sustainable. For example, many people have started to consume in different ways as new technologies make it easier to do things collectively, from sharing cars and work tools to managing community gardens. Consumers are also becoming producers in many cases (selling the electricity from rooftop solar panels or cooperatively producing and distributing food), which can have environmental benefits. Businesses can also play an important role. Retailers have great power to influence the products people buy, for example by offering more sustainable products or removing the most environmentally harmful choices altogether. Nonetheless, these initiatives need more political support to flourish, the report states.
Report available at:
http://www.eea.europa.eu/publications/environmental-indicator-report-2014

乎是看不到什么作用的。此外，欧盟在原材料方面极大依靠海外市场，进口量是出口量（按重量来计算）的8倍，这些材料的开采和运输给全球环境也带来了很大影响。
为此，欧盟环境署执行主任布鲁尼克斯（ Hans Bruyninckx）指出， 我们的生活和生产方式所产生的巨大影响已远远超出了我们的边界。在过去，欧盟更多地集中精力制定欧盟政策，努力使欧盟的生产变得更加环境友好；但是在全球化的今天，我们更加需要进行彻底反思如何消费和生产，从而推动产品全生命周期实现可持续环境管理。
报告还指出，某些可持续生产和消费方式也正在对社会产生积极影响。例如：随着新技术发展，人们可以共享一些服务，包括共享汽车、劳动工具等；共同管理社区公园；费者也可以变成生产者（出售自家屋顶太阳能板收集的电力资源、或者集体制作和配送食物等），这些都可以带来积极环境效益。商业界可以发挥积极作用，零售商可以对购买产品的人群产生很大影响，如：向消费者提供更符合可持续发展理念的产品、杜绝出售对环境造成影响的产品等。但无论如何，报告认为这些行动都需要更多政治支持才能够坚持和壮大下去。
报告刊载网址:
http://www.eea.europa.eu/publications/environmental-indicator-report-2014

New Automatic Sorting Method for Plastic Recycling

Even after years of application worldwide the recycling process for plastic materials is still a long way from perfection.
For example, the plastic recovered from separate collection is never used to produce high quality products because of its low chemical purity; in fact contamination levels as low as 5% are sufficient to significantly reduce the quality of the new products.
Now, however, a team of researchers at the Department of Chemistry of Ludwig Maximilians Universität (LMU) in Munich, Germany, have developed a new process, which is expected to greatly improve and simplify plastics sorting in recycling plants.
This technique provides for automated recognition of the polymer constituents of plastic objects, thus improving the efficiency of recycling and the re-use of the various types of plastic; it takes advantage of the photoexcitation effect, which in the case of plastics is highly polymer-specific. As Prof. Langhals, the head of the research team, explains: "Plastics emit fluorescent light when exposed to a brief flash of light, and the emission decays with time in a distinctive pattern. Thus, their fluorescence lifetimes are highly characteristic for the different types of polymers, and can serve as an identifying fingerprint".
The new technique, which is the subject of a patent application, will make the automated sorting of plastic feasible, since it permits the identification and sorting of up to 1.5 tons of plastic per hour, as well as being much more reliable.

塑料回收利用新自动筛选方法

尽管塑料回收利用已经开展很多年，但其回收工艺却远未达到完善程度。例如，由于受到纯度限制，所回收塑料从未用于生产高质量产品。事实上，即使将塑料受污染程度控制在5%以下，仍然会导致所生产产品质量大大降低。
一群来自德国慕尼黑Ludwig Maximilians 大学化学系的研究人员成功开发出一套新工艺，可以大大改进简化回收过程中塑料筛选。
这种技术可自动识别塑料物品中所含聚合物成分，从而提高塑料制品的回收和再使用率。该技术利用光激发作用，对塑料来说是对高聚合物发生作用。研究组组长Langhals教授解释说：“当塑料暴露在短暂光照下会发出荧光；荧光强度会随着时间推移而发生明显衰变。因此，荧光寿命是筛选不同聚合物的特征指示物，可以作为识别“指纹”。该项技术已获得专利申请，使得自动筛选塑料成为可能。具体来说，利用该技术可以完成每小时1.5吨的塑料识别和筛选，而且筛选过程更加稳定。

Air Pollution Legislation in the EU
欧盟空气污染管理政策

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Air pollution can have a serious effect on people's health. Exposure to air pollution may have long-term effects on health, associated in particular with premature mortality due to cardiopulmonary (heart and lung) issues. In the short-term, high pollution episodes can trigger increased admissions to hospital and contribute to the premature death of those most vulnerable to daily changes in levels of air pollutants. Air pollution also has negative impacts on our environment, both in terms of direct effects of pollutants on vegetation, and indirectly through effects on the acid and nutrient status of soils and water.

In recent decades, the EU has introduced and implemented various legal instruments to improve air quality. There are three different legal mechanisms for air quality management. The first mechanism is the creation of limits or targets for ambient concentrations of air pollutants. The second mechanism is the placing of limits on total pollutant emissions The third mechanism is the regulation of emissions from specific sources or sectors by setting emission standards (e.g. for vehicle emissions).

The Air Quality Directives 2008/50/EC and 2004/107/EC set legally binding limits for ground-level concentrations of outdoor air pollutants. Key elements are:

_ **EU limit values**, which are legally binding concentration thresholds that must not be exceeded. Limit values are set for individual pollutants and are made up of a concentration limit, an average time over which a pollutant is to be measured or estimated, the number of exceedances allowed per year;

_ **Target values** — which are to be attained where possible by taking all necessary measures not entailing disproportionate costs. Target values are not legally binding;

_ **Exposure reduction obligation** — concentrations are to be reduced by a given per cent depending on the mean triennial $PM_{2.5}$ urban background concentrations from 2008–2010 to 2018–2020.

At the Member State level, the National Emission Ceilings Directive (NEC Directive) imposes emission ceilings (or limits) for emissions of four key air pollutants (nitrogen oxides, sulphur dioxide, non-methane volatile organic compounds and ammonia) deleterious to human health and the environment.

Other key EU legislation is targeted at reducing emissions of air pollutants from specific sources, for example:

空气污染对人体健康造成严重影响。暴露于污染空气对健康会产生长期影响，所引发的心肺疾病会导致早期死亡。在短时期内，高污染事件可造成住院治疗人数增加，并导致易感人群过早死亡。空气污染也对环境产生很大负面影响，包括对植被的直接影响和通过酸性和营养物质对土壤和水产生间接影响。

近几十年来，欧盟制定并实施各种法律文件以改善空气质量，可归纳总结为三种不同的空气质量管理法律机制：第一种机制是制定环境空气中污染物的浓度限值或目标；第二种机制是确定污染物排放总量；第三机制是针对排放源或排放行业制定排放标准（例如，机动车尾气排放标准）。

《欧盟空气质量指令》（包括2008 / 50 /EC和《2004 / 107 / EC）规定了具有法律约束力的室外空气污染物地面浓度限值。主要要求包括：

_ **欧盟限值** 具有法律约束力的浓度阈值，不得超过。对每一种污染物、污染物监测或评价的平均时间以及每年允许超过的数量等都确定了限值；

_ **目标值** 通过采取各种可能措施争取达到的目标，不必完全不计一切代价。目标值不具有法律约束力；

_ **暴露削减目标** 以2008-2010年三年间PM2.5的平均城市背景浓度为基础，到2018-2020年将PM2.5浓度降低一定比例。

对于给人体健康和环境造成危害的四种关键污染物（氮氧化物，二氧化硫，非甲烷挥发性有机化合物和氨），欧盟成员国必须执行《污染物排放上限指令》。

其他欧盟法规则旨在减少具体行业领域的排放情况，例如：

_ 交通；
_ 固定源/ 工业设施；以及
_ 油漆和汽车修补漆

在国际上，联合国欧洲经济委员会《长距离越境空气污染公约》（简称LRTAP公约）及其议定书对空气污染物排放问题进行管制。LRTAP公约下的《哥德堡多种污染物议定书》确定了缔约方国家排放的上限。对于欧盟成员国来说，这些上限值等于或低于欧盟NEC指令。

空气质量评价和管理

与空气质量有关的欧盟法律规定：成员国有义务在全域范围内将领土划分成多个区块（或地区）和群（或城市），它们是空气质量评价和管理的基本单元。在这些区块内，成员国有义务利用各种仪器监测、模型模拟和实证手段等来进行空气质量水平评价。一旦出现污染水平升高，各成员国则应制定并实施相应空气质量计划，以确保在控制限值有关规定生效之日前不超过排放限值。通过监测、模拟和客观测算来评价大气环境质量，从而判断是否达到有关规定要求；并为下一步拟定减排行动计划提供信息。这种评价应基于严格遵照欧盟规定的方法和标准所进行的连续监测和模拟结果。《指令》不仅规定了最低评价要求，而且还规定了其他的评价任务，如：对污染水平高的区域要进行源解析。

各成员国必须采取应对措施对空气污染进行严格管理，以确保在相应规定日期内尽可能达到限值要求；一旦出现超限值情况，则必须拟定“改善空气质量计划”，并严格落实计划措施，从而在《指令》规定期限内达标。

《指令》中规定了“改善空气质量计划”的最低要求，该计划应向公众开放。对于应公开的最低信息量，在有关规定中也有明确要求。减排计划也应向公众公开。

按照欧盟空气质量有关法律规定，各成员国在初步评估空气质量后应将全域网格化信息和空气质量情况报送欧盟委员会。

在向欧盟委员会报送的年度报告中应包括与所确定的目标值之间的差距。

欧盟空气污染现状

欧盟老百姓呼吸的空气基本都是不符合质量要求的。目前空气污染水平显然会对城市居民健康造成危害。

欧盟大部分城市空气质量是不达标的，颗粒物、

_ transport;
_ stationary sources / industrial facilities; and
_ paints and vehicle refinishing.

Internationally, the issue of air pollution emissions is also being addressed by the UNECE Convention on Long-range Transboundary Air Pollution (the LRTAP Convention) and its protocols. The Gothenburg “multi-pollutant” protocol under the LRTAP Convention contains national emission ceilings that, for the EU Member States, are either equal to or less ambitious than those in the EU NEC Directive.

Air quality assessment and management

Assessing the main provisions of the European legislation relating to air quality, there is an obligation for Member States to divide their territory into a number of zones (or regions) and agglomerations (or urban areas). Zones and agglomerations are declared by the Member States, covering the whole territory of the given Member State. The zones represent basic areas for which assessment and management provisions are prescribed. In these areas, Member States must undertake assessments of air pollution levels using measurements and modeling and other empirical techniques. Where levels are elevated, the Member States should prepare an air quality plan or program to ensure compliance with the limit value prior to the date when the limit value formally enters into force.

Assessment of ambient air quality through monitoring, modeling, and objective estimation provides information on the degree of compliance with environmental standards and informs further air pollution abatement efforts. This assessment should be achieved by continuous monitoring or modeling, on the basis of common methods and criteria introduced by the European legislation. In the Directives, the minimum assessment requirements are described, however additional assessment is also needed, to be carried out by the Member States, such as source apportionment, in particular in those agglomerations and areas where the pollution is high.

Close management of air pollution in the Member States is needed to ensure that limit values are complied with throughout the territory of each State by their respective attainment dates, and that target values are respected to the extent possible. Action is required before the attainment dates where given assessment thresholds set in the Directives are being exceeded, generating a requirement to prepare and implement air quality plans or programs. The necessary air pollution reduction measures should then be compiled within a framework of air quality plans or programs which specify how the measures adopted will bring concentrations below respective limits or target values by the attainment date defined in the Directive.

Minimum requirements of such plans and programs are set out in the Directive. Plans and programs should be available to the public. Public participation requirements establish the minimum amount of information that needs to be provided to the public as regards the

assessment of concentrations. It also requires the public availability of abatement plans and programs.

The European air quality legislation requires Member States, after a preliminary assessment, to identify zones and urban areas throughout their territory and to communicate to the Commission information about the state of air quality. Information on zoning and local concentrations in comparison to air quality objectives should be provided through an annual assessment to be reported to the European Commission.

Current situation in EU regarding Air pollution

European citizens often breathe air that does not meet the European standards. The current pollution levels clearly impact on large parts of the urban population.

A significant proportion of Europe’s population live in cities, where exceedances of air quality standards regularly occur. Particulate matter (PM), NO_x and ozone (O_3) pollution are particularly associated with serious health risks, and exposure to high levels of organic pollutants, in particular PAHs is a growing health concern in Europe.

European anthropogenic emissions are the most important contributors to O_3 and PM concentrations levels over Europe, but the intercontinental drift of pollution also contributes to increased impacts on health, ecosystems and our economy. Hereunder follows some information regarding the main pollutants affecting the air in Europe: PM, nitrogen oxides and ozone.

PM in the air has many sources and is a complex heterogeneous mixture. The sizes and chemical composition of this mixture can change in time and space, depending on emission sources and atmospheric and weather conditions.

Despite the emission reductions of PM in the past years 22–44 % of the EU urban population was exposed to concentrations of PM_{10} in excess of the EU air quality daily limit value in the period 2002–2011.

_ Slight reductions were generally observed in ambient PM concentrations over the period 2002–2011.
_ 33 % of the EU urban population lives in areas where the EU air quality 24-hour limit value for particulate matter (PM_{10}) was exceeded in 2011.

Nitrogen oxides are emitted during fuel combustion, such as by vehicle engines, industrial facilities and domestic heating. Among the chemical elements that comprise NO_x, NO_2 is associated with adverse effects on health, as high concentrations cause inflammation of the airways and reduced lung function.

Some cities in Europe show an increase in concentrations of NO_2 measured close to traffic. This reflects the increasing numbers of newer diesel vehicles. Such vehicles emit less CO and NMVOCs than petrol vehicles, but may emit more PM and NO_2.

The decrease in NO_x emissions (34% from road traffic sources between 2002 and 2011) is attributed primarily to the increase in NO_2 emitted directly into the air from diesel vehicles

氮氧化物和臭氧污染对健康造成危害，形成高浓度有机污染物暴露环境，特别是多环芳烃类污染在欧洲正变得日趋严重。

欧洲人为活动是造成臭氧和颗粒物浓度升高的主要原因；但洲际间的污染物传输同时增加了对人体健康、生态系统和欧洲经济的负面影响。下面具体介绍影响欧洲空气质量的主要污染物情况：颗粒物、氮氧化物和臭氧。

空气中颗粒物的来源有很多，是一个复杂的异构混合物。由于排放源、大气及气象条件不同，混合物的大小和化学成分可随着时间和空间的变化而变化。

尽管过去几十年里颗粒物的排放不断削减，但欧盟22-44%的居民仍然生活在PM10超过“欧盟2002-2011年空气质量限值”的环境中。

_ 在2002-2011年期间PM10浓度出现轻度降低
_ 33 %欧洲城市居民生活在颗粒物（PM10）超过2011年空气质量标准中。

氮氧化物是燃料燃烧过程中排放的污染物，如汽车发动机，工业设备和家用取暖等。在氮氧化物中，二氧化氮对人体健康的危害最大，浓度过高会引起气道炎症和肺功能下降。

在欧洲一些城市二氧化氮的浓度与交通排放情况密切相关，并随着新上路柴油车的数量增加而升高。这种车比汽油车排放的一氧化碳和NMVOCs少，但可以排放出更多的颗粒物和二氧化氮。

氮氧化物排放量减少（占2002和2011期间34%道路交通源）主要归因于柴油车辆二氧化氮气体排放量增加的结果。

臭氧是一种在对流层中形成的二次污染物（即：它不是由任何污染源直接排放），由氮氧化物和NMVOCs的前体物经过复杂的化学反应后形成的。在欧洲大陆范围内，甲烷（CH_4）和一氧化碳（CO）也对臭氧的形成起到了一定作用。臭氧是一种强大的和侵略性的氧化剂，高浓度臭氧可导致呼吸道健康问题和过早死亡。

为了保护人体健康，欧盟制定了“2002-2011年欧盟臭氧控制目标值”。但实际情况是，欧盟14%-65%的城市人口暴露于臭氧浓度超过目标值的大气环境中。此外，21%-69%的农作物也暴露在臭氧浓度超过“欧盟2002-2010植被保护控制目标值”的大气环境中。

Ozone is a secondary pollutant (meaning that it is not emitted directly by any emission source) formed in the troposphere, the lower part of the atmosphere, from complex chemical reactions following emissions of precursor gases such as NO_X and $NMVOC_s$. On the continental scale, methane (CH_4) and carbon monoxide (CO) also play a role in O_3 formation. Ozone is a powerful and aggressive oxidizing agent, elevated levels of which cause respiratory health problems and lead to premature mortality.
Between 14% and 65% of the EU urban population was exposed to O_3 concentrations above the EU target value for protecting human health in the period 2002–2011. Furthermore, between 21% and 69% of agricultural crops were exposed to O_3 levels above the EU target value for protecting vegetation from 2002 to 2010.

Best Practices to reduce air pollution from traffic in the EU

Road transport accounts for a fifth of total EU CO_2 emissions, and urban transport is estimated to account for around a quarter of transport emissions. The passenger car represents around 74% of all private road transport within the EU, and the number of cars per 1000 people has increased by 20% between 1990 and 2009. This increase in private transport poses serious challenges for cities, raising issues of traffic congestion, health impacts and environmental damage. It is thus recognized that urban mobility needs to be more sustainable and many European cities are experimenting with new technologies and transport systems.
Such measures include policies aimed at increasing carpooling, for example, or new public transport systems, such as shared public bicycles. Purely electric cars, which are well suited to short-distance urban travel, represent a relatively new means of sustainable transport.

LEZ in Germany

One of the most aggressive responses to the new PM_{10} legislation in Europe has been the rapid adoption of so called “Low Emission Zones” (LEZs). A LEZ defines an area that a vehicle is allowed to enter only if it is classified as a low PM_{10} emitting vehicle. All high polluting vehicles are banned from driving into the LEZ. To date, LEZs have been implemented in 152 cities in 9 EU countries. Germany, in particular, has been at the forefront of efforts worldwide to establish LEZs.
To deal with the large number of cities exceeding the PM_{10} threshold, the German government requires that any German city where registered air pollution exceeds guidelines immediately develop a clean air action plan (AP). Implementation of LEZs has emerged as the most common, yet most aggressive and controversial, feature of Germany’s clean air action plans. As of January 2010, 41 German cities had implemented LEZs.
Every German vehicle—as well as any visiting foreign car—that seeks to enter a LEZ must display a colored windshield sticker indicating its PM_{10} pollution class. Vehicle entry into LEZs is restricted based on the color of the sticker, with some cities permitting only the cleanest vehicles (green stickers), and others allowing more pollution classes (yellow and red) into their LEZs. The fine for illegally entering an LEZ is 40 Euros plus one penalty point on the driver’s license. There is a scale of sanctions for penalty points, culminating in the loss of the driver’s license at 18 points.

London Electric Vehicle Delivery Plan

In 2009, Boris Johnson, Mayor of London, published the Electric Vehicle Delivery Plan for London with the aim of making London the electric vehicle capital of Europe. The EV Delivery Plan is only one strand of the Mayor’s strategy to decarbonise transport and improve air quality in London. Other elements include reducing the need to travel and the distance travelled through better land-use/transport planning, encouraging the use of less energy intensive modes of travel - more walking, cycling and travel by public transport, and the use of cleaner fuels and vehicles.
The aspiration is:
_ to have 100,000 electric vehicles on the road as soon as possible
_ to provide a network of publicly accessible charge points across London
_ for every Londoner to be within one mile of an EV charge point.
On 26 May 2011 Boris Johnson, launched the Source London charge point network.
Source London is a city-wide charge point network key to delivering the Mayor’s vision of increasing the uptake and usage of electric vehicles in London, but achieving his goal for London to be the electric vehicle capital of Europe will take much more than this. Transport for London is working in many areas alongside numerous public and private partners to make this vision a reality.
To ensure that new developments in London will be equipped for an electric future, the Mayor is using his planning powers to ensure that a portion of all car parking for new homes, offices and shops will be equipped with EV charge points. The specific requirements vary with the type of development and are set out in the London Plan, which was published in July 2011.
There will be a continuing phased installation of 1,300 public charge points on residential streets and off-street locations, such as supermarkets, public car parks and at shopping and leisure centres in the Source London network.

Traffic Management in Barcelona

Currently in Barcelona 22.9% of the bus fleet runs on natural gas, with NO_x emissions that are 85% lower than the Euro IV standard. Furthermore, various bus routes have been replaced with tramways (41 convoys), which account for an additional 11.4% (each tram replaces 3

减少欧盟汽车尾气排放的最佳实践

道路交通占欧盟二氧化碳排放的五分之一；城市交通占交通行业排放的四分之一。私人轿车占欧盟私人道路交通的74%；在1990-2009年期间每一千人拥有的轿车数量增长了20%。私人轿车数量的大幅增长给城市带来了极大挑战，加剧了城市交通拥堵程度、对人体健康和生态环境造成危害。因此，城市交通如何实现可持续发展致关重要。许多欧洲城市正尝试着运用新技术和新交通系统来缓解这方面的问题。这些措施的根本目的是提高轿车共享率、建立新公共交通系统。例如共享公共自行车是一种很适合于短距离城市交通的工具，代表了可持续交通的一种新形式。

德国的低排放区

欧洲应对PM10的最有力举措之一是快速建立“低排放区”（LEZs）。只有确定为低PM10排放的机动车才允许进入LEZ，并禁止任何高污染排放的机动车进入该区域。到目前为止，欧盟9个国家有152个城市执行低排放区控制制度。德国在这方面走在世界前列。
面对大量城市空气质量超标情况，德国政府要求所有超过PM10阈值的城市必须立即制定清洁空气行动计划（AP）。
低排放区（LEZs）是德国清洁行动计划最常见、最有效、也是最具争议的措施之一。到2010年1月，德国41个城市实施了LEZs.
每一部德国机动车、包括外来车辆，必须在挡风玻璃前贴着其PM10排放级别。根据标签的颜色来决定是否放行进入LEZs，有些城市只允许最清洁的机动车（绿色标签）进入LEZs, 有些城市适当放行污染稍重些的车辆（黄色和红色标签）。违令进入LEZs者，将被处以40欧元的罚款，并扣驾照1分。 驾驶执照一共有18分，根据违规情况处以不同程度的扣分。

伦敦电动车发展计划

2009伦敦市长鲍里斯·约翰逊宣布了“伦敦电动车发展计划”，以使伦敦成为欧洲的电动车之都。电动汽车发展计划只是市长先生努力让交通运输系统“脱碳”、改善伦敦空气质量的举措之一。其他措施还包括：更好地规划土地利用，制定更合理的交通计划，鼓励使用低能耗出行方式（包括多步行、多骑车、多利用公共交通工具），多使用清洁燃料和清洁机动车等等。
该计划的目标是:
_ 尽快让10万辆电动车上路
_ 在伦敦建立市民机动车充电网络
_ 每一位伦敦居民在1英里范围内可以找到充电站
2011年5月26日鲍里斯·约翰逊启动了“伦敦源”充电网络。
“伦敦源”城市充电网是市长先生推动公众接受并广泛使用电动汽车的重要措施，但要想将伦敦建设为电动车之都，需要采取的行动还远不止这些。伦敦交通部正与公共和私营部门一起合作努力推动实现市长先生确定的美好愿景。
为推动电动车发展规划实施，伦敦市长充分利用规划力量，确保在新建住宅、办公室和商场停车场安装电动车充电站。 具体要求因发展规划而各异，有关具体要求已在2011年7月公布的伦敦市规划中明确提出。
在住宅区街道和“伦敦源”网络内的非街道区域，如超市、公共停车场、商店及娱乐中心等，将逐步安装1300个电动车充电站。

巴塞罗那的交通管理

目前，巴塞罗那市有22.9%的公交车使用天然气，氮氧化物排放低于欧四标准。 很多公交线路都改为有轨电车（41条线）， 总量占公交车11.4% (由于载客量大大提高，每辆有轨电车可替代3辆公共汽车)。总体来讲，34.3%的公交车辆为低排放车辆（50%低于欧四标准）。
巴塞罗那采取了一系列措施降低私人轿车的使用量，具体包括:
_ 交通管理：2008年规定所有进入巴塞罗那市区的车辆限速为80公里/小时（50英里/小时），该项措施使得巴塞罗那氮氧化物排放量降低1.6%、颗粒物降低0.3%、事故率降低1.3% (2008-2009年数据)。
_ 机动车停放: 2005年引入“绿色区域管理”以缓解城市中心交通拥堵，为居民提供停车场所，并改善公共空地管理。这项措施在划定区域内减少13%的行驶车辆。巴塞罗那有43,497 个绿色停车场和9,791蓝色空地。此外，自1999年以来，新增了6,000 上货和卸货区，增长率为91%。
_ 共享车辆： 自2005年巴塞罗那开始尝试推动

buses, owing to their increased capacity). Overall, 34.3% of the bus and tram fleet is made up of low-emission vehicles (50% lower than the Euro IV standard).
Barcelona has taken a number of measures in order to reduce the number of private cars in use, these include:
_ Traffic management: In 2008 an 80 kph (50 mph) speed limit was introduced on fast roads leading into the city. This reduced NOx emissions in the city of Barcelona by 1.6%, a 0.3% reduction in particles and a 1.3% reduction in accident rates (figures for 2008-2009).
_ Vehicle parking: The Green Area was introduced in 2005 to relieve congestion in the city centre, provide parking spaces for residents and improving the organization of public spaces. This led to a 13% reduction in traffic in the regulated zones. Barcelona has 43,497 regulated green parking spaces and 9,791 blue spaces. Furthermore, since 1999 more than 6,000 loading and unloading spaces have been created, an increase of 91%
_ Car sharing: Barcelona pioneered car sharing in Spain, which has been operating in the city since 2005. It currently has 3,220 customers, 118 vehicles and 38 parking areas.
And has resulted in:
_ The use of private vehicles falling by 5% between 2001 and 2005
_ A reduction of 3% in the presence of vehicles per kilometer in the streets
_ Traffic intensity improving by 4%.
_ The number of cars per 1000 inhabitants falling by 9.4% between 2000 and 2008. Much emphasis has also been placed on the improvement of the cycle lane network in the city.
Other European initiatives include:

Autolib' in Paris

The Autolib' car-sharing service, featuring the all-electric Bluecar, uses Microsoft technology in its registration and rental kiosks, in the in-car systems, and in the handheld devices used by agents to serve drivers. The service is designed to reduce traffic congestion and emissions in Paris and its surrounding suburbs by making energy-efficient vehicles available as drivers need them, decreasing reliance on privately owned petrol-powered cars.
The technology for the Autolib' program consists of five major elements, including three kinds of kiosk for registration, rental and vehicle charging, an in-car system for driver access, navigation and customer assistance, and Ambassador handhelds to monitor vehicle location, charging levels and maintenance.
Registration kiosks. Seventy freestanding enclosed kiosks located throughout Paris and its suburbs enable new users to join the program within minutes. The kiosks, which run Windows Embedded POSReady, enable registrants to scan a credit card and valid driver's license, connect to a customer service agent via videoconference, and within minutes receive an RFID-enabled membership card that grants access to the 1,750 Bluecars in the Autolib' fleet.

“共享车辆”。目前有3220名用户、118辆机动车和38个专用停车场。
所取得成效包括:
2001-2005年期间私人机动车使用量降低5%
每公里道路减少3%车辆行驶
交通强度提高4%
2000-2008年期间每1000名居民轿车拥有量减少9.4%。与此同时还采取很多措施改善城市自行车专用道路。
其他欧盟国家所采取的行动还包括:

巴黎Autolib'倡议

Autolib' 共享汽车服务全部使用电动蓝色轿车，在登记、租赁亭、车内系统和代理机构的手持仪器上，全部都采用微软技术来服务客户。该倡议对减缓交通拥堵、减少巴黎城区及郊区尾气排放，减少居民对汽油车依赖度等方面发挥了较大作用。
Autolib' 倡议包括5大单元，即：三种登记亭，租赁与充电站，车内系统（以方便客人租车、导航和寻求客户援助），监控车辆位置，以及进行充电及车辆维护等。
_ 登记亭：在 巴黎市及郊区共有70个登记亭，可以确保新用户在几分钟之内享受到该项服务。登记亭采用了POSReady植入Windows系统，可以帮助用户扫描信用卡、有效驾驶证、，并通过视频接入客户服务端；在几分钟之内用户就可以接收到带有电子标签（RFID）的会员卡，然后就可以使用Autolib'网络内的1,750 辆蓝色汽车了。到目前为止，已经有60,000 名用户，租车期限为1天、1周、1个月到1年不等。
_ 租车亭：用会员卡可以登录，并使用POSReady Windows触屏系统来预订距离最近、充电量最高的汽车。租车亭为客人提供地图示意汽车停放地点，很可能汽车就停在租车亭附近；如果附近没有可用的汽车，也会给客人预定距离最近的汽车；并通过客服中心为用户提供其他必要帮助。
_ 充电站：在巴黎城区和市郊共有1750辆电动车、750个充电站；每个充电站可同时容纳6辆汽车。
_ 车内系统：Autolib' 网络车内系统采用了Windows标准系统，在客人进入车内之际，系统会自动欢迎驾驶员，并调节到客人事先登记的车

内温度、收音机频道。驾驶员可以运用触屏全球定位导航系统，或接入客户服务中心帮助寻找停车场或其他任何服务。

_ 中央Autolib' 数据管理系统：共有400名流动大使通过手持设备与 Autolib' 系统相连接。通过该数据系统，可以及时检查并修理车辆，并帮助客户处理交通事故。

罗马汽车共享计划（Car to Go in Rome)

2014年2月罗马开始执行汽车共享计划（Car to Go）。到目前为止，罗马有500辆Smart 轿车、欧洲其他城市有6000辆轿车参与本计划。Car2Go 计划是2008年在德国乌尔姆推出的一个试点项目，现已推广到欧洲和北美25个城市，拥有50万用户，9000辆车。驾驶员可以在项目城市内任何一个公共停车场领取车和交还车；无需事先预订，所有费用（包括燃油费、税、保险等）加起来折合每分钟0.29欧元。驾驶员在网上登记，然后去Car2Go 服务店领取会员卡。 一旦完成登记，用户则拥有了一个芯片和密码。用卡片打开车门，插入芯片， 回答一些关于车况的问题后即可将车开走。

用户打开车门并启动车的过程看似简单，但事实上应用了不同领域的先进技术。将会员卡放在位于驾驶员挡风玻璃上的读卡器上即可完成读卡。读卡器采用了NFC 技术 (附近通讯技术)，可以将用户会员卡上的相关信息传输到车载计算机上。计算机与主数据库进行连接核验会员卡真伪。一旦用户识别通过后，Smart车自动解锁，数据跟踪系统停止工作。

当旅途结束后，把卡片在触屏上扫一下，即可记录下旅途的终点，系统在卡片上将相关费用计入借方。这样汽车就又可以为下一位用户服务了。

结论

在相关管理政策推动下，催生了一批新技术研发，对欧洲空气质量改善发挥了很大作用。例如：汽油车的汽车发动机效率得到提高；柴油车安装了颗粒物过滤器；工业设施安装了污染物削减的设备等等。 拥堵费、清洁汽车减免税政策也很成功。通过这些努力，空气中二氧化硫、一氧化氮、苯等污染物大大削减，空气质量得到很大改善，有利于保护公众健康。对于其他污染物的削减情况，目前尚没有得到清晰因果关系。

尽管空气污染削取得了明显效果，但欧盟及成员国层面的政策尚未完全执行到位。颗粒物、二氧化氮、地面臭氧在许多城市仍然超标，氮氧化物全球排放也未按预期得到相应削减。

应立即采取措施减少颗粒物、地面臭氧和氮氧化物的排放。

More than 60,000 subscribers have enrolled in schemes ranging from one day to one week, month or year.

_ Rental kiosks. Autolib' members check in with a membership card and use the Windows Embedded POSReady-based touch-screen system to reserve the most fully charged car near their location — which may be right next to the kiosk or a short distance away if no car is available at the nearest station. The kiosk provides a map and directions; if the nearest station is empty, the kiosk shows the closest stations at which a car may be reserved, or connects members to a customer service agent if additional assistance is needed.

_ Charging station. There are 1,750 electric cars available at 750 charging stations throughout Paris and its surrounding suburbs; each station has parking spaces for four to six cars.

_ In-car system. The Autolib' in-car system, running Windows Embedded Standard, greets the driver by name upon arrival and sets the temperature and radio station in accordance with the driver's saved preferences identified during the registration process. The driver can access GPS navigation via touch screen or be connected to a customer service agent to find a parking space or report any problems.

_ Centralized Autolib' data management system. A team of 400 mobile ambassadors, using Ambassador handheld devices running Windows Embedded Handheld to connect to the Autolib' data system, circulates through the region to inspect and repair cars and assist members who are involved in accidents.

Car to Go in Rome

Car to Go is a car sharing project which has started in Rome in February 2014. At the moment 500 Smart cars are available in Rome and 6,000 in the European cities selected by the program. The Car2Go system was rolled out as a pilot project in Ulm, Germany in 2008, with a fleet of 50 cars. It is now operating in 25 cities in Europe and north America, has registered more than half a million users and has over 9,000 cars on its books. The system allows drivers to pick up and leave a Smart car in any public parking place within the area covered by the service. No forward booking is necessary and the all-inclusive cost (fuel surcharge, taxes, insurance, damage cover) for registered users works out at an average of euro 0.29 per minute. Drivers register online, then go to a designated Car2Go point and pick up their membercard. Once registered, users get a chip card and a pin number. The card opens the car, drivers then insert their pin, answer a few questions about the condition of the car and drive off.

Once the customer reaches the car, the procedure to open it is quite simple but nevertheless involves the use of different technologies. In fact, the user simply has to place the member card on the card reader in the car, glued under the windshield on the driver's side. This card reader uses NFC technology (Near Field Communication) which allows the transfer of the user's details from the member card to the on-board computer. This computer communicates with the main database and is thus able to authenticate the Car2Go member account. Once the user is recognized, the Smart car unlocks automatically and the tracking system is deactivated.

When the journey is finished, the card is passed over the touch screen display to record the end of the journey, allowing the system to debit the card. The car is then ready for the next customer.

The technological infrastructure that governs the entire logic of the system is therefore characterized by a constant direct interaction between the car and the user.

Conclusion

A number of technological developments, some of which were initiated by legislation, have contributed to improving Europe's air. For example, car engines have become more efficient in using fuels; new diesel cars have particle filters installed; and industrial facilities have started using increasingly more effective pollution-abatement equipment. Measures such as congestion charges or tax incentives for cleaner cars have also been quite successful. Emissions of some air pollutants, such as sulphur dioxide, carbon monoxide and benzene have been greatly reduced. This has led to clear improvements in air quality and thus also public health. For other pollutants, the results are less clear.

Despite improvements, the current policy efforts, at EU and national level, have not fully delivered the expected results. Limits and target values of particulate matter, nitrogen dioxide and ground-level ozone are exceeded in many urban areas and global emissions of nitrogen oxides (NO_x) are not decreasing as much as hoped.

Prompt action is essential to further reduce air emissions linked to the most problematic pollutants such as particulate matter, ground-level ozone, and nitrogen dioxide.

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Air Pollution Prevention and Control Action Plan
大气污染防治行动计划

Issued by the State Council on 10th September, 2013
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大气环境保护事关人民群众根本利益，事关经济持续健康发展，事关全面建成小康社会，事关实现中华民族伟大复兴中国梦。当前，我国大气污染形势严峻，以可吸入颗粒物（PM10）、细颗粒物（PM2.5）为特征污染物的区域性大气环境问题日益突出，损害人民群众身体健康，影响社会和谐稳定。随着我国工业化、城镇化的深入推进，能源资源消耗持续增加，大气污染防治压力继续加大。为切实改善空气质量，制定本行动计划。

总体要求：以邓小平理论、“三个代表”重要思想、科学发展观为指导，以保障人民群众身体健康为出发点，大力推进生态文明建设，坚持政府调控与市场调节相结合、全面推进与重点突破相配合、区域协作与属地管理相协调、总量减排与质量改善相同步，形成政府统领、企业施治、市场驱动、公众参与的大气污染防治新机制，实施分区域、分阶段治理，推动产业结构优化、科技创新能力增强、经济增长质量提高，实现环境效益、经济效益与社会效益多赢，为建设美丽中国而奋斗。

奋斗目标：经过五年努力，全国空气质量总体改善，重污染天气较大幅度减少；京津冀、长三角、珠三角等区域空气质量明显好转。力争再用五年或更长时间，逐步消除重污染天气，全国空气质量明显改善。

具体指标：到2017年，全国地级及以上城市可吸入颗粒物浓度比2012年下降10%以上，优良天数逐年提高；京津冀、长三角、珠三角等区域细颗粒物浓度分别下降25%、20%、15%左右，其中北京市细颗粒物年均浓度控制在60微克/立方米左右。

第一条 加大综合治理力度，减少多污染物排放

（一）加强工业企业大气污染综合治理。

（二）深化面源污染治理。

（三）强化移动源污染防治。

The protection of the atmospheric environment is vital for the general welfare of the people and for the sustainable development of the economy. It also enhances the social wellbeing and the rejuvenation of the great Chinese Dream. The issue of air pollution is currently a serious one in China. The problem of regional air quality, characterized by inhalable particulate matter (PM_{10}) and fine particles ($PM_{2.5}$), has come increasingly to the fore, causing damage to the people’s health and impinging on social harmony and stability. With the continuing industrialization and urbanization, energy resource consumption continues to grow, and the pressure on air pollution prevention and control increases as well. The following plan of action has been developed in order to improve air quality in China.

General outline: Taking “The Deng Xiaoping Theory”, “Three Represents” and “Scientific Development Outlook” as our guiding principles, and the protection of people’s health as our fundamental starting point, we will promote the construction of ecological civilization, combine government macro control with market adjustment, intervene in specific areas to achieve overall improvements with targeted breakthroughs; we will coordinate regional cooperation and local administration and aim for total emission reduction control along with air quality improvement. A new air pollution prevention and control mechanism will be established in which government takes the leading role incorporating initiatives by individual businesses, market forces and public participation. The new mechanisms will rely on regional management and stage by stage control, which will promote a process of structural optimization in industry, scientific and technological innovation, and qualified economic growth. The ultimate goal is to achieve environmental, economic and social benefits, and strive to build a beautiful China.

Goal: Over a five year campaign, the overall national air quality will be significantly enhanced. Heavy pollution days will be drastically reduced. Regional air quality in Beijing-Tianjin-Hebei, and the Yangtze and Pearl River deltas will be improved. After another five year campaign or an even longer period if necessary, heavily polluted days will gradually be eliminated and a notable improvement in air quality will be witnessed.

Specific indicators: By 2017, the urban concentration

of Particulate Matter (PM_{10}) should decrease by 10% compared with that of 2012; the annual number of days with fairly good air quality will gradually increase. Concentration of fine particulate matter ($PM_{2.5}$) in Beijing-Tianjin-Hebei, the Yangtze and Pearl River Delta areas will fall respectively by around 25%, 20% and 15%. The annual concentration of fine particulate matter in Beijing will be brought below 60 micrograms per cubic meter.

1. Increased efforts towards comprehensive control and reduced emission of multi-pollutants
(1) Enhanced comprehensive air pollution control on industrial enterprises.
(2) Enhanced area source pollution control. Comprehensively control of urban dust.
(3) Enhanced mobile source pollution prevention and control. Strengthening of urban transportation management.

2. Optimization of the existing industrial structure, promotion of industrial restructuring
(4) Strict controls over new capacity in high energy consuming and high polluting industries.
(5) Accelerated elimination of backward productivity practices.
(6) Reduction of excess capacity.
(7) A firm halt to illegal construction projects particularly in industries with over capacity.

3. Acceleration of technological transformation, improved innovation capability
(8) Strengthening of scientific and technological development and promotion.
(9) Full implementation of clean production.
(10) Vigorous promotion of a circular economy.
(11) Fostering of energy saving and environment-friendly industries.

4. Adjustment of the energy structure and increase of the clean energy supply
(12) Implementation of a coal consumption cap.
(13) Acceleration of clean energy take-up.
(14) Increased clean use of coal.
(15) Improved energy efficiency.

5. Strengthening of environmental thresholds and optimization of industrial layout
(16) Optimization of industrial layout
(17) Enhanced use of environmental protection and energy saving indicators.
(18) Optimization of spatial arrangement.

6. Facilitation of the play of market mechanisms and improvement of environmental economic policies
(19) Enhancement of the play the of market mechanisms.
(20) Improved pricing and tax policy.
(21) Opening up of investment and financing channels.

第二条 调整优化产业结构，推动产业转型升级
（四）严控“两高”行业新增产能。
（五）加快淘汰落后产能。
（六）压缩过剩产能。
（七）坚决停建产能严重过剩行业违规在建项目。

第三条 加快企业技术改造，提高科技创新能力
（八）强化科技研发和推广。
（九）全面推行清洁生产。
（十）大力发展循环经济。
（十一）大力培育节能环保产业。

第四条 加快调整能源结构，增加清洁能源供应
（十二）控制煤炭消费总量。
（十三）加快清洁能源替代利用。
（十四）推进煤炭清洁利用。
（十五）提高能源使用效率。

第五条 严格节能环保准入，优化产业空间布局
（十六）调整产业布局。
（十七）强化节能环保指标约束。
（十八）优化空间格局。

第六条 发挥市场机制作用，完善环境经济政策
（十九）发挥市场机制调节作用。
（二十）完善价格税收政策。
（二十一）拓宽投融资渠道。

第七条 健全法律法规体系，严格依法监督管理
（二十二）完善法律法规标准。
（二十三）提高环境监管能力。
（二十四）加大环保执法力度。
（二十五）实行环境信息公开。

第八条 建立区域协作机制，统筹区域环境治理
（二十六）建立区域协作机制。
（二十七）分解目标任务。
（二十八）实行严格责任追究。

第九条 建立监测预警应急体系，妥善应对重污染天气
（二十九）建立监测预警体系。
（三十）制定完善应急预案。
（三十一）及时采取应急措施。

7. Improvements to law and regulation systems. Continued legally based supervision and management
(22) Improvements to the law, regulation and standards framework.
(23) Improved environmental regulation capacity.
(24) Strengthened environmental protection law enforcement.
(25) Implementation of environmental information disclosure.

8. Establishment of regional coordination mechanisms and integration of regional environmental management
(26) Regional coordination mechanisms
(27)Allocation of goals and tasks.
(28)Strict accountability.

9. Establishment of monitoring and early warning system. Coping with pollution episodes
(29) Establishment of monitoring and early warning system.
(30) Emergency planning.
(31) Putting emergency measures in place promptly

10. Clarification of the concrete responsibilities of the government, businesses and public individuals. Motivatation of the public to participate in environmental protection
(32) Clear definition of the responsibilities of local governments.
(33) Strengthening interdepartmental coordination.
(34) Strengthening the contribution of businesses.
(35) Motivation of public participation.

Our country is still at the Primary Development Stage of Socialism. The task of preventing and controlling air pollution is a demanding one. We need to act with the encourage to bring the pollution under control by taking integrated measures, focusing on priorities and pushing forward the Action Plan progressively. We need to emphasize enforcement and concrete results. Each region, department and enterprise must follow the requirements of the Action Plan and fully implement the control measures while taking into consideration of local features so that the air quality targets are well achieved.

第十条 明确政府企业和社会的责任，动员全民参与环境保护
（三十二）明确地方政府统领责任。
（三十三）加强部门协调联动。
（三十五）广泛动员社会参与。

我国仍然处于社会主义初级阶段，大气污染防治任务繁重艰巨，要坚定信心、综合治理，突出重点、逐步推进，重在落实、务求实效。各地区、各有关部门和企业要按照本行动计划的要求，紧密结合实际，狠抓贯彻落实，确保空气质量改善目标如期实现。

Implementing Grid Management and Accelerating Fresh Air Action

实施网格化管理，全面推进清新空气行动

Tianjin Environmental Protection Bureau
天津市环境保护局

After a comprehensive campaign, air environment quality in Tianjin has improved year on year and the degree of public satisfaction with the process has increased accordingly. None the less, problems still persist with air pollution control in Tianjin: Firstly, the fundamental air environment quality is still far from being satisfactory at the present time, and efforts need to be redoubled to bring about quality improvement through the joint efforts of the government and the public; secondly, although people's awareness of and demand for air environment quality is rising, some people's working and living habits are still relatively wasteful and there is a need to specifically foster awareness of the urgency of air environment protection, to bring working and living practices into harmony with each other and with nature, and to encourage more active involvement in safeguarding the air environment.
To further stimulate public enthusiasm for participating in air pollution control, to mobilise greater numbers to join together in protecting the air environment and to lead people towards understanding and practising behaviour patterns conducive to air environment protection, Tianjin decided to implement an air pollution control grid management scheme, government-led but requiring wide public participation, to jointly achieve a comprehensive air pollution control system and strive together to improve air environment quality.
Grid management entails decisive government leadership and believing, motivating and relying on the capacity of the public to play their part in carrying out air pollution prevention work and work towards improving the air quality of their environment.
To bolster the air pollution prevention campaign in Tianjin, the administration has launched, from March 1, 2014, an air pollution prevention grid management scheme throughout the city which consists mainly in taking the following actions:

1. Improving the urban management grid and clarifying management roles and requirements

In accordance with the principles encapsulated in "management without dead angles, supervision without blind areas and monitoring without blank spaces", Tianjin is actively pursuing grid establishment and perfection goals. It has clarified the standards expected of grid

经过全面的努力，天津的大气环境质量逐年得到改善，公众的满意度不断提高，同时，天津大气污染防治工作依然存在以下问题：第一，目前，大气环境质量尚没有得到根本改善，还需要进一步加强工作力度，通过政府与公众的共同努力，不断改善大气环境质量；第二，虽然公众对大气环境质量的认识和要求越来越高，但是一部分公众的生产、生活行为还比较粗放，需要更加自觉地树立保护大气环境质量的意识，按照人与自然和谐的方式生产和生活，为保护大气环境做出积极的贡献。
为了进一步激发公众参与大气污染防治的热情，发动更多的公众共同保护大气环境，引导公众了解和实践保护大气环境的行为方式，天津市决定实施由公众广泛参与的大气污染防治网格化管理模式，由政府主导、公众参与，共同做好大气污染防治工作，努力改善大气环境质量。网格化管理的特点是以政府为主导，相信公众、发动公众、依靠公众，共同开展大气污染防治工作，改善环境空气质量。
为此，为深化天津市大气污染防治工作，从2014年3月1日开始，天津市在全市范围内启动实施了大气污染防治网格化管理。主要采取的做法如下：

一、完善城市管理网格，明确管理内容标准

按照“管理无死角，监察无盲区，监测无空白”的要求，天津市积极做好网格建立和完善工作，并明确了网格管理内容标准，初步形成了全市大气污染防治网格化管理框架。针对已有的“网格化”城市管理系统对建成区的管理比较完善，对农村地区的管理相对薄弱的实际情况，按照“统一平台，统一标准，统一监管”的思路，在城管委数字化城管的基础上，积极将网格建设拓展到农村地区，系统构建市大气污染防治网格化管理平台。

management and begun by forming an air pollution prevention grid management framework for the whole city. As the “gridding” management system is already adequate in urban areas and management in rural areas is relatively weak, Tianjin is actively expanding grid construction to the rural area based on the digital urban management model of the urban management committee with the slogan “unified platforms, standards and supervision” and is systematically constructing a comprehensive urban air pollution prevention grid management platform.

The regional administrations attach a high importance to this initiative, mobilising the whole city, actively striving to overcome local difficulties and organizing professional staff to work overtime to continue to expand and improve the urban grid supervision system, delimit rural grids with individual villages as the administrative unit, and advancing the air pollution prevention precision management model of “a map (grid division map), a network (grid management network) and a set of standards (working procedures)” for the whole city.

Under the scheme Tianjin has prioritised 8 air pollution prevention targets and has further clarified the action contents and standards of 25 indicators based on 17 air pollution prevention event indices that have been identified within the “gridding” urban management system, after a workable framework had been established for implementing air pollution prevention grid management.

2. Dedication to accomplishing the six basic tasks and building the grid management system

On February 22, 2014, the second meeting of the “Beautiful Tianjin No.1 Project” steering group examined and approved the air pollution prevention grid management work program. It further refined grid management aims according to the Tianjin administration’s related requirement of “clear boundaries, clear tasks and clear responsibilites”, defining and prioritising six basic tasks aimed at providing a guarantee for the implementation of a rationalised air pollution management.

Clarify the boundary and delimit the area. Tianjin is outlining and delimiting an air pollution prevention management grid according to established territorial management principles, with districts, counties, streets, towns and communities (villages) as the units and defining the supervision areas. At present, the 16 districts and counties of the city together with the Haihe Education Park area have been delimited with 33 first-level grids, 200 second-level grids, 2,041 third-level grids and 5,718 fourth-level grids, basically achieving complete coverage of the jurisdictional area and a no-dead-angle air pollution prevention map.

Define powers and allocate personnel. Appoint the district party secretary and district county magistrate as the first-level grid head, the district county vice leader as the second-level grid head, the street responsible person as the third-level grid head and the community resident committee and villager committee responsible person as the fourth-level grid head, based on the defined grid areas. Meanwhile, allocation and replenishment work by grid members at different levels should be properly executed and the basic-level gridding should be allocated according to the management model of “one head and three staff members” (grid head, information officer, environmental protection officer and law enforcement officer).

Implement labour division and allocate responsibilities. The first-level grid is mainly responsible for work supervision, driving forward problem tackling and researching and solving major difficulties. The second-level grid is responsible for researching and improving practical measures and helping solve important and difficult problems. The third-level grid is responsible for helping coordinate and carry out grid management work and being up-to-date on the work progress situation at any point in time. The fourth-level grid is responsible for walk-around inspection, notification and dissuasion, feedback and reports, coordination and handling, and tracking and implementing the air pollution prevention work within the grid.

Intensify requirements and set standards. Targeting key emission sources including coal fire pollution, dust and non-point source pollution, motor vehicle pollution and industrial pollution, Tianjin Fresh Air Action Sub-Command has confirmed the 25 tasks of air pollution prevention grid management and refined working standards, which provided criteria for basic-level grid management and bases for superior grid organization inspection.

Standardize disposal and establish procedures. Applying principles of unified government leadership, departmental division of labour responsibility, one platform (system) basis and classified problem elimination, the district administrations will combine with operators on the ground to set up grid management procedures. It is required that once the problems of the basic-level grid are identified, if the problems can be resolved by the parties concerned themselves, they should resolve them immediately to the best of their abilities. If they are unable to solve them, they should report to the urban management platform promptly to seek further solutions. The urban management platform conducts centralized resolution according to a unified classification system of problem types, and operational departments like environmental protection, urban management, public security, construction management and civil administration should intervene promptly and feed results back to the command centre.

Apportion responsibility strictly and assess degrees of infringement. With each level required to supervise its subordinate level and all levels stressing

在全市统一部署下，各区县政府高度重视，积极克服困难，组织专门人员加班加点工作，不断建立完善全市网格化监管体系，对农村地区以行政村为单位划定监管网格。努力在全市域推进“一张图（网格划分图）、一张网（网格管理网）、一套标准（工作标准流程）”的大气污染防治精细化管理模式。

根据大气污染防治网格管理的要求，在“网格化”城市管理系统已明确的17项大气污染防治事件指标基础上，增加8项大气污染防治事项，进一步明确了25项指标的工作内容和标准，为实施大气污染防治网格化管理奠定了基础。

二、狠抓六项基础工作，构建网格管理体系

2014年2月22日，“美丽天津·一号工程”领导小组第二次会议审定了大气污染防治网格化管理工作方案。按照天津市有关领导“边界清、任务清、责任清”的要求，进一步细化网格管理有关内容，重点完善了六项基础工作，为实现大气污染防治精细化管理提供了保障。

（一）明确边界定区域。按照属地管理原则，天津市以区县、街道、乡镇、社区（村）为单位，分级划定大气污染防治管理网格，明确监管区域。目前，全市16个区县加上海河教育园区已经划定一级网格33个，二级网格200个，三级网格2041个，四级网格5718个。基本实现了管辖区域全覆盖，大气污染防治无死角。

（二）充实力量定人员。在定区域、划网格的基础上，确定区县委书记和区县长任一级网格长，区县副职领导责任人，任二级网格长，街镇负责人任三级网格长，社区居委会和村民委员会负责人任四级网格长。同时，做好各级网格员的配备充实工作，要求基层网格按照“一长三员”管理模式配备（网格长，配齐信息员、环保员、执法队员）。

（三）落实分工定职责。一级网格主要负责工作督察、推动问题整改、研究解决突出问题；二级网格负责研究完善工作措施，帮助解决重点难点问题；三级网格负责帮助协调开展网格管理工作，及时掌握工作进展情况；四级网格负责巡视检查、告知劝阻、反馈上报、配合处理、跟踪落实所在网格大气污染防治工作。

（四）强化要求定标准。天津市清新空气行动分指挥部围绕燃煤污染、扬尘及面源污染、机动车污染、工业污染等重点排放源，确定了大气污染防治网格化管理的25项任务，细化了工作标准，为基层网格管理提供了准则，也为上级网格组织检查提供了依据。

（五）规范处置定流程。各区县结合实际，按照政府统一领导、部门分工负责，基于一个平台（系统）、分类处置问题的原则，制定了网格管理流程。要求基层网格一旦发现问题，如能自行解决应尽量自行立即解决，如不能自行解决应及时向城管平台上报请求解决。城管平台按问题类别统一派遣、归口处置，环保、城管、公安、建设管理、民政等职能部门按照“网格化”城管指挥中心的派遣，及时处置，并将结果反馈指挥中心。

（六）严格追责定考核。按照一级抓一级、层层抓落实的要求，天津市将对区县政府（教育园）、市级责任部门和市管国有重点排污企业大气污染防治工作进行量化考核，区县各级政府也要组织开展对下一级网格的考核问责工作，进一步细化完善本地区《网格员监督考核办法》，做到量化考评、奖惩分明。

三、狠抓“五控”任务落实，加强全市网格监管

实行大气污染防治网格化管理，目的是管好管住各类大气污染排放源；重点是监管落实好清新空气行动确定的控煤、控车、控尘、控污、控新建项目的“五控”任务；手段是分级落实，发挥好一、二级网格长、网格员（部门负责同志）组织协调、指挥调度的作用，同时也发挥好三、四级网格长、网格员在基层一线及时发现问题、处置问题的作用。

（一）对燃煤污染的监管。要求网格员开展“三项检查”，一是要检查网格内是否存在未入驻煤炭集中交易市场的煤炭经营企业；二是要检查网格内是否存在煤炭运输、装卸、储存、加工等环节环保措施不落实的现象，特别是要及时发现并制止露天煤场不苫盖、不喷淋行为发生；三是要检查网格内企业炉前煤煤质的检验报告文件，核查是否存在炉前煤煤质超标的情况。

（二）对机动车污染的监管。要求网格员重点关注“三类问题”，一是要及时发现网格内车场（站）进出的机动车、施工工地作业机械和农用机械

的“冒黑烟”污染；二是要及时发现网格内居民小区长期废弃的黄标车；三是要通过现场巡查，及时发现网格内加油站未安装油气回收治理装置的问题。

（三）对扬尘污染的监管。要求网格员开展“三项监督”，一是开展对各类施工工地扬尘污染的监督，要巡查网格内施工工地扬尘污染治理情况，对土石方作业不落实抑尘措施的、料堆渣堆不加苫盖措施的要进行劝阻，劝阻无效的要及时向辖区监督指挥平台报告，交由职能部门处理；二是开展对渣土运输及道路遗撒的监督，及时发现并报告渣土运输不密闭、车辆驶出工地不清洗的行为；三是开展对面源污染的监督，及时发现烧秸秆、烧垃圾、烧树叶，以及垃圾裸露、道路不洁、露天烧烤等面源污染。

（四）对工业污染的监管。要求网格员了解掌握“三种情况”，一是要了解掌握网格内企业污染物排放情况，对“冒黑烟”、“异味影响”等直观问题要立即上报；二是要了解掌握网格内企业是否存在偷排偷放，发现可疑现象要及时上报；三是要了解掌握网格内企业环保设施运行情况，通过现场了解或查看运行记录获取相关信息。

（五）对新建项目的监管。要求网格员做到“三及时”，一是要及时了解网格内新建项目情况；二是要及时发现网格内是否存在“未批先建”、“未验先投”、“批建不符”等情况；三是要及时上报发现的问题，并跟踪处置结果。

四、狠抓考核问责，确保网格化管理取得实效

为确保大气污染防治网格化管理落到实处，天津市市委组织部、市监察局、市清新空气行动分指挥部共同制定了《天津市清新空气行动督查考核和责任追究工作方案（试行）》，各区县政府也分别制定了《网格员监督考核办法》，将通过“分级考评、分类考评、分项定量考评”的形式，对工作表现突出的进行表彰奖励，对工作不到位的进行批评问责，实现闭路循环，确保大气污染防治网格化管理取得实效。

（一）分级考评。全市将由组织、监察等部门组成专门队伍，组织开展检查考核，实行月检查、季度督查和年度考核，对区县清新空气行动实施情况和一级网格进行考评，依据考核结果实施责任追究。同时，区县政府依照《网格员监督考核

implementation, Tianjin will conduct quantitative assessments of the air pollution prevention work of district county administrations, educational parks, responsible municipal departments and municipal state-owned key pollution discharge enterprises. District county governments at all levels should also organize and carry out assessments of work at the inferior-level grid and further fine tune the “Gridding Personnel Supervision and Evaluation Method”, which should be quantitative in assessment methodology and clear as to rewards and punishment.

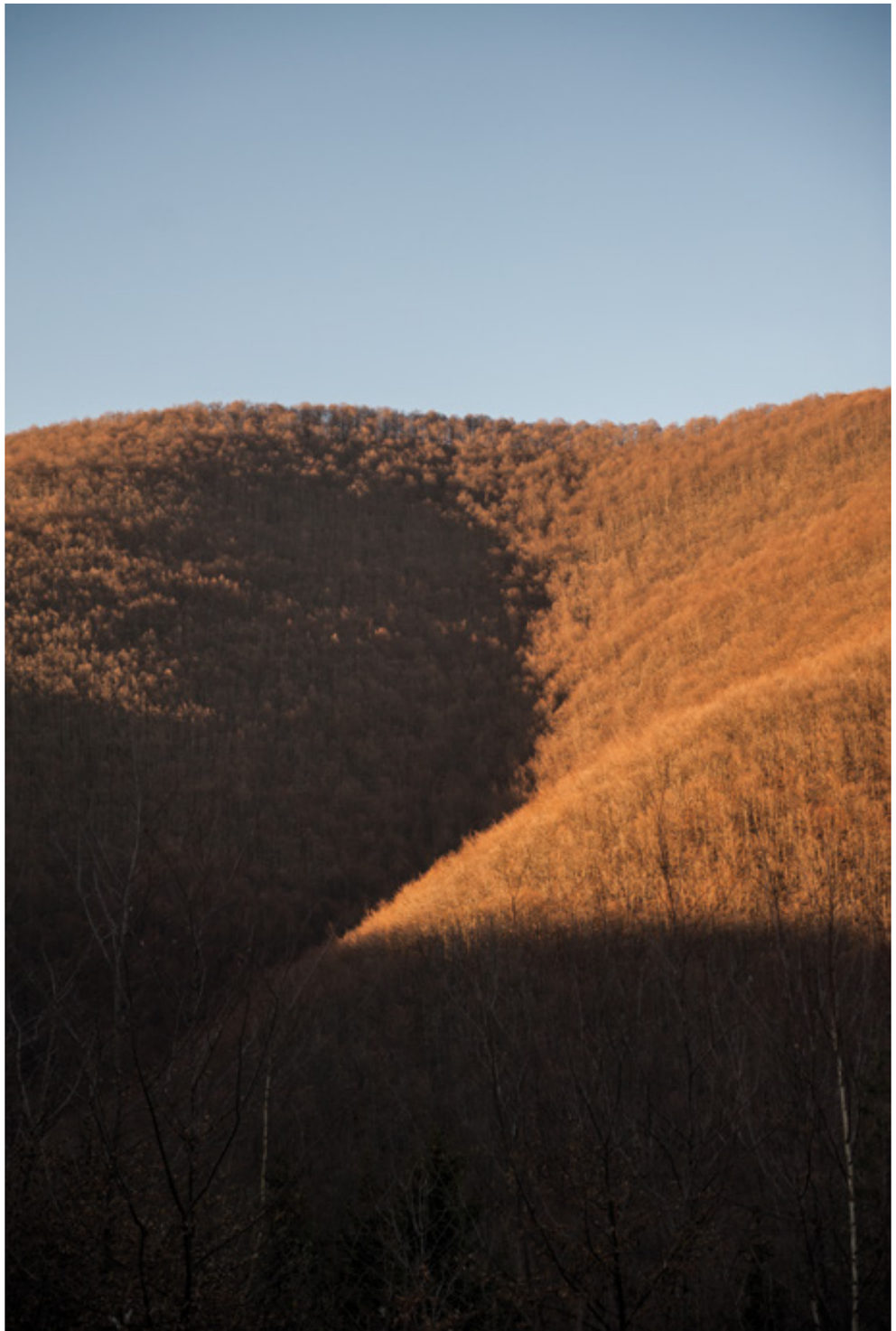
3. Attach a high priority to the task of implementing the “five controls” and strengthen grid supervision in the whole city.

The purpose of implementing air pollution prevention grid management is to bring under control the various air pollution discharge sources. The key is close supervision and implementation of the “five-control” schedule laid down under the fresh air action plan, namely controlling coal, vehicles, dust, pollution and new projects. In practice this entails grading implementation and seeing that first-level and second-level grid heads and personnel (departmentally responsible persons) play their parts in organization, coordination, command and dispatch and that the third-level and fourth level grid heads and personnel also properly perform their functions in discovering and handling problems at the front line.

(1) Regulate coal burning pollution. The grid personnel are required to carry out a “three-item examination”. First, check whether there are trading enterprises not entered in the coal centralized trading market in the grid; secondly, check whether environmental protection measures are being implemented in the transportation, loading and unloading, storage and processing of coal in the grid, specifically monitoring the practice of not covering and spraying the open coal yard in a timely fashion; thirdly, check the test report documentation regarding the quality of the feed coal of enterprises in the grid and determine whether the quality of the feed coal meets standards.

(2) Regulate motor vehicle pollution. The grid personnel are required to pay close attention to three kinds of problems. Firstly, to promptly detect the “black smoke” pollution of motor vehicles, construction site working machinery and agricultural machinery entering and leaving parking lots (stations) in the grid. Secondly, to promptly identify yellow-label vehicles that have been abandoned for a long time in the residential quarters in the grid. Thirdly, to identify problem gas stations in the grid that have not installed oil vapour recovery and control devices.

(3) Regulate dust pollution. The grid personnel are required to carry out “three-item supervision”. Firstly, to monitor dust pollution in construction sites of various kinds, inspect dust pollution regulation in the



construction sites in the grid, and discourage earthwork operations not implementing dust suppression measures and with materials and slag heaps not covered with straw mats. Those that are in contravention should be reported to the supervision command platform in the administration area promptly and be dealt with by the relevant operational departments. Secondly, to supervise waste transportation and road littering and promptly discover and report the incidence of non-enclosed muck transportation and non-cleaned vehicles pulling out of construction sites. Thirdly, to supervise non-point source pollution and promptly pinpoint such infractions as burning straws, garbage and leaves as well as uncovered garbage, dirty roads and open-air barbecues.
(4) Regulate industrial pollution. The grid personnel are required to be alert to three situations. First, to understand and monitor the pollutant discharge situation of businesses within the grid and immediately report obvious problems such as black smoke and abnormal smells. Second, to discover whether any enterprises in the grid may be emitting secret discharges and report suspects promptly. Third, to understand the environmental protection facilities of the businesses in the grid and obtain further relevant information by checking operation records.
(5) Regulate new projects. The grid personnel are required to be on the ball. First, they must be aware of the overall new project situation in the grid. Second, they must speedily discover where unapproved construction situations may exist, also unexamined initiatives and constructions inconsistent with the approval given. Third, they must quickly report any problems discovered and monitor the handling of the result.

4. Lay special emphasis on assessment and accountability to ensure the positive outcome of grid management

To ensure the implementation of air pollution prevention grid management, Tianjin Municipal Party Committee Organization Department, the municipal supervisory bureau and the municipal fresh air action sub-command jointly formulated the Tianjin Fresh Air Action Supervision and Responsibility Investigation Program (trial) under which the district administrations established Grid Personnel Supervision and Assessment Methods. Through a system of "grading assessments, classified assessments and itemized quantitative assessments", those showing outstanding task performance will be commended and rewarded and those who have failed to complete the required work will be criticized and shamed, with a view to realizing a self-regulating closed cycle and ensuring concrete outcomes from the air pollution prevention grid management project.
(1) Grading assessment. Responsible parties such as organization and supervisory departments will appoint special teams to organize and carry out inspection assessments, implement monthly examinations, quarterly supervisions and annual assessments, check and evaluate fresh air action project implementation by first-level grid district counties and initiate a responsibility investigation according to the assessment results. Meanwhile, the district county administrations will in their turn carry out step-by-step assessments according to "Grid Personnel Supervision and Assessment Methods" and apportion cash rewards or sanctions according to the assessment result.
(2) Classified assessment. Municipal-level assessment officers will carry out classified assessments of district county governments, responsible municipal departments and key local state-owned pollution discharge enterprises. The key indicators for district county government assessments are air improvement performance, overall management performance and air pollution prevention task implementation. The key indicators for the responsible municipal department assessments are again overall management performance and air pollution prevention task implementation. Finally the key indicators for the assessment of local state-owned pollution discharge enterprises are overall management performance and engineering task implementation. District counties should conduct classified assessments of the management grid and basic-level grid and here the key indicators for management grid assessment are work organization, implementation promotion, public and private investigation, etc. The key factors in basic-level grid assessment are work task completion, troubleshooting and reporting, disposal tracking, etc.
(3) Itemized quantitative assessment. The municipal assessment work program has listed 25 assessment indices for the district county governments and 20 assessment indices for responsible municipal departments and key municipal state-owned pollution discharge enterprises respectively, clarified corresponding specific scores and implemented itemized quantitative assessment. Contents such as assessment items, assessment standards, result assessment methods and rewards, detailed accountability rules and regulations should be clearly stated in the district county assessment plan, with a view to realizing a quantitative, detailed and practical assessment through quantitative assessment procedures.

5. Strengthening mobilization inspection and conscientiously overseeing the implementation of various tasks

To fully implement the air pollution prevention grid management work, Tianjin held an air pollution prevention grid management project video and telephone conference on March 13, 2014, to spur task mobilization in the launch and implementation of the air pollution prevention grid management plan over the whole city. It clarified the significance of, and the work involved in, implementing air pollution prevention grid management in the city and put forward specific job requirements for completing the grid management work.
Following the fifth headquarters meeting of the "Beautiful Tianjin No.1 Project", 16 inspection teams were formed from June 3, 2014 to carry out half-monthly special inspections in the whole city to monitor department regulatory responsibility, district county territory management responsibility and enterprise pollution control entity responsibility. Units and leaders failing to fulfil their responsibilities will be called to account.
The inspection teams will conduct a thorough inspection, examining reports, checking files, conducting interviews, making field surveys, conducting secret investigations and identifying problems. They must be impartial and incorruptible and completely eliminate relationship and face-saving inspections, focus on checking whether district counties and related departments are fulfilling their responsibilities in pollution prevention and identifying the underlying causes of pollution problems. For operational government departments lacking supervision and failing to fulfil their responsibilities, the responsibilities of the relevant units and personnel should be pursued strictly with the goals of promoting fresh air action and a clean fresh water supply and of achieving new breakthroughs.

办法》，逐级开展考评，并根据考核结果兑现奖惩。
（二）分类考评。市级考核将分别对区县政府、市级责任部门和市管国有重点排污企业进行分类考评。对区县政府考核的重点是空气改善绩效、综合管理水平、大气污染防治任务落实三个方面；对市级责任部门考核的重点是综合管理水平和大气污染防治任务落实两个方面；对市管国有重点排污企业考核的重点是综合管理水平和工程任务落实情况两个方面。区县也要对管理网格和基层网格进行分类考评，对管理网格考核的重点是工作组织、推动落实、明查暗访等方面；对基层网格考核的重点是工作任务完成情况、排查上报情况和跟踪处置情况等方面。
（三）分项考评。市考核工作方案已对区县政府列出了25个考核项，对市级责任部门和市管国有重点排污企业分别列出了20个考核项，并明确了相应的具体分值，实行分项量化考核。区县考核办法也要对考核项目、考核标准、结果评定方法、奖励问责细则等内容进行明确，通过定量考评，实现考核的量化、细化和实效化。

五、加强动员检查，认真推动各项工作落实

为全面实施大气污染防治网格化管理工作，2014年3月13日，天津市召开大气污染防治网格化管理工作电视电话会议，对在全市启动实施大气污染防治网格化管理工作进行了专题动员，明确了在全市实施大气污染防治网格化管理的意义和任务，对做好网格化管理工作提出了具体工作要求。
按照"美丽天津·一号工程"指挥部第五次会议部署，为推动落实部门监管责任、区县属地管理责任和企业治污主体责任，从2014年6月3日起，组成16个检查组，在全市开展为期半个月的专项检查，对责任不落实的单位和领导，将进行问责和追究。各检查组通过看报告、查底档、多谈话、下现场、勤暗访、找问题六个环节入手做好检查工作，做到铁面无私，杜绝人情检查、面子检查。重点检查各区县、各有关部门污染防治履职履责是否到位，找出导致污染问题的深层原因。对于政府职能部门监管缺失、履职不到位的问题，要严肃追究有关单位和责任人员的责任，促进清新空气行动和清水河道行动取得新突破。

Air Pollution and Traffic: Black Carbon Monitoring in Milan
空气污染与交通：米兰黑炭监测

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Introduction

Air quality is the most serious single environmental and health problem for Milan, a city located in the Po Valley in Italy, one of the main polluted EU areas. Although the heaviest pollutant concentrations have decreased during the last decade, every year a great number of EU Directive threshold exceedance episodes for PM_{10}, NO_2 and O_3 still occur, implying important health risks for the population (WHO, 2013).

Road traffic within the city is the main contributor to the emission of several airborne health hazardous compounds. As a result a variety of traffic limitation measures have been implemented in recent years to improve air quality in the city center. However, evidence of a reduction in PM and other pollutants has been as yet scanty.

By January 16th 2012 Milan Municipality had put in place a new private traffic restriction scheme called "Area C", which prohibits the circulation in the city center of diesel cars classified Euro 0, 1, 2, and 3, while a ticket is required for Euro 4-6, and for gasoline powered cars Euro 1-6. Only electric, hybrid, LPG and methane powered vehicles are allowed to enter Area C without charge. Area C ("*C*" stands for *Congestion Charge*) operates Monday to Saturday (excluding public holidays) from 07:30 am to 07:30 pm. This Low Emission Zone (LEZ) was introduced in accordance with the results of a public referendum indicating that the vast majority (79%) of Milan's citizens wanted to boost public transport and limit traffic-related pollution. Furthermore inside LEZ Area C access is also forbidden to heavy duty vehicles longer than 7.5 metres.

During the experimental phase of LEZ Area C implementation (2012) the Milan Municipality carried out an air quality monitoring project based on Black Carbon (BC) measurements. BC is considered a valuable additional air quality measurement tool for evaluating the health risks of primary combustion particles from traffic, including organics, not fully taken into account by $PM_{2.5}$ mass (WHO, 2012; UNECE-CLRTAP, 2012; US-EPA, 2011; HEI, 2010).

In fact Black Carbon, a proportion of primary PM consisting mainly of elemental carbon and a major component of *soot* - already well known as an important climate forcing agent - is harmful to the health both for its physical nature of nanoparticle and for the fact that its microporosity resulting in an elevated specific surface

引言

对于坐落于峡谷地带的城市米兰来说，其所面临的最严重、对健康产生危害最大的环境问题是空气污染。这个地区也是欧盟污染最为严重的区域。尽管在过去几十年里，空气污染物浓度持续下降，但PM10、二氧化氮、臭氧浓度超过欧盟标准的情况时有发生，对人体健康造成威胁（世界卫生组织，2013）。

道路交通是对人体健康造成危害的空气污染主要排放源。为此，近年来在城市中心地带采取了一系列交通管制措施以改善空气质量。然而，到目前为止尚未产生颗粒物（PM）和其他污染物下降的结果。

自2012年1月16日米兰市政府对私家车采取了进一步控制措施，简称“C区”计划：即，禁止欧I、欧 II和欧III柴油车进入城市中心区，欧IV-VI柴油车和欧I-VI汽油车得缴费才能进入。只有电动汽车、混合燃料车、液化气车和甲烷动力车才允许免费进入C区。C区(这里C代表拥堵费)的交通控制规定自周一至周六、每天早晨07:30至晚上07:30实施。低排放区概念是根据当地居民投票的结果才引入的，米兰绝大多数（79%）市民希望通过这项措施推动公共交通发展，降低由于交通而产生的污染排放。此外，不允许长度超过7.5米的重型卡车进入低排放区C区内。

在低排放区C区计划执行过程中（2012年），米兰市政府启动了空气中黑炭（BC）监测项目。通过对黑炭进行监测，可以评估来自于交通排放的主要污染物对健康所造成的危害，包括未被PM2.5全部聚合的有机污染物（世界卫生组织2012, 联合国欧洲经济委员会-《空气污染物长距离迁移公约》，2012; 美国环保局 2011; HEI, 2010）。

事实上，黑碳是一种主要由元素碳和烟尘结合而形成的颗粒物。众所周知黑炭是导致气候变化的一

area enables it to introduce into the human organism toxic and carcinogenic substances, such as polycyclic aromatic hydrocarbons (PAH) or metals (WHO, 2012). Thus BC is a perfect tracer of "TRP-Traffic Related Pollutants' whose health risks to citizens are additional to those deriving from "regional pollutants", or more homogeneously distributed in space, characterized by an important secondary fraction linked to atmosphere reactive conditions - such as PM_{10}, $PM_{2.5}$, NO_2, O_3 - which constitute the background exposure.
The aims of the Black Carbon monitoring Project in Milan were to evaluate BC, PM_{10} and $PM_{2.5}$ concentration inside and outside LEZ Area C in different traffic-proximity exposure conditions and to assess the effectiveness of Black Carbon as a new indicator for the environmental and health effects of traffic generated nanoparticles in the context of "local" circulation restriction measures in Milan.
The project was developed for the City of Milan by AMAT (City of Milan Mobility Environment and Land Agency) in collaboration with LARS, the Environmental Research Laboratory of SIMG (Italian Society of General Medical Practitioners). In the monitoring Protocol and the validation of final results experts from the University of Southern California, Los Angeles and from Cornell University, Ithaca, NY have been involved.

Material and methods

Black carbon, PM_{10} and $PM_{2.5}$ real-time measurements were taken contemporaneously inside and outside LEZ Area C, in four different seasons for several weeks, both at residential and kerbside pairs of "fixed sites", in order to represent the different kinds of traffic-proximity exposure for the resident population and for city users. In addition, a study was carried out of "personal exposure" to traffic proximity in LEZ Area C and in pedestrian areas.
BC concentrations were measured with Aethalometers (Magee, USA) and PM with Aerocets (MetOne, USA).
In the two sites, pairs of identical instruments were used, each aligned and calibrated with a reference instrument; at the end of the measurements a data processing system was adopted for compensation and validation of the measured data.
Traffic flow volumes, hourly patterns and composition were obtained by mean of inductive loop detectors and real-time video camera techniques; meteorological data and other TRP concentrations (e.g. NO_2, NO, CO) were processed with reference to the Regional Air quality and Meteorological network dataset.

Results and discussion

At kerbside sites in May, during working days with LEZ Area C operative, the 24h mean BC concentrations were -40% inside LEZ as compared to the outside area.
In September (Figure 1), at the same sites, during working days with LEZ in force, the 24h mean BC concentrations were -52% inside LEZ as compared to the outside area indicating an absolute mean difference of 3.5 µg/m^3. BC/PM_{10} and BC/$PM_{2.5}$ ratios were 50% and 60% lower inside LEZ during both the two campaigns.
At third floor residential sites, in February - with domestic heating turned on and at maximum power - the 24h mean BC concentrations reached an absolute difference of 2.2 µg/m^3 or -28% in the LEZ. BC/PM_{10} and BC/$PM_{2.5}$ ratios were 32% and 25% lower inside LEZ.
At the same sites, in October, a one-month sampling campaign was carried out over the period straddling the turning on of residential heating power plants. Referring to the first week, characterized by more stable meteorological conditions and the heating plants turned off the 24h mean BC concentrations were -32% inside the LEZ. The BC percentage difference between in and outside LEZ decreased by about 50% with domestic heating turned on (-12% *vs.* -33% on average or -24% *vs.* -52% on single days), during the last week of October, characterized by comparable meteorological conditions.
No statistically significant changes were found in PM_{10} and $PM_{2.5}$ concentrations between the inside and the outside sites for any of the sampling campaigns carried out.
The results obtained in this study (Figure 2) are in agreement with literature for similar sites in other cities: Berlin (Brukmann and Lutz, 2011), London (TfL, 2010), Barcelona (Reche *et al.*, 2011), Munich (Qadir *et al.*, 2013) and a previous kerbside summer study of the same area (Invernizzi *et al.*, 2011).
At kerbside, during the "Pedestrian Sundays" (or "Car-free Days") initiative Black Carbon mean concentrations of the two sites were measured at 78% lower (May 27th, 2012) or 75% lower (September 16th, 2012) compared to the nearest Sundays without traffic restrictions, despite also the less dispersive meteorological conditions.
These results are in a perfect agreement with traffic measurements which reported a 72% reduction in relation to a typical Sunday circulation.
At residential sites during the autumn campaign, corresponding with a temporary suspension of the LEZ Area C measure due to a public transport strike (October 2nd, 2012), an increase in Black Carbon concentrations was registered, ranging from 90% to 150% both inside and outside the LEZ Area C compared to measurements on the preceding and following days. The traditional TRP measured by the institutional air quality monitoring network (PM_{10}, $PM_{2.5}$, NO_2, CO) varied to a lesser extent on the same days. Considering the toxicity associated with this indicator (Janssen *et al.*, 2011) a possible increase in health risk could be expected during those days.
"Pedestrian personal exposure" was measured by persons carrying portable samplers and strolling outside/inside the Area C along one of the main access axes to the city center. In comparison to the outside Area, measurements of the pedestrian exposure inside LEZ Area C showed on average the following values: Black Carbon up to -43% inside LEZ Area C, up to -59%

个重要物质，它对人体健康造成危害不仅由于其是纳米级的细微颗粒，而且由于其多孔特性造成较高的比表面积，把多环芳香烃（PAH）或金属等有毒和致癌物质带入到人体内（WHO，2012）。从这个意义上讲，黑炭是一种理想的、“与交通有关的污染物（TRP）的指示物，可以用它来评估对人体健康带来的风险；与区域污染物不同，如PM10, PM2.5, NO2, O3 等在大气中平均分布，是一种二次污染，与大气反应条件密切相关。
米兰黑炭监测项目旨在监测低排放区C区内和C区外在不同交通条件下大气中黑炭、PM10 和PM2.5 的浓度；评价在局地采取管控措施后，黑炭作为交通领域产生纳米级污染物指示物的有效性。
该项目获得米兰市运输、环境和国土局（AMAT）批准，与意大利医学工作者协会环境研究实验室共同合作开展。根据监测导则，数据最终评价由来自南加州大学、洛杉矶和康奈尔大学的教授们来完成。

材料与方法

在低排放区C区内和C区外，对黑炭、PM10 和PM2.5进行了四个不同季节、长达几周的同步实时监测。监测点设在居民区和道路两旁，以便详细了解住宅区居民和城市使用者的暴露环境污染物浓度。此外，还对低排放区C区和步行区人员暴露进行了研究。
用Aethalometers (Magee, USA) 对黑碳浓度进行监测，用 Aerocets (MetOne, USA)对PM10进行监测。在两个地点，使用相同的一对仪器进行监测；每个仪器都与参考校准仪器进行了校准调试，在监测结束后，运用数据处理系统进行数据修正和验证。
通过感应线圈检测器和视频技术监测得到每小时交通流量和道路交通方面的数据；气象数据和其他与交通有关的污染物（TRP）（例如，二氧化氮、氮氧化物、一氧化碳）浓度数据则用区域空气质量和气象网数据库进行处理。

结论和讨论

在5月份道路两旁，在实施低排放区计划的工作日里，低排放区内与区外相比，24小时平均黑炭浓度为-40%； 在9月份实施低排放区计划的工作日里在同一地点进行监测，结果发现低排放区内与区外24小时平均黑炭浓度为-52%，绝对平均差为3.5 mg/m3。黑炭/PM10与黑炭/PM2.5之比在区域内的两次监测中分别降低了50%和 60%。
在2月份一座三层住宅楼监测的结果为：当室内取暖打开并且开到最大功率时，24小时平均黑炭浓度绝对平均差为2.2 mg/m3，或者在低排放区为-28%。低排放区内BC/PM10 与BC/PM2.5 之比率分别降低了32% 和25%。在同一地点在10月份进行了为期一个月的采样， 正好是供热电厂为居民开始供电的时间段。10月份最后一周气象条件平稳，具有可比性。
本研究结果（图2）与柏林 (Brukmann and Lutz, 2011)、伦敦 (TfL, 2010)、巴塞罗那(Reche et al., 2011)和慕尼黑 (Qadir et al., 2013)等类似城市的文献报告以及一份关于相同地区道路两旁夏季情况的研究报告(Invernizzi et al., 2011)所得出的结论高度一致。
尽管气象条件不太适于污染物扩散，但将“行人星期日”（或“无车日”）道路两旁黑炭浓度与无交通流量控制的周末（紧接着的周末）进行比对，可以发现黑炭平均浓度降低了78%（2012年5月27日）或降低了75%（2012年9月）。这些结果与交通监测数据也完全吻合，即：在典型星期日里，道路车流量减少了72%。
由于在低排放区C区出现了临时罢工（2012年10月2日），交通管制工作因此中断，罢工前和罢工后住宅区监测结果显示，黑炭浓度在C区内和C区外升高了90%-150%。当天空气质量监测网（PM10, PM2.5, 二氧化氮, 一氧化碳CO）监测结果显示：与交通有关的污染物（TRP）浓度变化幅度相对小些；但考虑到这一指标的毒性特征（詹森等人，2011），可以判断当时对人体健康带来的风险更高些。
个人携带便携式采样器沿城市中心轴在C区内和C区外散步。与C区外相比，C区内监测平均结果如下：黑碳在 C区内不超过-43%，在步行区内不超过-59%； BC / PM10在C区内不超过-46%，在步行区内不超过-63%。
黑碳浓度和车流量之间的皮尔森相关性分析结果（图3）显示，卡车和私家车的相关性系数较高，说明对于类似米兰这种柴油车占比相对较高的城市，黑炭在评价其交通政策影响方面是一种非常有效的指示性指标。

in Pedestrian Areas; BC/PM_{10} up to -46% in LEZ Area C, up to -63% in Pedestrian Areas.
The Pearson correlation analysis between Black Carbon concentrations and traffic flow patterns (Figure 3) showed high correlation coefficients both for trucks and private cars suggesting that this pollutant is a very effective indicator in traffic policy impact assessment for cities such as Milan, characterized by an high proportion of diesel engines in the vehicle fleet.

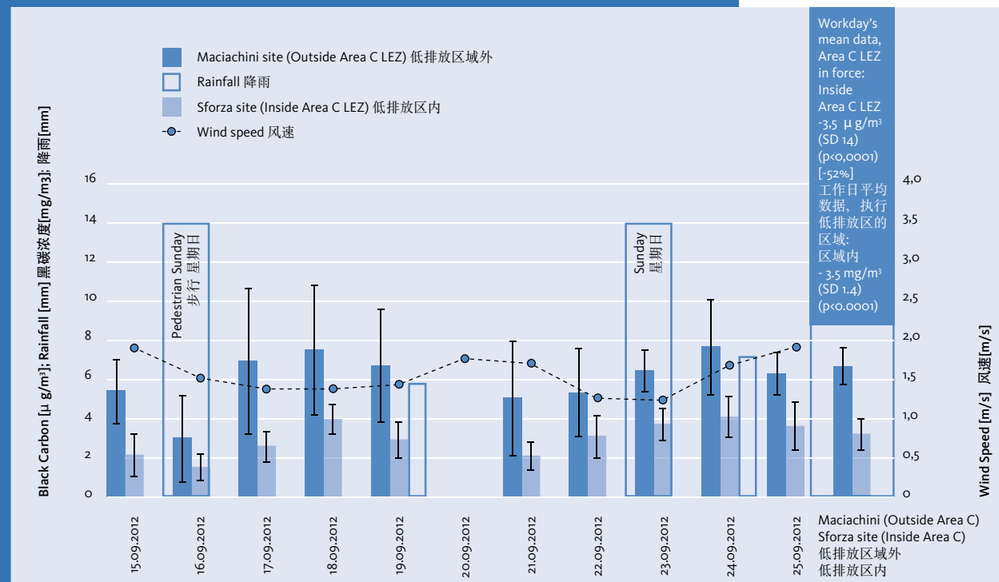
Conclusions

A statistically significant difference was found in BC concentrations inside LEZ Area C, both at kerbside and residential roadside sites, with an improvement of one to three BC epidemiological "change units" (Janssen *et al*., 2011); this indicates a remarkable difference in terms of personal exposure to traffic particulate toxic emissions and related expected mortality and morbidity, with health benefits for both the resident population and city users.
This study showed how local curbs on traffic circulation can produce important effects on airborne toxic traffic-related pollutants, such as Black Carbon, reducing direct proximity and residential exposure.

结论

在低排放区C区内，无论是道路两旁还是住宅区内，黑炭浓度都出现了明显变化，达到了1-3个"流行病学变化单位" (Janssen et al., 2011); 表明人体暴露在显著不同的源自交通的有毒颗粒物排放环境中，在发病率和死亡率方面也会有所差异，大大有益于C区居民和城市使用者的健康。这项研究表明，通过当地采取交通管控措施，可以有效削减空气中与交通有关的黑碳等有毒物质，从而降低周边和居民的暴露风险。

Figure 1: BC concentrations inside and outside LEZ Area C during the September monitoring campaign at kerbside sites
图1: 在9月份道路两旁监测项目的过程中，低排放区C区内和C区外的黑炭浓度。



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More Info and Contacts

http://www.amat-mi.it/it/ambiente/qualita-aria/il-progetto-di-monitoraggio-del-black-carbon/

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Figure 2: Overview of Black Carbon monitoring results during the first year of LEZ Area C
图2: 在低排放区C区，第一年的黑炭监测结果的概况

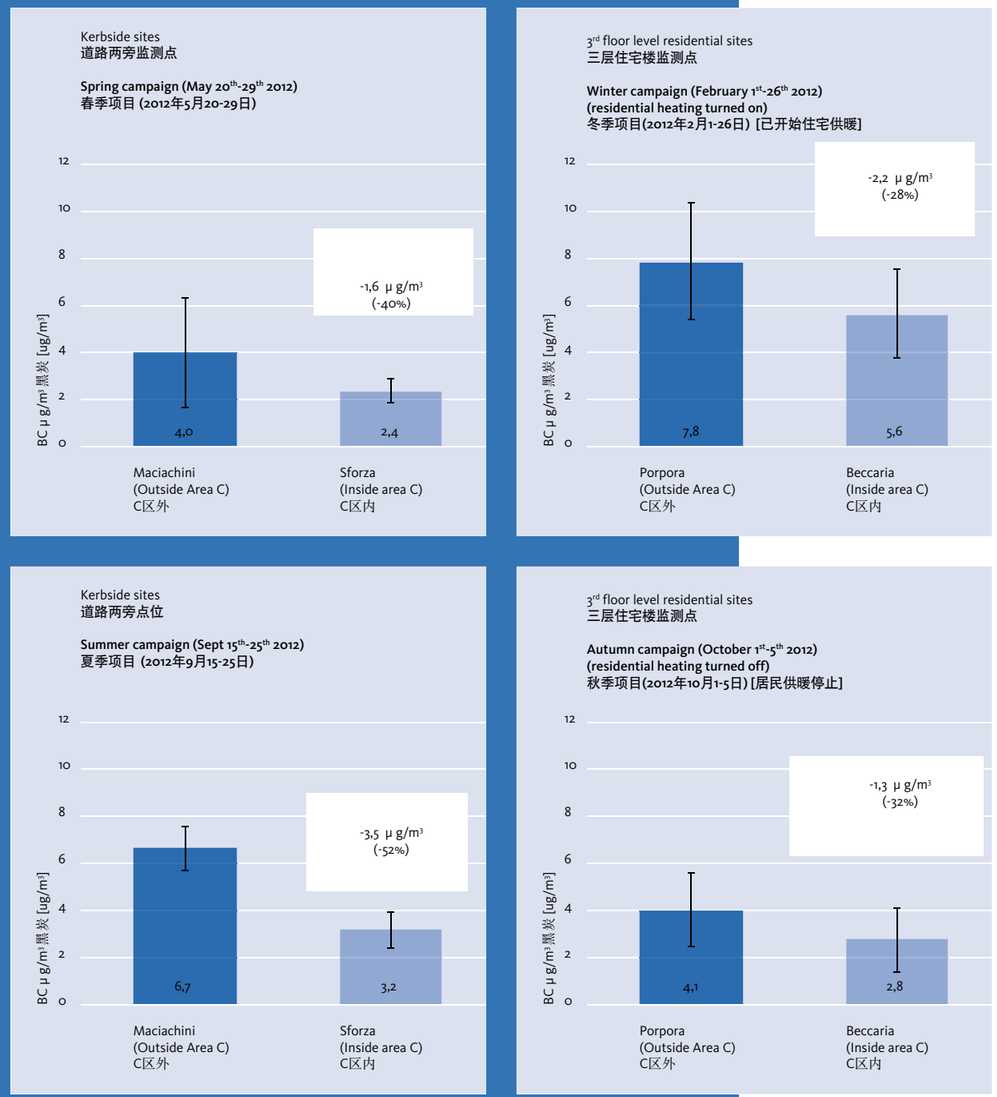
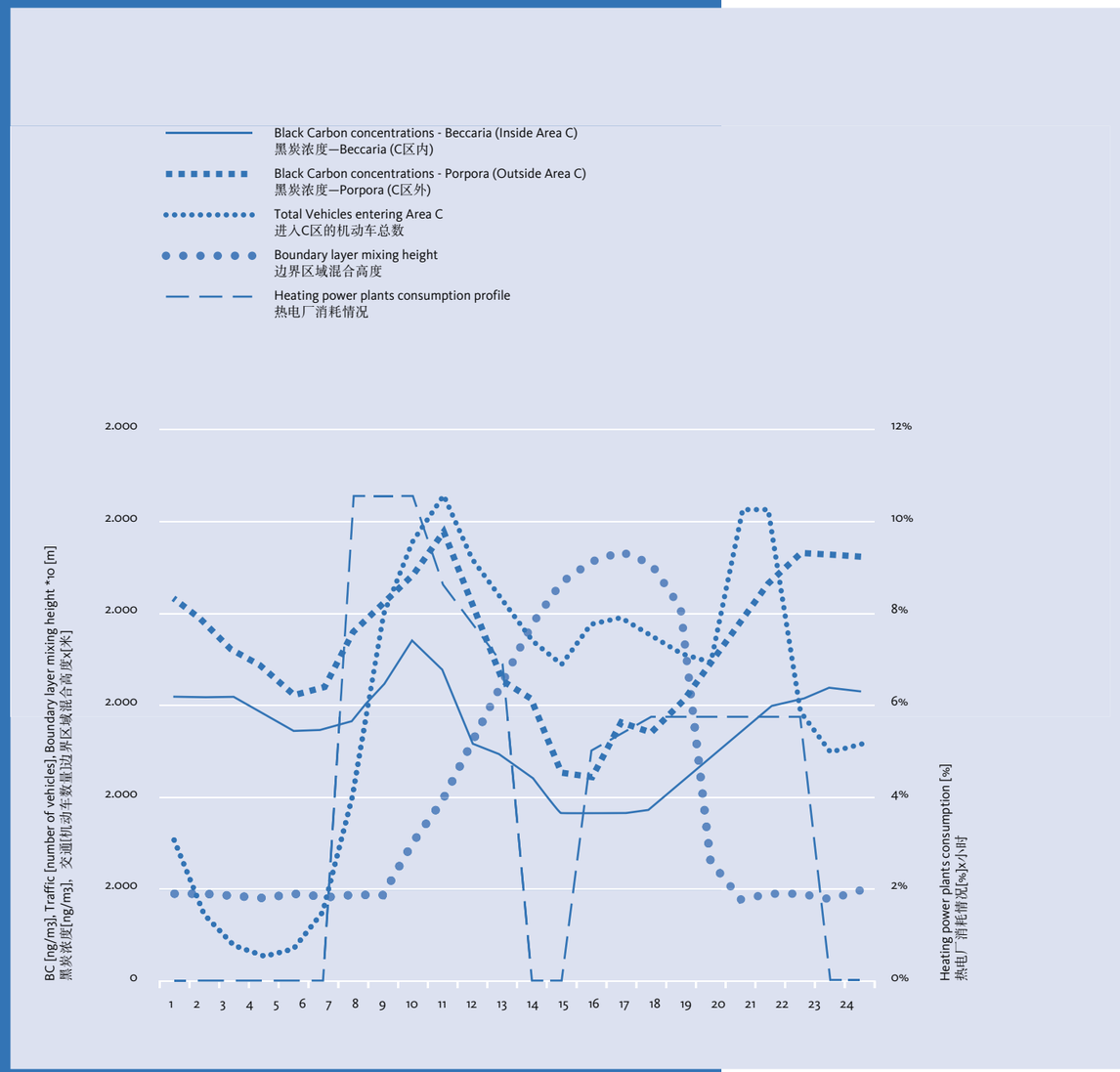


Figure 3: Correlations between Black Carbon concentration in/outside LEZ Area C, traffic patterns, referenced against height and heating power consumption profile. Hourly profiles of a typical "Working Day", Winter campaign, Residential roadside sites
图3: 在低排放区C区内和C区外，黑炭浓度与交通型式的相关性，对高度和制热功耗曲线引用。一个典型的“工作日期”，冬季监测项目，住宅区道路监测点的小时曲线。



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。

Beijing and Shanghai Municipal Environmental Protection Bureaus
Pollution Control Strategy and Instruments

Italy, December 1-12, 2013

41 participants

From December 1 to 12, 2013, 21 participants from the Beijing and Shanghai Municipal Environmental Protection Bureaus system attended the training course “Pollution control strategy and instruments” organized by Venice International University under the auspices of IMELS (Italian Ministry of the Environment).

After 14 lectures and 6 site visits, we were able to arrive at a comprehensive understanding of the ambient air and water pollution control policies and measures in place at the national and local level. From EU framework directives to local regulations in Venice, from abstract policies to specific measures, and from lab communications to site visits in industrial companies, the arrangements of lectures and site visits took full account of the logic of the trainees’ learning process. We hope there will again be this kind of lecture-visit combination in future trainings.

Many of these policies and measures concerning pollution monitoring and control can be applied to the Chinese context, including the licensing system, the distinctive characteristics of the chemical and biological water quality monitoring network in the Venice lagoon (transitional water body), the SIMAGE industrial pollution monitoring and emergency response system in the Veneto Region, etc.

Finally, the state-of-the-art equipment and professional team at ProAmbiente, as well as the large-scale pollution control network and innovative environment-friendly products of Italcementi Group, also left a deep impression on us.

北京市环境保护局和上海市环境保护局
污染管制策略与措施

意大利，2013年12月1日至12日

41名学员

2013年12月1日至12月12日，来自北京市环境保护局和上海市环境保护局系统的21名学员参加了由意大利环境、领土与海洋部委托威尼斯国际大学组织的“污染控制战略及控制措施”专题培训。

通过14个讲座和6个场地参观，我们对意大利国家和地方（威尼斯）层面的大气、水环境污染控制政策和措施有了较为全面的认识。

从欧盟的框架法令到威尼斯的地方条例，从抽象政策到具体措施，从实验室交流到工业企业参观，讲座和参观的安排充分考虑了学员接受知识的逻辑顺序，条理清晰。希望今后仍有类似与讲座内容相关的场地参观。

其中，许多政策和污染监测、控制措施都十分值得我们借鉴。如意大利的排污许可证制度、威尼斯泻湖区（过渡性水体）特色鲜明的化学和生物水质监测网络、威尼托大区的SIMAGE工业污染监测和预警系统等。

此外，国家实验室ProAmbiente先进的仪器设备和专业的技术团队，以及意大利水泥集团的规模化污染控制和环保创新产品研发都给学员们留下深刻印象。

Chinese Academy of Social Sciences
Environment and Health

Italy, March 2-13, 2014

37 participants

With the rapid development of the global economy, bringing with it increasingly serious pollution, environmental problems now constitute a major threat to human health. Currently, environment and health initiatives are attracting ever more attention from the international community and from the public. The Sino-Italian Cooperation Program – Eco-Management: Strategy and Policy Advanced Training this year focused on the specific theme of environment and health for the first time.

On March 2, 2014, the 38 participants in the advanced training program began a 12-day training course in Italy. The participants had previously taken courses with the Italian Ministry for Environment, Land and Sea, Venice International University, and the University of Turin

The training course was rich in content and high on relevance.

The Course content mainly related to air pollution and health, food safety and issues arising from agricultural development and appropriate countermeasures, soil pollution, urban black carbon and air control policy, ecological risk assessment of urban traffic problems and health risks, etc.

These lectures not only covered cutting-edge research methods and theoretical research in the field of environmental pollution and health but also discussed specific cases, adding interpretations of actual attempted solutions to the mix, by examining lessons learned and systems of ecological and environmental protection employed.

We also visited a water treatment works, VEGA industrial park and the University of Turin Agroinnova laboratory, which combined theory with practice in a manner helpful to our further understanding of relevant practical experience in the field.

Taking an overall view of the severe situation faced by current initiatives promoting environmental protection in our country, the students thought, first of all, that an awareness of the need for environmental protection, determination and a systematic approach are much more important than money and simple technology. We should strengthen environmental protection training and improve the environmental awareness of the public. Secondly, they pinpointed the advantages of strengthening Chinese and foreign cooperative research into the technology of environmental protection. Universities, scientific research institutions and high-tech enterprises should take advantage of their strategic positions to conduct wide-ranging cooperative environmental studies, maintain communication with one another and work in partnership to raise the general level of environmental protection technology. This professional training opportunity has enabled concerned parties from China to learn from the advanced experience of Italy and the European Union in the field of environmental and ecological protection and provided a good platform for our country's environmental protection personnel to enhance their theoretical and technological approaches to policy-making.

中国社会科学院
环境与健康

意大利，2014年3月2日至13日

37名学员

随着全球经济的迅猛发展，环境污染日趋严重，环境问题已经构成了对人类健康的最大威胁。当前，环境与健康工作已经引起国际社会和公众的高度关注。中意环保合作项目“生态管理：战略与政策”高级培训班也首次开展主题为“环境与健康”的专题培训。

2014年3月2日，中意生态管理高级培训班38位学员赴意大利开始了为期12天的培训学习。培训先后在意大利环境、领土与海洋部，威尼斯国际大学，都灵大学进行了授课。本次培训的内容丰富，针对性强。课程内容主要涉及空气污染与健康，食品安全与农业发展中存在的问题与对策，土壤污染，城市空气中的炭黑控制，生态风险评估，城市交通问题与健康等。

这些讲座不仅涵盖了环境污染与健康领域的前沿研究方法，而且探讨了具体的案例以深入解读生态和环境保护方面的制度、经验与教训，同时参观了净水厂，VEGA工业园区和都灵大学Agroinnova实验室，理论与实践相结合，有利于我们对相关知识更进一步的了解。

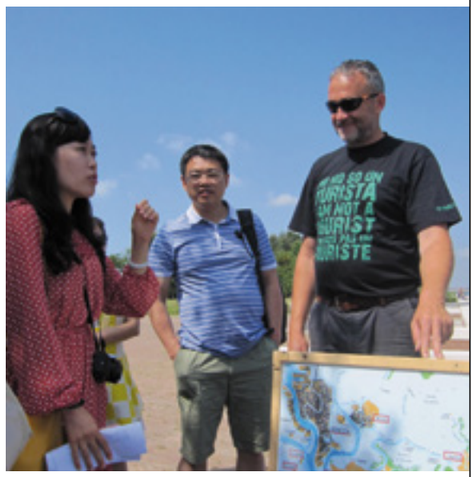
联系到我国目前环保面临的严峻形势，学员们认为，首先，环保意识、决心、制度比资金和单纯的技术更重要，应当加强环保培训，提高全民环保意识；其次，要加强中外合作研究环保的技术手段；高等院校，科研机构，高新企业要利用各自的优势广泛开展环保合作研究，互相交流相互借鉴，共同提高环保技术水平。

此次专业培训对于中国借鉴意大利和欧盟在环境和生态保护方面的先进经验，提高我国环境保护人员的理论水平、政策水平及技术能力提供了很好的平台。希望今后各国的发展都能够以人类健康为基础，以人类幸福作为为国家发展的立纲之本。

MOST High-Technology and Science Parks for Sustainable Development

Italy, June 21 – July 2, 2014
27 participants

China has been massively investing in innovation and research programs in support of economic growth, and this has led to a steep increase in the number of science and technology industrial parks during recent years. The first science and technology park in China was launched in 1988 in Beijing, and now there are more than 114, all officially recognized at national Government level.
While science and technology parks are most commonly considered high-tech clusters bringing research closer to the market, it is important to underline that definitions of what they are and what roles they play are not exactly the same in all countries; moreover even within one country science parks can vary in size, management and degree of specialization in the research carried out and the kind of firms operating in them.
The aim of the course “High-Technology and Science Parks for Sustainable Development” was therefore to introduce the role of science parks in Italy in promoting innovation and linking the research and production worlds with a view to developing new technologies in the framework of sustainable development.
During their 12-days stay in Italy, from June 21 to July 2, the 27 participants selected by the Chinese Ministry of Science and Technology, were introduced to Italian policies for the promotion of clean technologies and the incentives available for fostering innovation both at the EU and the Italian level. The role of science parks was explained combining class lectures and site visits, such as to the Tecnopolo Tiburtino in Rome, the Science and Technology Park of Udine, VEGA in Venice, POINT – Innovation and Technology Center in Dalmine – and the Environment Park in Turin.
It should be noted that many of these parks are managed by local agencies for innovation, which is testimony to the importance of the role they play in the promotion of innovation and of sustainable development linked to the entrepreneurial system and the particular characteristics of their regions.



科技部可持续发展高科技产业园

意大利, 2014年6月21-7月2日
27名学员

中国对研究和科技创新进行了大量投入以推动经济增长，催生了各地近年来建立了一大批科技工业园区。中国第一个科技园区于1988在北京建立，到目前为止共有114个国家级科技工业园区。一般来讲，科技园是高科技的集群园区，它使得科研成果更加贴近市场。然而需要指出的是对科技园区的定义以及其所应发挥的作用，在各个国家的情况并不尽相同；而且，即使在一个国家，其科技园区的规模、专业化程度以及园区内企业的情况也各不相同。
本期培训通过介绍“可持续发展高科技工业园”，帮助学员了解意大利是如何推动创新、使科研与生产企业相对接，从而实现通过新型技术来推动可持续发展的目标。
通过6月21日以来为期12天的培训，由中国科技部选送的21名学员了解了意大利关于推动清洁技术的政策体系，以及欧盟和意大利所采取的相关激励措施。培训课将室内讲解与现场考察相结合，组织学员们参观了位于罗马的 Tecnopolo Tiburtino，乌迪内科技园区，威尼斯VEGA 工业园区，达尔米内的创新技术中心—POINT，以及都灵环境工业园区。
应该指出的是，许多园区由当地机构进行管理。这是充分说明他们在推动创新、推动研究成果应用于生产企业方面所发挥的独特重要作用。

MEP Air Pollution Prevention and Control

Italy, June 29-July 7, 2014

19 participants

In western countries, one of the main factors that influence the citizens' well-being perception is the quality of the air they breathe. In China, severe air pollution episodes occurring in the recent past caused great concern among the population and induced the Chinese government to tackle the problem with unprecedented determination.

With the aim of offering its officials new and broader perspectives on tackling air pollution problems, the Ministry of Environmental Protection of China (MEP) decided to dedicate to "Air Pollution Prevention and Control" all three of the training courses of the 2014 edition of the Sino Italian Cooperation Program.

The second MEP delegation was hosted in Italy from June 29 to July 7. Nineteen senior officials from the central Ministry and the provincial departments addressed the theme of air pollution from several points of view: air pollution control at EU and Italian level, air pollution control technologies, air pollution control in industry, and sustainable mobility. Senior researchers from the Italian Ministry of the Environment, the National Research Council, and other institutions working on air pollution monitoring and control shared with the participants the European experience of managing air quality problems. Special attention was given to the issue of particulate matter (PM) monitoring and reduction. The case study of the city of Milan's "Area C" limited traffic zone and the results of a monitoring campaign carried out to assess the Black Carbon concentrations in PM inside and outside the area were also presented.

To complement the in-class lectures with applied examples, two site visits were organized: the delegates were given the chance to explore the working procedures of ARPAV, the local regional environmental protection agency, and visited the IREN cogeneration power plant in Turin, a modern power plant equipped with the most up-to-date monitoring systems.

环保部空气污染预防与控制

意大利, 年6月29日-7月7日

19位学员

在西方国家，影响公民幸福感主要因素之一是与每个人都息息相关的空气质量。中国最近发生的严重空气污染问题引发了全社会的极大关注，中国政府应正以前所未有的努力着力解决这个问题。

为了帮助中国官员创新思路，扩大视野，中国环境保护部决定2014年“中-意合作培训项目”将围绕大气污染防治来开展。环保部第二个代表团于2014年6月29日-7月7日在意大利接受培训。来自中央和地方的19名官员参加了本期培训，培训内容包括欧盟和意大利在大气污染防治方面的举措、大气污染控制技术、工业领域空气污染控制和可持续交通发展等等。

来自意大利环境部、国家研究委员会及相关机构从事空气污染控制与监测的高级官员和学者们与中方学员分享了欧盟在空气质量管理方面的经验，并对颗粒物的监测与削减进行了集中讨论。培训还以米兰“C区”限定交通区域为案例进行了详细讲解，对区域内和区域外的黑碳浓度监测结果进行了对比。

在室内培训的基础上，还安排学员参观了2个现场，帮助学员们了解意大利地方区域环境保护部门的工作流程，参观了现代化的、装配有最先进监测系统的都灵IREN热电联厂。

一、中意环保合作-洞庭湖富营养化防治最佳可行技术项目圆满完成

2014年5月22日，中意环保合作-洞庭湖富营养化防治最佳可行技术项目总结会在湖南省岳阳市召开。来自环保部国际司、污防司、对外合作中心，湖南省环保厅、岳阳市环保局，湖南省环科院、意大利环境、领土与海洋部，意大利SGI公司等单位代表共40余人参加了会议。

会议总结回顾了项目的设计要点和主要产出。项目坚持因地制宜、理论结合实践，以岳阳南湖为试点地区，引进了欧盟富营养化防治最佳可行技术筛选方法和工具，取得了显著成效。项目建成的水质自动监测设施，切实提高了岳阳市环保局水环境监测能力；制定的《南湖富营养化防治行动方案》被岳阳市有关部门采纳并实施，为政府科学决策提供了技术支撑。项目编写的《湖泊富营养化防治技术和管理指导方针》对我国其他地区开展湖泊环境保护工作提供了具有参考价值的指导方法和程序。

中意洞庭湖富营养化防治最佳可行技术项目于2010年正式启动实施，项目引进的欧盟湖泊环境监测技术和数序模型等分析工具，开展的一系列试点和示范活动，得到了当地政府和科研单位认可与肯定。目前，在各方的共同努力下，南湖水质已显著改善，水质从V类上升为IV类。项目产出成果为加强我国湖泊富营养化防治工作起到了有益的参考和借鉴作用。

I. Successful completion of the Sino-Italian Environmental Cooperation Project Studying the Best Available Technologies for Prevention and Control of Eutrophication in Dongting Lake

A concluding meeting on the completion of Sino-Italian Environmental Cooperation Project Studying the Best Available Technologies for the Prevention and Control of Eutrophication in Dongting Lake was held in Yueyang City, Hunan Province on May 22, 2014. More than 40 people from organizations such as the MEP Department of International Cooperation, the Department of Pollution Control, the Foreign Economic Cooperation Office; the Hunan Province Environmental Protection Bureau, the Yueyang Municipal Environmental Protection Bureau, the Hunan Academy of Environment Sciences, the Italian Ministry of the Environment, Land and Sea and the SGI company attended the meeting.

The meeting reviewed the design elements and main outcomes of the project. Adhering to the policy of "Combining theory with practice in line with local conditions", the project took the Nanhu Lake in Yueyang as a trial site and introduced the best available EU technologies, screening methods and tools for prevention and control of eutrophication and obtained remarkable results. The Project improved the expertise of Yueyang Municipal Environmental Protection Bureau in monitoring water environment.

The Action Plan for Prevention and Control of Eutrophication in Nanhu

Lake, developed under the project, was adopted and implemented by the relevant Yueyang departments, and was able to provide technical support to the government's scientific decision making. The Technology and Management Guidelines for Prevention and the Control of Lake Eutrophication was one outcome of the project which will provide general guidance and procedures for the protection of lake environments in other regions of China.

Officially launched in 2010, the Project introduced EU environmental monitoring technologies and analytical models for lake environments. A series of trials demonstrating the project's activities have been much appreciated by local government and research institutes. At present, the water quality of the

二、中意环保合作四川北川和青海玉树环境监测能力建设项目顺利完成设备验收和培训

2014年9月2-10日，中意环保合作四川北川和青海玉树环境监测能力建设项目设备验收和培训会分别在绵阳市和西宁市召开，来自环保部对外合作中心、四川省环保厅、青海省环保厅、北川羌族自治县环境监测站、青海省环境监测中心站、意大利CORAM公司的专家代表共30余人参加了培训会。

培训将理论知识讲解和动手操作结合起来。重点介绍了环境监测站例行监测、污染源监督性监测和环境应急监测所需设备和分析仪器的工作原理和操作方法。环境质量例行监测方面，重点培训的设备包括用于监测大气中二氧化硫、二氧化氮、PM2.5等污染物的紫外分光光度计和空气颗粒物监测仪，用于测定地表水及城镇饮用水中氟化物、重金属等参数的离子计、原子吸收

Picture 1
The concluding meeting on completion of the Project on the Best Available Technologies for Prevention and Control of Eutrophication in Dongting Lake
中意环保合作-洞庭湖富营养化防治技术项目结项会召开

Picture 2
Chinese and Italian experts visit the water quality automatic monitoring system at Nanhu Lake
中意专家考察南湖水质自动监测系统

Picture 3
Water quality automatic monitoring system on Nanhu Lake
项目建成的南湖水质自动监测系统

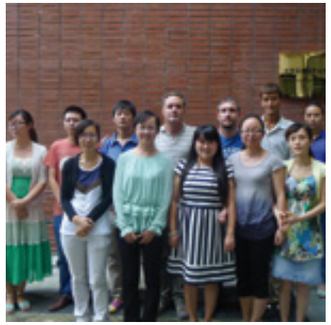
Nanhu Lake has significantly improved from Grade V to Grade IV thanks to the comprehensive measures taken. The achievements and outcomes of the project will serve as a good benchmark for enhancing the prevention and control of lake eutrophication throughout the country.

II. Streamlined checking & acceptance of the equipment and relevant training for the Sino-Italian Environmental Cooperation Project on Capacity Building and Environmental Monitoring in Beichuan (Sichuan Province) and Yushu (Qinghai Province)

Streamlined checking & acceptance of the equipment and relevant training for the Sino-Italian Environmental Cooperation Project on Capacity Building and Environmental Monitoring in Beichuan (Sichuan Province) and Yushu (Qinghai Province) took place in Mianyang City and Xining City respectively during September 2-10, 2014. More than 30 participants from different organizations attended the meeting, including representatives from the MEP's Foreign Economic Cooperation Office, the Sichuan Environmental Protection Bureau, the Qinghai Environmental Protection Bureau, the Beichuan Environmental Monitoring Center in Qiang Autonomous County, the Qinghai Environmental Monitoring Center and experts from Italian company CORAM. The training course combines theory with practical application. It mainly introduces the functions and operation techniques of the equipment and analytical instruments required for routine monitoring, supervision monitoring of pollution sources and environmental emergency resources monitoring.
In routine monitoring of environmental quality, it focuses on training with equipment such as ultra-violet spectrophotometers and particulate monitors for monitoring pollutants including SO_2, NO_2 and $PM_{2.5}$ in air; and ionometers, and atomic absorption spectrophotometers for determining the parameters of for example fluoride and heavy metals in surface water and urban drinking water. In the supervision monitoring of pollution sources, it focuses on training with such equipment as electrical induction smoke monitors and smoke samplers for determining the concentrations of air pollutants from industrial enterprises including cement works. In environmental emergency resources monitoring, it focuses on training with equipment such as portable infra-red gas detectors and multi-parameter water analyzers for monitoring the status of pollutant concentrations in the environment. The training course has achieved its expected outcomes and was keenly appreciated by all participants.
The Sino-Italian Environmental Cooperation Project on Capacity Building and Environmental Monitoring in Beichuan and Yushu was jointly developed and carried out by Chinese and Italian experts soon after the May 12 Wenchuan Earthquake and Yushu Earthquake in Qinghai. The project has provided the instruments, equipment and environmental monitoring vehicle for the newly established Environmental Monitoring Center of Beichuan Qiang Autonomous County to bring it to the level of a standard Grade III environmental monitoring center. It has also donated instruments & equipment for environmental emergency response and an emergency response monitoring vehicle for the Environmental Monitoring Center of Qinghai Province. This training has enhanced the monitoring capacity of Environmental Monitoring Center of Beichuan Qiang Autonomous County and improved the capacity of the Environmental Monitoring Center of Qinghai Province in its environmental emergency response monitoring.

分光光度计。污染源监督性监测方面，重点培训的设备包括用于水泥厂等企业废气污染物浓度测定的电感烟气监测仪和烟气采样器。应急监测方面，重点培训的设备包括用于监测环境状况和污染物浓度的便携式红外线气体检测器和水质多参数探测器。培训达到了预期效果，得到了学员一致认可。
中意环保合作四川北川和青海玉树环境监测能力建设项目是"5-12汶川特大地震"和"青海玉树强烈地震"发生后，中意双方联合开发并实施的。项目为新建成的北川羌族自治县环境监测站捐赠了三级站标准化建设所需要的仪器设备和环境监测车，

为青海省环境监测中心站捐赠了环境应急监测仪器设备和应急监测车。此次培训加强了北川羌族自治县环境监测站的监测业务能力，提高了青海省环境监测中心站环境应急监测水平。



Photos of the training course
培训会照片:

Picture 4
意大利专家在北川县环境监测站演示原子分光光度计的操作方法
Italian experts demonstrating how to operate an atomic absorption spectrophotometer at the Beichuan County Environmental Monitoring Center

Picture 5
中意环保合作北川羌族自治县环境监测能力建设项目培训会合影
Group photo of the training course participants from Beichuan Qiang Autonomous County of the Sino-Italian Environmental Cooperation Project on Capacity Building and Environmental Monitoring

Picture 6
意方专家在青海环境监测中心站演示气象多参数监测仪器
Italian experts demonstrating multiple-parameter meteorological monitoring instruments at the Qinghai Province Environmental Monitoring Center

what's ON at VIU
威尼斯国际大学快讯

The last quarter of the year continues to be full of exciting VIU events.
The **Advanced Training Program** on Environmental Management and Sustainable Development includes a large number of training activities for the rest of the year. Seven training courses are scheduled from September to December, of which three sessions are held in China, two in Beijing (MOST and Beijing EPB) and one in Shanghai (Shanghai EPB).
The main focus of these seven training courses is industry, considered from different perspectives in the context of sustainable development: eco-innovation and green technologies (MOST and Tianjin Science and Technology Committee), industrial energy efficiency (MOST), industrial air pollution control (Beijing EPB and Shanghai EPB). The choice of these themes highlights how China recognizes industry as one of the main actors in achieving sustainable development.
Parallel with the Sino-Italian training program on sustainable development, Venice International University, within the framework of the Sustainable Development Academy, hosted the **2014 Course for Sustainability**, from September 28 to October 5. The Training course featured two capacity-building components, the first one targeting the main challenges to sustainable development and resilience in the specific field of watershed management, involving as participants high-level officials from Ministries of the Environment and Municipal authorities from Albania, Kosovo, Macedonia, Bosnia & Herzegovina, Montenegro and Serbia. The second component was structured as a two-day high-level round table discussion, in which Founders, members and partners of the CEO Platform for Green Growth in MENA came together to talk about green growth challenges including water, energy resource efficiency and green public procurement and its potential applications, among other sustainability issues.
MENA countries are also the target of the 2014 edition of the **training course "New challenges for energy systems in the Mediterranean Region"** hosted at VIU November 2-6. This course, organized by the Enel Foundation, in cooperation with the International Energy Agency (IEA), the Observatoire Méditerranéen de l'Énergie (OME), the Renewable Energy Solutions for the Mediterranean Association (RES4MED) and VIU, aims at involving public officers and energy experts from the Mediterranean Region in discussions about the current state of the energy markets in the Mediterranean region, considering issues such as renewable energy sources development, interconnections, energy efficiency, gas markets.
Also Alcantara, the famous producer of the material that bears its name, chose Venice International University as co-organizer of the **International Symposium** on Sustainability focusing on **Sustainability and the New Automotive Value Chain.** The Symposium, held at VIU on October 16-17, involved leading international academic experts, car industry representatives and NGOs, brought together to debate how sustainability is affecting and will affect the business models of the global automotive industry and, as a consequence, its "value chain".
After the success of the Summer School on Sustainable Landfilling and Final Sinks, Venice International University continues its collaboration with IWWG-International Waste Working Group within the framework of the International Advanced School in Waste Management, promoting the **Winter School on Anaerobic Digestion** (November 15-22). The Winter School involves VIU member universities represented by their experts Raffaello Cossu (University of Padua), Paolo Pavan (University Ca' Foscari of Venice), Pinjing He (Tongji University) and is specifically programmed to run parallel to the Venice 2014 - Fifth International Symposium on Energy from Biomass and Waste in order to also take advantage of the presence and presentations of other international high level experts on waste management. Students take part in in-class lectures, sessions of the Symposium, field trips to two anaerobic digestion plants and working groups.

威尼斯国际大学2014年最后一季度各项活动依然丰富多彩。
在本年度剩余时间里"环境管理和可持续发展高级培训项目"将安排大量培训工作。从9月到12月将安排7期培训班，包括在中国举办的三期，其中两期在北京举行（科技部和北京市环保局的培训班）、一期在上海举行（上海市环保局）。
这七期培训班将从不同角度来研讨工业与可持续发展之间的关系，具体议题包括生态创新与绿色工业（科技部和天津市科委）、工业能效（科技部）和工业空气污染（北京市和上海市环保局）。议题如此集中充分反映"工业是实现可持续发展的关键因素之一"这一观点得到中国政府各部门普遍认可。
与中—意可持续发展培训项目相类似，威尼斯国际大学在"可持续发展学院"框架下，于9月28日—10月5日组织了"2014可持续发展培训课"。培训课安排了2方面的能力建设，其中第一部分是关于可持续发展所面临的挑战、生态修复与流域管理，邀请了阿尔巴尼亚、科索沃、马其顿、波斯尼亚、黑山和塞尔维亚等国家环境部门高级官员参加本次培训。第二部分是为期2天的高级别圆桌会议，"地中海和北大西洋国家（MENA）绿色增长执行总裁平台"的创始者、会员以及合作伙伴等参加了本次会议，并围绕绿色发展所面临的挑战，包括水、能源效率、绿色公共采购及潜在应用等问题进行了广泛交流。
威尼斯国际大学于11月2-6日举办"2014地中海地区能源系统所面临新挑战" 培训班，培训对象也是MENA国家，由Enel基金与国际能源署(IEA)、地中海地区能源观察所 (OME)、地中海再生能源协会 (RES4MED) 及威尼斯国际大学共同举办。邀请地中海地区的政府官员和能源专家共聚一堂，就该地区可再生能源发展、能源中端、能源利用率、燃气市场等问题进行广泛交流。
材料生产企业Alcantara继续选择威尼斯国际大学作为合作伙伴，于10月16-17日联合举办了"可持续发展与汽车工业新价值链国际研讨会"，国际知名学者、汽车工业代表及非政府组织代表等畅所欲言，围绕"可持续发展正在并将进一步对全球汽车工业商业模式、及其价值链产生影响"这一主题展开了热烈讨论。
继"可持续废物填埋夏季学校"之后，在"固体废物管理高级培训项目"框架下，威尼斯国际大学继续与国际废物工作组（IWWG-International Waste Working Group）合作，在11月5—22日举办了"厌氧反应冬季学校"， Raffaello Cossu (University of Padua)、Paolo Pavan (University Ca' Foscari of Venice)、何品晶（音译，Pinjing He）(同济大学)等知名学者教授应邀参加；很多国际知名废物管理学家还平行参加了"2014威尼斯—第五届生物质与废物发电国际研讨会"，这也让学员们 获益匪浅。此外，学生们还上课听讲、参加研讨，并参观了2家厌氧发酵企业。

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