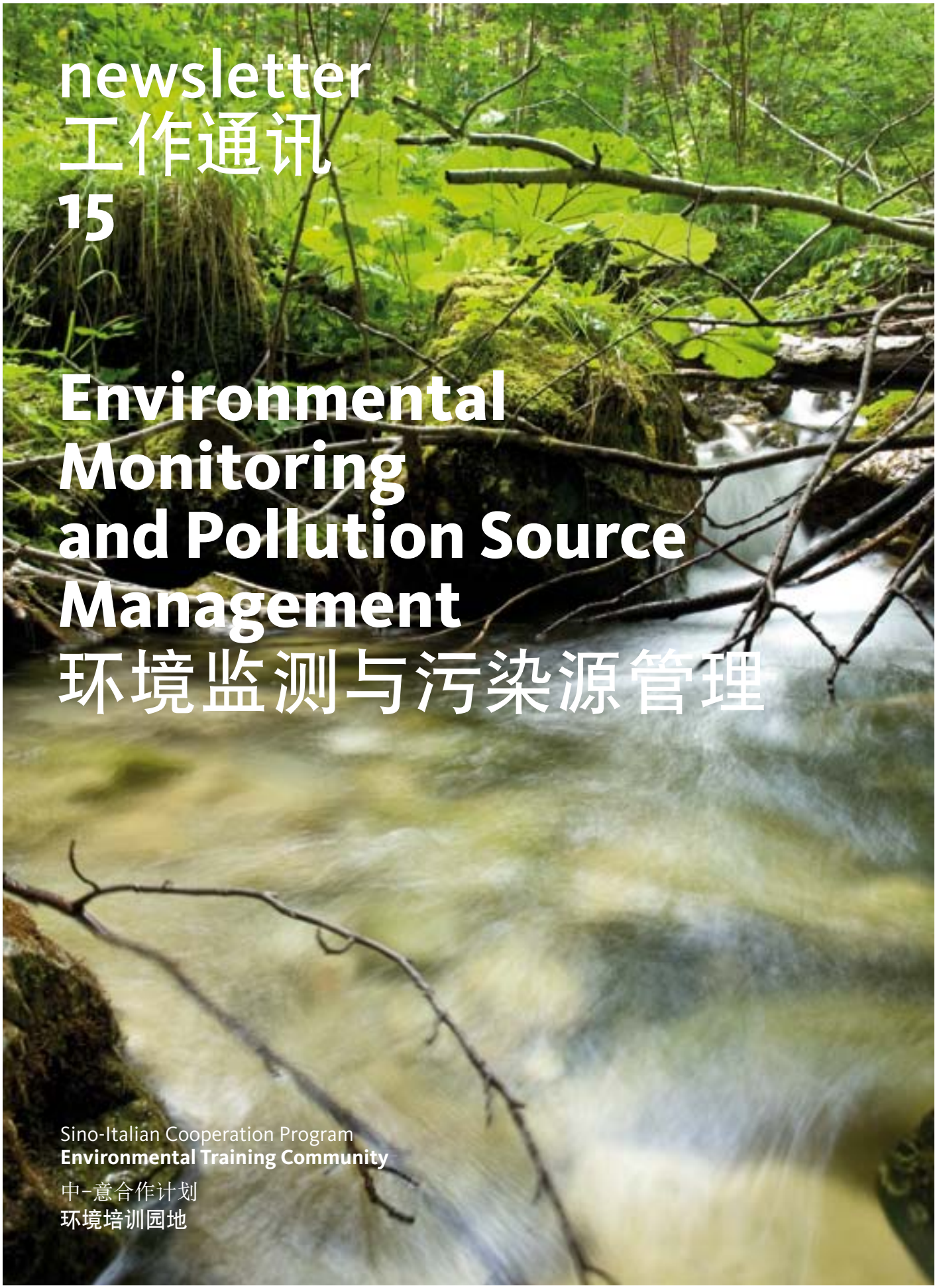

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15

# Environmental Monitoring and Pollution Source Management
# 环境监测与污染源管理

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

2011 Quadrimestrale Poste Italiane S.p.A. Spedizione in Abbonamento Postale – 70% DCB Venezia

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# editorial
# 编者寄语



China's economy and agricultural industry in particular have been growing in recent years. Agriculture has grown by more than 4 percent per annum. Unfortunately, such rapid growth has been achieved at the cost of a degraded environment and the overexploitation of natural resources. Soil and wind erosion, acid rain, water and air pollution, land degradation, soil salinization, desertification, deforestation, grassland destruction, and loss of biodiversity and wildlife habitat are widespread in China as well as in many other countries.

Like other countries, China's environment is fragile. Particularly in western China, most of the soil is prone to wind erosion, and desertification, and grassland destruction is concentrated. It is crucial that this is addressed for China's future economic development and the well-being of all Chinese. The environment in western China needs to be preserved for future development.

Environmental monitoring plays a major role in environmental protection. Many activities and projects carried out within the Sino-Italian Program have dealt with different aspects of this topic. Several Italian experts and companies cooperated with colleagues from China, transferring methodologies and experiences gained in our country. This issue of the newsletter will describe the results of such cooperation.

**Maria Lodovica Gullino**, AGROINNOVA, University of Turin



近年来，中国经济和农业持续增长，其中农业以每年4%的速度递增。然而，这种快速发展是以破坏环境和过度开发自然资源为代价的。土壤风蚀，酸雨，水和空气污染，土地退化，土壤盐碱化、荒漠化，森林砍伐、操场破坏、生物多样性和野生动物栖息地丧失等问题在中国及世界很多国家都广泛存在。

与很多国家相同，中国的环境十分脆弱；特别是西部地区，大部分地区都出现了土壤风蚀和荒漠化、草地破坏等。只有当这些问题得到妥善解决，中国未来经济才能实现可持续发展，人民生活得以改善。因此，为了将来的进一步发展，中国亟待保护西部环境。

环境监测在环境保护方面发挥着重要的作用。在中-意合作计划下，围绕这个主题开展了很多合活动和合作项目。一些意大利专家和企业与中国同事密切合作，积极探讨将在我国取得的方法学和经验向中国转让。本期《通讯》将介绍这方面的合作和所取得的效果。

**Maria Lodovica Gullino**, AGROINNOVA, 意大利都灵大学

# news and events
# 新闻和事件



## New Financing Scheme for Green Buildings in China

Under the 800 million yuan Multi-project Financing Program for energy-efficient construction projects, Asian Development Bank (ADB) and Shanghai Pudong Development Bank (SPD Bank) signed an agreement last May 2011 to jointly finance energy-efficient projects led by China's private sector.

The ADB will offer 300 million yuan (46.09 million U.S. dollars) as a partial credit guarantee to the SPD Bank, currently the ADB's first partner in China. This is intended to encourage the financial institution to lend to companies investing in the construction and operation of green buildings.

The initiative aims at supporting projects for enhancing the energy efficiency and water efficiency of buildings, both through the retrofitting of the existing building stock with adequate technologies and materials, and through the construction of new low-energy buildings. The objectives of the program are in line with the Chinese Government's effort to make energy saving and emission reduction in the construction, industry, and transportation sectors the focus of development, as it emerges from the 12th Five-Year Plan's Energy Saving and Emission Reduction Plan.

According to its financing program, ADB will work in partnership with the American energy management company Johnson Control, which will scout for the buildings with the highest potential for energy saving. ADB, on its hand, will share the risk with the partner bank. "By providing partial credit guarantees, we hope to relieve the financing bottleneck to help the private sector enter the energy-saving building sector and exert a positive effect on the country's efforts to control greenhouse gas emissions", said Hisaka Kimura, senior investment specialist with the ADB.

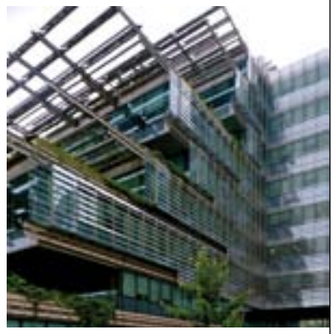
## 融资新计划支持中国绿色建筑

在总额为8亿元人民币的“能源效率多项目融资计划”下，2011年5月亚洲开发银行与上海浦发银行签订了合作协议，以支持私营部门在中国节能型建筑领域的融资。

亚行将向上海浦发银行提供3亿元人民币，以鼓励金融机构为致力于节能型建筑的企业提供融资支持。浦发银行成为亚行该项计划的首家中国合作伙伴。

该计划将帮助企业对旧建筑进行改造以降低能耗；建造绿色建筑，即对建筑进行设计、建造和维护，使其在使用期限内最大限度地达到节能和节水目标。本计划目标与中国政府的在节能减排方面所做的努力是完全一致的，即：重点加强建筑、工业、交通等领域的节能减排工作，这一点已在《十二五节能减排计划》中明确提出。

根据该融资计划，亚行将与美国江森自控有限公司合作，挖掘建筑节能潜力；“通过提供损失分担，我们希望帮助其缓解融资瓶颈，以扩大重要私营部门在中国绿色节能建筑领域的投资。希望这一举措将在中国减少温室气体排放方面产生长远影响，并带来积累效应”，亚行私营部门业务局高级投资专家木村寿香说。



## 意大利评估太阳能补贴政策，逐步削减补贴直至2016年完全取消

意大利政府终于批准了一项长期争论不休的法令，即：确认继续补贴该行业，但同时提出将逐步削减对太阳能发电企业的大幅补贴。该法令的颁布结束了由于政策不确定而给国际投资者带来的困扰，同时也明确了将由全球大型太阳能企业承担由此产生的负担。

该法令由意大利环境部长Prestigiacomo女士和意大利工业部长Romani先生联合签署。这份重要文件稳定了市场，明确了可预期的前景，并最终促使太阳能技术逐步发展并具有竞争性。

自2007年以来意大利是继德国之后全球第二大太阳能市场。政府的补贴政策催生了该行业的繁荣发展。但现在政府决定逐步减少补贴，从而将落在消费者电费账单上的负担取消。

根据新颁布的法令，从今年6月1日起到2013年为过渡期，将逐步缩小补贴幅度；在此之后，将效仿德国将补贴与装机发电量自动挂钩。新规则还考虑了光伏电厂的规模，将小型企业提升到200千瓦到1兆瓦。该法令规定将每年用于太阳能发电补贴的资金限制在60亿-70亿欧元，并一直保持到2016年，到2016年底意大利的太阳能发电设施总装机容量将达到12,000 兆瓦。

## 中国今年将面临严重电力短缺

根据中国最大的电网运营商国家电网公司介绍，如果当前中国普遍干旱的现象持续下去，由于煤炭价格上涨使得中国热电企业的亏损继续加大，那么中国2011年的电力短缺将达到400亿瓦。

这是自2004年以来最严重的一次，当时全国31个省、市、自治区都减少或限制用电。

许多因素导致了今年的电力短缺，包括煤炭供应短缺、一些地区发电实施不足、以及电网传输方面的问题等等。所有这些问题都在短时期内不能获得解决，并最终可能导致2012年电力短缺达到500亿瓦，2013年700亿瓦。

占中国发电量80%的燃煤价格不断上涨、政府对电价限制措施导致发电企业利润下降，这些都促使发电厂减少生产能力甚至停产。

根据中国电力委员会介绍，今年前4个月，中国5大发电企业就遭受了100.57亿元亏损；与2010年相比，多亏损了72.9亿元。

## 欧洲土壤退化：推动出台欧盟框架法令?

2011年5月23日欧盟委员会发布报告，介绍了欧盟国家土壤状况，指出土壤退化特别是覆土带来了一系列问题。

当用不透气的材料，特别是沥青和混凝土覆盖时，就形成了覆土。在



## Italy Reviews Incentive Policy for Solar Energy, with Gradual Reductions up until 2016

Italy approved a long-awaited and much-discussed decree that, while reaffirming subsidies for the sector, cuts generous spending on solar power incentives, ending a period of uncertainty that had irked international investors and weighed on shares of major global solar companies. The decree was signed by the Minister of Environment, Ms Prestigiacomo and the Minister of Industry, Mr Romani, who said, “This important document finally gives stability and long-term prospects to the market until it reaches technological competitiveness”.

Italy’s solar market, the world’s second-largest after Germany, has boomed since 2007, when the government boosted production subsidies, but the present trend is reducing the incentives, which directly weigh on consumers who support the scheme through power bills.

Under the new solar decree, a transitional period with gradual cuts in incentives will start from June 1 and run to 2013, after which the incentives will automatically be linked to reaching a certain level of installed capacity, according to an approach also adopted in Germany. New rules also concern the size of photovoltaic plants, raising the limit for small ones from 200 kW to 1 MW, and allowing small energy producers to enjoy higher subsidies.

The decree aims to cap subsidies for solar developers at 6-7 billion Euros ($8.9-$10.4 billion) per year by the end of 2016, when installed capacity is expected to be around 12,000 MW.

## China Facing Serious Power Shortage This Year

China’s electricity shortage might reach 40 GWh in 2011 if the widespread drought in China continues and losses of Chinese thermal power plants widen also due to rising coal prices, according to the State Grid Corp of China, the country’s leading power grid operator. This could be the worst case in decades, since the black year of 2004 when power shortages extensively affected the country, with power cuts or limits imposed in 27 out of its 31 provinces, municipalities and autonomous regions.

Many factors contribute to this year’s power woes, including a shortage of thermal coal, insufficient power-generating facilities in some areas and grid transmission problems – all issues that cannot be solved in the short term and which could lead to a continued shortage of 50 GWh in 2012 and 70 GWh in 2013.

The rising price of coal, which is used to generate nearly 80% of China’s electricity, and government caps on electricity prices have eroded profitability at thermal power plants, causing generators to reduce production or even shut down.

In the first four months of this year, the top five power producers in China suffered widened losses of RMB 10.57 billion from their thermal power operations. The losses were RMB 7.29 billion more than in the same period of 2010, according to figures from the China Electricity Council.



## Soil Degradation in Europe: Moving toward a European Framework Directive?

A new report released on the 23rd of May 2011 by the European Commission focuses on the conditions of soil in EU countries, pointing out the progression of soil degradation and soil sealing in particular.

Soil is sealed when it is covered over with an impermeable material such as asphalt or concrete. Between 1990 and 2000, at least 275 hectares of soil were lost per day in the EU, amounting to 1,000 km² per year. Half of this soil is permanently sealed by impermeable layers of buildings, roads and parking lots. According to the report, this trend has been reduced to 252 hectares per day in recent years, meaning that currently every year in Europe, soil covering an area larger than the city of Berlin are lost to urban sprawl and transport infrastructure.

Soil sealing causes an irreversible loss of the biological functions of the soil. As water can neither infiltrate nor evaporate, water runoff increases, sometimes leading to catastrophic floods. Landscapes are fragmented and habitats become too small or too isolated to support certain species.

The reports recommends a three-tiered approach to address the problem: limiting the soil sealing; mitigating its effects through permeable building materials or green roofs; and off-setting measures to compensate soil losses in one area by measures taken somewhere else.

The report will input a technical document to provide national, regional and local authorities with guidance on best practices for limiting soil sealing and mitigating its effects. It should be finalized in early 2012. This might revive the proposal for a Soil Framework Directive, put forward by the EC back in 2006 yet stalled by opposition from some member states.

1990–2000年期间，欧盟国家每天至少减少275公顷土壤，约合每年1000平方公里。 至少一半以上土壤是由建筑不透气层、道路和停车场所覆盖。据该报告，这种趋势在近几年已经减少到252公顷。这意味着在欧洲每年都会有一个比柏林还大的地区由于城市拓展和基础设施建设而消失。覆土导致了土壤的生态功能不可逆转地丧失了。由于既不能过滤水、又不能蒸发水，雨水径流很容易形成，并最终导致灾难性洪涝发生。自然景观破碎化，栖息地减少，甚至出现由于栖息地太小而不能支撑某些物种繁衍的情况。

该报告推荐了一种“三级方法”，即：限制覆土，通过使用透气性建筑材料或绿色屋顶来减少覆土影响，并在某地采取措施来弥补在它地的土壤损失。

该报告还提供了一份技术文件以指导全国、地区和地方政府当局采取最佳措施，来限制覆土并减少覆土带来的影响。该报告计划于2012年完成。这也许会推动欧盟考虑制定关于土壤的框架法令。早在2006年欧盟就提出该立法动议，但被一些成员国反对党阻止。

# China's Environmental Quality Monitoring System
# 中国环境监测系统

**Department of Environmental Monitoring of MEP**
中国环境保护部环境监测司





China's environmental quality monitoring started in the mid 1970s and there were more than 350 environmental quality monitoring stations at all levels nationwide by 1980 when the first National Environmental Monitoring Conference (NEMC) was convened. During "the Sixth Five-year Plan Period" and "the Seventh Five-year Plan Period", the environmental quality monitoring stations gained a strong momentum for the rapid establishment at the central, provincial and municipal levels and even in some counties. During "the Eighth Five-year Plan Period", the monitoring networks focused on the environmental quality monitoring and China's environmental quality monitoring technologyw and quality assurance system basically took shape. Since "the Ninth Five-year Plan Period", the state has made vigorous efforts to strengthen the environmental monitoring capacity building, establish advanced atmosphere and surface water automatic monitoring networks and implement real-time surveillance of environmental quality, daily and weekly reporting systems. At present, China has fundamentally implemented network-based organizational structures, systematic monitoring technologies and standardized monitoring capacity building. The national environmental quality monitoring system is endowed with 2,300 environmental quality monitoring stations staffed by approximately 50,000 employees, with environmental quality monitoring networks set up at the national, provincial, municipal and county levels.

## I. Development of the Environmental Quality Monitoring Network

### (1) The Environmental Quality Monitoring Network

At present, the national environmental protection system has set up water environmental quality monitoring networks in 10 water systems, and offshore environmental quality monitoring networks in coastal areas nationwide. Besides this, environmental air quality monitoring is conducted in 529 cities, precipitation monitoring in 487 cities and environmental noise monitoring in 530 cities, thus forming the national environmental quality monitoring network for regular environmental quality monitoring and a comparatively comprehensive command of national environmental quality.

中国的环境监测工作起步于上世纪70年代中期，到1980年召开第一次全国环境监测工作会议时，全国已建成350多个各级环境监测站。“六五”和“七五”期间，环境监测站快速发展，从中央到地方省、市和部分县，都建立了环境监测站。“八五”期间，形成了以环境质量监测为核心的监测网络；基本建立我国环境监测技术与质量保证体系。“九五”以来，国家大力加强环境监测能力建设，建立了先进的大气、地表水自动监测网络，实施环境质量的实时监视和日报、周报制度。目前，我国环境监测工作已基本做到了组织机构网络化、监测技术体系化、监测能力建设标准化。全国环保系统共有环境监测站2300个，5万人左右，组建了国家级、省级、市级、县级环境监测网。

## 一、环境监测网络的发展

### （一）环境质量监测网络

目前，我国环保系统已在全国十大水系布设了水质环境监测网，在沿海布设了近岸海域环境监测网。在529个城市开展了环境空气质量监测，在487个城市开展了降水监测，在530个城市开展了环境噪声监测。形成了我国环境质量监测网络，定期开展环境监测，比较全面地掌握了我国环境质量状况。

### （二）生态环境质量监测网络

在国家和省级监测站建立了生态环境质量监测网络，通过卫星、航空遥感技术和地面监测开展了生态环境质量监测，初步形成了我国生态环境质量监测网络。

### （三）污染源监督性监测网络

目前，环保系统每年对国家废水重点监控企业、国家废气重点监控企业和城镇生活污水处理厂开

### (2) The Ecological Environmental Quality Monitoring Network

Ecological environmental quality monitoring networks have been set up within the monitoring stations at the national and provincial levels to conduct the ecological environmental quality monitoring by means of satellite, remote sensing technology and surface monitoring. Thus, China's ecological environmental quality monitoring network has been formed.

### (3) The Pollution Source Supervisory Monitoring Network

Currently, the national environmental protection system has conducted supervisory monitoring of the key wastewater enterprises and waste gas enterprises under the national monitoring and municipal domestic sewage treatment plants, and all provinces (autonomous regions and municipalities) will conduct supervisory monitoring of key monitoring enterprises at the provincial and municipal levels according to the local industrial structural features to have a dynamic command of the discharge conditions of the pollution sources and establish the national supervisory monitoring network for the pollution sources.

### (4) The Environmental Emergency Monitoring Network for Environmental Emergencies

The state environmental protection administrative authority has established a mechanism for the response, implementation, coordination, data reporting and joint action for environmental emergency monitoring. Particularly in environmental emergencies like Songhua River's fatal pollution event and the Wenchuan Earthquake, etc., concerted efforts were made, by pooling together resources nationwide, to conduct emergency monitoring and establish the emergency monitoring network for environmental emergencies in China.

### (5) The Environmental Information Transmission System

The environmental information transmission system has taken shape, comprised of special network transmission, point-to-point transmission and Internet-based transmission in respect of environmental information transmission.

### (6) The Environmental Radiation Monitoring Network

The network has taken shape, comprised of monitoring points in key areas, cities and terrestrial radiation monitoring points and monitoring points for water systems based on monitoring points originally controlled by the state, further supplementing and improving the efficiency of environmental radiation monitoring.

展了监督性监测，同时各省（自治区、直辖市）还根据当地产业结构特点确定了省级、市级重点监控企业并开展监督性监测，动态掌握污染源排污状况，形成了我国污染源监督性监测网络。

### （四）环境突发事件环境应急监测网络

国家环保行政主管部门建立了环境应急监测响应、实施、协调、数据报送、联动等机制，在松花江污染事件、汶川特大地震等突发环境事件中，调集全国力量展开应急监测，形成了我国环境突发事件环境应急监测网络。

### （五）环境信息传输体系

在环境信息传输方面，已建成了由专用网络传输、点对点传输、互联网传输组成的环境信息传输体系。

### （六）辐射环境监测网络

在辐射环境监测方面，在原有的国控点位的基础上进一步补充和完善，已建成了由重点区域监测点、城市监测点、陆地辐射监测点和水体监测点组成的辐射环境监测网络。

### （七）“天地一体化”环境监测网络

30年来，环境监测覆盖的范围不断扩大，领域不断拓展，要素不断增加，管理体系不断完善，基本形成了我国较为完整的环境监测网络。2008年我国发射了环境一号卫星A星、B星并投入应用，我国的环境监测进一步向空间发展，将逐步形成功能更加完善、预警能力更强的“天地一体化”环境监测网络。

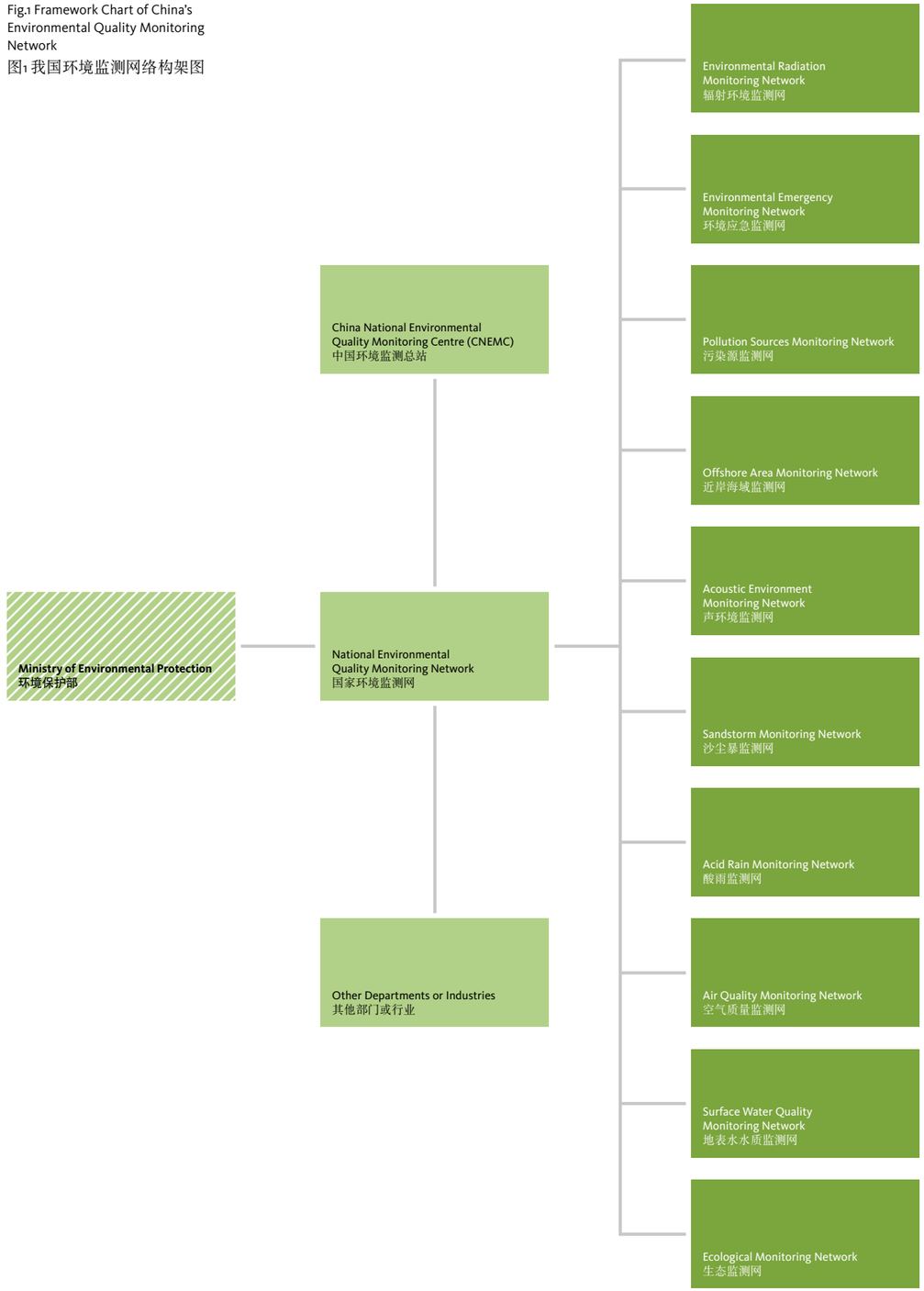
### （八）其他部门资源监测网络

水利部门建立了七大水系的水文、水资源监测网络；国家海洋局建立了全国海洋环境监测网；地质矿产部门建立了地下水动态监测网；农业、林业、气象、地质部门和中国科学院分别建立了有关生态监测或研究网络等。各部门、行业因监测目的不同，在各自管理领域开展监测活动，是我国环境监测体系的重要组成部分。目前，国家环保、国土资源、建设、交通、水利、农业、卫生、林业、气象、海洋等部门在全国各地已形成了有近万个监测机构、30多万人的监测队伍（图1）。





Fig.1 Framework Chart of China's Environmental Quality Monitoring Network
图1 我国环境监测网络构架图



## 二、环境监测技术的发展

目前，我国已初步建立了环境监测技术体系框架。一是研究并确立了环境空气、地表水、噪声、固定污染源、生态、固体废物、土壤、生物、核与电离辐射9个环境要素的监测技术路线体系；二是颁布了地表水和废水、空气和废气、生物、噪声、放射性、污染源等方面的监测技术规范以及污染源主要污染物排放总量监测技术规范；三是制定了地表水水质评价、湖泊富营养化评价、环境空气质量评价、酸雨污染状况评价、沙尘天气分级评价、声环境质量评价、生态环境质量评价等技术规定；四是颁布了近400项环境监测方法标准、227项环境标准样品和20项环境监测仪器设备技术条件；五是颁布了20余项环境监测质量保证和质量控制方面的国家标准，编制了《环境水质监测质量保证工作手册》和《环境空气监测质量保证工作手册》。

在环境监测手段方面，我国正逐步从传统的化学分析法向仪器分析转变、从全部手工监测逐步向半自动、自动化转变。同时，一些新技术，如地理信息系统，遥感卫星定位系统和互联网技术等也被逐渐应用于区域环境质量监测中。

## 三、环境监测信息发布

环境监测系统承担着综合评价全国环境质量状况，编写各类环境质量报告的任务。目前，分为日报、周报、快报、月报、季报、半年报、年报、年鉴等，以准确、及时、全面地反映环境质量状况及其变化趋势。

_ 1980年起，发布《全国环境质量报告书》；
_ 1997年起，发布《长江三峡工程生态与环境监测公报》（中英文）；
_ 1989年起，发布《中国环境状况公报》（中英文）；
_ 2001年起，发布《中国近岸海域环境质量公报》；
_ 2001年6月5日全国环保重点城市在中央电视台发布空气质量日报预报；
_ 2003年4月起，发布《地表水水质月报》。
_ 2009年7月，通过互联网向全社会公开发布100个国家地表水水质自动监测站的实时监测数据，每四小时更新一次数据，每天动态发布六次。
_ 2010年11月，通过互联网向全社会公开发布113个环保重点城市空气自动监测站的实时监测数据，每小时动态更新一次。

### (7) The Environmental Quality Monitoring Network Featuring "Whole Technology from Space and Land"

For 30 years, environmental quality monitoring has continually developed with more fields and more elements covered, so the management system is continuously improving and the comparatively complete environmental quality monitoring network has taken shape in China. In 2000, China launched Environment Satellite No.1 (Star A and Star B) into orbit for operation, creating further development in space.
China has gradually established the Environmental Quality Monitoring Network featuring "whole technology from space and land" with more complete functions and a stronger early warning capacity.

### (8) Resource Monitoring Network in other Departments

The water resource authorities have established the hydrology water resource monitoring networks for the seven main water systems nationwide; State Oceanic Administration has established the national marine environmental monitoring network; the geological and mining authorities have established the groundwater dynamic monitoring network; the agriculture, forestry, meteorology and geology authorities and the Chinese Academy of Sciences have established the networks for ecological monitoring and research. All departments and industries conduct the monitoring activities related to their own sectors for different monitoring purposes, constituting an important part of China's environmental quality monitoring system. Currently, the national environmental protection, land resources, construction, transportation, water, agriculture, health, forestry, meteorology and oceanography departments (amongst others) have established nearly 50,000 monitoring organizations staffed by more than 0.3 million workers (Fig. 1).

## II. Development of Environmental Quality Monitoring Technology

China has established the environmental quality monitoring technological system framework. Firstly, to study and establish the route system of monitoring technology related to such environmental elements as ambient air, surface water, noise, fixed sources of pollution, ecology, solid waste, soil, and biological, nuclear and ionizing radiation; secondly, to promulgate technical specifications for monitoring surface water, air, gas waste, organisms, noise, radiation and pollution, etc., as well as the technical specifications for monitoring the total discharge of major pollutants from the pollution sources; thirdly, to work out the technical regulations for surface water quality evaluation, lake eutrophication evaluation, environmental air quality evaluation, acid rain pollution condition evaluation, dust and sand weather grading evaluation, acoustic environmental quality evaluation and eco-environmental quality evaluation, etc.; fourthly, to issue nearly 400 environmental quality monitoring methods and standards, 227 environmental reference samples and 20 technical specifications for environmental quality monitoring instruments and equipment; and fifthly, to promulgate approximately 20 national standards for the quality assurance and the quality control of environmental monitoring and prepare and compile the "Environmental Water Quality Monitoring Quality Assurance Manual" and the "Environmental Air Quality Monitoring Quality Assurance Manual".
In view of the environmental monitoring methods, China has gradually transformed from applying traditional chemical analysis to instrumental analysis, from total manual monitoring to semi-automatic and automatic monitoring. At the same time, some new technology, for example, GIS, the remote sensing satellite positioning system and Internet of Things technologies, etc., are being gradually applied in regional environmental quality monitoring.

## III. Environmental Quality Monitoring Information Release

The environmental quality monitoring system undertakes the task of overall evaluation of national environmental quality conditions, the preparation of all types of environmental quality reports, specifically including the daily report, weekly report, brief update, monthly report, quarterly report, semi-annual report, annual report and yearbook, to fully reflect the environmental quality conditions and the variation tendency:
_ in 1980, the "National Environmental Quality Report" was released;
_ in 1997, the "Ecological and Environmental Monitoring Bulletin for the Three Gorges Project on the Yangtze River" (Chinese and English version) was released;
_ in 1989, the "Report on the State of the Environment in China" (Chinese and English version) was released;
_ in 2001, the "Report on Offshore Area Environmental Quality in China" was released;
_ On June 5, 2001, the Key Environmental Protection Cities in China released the air quality daily report on CCTV;
_ in 2003, the "China Surface Water Quality Monthly Report" was released;
_ in July 2009, real-time monitoring data on 100 surface water quality automatic monitoring stations was released to the general public through the Internet, updated every four hours, six times a day;
_ in November 2010, real-time monitoring data on 113 air automatic monitoring stations in the key environmental protection cities was released to the general public through the Internet and updated once every hour.

# Italian Policies for Pollution Source Management: Pollution Emission Inventory
# 意大利关于污染源管理的相关政策：污染物排放清单

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An atmospheric emission inventory is a compilation of estimates of emissions into the atmosphere from different types of sources such as cars, trucks, power stations and industrial plants. These emissions are estimated to help to find ways of reducing the impact of human activities on the environment and our health.
As it is not possible to measure emissions from all source types, atmospheric emissions are estimated in practice on the basis of measurements made from selected or representative samples of the (main) sources and source types.
The basic model for an emission estimate is the product of (at least) two variables, for example:
an activity statistic and a typical average emission factor for the activity, or an emission measurement over a period of time and the number of such periods in which emissions occurred in the required estimation period.
For example, to estimate annual emissions of sulphur dioxide ($SO_2$) in grams per year from an oil-fired power plant, you might use either:
annual fuel consumption (in tonnes fuel/year) and an emission factor (in grams $SO_2$ emitted/tonne fuel consumed), or measured $SO_2$ emissions (in grams per hour) and the number of operating hours per year.
In practice, the calculations tend to be more complicated, but the principles remain the same.
Emission estimates are collected together into databases which usually also contain supporting data on, for example: the locations of the source of emissions; emission measurements where available; emission factors; capacity, production or activity rates in the various source sectors; operating conditions; methods of measurement or estimation, etc.
Emission inventories may contain data on three types of source, namely point, area and line. The types of air pollutant emission sources are commonly characterized as either point, line or area sources:
point source — A point source is a single, identifiable source of air pollutant emissions (for example, the emissions from a combustion furnace flue gas stack). Point sources are also characterized as being either elevated or at ground level. A point source has no geometric dimensions. Point sources beyond certain thresholds are identified as large point sources (LPS) and considered individually in the inventory.

空气污染物排放清单是指对不同来源的污染物向大气排放总体情况的估算，污染源可包括轿车、卡车、发电厂以及工厂等。通过对排放情况的估算，旨在找出办法以减少人类活动对环境和人体健康的影响。
由于无法对所有污染源进行实际监测，因此现实工作中主要基于对选择性、或有代表性的排放源（主要源）和排放源类型进行监测，并在此基础上作出估算。
污染源估算的基础模型主要根据（至少）两个变量，例如:
_ 一项活动静止状态下和该活动典型状态下的平均排放因子；或者
_ 一段时间范围内的排放监测值和在规定的估算时间范围内该污染物排放出现的时间频次。
例如，为了估算燃油发电厂每年的二氧化硫的排放情况，你可以采取以下办法:
_ 每年的油料消耗情况（吨油料/年）和排放因子（所排放的二氧化硫（克））/每吨燃料；或者
_ 监测到的二氧化硫（每小时克）/每年运行时间的次数。
_ 在实际工作中，排放清单的估算变得越来越复杂，但原理是一样的。
然后将排放估算值录入到数据库中。通常情况下，数据库中还有一些支持性数据。例如：排放源地点、排放监测数据（如果有的话）、排放因子、生产能力、各领域的生产或活动频率、运行条件、监测方法和估算值等等。
一般来说，排放清单包括三类源，即：点源、面源和线源。空气污染物排放源可分为点、线或面:
点源 — 是单一的、可识别的空气污染物排放源（如：燃烧炉烟囱排放）。点源一般来说是升空排放或平面排放。点源没有几何维度。超出一定



Line sources — A line source is a one-dimensional source of air pollutant emissions (for example, the emissions from vehicular traffic on a roadway).
Area source — An area source is a two-dimensional source of diffuse air pollutant emissions (for example, the emissions from a forest fire, a landfill or the evaporated vapors from a large spill of volatile liquid).
Sources may also be characterized as either stationary or mobile. Flue gas stacks are examples of stationary sources and buses are examples of mobile sources.
At the international level, reporting of emission data is required by the Convention on Long Range Transboundary Air Pollution (CLRTAP) adopted in Geneva, 1979, and its protocols, and by the United Nations Framework Convention on Climate Change (UNFCCC), adopted in Rio de Janeiro, 1992, and the Kyoto Protocol.
The United Nation Economic Commission for Europe (UNECE) Convention on Long Range Transboundary Air Pollution requires parties to report annual estimates and projections of emissions of $SO_2$, $NO_x$, $NH_3$, NMVOC, CO, HMs, PM, POPs, with emission data disaggregated every five years on the European Monitoring and Evaluation Program (EMEP) grid 50x50 km$^2$; the reference methodology is provided by the EMEP/EEA (European Environment Agency) air pollutant emission inventory guidebook.
The UNFCCC requires parties to report annual estimates of emissions and removals of greenhouse gas emissions with direct effect ($CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, $SF_6$, $SO_2$) and indirect effect ($NO_x$, NMVOC, CO); the reference methodology is provided by the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, the 2000 Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and the 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry.
In Italy, the Institute for Environmental Protection and Research (ISPRA) has the overall responsibility for the emission inventory and for the submissions to CLRTAP and UNFCCC. Specifically, ISPRA is responsible for all aspects of national inventory preparation, reporting and quality management. The institute is also responsible for the communication of the pollutants under the NEC directive as well as to carry out scenarios jointly with the Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), as established by the Legislative Decree n. 171 of 21$^{st}$ May 2004. Moreover, ISPRA is the single entity in charge of the development and compilation of the national greenhouse gas emission inventory as indicated by the Legislative Decree n. 51 of 7$^{th}$ March 2008. The Ministry for the Environment, Land and Sea is responsible for the endorsement of the inventory and for the communication to the secretariat on the different conventions.
ISPRA has established fruitful cooperation with a number of governmental and research institutions as well as industrial associations, which helps improve some leading categories of the inventory. Specifically, these activities aim at the improvement of provision and collection of basic data and emission factors, through plant-specific data, and exchange of information on scientific researches and new sources. Moreover, when in-depth investigation is needed and a high uncertainty in the estimates is present, specific sector analyses are committed to *ad hoc* research teams or consultants.
ISPRA also coordinates with different national and regional authorities and private institutions for the cross-checking of parameters and estimates, as well as with *ad hoc* expert panels, in order to improve the completeness and transparency of the inventory.
The main basic data needed for the preparation of the national emission inventory are: energy statistics, published by the Ministry of Economic Development (MSE) in the National Energy Balance (BEN); statistics on industrial and agricultural production, published by the National Institute of Statistics (ISTAT); statistics on transportation, provided by the Ministry of Transportation (MINT); and data supplied directly by the relevant professional associations.
Emission factors and methodologies used in the estimation process are consistent with the EMEP/CORINAIR Guidebook, the IPCC Guidelines and Good Practice Guidance, and are supported by national experiences and circumstances. Final decisions are left up to inventory experts, taking into account all the information available.
For the industrial sector, emission data collected through the National Pollutant Emission Register (E-PRTR), the Large Combustion Plant (LCP) Directive, and the framework of the European Emissions Trading Scheme (EU-ETS), have yielded considerable developments in the inventory of the relative sectors. In fact, this data, even if it is not always directly used, is taken into account as verification of emission estimates and to improve national emission factors as well as activity data figures. In addition, final estimates are checked and verified in view of annual environmental reports by industries. For large industrial point sources, emissions are registered individually, and when communicated are based upon detailed information such as fuel consumption. Other small plants communicate their emissions, which are also considered individually.
In the last few years, data reported by industrial facilities has been gathered in a unique database, thus facilitating checks, identification of the main discrepancies in information and detection of potential errors.
In fact, ISPRA directly collects the data from the industrial associations and the inventory team manages all the information and makes use of it in the preparation of the national inventory, ensuring the consistency of the time series. The database is still under finalization but all of the figures are considered in an overall approach and used in the compilation of the inventory.
Tables 1 and 2 show the 10 industrial installations having

值的点源被定义为大电源 (LPS)，并在清单中单独列出。
线源—是单一维度的空气污染物排放（如：在路面上的交通尾气排放）。
面源 — 是指两维的、扩散的空气污染物排放（如：森林大火、填埋场、易挥发液体泄露场地所散发出的气体）。
排放源又分为固定源和移动源。烟囱烟气排放则为固定源，而公共汽车则是移动源。
根据1979年在日内瓦通过的《远距离越境空气污染公约》和1992年通过的《联合国气候变化框架公约》（UNFCCC）以及《京都议定书》，各缔约方应定期报送排放清单。
联合国能源经济委员会《远距离越境空气污染公约》（CLRTAP）要求，各缔约方每年报送关于二氧化硫、氮氧化物、氨、非甲烷挥发性有机物、一氧化碳、颗粒物及持久性有机污染物等。根据欧盟监测与评估计划（EMEP）的要求，参照《EMEP/欧盟经济区关于空气污染物排放清单导则》，按照50x50 平方公里的要求， 每5年报送一次污染物排放非加总数据。
《联合国气候变化框架公约》要求各缔约方每年报送温室气体排放清单，包括直接产生温室效应的污染物（如二氧化碳、氨、氧化亚氮、烃氟碳化合物、全氟碳化合物、六氟化硫、二氧化硫）和非直接产生效应的污染物（氮氧化物、非甲烷挥发性物质、一氧化碳）。所提供的参考方法包括1996年修订的、联合国气候变化专门委员会（IPCC）颁布的《国家温室气体排放清单导则》、《2000良好实践导则》、《国家温室气体排放清单不确定性管理》以及《土地利用、土地利用变化和森林2003良好实践导则》。
在意大利，由环境保护和研究所 (ISPRA) 全面负责CLRTAP and UNFCCC下的排放清单编制和递交工作。具体来说，ISPRA 负责国家排放清单的准备、报告和质量管理。按照NEC导则，该机构还负责交流、协调工作；并根据2004年5月21日n. 171法令，与新技术、能源和可持续经济发展部（ENEA）共同开展工作。此外，根据2008年3月n. 51法令，ISPRA是唯一授权负责国家温室气体排放清单的编制 的单位。环境、国土、海洋部负责批准清单，并与各公约秘书处对口保持联络。
ISPRA与相关政府部门、科研机构以及工业协会

建立了成功的合作关系，以帮助提高清单质量。具体来说，为提高数据提供和收集质量，通过合作可展开企业级的数据收集，并获得科研和新排放源信息。此外，当需要开展深度调查，或遇到很大不确定性情况下，则组建特别研究工作组或聘请咨询专家来进行有针对性的具体分析。

ISPRA还与各相关国家和地区政府部门及私营机构进行数据比对，并通过召开特别专家委员会来提高清单质量和透明度。

国家排放清单的主要基础数据包括由经济发展部发布的能源统计数据、国家统计局发布的工农业生产数据、交通部发布的交通统计数据、以及个专业机构和协会提供的相关数据。

估算过程中所采纳的排放因子和方法均与《EMEP/CORINAIR 导则》、《联合国气候变化专门委员会导则》和《良好实践导则》等一致，同时结合考虑国家经验和条件，最终由清单专家来作出决定，同时兼顾可获得的信息情况。

对于工业行业，排放数据主要来源于“国家污染物排放登计” (E-PRTR)，《大型燃烧企业导则》及欧盟排放交易框架等。事实上，尽管很多数据没有直接使用，但它们在数据核准方面发挥了参考作用，从而有助于提高排放因子及活动数据等方面的质量。此外，最终还会将这些数据与企业年度环境报告数据进行比较核准。大型工业点源在排放清单中单独列出，并提供详细信息，包括燃料消耗情况等。其他一些小型企业所递交的数据，在清单中也单独列出。

通过过去几年的努力，已将企业所提交的数据收集在一个特殊的数据库中，以便于进行复核、找出信息的主要差距并及时发现错误。事实上，ISPRA 直接从工业协会收集数据，清单编制人员则主要负责管理所有的信息，并确保在清单编制过程中充分利用了这些信息。目前，数据库还处在最后完善阶段，我们会对所有数据进行最终统筹考虑。

根据2009年E-PRTR，二氧化碳和氮氧化物排放最高的前10家企业分别见表1和表2。

由ISPRA负责编制的国家排放清单不包括面源和线源排放情况，这部分数据会体现在地方排放清单中，由各省、市政府部门负责，旨在满足管理工作方面的要求（空气质量计划、或者近期提出的、市长们关注的气候变化减缓承诺等）。地方

the highest $CO_2$ and $NO_x$ emissions, according to the data reported to the National Pollutant Emission Register (E-PRTR) for the year 2009.

The Italian national inventory, annually prepared by ISPRA, does not consider area sources or line sources, which are often included in the local inventories carried out by provincial or municipal administrations for specific policy objectives (air quality plans or, more recently, climate change mitigation commitments, as foreseen by the Covenant of Mayors). Local emission inventories represent an additional source of information for the verification of national emission estimates.

In the period 1990-2009, emissions from most conventional and trace pollutants reported to the CLRTAP show a downward trend. Reductions were especially relevant for the main pollutants ($SO_x$ -87%; $NO_x$ -51%; CO -63%; NMVOC -45%) and lead (-95%) whereas a significant rise was observed for polycyclic aromatic hydrocarbons (+20%) and hexachlorobenzene (+30%).

The major drivers for the trend were reductions in the industrial and road transport sectors, due to the implementation of various European directives which introduced new technologies, plant emission limits, the limitation of sulphur content in liquid fuels and the shift to cleaner fuels. Emissions also decreased because of the improvement in energy efficiency as well as the promotion of renewable energy.

The energy sector is the main source of emissions in Italy, with a share of more than 80%, including fugitive emissions in many pollutants ($SO_x$ 91%; $NO_x$ 98%; CO 85%; $PM_{2.5}$ 85%; Cd 83%). The industrial processing sector is an important source of emissions, specifically related to the iron and steel production - at least for particulate matter, heavy metals and POPs - whereas significant emissions of $SO_x$ and particulate matter derive from cement production; on the other hand, the sector involving solvent and other product use is characterized by NMVOC emissions. The agriculture sector is the main source of $NH_3$ emissions in Italy with a total national share of 95%. Finally, the waste sector, specifically waste incineration, is a relevant source of HCB, PAH and dioxin emissions (48%, 27% and 16%, respectively).

Total greenhouse gas emissions, in $CO_2$ equivalent – excluding emissions and removals of $CO_2$ from land use, land use change and forestry - decreased by 5.4% between 1990 and 2009 (from 519 to 491 million tons of $CO_2$ equivalent), whereas the national Kyoto target is to have a reduction of 6.5% as compared to the base year levels, by the period 2008-2012.

In particular, the most important greenhouse gas, $CO_2$, which accounted for 85% of total emissions in $CO_2$ equivalent in 2009, decreased by 4.3% between 1990 and 2009. $CH_4$ and $N_2O$ emissions were equal to 7.6% and 5.7% respectively of the total $CO_2$ equivalent greenhouse gas emissions in 2009. Both gases showed a decrease





排放清单为国家清单的核准增添了更多的信息来源。

在1990-2009年期间，CLRTAP数据显示：传统及微量污染物呈现下降趋势。主要污染物（硫化物-87%; 氮氧化物 -51%; 一氧化碳 -63%; 非甲烷挥发性物质-45%) 以及铅 (-95%)下降尤为明显；而多环芳烃碳氢化合物(+20%)和六氯苯 (+30%)则大幅增加。

由于执行了各种欧盟指令，引进了新技术，制定了工厂排放限值、液体燃料含硫量、并采取措施向清洁燃料转化，工业和道路交通排放量大为降低。此外，提高能效、推动可再生能源利用等也促进了排放降低。

能源行业是意大利污染物排放的主要来源，占总排放的80%，包括硫化物91%; 氮氧化物98%; 一氧化碳 85%; PM2.5 85%; 镉83%。生产行业（包括钢铁生产）也是一个主要排放源，主要排放了颗粒物、重金属、持久性有机污染等；水泥生产过程中主要排放了硫化物、颗粒物等。另一方面，涉及溶剂及相关生产领域的行业还排放了非甲烷挥发性物质。在意大利，农业是甲烷气体的主要排放源；占国家总排放量的95%。 最后，废物处置行业，特别是废物焚烧行业，六氯苯、多环芳烃和二噁英排放较高(分别占总排放的48%, 27% 和16%)。

在1990-2009年期间，温室气体排放量降低了5.4%（从5.19亿吨降低到4.91亿吨二氧化碳当量）。这里不包括由于土地使用、土地用途发生改变以及森林所带来的二氧化碳减排量。根据《京都议定书》，国家减排目标为：与基线相比，在2008-2012年期间减排幅度为6.5%。

需要指出的是，最主要的温室气体物质，即二氧化碳，在2009年占温室气体的总排放量85%，在1999年-2009年期间排放量减少了4.3%。2009年甲烷气体和氧化亚氮排放量占二氧化碳总排放量的7.6% 和5.7%。与1999年相比，两种气体分别下降了14.3% 和25.3%。其他温室气体，如烃氟碳化合物、全氟碳化合物和六氟化硫下降幅度在0.04%到 1.7%之间。

**Table 1 – Top 10 industrial $CO_2$ emitters in Italy in 2009**
**表 1 – 2009 年意大利二氧化碳排放量最大的10家企业**

| **Company**<br>企业名称 | **Installation**<br>设施 | **Region**<br>地区 | **Province (code)**<br>省(代码) | **Location**<br>地点 | **Emissions (tons/year)**<br>排放量（吨/年） |
|---|---|---|---|---|---|
| **ENEL Production S.p.A.** | Federico II (BR SUD) Thermal Power Station – 热电站 | Apulia | BR | Brindisi | 12.978.428,9 |
| **Edison S.p.A.** | Taranto Thermal Power Stations – 热电厂 | Apulia | TA | Taranto | 4.373.086,0 |
| **ENEL Production S.p.A.** | Fusina Thermal Power Plant – 热电厂 | Veneto | VE | Venice | 4.300.415,9 |
| **E.ON Production S.p.A.** | Fiume Santo Thermal Power Station – 热电厂 | Sardinia | SS | Sassari | 4.058.770,0 |
| **Edipower** | San Filippo del Mela Thermal Power Station – 热电厂 | Sicily | ME | San Filippo del Mela | 3.317.150,0 |
| **Enipower S.p.A.** | Enipower S.p.A. – Ferrera Erbognone Plant | Lombardy | PV | Ferrera Erbognone | 2.927.340,0 |
| **ENEL Production S.p.A.** | Enel Produzione SpA – Torrevaldaliga Nord Power Station – 动力站 | Lazio | RM | Civitavecchia | 2.855.881,0 |
| **Tirreno Power SpA** | Vado Ligure Power Station – 动力站 | Liguria | SV | Quiliano | 2.769.169,4 |
| **Enipower S.p.A.** | Enipower S.p.A. – Brindisi Plant | Apulia | BR | Brindisi | 2.258.955,0 |
| **ENEL Production S.p.A.** | Enel Produzione SpA – Sulcis (Grazia Deledda) Power Station – 动力站 | Sardinia | CI | Portoscuso | 2.241.850,0 |

Source: National Pollutant Emission Register (E-PRTR)
信息来源: 国家污染物排放登记(E-PRTR)



from 1990 to 2009, equal to 14.3% and 25.3% for $CH_4$ and $N_2O$, respectively. Other greenhouse gases, HFCs, PFCs and $SF_6$, ranged from 0.04% to 1.7% of total emissions.
The energy sector is the largest contributor to national total GHG emissions and in 2009 it produced 82.8%. Emissions from this sector decreased by about 2.8% from 1990 to 2009; however, emissions from the transport sector increased by about 15.9% in the same period.
For the industrial processes sector, emissions showed a decrease of 29.6% from the base year to 2009.
The decrease in industrial emissions is mostly due to a decrease in the chemical industry (due to the fully operational abatement technology in the adipic acid industry) and metal production emissions.
A considerable increase was observed in F-gas emissions. It should be noted that, except for the motivations explained, in the last two years the economic recession has had a remarkable influence on the production levels of most industries, energy facilities and consequent emissions. Emissions from the solvent and other product use sector decreased by 24.6% from 1990 to 2009.
The decrease observed in the total emissions from the agricultural sector (-15.1%) was mostly due to the decrease in $CH_4$ emissions from enteric fermentation and to the decrease in $N_2O$ from agricultural soils.
As regards land use, land-use change and forestry, from 1990 to 2009 total removals in $CO_2$ equivalent increased by 53.2%. Finally, emissions from the waste sector decreased by 8.9% from 1990 to 2009, mainly due to a decrease in $CH_4$ emissions from solid waste disposal on land.
Emission figures from the Italian emission inventory and other related documents are publicly available at http://www.sinanet.apat.it/it/sinanet/serie_storiche_emissioni.

能源行业是国家温室气体排放的最大贡献者，2009年占总排放量的 82.8%。1990 到2009年期间该行业温室气体排放减少了2.8%；而交通行业同期增加了15.9%。在此期间（从基线年1990年到2009年），工业领域排放量下降了29.6%，主要得益于化工行业（乙二酸行业减排技术应用）和钢铁行业的减排。烟道气排放大为下降，除了基于上述减排动机外，过去2年经济衰退也使得工业和能源领域的排放水平大为降低。1999到2009年期间，清洗剂和其他应用行业的排放量也减少了24.6%；农业领域减少了15.1% 主要是在发酵过程中减少了甲烷气体的排放和农村土壤中的氧化亚氮的排放。在土地使用、土地用途发生改变和森林领域，在1990 到 2009期间，二氧化碳的排放量下降了53.2%，废物处置行业的温室气体排放量下降了8.9%，主要是减少了固体废物填埋处理中甲烷气体的减排 。
意大利排放清单和相关文件公布在http://www.sinanet.apat.it/it/sinanet/serie_storiche_emissioni。

## 结论:

为了避免对环境和人体健康造成影响，相关国际公约和法令对工业设施的排放作出了规定。因此，必须将这些设施的排放情况定期向有关部门报告。

**Table 2 – Top 10 industrial $NO_X$ emitters in Italy in 2009**
**表 2 – 2009 年意大利氮氧化物排放量最大的10家企业**

| Company<br>公司名称 | Installation<br>设施 | Region<br>地区 | Province (code)<br>省（代码） | Location<br>地点 | Emissions (tons/year)<br>排放量（吨/年） |
|---|---|---|---|---|---|
| **ENEL Production S.p.A.** | Federico II (BR SUD) Thermal Power Station – 热电站 | Apulia | BR | Brindisi | 7.297,4 |
| **E.ON Production S.p.A.** | Fiume Santo Thermal Power Station – 热电站 | Sardinia | SS | Sassari | 3.691,3 |
| **A2A Production S.r.l.** | Monfalcone Thermal Power Station – 热电站 | Friuli Venezia Giulia | GO | Monfalcone | 2.995,2 |
| **Edipower** | San Filippo del Mela Thermal Power Station – 热电站 | Sicily | ME | San Filippo del Mela | 2.692,0 |
| **ENEL Production S.p.A.** | Fusina Thermal Power Plant – 热电站 | Veneto | VE | Venice | 2.501,8 |
| **ENEL Production S.p.A.** | Business Unit Bastardo – Pietro Vannucci Power Station – 动力厂 | Umbria | PG | Gualdo Cattaneo | 2.223,8 |
| **Tirreno Power S.p.A.** | Vado Ligure Power Station – 动力站 | Liguria | SV | Quiliano | 2.204,9 |
| **ENEL Production S.p.A.** | Enel Produzione S.p.A. – La Spezia “Eugenio Montale” Power Station – 动力站 | Liguria | SP | La Spezia | 1.688,8 |
| **Edison S.p.A.** | Taranto Thermal Power Stations – 热电厂 | Apulia | TA | Taranto | 1.682,5 |
| **ENEL Production S.p.A.** | Enel Produzione SpA – Sulcis (Grazia Deledda) Power Station – 动力站 | Sardinia | CI | Portoscuso | 1.478,0 |

Source: National Pollutant Emission Register (E-PRTR)
信息来源：国家污染物排放登记(E-PRTR)

## Conclusions

Emissions from industrial installations are regulated under several international conventions and directives to prevent harmful impacts on environment and human health. Therefore, industrial installations are subject to different reporting obligations as concerns their emissions. Given the different policy contexts, the information that is reported is often different in nature, extent and scope, and often the comparability and the consistency of the various data submissions is rather poor. On the other hand, comparability and consistency are essential elements when the environmental performance of different installations or techniques is studied, in particular when emission data has serious economic implications, such as for the emissions trading market. At the international level, there are currently no internationally-agreed principles or a comprehensive strategy for production of comparable and consistent emission data at the level of an industrial installation. Individual agencies operating at the national level have therefore established different approaches to improve the quality of the data submissions.
In Italy, given the fact that ISPRA is the technical body in charge of collecting and validating emissions under the different reporting schemes, this has been easier than in other countries. In general, the inventory team compares activity data and emissions reported under EU-ETS and EPER/E-PRTR to the information provided by the industrial associations. More recently, a comprehensive database has been established in order to facilitate the implementation of QA/QC procedures. The general outcome of this verification step shows consistency among the information collected under different legislative frameworks and the information provided by the relevant industrial associations.

由于不同政策的要求，所报告的信息也在其内容、程度、范围等方面各不相同。这也导致了不同机构递交的信息在一定程度上存在不可比的情况。而另一方面，工业设施的污染物排放信息非常重要，特别是当这些排放信息带来重大经济影响的情况下，如排放市场交易等，其信息的可比性和一致性则显得尤为重要。
在国际层面，还未就工业设施污染物排放数据的可比性和一致性形成共识的原则或者综合战略。为此，一些从事国家信息工作的机构建立了各自不同的方法学，以努力提高所提交信息的质量。根据相关的国家和国际数据报送计划，在意大利由ISPRA来具体负责数据收集和评估。相比之下，其工作比有些国家的情况相对简单些。一般来说，我们的清单工作人员会按照EU-ETS 和 EPER/E-PRTR 的要求，向行业协会收集数据并进行评估。近期，我们建立起一个综合性的数据库，以推动实施数据质量控制和管理规程（QA/QC）。实践表明，该项工作很有意义，使得来自于不同法律框架下要求报送的数据和工业行业协会提交的数据的一致性在一定程度上有所改善。

# Baseline Information about Surface Water Quality Monitoring and Management in China
# 中国地表水水质监测管理情况介绍

**Department of Environmental Monitoring of MEP**
中国环境保护部环境监测司





## I. Organization

The environmental quality monitoring system of the environmental protection authorities, which was set up in the 1970s, conducted the relevant monitoring and surveillance over all environmental elements, including water, air, soil and noise, etc. The National Surface Water Monitoring Network, comprised of the National Surface Water Environmental Quality Evaluation Network and the National Surface Water Special Monitoring Network, was set up to fully reflect the national surface water environmental quality conditions and the variation tendency. The National Surface Water Monitoring Network is in charge of the Ministry of Environmental Protection and China's National Environmental Quality Monitoring Centre (CNEMC) and is responsible for the daily network operation and business guidance, preparing the monitoring reports and releasing water quality information.

### (1) The National Surface Water Environmental Quality Evaluation Network

Mainly responsible for objectively reflecting the national surface water quality conditions and providing the decision-making foundation for national surface water pollution prevention and control.

### (2) The National Surface Water Special Monitoring Network

To meet water quality early warning requirements, demonstrate international cooperation, perform drainage area evaluation, monitor and control the quality of drinking water sources in key cities, prevent pollution and perform special water pollution prevention work, the Surface Water Special Monitoring Network has been set up to include the Surface Water Early Warning Monitoring Network, the National Boundary River Monitoring Network, the Provincial Section Monitoring Network, the Drainage Area Planning Evaluation and Monitoring Network, the Concentrated Drinking Water Source Monitoring Network of Key Environmental Protection Cities, and the "Manganese-rich Triangle" Surface Water Monitoring Network, etc.

1. The Surface Water Early Warning Monitoring Network is comprised of 148 automatic water quality monitoring stations funded by the state and responsible for the early

## 一、组织机构

环保部门环境监测系统成立于20世纪70年代，自成立之日起即开展水、空气、土壤、噪声等各环境要素的监测工作。为全面反映全国地表水环境质量状况及变化趋势，组建了国家地表水环境监测网，由国家地表水环境质量评价网、地表水专项监测网两大部分组成。国家地表水环境监测网由环境保护部负责管理，中国环境监测总站负责网络日常运行与业务指导，并编写监测报告，发布水质信息。

### （一）国家地表水环境质量评价网

主要负责客观反映全国地表水水质状况，为国家地表水污染防治提供决策依据。

### （二）国家地表水专项监测网

为满足水质预警、国际合作、流域考核、监控重点城市饮用水源地水质和污染防治工作的要求，反映专项水污染防治工作成效，设立地表水专项监测网，包括地表水预警监测网、国界河流监测网、省界断面监测网、流域规划考核监测网、环保重点城市集中式饮用水源地监测网、“锰三角”地区地表水监测网等。

1. 地表水预警监测网：负责预警监控重点水体水质状况，由国家投资建设的148个水质自动监测站组成。

2. 国界河流监测网：主要负责监测和监控国界河流出入境水质，客观反映国界河流（湖泊）水质状况，包括中俄、中蒙、中朝、中哈、中吉、中越、中缅、中印和中尼等边界的41条国界河流（湖泊）的78个断面。

3. 省界断面监测网：负责监测和监控省界水体水质状况，根据《水法》和《水污染防治法》有关条款，组建网络由环境保护部负责，具体监测任

warning and monitoring of water quality conditions of key water systems.
2. The National Boundary River Monitoring Network involves 78 sections of 41 national boundary rivers (lakes) flowing through the borders between China and Russia, China and Mongolia, China and Korea, China and Kazakhstan, China and Kyrgyzstan, China and Vietnam, China and Burma, China and India and China and Nepal, etc. It is mainly responsible for monitoring and surveillance of the water quality of the boundary rivers and objectively reflecting the water quality of the national boundary rivers and lakes.
3. The Provincial Section Monitoring Network is responsible for the monitoring and surveillance of the water quality of water systems flowing across the provincial boundaries and setting up networks. It operates under the charge of the Ministry of Environmental Protection according to the relevant provisions of the "Water Law of the People's Republic of China" and the "People's Republic of China's Law on Prevention and Control of Water Pollution". The Ministry of Environmental Protection and the Ministry of Water Resources are responsible for the specific monitoring tasks and the monitoring data is shared between them.
4. The Drainage Area Planning Evaluation and Monitoring Network is mainly responsible for drainage area planning and the evaluation of monitoring tasks of sections. It determines the evaluation sections according to the key drainage areas' water pollution prevention plans and sets up the drainage area planning and evaluation monitoring network.
5. The Concentrated Drinking Water Source Monitoring Network of Key Environmental Protection Cities comprises of 407 concentrated drinking water sources in 113 key environmental protection cities, where the water quality monitoring is conducted by each city on a monthly basis.
6. The Surface Water Quality Monitoring Network in the "Manganese-rich Triangle" Area (the comparatively serious manganese-polluted areas around the borders between Chongqing, Guizhou and Hunan) mainly demonstrates the achievements of pollution prevention and control in this area by monitoring and controlling the water quality conditions in this area.



## II. Water Quality Monitoring

The surface water quality monitoring in China includes routine monitoring, automatic monitoring and emergency monitoring.
Routine monitoring is used to evaluate the national surface water environmental quality conditions; automatic monitoring is mainly responsible for the early warning and monitoring of the water quality of water systems, while emergency monitoring mainly focuses on fast field monitoring in case of unexpected pollution emergencies.

### 1 Routing Monitoring

**1. Monitoring Section**
Routing monitoring mainly takes the drainage area as the unit and the optimization of sections as the basis by means of manual sampling lab analysis. There are mainly national sections, provincial sections and estuary sections, all of which are under the control of the state. The environmental quality monitoring stations are responsible for performing the monitoring tasks. The identification of monitoring sections, sampling methods, storage and transport and monitoring, etc. is based on "Technical Specifications Requirements for Monitoring of Surface Water and Waste Water" (HJ/T91-2002 )and the analysis method is based on the national standard method. The quality assurance and control is executed in accordance with the requirements of the second edition of "The Environment Water Quality Monitoring Quality Assurance Manual."

**2. Monitoring Frequency**
Prior to 2003, national surface water routine monitoring was carried out six times annually within three different periods, including the low-flow period, the normal-water period and the high-water period. From 2003, the monitoring was carried out on a monthly basis, 12 times a year. Monitoring sampling was performed from the 1st to the 10th of every month.

**3. Monitoring Project**
The river monitoring projects under the surface water routing monitoring are carried out in accordance with requirements for the 24 items stipulated in Table 1 of "Surface Water Environment Quality Standards" (GB3838-2002). Flow monitoring is also carried out in some provincial sections to calculate the pollutant flux. On the basis of the river monitoring items - particularly the lakes and reservoirs - four indicators are added to evaluate the eutrophication condition: total nitrogen, total chlorophyll, transparency and water level.
For different monitoring projects, the monitoring instruments used for water quality monitoring include large analytical instruments and fast field monitoring equipment, etc. The large laboratory analytical instruments mainly include the atomic absorption spectrometer, the gas chromatograph, HPLC, the UV spectrophotometer, the gas chromatography-mass spectrometer, the infrared spectrometer and the atomic fluorescence spectrometer, etc., while the fast field monitoring equipment includes the dissolved oxygen meter, pH meter and the thermometer, etc.

#### (2) Automatic Monitoring

The surface water automatic monitoring system is composed of a remote control center (or central station) and water quality automatic monitoring sub-stations (or sub-stations) with online automatic analyzers at the



务由环境保护部和水利部分别负责，监测数据共享。
4. 流域规划考核监测网：主要负责流域规划考核断面的监测任务，根据重点流域水污染防治规划确定的考核断面，组成流域规划考核监测网。
5. 环保重点城市集中式饮用水源地监测网：113个环保重点城市集中式饮用水源地共407个，由所在地城市每月开展水质监测。
6. "锰三角"地区（渝、贵、湘交界锰污染较为严重的区域）地表水监测网：主要反映"锰三角"地区污染治理成效，监测监控"锰三角"地区水质状况。

## 三、水质监测

我国地表水水质监测包括常规监测、自动监测和应急监测。常规监测用于评价全国地表水环境质量状况，自动监测主要实现对水体水质的预警监视。应急监测主要是对突发性污染事件采取的现场快速监测。

### （一）常规监测

**1. 监测断面**
常规监测主要以流域为单元，优化断面为基础，采用手工采样、实验室分析的方式。主要有国界断面、省界断面、入海口断面，均为国控断面，由环境监测站承担监测任务。
地表水常规监测的监测断面布设、样品采集方法、保存和运输、监测等均按照《地表水和污水监测技术规范》（HJ/T91–2002 ）进行，分析方法均采用国家标准方法。质量保证和质量控制按照《环境水质监测质量保证手册》（第二版）的要求执行。

**2. 监测频次**
2003年以前，全国地表水常规监测按水期进行监测，每年进行枯、平、丰3个水期共6次监测。自2003年开始，每月开展监测，全年共12次。监测采样时间为每月的1～10日。

**3. 监测项目**
地表水常规监测河流的监测项目按照《地表水环境质量标准》（GB3838–2002）中表1规定的24个

项目进行，部分省界断面还进行流量监测，以计算污染物通量。
湖泊、水库在河流监测项目的基础上，增加总氮、叶绿素a、透明度、水位等4项指标，用于富营养化状态评价。
根据监测项目的不同，水质监测使用的监测仪器有实验室大型分析仪器和现场快速监测设备等。实验室大型分析仪器主要有原子吸收仪、气相色谱仪、高效液相色谱仪、紫外可见分光光度计、气相色谱-质谱仪、红外光谱仪、原子荧光仪等，现场快速监测设备有溶解氧测定仪、酸度计、温度计等。

### （二）自动监测

地表水自动监测系统由一个远程控制中心（简称中心站）和水质自动监测子站（简称子站）组成，它以在线自动分析仪器为核心，运用现代传感技术、自动测量技术、自动控制技术、计算机技术、无线通讯技术等组成一个综合性的水质自动监测体系。地表水自动监测的断面布设、监测分析方法等按照《地表水自动监测技术规范》的有关要求进行。
目前国家投资建设的重点流域地表水自动监测站近150个，中心站设在中国环境监测总站，各省还建立了省控地表水自动监测站，基本形成覆盖全国重点水域的自动监测网络，形成对重点水域实施自动监测和实时监控的能力。
地表水自动监测频次一般可设为每2h或4h监测一次（即每天12个或6个监测数据），当发现水质明显变化或发生污染事故时，监测频率可调整为连续监测。
为保证自动监测的数据质量，中国环境监测总站对各承担水质自动监测任务的环境监测站实施“周核查、月对比”的质量管理措施，定期进行仪器校准，使用电极的设备定期更换老化的电极，不断强化自动监测的质量管理工作。
随着国家水质自动监测系统的投入运行，充分发挥了实时监视和预警功能，在跨界污染纠纷、污染事故预警、重点工程项目环境影响评估及保障水环境安全等方面发挥了重要作用。

### （三）应急监测

突发性水污染事故没有固定的排放方式和排放途

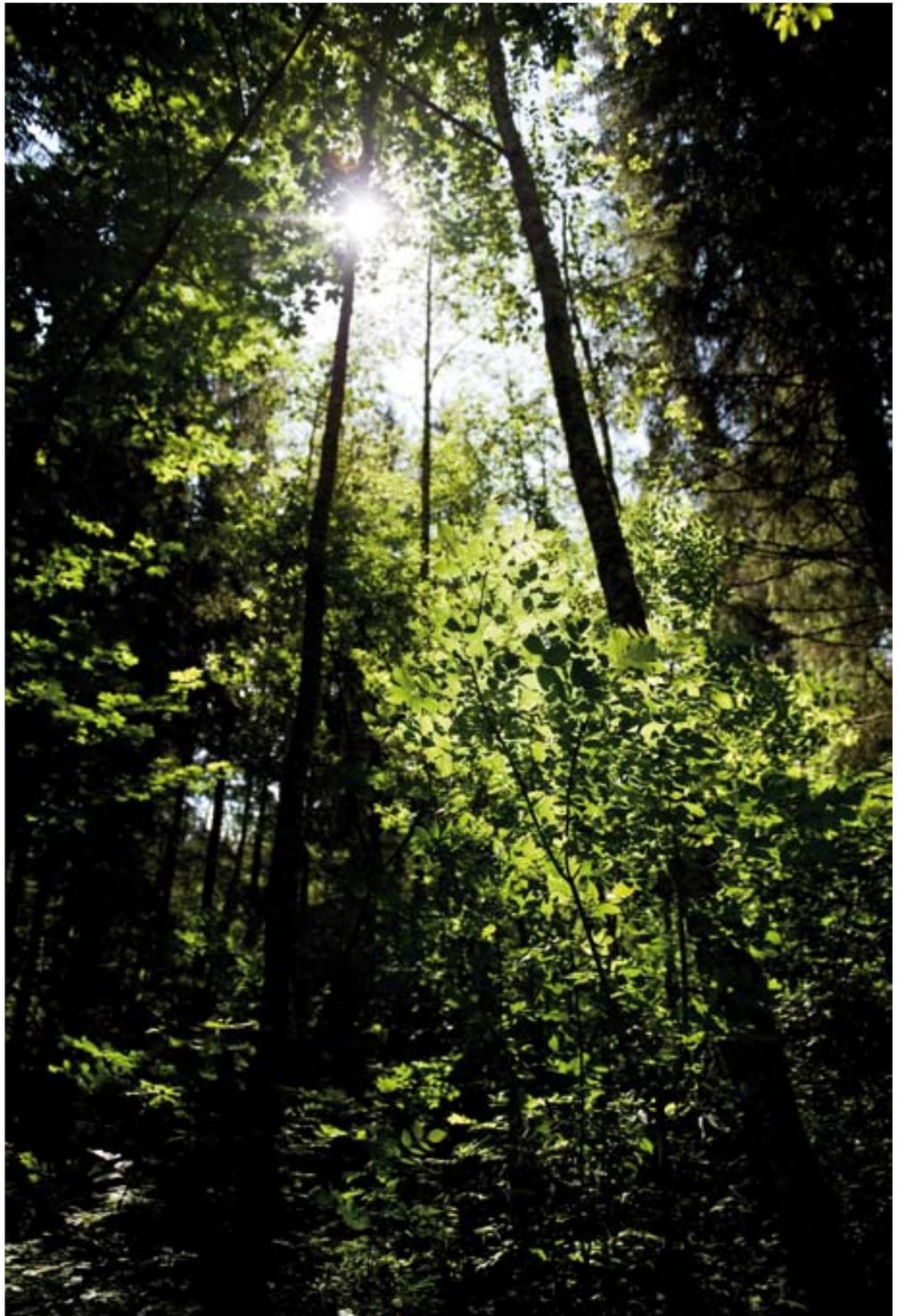


core, applying modern sensing technology, automatic measurement technology, automatic control technology, computer technology and wireless communication technology - constituting a comprehensive water quality automatic monitoring system. The identification of surface water automatic monitoring sections and the monitoring analysis methods is based on the relevant requirements in the “Technical Specification Requirements for Automatic Monitoring of Surface Water”.
At present there are nearly 150 surface water automatic monitoring stations funded by the state in the key drainage areas, with the central station in China’s National Environmental Quality Monitoring Centre (CNEMC). Each province has also set up provincial surface water automatic monitoring stations, thus the nationwide automatic monitoring network, covering the key drainage areas, has taken shape with a strong capacity for both automatic and real-time monitoring of the key drainage areas.
The frequency of surface water automatic monitoring follows two models: every 2 or every 4 hours (monitoring data is collected six or 12 times every day). The monitoring frequency can be adjusted to continuous monitoring in the case of any obvious change in water quality or the occurrence of a pollution emergency.
China’s National Environmental Quality Monitoring Centre (CNEMC) strictly implements quality management measures, featuring a “Weekly Check-up” and “Monthly Contrast.” It conducts regular instrument calibration and regular replacement of aging electrodes (for equipment that uses electrodes) so as to continuously strengthen the quality management of the automatic monitoring.
The implementation and operation of the national water automatic monitoring system has played a vital role in real-time monitoring, surveillance and early warning as well as in cross-boundary pollution disputes, early warning of pollution accidents, key engineering projects, environmental impact evaluation and the guarantee of water environmental security, etc.

### (3) Emergency Monitoring

Unexpected water pollution accidents are emergencies without fixed emission modes, routes or time frames. A large quantity of pollutants is discharged within a short period of time, which causes serious destruction to the environment. Unexpected water pollution accidents are mainly caused by highly toxic pesticides and poisonous chemical leaks or diffused pollution, and pollution accidents are caused by the abnormal emission of wastewater, etc.
The emergency monitoring and surveillance of the unexpected water pollution accidents are mainly carried out by the environmental quality monitoring professionals who conduct the field sample monitoring with the fast monitoring instruments. The emergency





monitoring results are generally reported on a real-time basis and the emergency monitoring personnel report the field monitoring results to the relevant department or authority dealing with the pollution accidents.

## III. Water Quality Evaluation

### (1) Evaluation Standards

In 1988, China promulgated the first "Environmental Quality Standard for Surface Water (GB3838-88) " and, in 1999, the Ministry of Environmental Protection re-issued the "Environmental Quality Standard for Surface Water GHZB1-1999)" based on the amendment to GB3838-88. In 2002, the state revised and promulgated the "Environmental Quality Standard for Surface Water (GB3838-2002)" which still remains effective today. With the amendment to the "Environmental Quality Standard for Surface Water", the Ministry of Environmental Protection revised and issued "Technical Specifications of Surface Water Environment Monitoring (HT/T91—2002) "and the surface water monitoring items were adjusted accordingly.

### (2) Evaluation Methods

Surface water quality classification evaluation is based on the single-factor evaluation method, to identify the item with the largest number of indicators of the sections to be assessed within the evaluation period. In view of the data statistics, the weekly, 10-day and monthly evaluation of the surface water quality is based on one-time monitoring data; in the case of multiple monitoring data, the evaluation is based on the arithmetic mean value of the multiple monitoring data. The quarterly evaluation is based on the arithmetic mean value of the monitoring data of more than two times (inclusive). The annual national surface water environment quality evaluation is based on the arithmetic mean value of the monthly monitoring data. As for a few sections or points that were not monitored due to reasons like a freeze-up period, there should be, in general, more than eight collections of monitoring data (inclusive) every year for the evaluation.
At present, national surface water quality evaluation is not based on the water periods.
Where the total number of sections of river drainage areas (water systems) is less than five, the arithmetic mean value of intensity of all evaluation indexes related to the river drainage areas (water systems) is calculated and then the evaluation can be carried out in the same way as the water quality of a single section is evaluated. Where the total number of sections of river drainage areas (water systems) is more than five (inclusive), the Method of Percentage of the Section Water Quality Grades is applied, namely to evaluate the water quality condition according to the percentage of sections of all water quality river drainage areas (water systems) out of the total number of evaluation sections of river drainage areas (water systems). Where the total number of sections of river drainage areas (water systems) is more than five (inclusive), the average water quality classification evaluation is not carried out.
The methods for evaluating the lake and reservoir eutrophication level is based on the comprehensive nutritional status index methods with such evaluation indicators as chla, TP, TN, SD and $COD_{Mn}$.

## IV. Water Quality Report and Information Release

The environmental protection system prepared the first annual environmental quality report in 1980. In 1991, the original State Bureau of Environmental Protection issued the "Environmental Quality Report Compilation Outlines (Interim Regulations)" and the "Technical Specifications for Environmental Quality Report Compilation (Interim Regulations)" (HJZ[1991] No. 092), stipulating the compilation outline and the publication regulations for the annual environmental quality report and five-year environment quality report, etc. The "Technical Specifications for Environmental Quality Report Compilation (Interim Regulations)" is mainly formulated for preparing municipal reports, so the national and provincial reports can refer to the provisions.
In the "Technical Specifications for Environmental Quality Report Compilation (Interim Regulations)", the annual report calls for the monitoring results from water sources, rivers, lakes, reservoirs, groundwater, offshore sea waters and others. Water quality evaluation requires that priority is given to the reflection of the water quality status and the interannual changes. The water quality review necessitates that priority is given to problems of environmental quality regarding different water systems and the trends for further development.
The preparation and compilation of the national five-year environmental quality report began in the 1990s. It requires that water environment quality evaluation is undertaken according to the different water systems, the reflection of the annual mean value, range of values and changes to the over-limit ratio conditions of drinking water sources within five years, as well as the evaluation of the groundwater and offshore sea waters.
In 1996, the original State Environmental Protection Administration promulgated the "Environmental Quality Monitoring Reporting System" (HJ[1996] No. 914), which required the classification of environmental quality monitoring reports into the brief update, bulletin, monthly report, quarterly report, annual report and (five-year) environmental quality report, according to the specific contents and the water periods. The brief update represents a report form focusing on the emergency monitoring of major pollution events, unexpected pollution accidents and natural disasters exerting serious impact on the environment. It is organized and prepared by the local environment protection authorities at different levels and reported to the upper authorities within 24 hours of the emergency's occurrence.





径、排放时间，都是突然发生，在短时间内排放大量的污染物质，对环境造成严重的污染和破坏。突发性水污染事故类型主要有剧毒农药、有毒化学品的泄漏或扩散污染事故，非正常大量排放废水造成的污染事故等。
突发性水污染事故的应急监测主要由环境监测专业人员采用快速监测仪器赴现场采样监测。应急监测结果一般采用即时上报的方式，应急监测人员及时将现场监测结果报送污染事故的处理部门。

## 三、水质评价

### （一）评价标准

1988年，我国颁布了第一部《地面水环境质量标准（GB3838-88）》；1999年，国家环保总局在GB3838-88标准的基础上修改颁布了《地面水环境质量标准（GHZB1—1999）》；2002年，国家重新修订颁布了《地表水环境质量标准（GB3838-2002）》，沿用至今。
随着地表水环境质量标准的修订，国家环保总局于2003年重新修订颁布了《地表水环境监测技术规范（HT/T91—2002）》，地表水例行监测项目也相应作了调整。

### （二）评价方法

地表水水质类别评价采用单因子评价法，即根据评价时段内该断面参评的指标中类别最高的一项来确定。
数据统计方面，地表水水质周、旬、月评价可采用一次监测数据评价；有多次监测数据时，采用多次监测结果的算术平均值进行评价。季度评价至少采用2次以上（含2次）监测数据的算术平均值进行评价。全国地表水环境质量年度评价，以每月监测数据的算术平均值进行评价，对于少数因冰封期等原因无法监测的断面（点位），一般应保证每年至少有8次以上（含8次）的监测数据参与评价。目前全国地表水不按水期进行评价。
当河流、流域（水系）的断面总数少于5个时，计算河流、流域（水系）所有断面各评价指标浓度算术平均值，然后按照单个断面水质评价方法评价。
当河流、流域（水系）的断面总数在5个（含5个）以上时，采用断面水质类别比例法，即根据评价河流、流域（水系）中各水质类别的断面数占河流、流域（水系）所有评价断面总数的百分比来评价其水质状况。河流、流域（水系）的断面总数在5个（含5个）以上时不作平均水质类别的评价。
湖泊、水库营养状态评价方法采用综合营养状态指数法，评价指标为：叶绿素（chla）、总磷（TP）、总氮（TN）、透明度（SD）和高锰酸盐指数（$COD_{Mn}$）共5项。

## 四、水质报告与信息发布

从上世纪八十年代起，环保系统开始编制年度环境质量报告书（1980年）。在1991年原国家环保局下发了《环境质量报告书编写大纲（暂行）》和《环境质量报告书编写技术规定（暂行）》（环监字[1991]092号）文件，规定了年度环境质量报告书和五年环境质量报告书的编写大纲以及报告书的出版规定等。《环境质量报告书编写技术规定（暂行）》主要为城市级报告书的编写制定的，全国及省级报告书可参照执行。
《环境质量报告书编写技术规定（暂行）》中，年度报告书要求分别给出饮用水源、江河、湖库、地下水、近海海域及其他监测结果。水质评价部分要求重点反映水质状况及年际变化情况。水质评述部分要求重点评述不同水体水环境质量问题及发展趋势等。
全国五年环境质量报告书的编制从上世纪九十年代开始，要求水环境质量评价时要按不同水体进行评价，对饮用水源给出反映五年中各年年平均值、范围值及超标率变化情况；对江河、湖库给出反映五年中各年不同水期平均值、范围值及超标率变化情况；同时对地下水和近海海域也需进行评价。
1996年，原国家环保局又颁布了《环境监测报告制度》（环监[1996]914号）文件。《环境监测报告制度》要求环境监测报告按内容和水期分为环境监测快报、简报、月报、季报、年报、环境质量报告书（五年）。环境监测快报是对重大污染事件、突发性污染事故和对环境造成重大影响的自然灾害等事件的应急监测进行报告的一种形式，由地方各级环保局负责组织编写并在发生事故的24小时之内报出。环境监测季报、月报由地





The environmental quality monitoring quarterly report and monthly report are organized and prepared by the relevant local authorities, focusing on the environmental quality monitoring data under their jurisdiction and the text-based report is prepared and reported by China's National Environmental Monitoring Centre (CNEMC). The Environmental Quality Monitoring Report and the Five-year Report are organized and prepared by the local environmental protection authorities, and CNEMC is responsible for preparing and compiling the National Environmental Quality Report. All environmental quality reports will be based on "Technical Specifications for Environmental Quality Report Compilation (Interim Regulations)" in terms of the specific contents and methods for data processing and evaluation.
China's National Environmental Quality Monitoring Centre (CNEMC) will prepare and compile all types of reports on a regular basis, such as the "Water Quality Monitoring Weekly Report of Key Drainage Areas", the "National Surface Water Quality Report", the "Water Quality Monthly Report on Concentrated Drinking Water Sources in Key Environmental Protection Cities" and the "National Environmental Quality Report", etc. They will be properly released according to "Environmental Quality Monitoring Reporting System".
For the purpose of further deepening the public's knowledge of environmental quality and giving more attention to the role played by the national surface water quality automatic monitoring stations in real-time monitoring and early warning and surveillance of environmental management and water pollution prevention and control and implementation of the provincial boundary target responsibility systems, the Ministry of Environmental Protection released to the public on July 1, 2009 via the website www.mep.gov.cn and www.cnemc.cn, real-time monitoring data collected by the national surface water quality automatic monitoring stations.
The provincial and municipal environmental quality monitoring stations are responsible for preparing and compiling all kinds of reports concerning the water environmental quality under their respective jurisdiction and reporting to both the local environmental protection authorities and relevant government departments.
The public release of all kinds of water environmental quality reports and the real-time automatic monitoring data satisfies the public's right to know about environmental quality, and enables greater efforts to strengthen the vigorous publicity of environmental protection, enhance public environmental awareness and elevate the image of government departments.

方组织编写本辖区内的环境监测数据型报告，文字型报告由中国环境监测总站编写并上报。环境监测年度和五年报告书由地方环保局组织编写辖区内的年度和五年环境质量报告书，总站负责编写全国环境质量报告书。所有环境质量报告书的编写内容和数据处理与评价方法等都执行《环境质量报告书编写技术规定（暂行）》。
根据《环境监测报告制度》，中国环境监测总站定期编制的各类报告，如“重点流域水质自动监测周报”、“全国地表水水质月报”、“国家环保重点城市集中式饮用水源地水质月报”、《全国环境质量报告书》等，定期报送环境保护部，并以适当的方式发布。
为进一步深化环境信息公开工作，充分发挥国家地表水水质自动监测站在环境管理、水污染防治方面的实时监控与预警监视作用，落实省界目标责任制，环境保护部于2009年7月1日起向全社会公开发布国家地表水水质自动监测站的实时监测数据，发布地址为环境保护部网页（www.mep.gov.cn）和中国环境监测总站网页（www.cnemc.cn）。
各省、市环境监测站编制辖区内水环境质量的各类报告，报送当地环境保护主管部门、政府部门。
各类水环境质量状况报告、自动监测实时数据等的公开发布，满足了广大人民群众的环境质量知情权，加大了环境宣传的力度，增强了社会公众的环境意识，提升了政府部门的形象。

# Biological Monitoring: a Tool for Water Management
# 生物监测: 水管理工具

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The management of water resources has been, until very recently, based almost completely on the monitoring of the chemical characteristics of industrial and urban effluents and, to a lesser extent, on the chemical monitoring of the receiving water bodies. This approach, in many cases, has failed to adequately protect aquatic environments. Hence, it has become necessary to perform environmental monitoring with a combination of chemical and biological tools.

**Chemical analysis** is traditionally used for: monitoring single substances, with the primary objective of identifying and quantifying the major contaminants that may be of concern; for monitoring the compliance with water quality standards/limits; or for monitoring levels of parameters (i.e. nutrients) of importance to ecological assessments. Very often, the number of substances and parameters measured are voluminous and not defined in line with the primary requirements for either retrospective or prospective environmental impact assessments. The parameters have often been identified on the basis of historical reasons and the tendency has been towards an expansion of the number of organic xenobiotic substances and metals monitored, as the technical ability of chemical analysis developed.

**Biological monitoring** is mainly focused on the assessment of the ecological structure (diversity) and to a lesser extent on its function. An important strength of well-designed ecological monitoring is that the registration of integrated responses, due to environmental pressures and anthropogenic changes, is possible for long periods. Both single biological indicators and communities of biological indicators are known to be excellent means of assessing water quality. Unlike the monitoring of chemical and physical data, biomonitoring is capable of revealing the effects of toxic substances on living organisms. Biomonitoring can also detect synergistic or antagonistic effects of contaminant mixtures and, as it investigates the composition of biological communities, it characterizes water quality over a certain period of time without the limitation of the "snapshot" approach or chemical analysis. In order to make sure that all effects are observed, a tendency similar to that of chemical monitoring has been seen: ever more species must be included in the programs. The natural variation in the species' composition due to climatic conditions and/or interspecies competition is in many situations so high, however, that very long time series

一直以来对水资源的管理主要是基于对工业污水和城市生活污水的化学特征进行监测，而很少对受体水进行化学监测。这种方法在很多情况下不能很充分地保护水环境。因此，有必要将化学和生物工具结合起来进行环境监测。

**化学分析**传统上是用来监测单一物质，将所关注的污染物进行识别和量化，监测其是否符合水质标准，或监测对生态评价具有重要意义的一些参数（如：营养物质）。一般来讲，所监测的物质数量和参数数据是海量的，与追溯性评价和前瞻性评价的主体要求不相符合。这些数据基本上是根据当前的化学分析能力，基于历史情况、有机异型生物质数量以及所监测到的金属情况来确定的。

**生物监测**主要是对生态结构（生物多样性）进行评价，而对其功能评价在一定程度上关注较低。因此，加强生物监测，即：对由于环境压力和人文干扰所产生的反应进行综合性一体化记录，这种做法在较长时期内是可行的。众所周知，单一生物指标和集群生物指标都是对水质量进行评价的很好方法。与化学和物理监测不同，生物监测能够反应活性组织中有毒物质的影响。生物监测也可以发现协同性或对抗性污染物混合体所产生的效应。随着生物监测对生物集群成分进行分析，也就在一定时间内反应出水质特点，避免了"快速间断"方法或化学分析方法所带来的局限性。为了确保所有影响都能被及时观察到，也逐渐出现了与化学监测相似的趋势。由于气候变化或物种间竞争，使得物种成分出现了些自然变化，通过长期观测可以发现这种变化对环境产生的影响。此外，生物监测的一般性和非针对性使得其监测结果作为决策依据变得很困难。如何对生态影响类型或哪种生态功能及结构濒临危险进行预测，将是服务于管理的生态监测计划中的一项重要任务。

为了提高对水管理信息服务，最近提出了生态毒

are required to unveil significant environmental effects.
In addition, the general, unspecific nature of this ecological monitoring makes it difficult to make management decisions based on such results. Prediction of which types of ecological impacts to expect or which ecological function or structure are at risk should be an important task in management-oriented ecological monitoring programs.
To improve the information for correct water management, the ecotoxicological monitoring tool has recently been launched, involving direct testing of environmental samples for their direct toxicity to selected laboratory test organisms.
**Ecotoxicological monitoring** is aimed at the assessment of the environmental impact of hazardous substances, either as a theoretical predictive assessment of chemical monitoring data (assessment of the potential effects of the single components quantified) or as a direct measurement of the toxicity of samples to various laboratory cultures of organisms.
Ecotoxicological concepts, principles and methods can be employed either before or after a pollution event takes place:
_ before forecasting the possible undesirable effects on the environment due to the input of a single chemical or a mixture of chemicals;
_ after assessing the undesired effects produced into the environment by the introduction of a single chemical or a mixture of chemicals, considering the physical, chemical and biological interactions with the different abiotic components of the environment itself.
The application of ecotoxicological tools should be seen as a result of the increasing awareness of the contamination of the environment by a very high number of chemicals – a problem for which a chemical analytical approach alone would be technically impossible and also far too expensive to implement.
The strength of the biotesting approach is that the combined toxic impact of all the hazardous components in the sample is accounted for – also those that have been overlooked in the chemical monitoring program or have not been detected above the detection limits of the analytical method applied.
The primary weakness is that the testing organism used may not be among the most sensitive organisms for the sample composition in question. Consequently, there may still be a toxic impact on some of the organisms in the compartment even when the biotest does not signal any toxic impact. Another problem is that, very often, the methods used are screening methods and the data from such methods is not easily extrapolated into the long-term chronic impact on the biota.
Therefore, there is a need for the development of sufficiently sensitive methods that are interpretable in an ecological context.
For these reasons, in water management, the prediction of the risk of impact on ecological systems must be assessed with all the described biological tools that can be applied through different approaches:



理监测工具。利用它可以对环境样品的实验室检测组织直接进行毒性检测。
**生态毒理监测**是对危险物质给环境所带来的影响进行监测。它既可以对化学监测数据予以理论性预评估（对定量单一物质潜在影响进行评价），也可以对各种实验室培养的组织的环境样品毒性进行直接检测。
在污染事故发生前后，都可以采用生态毒理的概念、原则和方法:
_ 当单一化学品或混合物进入环境后，在预测其可能带来的不良影响之前;
_ 考虑到各种非生物成分在环境中可能发生物理、化学和生物反应，可对单一化学品或化学品混合物对环境所产生影响后评估之后;
生态毒理工具的应用是对大量化学物质污染环境的认识的提高。这个问题只靠化学分析方法是解决不了的，而且执行起来也太过昂贵。
生物检测工具的优点就在于能够将样品中所有危险物质所带来的毒性影响能够检测到，也可以将漏掉的化学品检测出来，或者是把在检测线内未检出的物质检测出来。
该工具的主要弱点是测试组织有可能不对样品中各种成分最为敏感，其结果导致检测后并没有发现任何毒性影响。另一个问题是，所采用的方法是筛除法，这种方法所得数据并不能轻易地推算出对生物质将产生的长期效应。
因此需要开发出一种灵敏度较高的方法，以便对所产生的生态影响作出解释。
正是基于这些原因，在水管理方面需要采取各种方法对生态系统可能产生影响的风险进行评估:
_ 对暴露组织的生态学进行研究，以期发现一定水平的化学品毒性对暴露在环境中的该组织所产生的负面影响;
_ 选择液体或组织进行浓度比较;
_ 测定暴露在有毒化学品环境中的生物参数。
考虑到所调查地点的流行病和该地生物的行为状况，第一种方法主要集中解决集群成分问题（物种数量、丰富程度、生物多样性指标等）。
第二种方法是利用生物指示物，这些组织从环境中以不同方式吸收有毒物质。这种研究的目的是评价:
_ 水中生物浓度 (即: 地衣和苔藓中的金属含量);
_ 水、空气、土壤、食品的生物蓄积性 (即: 软体动物污染物浓度测定);
_ 通过食物链 放大 (即: 梭鱼中汞含量，食欲鸟中的DDT含量)。
第三种生态毒性方法是基于以下检测:
_ 具体的生物化学指标 (即: 细胞色素P450 单加氧酶摄入，标志着暴露在有机污染物中);
_ 非具体生物化学指标（在儿苯酚胺和皮质类固醇荷尔蒙分泌变化所导致的内分泌系统反应、生殖性类固醇荷尔蒙变化所导致的生殖系统反应）;
_ 分子反应 (由于致癌物和基因毒性化合物所导致的基因表达，DNA加合物形成，以及DNA链断裂)。

### 意大利在水环境管理方面，一体化的、化学、生态、生态毒理监测方面的立法情况:

意大利水管理政策对上述各种监测工具的一体化运用作出了明确的规定。
编号为D.lgs 152/2006法律和欧盟指令 (dir. 200/60/CE)旨在要求建立对表面淡水、过渡性水域（入海口、沿岸泄湖）、沿岸水域、地下水等制定相关规定，以期:



_ the study of the biology of exposed organisms, aiming to detect adverse effects which could indicate exposure to toxic levels of chemicals in the environment;
_ the comparison of the concentrations in selected fluids or tissues with reference limits;
_ the measurement of biological parameters which are related to the exposure to toxic chemicals.
The first approach addresses the community composition (number of species, relative abundance, richness, diversity or biotic indexes) taking into account the epidemiology and the behavior of the inhabitants of the investigated site.
The second approach makes use of bioindicators, which are organisms that pick up the toxicants from their environment in different ways. In particular, the studies of this kind aim to assess:
_ bioconcentration from water (i.e. metals in mosses and lichens);
_ bioaccumulation from water, air, soil, food (i.e. measure of pollutant concentrations in molluscs);
_ biomagnification through the food web (i.e. accumulation of Hg in pikes, or DDT in fish-eating birds).
The third ecotoxicological approach is based on the detection of:
_ specific biochemical indicators (i.e. Cytochrome P450 monooxygenase induction, indicating an exposure to organic pollutants);
_ nonspecific biochemical indicators (endocrine responses resulting from alterations in the release of catecholamines and corticosteroid hormones; reproductive responses after alterations of reproductive steroids hormones);
_ molecular responses (gene expression, DNA adduct formation, DNA strand breakage, due to carcinogenic and genotoxic compounds).

## Integrated Chemical, Ecological and Ecotoxicological Monitoring in Italian Legislation in the Field of Water Policy

An example of the application of integrated monitoring based on all the described tools is represented in the Italian legislation in the field of water policy.
The overall purpose of the quoted new Italian law (D.lgs 152/2006) and the EU Directive (dir. 200/60/CE) is to establish a general discipline for surface fresh water, transitional waters (estuaries, brackish coastal lagoons), coastal waters and groundwaters, with the aim of:
_ preventing further deterioration, protecting and enhancing the status of aquatic ecosystems;
_ promoting sustainable water use based on the long-term protection of available water resources.
All significant water bodies are considered to be ecosystems directly connected to a territorial district and their monitoring and control must be performed on water, sediments and biota.
For each different type of water body, the classes of environmental quality have been defined and the quality objective of a good environmental status has been fixed to be reached by the year 2016 for all significant water bodies. The good environmental status is defined as the condition in which the water body, although influenced by human activity, nevertheless maintains its capability of recovering the natural conditions needed to support rich and balanced animal and vegetal communities. Normative definitions for the ecological status classification are described, and the quality elements (biological, hydromorphological and chemical) to be considered for assessment of the quality status are fixed according to the different water types.
For each of the different types of water bodies, a specific monitoring and classification procedure is defined to classify the water body according to a scoring method. Indexes of chemical quality (based on a reduced number of parameters), biological quality (the EBI index, based on the macro-invertebrates community is compulsory), ecological quality (combined chemical and biological index) and environmental quality (ecological index and presence/absence in water, sediment and biota of dangerous micropollutants) are established to assign the defined quality to the examined water body.
For the assessment of its environmental quality, biological and ecotoxicity monitoring have been established. For example, in the case of biota, suggested toxicity tests are:
_ *Daphnia magna;*
_ teratogenic and mutagenic assay on concentrated samples;
_ algae;
_ bioluminescent bacteria;
_ bioaccumulation assay on fish muscle tissues or macrobenthos species.
Thus, the Italian legislation suggests the development of specific toxicological tests and methodologies, for the different types of water bodies, encouraging the use of autochthonous species. Moreover, established ecotoxicological tests (acute tests) are already compulsory in the case of discharges (urban and industrial, water treatment plants) in surface waters.

## Conclusions

In future monitoring activities, the use of an integrated monitoring approach should be applied, selecting relevant chemical, ecotoxicological and ecological monitoring tools focused on the protection of the environment and human health according to defined quality objectives. The future monitoring programs should be planned and conducted in a more proactive fashion, only including those parameters that are of relevance to impact assessment or which should be followed to control the success of mitigating activities in the area. The program should be regularly reviewed in order to take into account the dynamic changes in the monitored environment and the resulting changes in risk quotients for risk to ecological systems and human health.





_ 预防进一步恶化、保护和提高水生系统状况;
_ 长期保护可用水源，推动可持续水利用。
所有重要水域都要与陆地系统直接相连，因此必须对水体、沉积物和生物介质进行全面监测。
对于每一种不同水体，都对其环境质量进行准确界定；并确定了所有重要水体到2016年应到达的良好环境质量目标。尽管水体会受到人类活动的影响，但对于重要水体，则要求必须达到能够维持自然恢复其良好系统状态，以支持丰富的、平衡的动植物种群。在法规中对不同生态状态的类型给出了准确定义， 并对不同类型水体的各类质量因素（包括生物、水形态、化学的）进行了明确，以利用它们对水质状态进行评价。
对于不同类型的水体，根据打分方法来选定具体的监测和分类程序。对不同水体将采用这些指标进行检测：化学质量指标 (基于参数数量减少)、生物质量指标 (EBI指标, 对于大型无脊椎动物群体，该项指标是必选动作)、生态质量指标 (将化学与生物指标相结合)和环境质量指标（生态指标和危险微生物在水体、沉积物和生物介质中存在/消失的情况）等。
评价环境质量的生物和生态毒性检测方法已经建立起来。建议采用以下生物介质进行毒性检测:
_ 大型蚤;
_ 对高浓度样品致畸、突变组织;
_ 水藻;
_ 生物荧光细菌;
_ 对鱼体肌肉组织或者大型海底生物种类。
为此，意大利法律规定鼓励用当地生长的物种来进行不同水域的毒性测试，并建立相应的方法学。此外，对接受排污的地表水，政策必须采用已建立的生态毒性检测方法（急性测试方法）。

## 结论

在将来的监测工作中，应当运用一体化的综合监测方法，根据质量目标，为保护环境和人体健康选择相关的化学、生态毒性、和生态监测工具。未来的监测计划将以一种更为积极的方式进行规划并发挥作用，并只引入那些对影响评价有帮助的参数，或者只跟踪那些确保污染物成功削减的数据。应该定期对监测计划进行评估，以充分考虑环境中的动态变化，以及这些变化给生态系统和人类健康所带来的危害。

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# 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。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。



## Tianjin Science and Technology Committee
## Innovation of Environmental Technology and Management
Italy, October 2-16, 2010
21 participants

The arrangement of this training program was very well considered and the study content was abundant. This program offered us a comprehensive understanding of the environment and history of Venice, the environmental policies of both Italy and the EU, Italy's national and local air pollution control and water pollution control strategies, as well as the management and technology of recycling resources and low carbon energy efficiency.

**1. My Impression of Italy**

**(1) Environment Protection**

Italy pays attention to the establishment of laws and regulations so as to identify related aims. During the study I really felt that the Italian government attaches great importance to environmental issues. The government not only implements EU environmental laws and standards, but also makes upgrades according to the development of the economy and environmental changes. The Italian government controls the total amount of pollutants based on the issues of air and water protection made by Italy and the EU. It also manages the pollution emission rights of industries to severely restrict the function of government administration and the behavior of enterprises during pollution reduction control and energy conservation. Italy has built a strict water resource protection and supervision system, implemented a series of plans for water pollution control and management, and established dedicated valley management mechanisms and technological institutes. All of these measures have offered reliable legal and institutional guarantees for the sustainable regional development of the environment and the economy.

**(2) The Establishment of an Environmental Monitoring Network**

With nearly 100 monitoring network stations, Italy has created a more comprehensive environment monitoring network and environmental evaluation system. The monitoring data is regularly released to the public to both achieve and draw attention to all aspects of quality environmental management. City air monitoring stations, traffic air monitoring stations and industrial area air monitoring stations have all been set up around the nation; the air monitoring stations have been established in the rural areas as well.

**(3) The State Gives Full Support and the Government and Enterprises Take Responsibility for Themselves**

With a certain amount of money used for environmental monitoring and research, the Italian government pays special attention to environmental protection input. The government values the planning of



## 天津市科学技术委员会
## 环境技术与管理的创新
意大利, 2010年10月2日-16日
21位学员

本次培训在时间安排上有序、内容充实，使我们了解了威尼斯的环境和历史、欧盟和意大利的环境政策、意大利国家和地方层面的大气、水污染控制以及资源循环利用、节能低碳等方面的管理与技术。

**一、对意大利的印象**

**1、在环境保护方面**

意大利注重建立法律、法规，明确相应目标。在学习中感受到意大利政府对环境工作非常重视，不仅执行欧盟的环境法律和标准，并根据经济发展和环境目标的改变不断进行更新。意大利政府不仅依据本国及欧盟所设定的大气和水质保护的目标进行污染物排放的总量控制，对排污企业实施排污权管理，以严格约束政府管理部门和企业在污染控制、减排中要履行的职能和行为。意大利建立了严格的水资源保护和监督体制，实施了一系列水污染控制和治理计划，成立专门的流域管理机制和技术机构，为保障区域内环境和经济的可持续发展提供了可靠的法律和组织保障。

**2、建立环境监测网络**

意大利目前形成了较为完善的环境监测网络和环境影响评价体系，全国布点近百个监测网站。通过监测数据向社会定期进行公布，以得到方方面面重视，并满足环境质量管理要求。全国不仅设城市空气监测站、交通空气监测站、工业区空气监测站，而且还设农村空气监测站，较为全面的反映整个区域的空气质量变化特征及变化规律，对区域环境污染特征、规律的研究及环境质量改善有非常重要的意义。

**3、国家重点支持，政府、企业各负其责**

意大利政府非常重视对环境保护的投入，每年投入一定资金用于环境监测和科研工作。意大利政府重视工业区规划，将工业区同一类型企业进行集中，有利于采取统一技术对污染进行处理，要求企业安装污染物自动监测系统，凡是没有安装连续监测系统的企业不允许开工生产。在威尼斯大区，政府环保部门

industrial areas by centralizing the same type of enterprises in the industrial area. These measures help to manage pollution by adopting the same technology. The government also asks enterprises to install automatic pollutant monitoring systems. Enterprises without continuous monitoring systems are not allowed to operate.
In Venice, the environmental protection department of government and enterprises jointly invested in building monitoring facilities and platforms. The enterprises take part in daily pollution monitoring and management.

**(4) Focus on the City's Energy Efficiency and the Use of Renewable Energy**

The Italian government attaches great importance to energy conservation in city buildings. It considers the needs of energy conservation, from design to construction materials. With regard to energy consumption, Italy increasingly reduces the consumption of petroleum and coal, vigorously develops renewable energy, and offers preferential power prices for renewable energy. Meanwhile, the government grants an energy-saving green certification to enterprises that implement energy conservation to encourage them to save energy.

**(5) Improve Production Layout to Build Green Industrial Area**

More than 90% of enterprises in Italy are small and medium enterprises, mainly agricultural processing, fashion, furniture, machine automation, and automobiles and parts. Employment, revenue and export all depend on these industries. Italy centralizes enterprises that have a commonality, are complementary and are of the same value chain in certain fields. It establishes green industrial areas to develop industry clusters. Tertiary industry plays an important role in Italy. The design of products is completed by companies of tertiary industry - enterprises responsible for manufacture and management. This measure helps to centrally treat wastewater and waste produced by these enterprises. It can also reduce the production costs of enterprises and improve the benefits.

**2. Reference for Future Work**

**(1) Draw Lessons from Italy's Experience of City Management**

Italy has many historical cultural sites that are well preserved. In our future work, we need to utilize Italy's experience as a reference to enhance historical construction and historical cultural protection. Every new project should be conducted according to the planning and through sufficient argumentation and selection. Historical sites should not be demolished at will. We should make planning a priority and carry out construction based on planning to preserve the historical style.

**(2) Attach Importance to Fundamental Research and Strengthen Environmental Monitoring**

We should enhance and pay attention to fundamental research and the construction of a monitoring network, establish and perfect environmental monitoring systems and related laws and regulations, and punish polluters with laws and regulations according to monitoring data.

**(3) Let Enterprises Participate in Pollutant Monitoring**

We should change the fact that enterprises are passively regulated by authorities in pollutant monitoring. The authorities need to identify the responsibilities of enterprises and encourage them to take part in management and monitoring. The transparency of the regulation should be improved, and the sense of responsibility and initiative for enterprises to protect environmental needs should be strengthened as well to reduce management costs and promote more effective management.





和企业共同投资建立了工业区监控设施及监控平台，企业参与日常的污染监控和管理。

**4、注重城市能源效率和可再生能源利用**

意大利政府高度重视城市建筑节能。从设计到建筑用材等多方面考虑节能的需要，在能源消耗方面，逐步减少石油、煤炭消耗比重，大力发展再生能源，对可再生能源国家给予电价优惠。同时节能企业生产的产品给予节能绿色认证，鼓励企业节能。

**5、搞好生产布局，建立绿色工业园**

意大利90%以上的企业为中小企业，主要有农副产品加工、时尚产品、家俱、机械自动化、汽车及配件等，人员就业、财政收入、出口创汇都集中在这些行业，意大利发展产业集群，就是将特定领域，有共同性、互补性、价值链能连起来的企业进行相对集中，在这些区域建立绿色工业园。充分发挥第三产业的作用，在园区内企业产品的设计、理念由第三产业公司来完成，企业进行生产管理。这样一方面有利于对这些企业生产的废水、废物进行统一处理，另一方面能降低企业生产成本，提高企业效益。


**二、对今后工作的借鉴**

**1、借鉴意大利的城市管理经验**

意大利历史文化遗迹多，保护的也好。我们在今后工作中要特别借鉴这方面的经验，加强对历史建筑、历史文化的保护，每项新的建设都要遵规划而行，每个工程都经充分论证、比选，特别是对历史遗迹不能随意拆除，做到规划先行，依据规划进行建设，保护历史风貌。

**2、重视环境基础研究工作，加强环境监测**

加强和重视环境基础性科研和监测网建设，建立完善环境监测体系和相关法律法规，以监测数据为依据，用法律、法规对污染企业进行惩罚。

**3、让企业主动参与污染源监控**

在污染监督管理中，应该逐步改变企业被动接受管理的局面，在区域污染控制和管理中，明确企业的责任，引导企业参与共同管理和监控，提高执法监督的透明性，增加企业对环境保护和污染减排的责任感和主动性，以降低管理成本，提高管理成效。

**4、用政策倾斜来鼓励企业保护环境**

现在我们与意大利在污水处理技术方面没有差别，但是在污泥处理方面还有差距，我们目前对污泥还是采取填埋或堆放方式，这样一方面污染环境，二是加大占地空间，现在意大利对污泥采取焚烧发电方式，发电除自用外，对余电允许上网并给予优惠，同时将最后余渣用做建筑材料或修公路，这样能使污水处理企业做到可持续发展。

孙占明

**(4) Encourage Enterprises to Protect the Environment with Preferential Policies**

Our technology with regard to sewage management is as good as that of Italy, but we are still backward in the field of sludge disposal. At present, we still dispose of sludge by burying or dumping it. This method both contaminates the environment and occupies more land. Italy treats sludge by burning and generating electric power. The electric power generated by burning sludge not only meets the demands of power plants but is also sold on the Internet at preferential prices. The residue of buried sludge can be used to build highways or as construction materials. By taking this measure, the sewage treatment enterprise can achieve sustainable development.

*Sun Zhanming*



## Beijing Municipal Environmental Protection Bureau
## Pollution Source Management Permit and Emission Trade

Italy, September 4-18, 2010

15 participants

From September 4-18, 2010, 15 officials and technicians from BMEPB attended the training program Pollution Source Management – Permit and Emission Trading. Sixteen lectures and four site visits were arranged, mainly concerning three aspects of pollution source management: environmental laws, policies and institutions in the EU and Italy; the EU and Italy's experiences on pollution source management, namely emission inventory management, industrial emission monitoring and alarm systems, and mobile source management; and the EU – ETS.

We were deeply impressed by the well-organized program and the earnest and hardworking Italians involved. Both living and working issues were carefully arranged, which could be seen in the details, for instance, from the on-time pickup, the considerable attention to Chinese and Italian meals, neatly bound lecture materials, internet access and carefully prepared lectures, etc.

The lectures and site visits stressed the important roles of environmental legislation and economic stimulation in environmental management, especially the legislative reaction to asbestos pollution. Other good qualities in western culture, such as emphasizing operational details, should be combined with our good qualities in future practice.



## 北京市环境保护局
## 污染源管理–许可与排放贸易

意大利, 2010年9月4日 - 18日

15位学员

2010年9月4–18日，围绕本次学习的主题“污染源管理—污染物许可和排放交易”，北京市环保局一行15人共参加了16次课堂学习、4次实地参观。主要学习内容可以概括为三个方面，一是欧盟和意大利环境法律、政策与管理体制，二是欧盟及意大利污染源管理经验，包括排放清单管理、工业污染监测与预警系统、移动源管理等，三是欧洲排污交易体系ETS运行机制和现状等。

整个培训组织安排得十分周密，而且意方人员工作作风非常严谨，给我们留下了深刻的印象。无论生活安排，还是课程安排，每个具体事项都做到了严谨和周密。例如接送机，城市间的交通，中西餐的调配；又如装订成册的培训讲义、电子文档、网络账户，精心选定的专题，认真准备的课件和答疑讨论，等等。

通过交流，我们特别指出几点体会:

一是在环境管理理念上，更加深刻地树立了建立法制护驾、经济手段调节的环境管理体系的观念。

对石棉污染事故的刑事处理一讲，让学员感触颇深。意大利已经将环境管理与可持续发展真正融合在一起。这对我们的环境管理、环境保护工作是一种深刻的启发。健全和运用法制手段和经济手段，才能使环境管理更科学和有效。

二是在管理实践中，需要学习与借鉴欧盟/意大利所代表的西方文化，重唯理、思辩，重细节分析。

中国文化重经验、直觉，长于整体综合。西方文化以理性思维为原则的行为，环境管理的条理与脉络清晰。细节决定成败。我们需要在宏观层面的分析判断基础上，借鉴西方文化，从小事做起、做好细节。

课程设置的参观工业区、垃圾处置场、污水处理厂等内容很好，建议在以后的培训中保留。

## Ministry of Environmental Protection
## Multilateral Environmental Agreements

Italy, October 6 to 20, 2010
24 participants

In the framework of the Sino-Italian Co-operation Program for Environmental Protection (SICP) and endorsed by the Ministry of Environmental Protection, the Foreign Economic Cooperation Office supported the organization of the second Special Training Program on the Performance of Multilateral Environmental Agreements (hereinafter referred to as the "second training class") which took place from October 6 to 20, 2010 and successfully completed all tasks. What follows is a report on the training.



**I. Baseline Situation of the Training**

During the period October 6 to 20, 2010, the second training class was involved with research and inspection activities, respectively with the Italian Ministry for the Environment, Land and Sea (IMELS), the University of Siena, Venice International University, etc.

The attendees listened attentively to the specially-themed lectures on environmental protection and the performance of Multilateral Environmental Agreements (MEAs) and made the on-site inspection of Venice's Industry Association, GVG International Limited, Veneto ARPAV Chemistry and Microbiology Laboratory and Venice Wetland, financed by the World Wide Fund for Nature (WWF), etc.

The Italian Ministry for the Environment, Land and Sea (IMELS) attached great importance to this training and fully prepared lectures and site visits with abundant content. Throughout the entire training process, all attendees cherished this good opportunity by preparing themselves for the lectures, raising positive questions, engaging in heated discussions, taking their initiative to communicate with the instructors and lecturers so as to forge an in-depth understanding of Italian and EU practice in respect to environmental protection and gain better insight. It is generally felt that the study and inspection activities have broadened their horizon, enriched their knowledge, evoking better ideas through drawing on successful experiences; in their opinion, this training offered them a rewarding trip and much food for thought. All attendees strictly adhered to the foreign affairs discipline, cared for and showed consideration for each other and achieved satisfactory results in their professional expertise and academic research capacity. At the same time, they also presented a good and healthy image of Chinese officials and cadres in the environmental protection sector.

In addition, this training coincided with the activities of the Chinese Cultural Year in Italy, so all attendees were fortunate enough to have a private view of the Chinese Environmental Protection Exhibition under the delicate arrangement of IMELS.



## 中国环境保护部
## 多方环境协议

意大利, 2010年10月6日- 20日
24位学员

在中意环保合作计划的模式框架下和环保部认可的前提下，由环境保护对外合作中心支持组织开展的，2010年10月6日至20日，关于“环境发展与可持续发展”国际公约履约专题第二培训班（以下简称“第二期培训班”），圆满完成了培训中的各项任务。现将有关情况报告如下:

**一、培训的总体情况**

2010年10月7日至19日，第二期培训班分别在意大利环境领土与海洋部、锡耶纳大学、威尼斯国际大学等地进行学习考察。大家听取了关于环境保护和国际公约履约等专题讲座，实地考察了威尼斯工业协会、威格国际、威尼托大区环保署化学与微生物实验室、世界自然基金会威尼斯湿地等。

意大利环境领土与海洋部Italian Ministry for the Environment, Land and Sea (IMELS)对这次培训高度重视、准备较为充分，安排学习考察内容也较为丰富。在整个培训过程中，大家十分珍惜这次难得的机会，认真听课，积极提问，热烈讨论，主动与老师沟通，深入了解意大利和欧盟有关环境保护方面的做法和体会。大家普遍认为，通过学习考察，既开阔了视野，又增长了知识；既拓宽了思路，又学到了经验；受益匪浅，不虚此行。大家严格遵守外事纪律，相互关心，相互照顾，学学相长，取得了实实在在的成效，达到了预期的目的，同时也树立了中国环保部门和环保干部的良好形象。

另外，这次培训正值意大利举办“中国文化年”活动。在意大利环境领土与海洋部的组织安排下，大家有幸参观了中国环境保护展预展。

**II. Main Contents and Arrangements**

In this training, IMELS presented a brief introduction of its functional structures, its strategy for promoting the environmental protection towards sustainable development, the formation of the European Union and its legal system, operation mechanism and procedures, etc, the University of Siena and Venice International University and their principles, implementation, development, and performance results of Multilateral Environmental Agreements (MEAs) - particularly the Chemicals and Solid Waste Convention and Convention on Biological Diversity (CBD) etc. Emphasis was placed on the detailed introduction of the Performance of Multilateral Environmental Agreements (MEAs) in Italy and the EU.



All attendees realized that Italy is a country with a sophisticated legal system, which shows respect for history and upholding social and moral practices, where the citizens are legally minded, well-prepared for any hidden troubles and dangers and highly conscious and mindful of potential perils and environmental emergencies. In view of the environmental protection, Italy has taken the initiative to participate in relevant international conventions and perform therein, thus achieving remarkable results in this area.

**III. Precious Experience and Better Understanding Gained from the Training**

(1) Further Enhancing Responsibility and Urgency in Environmental Protection. The series of lectures and inspection activities in the training facilitated the attendees to form a clear understanding of the new situations and tasks challenging  environmental protection in China. We are now facing a serious situation and shouldering the heavy responsibility of fulfilling the arduous task of environmental protection. We are all aware that we must uphold a “Scientific Approach to Development” as the overall guidelines, to further enhance the overall consciousness of responsibility, pool together all conceivable resources and advantages within the national environmental protection system, abide by the reform and technical innovation and take the initiative to blaze a new path towards sustainable environmental protection that is low cost, low emission and highly efficient.

(2) Further enhancing our consensus that it is imperative to strictly implement the prevention-based and source-contained policy in the scientific development of environmental protection. During the training period, many Italian officials and lecturers repeatedly emphasized that efficient environment protection in all countries in the EU, particularly Italy, lies in the top priority being given to the precautionary principle. It follows that the pre-stage precaution is more cost-efficient than greater efforts made later, from the point of view of the precautionary measures and financial investment for environmental protection enumerated by them at the lectures. An abandoned iron works in Bulgaria is a typical case that requires a multi-billion-dollar remedy for environmental pollution control, yet initially it was merely a multimillion-dollar project for the same purpose. We are acutely aware that the important experience gained by the EU, particularly Italy, in promoting environmental protection, is used to strongly integrate environmental development with sustainable development, the top priority for prevention through source control and to make the great change from “low yield and high risk” to “high yield and low risk”. It is necessary for us to abide by the precautionary policy featuring prevention first and source control so as to vigorously promote ecological civilization construction and harmony between man



**二、培训的主要内容和安排**

这次培训，意大利环境领土与海洋部主要介绍了其职能设置和坚持环境发展与可持续发展战略，欧盟的形成和法律体系、运行机制和程序等；锡耶纳大学University of Siena、威尼斯国际大学主要介绍了多边环境协议的原则、实施和发展，化学品和固废公约、生物多样性公约等及其执行情况，重点对意大利和欧盟国际公约履约情况做了较为详细的介绍。

通过培训团员们体会到，意大利是一个尊重历史，崇尚文明，法律体系完备的国家。民众法制观念很强，居安思危，有强烈的忧患意识和环保意识。在环境保护方面意大利积极参加有关国际公约签订和履约，环境保护取得显著效果。



**三、培训的主要收获和体会**

（一）进一步增强了做好环境保护工作的责任感和紧迫感。通过学习考察，大家进一步认清了我国环境保护工作面临的新形势新任务。我们面临的形势十分严峻，任务十分艰巨，环保人肩负的责任十分繁重。大家表示，一定要以科学发展观为统领，进一步增强大局意识和责任意识，举全国环保系统之力，坚持改革创新，积极探索出一条代价小、效益好、排放低、可持续的环境保护新道路。

（二）进一步坚定了科学发展环境保护工作必须贯彻预防为主源头治理的方针。培训期间，意大利多位官员和老师在授课中反复强调：欧盟各国特别是意大利做好环境保护工作的首要是坚持预防性原则，从列举的预防性措施和环境灾害治理投入经费比较看，先期预防比后期治理成本要低很多很多。如保加利亚一家废弃铁矿厂没有投资几百万美元采取预防措施，结果造成了污染之后投入数十亿美元才得到治理。大家深切感受到：欧盟特别是意大利在推进环境保护工作方面，很重要的一条经验是坚持环境发展与可持续发展相结合，坚持预防为主与源头治理相结合，同时也体现出了由“低收益、高风险”到“高收益、低风险”的变化。我们大力推进生态文明建设，促进人与自然和谐，不断追求天更蓝、地更绿、水更清的环境质量目标，就必须坚持防范在前，贯彻预防为主、源头治理的方针，借鉴启迪，博采众长，杜绝和避免先污染后治理、边污染边治理的现象发生。另外，面对当前严峻的环境形势，改革创新环境监察机构设置和环境执法方式是亟待研究解决的一个问题。

and nature, to continuously aspire to environmental quality objectives featuring bluer skies, greener land and clearer waters and eliminate and avoid the occurrence of just follow-up measures for pollution emergencies and merely matching the immediate efforts with simultaneous pollution emergencies. Furthermore, there is an urgent need to revamp and restructure the environmental supervision organizational framework and upgrade the environmental enforcement approaches in face of the current severe environmental scenario.

(3) Further clarification of the fundamental principle of "common but differentiated responsibilities" for performing international environmental conventions. We have reached the profound understanding and have a better command of the common but differentiated responsibilities and obligations of developed and developing countries with regard to environmental protection for sustainable development. Developed countries have used the "lion's share" of natural resources in their economic development and, at the same time, they have caused serious harm – and even destruction – to the global environment. Therefore, they should accept international liability and implement greater environmental protection and control processes - this defies any doubt and has been boiled down to a consensus in developed countries in the EU. Therefore, China has righteously emphasized the principle of "common but differentiated responsibilities" in international consultation and discussions in a bid to gain more support and assistance with respect to technology, equipment and finance, etc. We also realize that "International conventions or agreements must be fully performed." This is the inevitable requirement for the implementation of Multilateral Environmental Agreements (MEAs). At present, most international conventions have set forth the relevant provisions for supervision and punishment and those countries failing to perform or violating the conventions shall be subject to moral condemnation, sustain direct economic losses which may affect their international image and bear heavy penalty costs. Besides this, the permanent convention establishments will play a more important role in the performance thereof. A typical international environmental convention – the "Montreal Protocol on Substances that Deplete the Ozone Layer" – considered to be highly recognized and well accomplished in the world community, has achieved the intended goals with lower costs but better efficiency by means of multilateral funds.

**IV. Some Proposals**

Enhancing the perspective study of the International Multilateral Environmental Agreements (IMEAs). Problems put forward by some lecturers during the training period concerning mercury production and mercury limitations in China, its future attitude towards the "International Mercury Convention" and other relevant problems have aroused in us a keen interest in further deliberation. It has been strongly suggested that the relevant departments should prepare themselves in advance to further enhance the perspective study on the relevant international environmental conventions, particularly in relation to mercury production and mercury pollution, prevention and control, etc. Future efforts should be prioritized to investigate and verify the basic data and keep abreast of the latest international policies and trends, etc., in a bid to gain more initiatives in future international environmental convention negotiations.





（三）进一步明确了在国际环境公约领域必须坚持"共同但有区别的责任"这一基本原则。通过学习考察，大家一方面加深了对发达国家和发展中国家在环境发展与可持续发展国际义务中既有共同又有区别的责任的理解和把握。发达国家在发展中占用了大量的自然资源，同时也给环境造成了伤害甚至破坏；当然在治理过程中就应当承担更多的国际责任和义务，这是毫无置疑的，而且这一理念在欧盟等发达国家已经形成共识。因此，我国在国际磋商中要理直气壮地坚持"共同但有区别的责任"原则，争取在技术、设备、资金等方面得到更多的支持和帮助。另一方面大家也认识到"有约必践"逐渐成为国际环境公约履约的必然要求。目前，大多数国际环境公约中都设定了监督和惩罚的相关规定，对不能履约或者违约的国家，不仅在道义上会受到谴责，而是也会直接遭受经济损失，甚至影响国际形象，违约成本很高。此外，公约常设机构，在履约工作中发挥着愈加重要的作用，以国际社会公认的、执行最好的国际环境公约——《关于消耗臭氧层物质的蒙特利尔议定书》为例，正是采用多边基金的方式实现了成本低、效益好的公约既定目标。

**四、几点建议**

加强对国际环境公约前瞻性研究。培训期间，有教员提出中国的汞生产和对汞限制情况以及中国对未来汞公约态度等问题，引起我们的思考。建议：有关部门应提早准备，进一步加强对汞生产和汞污染防治等相关国际环境公约的前瞻性研究，重点做好基础数据的调查摸底和了解掌握国际政策及动态等，力争在未来相关国际环境公约谈判工作中取得更多主动。

## Chinese Academy of Social Sciences
## Sustainable Urban Development and Eco-building

Italy, November 20-December 4, 2010
38 participants

Thirty-eight participants from CASS attended Eco-Management: Strategies and Policies Training Program on Urban Sustainable Development and Ecological Building, which was held in Italy, over fifteen days, from November 20 to December 4, 2010.

The training focused on the topic of Urban Sustainable Development and Eco-building, and started with the content of Italian environmental protection policies, new energy economic stimulus mechanism and building energy efficiency, combined with case studies and site visits. Through the face-to-face communication with project officers and managers, the participants generally agreed that the training content was rich, relevant and practical, and utilized varied teaching methods; theory and practice were closely integrated and the participants learned a lot.

At present, driven by the encouraging policy and technical advances, some impressive low-carbon architecture is being developed. For large-scale promotion, however, it is still necessary to break down all of the barriers and obstacles, and this training provides the motivation for the participants to extend their knowledge in this area.

Some participants felt that the content on Italian environmental protection policy and mechanism was too general and superficial, lacking information on technical and policy implementation: for example, whether the government encountered barriers when promoting green energy buildings and the relative resolution plan and case studies; and whether the EU and Italy have a similar urban development plan and, if so, how to implement it. These will have further demonstrable effects on China in the area of sustainable development and eco building and also benefit all the participants.

During the site visits, the participants felt it was hard to hear the tutors because there were so many participants and it was a noisy environment. If possible, please provide earphones for participants or another solution. Some participants thought that visiting some similar and typical enterprises would have been helpful. And they thought that the site visits schedule was quite tight and didn't provide enough time to digest the information or allow for site communication.

The teaching material for participants was well-prepared but all materials could have been delivered in advance so the participants could preview them for better site communication with the experts.

The participants were all interested in the training content and site visits, and they hope to strengthen the communication with the lecturers and enterprises they visited. They hope the organizer can hold some short non-classroom discussions for the participants, experts and managers to communicate and discuss the topics of interest.

After the training, the participants hope to build a communication platform on all topics for further communication.



## 中国社会科学院
## 城市可持续发展和生态建筑

意大利, 2010年11月20日 - 12月4日
38位学员

2010年11月20日至12月4，来自中国社会科学院方面的38名学员参加了生态管理：战略与政策高级培训班，培训为期15天，围绕“城市可持续发展和生态建筑”为主题，本次培训从欧盟和意大利的环保政策、新能源经济鼓励机制以及建筑的能源效率等内容出发，结合现实案例分析和现场考察，让学员和项目执行者和管理人员面对面交流沟通，形式生动，内容丰富，学员从中收获颇丰。

中国受到政策鼓励和技术发展的双重推动，市场上的低碳建筑实践已然涌动，做了不少有益的尝试，但是大规模推广低碳建筑仍需要突破各方面的壁垒障碍。此次培训对学员拓展这方面知识有深刻的推动作用。

学员反映讲座在欧盟和意大利环保政策和机制的普及型知识方面涉及较多，但技术层面和政策执行方面讲解不够详细深入，如政府在执行绿色能源建筑的过程中是否遇到阻碍，以及相关解决方案的案例，欧盟或意大利是否有与中国相类似的城市可持续发展规划以及如何执行，这些都会对中国在可持续发展和生态建筑方面起到更深远的示范作用，对学员也更具有参考意义。

实地考察方面由于人员众多，环境嘈杂，不利于学员理解工作人员的讲解，是否可以提供解决方案，如为每位学员配备耳机? 如果能够选取一些更具有代表性、与中国国情接近的企业提供考察，将会对学员更有帮助 。同时现场考察安排的行程比较紧凑，没有给学员预留出充分的思考和消化理解的时间，也不利于学员在现场与培训人员的沟通交流。

培训的组织人员准备充分，为学员提供了详细的课件资料，但只在讲座或考察现场分发也让学员无法做到提前预习掌握，阻碍了与老师的现场沟通交流，是否可以在培训开始前把已经掌握的课件和参观企业的背景资料挂在网站上提供给学员下载，这样学员可以预先了解相关内容，为课程做好充分的准备。

学员对培训中安排的许多课程内容和现场考察都非常感兴趣，也希望能够增加于讲座教授或参观企业的联系沟通。学员希望可以在培训的过程中增加一到两次短时间的非课堂讨论，邀请学员教授或管理者共同参加讨论学员感兴趣的话题。培训结束后也希望增加与相关方的交流，如是否可以在网站上设立一个沟通交流的网络平台，可以供学员随时可以就感兴趣的话题提出来，现场或及时得到解答。

# VIU training program activities report
# 威尼斯国际大学培训计划 培训活动







## Waste Management, CASS
Italy, February 19 – March 5, 2011
42 participants

The first CASS delegation of 2011 attended a training course on waste management, a topic that, since the beginning of the cooperation between CASS and VIU, has strongly aroused the interest of our Chinese partner.
This year VIU selected some interesting topics in the field of waste management and included them in the training agenda, in order to present the best technologies applied in Italy and hence offering a more effective and relevant experience to our Chinese partners.
In particular, a whole day was devoted to visiting the *Centro Riciclo Vedelago* (Vedelago Recycling Center, VRC) where the director, Ms Carla Poli, presented recent projects carried out by the center in the field of plastic recovery.
VRC is a firm which recovers the kind of plastics that are usually not recycled and produces a new plastic material, the “plastic flake”, from the residual waste. The plastic flake produced has been tested from a physical and chemical point of view, showing it to be suitable for building materials (handmade cement, tiles, partition walls, etc.) and for the plastic industry (garden tables and furniture, pallets, chairs/armchairs backings and seats, etc.).
In Turin, the delegation had the chance to visit the young company AgriNewTech, a spin-off of the University of Turin. AgriNewTech is a relevant example of how innovation and new technologies can enhance the methodologies available for organic waste management. The company works mainly in the valorization of organic and agricultural waste, using patented micro-organisms and innovative analysis methodologies to guarantee the compost quality.

## 废物管理，CASS
意大利，2011年2月19日– 3月5日
42位学员

2011年社科院第一期培训的主题是废物管理。该主题自威尼斯国际大学与中国社科院合作以来，一直是一项重要的培训内容，引起了中国合作伙伴的强烈兴趣。
今年威尼斯国际大学有选择性地安排了一些废物管理领域里很有趣的内容，通过向学员介绍意大利所采用的最好技术，使得学员能够更有效地、更直观地了解意大利在废物管理领域所积累的经验。同时，还专门安排了一天时间访问了Centro Riciclo Vedelago (Vedelago废物回收利用中心)，中心主任波丽女士（音译，Carla Poli）介绍了中心新上项目---塑料回收项目。
该中心回收那种一般不回收的塑料，并从剩余的废塑料中生产出新的塑料原料“塑料片”。通过对该种“塑料片”的物理和化学方面的检测，证明该种原料适合做建筑材料（手工水泥、瓦片、隔板等）以及塑料工业加工原料（公园桌椅、转盘、椅子/扶手椅后背、坐垫等）。
在都灵代表团访问了年轻的AgriNewTech公司。该公司隶属于都灵大学，主要致力于推动将具有创新性的、新技术运用到有机废物管理中。通过利用该公司专利发明的微生物技术和具有创新性的分析检测技术，可以将有机和农业废物很好地稳定化，从而确保了有机肥料的良好质量。

## Environmental Monitoring Management, BMEPB

Italy, February 26 – March 12, 2011
15 participants

The rising interest in Environmental Monitoring, a key topic in 2010, continues in 2011. Among the training organized this year by Venice International University and the Beijing Municipal Environmental Protection Bureau, the first training course was devoted to this issue.
Environmental monitoring is a broad theme, which includes different aspects ranging from management to adopted techniques.
The course agenda was designed to offer a well-rounded picture of environmental monitoring in Italy, starting from a theoretical background on the laws and regulations adopted in the EU and in Italy and then covering the main environmental quality monitoring sectors such as air quality monitoring, water quality monitoring and noise monitoring.
The key issue of pollution source monitoring and management was presented with a special focus on industrial emissions. During the site visit to the ENEL coal power plant in Mestre (Venice) the technologies adopted and the CEM system were illustrated.
The opportunity to meet different experts from the Regional Agency for Environmental Prevention and Protection (ARPA) was offered to the 15 participants together with the possibility for the Chinese participants to visit the various agencies. Finally, particular attention was devoted to the environmental data flow, describing the process that starts with data collection and analysis, data validation and presentation, and ends with the publication of that data.

## Environmental Protection Supervision and Inspection, MEP

Italy, April 30 – May 14, 2011
25 participants

As China tries to pursue sustainable development, the strengthening of environmental protection, law enforcement and compliance represents one of the key points. To address this issue, a strategic move is underway to train a new environmental and inspection team (which has been a department within the Chinese Ministry of Environment since 2003) to implement environmental supervision and inspection powers.
It is from this perspective that the Chinese Ministry of Environmental Protection and Venice International University decided to organize, for the year 2011, three training courses on the “Environmental Protection Supervision and Inspection” theme.
The first advanced training course was held in Italy from April 30 to May 14, and was addressed to 25 participants from supervision centers and local environmental supervision agencies.
The agenda was targeted at giving a broad overview of the different aspects related to the supervision and inspection theme, including the legal and policy system, the Italian supervision control bodies at national and local level, the efforts to coordinate different institutions, and several case studies. Outstanding experts with specialised legal backgrounds and experience in environmental regulations and enforcement accepted the invitation to lecture at the course, such as a judge of Venice’s Civil Court, an environmental lawyer and a public prosecutor. The opportunity to visit some Italian institutions implementing environmental controls and then speak with experts there, was also offered to the participants.





## 环境监督管理，BMEPB

意大利，2011年2月26日– 3月 12日
15名学员

曾经是2010年培训热点的环境监测在2011仍热度不减。由威尼斯国际大学和北京市环保局共同组织的培训合作第一期即围绕环境监测展开。
环境监测这个主题跨度非常大，涉及环境管理到环境技术等各个方面。
本期培训旨在向学员全面介绍意大利环境监测工作，既包括欧盟和意大利法律法规制订的理论背景，也涉及了主要环境质量监测领域，如：空气质量监测、水质量监测及噪声监测。
通过介绍工业污染排放情况，集中讲授了意大利污染源监测和管理中的关键问题。对位于威尼斯莫斯特拉（Mestre）工业区的ENEL煤炭电力企业访问，使学员了解到该企业所采用的先进技术和CEM系统。
此次培训还安排访问了环境保护地区署 (ARPA)，以及其它一些相关机构和专家；并重点讲解了环境数据流的有关情况，包括数据收集与分析、数据评估到最终数据发布。

## 环境保护监察，MEP

意大利，2011年4月30日– 5月14日
25 名学员

在中国积极推动可持续发展进程中，加强环境保护法律执行和监督显得尤为重要。为此，对这批新的环境管理队伍加强培训具有战略意义。2003年环境保护部成立了监察局。
2011年中国环境保护部会同威尼斯国际大学将共同组织3期环境监察培训。第一期培训已于今年4月30日-5月14日举办，学员共25名，主要来自于监察中心和地方监理大队。
本期培训主要介绍了与环境监理有关的各个不同方面，包括法律政策体系、意大利环境监察机构、在国家和地方层面开展的一些监察工作，并通过具体案例介绍了在各机构之间是如何协调监理工作的。我们邀请了非常优秀的、具有法律背景和实践经验的专家进行授课，包括威尼斯民事法庭大法官、环境律师和检察官。此外，还安排学员访问了一些负责环境控制与监督的机构，并与有关专家进行了深入交流。

## Environmental Regulation and Economic Policies, BMEPB

Italy, May 21 - June 4, 2011
15 participants

The second course of the year, organized for a delegation selected by the Beijing Environmental Protection Bureau, covered a new topic focusing on regulations and economic policies for supporting the protection of the environment.
Despite Beijing already meeting economic and political standards to be considered a World City, environmental protection is still a major concern for the government. The key points drafted by the municipality to become a World City form the basis for choosing this particular training topic. It focused on regulations and economic policies for supporting the protection of the environment and thus improving the living conditions of the citizens.
The course introduced the Chinese participants to European and Italian laws and policies in different fields of environmental protection, and their successful application at local level.
Each training day, a specific issue of environmental management was addressed in relation to the general topic of the course, namely regulations and economic policies for waste management, air pollution reduction from industries and transport, electromagnetic and noise pollution and water management. Each topic was presented so as to gradually focus from the macro to the micro level, that is, from provisions at the European level to their implementation locally.
In order to better understand the enforcement and effectiveness of regulations and policies, case studies and sound practices were also provided through some interesting site visits, such as: the visit to *Centro Riciclo Vedelago* (Vedelago Recycling Center, VRC), offering an example of how recycling plastic whilst respecting and implementing the laws can also be profitable; the Mobility Agency of Milan, where the participants were introduced to the plans and economics instruments used to improve traffic sustainability; and SMAT, the company managing water treatment in Turin.

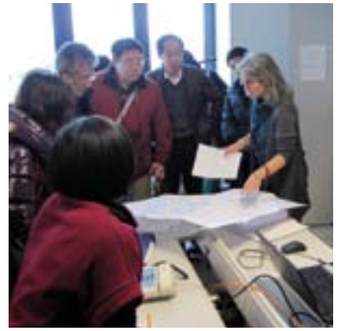




## 环境法规和经济政策，BMEPB

意大利，2011年5月21日-6月4日
15名学员

该主题为本年度第二次培训内容，是为北京市环保局代表团精心安排的，培训围绕支持环境保护的相关法规和经济政策展开。
尽管北京已经达到了“世界城市”的经济和政治标准，环境保护依然是政府面临的主要问题。本期培训即围绕市政府提出的关于建设世界城市的关键点开展，即：集中介绍支持环境保护、提高人民生活水平的相关环境法规和经济政策。
通过培训，向与会代表介绍了欧盟和意大利在各领域的环境保护法律和政策及其在地方成功应用的情况。
每天都选择一个专门的、有关环境管理的主题来介绍，包括废物管理法规和经济政策、工业、交通、工业和交通领域削减空气污染、电磁和噪声污染以及水管理。讲座从宏观逐步进入微观，从欧盟有关规定直到其在当地具体执行。
为了更好地了解和执行政策法规的有效性，培训还安排代表团对典型案例和成功经验的现场参观，例如：对Riciclo Vedelago中心的参观为学员介绍了回收塑料的例子。实践证明，在尊重和执行法规的同时，回收塑料可依然获得利润。在米兰交通管理局学员们了解了有关改善交通可持续发展的规划和经济手段。此外，学员还参观了在都灵从事水处理的SMAT公司。



## New Activities for Prevention and Mitigation of Oil/Chemical Spills and Environmental Emergencies Management

On February 17, 2011, a kick-off meeting was held in Beijing SICP PMO for the new activities related to the Prevention, Assessment and Management of Oil/Chemical Spills Program, which began in 2006.
The new activities play an important role in the continuation of the fruitful results of past projects concerning the prevention and management of the environmental emergencies deriving from industrial accidents in China.
Under the supervision of the Environmental Emergency Response and Accident Investigation Center of MEP, and the management of SICP PMO, the activities will be implemented by the Water Science Institute of Beijing Normal University (BNU) with the support of China's Natural Gas and Petroleum Corporation (CNPC) and Italy's D'Appolonia.
Following the recent pipeline oil spill events in China (e.g. the spill from a diesel pipeline into the Wei and Yellow rivers) the need to strengthen the capabilities of MEP and the local EPB to improve the prevention, management and mitigation of spills from the oil pipeline network in the country has arisen.
The new activities will cover a period of one year to primarily develop the following tasks:
_ emergency management for pipeline oil spills in China: current status and future directions;
_ current practice in the prevention, preparedness and rapid assessment of pipeline oil spills;
_methods and techniques for site cleanup and waste disposal;

## 油品/化学品溢漏预防减灾与环境应急管理项目新的活动

2011年2月17日，油品/化学品溢漏预防，评估和管理项目（自2006年开始）新的活动项目启动会议在北京中意环保合作项目管理办公室召开。
项目新的活动将作为中国工业事故引发的环境应急预防与管理项目丰硕成果的重要延续。
在中国环境保护部环境应急与事故调查中心的监督与中意环保合作项目管理办公室管理之下，该项目将由中方技术支持单位北京师范大学水科学研究院（BNU），中国石油天然气集团公司（CNPC）与意方技术支持单位D'Appolonia共同进行。
继近期在中国发生的石油管道溢漏事件后（如柴油泄漏至渭河与黄河的事故），必须认识到需要加强环境保护部和地方环保局在石油管道网络溢漏事故的预防，管理和减灾的相关能力。






项目新的活动为期一年，主要包含以下的研究任务:
_ 中国的石油管道溢漏应急管理：现状和未来发展方向;
_ 管道溢漏事故的预防，准备与快速评估的实践;
_ 现场清理和废物处置的方法和技术;
_ 中意环境应急支持中心（EESC）的计划和结构。
中意环境应急支持中心的建设将成为中意环保合作项目的一个重要成就，旨在加强中国和意大利专家的长期合作，加强中国环境保护部和意大利环境、领土与海洋部之间的关系。

## 中意气候变化合作计划启动

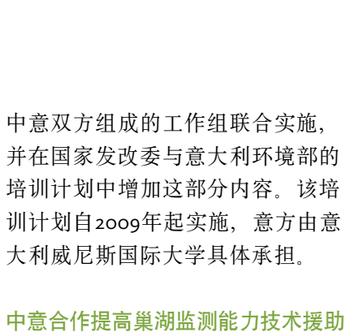
专门致力于解决气候变化问题的新一轮中意两国合作计划于2011年3月在北京启动。意大利环境部司长克里尼先生和国家发改委气候司苏伟司长共同宣布该项目正式启动。
该项目源自意大利环境部长访华期间，与发改委主任解振华先生签署的合作备忘录，旨在联合共建气候变化国际中心。
在启动仪式上，介绍了率先进入管道的4个项目：在山西省开展碳捕集和存储技术综合运用和示范项目、沿海生态系统适应气候变化能力建设项目、新疆维吾尔自治区气候变化实施计划、以及气候变化交流与公众意识提高项目。这些项目将由

_ plan and set-up of a Sino-Italian Environmental Emergencies Support Center (EESC).
The realization of the Sino-Italian EESC will be a great achievement for the SICP for environmental protection, setting a basis for long-term cooperation between the Chinese and Italian experts and strengthening relations between MEP and IMELS.

## The Sino-Italian Climate Change Cooperation Program Launched

A new cooperation program between China and Italy, especially dedicated to climate change, was launched last March in Beijing by the Director General of the Italian Ministry for the Environment, Mr Corrado Clini, and Mr Su Wei, Director General of the National Development and Reform Commission of China.
The program was formed on the basis of the Memorandum of Understanding, signed by the Italian Minister Prestigiacomo and the Chinese Minister Xie Zhenhua during the official visit of the former to China, and aims at starting a joint program of activities in view of the creation of an international center on climate change.

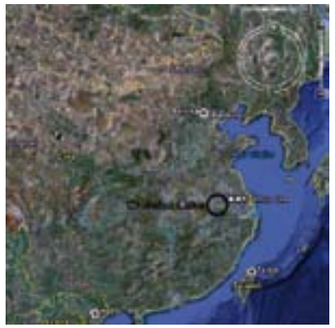
中意双方组成的工作组联合实施，并在国家发改委与意大利环境部的培训计划中增加这部分内容。该培训计划自2009年起实施，意方由意大利威尼斯国际大学具体承担。



新设备与现有实验室和自动监测站匹配，以提高对湖区的参数和毒性指标监测。改进后的数据将创建SCADA, 可以在早期预警系统中运用中枢网络。
意大利合作伙伴Progetti e Ambiente将帮助巢湖环保局，并为项目提供实验室仪器和SCADA系统运行方面的培训。

## 中意合作提高巢湖监测能力技术援助项目---项目二期已进入实施

在巢湖项目一期成功实施的基础上，中意双方商定将继续开展合作，项目二期定位在更为具体和操作层面上的合作。巢湖是中国第五大淡水湖，在项目一期中，通过双方共同努力，明确了应采取的一系列措施和最佳方案来缓解巢湖的富营养化问题，确保饮用水安全，并建立了一套早期应急预警管理系统。.
项目二期于2011年3月在巢湖正式宣布启动。该项目将致力于提高监测和早期预警能力，并建立一套专门的应急管理框架。将采购一批



During the ceremony, the first four projects in the pipeline were presented: the Carbon Capture and Storage, Comprehensive Application and Demonstration Project in Sha'anxi Province; the Capacity Building of Coastal Ecosystems to Adapt to Climate Change project; the Xinjiang Uyggur Autonomous Region Climate Change Implementation Plan; and the Climate Change Communication and Public Awareness Raising project.
The activities have been implemented by Sino-Italian working teams, and have been added to the NDRC-IMELS Training Program, in cooperation with VIU, since 2009.

## Sino-Italian Cooperation Project Technical Assistance for Monitoring Improvement in Chaohu Lake: Second Phase Started

Following the success of the first phase of the project, which supported the identification of a set of measures and best options to mitigate the eutrophication, grant safe drinking water and set up an early-warning and emergency management system in Chaohu lake (the 5th largest freshwater lake in China), project partners moved to a more operational phase of the cooperation.
The follow-up activities, officially started in Chaohu city in March 2011, focus on the improvement of the monitoring and early warning systems, as well as setting up a dedicated emergency management structure.
New equipment will be integrated into the existing laboratory and automated station, specifically aimed at better





monitoring of relevant parameters and toxicity at lake level. The input of enhanced data will create a SCADA, using neural networks for the early warning system.
The Italian partner Progetti e Ambiente will assist Chaohu Environmental Protection Bureau and provide specific training on the laboratory instruments and SCADA system set-up.

## The First Sino-Italian Scientific Meeting on Clean Coal Technologies

The first Sino-Italian Scientific Meeting, held in Beijing on May 11-13, 2011, is one of the milestones of the Sino-Italian Carbon Capture and Storage (CCS) pre-feasibility demonstration project, kicked off last October.
The seminar, organized within the framework of the agreement among the Italian Ministry for the Environment, the Chinese Ministry of Science and Technology and the Italian energy company ENEL, aimed at favoring the exchange of research results and experiences on application of CCS to coal-fired plants among researchers, designers and operating personnel from Chinese and Italian institutions.
Around 50 experts from the Huaneng Group, ENEL, Tsinghua University, the Chinese Academy of Science, Peking University and China's University of Petroleum attended the event, as well as representatives from the sponsoring ministries.
The three-day workshop offered an opportunity for the participants to share their latest progress and experiences, particularly during the first day sessions, which were open to relevant specialists and experts from Chinese and Italian institutions. The scientific meetings continued on the second day and were limited to the project partners as working sessions to discuss project progress and planning. On the third day, ENEL's delegates went on a study visit to the Huaneng $CO_2$ Capture facility in Shanghai – the biggest in the world.
On the occasion of the meeting, the personnel exchange program was launched, with the first group of Chinese engineers and researchers traveling to Italy in May to participate in the tests at Enel's $CO_2$ Capture Pilot Plant in Brindisi.

## 中意双方首次召开清洁煤技术科技会议

中意合作碳捕集和存储预可行示范项目于去年10月正式启动。2011年5月11–13日双方召开了具有里程碑意义的首次科技研讨会。
研讨会是在意大利环境部、中国科技部、意大利能源公司ENEL三方共同签署的合作备忘录框架下举行的。希望通过本次会议，能够在科研人员、设计师、以及业内工作者之间充分交流双方在该领域的科研进展和所取得的经验 。
来自华能集团、ENEL、清华大学、中科院、北京大学、中国石油大学、及本项目资助方等机构的近50名专家参加了本次会议。
为期三天的研讨会为与会代表提供了分享最新科研进展和经验的机会。研讨会的第一天向所有的中意两国相关机构和代表全面开放。会议第二天仅限于项目合作伙伴之间，具体讨论了项目进展、计划等。第三天安排了ENEL 公司代表参观了华能集团在上海的二氧化碳捕集设备。该套设备是目前世界上最大的设备。
在本次研讨会期间，还启动了人员交换项目。中国首批工程师和研究人员将访问意大利，参加在Enel's Brindisi二氧化碳捕集示范工厂开展的实验工作。

# what's ON at VIU
# 威尼斯国际大学快讯



The **Sino-Italian Community for Sustainable Development** – www.sdcommunity.org is a new website for the environmental training community.
The SDCOMMUNITY website was conceived as an online platform that compiles the experiences of the Sino-Italian Advanced Training Program. It offers the Chinese trainees constant updates on the program, including training agendas, lecture material, the contact details of experts, companies and enterprises, research papers, events, and news on the latest developments in environmental management.
Each Chinese trainee from the SICP network can access a private area to download all ppt presentations, especially those from the latest courses: at the end of each training session, the SDCOMMUNITY website is uploaded with all the material presented in class and during the site visits, thus guaranteeing up-to-date information on the topics addressed in the program, especially with regard to EU legislation or new technologies. On the website, each community member, whether a trainee or a lecturer, can update his/her profile and exchange knowledge and information with other Italian and Chinese community members.
In this way, the Sino-Italian Community for Sustainable Development offers a unique opportunity to continue the training experience in China and to keep in contact with other Chinese trainees and Italian experts on sustainable development, in order to strengthen the Sino-Italian Community since it's development from the Advanced Training Program in 2003: today it includes more than 7,000 Chinese trainees, 150 Italian and international experts and 100 green Italian companies.
The experience of the Sino-Italian Training Program and its network community is an example of excellence in the promotion of sustainable development.
In fact, the Italian Ministry for the Environment, Land and Sea invited Venice International University to **Bright Green Cities**, a three-day event in Rio De Janeiro, Brazil, devoted to the promotion of green businesses and the green economy. The Sino-Italian Advanced Training Program offers a unique example of education that merges the different players involved in sustainable development, namely governments, academia, private companies and public institutions.
The success of this kind of training experience has also recently been recognized by the Treviso Association of Industries, which has decided to train its associates on the principles of sustainable development in order to raise awareness on green production among the local entrepreneurs. The project, called **Innovation gets Green**, is based on a series of seminars and site visits on the key aspects of the green economy, and includes a final conference where the renewed Italian enterprise is presented as "green, creative and international".
Venice International University's growing interest in the green economy has led to a new joint project which is under development with the Italian Ministry for the Environment, Land and Sea that aims to create a community of green Italian companies launching their green experience worldwide.



专门集中介绍**中-意环境培训**项目、以**中-意可持续发展园地**命名的的网站（www.sdcommunity.org）即将上线。
该网站将成为中-意环境高级培训项目的在线交流平台，可以使中方学员随时了解到培训项目的进展，包括培训课程、讲义材料，专家、公司及企业的联系方式，研究文献，重大事件以及环境管理领域一些最新进展等。
参与中-意环保合作计划的每一位学员都有一个属于自己的区域，可以用来下载所有讲课PPT资料，特别是新近安排的一些课程：在每期培训末，网站将上传所有课堂和参观中所讲授的培训资料，确保学员们能够适时跟踪培训内容，特别是关于欧盟立法、最新技术进展等方面的信息。
无论是学员还是老师都可以在网上适时介绍自己，并与中-意双方的园区成员们交换和分享知识与信息。
通过这种网上在线的独特方式可以将培训工作很好地拓展出去，使得自2003年以来参加培训项目的中方学员之间、与意方专家学者之间建立起更紧密的联系。到目前为止，已经有7,000名中方学员、150名意大利和国际专家、以及100家意大利绿色企业参与到培训工作中。
中-意培训项目及其网络园地经验被称为是推动可持续发展的典范行动。为此，意大利环境、领土和海洋部专门邀请威尼斯国际大学代表参加了在巴西里约热内卢召开的、为期3天的"亮丽绿色城市"研讨会。该研讨会的主题是推动绿色商业和绿色经济发展。中-意高级培训项目在融合推动可持续发展的各类角色方面积累了成功的经验，包括政府部门、科研单位、私人企业和公共服务机构等。
培训项目的成功经验也获得了Treviso工业协会的认可。该协会决定对会员单位进行关于可持续发展方面的培训，以提高当地企业家的绿色生产意识。该项目的名称是"**创新赢得绿色**"，项目将以绿色经济为主题，从各个角度进行研讨和实地考察，并在总结大会上提出意大利企业的新生之路，即："绿色、创新和国际化"。
威尼斯国际大学在推动绿色经济方面的兴趣也日趋渐浓。最近与意大利环境、领土和海洋部合作，通过项目实施来推动意大利绿色企业建立伙伴关系，并在世界范围内共同分享其绿色经验。

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