newsletter
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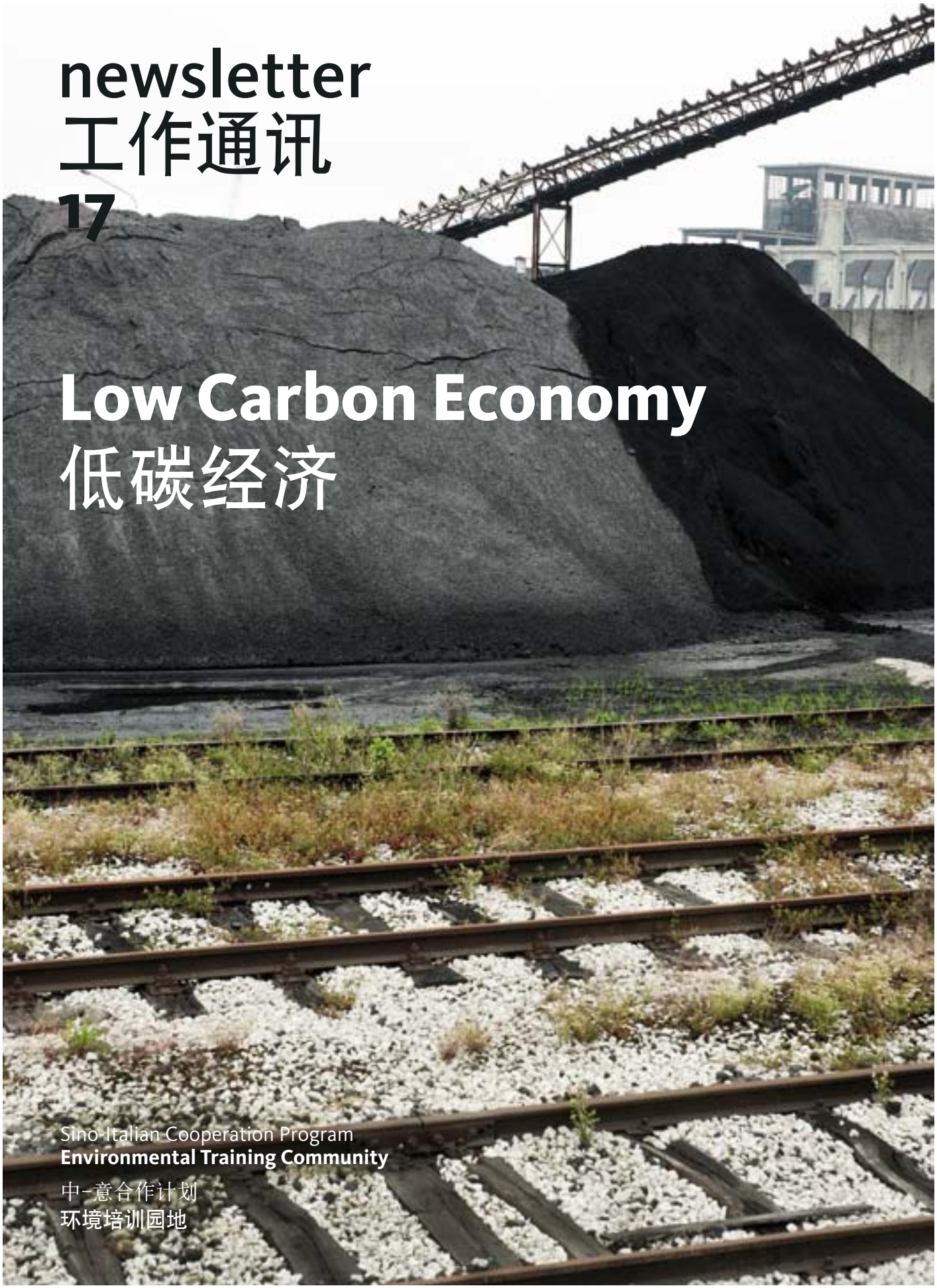

Low Carbon Economy
低碳经济

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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Editor
Ignazio Musu,
TEN Center, Venice International University

Editorial Board
Corrado Clini,
Italian Ministry for the Environment, Land and Sea
Maria Lodovica Gullino,
Agroinnova, University of Turin

Edited and Published by
TEN Center, Venice International University
Isola di San Servolo
30100 Venice, Italy
Italian Ministry for the Environment, Land and Sea

Project coordination
Alessandra Fornetti, Alessandro Celestino,
Ilda Mannino, Lisa Botter

Graphic design
peppe clemente, studio cheste venezia

Page layout
Isabella Zegna, studio Cheste Venezia

Cover and On Focus photos
Andrea Penisto

English proofreading
Felicity Menadue

Chinese translation
Mike Peng

Contributions by
Maria Pia Ancora, Selina Angelini, Lisa Botter,
Elisa Carlotto, Alessandro Celestino, Ellie Dawkins,
Alessandra Fornetti, Andy Gouldson, Martina Hauser,
He Xin, Huang Jinli, Niall Kerr, Johan Kuylenstierna,
Ilda Mannino, Erika Mattiuzzo, Massimiliano Montini,
Richard Pearce, Alessia Pietrosanti, Ivana Radulovic,
Alice Ren, Radmila Vlastelica Sutic, Denise Tonolo,
Corrado Topi, Francesca Volpe, Wang Shutang,
Francesca Zennaro and the Department of Climate
Change of the National Development and Reform
Commission of the P. R. of China.

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编辑
Ignazio Musu,
威尼斯国际大学-TEN中心

编委
Corrado Clini,
意大利环境、领土与海洋部
Maria Lodovica Gullino,
都灵大学Agroinnova研究中心

编辑和出版
威尼斯国际大学-TEN中心
Isola di San Servolo
30100，威尼斯，意大利
意大利环境、领土与海洋部

项目负责人
Alessandra Fornetti, Alessandro Celestino,
Ilda Mannino, Lisa Botter

平面设计
peppe clemente，威尼斯Cheste工作室

版面设计
Isabella Zegna，威尼斯Cheste工作室

封面的照片和焦点的照片
Andrea Penisto

英文校对
Felicity Menadue

中文翻译
Mike Peng 彭迈克博士

对本书亦有贡献者
Maria Pia Ancora, Selina Angelini, Lisa Botter,
Elisa Carlotto, Alessandro Celestino, Ellie Dawkins,
Alessandra Fornetti, 黄 金丽, Andy Gouldson, Martina
Hauser, 贺 信, 黄 金丽, Niall Kerr, Johan Kuylenstierna,
Ilda Mannino, Erika Mattiuzzo, Massimiliano Montini,
Richard Pearce, Alessia Pietrosanti, Ivana Radulovic,
任艳明, Radmila Vlastelica Sutic, Denise Tonolo,
Corrado Topi, Francesca Volpe, 王树堂, Francesca
Zennaro and the 中华人民共和国国家发展和改革委员
会应对气候变化司.

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工作通讯电子版

editorial
编者寄语

Climate change is now recognized as a serious global environmental problem. Substantial rises in greenhouse gases (GHGs) come from anthropogenic activity that has been shown to cause discernible effects on the global climate system.
As we speak, thousands of tons of CO_2 are polluting the atmosphere and the only weapon we have against GHGs is to improve the low carbon culture.
Governments can play a fundamental role in increasing awareness and knowledge on the topic of climate change by developing and promoting a low carbon economy. China and Italy are two countries moving in this direction.
China is fully committed to developing a low carbon economy. By the end of 2020, the CO_2 emissions per GDP unit in China will be reduced by 40-45% in comparison with 2005. The *Twelfth Five-Year Plan for National Economic and Social Development* highlights the policy orientation of accelerating the transformation of the growth mode, fulfilling the requirements for scientific development and green, low-carbon growth. The measures envisaged for the *Five-Year* Plan focus on the reduction of energy consumption, the optimization of energy structure, the increase in forest carbon sinks, and the minimization of the intensity of energy consumption and carbon dioxide emissions.
The Italian Ministry for the Environment, Land and Sea is involving universities and firms in the paving of a low carbon pattern. Minister Corrado Clini has firstly selected universities to develop pilot projects and know-how dissemination; secondly, he has collected a cluster of leaders in each sector of the Italian market, developing carbon footprint projects and methodologies, which could then be reapplied by all other companies in the future.
Thanks to the proactive efforts of the Ministry of Environment, many important Italian enterprises voluntarily signed the agreement on the carbon footprint projects. Provided with ministerial expertise and know-how, the companies involved will be able to collect data for the Life Cycle Assessment of Goods, which is a "value chain disintegration", with the objective of finding the Carbon Emission Factor related to each micro asset of the company and its supply chain. The following step is GHGs Offsetting, which involves buying emission credits or adopting Carbon Reduction Measures, and finally, Green Marketing Strategies.
The increasing number of agreements on carbon footprints signed by companies on a voluntary basis gives an idea of the growing importance of "green" brands in terms of market competitiveness. Being able to read information on a packet of potato chips, such as "the amount of GHGs emitted is 75g", can raise awareness and help consumers to make green and eco-aware choices.

Martina Hauser, Italian Ministry for the Environment Land and Sea

气候变化是目前公认的、严重的全球性环境问题。人文活动所导致的温室气体大幅上升已被证明对全球气候系统造成明显影响。
正如我们所说，数千万吨的二氧化碳正在污染大气环境，而我们对付温室气体的唯一武器是提高低碳文化。
在推动和促进对低碳经济重要性的认识、积极应对气候变化方面，政府部门可以发挥重要作用。中国和意大利两国正在朝着这个方向努力。
中国正在致力于发展低碳经济。与2005年相比，到2020年年底中国单位国内生产总值的二氧化碳排放量将减少40–45%。国民经济和社会发展“第十二个五年规划”强调积极加强政策引导以加快转变增长方式，从而满足科学发展和绿色、低碳增长的要求。未来五年的工作重点是减少能源消耗，优化能源结构，增加森林碳汇，并最大限度降低能源消耗强度和二氧化碳排放强度。
意大利环境、领土和海洋部积极邀请高等院校创建低碳模式。克拉多·科里尼（Corrado Clini）部长首先选择了一批大学来开发试点项目并传播信息和知识；然后他邀请了活跃在意大利市场上的、每个领域的龙头企业家们来共同开发碳足迹项目，并积极研究方法学。一旦这些方法成熟，将在各企业推广使用。
在意大利环境部的积极推动下，许多重要的意大利企业自愿签署了“碳足迹项目协议”。在环境部的专业指导下，签约公司将为产品生命周期评估提供数据，某种意义上这是一个“价值链的分解”过程，从而估算出微观层面上企业及其供应链的碳排放因子；在此基础上，将进行温室气体减排方面工作，其中包括购买排放配额或采取减碳措施；并最终制定出绿色营销策略。越来越多的企业自愿签署协议加入到“碳足迹项目”中，这足以证明 “绿色”品牌在市场竞争力方面日益凸显的重要性。如果在一包薯片袋上标识出“温室气体排放量为75g”，则足以帮助消费者作出选择绿色和有益于生态环保的购买选择。

Martina Hauser, 意大利环境、领土和海洋部

Durban Conference on Climate Change: a Key Step towards a New International Regime

Minister Clini: "China and EU are the main players for the global switch to green economy". The work of the COP17/MCP7 closed in Durban on December 11, after two extra days' negotiations, which led to an agreement to save the Kyoto Protocol, the first commitment period expiring in 2012, or rather to "launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the convention applicable to all Parties", as the relevant decision says.

The negotiations defined a new geography for global climate policy, which, together with the driving role of the EU and Italy, saw the growing influence of emerging economies such as China, India and Brazil, which, though not bound to reduction commitments, played a key role in the negotiations and will mark the pace of the process started in Durban.

Corrado Clini, newly appointed Minister for the Italian Ministry for the Environment, Land and Sea, led the Italian delegation during the conference and participated as keynote speaker to the high-level forum side-event organized by the Chinese Government, together with Minister Xie Zhenhua, China's head of delegation, EU Climate Action Commissioner, Connie Hedegaard, the British Secretary of State for Energy and Climate Change, Chris Hunhe, Sri Mulyani Indrawati, managing director of the World Bank and Lord Prescott, former deputy prime minister of the UK.

Minister Clini stressed that "China is the engine for the change. Italy is committed to supporting China's low carbon growth through over 250 joint projects promoted by the Italian Ministry for the Environment. While the EU is ready for a second Kyoto Protocol commitment, a strong partnership between the EU and China and other emerging economies is needed, and together they can build a platform for low-carbon development."

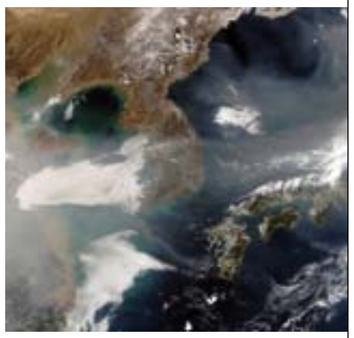
气候变化德班会议：迈向新的国际格局

克里尼部长说："中国和欧盟是推动全球发展绿色经济的主角"。

《联合国气候变化框架公约》第17次缔约方会议暨《京都议定书》第7次缔约方会议在经过两天加时谈判后终于在12月11日在德班落幕。正如大会有关决议文件所说：大会挽救了即将于2012年失效的《京都议定书》，避免启动谈判对各缔约方有约束力的另外一个法律文书。

大会谈判过程本身即展示出全球气候政策的新地域格局，即：中国、印度、巴西等新兴经济体与欧盟、意大利等尽管在减排承诺方面不尽一致，但这些国家和区域组织作为大会的主要驱动力在谈判过程中发挥着关键作用，并将成为德班会议之后的历史进程标志。

科拉多.克里尼先生作为意大利环境、领土和海洋部的新任部长，率领意大利代表团参加了缔约方大会，并在中国政府在德班会议期间组织的中国角边会"系列活动之一"应对气候变化高峰论坛"上做了主旨发言。中国政府代表团团长解振华副主任、欧盟气候行动委员康妮.赫泽高、英国能源与气候变化大臣克里斯.休恩、世界银行世界银行常务副行长英格拉瓦蒂、英国前副首相普雷斯科特等出席会议。克里尼部长强调指出："中国是带来变化的引擎。意大利政府一直以来支持中国推动低碳发展，并在意大利环境部的具体推动下与中国合作开展了250多个项目。欧盟已经做好了《京都议定书》第二个承诺期的准备，与此同时还应在欧盟、中国和其他新兴经济体之间建立强有力的伙伴关系，只有这样才能建立起推动低碳发展的平台"。



New Emission Standards in P.R. of China for Air Pollution

In its efforts to tackle air pollution, China has been using a similar approach to that of Europe to reduce SO_x and this has shown to be quite successful: the target of a 10% overall reduction in the 11th Five-Year Plan was exceeded, and SO_2 emissions in the power sector were reduced by 29% between 2005 and 2009. China now has similarly ambitious plans - and most likely a similar possibility of success - for nitrogen dioxides (NO_x), another key pollutant from coal combustion, with a 10% reduction target in the next 5 years mandated by the 12th Five-Years Plan. Also, the latest emission standards for the power plant sector, which came into force on January 1, 2012, are much more stringent than those

中国颁布大气污染新标准

在控制大气污染方面，中国所采用的方法与欧盟相似：即减少氧化硫的排放。在这方面中国取得了很大的成功，在十一五期间削减10%二氧化硫的指标超额完成，在2005-2009年期间电力行业的二氧化硫排放减少了29%。中国现在制定了新的、更宏大的、很可能也将取得巨大成功的计划——在十二五期间，将氮氧化物削减10%。最近颁布的、于2012年1月1日起执行的电力行业排放标准中，提出了比欧盟更严格的排放要求（氧化硫和氮氧化物的排放标准是比欧盟和日本的一半）。

与过去8年安装脱硫装置一样，削减氮氧化物的技术将在全国的发电企业上应用。这将为国外企业提供了很好地机会，中国政府也将为此投入大量的资金，这样确保污染物控制设备的成本不直接转移到电费中。这种做法也与世界各地都一样。
“中意合作计划”在中国多个城市致力于开展改善空气质量的合作，推动氮氧化物控制技术的转让和能力建设。

意大利能源效率现状报告发布

2012年1月20日意大利新技术、能源、可持续经济发展国家局首次发布了能源利用效率年度报告。
以2011年12月31日可获得数据为基线，该报告介绍了意大利能源利用与能效状况。
该报告还介绍了意大利所执行的能效政策与措施，并分析了这些政策的实施效果，以期核定国家能效目标在不同行业的完成情况。
根据该文件，意大利已经超额完成了到2010年节能47,711 GWh的目标。最有效的节能政策是建筑领域的严格能效标准以及白色证书，后者保证了每节约一度电的最低公共投资。
通过评估不同政策的经济有效性，并对各行业节能情况进行了全面介绍，该报告对成功实施的能效政策

enacted in Europe (emission standards for SO_x and NO_x are half of what is in place in Europe and Japan).
The technologies to abate NO_x emissions will have to be deployed all over the country's fleet of power plants, as was the case with the DE-SO_2 technology in the past eight years. This will be a great opportunity for foreign companies, as well as a huge overall investment for the Chinese government, which cannot transfer the costs of the control equipment into the electricity bill, as happens elsewhere.
The Sino-Italian Cooperation Program is contributing to the efforts to improve air quality in Chinese cities with several projects aimed at know-how transfer and capacity building with regard to NO_x control.

Report on the status of Energy Efficiency in Italy presented

On January 20, 2012, the first yearly report on energy efficiency in Italy was presented by the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA).
The report shows a picture of the state of energy use and energy efficiency in Italy, based on available data at December 31, 2011. The energy efficiency measures implemented in Italy are presented in the report and the results achieved are analyzed with the aim to verify if national targets for energy efficiency in the different sectors have been reached.
According to the document, Italy has already exceeded the target set for 2010 by saving 47,711 GWh. The best policies supporting energy saving have been stricter energy efficiency standards in the building sector and white certificates - the latter having the added advantage of requiring the lowest public investment per kWh saved.
By evaluating the cost-effectiveness of the different measures and by presenting a clear overview of the savings achieved in the various sectors, the report provides feedback on the success of energy efficiency policies and is a useful tool for policy makers to identify the most effective actions to be fostered in the future.

进行了很好地总结，成为政策制定者的一个有用的工具，以便将这些有效行动进一步固化和执行下去。

2011年全球清洁能源投资持续增长

彭博社“新能源财经”在1月底发布的数据显示，去年（2010年）全球绿色能源总投资创新高，达到了2600亿美元（2030亿欧元），比去年增长了5%；其中美国是最大的投资国，总投资达560亿美元，是自2008年以来首次超过中国（总投资474亿美元）的国家。
美国这些数据是奥巴马总统经济恢复刺激计划所带来的结果。如果将高速铁路投资也计算进去的话，该计划一共对绿色经济投资达到了800亿美元。
全球2600亿美元的投资包括对可再生能源、生物燃料、智能技术等方面的投入；但不包括天然气、核能和清洁煤方面。投资上涨主要是由于对太阳能的大幅投资，投资达到了1366亿美元，比去年增长了36%；而对风力发电的投资有所降低，减少到749亿美元，比去年减少了17%。
对绿色能源投资持续增加的趋势还是很明显的；但如果能够像德意志银行气候变化咨询组那样，对清洁能源投资确定出更严格的标准，投资上涨的趋势将会更加强劲。与2010年同期相比，去年前9个月的总投资已经从1030亿美元增长到1400亿美元。
分析家认为投资增长的趋势将会贯穿整个2012年以及未来更远的时间。在美国，投资趋势将会受到投资刺激计划实施情况的影响；也会受到29个州对可再生能源增长需求的影响，在这些地区，风能、太阳能、地热资源和生物质能必须得在其能源供应中占有一定的份额。而在中国、印度和巴西这些新兴经济体中，能源需求的不断增长迫使它们转向替代能源。

Global Investments on Clean Energy Continue to Rise in 2011

At the end of January, Bloomberg New Energy Finance released the 2011 data, which showed a new high in global green energy investment totaling $260bn (euro 203 bn) last year (a 5% increase) with the US becoming the biggest investor with $56bn and, for the first time since 2008, overtaking China, which invested $47.4bn.
These American numbers are the results of President Obama's stimulus package for economic recovery, which set aside as much as $80bn for the green economy, once investment in high-speed railways is taken into account.
The global $260bn figure includes investment in renewables, biofuels and smart technologies. It does not include natural gas, nuclear energy or clean coal.
The increase is driven by the investment in solar power, which rose 36% last year to $136.6bn, while the big loser was wind power, for which investment fell by 17% to $74.9bn.
The positive trend for green energy is clear though, and when even stricter criteria to define investment in cleaner sources are used, as is the case with Deutsche Bank's climate change advisors' group, the trend is even stronger, showing a rise to $140bn in the first nine months of last year from $103bn over the equivalent period in 2010.
Analysts agree that the positive trend will continue through 2012 and beyond. In US this will be driven by the phasing out of the stimulus package and by the growing demand for renewable power, with 29 states in the US requiring utilities to generate a share of their electricity from wind, solar, geothermal and biomass. In the emerging economies of China, India and Brazil this will be driven by the increasing energy demand and turning to alternative sources to satisfy it.

Low Carbon Economy: a Glance at the EU Policy and an Italian Case-Study
低碳经济: 欧盟政策概览和意大利案例简介

Massimiliano Montini and Francesca Volpe
Environmental Legal Team, University of Siena
锡耶纳大学环境法团队

Introduction

The expression “low carbon economy” refers to a desirable scenario where higher resource productivity - producing more with fewer natural resources and less pollution - contributes to higher living standards and to a better quality of life.[1]

The concept of a low carbon economy now represents, both at a European and international level, a common expression to refer to an economy characterized by high resource productivity and minimal output of greenhouse gas (GHG) emissions. Various GHG abatement options can be detected, but they can be grouped around three main categories: energy efficiency measures, low carbon energy supply and terrestrial carbon (forestry and agriculture).[2]

Thus, the low carbon economy challenge is strictly connected to climate change and energy issues.

Since natural resources and the resilience of natural systems are physically limited, and science has warned us for a long time that the steady increase in GHG emissions is leading to dangerous climate change effects, we need an urgent shift towards a low carbon economy to clear the hurdle of the present high-intensive carbon economy which seems unsustainable in both the medium and long term.

The main reasons for the shift to a low carbon economy can be grouped under the following three types of needs: environmental needs (e.g., climate change – science tells us that to prevent dangerous unpredictable anthropogenic interference with the climate system, the increase in the global temperature should be maintained below 2° Celsius); economic needs (e.g., energy supply security - with increasing fossil-fuel scarcity, there are serious threats to the world’s energy security); social needs (e.g., growing population - the necessity to deal with an increasing global demand for energy).

The global crisis we are experiencing may offer an opportunity to implement a low carbon economy and to broaden such a concept from merely a response related to climate change to an effective way to rethink our unsustainable consumption models and move into more sustainable development patterns.

简介

所谓“低碳经济”是指通过提高资源生产力，尽可能减少自然资源使用和污染物排放，实现高水平和高质量生活的一种理想经济发展形态[1]。

现阶段在欧盟乃至世界范围，低碳经济代表着高资源生产力、低温室气体排放的经济形态。为此涌现出了各种温室气体的减排措施，总体来讲可以将其分为三大类：提高能效、低碳能源供应和陆生碳（林业和农业）[2]三类。

低碳经济所面临的挑战与气候变化及能源问题紧密相关。

自然资源和自然系统修复是有限度的。科学研究成果也已警告我们，由于过去温室气体长期大量排放导致了很危险的气候变化效应，因此我们需要紧急采取措施转向低碳经济，以消除当前阻碍经济可持续发展的障碍——高强度碳排放经济发展模式。转型发展低碳经济的主要原因可以归结为基于满足以下三种需求：环境需求（例如：气候变化——科学告诉我们，为避免对气候系统造成有危险的、不可预测的人文干扰，全球气温上升幅度应控制在2°C以下）、经济需求（例如：能源供应安全——随着化石燃料日渐稀缺，世界能源安全受到严重威胁）、社会需求（例如：不断增长的人口数量——需要满足不断增长的全球能源需求）。

我们正在经历的全球危机为我们提供了一个转型发展低碳经济的机会，也使我们从应对气候变化这一单一概念拓展到更有效地反思我们不可持续的消费模式，并进而转向推动可持续发展。

Eu Policies for the Promotion of a Low Carbon Economy

The European Legislative Framework

The European Union (EU) is at the forefront in the design and implementation of an effective low carbon economy framework, having acknowledged that "*the crisis is a wake-up call, the moment where we recognise that business as usual would consign us to a gradual decline*"[3] and that "*the crisis is occurring on the eve of a major structural shift towards the low carbon economy. The goal of fighting climate change can be combined with major new economic opportunities to develop new technologies and create jobs and enhance energy security*".[4]

The main steps in the European policy framework for the promotion of a low carbon economy are as follows: the *European Strategic Energy Technology Plan (SET-PLAN) "Towards a low carbon future"*, the *Climate and Energy Package* and the *Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth* within which, in particular, the *Resource Efficiency Flagship Initiative*, is intended to put the EU on course to use resources in a sustainable way.

In 2007, the EU released the SET-PLAN to accelerate the development and deployment of cost-effective low-carbon technologies.[5] The SET-PLAN is structured around a series of sectoral goals for the year 2020 and various initiatives foreseen to meet such targets: up to 20% of the EU electricity produced by wind through the European Wind Initiative; up to 15% of the EU electricity generated by solar power through the Solar Europe Initiative; 50% of the European grid able to operate along the "smart" principle, effectively matching supply and demand, through the European Electricity Grid Initiative; at least 14% of the EU energy mix from cost-competitive, sustainable bio-energy through the Sustainable Bio-Energy Europe Initiative; carbon capture and storage technology costs reduced to 30-50 euro per ton of CO_2 abated within the framework of the European CO_2 Capture, Transport and Storage Initiative; and the first Generation-IV nuclear reactor prototypes put into operation through the Sustainable Nuclear Fission Initiative. In general, there is a need for international cooperation and the involvement of the private sector, at both a national and global level, as an essential means to fully implement an effective strategy for the achievement of a low carbon economy.

The Climate and Energy Package,[6] released by the EU in 2009, could be considered the most relevant step made in the recent past by the EU in the struggle against climate change and in the implementation of a more effective medium-term strategy, due to the setting of legally-binding targets to be reached by 2020. More precisely, the Climate and Energy Package introduces two mandatory targets for the year 2020, namely a 20% reduction in GHG emissions (compared to 1990 levels) and a 20% share of energy from renewable sources, and an indicative goal of a 20% reduction in primary energy use (measured against a business-as-usual scenario) to be achieved by improving energy efficiency.

Through the *Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth*[7] the EU has broadened its field of intervention, setting measurable targets to be reached by 2020, not only for climate and energy, but for employment, innovation, education and social inclusion as well.

Given these European targets, the EU concentrates its efforts around three priorities: developing an economy based on knowledge and innovation (smart growth); promoting a more resource efficient, greener and more competitive economy (sustainable growth) and fostering a high employment economy delivering social and territorial cohesion (inclusive growth).

More particularly, as far as climate and energy are concerned, the *Resource Efficient Europe Flagship Initiative*[8] aims at supporting the shift towards a resource efficient and low carbon economy, decoupling the economic growth from resource and energy use, reducing CO_2 emissions, enhancing competitiveness and promoting greater energy security. Under this flagship initiative, the Energy Efficiency plan 2011,[9] a Roadmap for moving to a competitive low carbon economy in 2050[10] and a White Paper on Transport[11] have been released as long-term policy plans.

欧盟推动低碳经济的相关政策

欧盟法律框架

在制定和执行有效推动低碳经济的政策方面，欧盟是走在最前面的。欧盟认为，当前所面临的危机对人类敲响了警钟，如果我们还继续当前的发展模式，那么我们一定会逐步走向衰退"[3]。"在我们进行结构调整、推动低碳经济发展的前夕，危机发生了"。应对气候变化的目标可以与新的、经济发展机会相结合，包括发展新技术、创造就业机会、提高能源安全等[4]。

欧盟推动低碳经济的政策框架主要包括以下部分：欧盟战略能源技术规划（SET-PLAN)）、"迈向低碳经济"、气候和能源一揽子政策以及欧盟智能、可持续和包容性增长的2020战略，其中后者重点强调在欧盟广泛推动可持续利用能源这一理念。

2007年欧盟发布了SET-PLAN，以加速发展和运用成本有效的低碳技术[5]。该计划为诸多相关领域制定出到2020年将实现的目标，以及为实现这些目标而提出的行动倡议：通过实施欧盟风电倡议，将风电在欧盟发电领域所占比例提高到20%；通过实施欧盟太阳能倡议，将太阳能应用比例提高到15%；欧盟50%的电网应符合"智能网"原则，以有效解决供需平衡；通过实施欧盟可持续生物质能倡议，低成本、有竞争力、可持续利用的生物质能将占电网发电量的14%；在欧盟二氧化碳捕获、传输和存储倡议框架下，将二氧化碳捕获和存储技术成本降低到每吨二氧化30-50欧元；通过执行欧盟可持续利用核能倡议，将第一代—四型核反应堆样机投入运行。总体来说，需要在国家和全球范围内广泛开展国际合作，充分吸纳私人企业参与。只有这样才能全面实施低碳经济发展的规划与战略。

2009年欧盟发布了气候与能源一揽子政策[6]。由于在该政策中明确提出了到2020年将达到的、具有法律约束力的目标，因此被看做是欧盟在过去几年里应对气候变化、确保中期战略顺利实施的最具相关性的政策。更准确地说，气候与能源一揽子政策提出了到2020年必须实现的两个强制性目标：即与1990年比，减少二氧化碳排放量20%；欧盟能源消耗中可再生能源利用率达到20%。此外，还有一个指示性指标，即：通过提高能源效率，将一次性能源使用率（从现在的水平）降低20%。

通过颁布欧盟2020智能、可持续发展和包容性增长战略[7]，欧盟提出了更广泛的要求，不仅在应对气候变化和能源方面，而且在就业、技术创新、教育、社会包容发展等方面制定出了到2020年将达到的可测量的目标。为实现这些目标，欧盟将以下确定为优先领域：在知识和创新（智能增长）基础上发展经济；推动更加节约资源、绿色和有竞争力的经济（可持续增长）；促进高就业率经济，增强社会和区域凝聚力（包容性增长）。

更具体来说，在气候和能源领域发布了《资源有效利用旗舰倡议》[8]，旨在推动向资源有效利用发展低碳经济转型，将经济增长与资源和能源利用脱钩，降低二氧化碳排放，提高竞争力，全面推动实现能源安全。在该旗舰倡议下，作为长期政策规划，欧盟发布了《能效计划2011》[9]，为欧盟勾勒出了到2050年[10]向有竞争力的、低碳经济转型的路线图。此外还发布了《交通白皮书》[11]。

The Results Achieved by the EU and the Way Forward

The EU, having recognized that renewable energies form the heart of any low carbon energy scenario, is making real efforts to promote the use of renewable energies and to reduce its GHG emissions, thus easing the shift to a low carbon economy. Also, thanks to an increasingly supportive legislative framework, between 2005 and 2008, the EU cut its emissions from 7% to 10% below 1990 levels[12] and, in the past two decades, emissions have gone down by 16%, whilst the economy has grown by 40%.
It has been estimated that, with the full implementation of current measures, the EU is on track to achieve its target for 2020 of reducing emissions to 20% below 1990 levels and raising the share of renewable energies to 20%. However, the EU is currently only halfway towards the third goal of improving energy efficiency by 20% for the year 2020.[13] This means that a much greater effort will be needed in order to meet the energy-efficiency target, and the European effort to draft a new directive on energy efficiency needs to be read in this sense.
Furthermore, in the longer term, the transition towards a competitive low-carbon economy means that the EU should reduce its domestic emissions by 80% by 2050 compared to 1990.[14] To this effect, both the EU and the member states need to work on appropriate and effective strategies. In this sense, the EU Committee on the Environment, Public Health and Food Safety recently adopted a non-legislative report (in January 2012) which calls for an improvement on the Emissions Trading System and other EU policies in order to help the transition towards an economy less dependent on carbon fuel.

An Italian Case-Study

An interesting example of low carbon economy principles and policies put into practice is the Italian case of San Benedetto's carbon neutral mineral water bottle "*EASY*".[15] This positive experience originated from the signing, during the International Forum on Low Carbon Technologies (2009), of a voluntary agreement between the San Benedetto company and the Italian Ministry for Environment, Land and Sea, with the aim of identifying common initiatives under the framework of the Kyoto Protocol. Great work has been achieved by San Benedetto in the development of a methodology for reducing bottled mineral water's carbon footprint through the entire product life cycle (the so-called "cradle to grave" approach) and in the utilization of clean technologies in bottled mineral water production. An independent third party[16] performed the technical verification of the methodology used to reduce San Benedetto's carbon footprint and neutralize GHG emissions, basing its control on the requirements of the standard UNI ISO 14064-1:2006.These efforts represent an important first step in the process of qualifying San Benedetto's mineral water as carbon neutral and identifying, at a ministerial level, an effective methodology for the calculation of the product's carbon footprint and its neutralization.

欧盟政策实施效果和下一步走势

欧盟充分认识到可再生能源是构成其低碳经济的核心，因此正着力推动可再生能源的利用，以减少二氧化碳排放，顺利实现向低碳经济转型。
在强有力的支持性政策框架下，在2005和2008年，欧盟在1990年排放水平[12]的基础上削减了7% - 9%的温室气体排放；并且在过去20年里，经济增长了40%，温室气体排放减少了16%。
根据预测，如果欧盟能够全面执行相关政策，到2020年欧盟可以完成与1990年相比削减20%的减排目标，并将可再生能源应用提高到20%。不过，目前欧盟还只完成了2020年20%削减目标[13]的一半。这意味着还需要付出更大的努力，以确保目标实现。从这个意义上讲，欧盟致力于制定新的指令这项工作也应当提到议事日程上了。
从长远来看，向有竞争力的低碳经济转型意味着：到2050年欧盟将在1990年的基础上减少其排放的80%[14]。因此，欧盟环境、公共健康和食品安全委员最近（2012年1月）通过了一份非制度性的报告，呼吁改进排放交易制度以及欧盟其他相关政策，以推动向更少依赖化石燃料的经济转型。

意大利的一个具体案例

意大利善.贝纳德图（音译，San Benedetto）公司在执行低碳经济原则和政策方面称得上是一个很有意思的典型案例。该公司的瓶装中性矿泉水的商标为"EASY"[15]。在低碳技术国际论坛（2009）期间该公司与意大利环境、领土和海洋部签署了自愿减排温室气体协议，旨在《京都议定书》框架下提出共同减排的倡议。善.贝纳德图公司将其产品全生命周期（即从摇篮到坟墓）纳入考量范畴，在减少瓶装矿泉水碳足迹的方法学开发方面做出了很大成绩；并在瓶装矿泉水生产方面采用了清洁生产技术。第三方独立评估机构[16]按照UNI ISO 14064-1:2006标准的有关控制要求，对其减少碳足迹和降低温室气体排放的方法学进行了技术复核。
这些努力是最终确认善.贝纳德图公司在矿泉水生产过程中减排温室气体的重要环节，其产品碳足迹和温室气体减排计算方法在部门层面最终获得了有效认可。

结论

毫无疑问，向低碳经济转型是我们当今面临的主要挑战之一。稳步转型需要一个长期过程，并需要尽快采取行动。正如斯特恩评估报告所指出：现在采取行动，可以把成本控制在全球年GDP的1%；如果不行动，全球将损失年GDP的5-20%[17]。
在过去几年里，欧盟在推动向低碳经济转型方面可谓坚定不移。然而，尽管欧盟在出台政策、采取措施方面做出了积极努力，但由于欧盟只占全球温室气体排放总量的10%，因此，只靠欧盟自身的努力是不可能应对气候变化和推动低碳经济的发展。与气候变化相关的其他挑战、能源供应安全、以及经济竞争力等方面，只靠欧盟自身的努力也是解决不了问题的，需要在全球范围内协调解决。国际社会共同努力是应对气候变化和保证能源供应的唯一可行办法。只有发展低碳经济才能推动经济可持续发展，因此，欧盟必须发挥牵头作用，并带动其伙伴（包括发达和发展中国家、能源生产者以及消费者）积极参与，在相互信任、广泛合作、相互依赖的条件下共同推动实现低碳经济！

1 该定义首次出现在2003英国能源白皮书"我们的能源未来——创建低碳经济"。
2 Mc Kinsey & Company, 通往低碳经济之路——全球温室气体减排成本曲线第二版本。
3 欧洲2020——智能、可持续和包容性发展的欧盟战略- COM(2010)2020.
4 欧盟经济恢复计划– COM(2008)800.
5 COM(2007)723.
6 气候和能源一揽子政策的核心是：关于可再生能源的2009/28/EC法令、关于温室气体减排的2009/29/EC法令、关于碳捕获和储存的2009/31/EC法令，以及关于欧盟排放交易体系以外的、其他行业排放的法令406/2009/EC。该政策于2009年6月生效。
7 Europe 2020, cit.
8 COM(2011)21.
9 COM(2011)109.
10 COM(2011)140.
11 COM(2011)112.
12 COM(2010)265.
13 COM(2011)112.
14 COM(2011)112.
15 由意大利环境、领土和海洋部中东欧工作组在"焦点"的下一篇文章中详细介绍善.贝纳德图公司案例。
16 Bureau Veritas 意大利.
17 斯特恩, 气候变化经济学——斯特恩评估报告，剑桥，2007.

Conclusions

The shift to a low carbon economy undoubtedly represents one of the major challenges of our day.
A coherent transition to a low carbon economy will take a long time and quick action is needed. As the Stern Review estimated, the cost of action could be limited to around 1% of global GDP per year, while inaction could result in losing 5-20% of global GDP annually.[17]
The EU, in the last few years, has shown a clear commitment in a shift towards a low-carbon economy. However, despite the positive European policies and measures planned and taken, the EU - with about 10% of the global emissions - will not be able to tackle climate change and promote a move towards a low-carbon economy on its own. The inter-related challenges of climate change, security of energy supply and competitiveness, in fact, cannot be overcome by the EU alone. It will require a coordinated response at a global level. International progress is the only way to solve the problem of climate change and energy supply, thus easing the transition to more sustainable patterns of development, based on low-carbon economy scenarios. Therefore, the EU must continue to take a lead and engage its partners - both developed and developing countries, as well as energy consumers and producers - for a low-carbon economy future based on mutual trust, cooperation and interdependence.

1 This definition was firstly contained in the 2003 UK Energy White Paper "Our energy future – creating a low carbon economy".
2 Mc Kinsey & Company, *Pathways to a Low Carbon Economy* – Version 2 of the Global Greenhouse Gas Abatement Cost Curve, 2009.
3 *Europe 2020 – A European Strategy for Smart, Sustainable and Inclusive Growth* - COM(2010)2020.
4 *European Economic Recovery Plan* - COM(2008)800.
5 COM(2007)723.
6 The core of the Climate and Energy Package, which took force in June 2009, comprises Directive 2009/28/EC on renewable energy, Directive 2009/29/EC on greenhouse gases emissions, Directive 2009/31/EC on carbon capture and storage, Decision 406/2009/EC on the emissions from sectors not covered by the European Emission Trading System.
7 Europe 2020, cit.
8 COM(2011)21.
9 COM(2011)109.
10 COM(2011)112.
11 COM(2011)140.
12 COM(2010)265.
13 COM(2011)112.
14 COM(2011)112.
15 The San Benedetto case study is analyzed in depth in the next article "Carbon Footprint: the San Benedetto S.p.A. Project" by I. Radulovic and R.V. Sutic of the Task Force for Central and Eastern Europe, Ministry for the Environment, Land and Sea
16 Bureau Veritas Italy.
17 N. Stern, The Economics of Climate Change – The Stern Review, Cambridge, 2007.

Carbon Footprint: the San Benedetto S.p.A. Project
碳足迹: 善.贝纳德图公司的案例研究

Ivana Radulovic and Radmila Vlastelica Sutic
Task Force for Central and Eastern Europe, Ministry for the Environment, Land and Sea - Italy
Ivana Radulovic 和 Radmila Vlastelica Sutic
意大利环境、领土和海洋部中东欧工作组

Introduction

Global warming, one of the main environmental impact categories, has become a very important global problem that has led to international action to deal with the uncertain consequences related to climate change. Governments, research and academic institutions, businesses and the community in general have obviously made an unwritten agreement to respond to this issue urgently, on both a national and international level.
The measures performed globally so far are not sufficient to reverse climate change or even stabilize it. Therefore, more stringent action must be taken to at least stabilize the level of greenhouse gases (GHG) in the atmosphere. These more stringent measures will lead to an increase in the price of carbon credits, which will also have a financial impact. Only in this way will the business community, one of the major players in the carbon pollution pool, be attracted to address the challenges of climate change, connecting both risks and opportunities for business. Beside this, in order to be competitive in the low-carbon market, retailers will need to establish a sustainable strategy for managing their GHG emissions, otherwise they will have much higher expenses later when they try to catch the flow of the environmental trends.
The Italian Ministry for the Environment, Land and Sea (IMELS) has made its first efforts to foster and promote action in the different industrial sectors in Italy to assess their carbon emissions and work on their neutralization. IMELS, through voluntary agreements on joint activities, aims to achieve carbon neutral final products, presenting them as best practices in terms of organizing and managing carbon pollution caused by businesses and, therefore, effectively combating climate change.

San Benedetto Case Study

The voluntary agreement between IMELS and the mineral water company, San Benedetto S.p.A, is the first of its kind in this field and as it is relevant to the topic of this article, the San Benedetto case will be presented hereby. San Benedetto S.p.A. has shown that they are open to participate in this initiative, in line with the company's strategy to focus as much as possible on environmental issues, presenting a good example to the market of a carbon neutral product.

简介

全球变暖作为对环境造成影响的主要因素之一，已经变成了非常重要的全球问题，要求国际社会采取一致行动应对气候变化所带来的各种不确定性。显而易见，政府部门、科研机构、企事业单位等都已经达成非书面共识，国内和国际社会都来共同采取行动以积极应对这一紧迫问题。到目前为止在全球范围所采取的行动还不足以逆转或者甚至稳定气候变化。因此，应采取更严格的措施至少将大气层中温室气体的排放控制住。这些更严格的措施将会导致碳交易额价格上涨，这将会对金融领域产生影响。只有这样，作为碳污染池中的主要角色才会从商业的风险和机会角度来关注解决这个问题。此外，为了在低碳市场上更加有竞争力，零售商应该制定可持续战略以管理其温室气体排放；否则，当他们想赶上来解决这些环境问题时，所付出的代价可能会高得多。

意大利环境、领土和海洋部（以下简称意大利环境部）首先在各工业领域积极推动碳减排，评估企业二氧化碳排放情况、以及减排所应该采取的措施；并积极推动与企业签订自愿减排协议，贯彻实施最佳环境实践，要求企业对碳排放进行科学管理，以期能够在最终产品上将碳排放降低，从而有效应对气候变化。

善.贝纳德图案例

意大利环境部与善.贝纳德图矿泉水公司签订的自愿减排协议是该领域减排的第一个协议，因此本文将其作为案例进行详细介绍。善.贝纳德图公司认为加入环境部倡议行动和其企业自身发展的总体战略是一致，即：尽可能解决和改善环境问题，为市场树立低碳排放的好榜样。
为了实现这个目标，善.贝纳德图必须完成以下任务：(i) 测算企业和产品的碳足迹；(ii) 制定到2012

In order to reach this goal, San Benedetto S.p.A. had to complete the following tasks: (i) calculate the corporate and product carbon footprint, (ii) design an action plan to achieve GHG emission reductions by 2012 and (iii) neutralize residual GHG emissions through carbon offsetting. The outcomes of the tasks performed were certified by the independent third party i.e. Bureau Veritas, Italy.
Accounting for the carbon footprint of an industry and its products is just the first step to see where the company is at (from the GHG emissions point of view). The main goal is to achieve real GHG emission reduction through investment in different energy-saving procedures. Therefore, the corporate and/or product carbon footprint represents a reference point for companies to prepare a credible carbon management plan with the aim of reducing GHG emissions.
As mentioned, the first step taken by San Benedetto

年减排温室气体的行动计划；(iii) 通过采取措施减少温室气体排放。这些任务所产生的效果将由意大利第三方独立公司Bureau Veritas来评估。
测算企业和产品的碳足迹是第一步，用于评估企业温室气体减排的基线；最主要的目的 是通过在各环节进行节能投资，从而降低其排放水平。因此，企业和/或产品的碳足迹是个参照值，以帮助企业制定出一个可信赖的、碳减排计划，从而实现温室气体减排目标。
如前文所说，善.贝纳德图所采取的第一步是估算其碳排放足迹，即：在报告期内对其产品全生命周期（即：从摇篮到坟墓）的温室气体排放水平进行全面评估。评估方法学的主要依据是已有的几部规范，并重点参考了WRI/WBCSD 温室气体排放规约（WRI/WBCSD GHG Protocol）。根据《企业核算与报告标准》（Corporate Accounting and Reporting Standard）和《产品生命周期核算与报告标准》（WRI/WBCSD Product Life Cycle Accounting and Reporting Standard）所核定的碳排放足迹是可信赖的、透明的和可理解的。善.贝纳德图的碳足迹核定包括了善.贝纳德图的品牌瓶装矿泉水。该企业位于Scorze，是善.贝纳德图最大的瓶装矿泉水生产企业，也是善.贝纳德图唯一的的生产矿泉水的企业。按照温室气体的有关规约（GHG Protocol），确定了该企业的基线排放水平、基线年、和功能单元。在计算中所采纳的排放因子是从各种官方数据源引来的。将“1l 聚酯瓶EASY”这个新产品选定为功能单元。为了制定可靠的减少碳足迹的目标，在善.贝纳德图提供了所有相关生产数据基础上，将2008年选定为基线年，同时也收集了2009年和2010年的数据。下列排放源被识别为有减排空间，总结起来可分为三类：第一类包括装瓶生产过程的能源使用和制冷剂的泄露问题；第二类包括用于矿泉水生产的、从意大利电网上买来的电力；第三类是原材料（包括聚酯颗粒、玻璃、纸张、以及其它包装材料等）的抽提、加工、运输、网电输送及分配过程中的损失、天然气生产、运输、分配过程的泄露、瓶装矿泉水生产、存储、流通、零售、产品废弃及与该产品相关的所有产品使用后所产生的废物。
在对基线年温室气体排放和未来投资计划评估后，善.贝纳德图公司确定了将采取的具体措施，以实现减少温室气体排放、并节约能源。其中一

focused on acknowledging the company's carbon footprint, i.e. on the evaluation of the amount of GHG emissions caused by its production through the whole life cycle, using the so-called "cradle-to-grave" approach within a defined reporting period. This methodology is based on several available protocols, with particular reference to the WRI/WBCSD GHG Protocol: A Corporate Accounting and Reporting Standard and WRI/WBCSD Product Life Cycle Accounting and Reporting Standard, presenting the GHG results in a credible, transparent and understandable way.
The assessment of San Benedetto S.p.A.'s carbon footprint comprised San Benedetto brand bottled water, produced in the plant Scorze, as the largest producer of bottled mineral water within the San Benedetto Corporation and the only plant where San Benedetto bottled water is produced.
Since the GHG Protocol, the organizational and operational boundaries, the base year, and the functional unit have been defined. The emission factors used in the calculation have been taken from different official data sources. The new product, 1l PET bottle EASY, for natural water, was selected as an appropriate functional unit.
In order to set up reliable carbon footprint reduction and neutralization targets and, taking into account the availability of the comprehensive data for the whole bottled water life cycle of the related San Benedetto production, the year 2008 was chosen as a base year, while the data was collected for 2009 and 2010 as well.
The following emission sources have been considered within operational system boundaries for the San Benedetto case, grouping them into three scopes.
Scope 1 includes the energy used for the bottled water production process and refrigerant leakage, *scope 2* includes electricity purchased from the Italian power grid also used for the bottled water production process, and *scope 3* includes the extraction, processing and transport of raw and input materials (PET granules, glass, PE, paper, other packaging etc.), transmission and distribution losses due to the electricity transferred by the power grid and fugitive natural gas emissions from its extraction, processing, transport and distribution, waste generated from the bottled water production process, storage, distribution, retail, end-use and end of life of the related products.
After the assessment of GHG emissions for the relevant base year and following its own future investment plan, San Benedetto S.p.A. defined the possible measures which, as a result would reduce GHG emissions and create energy savings as well. Some of these measures were already under development, while some were in the process of project documentation, with the goal to be realized by the end of 2012. Some of the analyzed measures were: the reduction of bottle weight, the use of recycled PET, the optimization of the bottling process, and the introduction of a photovoltaic system and three-generation plant.

部分措施已经在执行中，而有些尚未开展，目标是到2012年底实现减排目标。这些措施包括：降低瓶子重量、循环利用聚酯塑料、优化装瓶工艺、引入光电系统和三级发电厂。
一般来讲，在评估可能减排的措施后，可考虑抵消剩余碳排放额度或利用《京都议定书》机制投资项目或从别的市场上购买碳交易额 (CERs/VERs)。善.贝纳德图选择了在泰国的一个项目中购买碳排放交易额，该项目是利用生物质作为能源进行污水处理。
善.贝纳德图希望能够将碳足迹减排工作适时向公众通报，并特别希望能够公布其减排结果，因此建议每年进行一次减排核定。他们执行了核定程序，对产品全生命周期、购买碳抵消额、所选择产品的减排效果等进行了核准。
该项目的最后一步就是如何公布所达到的减排效果。由于计划中的减排措施还在执行中，善.贝纳德图公司将在头几年更多地依靠在市场上购买碳交易额来抵消自己应减少的排放量。

In general, after the assessment of the potential reduction measures, the following step is related to the offset of the residual emissions or by investment in the projects using different Kyoto Protocol mechanisms or buying carbon credits (CERs/VERs) from different carbon markets. In this case, San Benedetto chose to buy the VERs from a project developed in Thailand related to the wastewater treatment plant generating biogas used for energy production.
Since San Benedetto S.p.A. intended to communicate its carbon footprint publicly, it was highly recommended that it certify it year-by-year, particularly if they wanted to use carbon neutral statements. They performed the certification procedure confirming the level of emissions through the whole product life cycle, the quality of carbon offsets bought and the carbon neutral statement for the chosen product.
The last step of the project was related to the communication of the achieved results. Since the planned emission reduction measures are still under development, San Benedetto, for the first couple of years, offset the current emissions related to the chosen bottle by buying carbon credits from the voluntary market.

Results

The final results of this assessment have shown that more than 83% of emissions are caused by scope 3 emission sources, while 2.3% and 14% are caused by scope 1 and 2 respectively. The main contribution to scope 3 emissions belongs to input materials and distribution of final products - 55% and 10.5% respectively. The main impact to the emission share of input materials has the input of PET granules comprising 75% of total emissions from input materials. Concerning scope 2 emissions, the main consumer of electricity within the industrial process belongs to the process of production of PET pre-forms and PET bottles.
The chosen measures for energy savings and use of renewable energy have shown that the total level of potential emission reduction should be reached by 2012, to the value of 41,000 tCO_e.
The GHG emissions caused by the total annual production of the one-liter bottle PET EASY was neutralized by buying carbon credits from the voluntary market.
The bottled 1l PET bottle EASY has been described as a carbon neutral product.

Conclusion

The carbon neutral product, the goal of this pilot project, is related to the carbon footprint assessment and can be obtained by following three important steps: a carbon footprint calculation for the whole product life cycle, reducing it and then offsetting residual emissions.
To reach this goal in a transparent way, it was necessary to provide clear information on the emissions measured, reductions made and the offsets purchased for a specific

结果

通过评估发现，83%的二氧化碳排放来源于第三类；而2.3%和14%的排放量来源于第一和二类。 第三类的二氧化碳主要贡献者是输入原材料和最终产品流通，各占了55% 和10.5% 。输入原材料，即聚酯颗粒，占原材料二氧化碳排放的75%。第二类主要是工业用电所产生的二氧化碳排放，即聚酯塑料的预成型和 聚酯瓶的生产过程。
通过采取相应节能措施和充分利用可再生能源，到2012年可以实现减排目标，即减排41000吨当量二氧化碳。
每年生产1升聚酯EASY瓶的温室气体排放量可通过在市场上购买碳交易额来完成。因此，聚酯瓶EASY矿泉水被称作是低碳产品。

结论

通过对该项目碳足迹评估，促进实施低碳转型。主要包括以下三个步骤：对产品全生命周期进行碳足迹测算、减少碳排放、并抵消碳排放量。为了公开

time period. Only then can it be stated that the product is carbon neutral. Since more than 83% of total emissions concerning the whole product life cycle are related to scope 3 emission sources, over which San Benedetto doesn't have direct control, the assessment of these emissions was based on a lot of assumptions and data basis concerning the same industrial processes but not the actual ones. This increased the uncertainty level. So, the next step of this initiative could be to involve suppliers of the input materials and distributors of final products to do as San Benedetto did, ensuring more precise results. Another important issue is related to the communication of the accounted carbon footprint. Communicating the carbon footprint to consumers as a number is not a response to climate change without concrete action and a commitment to reduce it. Taking into account the growing interest of consumers in understanding the issues of the carbon footprint of the products they buy, it is recommended that they are given a clear picture of how important the climate change issue is to San Benedetto by displaying publicly, on the product label, their commitment to this issue. This will help consumers to compare different products and to choose, and it will help San Benedetto itself to reduce its carbon footprint in order to achieve its market position.

透明地实现这一目标，有必要对碳排放监测数据、减少的排放量 、在一段时间内购买的碳交易额等情况完全公开。只有在这种条件下才可以将该产品称为低碳产品。由于产品全生命周期的83% 以上的碳排放量与第三类有关，而善.贝纳德图公司对这部分排放量没有控制权，因此碳排放评估是以一些假设和数据为基础的，而不是根据实际情况进行测算的。这增加了测算的不确定性。因此，该项目下一步将考虑邀请负责原材料和负责最终产品流通的相关企业加入到该项目中，以确保项目的准确性。另一个重要问题是如何向社会介绍碳足迹减排工作。仅向消费者介绍碳足迹数据，而没有采取具体措施、没有具体减排承诺，则没有太大意义。考虑到消费者对所购买产品的碳足迹问题兴趣日渐变浓，因此建议向消费者讲解清楚气候变化对善.贝纳德图来说是一个非常重要的问题，并通过产品标识等将其减排承诺公布出去。这有助于消费者对产品进行比较和选择；也有助于善.贝纳德图减少二氧化碳足迹，从而赢得市场！

China's Major Policies and Measures in Response to Climate Change during the 12th Five-Year Plan Period

中国“十二五”期间应对气候变化主要政策和措施

Department of Climate Change of the National Development and Reform Commission of the People's Republic of China
中华人民共和国国家发展和改革委员会应对气候变化司

Climate change is a harsh challenge to human survival and development. Green, low-carbon growth is a brand new concept integrating development and climate change, which has become an international consensus and a general trend.

Ushering in the second decade of the 21st century, upon full consideration of future development trends and conditions, China has formulated the *Outline of the Twelfth Five-Year Plan for National Economic and Social Development*, and established the overall development direction and strategic tasks in the next five years, which highlights the policy orientation of accelerating the transformation of the growth mode, fulfilling the requirements for scientific development and green, low carbon growth. Compared with the *Eleventh Five-Year Plan*, the *Outline of the Twelfth Five-Year Plan* specifies active response to climate change as a separate chapter, stressing the significance of this task during the 12th five-year plan period.

The *Outline* identifies the energy consumption per unit of GDP and the targets for cutting carbon dioxide emissions and increasing the proportion of non-fossil energy sources and forest reserves, which are listed as binding targets subject to deadlines for implementation. Key tasks are also clarified in terms of controlling greenhouse gas emissions, adapting to climate change, engaging in international cooperation, etc.

To control greenhouse gas emissions, initiatives should be put in place to save energy and reduce consumption, optimize energy structures, increase forest carbon sinks, minimize the intensity of energy consumption and carbon dioxide emissions and speed up the development of industrial systems of energy, industry, construction and transportation etc., as well as promoting a lifestyle featuring low carbon emissions. The circular economy should be further developed by promoting its key technology, expanding the recycling of waste products and reducing resource-based energy consumption and associated emissions. There should be reasonable controls over aggregate energy consumption, with an increased proportion of non-fossil energy sources through the vigorous development of wind power, solar power and other renewable energy sources and nuclear energy, steady progress in biomass and geothermal energy, and the orderly development of hydropower.

气候变化问题是当今人类生存和发展面临的严峻挑战。绿色低碳发展是兼顾发展和应对气候变化的全新理念，已成为各国共识和大势所趋。

步入21世纪的第二个十年，中国充分考虑未来发展趋势和条件，制定了《国民经济和社会发展第十二个五年规划纲要》，确立了今后5年发展的总体方向和战略任务，突出体现了加快转变经济发展方式，实现科学发展的要求，绿色低碳发展成为重要的政策导向。与“十一五”《规划》相比，“十二五”《纲要》将积极应对气候变化单独列为一章，彰显了应对气候变化工作在“十二五”时期的重要位置。

《纲要》确定了单位国内生产总值能耗和二氧化碳排放下降以及增加非化石能源比重和森林蓄积量等目标，并作为约束性指标，确保如期实现。明确了控制温室气体排放、适应气候变化和积极开展国际合作等方面的重点任务。

在控制温室气体排放方面，要大力开展节能降耗，优化能源结构，增加森林碳汇，大幅降低能源消耗强度和二氧化碳排放强度，加快形成以低碳排放为特征的能源、工业、建筑、交通等产业体系和生活方式。进一步发展循环经济，推广循环经济重点技术，扩大废旧产品再利用，减少资源能源消耗和相关排放。

合理控制能源消费总量，增加非化石能源比重，大力发展风电、太阳能等可再生能源和核能，稳步推进生物质能和地热能发展，有序开发水能资源。继续实施建筑节能、绿色照明、电机改造等十大重点节能工程，推进工业、建筑、交通运输等重点领域和能源、原材料等重点行业节能；全面实施节能产品惠民工程，推广先进节能技术与产品；继续推进千家企业节能行动，加强能效水平对标工作。

积极推进碳汇造林项目实施，提高森林蓄积量。

2010年8月，中国首先在广东、辽宁、湖北、陕西、云南五省和天津、重庆、深圳、厦门、杭州、南昌、贵阳、保定八市开展低碳试点工作，通过实践积极探索建立以低碳排放为特征的产业体系，建立温室气体排放数据统计和管理体系，积极倡导绿色低碳生活方式和消费模式。

在适应气候变化影响方面，要在农、林、水、气等重点领域和沿海及生态脆弱地区采取有效措施，趋利避害，最大限度地减轻气候变化对国民经济和社会发展的负面影响。加强区域气候变化科学研究、观测和影响评估，强化基础设施和重大工程的科学规划和设计。研究制定农林业适应气候变化政策措施,保障粮食安全和生态安全。合理开发和优化配置水资源，强化各项节水政策和措施。加强海洋和海岸生态系统监测，提高沿海地区抵御海洋灾害能力。完善应对极端气象灾害的应急预案、启动机制以及多灾种早期预警机制，提高应对极端气候事件的综合监测预警能力和抗灾减灾能力。

在积极开展国际合作方面，进一步把应对气候变化摆到国家外交总体格局的重要位置，坚持“共同但有区别的责任”原则，推进《联合国气候变化框架公约》和《京都议定书》及本框架的实施，积极参与各种国际规则的制定，推动建立公平合理的应对全球气候变化国际机制。拓展应对气候变化国际合作渠道，建立资金、技术转让和人才引进等机制，构建国际合作平台。通过“南南合作”深化与发展中国家的合作，支持非洲国家、最不发达国家、小岛屿和其它易受不利影响的发展中国家提高适应气候变化能力。

中国开展低碳省区和低碳城市试点工作情况介绍

为实现上述行动目标，积极探索现阶段济发展经济、改善民生，又应对气候变化、降低碳强度、推进绿色发展的做法和经验，2010年8月，国家发展改革委确定在全国开展低碳省区和低碳城市试点工作。这是新形势下中国积极应对气候变化所采取的一项重大措施。

首批试点地区包括广东、辽宁、湖北、陕西、云南五省和天津、重庆、深圳、厦门、杭州、南昌、贵阳、保定八市，试点工作主要在以下五方面进行探索:

（一）编制低碳发展规划。将应对气候变化工作

Ten major energy conservation projects should be continued, including building energy efficiency, green lighting, motor transformation, etc., to facilitate energy saving in industry, construction, transportation and other key areas, as well as in energy sources, raw materials, etc. The project of using energy-saving products to benefit people should be fully implemented to spread the use of advanced energy-savingtechnologies and products.

The energy-saving actions of a thousand companies should be intensified to strengthen energy efficiency benchmarking. Carbon sink afforestation programs should be reinforced to enhance forest reserves.

In August 2010, China’s first low carbon pilot projects were initiated in five provinces (Guangdong, Liaoning, Hubei, Shaanxi and Yunnan) and eight cities (Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang and Baoding) with the aim of building an industrial system characterized by low carbon emissions through practice and a system for statistics and management of greenhouse gas emissions so as to advocate green, low carbon lifestyles and consumption patterns.

As for adaptation to the impacts of climate change, effective measures should be taken in agriculture, forestry, water, gas and other key sectors, as well as coastal and ecologically-fragile areas, making use of advantages while avoiding disadvantages to minimize the negative impacts of climate change on economic and social development. Scientific research, observations and impact assessment should be strengthened in respect to regional climate change, and the scientific planning and design of infrastructure and major projects should be reinforced. Policy measures should be studied and formulated in relation to agriculture and forestry for adaptation to climate change, ensuring food safety and ecological security. Rational development and optimized allocation of water resources should be carried out and water-saving policies and measures should be enhanced. Surveillance of marine and coastal ecosystems should be intensified to enable coastal areas to resist marine disasters. Contingency plans, start-up mechanisms and multi-hazard early warning systems should be improved in response to extreme meteorological disasters, striving for higher capacity for comprehensive monitoring and early warning, control and mitigation of extreme weather events.

In respect of active international cooperation, response to climate change should be further placed in a critical position in the overall structure of diplomacy, following the principle of common but differentiated responsibilities to promote the implementation of the UNFCCC and the Kyoto Protocol, as well as the framework hereof, with active participation in the various international rules to promote the establishment of a equitable and reasonable international mechanism to address global climate change. Channels for international cooperation on climate change should be expanded, fund and technology transfer mechanisms should be set up, talent should be introduced, and a platform for international cooperation established. Cooperation with developing countries should be deepened through South-South cooperation so as to support African countries, the least developed countries, small islands and other vulnerable developing countries to increase their ability to adapt to climate change.

Pilot Programs on Promoting Low Carbon Economy at Regional Level in China

In order to achieve these operational objectives, and to pro-actively explore the proper ways and experiences for promoting economic development, improving people's livelihood and addressing climate change by reducing carbon intensity, in August 2010, the National Development and Reform Commission decided to launch a nationwide pilot program for promoting a low carbon economy. This is an important measure that China has actively taken to address climate change.

The first batch of pilot areas include five provinces and cities, i.e. Guangdong, Liaoning, Hubei, Shaanxi, Yunnan provinces and Tianjin, Chongqing, Shenzhen, Xiamen, Hangzhou, Nanchang, Guiyang, Baoding cities.

The following five aspects are the major content for piloting and experience seeking:

(A) The preparation of a low carbon development plan. The work on climate change has to be fully integrated into the regional 12th Five-Year Plan and the low carbon development plan of the pilot provinces and cities. The plan should play a comprehensive guiding role, integrating the adjustment of the industrial structure, optimizing energy structure, improving energy efficiency and increasing the carbon sinks. In the plan, the operative targets at the regional level for the reduction of carbon intensity and the major tasks and concrete measures thereof should be clearly spelled out. By implementing these plans, the suitable development modes will be studied and explored.

(B) The enacting of supporting policies to promote low carbon green development. Pilot areas should give close attention to develop the synergistic effects of energy saving and environmental protection, new energy development, ecological conservation, and actively explore the institutional mechanisms conducive to the development of energy saving and low carbon industries. The target responsibility system to control greenhouse gas emissions should be implemented. Policies for effective governmental guiding and economic incentives should be studied. Market mechanisms to promote the goal of controlling greenhouse gas emissions should be piloted at full scale.

(C) Accelerating the establishment of an industrial system with low carbon characteristics. Taking the specific features of the local industries and development strategies, the innovation of low carbon technologies should be accelerated and industrialized. The traditional industry should be transformed and upgraded by low carbon technologies. At the same time, it is necessary to closely follow up the latest developments of low carbon technological advances and actively promote the introduction and digestion of new technologies and establish joint R & D with foreign partners.

(D) The establishment of statistics and a data management system of the greenhouse gas emissions. The statistical work of greenhouse gas emissions and a complete data collection and accounting system should be established. To achieve this, building up the institutional and human resources capacity is a prerequisite.

(E) To actively promote low carbon consumption and lifestyles. Training activities for leaders at all levels will be organized to enhance the awareness of climate change so as to improve the levels of decision-making and policy implementation. It has been decided to vigorously carry out publicity and education outreaching activities, encourage low carbon lifestyles and behavior, promote the use of low carbon products and encourage large-scale participation by the general public to lead a low carbon lifestyle.

Currently, the National Development and Reform Commission is considering further strengthening the policy guidance and macro-coordination of low carbon pilot work, while exploring low carbon buildings and low carbon transportation. Concrete projects to help the locals address issues of climate change will be launched. In addition, China will also study the feasibility of introducing the certification system of low carbon products. By doing so, low carbon living and low carbon consumption may be further promoted, which will, in turn, push for the upgrade of the relevant industries. All these works will provide robust support to the whole nation in reaching the national goal of GHG reduction in the year 2020.

全面纳入本地区“十二五”规划，研究制定试点省和试点城市低碳发展规划。发挥规划综合引导作用，将调整产业结构、优化能源结构、节能增效、增加碳汇等工作结合起来，明确提出本地区控制温室气体排放的行动目标、重点任务和具体措施，降低碳排放强度，积极探索低碳绿色发展模式。

（二）制定支持低碳绿色发展的配套政策。试点地区要发挥应对气候变化与节能环保、新能源发展、生态建设等方面的协同效应，积极探索有利于节能减排和低碳产业发展的体制机制，实行控制温室气体排放目标责任制，探索有效的政府引导和经济激励政策，研究运用市场机制推动控制温室气体排放目标的落实。

（三）加快建立以低碳排放为特征的产业体系。结合当地产业特色和发展战略，加快低碳技术创新，推进低碳技术研发、示范和产业化，积极运用低碳技术改造提升传统产业，加快发展低碳建筑、低碳交通，培育壮大节能环保、新能源等战略性新兴产业。同时要密切跟踪低碳领域技术进步最新进展，积极推动技术引进消化吸收再创新或与国外的联合研发。

（四）建立温室气体排放数据统计和管理体系。加强温室气体排放统计工作，建立完整的数据收集和核算系统，加强能力建设，提供机构和人员保障。

（五）积极倡导低碳绿色生活方式和消费模式。举办面向各级、各部门领导干部的培训活动，提高决策、执行等环节对气候变化问题的重视程度和认识水平。大力开展宣传教育普及活动，鼓励低碳生活方式和行为，推广使用低碳产品，弘扬低碳生活理念，推动全民广泛参与和自觉行动。

目前，国家发展改革委正在考虑进一步加强对低碳试点工作的政策引导和宏观协调，同时探索开展低碳建筑、低碳交通和地方应对气候变化专项的试点。此外，中国也在抓紧研究制定重点行业典型产品低碳认证制度，筹备低碳产品认证试点，积极引导低碳生活和低碳消费，带动产业升级，为落实2020年碳排放强度下降目标、实现可持续发展提供支持。

Low Carbon Cities are not That Bad: Economic Returns, Job Creation and Major Investments. The Output of a Mini Stern Review for the Leeds City Region
低碳城市并没有那么糟糕：经济回报、就业机会和大量投资——关于利兹市区的“小型斯特恩回顾”研究

Andy Gouldson, Niall Kerr
University of Leeds, 利兹大学
Corrado Topi, Ellie Dawkins, Johan Kuylenstierna
Stockholm Environment Institute at the University of York
约克大学斯德哥尔摩环境研究所
Richard Pearce
Quantum Strategy and Technology
战略与技术咨询公司

What is the best way of decarbonising a city? A new study by the authors shows that the Leeds City Region could cut its energy bill by £1.2 billion by exploiting commercially attractive opportunities in energy and carbon management. These investments would pay for themselves on commercial terms in just four years.

The Leeds City Region has a population of 3 million, a GVA of £54 billion a year and incorporates 10 major cities in the north of England. The total energy bill in the Leeds City Region is £5.4 billion a year: paying the energy bill means that 10% of all income generated in the Leeds City Region leaves the local economy every year – an amount that is forecast to grow to £7.2 billion by 2022. Leeds itself is the second largest metropolitan borough in England outside of London.

The task of decarbonising a major city is daunting for decision makers: there are hundreds of low carbon options available and whilst they present a significant opportunity to reduce energy bills and carbon footprints, there is often a lack of reliable information on their performance.

The lack of robust evidence generates additional risk, which in turn can be a major barrier to real-world deployment and make the business, political or social case for investment in a low carbon economy difficult to develop. Yet, in order to implement a safe transition to a low carbon, sustainable and resilient city economy, we need to be able to build clear business, political and social cases to set targets and stimulate investments.

The methodology developed by the authors and tested in the Leeds City Region in the UK attempts to address this issue. The approach is based on a robust evaluation of the costs and benefits of different levels of decarbonisation at the city scale. To make the case politically robust the team used data on cost, energy and carbon savings published by government sources and accepted and used by city level decision makers. To make the case more realistic and less favourable, the team excluded those economic activities that are outside the control or influence of city level decision makers. e.g. large scale power plants, and included micro generation and local level community renewables. Planned changes to the national economy and energy infrastructure were kept into account.

Typical commercial interest rates and conservative energy prices projections were used together with realistic scenarios for the rate at which different technological and behavioural options are adopted. To account for gaps, rebound effects

城市脱碳的最好方式是什么？作者一项新研究成果显示，利兹市地区可利用能源和碳管理的商业机会，削减1.2亿英镑的支出；并在短短四年时间内可以商业形式将所做投资收回。

利兹市地区拥有300万人口，年增加值总额为540亿英镑，位于英格兰北部，由10主要城市组成。

利兹市地区每年的能源总支出为54亿英镑，占利兹市地区年总收入的10％——据预测到2022年能源总支出会增长到72亿英镑。利兹是英国的第二大行政市，仅次于伦敦之后。

对一个大型城市进行脱碳，对决策者来说往往是一项十分艰巨的任务：有数以百计的低碳方案可供选择；有降低能源支出和减少碳足迹的重要机会，但这类报告往往缺乏可靠信息。缺乏有力的证据，会产生额外的风险；反过来它又是现实世界推动低碳城市的一个主要障碍，使商业，政治或社会投资于低碳经济的事业很难发展下去。然而，为了实现安全过渡到低碳、可持续和生机勃勃的城市经济，我们需要建立清晰的商业、政治和社会发展路线图，以制定出发展目标并刺激投资。

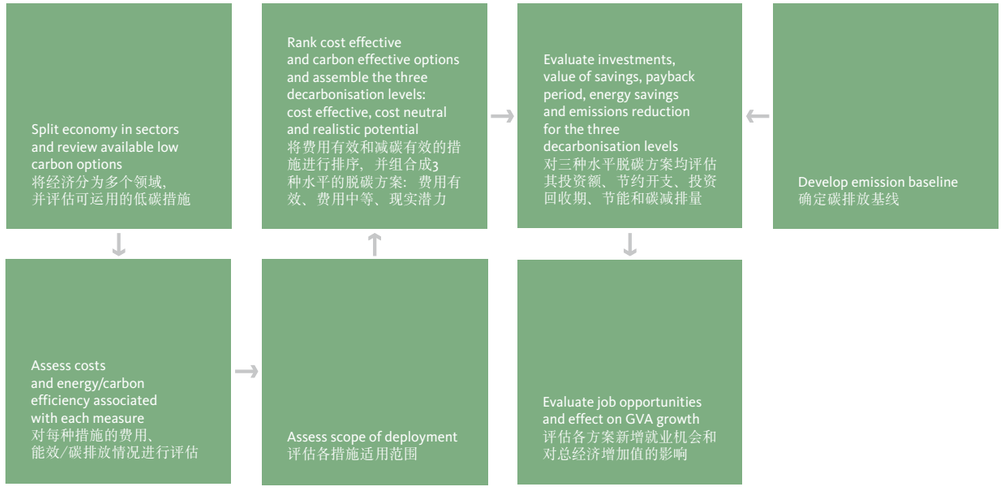
由作者开发、并在英国利兹市地区进行测试的这套方法试图解决这一问题。

该方法基于对城市规模不同程度脱碳方案进行全面的费用效益分析。为了确保案例分析在政治上经得起推敲，本研究所采用的数据，包括关于费用、能源和节碳等方面的数据，均来自于政府所发布数据，并且被城市级决策者所接受。为了使案例研究更真实，本研究剔除了城市决策者掌控范畴之外的经济活动，例如：大型发电厂等；而将小微型发电厂和当地社区级的可再生能源活动涵盖入本研究。规划中的国家经济和能源基础设施建设属于本研究考虑范畴。本研究采用了典型的商业利率和保守的能源价格预测，同时还使用了不同技术和行动方案下现实情景的利率数据。为了说明这些差距、回弹

Table 1 / 表 1

LCR Sector LCR 领域	Capital Cost by 2022 到2022年 资本投资	Annual saving by 2022 到2022年 支出节约	Carbon savings by 2022 到2022年 碳减少量	Average Payback 平均回收期	Reduction in emissions compared to 1990 与1990年 相比所减 少的温室气
	£bn 10亿英镑	£bn 10英镑	KTCO2 二氧化碳 公吨	yrs 年	%
Cost effective measures 费用有效措施					
Domestic / 家庭	£1.11	£0.40	907.81	2.78	3.81%
Transport / 交通	£0.85	£0.13	213.84	6.33	0.90%
Commercial / 商业	£1.87	£0.34	937.08	5.58	3.93%
Industry / 工业	£1.07	£0.32	1022.90	3.31	4.29%
Total / 合计	**£4.90**	**£1.19**	**3081.63**	**4.11**	**12.93%**
Cost neutral measures 费用中等措施					
Domestic / 家庭	£3.57	£0.56	1266.77	6.41	5.32%
Transport / 交通	£2.21	£0.26	606.32	8.50	2.54%
Commercial / 商业	£3.41	£0.45	1163.76	7.64	4.88%
Industry / 工业	£2.38	£0.32	1260.78	7.34	5.29%
Total / 合计	**£11.58**	**£1.59**	**4297.63**	**7.29**	**18.04%**
Realistic technical potential 现实技术潜力					
Domestic / 家庭	£3.57	£0.56	1266.77	6.41	5.32%
Transport / 交通	£3.67	£0.39	780.47	9.52	3.28%
Commercial / 商业	£3.41	£0.45	1163.76	7.64	4.88%
Industry / 工业	£2.38	£0.32	1260.78	7.34	5.29%
Total / 合计	**£13.03**	**£1.71**	**4471.78**	**7.61**	**18.77%**

Fig. 1 / 图 1



and resistance to change for different reasons, adoptions rates were adjusted using haircuts. Hidden and missing costs, including implementation and project management costs, were accounted for.

The stages of the approach are set out in Fig. 1.

The economy of the region was split in four economic macro-sectors (domestic, commerce, industry and transport): for each sector, the team produced a review of thousands of energy efficient and low carbon options covering the totality of those sectors. Economic and energy efficiency parameters for each measure were assessed under realistic assumption, in particular, capital investments, value of savings and payback period on the one hand and energy savings and carbon savings on the other. The team then explored the scope of deployment of these measures for households, commerce, industry and transport for each of the ten cities and for the region as a whole. The review then identified the business case for major scale investments in low carbon options at the city scale, examining the investment and payback periods associated with different levels of decarbonisation. To that aim, the options were ranked in terms of carbon effectiveness and cost effectiveness and categorised in three groups corresponding to three different levels of de carbonisation:

The *cost effective* level: all of the measures that would pay for themselves and produce a stream of revenues over their lifetime.

The *cost neutral* level: all of the measures that could be deployed if the revenues from the cost-effective measures were captured and reinvested in further low carbon options.

The *realistic technical potential* level: this includes all of the measures that could realistically be adopted. It includes cost-effective, cost-neutral and costly measures.

效应、以及由于种种原因拒绝变革，实际采用的利率稍微做了些调整。隐藏和缺失的成本，包括实施和项目管理费用等都一并予以考虑。

本方法的研究步骤见图1。

将该地区的经济分为4个大的领域（家庭、商业、工业和交通）。课题组对每个领域提出了上千种节能和减碳方案，该领域的所有范围都涉及到了。

在真实的假设情境下，对每项措施的经济和能源效率参数进行了评估，尤其是对资本投资，节余和投资回收期等进行了详细评估；同时，也对节能和减碳情况进行了分析。针对该地区10个城市中的每一个城市以及该城区作为整体，课题组都对其采纳这些措施的范围进行了研究，领域包括家庭，商业，工业和运输；然后提出了在低碳领域主要的投资建议，并将不同程度减碳措施的投资规模和费用回收周期进行了详细测算。为了实现上述目的，所提建议方案按照减碳有效和费用有效来排序，并根据三种不同脱碳水平将建议分为相应3类：

_ 费用有效性水平：所有措施都能自行承担费用，并在其生命周期内产生收益流；

_ 费用中等水平：所采用方法能够确保实现费用有效措施产生收益、并再次投入到后续低碳行动中；

_ 现实并有技术潜力的水平：包括现实中所采用的所有措施，包括费用有效、费用中等和较昂贵的措施。

Table 2 / 表 2

Decarbonisation level 脱碳水平	Cut in energy bills 费用减少
Cost effective / 费用有效	£1.2 billion / 12 亿英镑
Cost neutral / 费用中等	£1.6 billion / 16 亿英镑
Realistic potential / 现实潜力	£1.7 billion / 17 亿英镑

Table 3 / 表 3

Decarbonisation level 脱碳水平	Job opportunities 就业机会	GVA 总经济价值
Cost effective / 费用有效	4,443	+£211 million / +2.11 亿英镑
Cost neutral / 费用中等	5,226	+£230 million / +2.30亿英镑
Realistic potential / 现实潜力	9,669	+£442 million / +4.42亿英镑

For each level of decarbonisation, the methodology estimates the total value of investment, the yearly value of savings and the average payback period for the households, commerce, industry and transport sector, together with an estimate of energy savings and of reduction of emissions when compared to baseline trends.
Finally, the methodology explores the wider economic implications of the three levels of decarbonisation, evaluating the opportunities for job creation in the green economy, i.e. in the low carbon and environmental goods and services sector together with the increase in local GVA.
As a first case study to test the method, we applied it to the Leeds City Region (LCR) and to the 10 cities it incorporates.

对每一种脱碳水平，都针对家庭、商业、工业和交通的总投资、年度节支和平均回收期进行了预测；同时还预测了在基线水平上新增的节能和温室气体减排情况。
最后，针对三种水平的脱碳情景，本方法学还逐一研究了其所产生的更为广阔的经济影响，评估了绿色经济（即：低碳和环境产品与服务）所带来的新增就业机会、以及对当地经济总增加值的影响等。由于是首次对该方法学进行测试，我们将其运用到了利兹城市地区（LCR）和其所辖的10个城市。

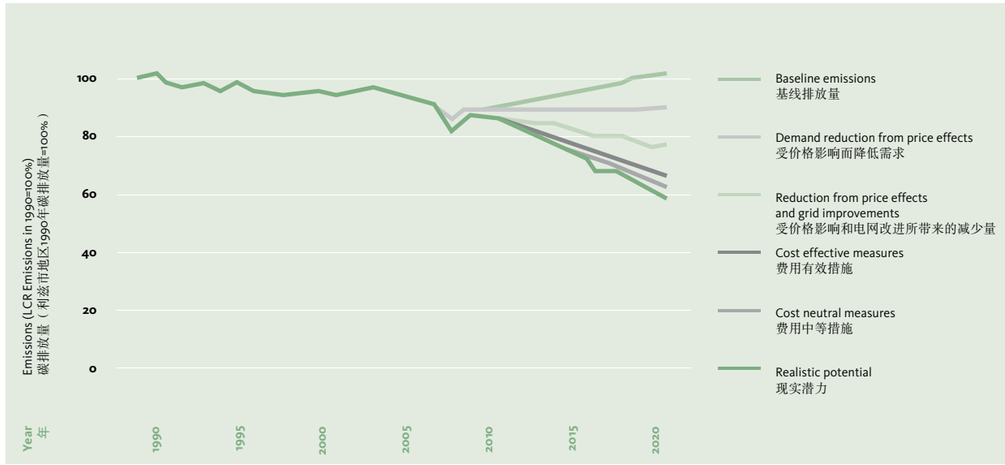
Case Study Results

Table 1 summarises the economic case for the three different levels of decarbonisation for the Leeds City Region. The chart in Fig.2 shows the effects on the emissions projections, comparing the effects of the different decarbonisation levels to the baselines (i.e. the business as usual case), the effects due to the future energy prices and the effects due to the planned decarbonisation of the national grid. The results of the analysis confirm that the difference in terms of reduction in emissions between deploying the full range of "realistic potential" measures and the "cost neutral" measures is small (<1%). It is a key finding: it appears that by investing only in the measures that pay for themselves as a whole we can achieve a total amount of emissions reduction that is near to the realistic potential.
In terms of the energy bill, the 2011 Leeds City Region energy bill was worth £5.4 billion per year. Our forecast based on conservative estimates is that the energy bill will grow to £7.2 billion by 2022.

案例研究结果

表1为利兹地区三种不同水平脱碳所产生的经济结果。
图2 表明了不同水平脱碳措施所带来的与基线水平相比的温室气体减排量预测、能源价格所带来的影响、和对计划中国家电网减碳措施所产生的影响。研究结果表明，“现实潜力措施”与“费用中等措施”之间的碳减排量差距很小（<1%）。本课题研究的关键成果是：只采纳可支付费用的措施，从整体上看，可以达到“现实潜力措施”所完成的减排量。
至于能源支出费用，2011年利兹城市地区的能源总支出为54英镑；根据保守预测，到2022年能源支出将达到72亿英镑。

Fig. 2 / 图2



The effects of this 33% (£1.8 billion) increase in the energy bill could be largely compensated by the reductions produced by exploiting the options. Table 2 shows the cut in the energy bill due to the exploitation of the measures in the three categories.In other words, by investing in decarbonisation the Leeds City Region can also protect its economy against projected energy price increases. We then estimated the wider economic benefits within the Leeds City Region in terms of jobs opportunities and GVA growth (Table 3):
Finally, we confirmed the robustness of our findings by running a sensitivity analysis on the most important variables. i.e. interest rates and projected energy prices.
In conclusion, our analysis shows that within the Leeds City Region as a whole there is very considerable potential to reduce energy use and carbon footprints through cost-effective and cost-neutral investments on commercial terms. The same conclusion holds true for the 10 cities when considered individually, even if publishing the individual results is outside the scope of the present article.
Deploying a climate change mitigation strategy for the Leeds City Region and the 10 cities within its boundaries appears to be not only feasible and viable, but also very much desirable in terms of economic development, rather than purely in terms of environmental sustainability.
The authors are looking for case studies in different countries to replicate the methodology and confirm the results.
If the results were confirmed in a wide range of cases, the deployment of integrated energy efficiency strategies on cities may be the key not only to substantially reducing emissions from human activities but also to a transition to a more sustainable and resilient economic model.
The full results and the report of the study are available from the author in English and Chinese.

能源支出增长的33%（18亿英镑）基本上可被所采取的措施所抵消。表2为三种不同措施所导致的节约能源费用 换句话说，利兹地区通过在脱碳领域的投资，可以保护其经济免受能源价格上涨所带来的影响。然后我们又为该地区评估了其在更广泛领域的收益情况，包括增加的就业机会和增长的总经济价值(表 3)。
最后，我们通过灵敏度分析来确认我们的研究成果之正确性，即：用最重要的变量——利率和预测能源价格来进行灵敏度分析。
总之，我们的分析表明，将利兹市地区作为一个整体来看，通过采取费用有效和费用中等措施进行商业投资，其降低能源使用和减少碳足迹的潜力相当大。尽管本研究报告无法公布每个城市的信息，当单独考虑这10个城市中的每一个，结论也是同样成立的。在利兹市地区和10个城市制定气候变化应对战略是完全可行的和有生命力的，不仅从环境可持续角度来看，而且从其经济发展结果来看都是非常理想的。当前作者正在积极寻求在不同国家进行更多案例研究，以重复该方法学并确认研究结果。
如果该研究成果在更多案例中得到确认，那么，在各地运用综合能效战略不仅可大大减少人类活动的碳排放量，而且还可成功推动向更加可持续、充满活力的经济发展模式过渡。
作者有本研究的全部结论和中英文报告。

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.

Shanghai Environmental Protection Bureau
Low Carbon Economy

Italy, June 11-25, 2011

21 participants

The training course of "Sustainable Development and Environment Management Advanced Training" was held during June 11 to 25, 2011 in Italy. The delegation of 21 representatives from relevant environmental administration & monitoring agencies in Shanghai attended this course.

The main training content contains the footprint of carbon and the application in Italy, low carbon community and case, solar photovoltaic electricity, energy saving design of building, energy efficiency and policies of renewable energy, together with the sites visiting of lagoon, solid waste recycling center and ecological building.

The most interesting topics include the carbon reduction objectives in EU, sustainable energy policies, LCA (Life cycle assessment) application on carbon footprint, energy saving buildings etc.

It was learned the 20-20-20 target of EU Climate & Energy Package was set in EU, including "a 20% reduction of GHG (greenhouse gases) emissions below 1990 levels to be achieved by 2020; a 20% share in EU gross final consumption of energy coming from RES by 2020; a 20% reduction in primary energy use to be achieved by enhanced energy efficiency by 2020". Since cities have a fundamental role in the whole community, they are the residential place but also administrative, trading and productive places. The urban world consumes about 75% of global energy and emits about 80% of total greenhouse gas.

Fossil fuels still predominate the major source of energy. About 79% of the energy needs of the average European are met by coal, gas and oil. Around 13% comes from nuclear power and the remaining 8% comes from rapidly increasing renewable energy sources (especially wind and solar energy).

In order to realize the GHG reduction objective, the CONVENANT OF MAYORS has been pushed to address the local and regional Authorities. There are total 2679 Signatories throughout the EU territory up to now.

Other good experiences are composed of local Energy Days, car-pooling initiative as well as various local contributions.

In general, the content and training types were various and interesting, which was welcome by participants and benefit the environmental low carbon work in Shanghai.

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

上海市环境保护局
低碳经济

意大利，2011年6月11日25日

21位学员

"可持续发展与环境管理高级培训计划"于2011年6月11日至25日在意大利举行。来自上海市环境管理和监测部门21名业务骨干参加了此次培训。为期二周的培训课程主要学习了碳足迹和在城市中的应用；低碳社区及案例分析；太阳能发电技术；城市建筑的节能设计；能源效率和可再生能源政策等，此外还安排了对威尼斯泻湖、固废回收中心、生态示范建筑现场考察。其中,印象深刻的有欧盟碳减排目标、意大利可持续的能源政策以及生命周期评价法在碳足迹管理和节能建筑等方面的应用。通过学习，学员们了解到欧盟出台了2011年减排计划，并确定了20-20-20气候变化和节能减排的总体目标，即2020年减少温室气体排放量20％；可再生能源占总能耗比重的20%；通过提高能源效率减少一次能源消耗20%。城市消耗了全球75%的能源，排放了80%的温室气体，因此，城市以及当地的积极努力是确保温室气体减排的主要载体。为了达到这个目标，主要靠提高能源效率的同时，倡导使用可再生能源。另外，欧盟积极开展和推行"市长盟约"、拼车等地方性自觉行动，共同推进欧盟碳减排项目的行动。欧盟的"市长盟约"项目在意大利具备一定的吸引力，但目前签订盟约的城市有2679个，仅占总数的1%。此外，意大利还有些好做法值得学习，如：能源日、共享出行倡议等等。

总之，培训内容和形式丰富多样，深受学员们的欢迎，一定会对今后上海的低碳环保工作提供帮助。

Tianjin Science and Technology Committee
Low Carbon Economy and Innovation Management

Italy, September 3-17, 2011

24 participants

This training program helps us not only understand Italy's Strategic environmental impact assessment method, Restoration and redevelopment of land system and relative professional work flow, but also enjoy its advanced experience of environment protection and sustainable development and Broaden our horizons through experts' analyses of some cases. Meanwhile, we also further enhanced our understanding of energy saving, clean energy and the development of renewable energy', "ecological building and city sustainable planning", "garbage utilization", "sustainable traffic", "sustainable agriculture" and capability building of environment protection and increased our comprehensive capacities of decision-making, management and research as well. Moreover, we have noticed our own gap, which offers us direct and realistic reference to make scientific decision and promoting good and fast development of economy and society.

The courses of this program, especially the cases of the European Union and Italy's idea of sustainable development in decision-making and management, give us deep impression and inspiration. All kinds of policy constraints and operation system as well as successful practice of sustainable development model items better put the idea of sustainable development into practice. These measures reflect the new thoughts of government decision and management and better put the idea of sustainable development into the public affairs, which establishes an atmosphere of consistent exploration and practice for promoting the sustainable development of the society.

During the training several renowned international experts in environment and economics gave speeches to participants. These experts discussed various problems in environment and development from the modern point of view, including green economy, green architecture, low carbon economy, energy issue, carbon trade, environment pollution, and city sustainable development.

All the participants have understood EU and Italy's updated and advanced ideas and technology in environment protection aspect so as to promote Tianjin's sustainable development. For one thing, this training is a precious process of science exchange, for another, it overcomes the limitation of traditional training methods, fully enlarges the scope of knowledge and technology sharing, thus better enhance the cooperation in the world, all of which possess important significance to guiding the world.

The idea of sustainable development has been enhanced in this training. It is true that taking the road of sustainable development is to rationally limit the development in essence.

To turn this idea into reality, the national and local governments need to integrate the concept of sustainable development in policy making and management, namely, the whole society should possess the capability of sustainable development.

The formation of sustainable development in the society depends on progressive education and the capability of sustainable development at the government level is the key to the formation of sustainable development in the society. The multidimensional, multiform and in various fields of international exchange and interactional both at home and abroad is an essential way to promote the formation of sustainable development in the society.

Most of the participants of this training are leaders of government.

天津市科学技术委员会
低碳经济和管理创新

意大利，2011年9月3日17日

24 位学员

本次培训我们不但了解了意大利战略环境影响评价方法、土地修复及再开发等系统、专业的工作流程，而且通过专家们对一些案例的分析，分享了意大利发达的环境保护与可持续发展领域的先进经验，开拓了我们的视野，同时对“节能、清洁能源和可再生能源发展”、“生态建筑和城市可持续规划”、“垃圾资源利用”、“可持续交通”、“可持续农业”、“环境保护能力建设”等领域也有了进一步了解，提高了我们对环境保护与可持续发展的认识，增强了我们在决策、管理和研究等方面的综合能力。此外也看到了我们自身的差距，对今后在经济和社会发展中如何运用可持续发展理念，把握好科学决策，推动经济、社会又好又快的发展有了直观和现实的参照。

这次培训的课程，特别是欧盟及意大利在决策、管理中体现可持续发展理念的案例给予了我们很深的印象和启发。欧盟和意大利在推动社会可持续发展方面制定的各类约束性政策和运行机制，以及可持续发展示范项目的成功实践，较好地将可持续发展理念贯穿其中，既体现了政府决策与管理的新思维，又较好地将可持续发展理念渗透到公众的日常活动之中，为推动社会的可持续发展营造了一个不断探索与实践的氛围。

在意大利培训期间国际著名的环境问题专家和经济学家为学员们授课，他们从现实的角度探讨了当前环境和发展所面临的各种问题，包括绿色经济、绿色建筑、低碳经济、能源问题、碳交易、环境污染与城市可持续发展等主题。学员们在学习中了解更多欧盟与意大利在环保方面最新的和先进的理念与技术，以促进天津的可持续发展。这不仅是一次宝贵的科学交流过程，而且克服了传统培训方式的局限性，充分地扩大了知识和技术共享的范围，更有效地加强了世界范围内的合作，具有重要的现实指导意义。

通过这次学习，强化了可持续发展理念。应当说走可持续发展道路，实质上就是对发展作理性的限制，这就需要我们国家和地方在制定政策与实施管理中要融入可持续发展的理念，也即需要社会整体具备可持续发展的能力。社会可持续发展能力的形成，需要梯次递进的形式进行培育，政府层面的可持续发展能力是引导社会形成可持续发展能力的关键，通过开展多层面、多形式、多领域的国际国内间的交流与互动是推动社会形成可持续发展能力必要途径。

培训班的培训对象是以政府管理部门领导为主，这个层面的人员肩负着国家政策执行、管理与公共服务的责任，与国家的经济、社会发展息息相关，其履行职责是辐射、传播可持续发展理念的非常有效的途径。在意大利期间，通过对绿色建筑、城

Being closely related to the country's economic and social development, these people are holding responsibilities of implementing national policies, discharging their management functions and offering public services. Performing their duties is a very effective way to spread the concept of sustainable development. Through the field trips to projects such as green building, urban waste water treatment, waste disposal, clean production and the development of new energy, we have a feeling that it's important for government to adopt some measures of sustainable development in making policies of social development and the implementation of some restrictive policies is the guarantee to continuously implementing sustainable development projects. Government managers plan a very important role in promoting the formation of capability of sustainable development in the society. In this case, government is the key factor of the building of capacity of sustainable development. Meanwhile, the following systems are also needed. The first one is management system. Many problems concerning the incoordination between environment and development are caused by improper decision and management. We should train qualified decision-making and management personnel and establish scientific decision-making and coordinating management mechanisms. The second one is the legal system. The enforcement of legislation on sustainable development is not only the essential guarantee of the implementation of sustainable development strategy, but also the premise of reasonably utilizing the natural resources as well as controlling the ecological damage and environment pollution.
The third one is the science and technology system. This system can be used to provide basis and measures for sustainable development, achieve deeper mutual understanding between human being and the nature and offer effective means to protecting ecological environment and controlling environment pollution.
The fourth one is the education system. It can not only offer knowledge of sustainable development to people, but also make people possess ethical standards of sustainable development. The fifth one is public participation. The aim and action of sustainable development must depend on the maximal recognition, support and participation of the public and social groups.
As for suggestions to the later training, first of all, some of the participants' English is not good. Although there is translator available, we can not have an overall grasp of the contents in the class due to a large amount of professional knowledge points. We really hope that the Chinese version of the class contents can be offered in advance in the later training so as to improve the effect of the training. Secondly, water city is Venice's notable character, we do expect that contents, such as features of water city and water resource protection, can be added in the future training.

Sun Hualin, Environmental Protection Bureau of Nankai District, Tianjin

市污水处理、垃圾处理、清洁生产与新能源开发等项目的实地考察，感觉到政府在制定社会发展的政策中采取可持续发展的一些措施是很重要的，通过实施一些约束性政策来保证社会的可持续发展项目不断实践，政府的管理者在推动社会形成可持续发展能力的进程中举足轻重。
因此可持续发展能力的建设关键在政府，同时需要有几个系统的支撑：一是管理体系：环境与发展不协调的许多问题是由于决策与管理的不当造成的，应当培养高素质的决策与管理人员，形成科学决策与协调管理的机制。二是法制体系：与可持续发展有关立法的实施是可持续发展战略付诸实现的重要保障，也是实现自然资源的合理利用以及使生态破坏与环境污染得到控制的前提；三是科技系统:为可持续发展的决策提供依据与手段，加深人与自然关系的理解，提供保护生态环境和控制环境污染的有效手段；四是教育系统:不仅使人们获得可持续发展的科学知识，也使人们具备可持续发展的道德水平；五是公众参与：可持续发展的目标和行动，必须依靠社会公众和社会团体最大限度的认同、支持和参与。
关于对以后培训的建议，我认为首先我们有部分同志的英语不甚流畅，虽然有翻译，但是由于涉及专业，授课内容较多，所以对课堂内容的整体把握还有欠缺。希望在以后的培训中最好能提前提供意方教授专家讲稿的中文翻译，从而提高培训效果。其次，水城是威尼斯的特点，在以后的培训中最好加入威尼斯水城的特点和对水体保护等内容。

天津市南开区环境保护局 **孙华林**。

Tianjin Science and Technology Committee
Low Carbon Economy and Innovation Management

Italy, September 17 - October 1, 2011

25 participants

The training in Italy this time featured prominently in tight schedule, rich content, rational knowledge structure, advanced concept as well as its timeliness and close connection with China's condition. The training invited experts from IMELS, University of Padua and Agroinnova to give lectures, which impressed the participants a lot and were very fruitful.

The training, rich in contents and practices, demonstrated the main cause and driving force of sustainable development, which are the consensus of controlling pollution and legislation and implementation of environmental management. The experts gave their lectures by integrating basic theories with case studies, covering a wide range of topics encompassing environmental management, EU directives, LCE in Italy, lessons from Japan's nuclear disaster, the development of new energy, energy efficiency, eco-building, carbon tax, food safety and greenhouse gas reduction.

The lectures and site visits enabled us to have a comprehensive understanding of Italy and EU's theory study and technological practices consistent with environment and sustainable development. They also set us thinking on Tianjin's sustainable development.

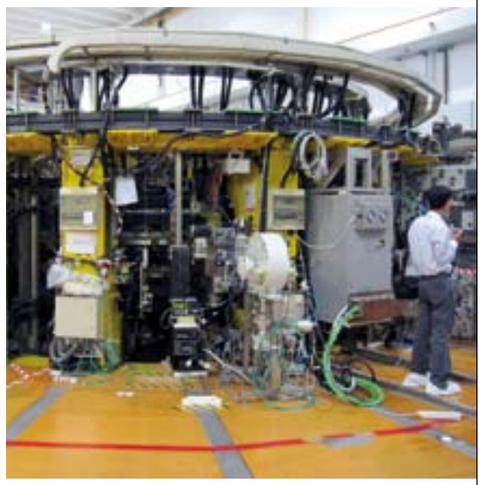
1. The collection and coordination of basic information should be enhanced. Especially the geography information system and system for eco-environment protection and monitor should be established step by step. The meticulous and complete planning in Italy mainly benefited from the perfect fundamental researches, which have a strong characteristic of using data. By establishing geography information system and decision support system, which include data of history, humanities, geography, hydrology, buildings and pollution, we can have a better command of historical information and up-to-date information of a certain area. This could lay a solid foundation for future urban construction and environmental protection.

2. The legislation on sustainable development should be enhanced.

(1) Make clear the legislative subject and law enforcement responsibilities for protecting environment and waters as well as perfect and carry out the laws and regulations on environmental protection. Intensify the communication between legislative subject, enforcement subject and law breakers to improve the consciousness of environmental protection and to enhance the implementation and deterrence of environmental protection laws.

(2) Promote primarily the legislation on circular economy and enhance environmental effect assessment in Binhai New Area. As a new open experiment area and one of China's policy-favored areas, Binhai New Area should take the lead in enhancing environmental effect assessment and achieving cleaner production in newly-introduced projects invested both domestically and overseas.

(3) Enhancing local environmental protection is an important foundation for enforcing national environmental protection policies. In Italy, local governments attach even greater importance to environmental protection than the central government, contrasting sharply with the situation in China. Some local governments, especially the basic levels, pursue excessively the economic development, leading to regional protectionism and ineffective pollution control. I suggest that local governments announce publicly the pollution and promote the supervision of local governments by people, meanwhile, carry out continuously the signing of environmental protection target liability statement and put environmental protection into achievement appraisal of the officials by stating clearly the handling for the unqualified.



天津市科学技术委员会
低碳经济和管理创新

意大利，2011年9月17日至10月1日

25位学员

此次赴意大利培训日程安排紧凑、内容充实丰富、知识结构合理、思想理念前沿、具有较强的针对性和时效性。培训班上分别聘请了意大利环境，国土与海洋部（IMELS）、帕多瓦大学、都灵大学农业创新中心等部门的教授及资深专业人士进行专项培训。课堂上教师讲解生动，学生反应活跃，双相互动，收到很好的学习效果。课程内容丰富，实践性强。所讲授的内容无一不昭示着可持续发展全球呼声背后的主要根源和驱动因素，治理环境污染的共识和环境管理的立法执法。讲授者对每一项内容的讲解，都以理论知识为基础，辅以对问题的解决方案为案例。从环境管理和欧盟指令到意大利低碳经济；从日本核灾难对人类的启示到核能等新能源的发展；从能源效率和生态建筑到碳排放和碳税；从食品质量和安全到减少温室气体排放，所有授课和实地考察使我们对意大利及欧盟围绕环境和可持续发展所作的理论探索、技术实践与政策法规有了较全面的认识，并对天津市的可持续发展做了许多思考。

1、应当加强基础信息的收集和整理工作，尤其是要逐步建立我市的地理信息系统和生态环境保护与监测体系。国外规划工作的细致与完备，主要得益于基础研究工作比较充分，用数据说话是他们的一大特点。通过掌握地理区域丰富的历史信息和实时信息，建立包括历史、人文、地理、水文、建筑、污染等基础数据资料的地理信息系统和决策支持系统，将为我市今后的城市建设和环境保护奠定良好的基础。

2、加强可持续发展相关法律法规建设

(1) 明确对环境保护和水体保护的立法主体与执法责任，完善、落实有关的环境污染防治的法律法规。加强立法主体、执法主体和违法主体的沟通，提高环境保护意识和自觉性，增强环保法规的可执性和震慑力。

(2) 率先推动滨海新区的循环经济立法和加强环境影响评价工作。滨海新区作为新一轮开发开放的试验区，作为国家政策的先导区之一，应当率先在新区加强环境影响评价工作的开展，对新引进内外资项目做到落实三同时制度与清洁生产。

3、加强地方环保工作是落实环保基本国策的重要基础。意大利的地方政府比中央政府还要重视环保工作，这一点与我国的情况恰恰相反。我国的一些地方，尤其是在基层，往往片面追求经济发展，地方保护主义严重，对污染行为控制力度不够。建议加大公布各地污染状况的力度，推动公众对地方政府的监督，同时，继续推行从中央到地方各级人民政府签订环保目标责任书，并实行将改善环境质量指标纳入党政领导干部政绩考核的制度，明确规定环保考核不合格的处理方法。

4. Enhancing international cooperation and communication on technology.
(1) Launch ecological restoration in Bohai sea rim. By cooperating with Italian government and enterprises, we will control pollutions of environment and waters to restore the ecology of land, waters and sea in Bohai sea rim.
(2) Develop intelligent traffic. By cooperating with Italian government and enterprises, we will develop intelligent traffic system in Tianjin from an overall point of view to improve urban traffic congestions. As for the newly developed suburbs and peripheral counties, we will carry out planning program in pilot areas to build sustainable projects that will bring benefit to the future generations.
(3) Waste management and reclamation projects. By cooperating with Italy, we will enhance the sorting and reclamation of wastes.
We will also enhance the reclamation of waste water, polluted water and rain water. By constructing multi-functional drainage system integrated with running water, normal water and contaminated water, we can strengthen the exploitation and utilization of water resources and alleviate urban water crisis.
(4) Cooperation on knowledge management. We should learn from EU and Italy on knowledge management platform. Through internet, we can build a knowledge management platform integrated with scientific knowledge, practices and policies to enhance the sharing and spreading of knowledge and to promote democracy and transparency of the government, making all people involved in the urban construction and environmental protection.
As for future suggestions, it is important that the lecturers understand China's situation, which will facilitate the communication and will enhance the effectiveness and connections with China. Language is another issue which might hinder the smooth and effective communication between the lecturers and us. It would be very helpful if the lecturing materials could be translated and distributed to us in advance so that we would be well prepared for the courses.

Ma Huzhao, Tianjin Institute for Science of Sciences

4、加强国际技术交流与合作。
(1) 开展环渤海区域生态恢复工作。与意大利政府和企业合作，治理周边环境污染与水体污染，恢复环渤海区域的陆地与水体、海域生态。
(2) 发展智能交通。与意大利政府和企业合作，从全市整体规划的角度，打造天津智能交通系统，改变市区内的交通拥挤状况。对于新发展的市郊区和周边区县，试点执行综合的市镇设计规划，建设造福于后代的可持续发展工程。
(3) 垃圾处理与资源化项目。加强与意大利的合作交流，加强垃圾分拣和分类处理，注意废旧物资的回收与循环再利用；加强废水、污水、雨水的资源化处理，构建集成自来水、中水、污水等多个功能的排水管理体系，加强水资源的开发与利用，缓解我市的水资源危机。
(4) 知识管理合作。学习欧盟及意方的知识管理平台，通过公共的网络平台，建立有机链接科学知识、实践、政策三者的知识管理平台，加强知识共享和传播，推进政府办公民主化、透明化，使全社会参与到市政建设、环境保护中来。
关于对以后培训的建议，我以为首先授课人员应了解与所授课程相关的政策、做法及公众关心的问题，因为是针对中国学员的课程，最好对中国相关方面的情况有所了解，这样便于和学员交流，以增强授课的针对性和有效性。其次，语言问题仍然是教学和交流的主要障碍，最好能够课前拿到授课教师的讲课内容并翻译成汉语，这样在上课前能够事先对整个课程有一个总体印象，对课程内容作出自己的思考，带着问题去听课，这样课堂效果会更佳。

天津市科学学研究所 **马虎兆**

Environmental Information Management and Application, BMEPB

Italy, October 1-15, 2011
15 participants

To obtain efficient environmental management, one of the key points is to have a reliable base of environmental data and information.
In the last few years, attention has gradually shifted from simple data collection and analysis to a broader perspective that includes all aspects of environmental information management such as environmental data sharing and publication.
One of the three courses organized in 2011, in collaboration with the Beijing Environmental Protection Bureau, was devoted to the topic of "Environmental Information Management" to discuss in detail how to implement an efficient system of environmental information management.
After the initial introduction of European and Italian policies and strategies on environmental information management, each day of training addressed a specific issue of environmental information management, covering data collection, publication and visualization.
In Italy, environmental data is collected, analyzed and disseminated at a local level by ARPA (the local Agency for Environmental Protection) and managed at a national level by ISPRA (Institute for Environmental Protection and Research). Some experts of both these institutions were involved in the course to offer the participants a complete picture of the system.
The environmental data network setup and management was illustrated from the European level (EIONET data network) to the national level (SINANET system), through the involvement of the head of the Italian National Focal Point. Data/information collected from all EU member states is necessary to demonstrate the compliance with EU legislation, to describe the state of the environment, trends and outlook, and to assess the effectiveness of environment-related legislation, policies and strategies. The final aim of this system is to make information available to anyone.
One day was specifically devoted to pollution source monitoring due to the key role of industrial production in determining air quality and the importance of having reliable and updated data on emissions.
Two continuous emission monitoring systems were illustrated to the participants - the first one, the SIMAGE system, is an early warning system in the case of accidents in the petrochemical industrial zone of Porto Marghera; the second one, the CEMS network, is a continuous emission monitoring system collecting data from some large industrial plants, especially incinerators, in the Lombardy region.
Some practical cases of environmental information application to support decision-making by authorities were illustrated to the participants during visits to different regional environmental agencies.

环境信息管理与应用，北京市环保局

2011年10月1-15日，意大利
15 名学员

环境管理工作有效开展，关键因素之一是建立起一个可靠的环境数据信息库。在过去几年里，信息管理的关注点已经从简单的数据收集和分析逐步过渡到更广阔的范围，包括环境信息管理的各个方面，如环境数据的分享与公开等等。
2011年与北京市环保局合作开展的3个培训班都围绕“环境信息管理”这个主题，详细介绍如何使环境信息管理更为有效。
在全面介绍欧盟、意大利关于环境信息管理的政策和战略基础上，围绕数据收集、公开、可视等，培训班每天集中学习一个主题。
在意大利，环境数据由地方环保部门（当地环保局）负责收集、分析和发布；在国家层面由国家级机构（环境保护与研究所）负责管理。这两类机构专家就信息管理问题向学员们做了系统介绍。
国家层面 (SINANET system) 的环境数据网建立和管理由欧盟 (EIONET data network) 通过国家联络点负责人来完成。需定期收集各欧盟成员国相关信息，以监督欧盟相关法规的执行情况，报告环境状况、趋势和前景，评价与环境有关的法律、政策及战略的执行效果。这套系统的最终目标是让所有人获得相关信息。
培训班专门安排了一天时间考察了污染源监测，因为工业企业对空气质量的好坏、以及数据可靠性方面发挥着决定性的作用。向学员介绍了2个连续监测系统：第一个叫做SIMAGE system，在Marghera港口工业园区，一旦化工企业发生事故，该系统可以提前报警；第二个系统叫做CEMS network，对一些大工业企业、特别是隆巴迪地区的大企业进行污染物连续监测。
在考察区域环保局期间，还向学员们介绍了如何利用环境信息为决策提供支持服务。

Environmental Protection Supervision and Inspection, MEP

Italy, November 12 - 26, 2011

24 participants

One of the key points in pursuing sustainable development is represented by the implementation of an effective system to control the enforcement and compliance of environmental laws.

On November 12th, a delegation of 24 participants from the Chinese Ministry of Environment arrived in Italy to attend the third course devoted to the topic of "Environmental Protection Supervision and Inspection".

The agenda was targeted to give a broad overview of the different aspects related to the theme of supervision and inspection, including the legal and policy system, the organization of the control bodies at different geographical levels and the tools available for a better knowledge of the environment.

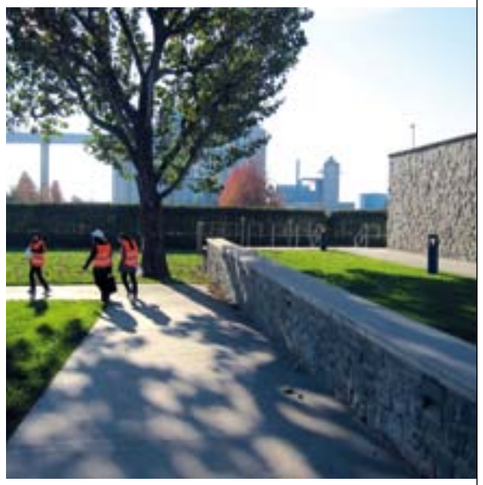
The opportunity to discuss some practical aspects related to environmental control and inspection activities was offered to the participants through visits to Italian institutions implementing environmental law, such as the Province of Venice and the Regional Environmental Agency.

Specific tools for implementing laws were illustrated to the participants, including the Continuous Emission Monitoring Network System (CEMS) recently implemented by ARPA Lombardia. It is a centralized control system for big plant emissions and it is one of the first systems of this kind used in Europe.

The course involved lecturers from both authorities in charge of the environmental control and private companies. The aim was to illustrate different points of view related to environmental control and to the difficulties encountered in implementing environmental law by all of the stakeholders.

A visit to Italcementi, one of the largest Italian companies and the world's fifth largest cement producer, was organized to show a factory with a cutting-edge system for environmental impact reduction that is pursuing a cooperative approach with local institutions and the general population.

All of the lecturers greatly stressed the importance and the effort necessary to override a command and control approach in favor of a collaborative approach.



环境保护部环境保护监察局

意大利，2011年11月12-26日

24名学员

在推动可持续发展的进程中，其中一个关键点是建立一套有效系统来严格监督环境法的执行。

11月12日，来自中国环境保护部的24名学员来到意大利参加第三期主题为“环境保护监督与执法”培训班。

培训内容主要是向学员广泛介绍与监督执法相关的各个方面，包括法律政策体系、在不同地域范围监督机构的组织形式、以及更好掌握环境保护信息的工具等。

通过考察意大利的环境法执行机构，如：威尼斯省和区域环境保护局，帮助学员了解在实际工作中环境监督执法工作的开展情况。培训班还向学员讲授了执法的具体工具，包括最近在隆巴迪地区环境保护工作中运行的污染物连续监测网。这是一种对大企业污染物进行集中控制的手段，在欧洲是首例应用。

授课老师既包括来自政府部门、负责环境管理的官员，也有来自私人企业的代表；通过其切身体会，希望向学员介绍在意大利对于环境管理的不同观点以及不同利益群体在执行环境法过程中遇到的困难。

学员们还参观了意大利最大企业之一、世界第五大水泥生产企业Italcementi。该企业建立起一套先进系统来降低对环境影响，并与当地各机构和普通公众建立起一种合作关系。

所有授课老师都强调要改变那种简单行政命令的方式；以合作协商的方式进行管理更为有效。

Clean Production and Green Economy, MOST

Italy, December 3-17, 2011
26 participants

The agenda focused mainly on the firms' experience and expertise, enabling participants to get to know some successful Italian examples of clean production.
These firms were selected to present a wide range of both production sectors and approaches to green production.
VIU selected Italian firms that distinguish themselves for their innovative and eco-friendly technologies applied to the production process and/or to the final product, and firms that invest in social corporate responsibility, having in place a process to integrate social, environmental, ethical and human rights.
Valcucine, a famous brand known for its highly technical kitchen design, is an example of both a green process and product, combining environmentally-friendly technologies and beautiful design.
The product presented during the site visit was designed to be dismantled and totally recyclable, making it functional and long-lasting.
Moreover, the production process was structured to reduce waste production and water use, to avoid the use of hazardous material and to improve energy efficiency.
FIAMM Green Energy Island, an example of clean technologies, presented an innovative system that can store produced renewable energy using lead-free sodium nickel chloride batteries.
For the first time in the program, the well-known firm Lavazza offered its experience in corporate social responsibility presenting its 100% Rainforest Alliance-certified coffee.
The Rainforest Alliance and Lavazza help farmers in Colombia, Honduras, Peru, Brazil, Tanzania and India to produce top-quality beans at better prices, with training and dissemination of good practices, helping them to create a sustainable rural community and conserve the rainforest.

清洁生产和绿色经济，科技部

意大利，2011年12月3-17日
26名学员

培训重点介绍了来自企业的经验和专门技术，从而让学员了解到意大利清洁生产方面的实际成功案例。
这些企业代表了各生产领域，既向学员介绍了清洁生产情况，也讲解了其所采用的绿色生产办法。
威尼斯国际大学所选择的这批企业有自己独特的创新性，他们将生态友好技术成功应用到生产过程和/或最终产品中。这些公司注重社会责任，在社会关怀、环境保护、道德和人权方面都有良好的表现。
瓦酷赛恩（Valcucine）是一家著名的高科技厨房设计公司，是绿色生产和产品的代表，将环境友好技术与优美设计完美结合。
代表们参观的一种产品是可拆卸和全部回收的，不仅功能完备经久耐用，而且在其生产过程中始终贯彻的理念包括减少废物产生、减少水资源使用，减少危险材料使用、关注提高能源利用效率等。
FIAMM 绿色能源岛是清洁技术的又一典范。这种技术可以利用无铅氯化镍电池存储所产生的可再生能源。
Lavazza 公司首次介绍了其在社会关怀方面的经验，展示了其100%雨林联盟认可咖啡。雨林联盟和Lavazza公司一道共同帮助哥伦比亚、洪都拉斯、秘鲁、巴西、坦桑尼亚和印度的农民生产出高质量咖啡豆，并可以卖到最好的价钱。他们对农民进行培训、组织经验交流，帮助建立可持续农村社区，并很好地保护雨林。

Technical Support on MEP Building Concept Design Project - Study Tour Conducted

As part of the "Technical Support on MEP Building Concept Design" project, a study tour to Italy and Germany was conducted from November 22 to December 1, 2011. The Chinese delegation consisted of four officials from the Internal Service Department, Foreign Economic Cooperation Office and Environmental Satellite Center of Ministry of Environmental Protection.
The objective of the study tour was to learn from Italian and German experiences with modern design and green building technology, so as to support MEP's decisions on the new office building design and construction.
The major activities of the study tour included workshops and site visits in both Italy and Germany.
The delegation visited green buildings, factories and institutes where they were provided with detailed information on modern and green designs, energy saving technologies, geothermal heat pumps and solar energy systems etc.
The delegates found this study tour very fruitful and interesting and hoped for future cooperation with the enterprises and agencies they visited.

环保部办公大楼概念设计技术支持项目-赴意大利、德国访问顺利举行

"环保部办公大楼概念设计技术支持"项目赴意大利、德国考察于2011年11月22日至12月1日顺利举行。进行考察的中国代表团由4名官员组成，分别来自环保部机关服务中心、环保部对外合作中心及环保部卫星应用中心。本次考察旨在学习意大利和德国关于现代建筑设计和绿色节能技术的相关经验，以便为环保部新办公大楼的设计和施工提供支持。
代表团的考察活动主要包括参加讲座和实地考察等。通过参观意大利及德国的现代建筑和绿色节能大楼，走访绿色技术工厂和研究所等，考察团详细了解了关于现代设计、绿色节能设计及技术、地源热泵及太阳能技术等方面的内容。
团员一致认为，此次考察内容丰富，著有成效，并希望能够同走访的相关企业和机构开展进一步的合作。

Experts from China and Italy Exchanged and Discussed their Experience and Ideas on Prevention and Control of Heavy Metals Pollution

The SICP workshop on Heavy Metals Pollution Prevention and Control was held in Beijing on November 18, 2011. It was jointly sponsored by the Chinese Ministry of Environmental Protection and the Italian Ministry for the Environment, Land and Sea.

中意双方开展重金属污染防治国际经验交流

2011年11月18日，由环境保护部和意大利环境、领土与海洋部联合主办的"中意环保合作-重金属污染防治国际经验交流会"在北京召开。环保部对外合作中心李培副主任和意大利环境、领土与海洋部特别顾问Massimo Martinelli先生出席会议并致辞。来自环保部污防司、对外合作中心、环境工程评估中心、环境规划院、天津市环保局、中国环境监测总站、中国环境科学研究院、中国石油和化学工业联合会等产业协会、意大利环境、领土与海洋部、意大利相关企业代表共60余人参加了会议。
会议分析了中国当前和今后一段时期重金属污染防治工作目标和主要任务，介绍了欧盟和意大利水资源管理的法律法规标准体系和管理模式、重金属冶炼等行业清洁生产工艺和末端治理技术以及重金属污染场地修复示范技术。双方专家还围绕我国"十二五"期间重金属污染防治工作的实际需求，深入探讨了重金属污染防治面临的问题和解决方案。
本次会议促进了双方专家在重金属污染防治经验和技术上的沟通和交流，为我国重金属污染防治工作的开展拓宽了思路，为中意环保合作项目开发创造了有利条件，达到了预期目的。

The deputy director general of the Foreign Economic Cooperation Office, Ms. Li Pei, as well as the Chinese Ministry of Environmental Protection and Mr. Massimo Martinelli, special advisor to the Italian Ministry for the Environment, Land and Sea, introduced the workshop. Over 60 representatives from the Chinese Ministry of Environmental Protection, the Italian Ministry for the Environment, Land and Sea, the Chinese Academy for Environmental Planning, the Tianjin Environmental Protection Bureau, the Chinese National Environmental Monitoring Center, the Chinese Academy of Environmental Science, as well as Chinese industry associations and Italian companies, participated in the meeting.
During the workshop, Chinese experts introduced and analyzed the current situation, the major objectives and the mission of prevention and control of heavy metal pollution in China.
Italian experts introduced the system of laws and regulations within the European Union and Italy, water resource management, clean technologies and the process of production in steel and other industries, as well as restoration technologies on heavy metal contaminated sites in Italy and America.
Experts from China and Italy discussed the problems and challenges regarding the prevention and control of heavy metal pollution currently facing China, and analyzed the potential solutions.
The meeting provided a good opportunity for experts from China and Italy to exchange their ideas and experiences on the prevention and control of heavy metal pollution. It was also helpful for developing ideas on how to carry out tasks during the 12th Five Year Plan.

中意双方开展氮氧化物污染防治技术交流

结合“十二五”减排工作重点，2011年11月16日，由环境保护部、意大利环境、领土与海洋部及北京市环保局联合主办的 “中意环保合作-氮氧化物污染防治技术交流会”在北京召开。环保部对外合作中心李培副主任、意大利环境、领土与海洋部特别顾问Martinelli博士和北京市环保局方力副局长出席会议并致

辞。来自环保部污防司、环保部对外合作中心、环境规划院、环境与经济政策研究中心、环境工程评估中心、环境发展中心、中国环境监测总站、中国建筑材料科学研究总院、中国科学研究院、北京市环保局、天津市环保局、意大利环境、领土与海洋部及中意两国相关企业代表共100余人参加了交流会。

会上，中方代表就我国及北京市大气污染防治工作进展、“十二五”电力行业及水泥行业氮氧化物减排计划做了详细介绍。意大利专家介绍了欧盟氮氧化物减排重点行业管理相关法规政策标准以及电力与水泥行业氮氧化物减排技术与经验。中意双方专家还就我国氮氧化物减排重点行业如何借鉴国际先进的减排经验与技术等问题进行了讨论。本次会议促进了中意双方在氮氧化物污染防治技术与经验方面的交流，为我国氮氧化物污染防治工作的展开拓宽了思路，为中意环保合作项目开发创造了有利条件，达到了预期目的。

Sino-Italian Cooperation Workshop on Nitrogen Oxide Emission Control

In line with the National 12th Five-Year Plan and the reduction priorities for the Chinese Ministry for Environmental Protection, a workshop on Nitrogen Oxide Emission Prevention and Control was held on November 16, 2011.

It was jointly organized by the Chinese Ministry of Environmental Protection (MEP), the Italian Ministry for the Environment, Land and Sea (IMELS) and the Beijing Environmental Protection Bureau within the framework of SICP.

Ms. Li Pei, deputy director general of the Foreign Economic Cooperation Office, the Chinese Ministry of Environmental Protection, Mr. Massimo Martinelli, special advisor to the Italian Ministry for the Environment, Land and Sea, and Mr. Fang Li, deputy director general of the Beijing Environmental Protection Bureau, attended the meeting and delivered speeches.

More than 100 people participated, including governmental officials and experts from the Foreign Economic Cooperation Office, the Pollution Control and Prevention Department of MEP, the Ministry of Environmental Protection, the Environmental Planning, Environment and Economic Policy Research Center, the Environmental Engineering Assessment Center for Environment and Development Center, the Chinese National Environmental Monitoring Center, China's Building Materials Academy, China's Science Research Institute, the Beijing Environmental Protection Bureau, the Italian Ministry for the Environment, Land and Sea, and representatives from Italian and Chinese companies.

During the workshop, the Chinese participants discussed their progress on NO_x emission control both in China and Beijing and the NO_x emission reduction plan in power and cement industries in the 12th Five Year Plan.

The Italian experts introduced the relevant regulations and policies with regard to NO_x emission reduction in the EU and Italy and shared their advanced experiences and technologies regarding NO_x emission reduction in key industries. Experts from both sides discussed how to learn from advanced international experience and technologies.

The workshop promoted an exchange on NO_x emission control between China and Italy and laid the foundation for the Sino-Italian environmental protection cooperation program development.

Second Sino-Italian Scientific Meeting on Clean Coal Technologies

Under the Sino-Italian project for carbon capture and storage (CCS) application pre-feasibility study, promoted by IMELS, MOST and ENEL, the Second Sino-Italian Scientific Meeting was held in Italy in December 2011.

The Chinese delegation, led by the MOST Director and comprising representatives from industry and academia, such as Huaneng, CAS and Tsinghua University, visited the ENEL pilot facility in Brindisi and attended the 2-day Sino-Italian Scientific Meeting in Rome.

Experts from ENEL, OGS and Italian research institutions participated in the meeting, as well as institutional representatives from the Italian Ministry for the Environment, Land and Sea, the Italian Ministry for Economic Development and the Italian Ministry of Foreign Affairs.

The meeting was a milestone towards the successful completion of the project's first phase, expected to deliver the pre-feasibility study by April 2012, and laid the basis for a wider platform for cooperation between ENEL and Huaneng. It is also a move towards a further phase of the Sino-Italian CCS, implementing the feasibility study, the plant building and operation.

主题为清洁煤的第二次中国-意大利科技会议召开

在中-意合作开展的碳捕获与储存(CCS)应用预可行性研究项目下，在意大利环境部、中国科技部和ENEL公司的积极推动下，第二次科技会议于2011年12月在意大利召开。

中国代表团由科技部相关司局负责人带队，代表团成员包括中国华能集团公司、中国社科院、清华大学等企业及科研单位专家。代表团参观了ENEL公司在Brindisi 的示范设施，并参加了在罗马召开的为期2天的第二次科技会议。

来自于ENEL, OGS和意大利科研机构的专家参加了本次会议。 意大利环境、领土和海洋部、意大利经济发展部和意大利外交部等部门派代表参加了本次会议。

本次会议是该项目第一期成功结束的里程碑， 并计划于2012年4月提交预可研最终报告。该项目为ENEL与华能集团等企业之间开展合作搭建了平台，并为中意双方进一步在CCS领域进行可行性研究、设施建设与运转等合作奠定了基础。

what's ON at VIU
威尼斯国家大学快讯

Venice International University governing bodies were reorganized. Ambassador Umberto Vattani has maintained the role of President of VIU and Professor Agar Brugiavini of Ca' Foscari University Venice has been appointed the new Dean. Ambassador Vattani has been the head of VIU since 2001 and succeeded Carlo Azeglio Ciampi after his election to the Presidency of Italian Republic. Professor Agar Brugiavini is a full professor of economics, pro-rector of teaching activities and chairperson of the Graduate School of Economics and of the Doctoral Program in Economics at Ca' Foscari University Venice. VIU wishes to express its most sincere thanks to Professor Stefano Micelli who served as Dean from 2005 and will continue to head and develop international cooperation projects within VIU in the field of green economy.

Venice International University has a new Member University: the University of Padua which is the second oldest university in Italy. Along with universities such as Bologna, Paris, Oxford and Cambridge, Padua University was one of the first to exemplify the idea of a *Gymnasium Omnium Disciplinarum*. VIU and Padua already have a strong cooperation within the framework of the Sino-Italian Advanced Training Program, especially in the field of renewable energy, energy efficiency and through their application of eco-building. The University of Padua will now join VIU member universities in the new project *Space, Time and City, Training and Teaching in a Digital Laboratory*, which will open in July and involves experts and professors from both University IUAV of Venice and Duke University.

Within the framework of Venice International University's cooperation with Harvard University, the 6th annual Executive Session on Grand Challenges of the Sustainability Transition will be held at VIU from May 27th-30th. The workshop, *Industrial Pollution, Regulation and Growth: Governance Challenges and Innovation*, was conceived to offer a space to objectively discuss the feasibility, challenges and potential for impact of a variety of innovative policies developed in recent years for regulating pollution. Twenty-five world leaders were invited from research, business, civil society and policy communities to participate, with the goal of learning from the experiences of their colleagues, in order to gain a wider spectrum of available policy options to advance the sustainability transition worldwide. The workshop will be co-chaired by Minister Corrado Clini and Rohini Pande, Professor of Public Policy at Harvard Kennedy School.

On May 21st, the first delegation of the 2012 Sino-Italian Advanced Training Program on Environmental Management and Sustainable Development will open the 9th edition of the program. This year, the Advanced Training Program foresees 15 courses in Italy, each including a delegation of 40 participants. Although the number of courses arranged is lower than in past editions, the higher number of delegates in each course allows for the same number of Chinese trainees to participate in the program as in previous years.

For the full list of the 2012 training courses, please visit the program website at www.univiu.org

威尼斯国际大学的理事会进行了改选。万坦尼大使（Umberto Vattani）再次当选理事长，Ca' Foscari大学的布鲁格维尼教授（Agar Brugiavini）被任命为新校长。自夏阿皮先生（Carlo Azeglio Ciampi）获选意大利共和党党首后，从2001年以来万坦尼大使一直担任威尼斯国际大学理事长。布鲁格维尼教授是Ca' Foscari大学的专职经济学教授，担任分管教学的校长、经济学研究生院院长和经济学博士生培养计划负责人。威尼斯国际大学对自2005年以来担任校长的弥赛里教授（Stefano Micelli）表示衷心感谢，感谢他对威尼斯国际大学的贡献。弥赛里教授还将继续负责威尼斯国际大学在绿色经济领域的国际合作项目。

一位新成员加入了威尼斯国际大学：帕多瓦大学。该大学是意大利第二历史悠久的大学，与博洛尼亚、巴黎、牛津、剑桥大学一样，帕多瓦大学同样贯彻了“学校是所有”这个观点。威尼斯国际大学和帕多瓦大学在中意合作高级培训项目下已经开展了合作，特别是在可再生能源、能源效率、生态建筑等领域有着广泛合作。帕多瓦大学将加入威尼斯国际大学的新项目：**空间、时间和城市，在一个数字化的实验室进行培训和教学**。该项目将于7月份启动，将邀请来自威尼斯IUAV大学和美国杜克大学的教授和专家们参与该项目。

在威尼斯国际大学与哈佛大学合作框架下，“**可持续转型面临巨大挑战**”项目的第六次年度执委会将于5月27-30日在威尼斯国际大学召开。届时还将举办主题为**工业污染、规范与增长：政府管理面临的挑战与创新** 的研讨会，讨论近年来提出的、在污染防治方面具有创新性政策的可行性、所面临的挑战、和可带来的潜在影响。来自研究机构、工商界、民间团体、以及政府部门的25位世界顶级领导将应邀参加会议，旨在相互交流学习，从各个政策角度推动全世界实现可持续转型。研讨会由意大利环境部部长科拉多.克里尼（Corrado Clini）博士和哈佛大学肯尼迪学院公共政策教授 潘德（Rohini Pande）先生共同主持。

5月21日，中意合作高级培训班将迎来主题为“环境管理与可持续发展”的 第一批受训学员，这是该主题的第九期培训班。今年计划在意大利共举行15期培训，每期培训有40名学员参加。与过去相比，尽管培训期数有所减少，但由于每期受训人数增加了，因此年度总培训人数与往年持平。关于2012年各培训班具体情况，请登录www.univiu.org。

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Venice International University
TEN Center, Thematic Environmental Networks
威尼斯国际大学
Isola di San Servolo
30100 Venice Italy
Tel. 电话 +39 041 2719525-524
Fax 传真 +39 041 2719510
ten@univiu.org

Italian Ministry for the Environment, Land and Sea
意大利环境领土与海洋部
Via Cristoforo Colombo, 44
00147 Rome Italy

Sino-Italian Cooperation Program for Environmental Protection
中国 – 意大利环境保护合作项目管理办公室
Program Management Office, Beijing
北京项目管理办公室
4C Building, 6th floor
5 Hou Ying Fang Hu Tong Xin Cheng District,
100035 Beijing, P.R.China
中国北京市西城区后英房胡同5号
环保履约大楼6层
邮编: 100035
Tel. 电话 0086-10-82268788
Fax 传真 0086-10-82200587/0586
newsletter@sicppmo.org
info@sicppmo.org
Program Management Office, Shanghai
上海项目管理办公室
Room 1901-1906,
The Center, 989, Changle Rd.
Shanghai, 200031 P.R. China
上海市长乐路989号世纪商贸广场1901-1906室
中意环保项目上海办公室
Tel. 电话 021 61104860
Fax 传真 021 61104861
info@sicppmo.org