

Climate Change: What After Copenhagen?  
气候变化：哥本哈根后如何走？

Sino-Italian Cooperation Program  
Environmental Training Community

中-意合作计划  
环境培训园地

# newsletter 工作通讯

12

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## Editorial

Ignazio Musu, Ca' Foscari University and TEN Center – VIU

This newsletter's issue is devoted to the important topic of climate change. The reason for this choice is that it provides the opportunity to discuss last December's important Copenhagen Summit, but it is also due to the growing interest in the topic of climate change shown during various courses within the Sino-Italian Advanced Training Program on Sustainable Development and Environmental Management.

We are devoting more and more time to lectures introducing the different aspects of the climate change problem, from the scientific and technical to the economic, legal and institutional aspects. The topic is increasingly relevant in courses devoted to the energy challenges; new lectures and courses are now covering topics such as the Low Carbon Economy.

In fact, capacity building in analysis and management of climate change is becoming increasingly necessary; it is particularly important to link this aspect of capacity building to the more general need of capacity building in sustainable development.

As shown in this issue's contributions, China's role in the climate change problem is increasing. Not only is China one of the big emitters of CO<sub>2</sub>, but its domestic climate change policy and the way it contributes to international cooperation to address this problem will play an essential part.

China is making substantial steps toward building a consistent policy to deal with climate change. A policy supporting innovations in energy efficiency and renewable energy sources has already achieved great success.

The big challenge, however, is to contribute to an international framework that includes policies of this type undertaken both by developed and developing countries.

The fact that China was one of the countries that proposed the text of the approved Copenhagen Agreement is a good sign that significant steps toward such international cooperation can be achieved in the near future.

Developed economies such as the United States and Europe also have a clear responsibility to achieve this objective as their energy systems and models of economic growth have contributed to making climate change such a dramatic problem.

They have a duty to undertake urgent initiatives to steer both their energy systems and their models of economic growth in a low carbon direction.

Europe, in particular Italy, will play a leading role in promoting international cooperation.

Following the Copenhagen Summit, this will prove to be a credible first step toward an international strategy in this post-Kyoto period.

Any action undertaken by way of an agreement between individual European countries and China in the capacity building area will be important in fostering this cooperation.

With this in mind, we will do our best to give more attention to the topic of climate change in future courses within the Sino-Italian Advanced Training Program.

## 编者寄语

Ignazio Musu 教授, Ca' Foscari大学和威尼斯国际大学 TEN 中心

本期通讯将集中讨论气候变化这一重要议题。

选择这个议题的主要原因不仅是由于继去年12月哥本哈根会议后, 有很多问题需要进行讨论; 而且还因为在中-意可持续发展和环境管理高级培训项目下, 该议题得到越来越多的关注。

我们安排了很多时间来讲授与气候变化相关的各领域的问题, 包括科学、技术、法律、经济以及机构机制等方面的内容。气候变化与我们授课中的能源挑战问题也关系愈加紧密, 新增的授课内容还包括了“低碳经济”等议题。事实上, 应对气候变化的分析和管理能力在当今社会正变得更加重要, 因此, 在进行可持续发展能力建设过程中, 就必然会涉及到加强应对气候变化的能力。

正如本期通讯所介绍的, 中国在气候变化问题方面所发挥的作用正日趋增加, 这不仅因为中国是最大的二氧化碳排放国, 而且更因为其国内应对气候变化的政策和与国际社会合作的方式将是解决气候变化问题的基础。

中国正在采取一系列措施积极应对气候变化, 并且在这些政策支持下, 广泛开展了提高能源利用率的技术创新, 积极推动可再生能源的广泛利用, 这些措施产生了明显的效果。

当然, 如何建立起国际政策框架, 让发达国家和发展中国家都积极采取措施是当前面临的重大挑战之一。中国是向哥本哈根会议提出案文的起草国之一, 这一点非常重要, 标志着在不久将来达成国际合作协议方面迈出的重要一步。

由于其能源生产、消费方式和经济增长模式的原因, 美国和欧盟等发达国家在气候变化方面负有不可推卸的责任。他们有义务尽快采取措施改变其当前的能源政策和制度, 推动经济向“低碳方向”发展。

欧盟、特别是意大利, 在加强国际合作方面将发挥领导作用。在哥本哈根会议后, 这一点在后京都阶段, 在推动迈向国际战略方面, 将是很重要的一步。

欧盟成员国与中国在能力建设方面所采取的行动都将极大地加强这种合作关系。我们会牢记这一点, 并尽我们最大的可能在今后的中-意高级培训项目中更多地讲授有关气候变化的内容。



## news and events

### Italy Leads the Partnership for the New EU-China Clean Energy Centre

The Polytechnic University of Turin is the leader of the winning consortium of the EU-funded project for the establishment of the EU-China Clean Energy Centre (EC2), officially launched on April 30 in Beijing during EC President Manuel Barroso's visit to China. The project, costing over Euro 12 million, involves the main Chinese authorities in the sector and is supported and co-funded by Italian Ministry for the Environment Land and Sea. It will benefit from its showcase eco-building headquarters in the Sino-Italian Environment and Energy Efficient Building (SIEEB) at Tsinghua University Campus.

The goal of the EC2 Centre is to promote an increased use of clean energy in China and to become the top reference point for key players in the energy sector, both Chinese and European.

The EC2 will become a network of excellence for energy-related issues and act as an intelligence hub able to provide advice on clean energy issues to Chinese as well as European policy makers, energy authorities and other operators.

The centre will address both energy policies and technology transfer issues in order to create an enabling environment for boosting the EU and China's cooperation in five main sectors: clean coal, sustainable bio fuels, renewable energy sources, energy efficiency in energy consumption and sustainable and efficient distribution systems.

In addition to 360-degree consultancy services in these sectors, the centre has a wide program of information, training and capacity building activities, including the organization of training, workshops, international *fora*, study visits and awareness-raising campaigns.

Other partners of the winning consortium include, on the Chinese side, the Chinese Academy of Social Sciences, the Energy Research Institute of NDRC and Tsinghua University. On the EU side, the Euro-Mediterranean Centre for Climate Change (I), Commissariat à l'Énergie Atomique (F), the University of Calabria (I), Chalmers University of Technology (Se), and the Regional Environmental Center for Central and Eastern Europe (H).

The inauguration of the EU-China Clean Energy Centre was held on Thursday, April 30 at the centre's premises, Tsinghua

University Campus, Beijing in the presence of the EC President, Manuel Barroso, the vice chairman of NDRC Zhang Guobao, high representatives of the Chinese Government and the Italian Minister for the Environment, Stefania Prestigiacomo. Three hundred representatives from the main institutions as well as stakeholders from the sector participated in the opening.

### The EU Launches its Biggest Energy Package

The European Union has launched a package of 43 gas and electricity projects to split Euro 2.3 billion, the biggest amount ever spent by the EU on energy infrastructure in a single package. Thirty-one of these projects concern gas pipelines and include the Nabucco pipeline from the Caspian Sea region to Austria via Turkey, and the Galsi pipeline from Algeria to Italy via Sardinia. The other 12 projects involve upgrading connections between power grids to link countries like Ireland, Malta, Lithuania, Latvia and Estonia to the wider EU energy network. The package uses up the last part of the budget the EU set aside during the recession to give the economy a boost. These projects should create new work possibilities and support small businesses to survive tough times, especially in the construction and services sectors. In providing an initial outlay, the EU contribution could lever private investments up to Euro 22 billion.



## 新闻和事件

### 意大利引领“新中-欧清洁能源中心”伙伴关系

中-欧清洁能源中心（EC2）由欧盟资助，都灵理工大学是该项目中标合作单位的牵头机构。中-欧清洁能源中心（EC2）将在欧盟委员会主席曼努埃尔·巴罗佐（Manuel Barroso）访问中国期间，于4月30日正式在北京启动。该项目总投资超过1200万欧元，中国主要官方机构参与其中，由意大利环境、领土与海洋部支持和共同资助，建立在清华大学校园的中意环境节能楼（SIEEB）将为本项目实施提供很大的帮助。

中-欧清洁能源中心（EC2）的目标是促进中国增加使用清洁能源，并为中国和欧洲能源领域关键部门提供最佳参考。中-欧清洁能源中心应成为一个出色的能源相关问题网，并充当情报中心，能够就清洁能源问题向中国和欧洲决策者、能源部门和其他经营者提供意见和建议。

该中心将帮助解决能源政策和技术转让问题，为中欧在以下5个主要行业的合作创造有利的环境：净煤、可持续生物燃料、可再生能源、能源消耗和可持续有效分配体系的能源效率。除了在这些领域提供全方位咨询服务

外，该中心还制定了广泛的信息、培训和能力建设活动方案，包括组织培训、研讨会、国际论坛、考察访问等各种活动以提高人们的节能意识。

中标单位的其他合作机构包括中方的中国社会科学院、国家发改委（NDRC）能源研究所和清华大学。

欧盟方面，包括欧洲-地中海气候变化中心、法国原子能总署、意大利卡拉布里亚大学、瑞典查尔姆斯理工大学、中欧和东欧区域环境中心等。

中-欧清洁能源中心的落成仪式于4月30日在该中心建成地北京清华大学校园举行，欧盟委员会主席曼努埃尔·巴罗佐（Manuel Barroso）、国家发展与改革委员会副主任张国宝、其他中国政府高级代表和意大利环境部长斯特凡尼亚·普雷斯蒂贾科莫（Stefania Prestigiacomo）出席了该仪式。来自主要机构和部门利益相关者的300名代表出席参加了开幕式。

### 欧盟推出了其最大的能源一揽子计划

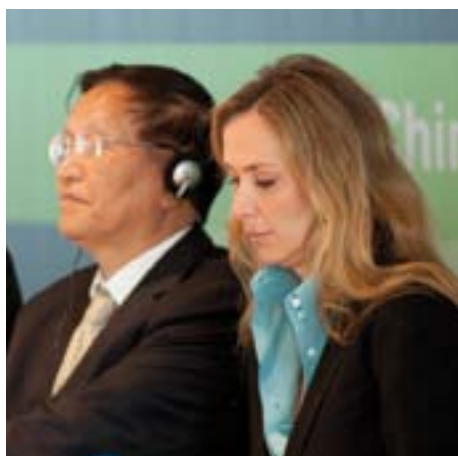
欧盟已推出了一项一揽子计划，该计划包括43个天然气和电力项目，总投资达23亿欧元，这是欧盟有史以来在单个一揽子计划中花费在能源基础设施上的最大金额。



这些项目中有31个涉及到天然气管道，其中包括建设从里海地区经土耳其到奥地利的纳布科（Nabucco）的管网，以及从阿尔及利亚经撒丁岛到意大利境内的Galsi管网铺设。其他12个项目涉及改善电网之间的连接，以使类似爱尔兰、马耳他、立陶宛、拉脱维亚和爱沙尼亚这样的国家连接到更广泛的欧盟能源网。

这一揽子计划使用的是欧盟预留给经济衰退时期用于刺激经济的最后一笔投资。这些项目应创造新的工作机会，并支持小企业，特别是建筑业和服务业的小企业，助其熬过难关。在提供初始费用方面，欧盟的投资可融合私人投资多达220亿欧元。





Günther Oettinger, the European Commission's new energy commissioner, underlined the fact that this energy package will diversify gas imports and improve the flow of energy across European borders. He also added that Europe's energy and climate objectives require large and risky infrastructure investments with long pay-back times. The first batch of grants announced in December 2009 allocated Euro 1.5 billion to nine offshore wind parks and six projects for burying climate-changing carbon. More than 50% of the EU's energy is produced in countries outside the union. A big part of that originates in Russia, whose disputes with the Ukraine and other transit countries have disrupted gas supplies in recent years.

### Chinese Moves to Boost Energy Saving

The Chinese government will adopt stricter measures to boost energy conservation this year to meet the goal set by an important five-year plan, Xie Zhenhua, Vice Chair of the National Development and Reform Commission, said on the 11<sup>th</sup> of March. "It's the last and decisive year for us to realize the goals set by our country's 11<sup>th</sup> Five-year Plan", Xie said at a press conference on the sidelines of the annual session of the National People's Congress, China's top legislature.

"The current energy conservation situation lags far behind the goal set in our plan and our task is still formidable", said Xie, one of China's leading negotiators for climate change talks.

Under the 11<sup>th</sup> Five-year Plan ending this year, China pledged to cut energy consumption per unit of gross domestic product (GDP) by 20%, or 4% each year, but consumption fell by a margin much smaller than the set target during the past four years.

The per unit GDP energy consumption fell only 14.38% from the 2005 level. Xie said the Chinese government would enact a series of measures this year to boost energy conservation, including the introduction of an accountability mechanism for provincial governments and tight control of projects with high-energy consumption and high pollution.

### China is Leader for Investments in Green Energy

According to the independent report by non-profit organization Pew Charitable Trust, entitled "Who is winning the clean energy race?", the answer could be China. Last year, China invested US\$34.6 billion in the renewable economy, overtaking the USA for the first time, which took second place with an investment of US\$18.6 billion. Overall, investment in the sector fell by about 6.6% worldwide in 2009 because of the recession, marking US\$162 billion, but this is a temporary trend and already for 2010 a rise of about US\$200 billion is projected.

What makes China's plan very attractive is the government's choice to adopt national targets for renewable energy, including mandates for 30 GW from wind and biomass by 2020, the enforcing of a feed-in tariff for wind projects and the preparation of similar measures in the field of photovoltaic energy. Runners up after the USA and China were Britain with US\$11.2 billion and Spain with US\$10.4 billion, countries with strong policy

frameworks both at national level and within the carbon market.

According to the increase rate, Turkey took the lead with 178%, followed by Brazil (+148%), China (+148%) and the UK (+127%). Very positive results were also achieved for Italy which, with its 9.8 GW of renewable capacity and US\$2.6 billion invested, took ninth place overall in the last five years, showing a growth rate of 110%.



新能源专员君特·奥廷格（Günther Oettinger）强调，该能源一揽子计划将使天然气进口渠道多元化，并会改善欧洲接壤国家间能源的流动。他还补充道，要实现欧洲的能源和气候目标，需要大量基础设施投资，该投资风险较大，因为其投资回报周期很长。

在2009年12月公布的第一批拨款，划拨了15亿欧元用于建设9个海上风力发电厂和实施6个存储碳的项目。

欧盟50%以上的能源是在欧盟以外的国家生产的。其中大部分源于俄罗斯，但其与乌克兰和其他过境国的争端近年来已妨碍了天然气供应。

### 中国政府鼓励节能

国家发展和改革委员会副主席解振华在3月11日说，我国政府今年将采取严厉的措施，大力推进节能，以实现一项重要的五年计划既定目标。

在全国人民代表大会（中国的最高立法机关）年度会议的记者招待会上，解主任说，“我们要实现我国第十一个五年计划确定的目标，这是最后一年，也是决定性的一年。”

作为中国气候变化谈判代表团团长，解主任还说，“当前的节能情况落后于我们设定的目标，我们的任务仍然很艰巨。”

第十一个五年计划即将结束，中国承诺每单位国内生产总值（GDP）减少20%的能源消耗，或每年减少4个百分点，但在过去四年能源消耗量下降幅度远远小于设定的目标。

与2005年相比，每单位GDP能耗量仅下降了14.38%。

解主任说，中国政府今年将制定一系列措施来推动节能，包括为省级政府引入问责制和严格控制高耗能、高污染的工程。

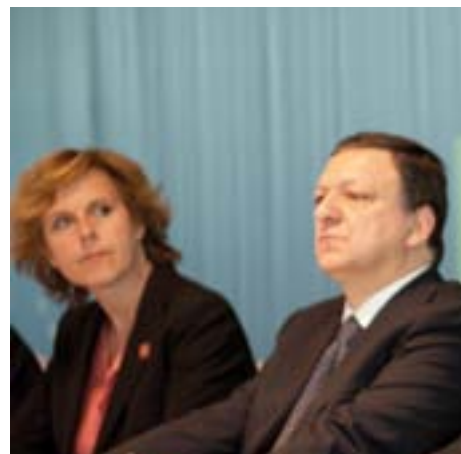
### 中国在绿色能源投资方面全球居首

根据非营利组织皮尤慈善信托基金会（Pew Charitable Trust）的独立报告，即所谓的“谁赢得了清洁能源比赛？”，其答案可能是中国。

去年，中国投资了346亿美元鼓励使用可再生能源，首次超越了美国（投资186亿美元），排名第二。总的来说，2009年因经济衰退，全球在该领域的投资下降了约6.6%，总投资额仅为1620亿美元，但这只是暂时的趋势，预计2010年该投资额将上升到2000亿美元。

中国如此具有吸引力，是因为政府选择将推广可再生能源作为国家目标，包括到2020年风能和生物质能达到30兆瓦的指令，此外，还实施了风力发电项目保护性分类电价制度，并在光伏发电领域制定了类似的措施。紧随美国和中国之后的是英国和西班牙，投资额分别为112亿美元和104亿美元，在其全国范围内和碳市场也制定了有力的政策框架。

按增长率排名的话，土耳其以178%的涨幅位居首位，紧随其后的是巴西（+148%）、中国（+148%）和英国（+127%）。此外，意大利也取得了非常理想的效果，再生能源开发能力达到了9.8兆瓦，总投资额达26亿美元，在过去五年里排名第九，增长率达到了110%。



## on focus climate change: what after copenhagen?

# After Copenhagen: New Perspectives for International Cooperation to Face Climate Change

Corrado Clini, Director General of IMELS and Member of the CCICED

In September 1999, when the US Senate unanimously rejected President Clinton's proposal to ratify the Kyoto Protocol, and in December 2000, after the breakdown of negotiations between the USA and the EU during COP 6 at The Hague, a different path should have been taken by the EU (the international leader in this area at the time) to address the global emergency of climate change.

An international treaty, based more on rules and bureaucratic devices than on programs and policies aimed at technological innovations in the energy field, would not have been approved by the US and would have had no effect on emission reductions from large emerging economies such as China, India and Brazil. The EU should have understood that a solitary commitment to reduce emissions, without the participation of the largest world economy (and the largest energy consumer and CO<sub>2</sub> emitter) would lead nowhere.

In 2003, during Italy's presidency of the EU, it tried unsuccessfully to present a critical review of the real efficacy of the Kyoto Protocol and bring to light the need to have a new and open dialogue with the US and China. In 2005, the EU insisted on actively enforcing the Kyoto Protocol, eight years after the Kyoto agreement, regardless of the fact that the world economy had radically changed and emissions were continually increasing in the US, China and other emerging economies which were not subject to the Kyoto commitments.

In 2007, the IV Report of the IPCC and the World Energy Outlook of the IEA clearly showed how marginal the role of the Kyoto Protocol was: while Kyoto had an objective of reducing global emissions of CO<sub>2</sub>, the growing consumption of fossil fuels in the US, China and South America would have caused global emissions of CO<sub>2</sub> to increase by 60% by the year 2030

with respect to 1990 levels: in other words, the Kyoto objective could not be reached.

In the same year, the Bali Conference on Climate Change decided on a road map toward a new treaty beyond the Kyoto Protocol – eventually involving the US, China and the other emerging economies – in a common effort to protect the global climate.

At the G8 meeting in L'Aquila in July 2009 and the Major Economies Forum (MEF), the collective commitment to reduce CO<sub>2</sub> emissions (limiting the increase in temperature to 2° by 2050) was announced. The radical change in the world's energy systems required to reduce CO<sub>2</sub> emissions must be achieved through new technologies with low carbon content in developed and developing countries. It should be supported by financial mechanisms to help diffuse technology to poorer countries, and by appropriate international coordination.

These measures, which go beyond the simple definition of the legal objectives of emission reductions, were only partially taken into consideration during the negotiations led by the UN Secretariat and Denmark to prepare for the Copenhagen meeting. In November, the US President Barack Obama and the Chinese President Hu Jintao declared that it would have been impossible to reach a global agreement involving all countries at Copenhagen to succeed the Kyoto Protocol. They clearly signaled the need to continue negotiating. Unfortunately Denmark and the UN did not get the message and insisted on elaborating on a set of complex and confusing proposals in the hope of arriving at what would be an impossible global agreement. The EU has supported this approach by insisting on prolonging the Kyoto Protocol and waiting for a global agreement. At Copenhagen, Brazil's President Lula declared that he had never participated in such an inconclusive meeting so detached from the real problems.

## 焦点 气候变化：哥本哈根后如何走？

# 哥本哈根会议之后：国际合作应对气候变化的新前景

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1999年9月，美国参议院一致否决了克林顿总统提出的与批准京都议定书相关的全部提案。在2000年12月海牙举办的第六届缔约方会议中，美国和欧盟出现重大分歧后，欧盟认为应采取不同的办法来应对全球气候变化的紧急情况。当时欧盟在这一领域处于国际领先地位。

国际条约主要注重规则和管理办法的制定，而忽略在能源领域实施技术革新和政策。美国没有批准该条约；而且该条约也不会对新兴经济体（例如：中国、印度和巴西）造成任何减排约束。欧盟应认识到没有最大的世界经济体（也是最大的能源消费国和二氧化碳排放国）的参与，设定减排目标是没有意义的。

2003年，意大利在担任欧盟轮值主席国期间，试图对《京都议定书》的真实效力进行批判性反思，并推动与美国和中国开展新一轮对话，但并未成功。

欧盟坚持在气候变化公约（制定于2005年）生效8年后，推动京都议定书生效。然而在此期间，世界经济发生了翻天覆地的变化：美国、中国以及京都协议缔约方外的其它新兴经济体，排放量不断增长。

2007年，联合国政府气候变化专门委员会 (IPCC) 的《第四期报告》和国际能源署 (IEA) 的《世界能源展望》已明确指出京都议定书所发挥的作用是非常有限的：虽然京都议定书以降低全球二氧化碳的排放量为目的，但是美国、中国和南美不断增长的矿物燃料消耗是全球二氧化碳主要来

源，与1990年的水平相比，到2030年排放量将增加60%。换言之，京都的目标无法实现。同年，巴厘岛气候变化会议决定在京都议定书之外为新的条约制定一个“路线图”，让美国、中国和其它新兴经济体都参与进来共同保护全球气候。

2009年7月在拉奎拉召开的八国集团会议和主要经济体论坛 (MEF) 已明确达成共识，即降低二氧化碳排放量，到2050年将温度上升控制在两度以内，但需对京都议定书进行修订。要实现世界能源体系的彻底改变，需在发达国家和发展中国家通过实施各项新技术，减少碳含量并从而降低二氧化碳排放量。与此同时，还需要资金机制的保障和国际规则的支持，以确保将减排技术传播到较贫穷国家，避免在减排过程中出现一些国家获益，而牺牲另一部分国家的利益。

这些措施远不止对减排目标作出一个简单的法律定义。而由联合国秘书处和丹麦主持的哥本哈根会议仅考虑了这些措施中的一部分。美国总统奥巴马和中国国家主席胡锦涛11月在哥本哈根宣布世界所有国家不可能一致通过京都议定书。他们清楚地表明需要继续就仍旧存在的问题进行谈判。

不幸的是，丹麦和联合国并不同意上述观点，仍在坚持试图制定一项复杂和混乱的提案，试图达成一项不可能的全球协议。欧盟支持这种做法，主张延长京都议定书，等待一个全球协议的诞生。巴西总统卢拉在哥本哈根宣称他从来没有参加过像这样一个无结果的会议，会议逃避了真正的问题。



It is however important that the US, as shown by the law passed in the House of Representatives, is committed to undertake domestic measures to mitigate CO<sub>2</sub> emissions. However, from the law it is clear that the US should constrain its strategy of favoring climate change mitigation and adopt an analogous strategy to “big emitters” like China, India and other large emerging developing countries. This may not help a cooperative agreement because the probability that these countries undertake mitigation strategies depends on the credibility of the US commitment.

Considered in this perspective, the Copenhagen Agreement, although it appears rather general and unfortunately lacks precise quantitative emission reduction commitments, can be seen as a first step forward in the direction of building a more cooperative strategy involving both types of big emitters: advanced economies such as the US and EU, and emerging developing economies such as China and India. It is important that the agreement was initially proposed

and signed by the US, China, Brazil and South Africa.

It is also important that the principle of “common but differentiated responsibilities” was recognized, so that each nation (including the rapidly developing countries that, according to the Kyoto Protocol terminology, form part of the so-called Non-Annex I countries) agrees to commit to domestic climate policies which will be assessed by some kind of international consultation and analysis.

If the US could succeed in having a law passed by the Senate, committing itself to a consistent strategy of not only addressing the domestic energy challenge, but also contributing economically to the global climate change problem, this would be a further step toward the conditions required to build an effective international post-Kyoto agreement.

The US would then join the EU in setting an example for emerging developing countries, giving them more credibility when requesting these countries to undertake similar mitigation action.



不过，有一点很重要，即：美国众议院通过了相关法律，以推动国内减少二氧化碳的排放；当然，也可以清晰地看出，美国能否实施减排战略，很大程度上取决于“大排放国”（例如，中国、印度和其他较大的新兴发展中国家）的响应程度。在这种类型的国际谈判中，需解决一个众所周知的循环往复问题，即：这些国家加入减缓协定的可能性在很多程度上取决于美国谈判立场的可信度。

从这个角度考虑，虽然哥本哈根协议比较笼统，并且缺少更精确的量化减排政策，但它是建设更紧密合作战略的第一步，合作策略涉及两种类型的“大排放国”，即发达经济体（例如：美国和欧盟）和发展中的新兴经济体（例如：中国和印度）。这一协议首先由美国、中

国、巴西和南非提出并签署是非常重要的，同时承认“共同但有区别的责任”这一原则也非常重要，这样每个国家都应承诺在本国采取减排措施（包括迅速增长的发展中国家，其中部分国家在京都议定书中被称为非附件1国家），并且这些措施应接受国际咨询机构的评估。

如果美国能够成功制定一项法律（由参议院通过），承诺将在本国持续减排，这个战略不仅可以解决其国内能源挑战问题，而且也明确了美国经济将如何向全球气候变化做出贡献，这将向建立有效的国际后京都协议又迈进一步。美国将和欧盟一起为那些新兴快速发展国家做出榜样，在要求那些国家采取减排措施时，其可信度也将有所提高。





## on focus climate change: what after copenhagen?

# Climate Policy in China. An Economic Assessment

Carlo Carraro and Massimo Tavoni, The Fondazione Eni Enrico Mattei (FEEM)

At COP 15 in Copenhagen, China put forward a proposal for cutting its carbon intensity by 40-45% (from 2005 levels) by 2020. The scheme has generated a variety of responses, which is unsurprising given the difficulty of assessing the intensity target. In particular, it gives the impression that China and the US may take the lead in the fight against climate change. In comparison to historical figures and recent projections, this proposal illustrates how ambitious the Chinese climate proposal is and the extent of China's cooperative effort to control climate change.

At COP 15 in Copenhagen, China announced that the country carbon emissions per unit of gross domestic product (GDP) will be reduced in 2020 by 40-45% with respect to 2005 levels (this commitment is in the Annex to the so-called Copenhagen Accords). This has marked a point of departure from the longstanding reference to the UNFCCC principle of "common but differentiated responsibilities", which requires Annex 1 countries to take on the initial responsibility of reducing carbon emissions (Bosetti *et al.* 2009; Blanford *et al.* 2009). China's appeal to the historical responsibility of developed countries and their higher *per capita* emissions remains a very valid point, but its current undisputed role as the largest emitter in the world – with 25% more emissions than the second largest emitter, the United States – doesn't go unnoticed. Before and during COP 15, many countries had pressed China to take action to control their very rapid emission growth.

Although China has resisted demands from American and European negotiators to adopt binding limits on its emissions, arguing that environmental concerns must be balanced with economic growth and that developed countries must first demonstrate a significant commitment to reducing their own emissions, its 40-

45% proposal can be considered an important political statement. However, the assessment of its implications in terms of emission reduction has generated less consensus, given that specific assumptions are needed to convert the somewhat elusive metric of carbon intensity into the conventional one of quota targets. Economic and emissions projections can be used to provide some understanding of how demanding the intensity proposal is. According to the Energy Information Agency of the US Department of Energy (EIA-IEO2009), in 2020 China will have an economy of 16.9 trillion USD (measured in \$2005, PPP) and energy-related emissions equal to 9.4 GtCO<sub>2</sub>, and thus a carbon intensity of 0.56 tCO<sub>2</sub>/'000\$; with an intensity in 2005 just above 1, the country is thus assumed to achieve the 45% reduction target in the so-called "business as usual" scenario, without any additional effort.

Another well-known energy outlook, provided by the International Energy Agency (IEA-WEO-2009), foresees a very close carbon intensity figure (0.55 tCO<sub>2</sub>/'000\$), reinforcing the argument that the Chinese proposal would not entail additional measures to those considered baseline. What China commits to do therefore is business as usual.

However, this interpretation is at odds with declarations that suggest that significant action will be required to achieve a de-carbonization of the economy of this sort, released for example by the same IEA<sup>1</sup>. Chinese commentators<sup>2</sup> have suggested that the objective will require significant investments and increased taxes on energy or emissions. Yet, looking at China's own forecasts doesn't provide a different picture from those of foreign agencies: in the report that forecasts energy and emissions to the year 2050, produced by China's Energy Resource Institute, the carbon intensity in the baseline is expected to fall within the 40-45% band. Indeed, and contrary to other countries such as India,

## 焦点 气候变化：哥本哈根后如何走？

### 中国气候政策。经济评估

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在哥本哈根第15次缔约方会议上，中国提出到2020年降低碳浓度40%-45%（与2005年水平相比）的方案，该方案引起各种回应，给该浓度目标评估带来难度毫不奇怪。特别是，中国和美国可能率先应对气候变化，给人们留下深刻印象。通过与历史数字和最近预测相比，该方案阐明中国气候方案的雄心抱负和共同努力控制气候变化的程度。

中国在哥本哈根第15次缔约方会议上宣布，2020年单位国内生产总值碳排放量将比2005年水平降低40%-45%（该承诺见《哥本哈根协议》附录）。这标志着长期参考《联合国气候变化框架公约》“共同但有区别的责任”原则的起点，要求附录1国家承担减少碳排放的初始责任（见博塞蒂（Bosetti等人，2009年；布兰福德 Blanford 等人，2009年）。中国呼吁发达国家对其更高的人均排放承担历史责任，这是非常正确的，但中国作为世界最大排放国，这是当前无可争辩的事实（排放量比第二最大排放国美国多25%），不能不引人注目。在第15次缔约方会议之前和会议期间，许多国家已经强烈要求中国采取行动控制飞速增长的排放量。

尽管中国反对欧美谈判代表们对中国采取排放约束性限制的要求，主张环境问题必须与经济增长相平衡，发达国家必须首先证明对降低各自排放的重大承诺，但其40%-45%方案可能被认为是一项重要的政治声明。然而，考虑到需要具体假定

将限额指标从难以理解的公制碳浓度换算为常规制，其在减排方面的意义评估较少达到共识。

可使用经济和排放的预测大致认识浓度方案的要求程度。根据美国能源部能源信息管理局

（能源信息管理局《2009年国际能源展望》）估计，2020年中国经济将达到16.9万亿美元（2005年购买力平价美元测量），能源相关的排放为94亿吨二氧化碳，得出碳浓度为每千美元0.56吨二氧化碳；2005年浓度正好大于1，因此假定中国无需做任何额外努力就可在所谓的“一切正常”情况下实现45%的减排目标。

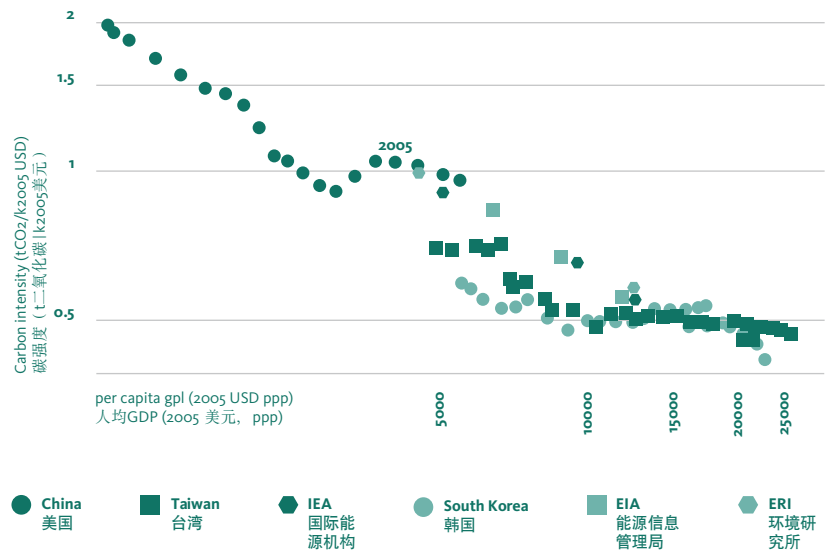
国际能源机构编制了另一份著名的能源展望（国际能源机构《2009年世界能源展望》），预测一个非常接近的碳浓度数字（每千美元0.55吨二氧化碳），增强了中国方案不需要采取额外措施达到这些环保基线的论点。因此，中国的承诺是一切正常。然而，这与国际能源机构发布的声明意见不一致，该声明间接表明，要实现这种经济脱碳化需要采取相当大的行动。中国评论员已经表明，实现该目标需要相当大的投资和增加对能源或排放的税收。然而，对中国自己预测的考察结果，与外国机构所得的结果并没什么不同：中国能源研究所编制的2050年能源与碳排放预测报告中，基线碳浓度预期在40%-45%之间。实际上，与印度等其他国家相比，主要预测似乎对相似增长达成一致，排放增长（每年3%）和经济增长（每年8%），由此得出哥本哈根中国方案中提出的脱碳率。

the main projections seem to agree on similar growths in emission (3% per year) and in the economy (8% per year), which yield the rate of de-carbonization set forth in the Chinese proposal in Copenhagen.

It should be noted that business as usual scenarios incorporate significant investments in low carbon technologies: for example, according to the IEA, 114 GW of wind and nuclear energy will be in place in 2020, as compared to 14 GW today. China has also committed to a significant improvement in energy efficiency before 2010. Coal, however, is expected to continue to dominate the energy mix, with the astonishing installed capacity in 2020 of almost 1000 GW; twice as much as today. It thus remains unclear whether the proposed climate policy will achieve more than the already demanding “natural” evolution of baseline. History provides some partial guidance for the future. In the 15 years preceding 2005, China's carbon intensity decreased by roughly 44%, the same figure that is forecast for 2020, either as baseline or policy.

Yet, significant variations can be detected over time. In Figure 1, we plot the historical carbon intensity for China, as well as for South Korea and Taiwan<sup>3</sup>. China achieved a remarkable drop from its initial extremely high carbon intensity, but then experienced a sudden reverse of this trend in early 2000, ceasing only after 2004. Though this well noticed fact can be imputed to a swift reallocation of the economic activity towards energy intensive sectors such as cement and aluminum, and to potential misreporting of emission inventories around the turn of the century, it also serves as a reminder that steady intensity improvements should not be taken for granted (Fig.1).

Indeed, looking at a sufficiently large panel of countries does not provide an unequivocal relationship between economic development and carbon intensity<sup>4</sup>. Carbon efficiency gains are observed in many circumstances, but in widely varying degrees to the economy. Figure 1 provides some evidence for two neighboring countries. Both Taiwan and Korea started with lower levels of intensity than China which shares a similar level of income, potentially because both countries rely almost exclusively on imported energy and do not have significant coal resources. Over time, both managed to improve their intensity, though at rates lower than the historical (and projected) one for China. Other coal-rich countries in transition, with similar levels of intensity or wellbeing, provide different evidence. Poland managed to decrease its intensity by roughly one to one with



its economy, while South Africa did not achieve any efficiency gain.

The historical evidence, therefore, provides us with only limited confidence to believe that as China's economy develops from approximately \$5000 *per capita* today to \$11,500 *per capita* in 2020, the carbon intensity will be driven down by the growing role of the service sector and technology. That is, the projections reported in Figure 1 indicating a baseline straightly approaching the climate target might well be correct, but it is also plausible that deviations from the historical rates of de-carbonization would result in a much more demanding job.

By regressing carbon intensity on *per capita* GDP (in logs), we can estimate the income elasticity of carbon intensity for different countries and time spans. Looking at the past 20 years (1988-2008), China's elasticity is about -0.5, meaning that every 1% increase in *per capita* income has been accompanied by a 0.5% decrease in carbon intensity. This value is also true for Taiwan, as for the K\$5-11.5 *per capita* range assumed for China between now and 2020. Using this value to project forward would result – as noted above – in a carbon intensity reduction in line with the climate proposal of about 41% with respect to 2005. Indeed, despite using a much richer modeling approach, this is what international and national scenarios are projecting.

Figure 1. Carbon intensity versus per capita GDP (log scales). Historical data for China (1988-2008), South Korea (1980-2005) and Taiwan (1975-2006), and projections to 2020 from EIA IEO 2009, IEA WEO-2009 and ERI. The two horizontal lines indicate the carbon intensity reduction target of 40-45% with respect to 2005

图1. 碳浓度与人均国内生产总值（对数标尺）。中国（1988年-2008年）、韩国（1980年-2005年）和台湾（1975年-2006年）历史数据以及能源信息管理局《2009年国际能源展望》、国际能源机构《2009年世界能源展望》和能源研究所的2020年预测。这两条水平线显示碳浓度比2005年减少40%-45%的目标

应注意的是，正常的设想方案包含大量的低碳技术投资：例如，据国际能源机构称，2020年风能和核能将达到114吉瓦，与今天的14吉瓦形成鲜明对照。中国还承诺2010年之前明显改善能源效率，然而能源构成预期煤炭继续占优势，2020年装机容量惊人，几乎达到1000吉瓦，比现在翻了一番。因此尚不清楚，提议的气候政策是否会超过本已严格的基线“自然”发展。

历史可为未来提供部分指导。2005年之前的15年里，中国的碳浓度减少了大约44%，无论作为基线还是政策，该数字都与2020年预测相同。然而，一段时间内可检测到明显差异。图1描绘了中国以及韩国和台湾的历史碳浓度。中国最初极高的碳浓度明显下降，但之后却在2000年上半年突然提高，只是2004年后才停止增多。尽管这种惹人注意的事实可归因于水泥、铝等能源密集型部门经济活动的飞速再分配和世纪之交排放清单的可能误报，但该事实也提醒我们将稳定改进浓度当作理所当然的事（图1）。

的确，考察大量国家的典型调查并不能得出经济发展与碳浓度之间的明确关系。虽然在许多情况下观察到碳效率增益，但经济程度大不相同。图1所示为两相邻国家的基本情况。台湾与韩国开始的浓度水平都比收入水平相似的中国高，部分原因是因为台湾和韩国几乎全靠进口能源，没有重要的煤炭资源。一段时间之后，台湾和韩国成功改善了浓度，但速度却低于中国的历史（和预测）浓度。其他煤炭丰富的转型国家具有相似的浓度或福利水平，提供了不同的证据。波兰成功降低了碳浓度，与之经济大致一对一地协调进行，而南非却没有取得任何效率增益。

因此，历史证据只能让我们抱着有限信心相信，随着中国经济从今天的约人均5000美元发展为2020年的人均11500美元，服务部门和技术的增长势必会降低碳浓度。就是说，图1显示直接逼近气候目标的基线，其报告的预测可能是正确的，但历史脱碳率偏差有可能导致工作更加费劲。



**Table 1 Implications of different elasticities on carbon intensity and emissions in China in 2020**

Income elasticity of carbon intensity	Carbon intensity reduction w.r.t 2005	Emissions (GtCO <sub>2</sub> )	Emission reductions needed to achieve a -42.5% objective
-0.5	41%	9.4	2%
-0.3	27%	11.6	26%
-0.25	23%	12.3	33%

Using lower elasticities would alter the picture. For example, since 2004 (and according to provisional emission estimates to 2008) China's income elasticity of carbon intensity has been around -0.3. Estimates for South Korea – for a similar range of *per capita* income – yield a value of -0.25. Table 1 show what would happen if China should follow such rates of de-carbonization. The carbon intensity reductions for these two lower values would be lessened, consequently, to 27% and 23% respectively. Such lower rates would result in higher emissions, or in equivalently more emission reductions had the climate proposal of 40-45% been attained. Table 1 also shows that elasticity value of -0.3 would result in a mitigation effort of -26%, and that would exceed -33% for the lower case. These results indicate that assessing the challenge of the carbon intensity target proposed by China is not an easy task. If China were to continue with this long-term historical trend, then the 40-45% objective would essentially yield nothing more than the baseline. No additional effort would be required. There would be no leadership to fight climate change. The Copenhagen Accords would be even emptier than what they are now. This is what energy scenarios seem to be predicting to be the most likely case. Yet, the significant variations over time and across countries suggest that the proposal could turn into a serious mitigation policy, and possibly a very challenging task, even for somewhat lower rates of de-carbonization of the Chinese economy (Table 1).

#### Notes

- 1 The IEA Chief Economist, Fatih Birol, told Nature that "if the target is met, it would have significant implications for China and the rest of the world." Nature, "China's climate target: is it achievable?", Vol 462|3 December 2009.
- 2 See for example [http://www.chinadaily.com.cn/china/2009-12/04/content\\_9113522.htm](http://www.chinadaily.com.cn/china/2009-12/04/content_9113522.htm)
- 3 Data sources for GDP, population and emissions: World Development Indicators, CDIAC, Penn World Tables.
- 4 Similar suggestions hold for economic development and per capita emissions, a topic widely analyzed in the so called environmental Kuznets curve literature.

#### References

- \_ Bosetti V., Carraro C., Tavoni M. (2009), "A Chinese commitment to commit: can it break the negotiation stall?", *Climatic Change*: Volume 97, Issue 1 (2009), pp. 297-303.
- \_ Blanford G., Bosetti V., Carraro C., Richels R., Rutherford T. and M. Tavoni (2009), "Breaking the Climate Stalemate", *Vox*, December 2009.
- \_ Energy Information Agency (EIA), 2009, "International Energy Outlook 2009".
- \_ Energy Research Institute (ERI), 2009, "2050 China Energy and CO<sub>2</sub> Emissions".
- \_ International Energy Agency (IEA), 2009, "World Energy Outlook 2009".



表1 不同弹性对中国2020年碳浓度和排放的意义

碳浓度的收入弹性	与2005年相比 碳浓度降低	排放（10亿 吨二氧化碳）	实现-42.5% 的目标需要排放降低
-0.5	41%	9.4	2%
-0.3	27%	11.6	26%
-0.25	23%	12.3	33%

通过人均国内生产总值碳浓度（对数）回归法，我们能够估计不同国家和时间间隔碳浓度的收入弹性。从过去20年（1988年 - 2008年）的考察情况来看，中国的弹性约为-0.5，这意味着人均收入每增加1%，碳浓度就减少0.5%。至于中国现在与2020年之间假定的人均幅度5000美元 ~ 11500美元，该值对于中国台湾地区来说也是正确的。使用该值计划将会导致（如上所述）比2005年碳浓度降低约41%的积极方案。事实上，尽管使用更丰富的建模方法，但这正是国际和国家方案预测的结果。使用更低弹性会改变这种情况。例如，2004年以来（根据2008年排放临时估算），中国碳浓度收入弹性已成为约-0.3。韩国估算（同样的人均收入幅度）值为-0.25。表1所示为中国执行脱碳率的情况。因而，这两个较小值的碳浓度降低就会分别减少为27%和23%。如果实现40%-45%的气候方案，脱碳率降低会导致排放提高或同等多的排放降低。表1还表明，弹性值-0.3将会导致-26%的缓解工作，更低情况将会超过-33%。这些结果表明，评估中国碳浓度目标所面临的问题并非一项容易的工作。如果中国继续这种长期的历史趋势，那么40% ~ 45%目标实质上只能达到基线。不需要任何额外努力。在应对气候变化方面就没有任何领导力。《哥本哈根协议》甚至比现在还要更形同虚设。这就是预测最可能情况的能源方案。然而，一段时间之后，不同国家的显著差异间接表明，方案可能变成严重的缓冲政策，甚至对中国经济的低脱碳率而言，可能是一项极富挑战性的任务（表1）。

#### 注释

1 国际能源局的首席经济学家Fatih Birol告诉《自然》“如果这个目标能够实现，将会对中国和世界其他地区产生深远影响”。

《自然》，“中国的气候变化目标：能否实现？”

462/3期，2009

2 具体案例见[http://www.chinadaily.com.cn/china/2009-12/04/content\\_9113522.htm](http://www.chinadaily.com.cn/china/2009-12/04/content_9113522.htm)

3 GDP、人口、排放量数据来自于直接发展指标，CDIAC, Penn World Tables

4 有关经济发展和人均排放量方面的建议，这个题目在环境领域以库兹涅兹曲线进行分析。

#### 参考文献

\_ 博塞蒂（Bosetti V.）、卡拉罗（Carraro C.）、塔沃尼（Tavoni M.）（2009年）：“中国承诺：是否能够打破谈判僵局？”，《气候变化》2009年97卷第1期，297页 - 303页。

\_ 布兰福德（Blanford G.）、博塞蒂（Bosetti V.）、卡拉罗（Carraro C.）、里歇尔斯（Richels R.）、拉瑟福德（Rutherford T.）和塔沃尼（M. Tavoni）（2009）：“打破气候僵局”，《Vox》2009年12月。

\_ 能源信息管理局（EIA）2009：《2009年国际能源展望》

\_ 能源研究所（ERI）2009：《2050年中国能源和二氧化碳排放》

\_ 国际能源机构（IEA）2009：《2009年世界能源展望》



on focus climate change: what after copenhagen?

## Prospect for Negotiations over Post-Copenhagen Technological Development and Transfer

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### 1. The Development and Transfer of Environmentally Friendly Technologies is Necessary and Urgent

The Intergovernmental Panel on Climate Change (IPCC) pointed out that the cost and speed of humanity slowing climate change to some extent depends on the cost, properties and availability of the environmentally friendly technologies used to reduce future emissions.

The International Energy Agency pointed out that sustainable energy development is achievable, and while technology and energy efficiency play a critical role, the capture and storage of CO<sub>2</sub> and low-carbon technologies such as renewable energy and nuclear electricity are equally important.

However, a huge gap exists between developed and developing countries in the main fields of technology for slowing and adapting to climate change.

The quick elimination of this technological gap would help developing countries overcome the lockup effect of technology and create historical opportunities for emission reduction in the coming decades, producing tremendous climate benefits worldwide.

It is vital for research institutions and enterprises of developing countries to adopt advanced climate-friendly technologies by improving their capabilities in technological innovation, introduction and absorption to speed up the dissemination of the relevant technologies, expand the scope and scale of application and enable such technologies to make greater contributions to climate protection and the adoption of the sustainable development mode.

### 2. Technological Development and Transfer is an Essential Part of the Copenhagen Agreement

Given the important role played by technological development and transfer in the global effort to address climate change, the 1992 United Nations Climate Change

Framework Convention (hereinafter referred to as the Convention) stressed that developed countries have the responsibility and obligation to transfer environmentally friendly technologies under preferential conditions to developing countries in Sections 4.1(c), 4.5 and 4.7.

As Section 4.5 of the Convention prescribes, "The contracting developed countries listed in Appendix 2 and other contracting developed countries should all take practical steps to promote, facilitate and finance the transfer of environmentally friendly technologies and technical know-how to other contracting parties, especially contracting developing countries, or enable them to obtain such technologies and know-how".

Since the Convention took effect, technological development and transfer has been one of the topics of UN climate negotiations, with some progress having been made. For example, in order to enhance the implementation of Section 4.5 of the above Convention, the Conference of the Parties 7 (COP7) in 2001 reached the Marrakech Accords which set out the technological development and transfer framework, including technological demand evaluation, technological information, suitable environment for technology, capacity building and technological transfer.

Generally, little progress has been made in the area of technological development transfer since the Convention took effect in 1994, with little effective action taken and funds spent at the operational level. The current level of international technological development, transfer and dissemination is not nearly enough to address the challenges of climate change, in either scale, scope or speed. Thence, technological development and transfer is listed as an important issue in the Second Commitment Period of the Kyoto Protocol and the negotiations over long-term cooperative actions to address climate change. Additionally, in the Bali Action Plan reached at the end of 2007, technological development and

## 焦点 气候变化：哥本哈根后如何走？

# 后哥本哈根技术开发与转让议题谈判展望

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### 1. 环境有益技术开发与转让的必要性和紧迫性

政府间气候变化专门委员会（IPCC）提出，人类减缓气候变化的成本和速度将在一定程度上取决于降低未来排放的环境有益技术的成本、性能和可获取性。国际能源署（IEA）则提出，能源可持续发展是有可能实现的，其中科技将是关键因素，能源效率、CO<sub>2</sub>捕获和封存、可再生能源和核电等低碳技术都非常重要。

但是，发达国家与发展中国家在减缓与适应气候变化主要技术领域存在着巨大的差距。迅速弥补这一技术差距，有利于发展中国家克服技术的

“锁定效应”，为未来几十年的减排创造历史机遇，从而产生巨大的全球共享的气候效益。发展中国家的研发机构和企业提高技术创新、引进、消化吸收能力，获得先进的气候有益技术，是加快相应技术扩散速度、扩大应用范围和规模、进而使其为保护气候做出更大贡献、走上可持续发展道路的必由之路。目前先进技术大部分在发达国家，发展中国家又有较大减排潜力，这就是气候有益技术开发与国际转让的意义所在。

### 2. 技术开发与转让是哥本哈根协议中的关键内容

由于技术开发与转让在全球应对气候变化过程中的重要作用，早在1992年，“联合国气候变化框架公约”（以下简称“公约”）就在4.1（c）、4.5、4.7等条款中强调发达国家有责任和义务以优惠条件向发展中国家转让环境有益技术。

其中，公约4.5条款规定，“附件二所列的发达国

家缔约方和其他发达缔约方应采取一切切实可行的步骤，酌情促进、便利和资助向其他缔约方特别是发展中国家缔约方转让或使它们有机会得到无害环境的技术和技术诀窍”。

公约生效以来，技术开发与转让一直是联合国气候谈判中的议题之一，也取得了一定进展。譬如，为增强上述公约4.5条款的执行，2001年第7次缔约方大会达成的“马拉喀什协定”中提出技术开发与转让框架，包括了技术需求评估、技术信息、技术适宜环境、能力建设和技术转让机制5项内容。

但是总体而言，从1994年公约生效以来，技术开发与转让议题进展缓慢，在操作层面的有效行动和实质性的资金投入太少，现有的国际技术开发、转让和扩散，无论是规模、范围还是速度，都远不能满足应对气候变化挑战的需要。

有鉴于此，在当前关于京都议定书第二承诺期和应对气候变化长期合作行动计划谈判中，技术开发与转让被列为重要议题。在2007年年底达成的“巴厘行动计划”中，技术开发与转让与减缓、适应和资金一起，被视作未来国际气候进程的四个要素之一。“巴厘行动计划”具体指出应从以下四方面努力，促进技术开发与转让，即：（1）建立有效的机制和加强的手段，消除进一步开发技术和向发展中国家缔约方转让技术的障碍，并提供资金和其他激励办法，以利获取能够负担得起的环境有益技术；

（2）探索加快部署、推广和转让能够负担得起

transfer was regarded as one of the four elements of the future international climate process, along with slowing, adaptation and funding. The Bali Action Plan proposes efforts be made in the following four aspects to promote technological development and transfer:

(1) establishment of effective mechanisms and enhanced measures to eliminate barriers to the further development of technologies and transfer of technologies to contracting developing countries and provision of funds and other incentives to facilitate the acquisition of affordable environmentally friendly technologies; (2) exploration of approaches for speeding up the deployment, promotion and transfer of affordable environmentally friendly technologies; (3) cooperative research and development of current technologies, new technologies and innovative technologies, including win-win approaches; (4) discussion of the effectiveness of technological cooperation mechanisms and relevant tools in specific sectors. Therefore, it is essential to establish mechanisms for technological development and transfer, including a sufficient and definite financial guarantee, to achieve substantive progress in climate negotiation.

The 15<sup>th</sup> Conference of the Parties held in Copenhagen in December 2009, despite the failure to achieve the expected objectives and the fact that some substantial issues remain pending, clearly proposed the establishment of a technical mechanism to enhance technological development and transfer in the Copenhagen Agreement. This clause ensures that the mechanisms for technological development and transfer will be included in the subsequent agendas, making further negotiations possible. Of course, the functional scope, empowerment and fund source in respect to the mechanism are yet to be negotiated, and it is unknown whether it will play a substantial role in promoting international technological development and transfer. This will be discussed below.

### 3. Understanding of the Technological Development and Transfer Mechanism

As indicated by long-term technological application, there are various problems in the hardware/software of climate-protection-friendly technology. Regulations and policies, funds and manpower must be addressed in a comprehensive manner before the genuinely effective application of this technology is possible. Therefore, environmentally friendly technology should take into consideration not only its equipment or hardware, but also knowledge, experience, commodity

and services, manpower, funding and organization/management procedures etc.

Technological development and transfer, based on external characteristics and the public nature of the global climate change issue, enables developing countries to truly learn, afford, and use environmentally friendly technologies and see actual results. By “learn”, we stress the necessity of improving the technology market and reducing the current ambiguous and inaccurate information with regard to technology supply and demand, enabling developing countries to understand their demand for technologies, available technologies and channels for obtaining them; by “afford”, we mean that the developed countries should offer environmentally friendly technologies at prices universally affordable to developing countries through subsidies or preferences; by “use” and “see actual effects”, we mean that the technologies should meet the needs of developing countries and improve the capability of developing countries to address climate change through technology transfer and promote the progress of developing countries toward sustainable development.

Therefore, unlike technological trade within purely commercial environments, the technological development and transfer mechanism under the Convention has a specific meaning.

Therefore, discussions regarding the technological development and transfer mechanism must also be based on the relevant provisions in Sections 4.1(c), 4.3, 4.5 and 4.7 of the Convention and the Bali Action Plan, and acknowledge the special implications of technological development and transfer for the global public nature of climate protection and the external nature of addressing climate change.

#### 3.1. Concept of Technological Development and Transfer Mechanism

The technological development and transfer mechanism under the Convention aims to change the speed, scope and scale of technology and capital flow and ultimately change the speed, depth and breadth of technological development and transfer by changing the behavior of stakeholders (including the governments, research institutions, technology owners/requesters, agencies and the financial sectors of developed and developing countries) through a series of institutional arrangements, as shown in the figure 1.

The figure 1 shows how the technological development

的环境有益技术的方法；（3）合作研究和开发现有技术、新技术和创新技术，包括探索双赢办法；（4）在具体部门探讨技术合作机制和相关工具的有效性。因此在气候谈判中要推动技术议题取得实质进展，核心是要建立技术开发与转让的相关机制，包括要有充足的、明确的资金保障。

2009年12月在哥本哈根召开的第15次缔约方大会，虽然没有实现预期目标，在关键议题上，一些实质性问题悬而未决。但是，“哥本哈根协议”中，明确提出了要建立技术机制来加强技术开发与转让相关的活动。这一条决议，保证了技术开发与转让机制被纳入后续议事日程，开启了进一步谈判的大门。当然，这个机制的职能范围、授权、资金来源等问题，依然有待进一步的谈判，对国际间的技术开发与转让能否发挥实质性的推动作用还不得而知。这也正是下文需要讨论的问题。

### 3. 对技术开发与转让机制的理解

长期的技术应用实践表明：一项有益于气候保护的技术真正得到有效的应用，需要同时综合解决技术硬件、技术软件、体制政策条件、资金和人力资源等多方面的问题。因此，环境有益技术不应仅仅局限于设备或“硬件”，它还包括知识、经验、商品和服务、设备、人力资源、资金、组织和管理程序等要素。

技术开发与转让则是基于全球气候变化问题的外部性特征和公共物品性质，通过促使发达国家向发展中国家转让技术（包括技术诀窍和技能），使发展中国家对环境有益技术真正做到“可知晓，买得起，用的上，见实效”。其中“可知晓”是指改善技术市场状况，减少目前技术需求、技术供给信息不透明，不清楚，不准确的问题，是发展中国家了解自身的技术需求，可获取的技术以及获取技术信息的渠道；“买的起”指通过发达国家采取补贴或优

惠等方式，使得发展中国家能够普遍承受环境有益技术的价格；“用得上”和“见实效”指技术符合发展中国家的需求，且发展中国家在获取技术设备的同时，还掌握了运转设备，检修设备以及调试设备的能力，能使技术真正发挥作用，而且通过技术转让，实实在在提高了发展中国家应对气候变化的能力，推动了发展中国家的可持续发展进程。

因此，公约背景下的技术开发与转让机制，不同于纯粹商业环境下的技术贸易，具有特定含义。对技术开发与转让机制的讨论，也必须基于公约4.1(c)、4.3、4.5、4.7条款以及“巴厘行动计划”的相关规定，需要确认技术开发与转让对于保护气候这一全球公共物品，解决气候变化的外部性所具有的特殊含义。

#### 3.1. 技术开发与转让机制的概念

公约背景下的技术开发与转让机制，是通过一系列制度安排改变利益相关者（包括发达国家和发展中国家的政府、研发机构、技术所有/需求方、中介公司、金融界等等）的行为，从而改变技术流和资金流的速度、范围和规模，并最终改变了技术开发和转让的速度、深度和广度。如下图所示。

该图展示了技术开发与转让机制是如何通过影响不同利益相关者的行为而提高技术开发与转让的绩效的。事实上，设计、实施和评价任何制度机制创新，其成功与否要以取得的实效为检验标准，就是要看技术开发与转让国际合作进程是否加快，范围是否扩大，减控排放效果是否显著，成本是否降低。转让的技术要做到让广大发展中国家企业买得起，用得上，见实效。

因此，基于对技术开发与转让机制概念上的理解，笔者提出该机制应该包含以下关键组成部分：公约下机构安排；资金机制；监督核查与绩效评估机制；知识产权机制；企业社会责任与能力建设机制；促进技术交易机制等（图1）。

and transfer mechanism improves the performance of technological development and transfer by affecting the behavior of various stakeholders. In fact, actual results are the ultimate *criterion* for determining whether the innovation of any system or mechanism is successful. This depends on whether the progress of international cooperation on technological development and transfer is accelerated and expanded, whether a conspicuous result is achieved in emission reduction and control and whether the cost is reduced. The technology transferred should be affordable and user-friendly for the enterprises of developing countries and it should achieve actual results.

Therefore, based on the understanding of the concept of the technological and transfer mechanism, the authors propose that the mechanism consist of the following key parts: institutions under the Convention; fund mechanism; supervision/ inspection and performance evaluation mechanism; intellectual property rights mechanism; corporate social responsibility and capacity building mechanism; mechanism for promoting technological trade etc (Fig. 1).

### 3.2. Objectives of the Technological Development and Transfer Mechanism

The technological development and transfer mechanism should be committed to accelerating the transfer of environmentally friendly technologies from developed countries to developing countries, expanding the coverage of international cooperation in environmentally friendly technology, strengthening international cooperation and increasing the depth of international cooperation in environmentally friendly technologies, enabling developing countries to fully comprehend their technological demand and advanced technologies and to acquire the technologies they need at affordable prices, be capable of applying the technologies and then slowing or adapting to climate change by applying the technologies.

### 3.3. Characteristics of the Technological Development and Transfer Mechanism

The technological development and transfer mechanism under the Convention is different to the conventional mechanism in the following aspects:

\_ the ultimate goal of the mechanism is to protect the climate (which is a public issue) and achieve sustainable development for all mankind. This differs greatly from

the conventional mechanism, which pursues maximum economic benefits;

\_ the mechanism advocates the transfer of technologies to developing countries from developed countries, which, as major and long-term emitters of greenhouse gas and owners of advanced technologies, are required to take measures to quickly, extensively and substantively transfer and disseminate technologies to developing countries and improve the scientific research competence of developing countries through joint research etc.;

\_ the mechanism features the partnership between public and private sectors, where the government plays a leading role and private sectors are fully involved, to resolve the externality and market failure problems arising during the development and transfer of environmentally friendly technologies, which are public in nature.

### 3.4. Principles of the Technological Development and Transfer Mechanism

#### 3.4.1. "Common but Differentiated Responsibility"

First of all, the technological development and transfer mechanism must be based on the principle for the technological transfer and fund mechanism as determined by the Convention and the Kyoto Protocol and is the responsibility of developed countries to fulfill their commitment.

It is the responsibility of developed countries, as major and long-term emitters of greenhouse gas and owners of advanced technologies, to protect the global climate transferring and disseminating environmentally friendly technologies to developing countries.

The governments and legislatures of developed countries should show their political will to protect the global climate by promoting the worldwide responsibility of environmentally friendly technologies, voluntarily shaping an encouraging policy environment, creating positive conditions for their research institutions and enterprises to transfer technologies to developing countries and actively cooperating with regard to public technologies. Those enterprises with financial and technological power in developed countries should undertake their social responsibilities in protecting the global climate, maintain a balance between the internalization of external costs and the intellectual property rights of the technologies, and transfer and disseminate environmentally



Fig.1 Technological development and transfer mechanism based on the structure-behavior-performance framework  
图1 基于结构-行为-绩效框架的技术开发与转让机制



friendly technologies to the enterprises and markets of developing countries in various forms and under preferential conditions, fulfilling their social responsibilities for protecting the global climate.

#### **3.4.2. Equal Emphasis on Slowing and Adapting**

The mechanism is not only for technologies that slow climate change, but also for the promotion of the development and transfer of adaptation technologies to reduce the vulnerability of developing countries to climate change and lower losses incurred by climatic disasters.

#### **3.4.3. Market-based Cooperation Between Public and Private Sectors, where the Government Leads and Enterprises Participate**

The government should play a leading role in guiding enterprises and supervising the market, as determined by its role as a public service provider. The government should encourage private sectors to make decisions beneficial to climate protection through definite policies of the state, using public finance to create favorable conditions for enterprises in developing, transferring and deploying environmentally friendly technologies by lowering transaction expenses, reducing the risks of developing the market and adopting new technologies and compensating for incremental costs. The public finance areas of developed countries should take the lead in playing the driving and incentive role.

#### **3.4.4. Equal Emphasis on Technological Research and Promotion**

The international cooperation of environmentally friendly technologies can be comprehensively carried out in all phases of technological evolution, in various forms and at various locations, including the joint development/design as well as the joint manufacture and direct purchase of intellectual property rights and equipment etc.

#### **3.4.5. Cost Effectiveness**

The spending/yield of the mechanism should be based on the principle of cost-effectiveness, where the yield of the mechanism can be measured by the emissions, climatic loss avoided, the effect of promoting sustainable development and the amount of funds entering the market of environmentally friendly technologies from the carbon market for technological development and transfer.

#### **3.4.6. Oriented Toward Global Public Interest**

The mechanism is aimed at protecting the climate which is a public issue, and oriented toward the interests of the public, which differentiates it from the conventional mechanism, which is oriented toward business interests. Elements of the technological and transfer mechanism. As previously mentioned, the Copenhagen Agreement has proposed establishing a technical mechanism to strengthen technological development and transfer. Post-Copenhagen climate negotiations should delve into the relevant elements of the mechanism. These elements are important for achieving results in the negotiations over technological development and transfer.

### **4. Elements of the Technological and Transfer Mechanism**

As previously mentioned, the Copenhagen Agreement has proposed establishing a technical mechanism to strengthen technological development and transfer. Post-Copenhagen climate negotiations should delve into the relevant elements of the mechanism. These elements are important for achieving result in the negotiations over technological development and transfer.

#### **4.1. Institutional Arrangement**

The Convention has made some decisions concerning the development and transfer of environmentally friendly technologies. However, a mechanism that ensures these resolutions are implemented during international cooperation is yet to be established due to the absence of a special executive institution such as the execution committee for the clean development mechanism. Therefore, in order to strengthen the role of the intergovernmental cooperation mechanism, it is advisable to establish a permanent intergovernmental affiliated institution dedicated to international cooperation on environmentally friendly technologies. Such an institution will be responsible for the planning, coordination, organization, review and assessment of technological development and transfer activities and promote the communication of technology information and experience between different international stakeholders. The figure 2 illustrates the structure of the affiliated institution for technological development and transfer (Fig. 2). The affiliated institution for technological development and transfer is an operational and accomplished institution, which is parallel to SBI and accountable to the Conference of the Parties, and comprises a strategic planning committee and several dedicated task forces.

### 3.2. 技术开发与转让机制的目标

技术开发与转让机制应该致力于加快发达国家向发展中国家转让环境有益技术的速度，拓宽环境有益技术国际合作的覆盖领域，加大国际技术合作的力度以及深化环境有益技术国际合作的深度，使得发展中国家充分了解自身的技术需求和先进技术信息，能够以可承受的价格获取自身需要的技术，同时具备应用技术的能力，能够通过应用技术获得实实在在的减缓或适应气候变化的收益。

### 3.3. 技术开发与转让机制的特点

公约背景下的技术开发与转让机制与传统机制的不同主要体现在以下几方面：

\_ 机制作用的最终目的是保护气候这一全球公共物品，实现全人类的可持续发展。这就与传统机制追求经济利益最大化的目的有了很大区别。

\_ 机制倡导的技术转让特指技术从发达国家向发展中国家的转让，要求较早和较多地占有温室气体排放容量公共资源、并拥有先进技术的发达国家采取主动措施，实现技术从发达国家向发展中国家的快速、广泛、实质性的转让和扩散，同时通过联合研发等方式提高发展中国家自身的科研能力。

\_ 机制遵循以政府为主导，私人部门充分介入的公私合营伙伴关系思路，用以解决具有公共物品属性的环境有益技术在开发与转让过程中所产生的外部性和市场失灵问题。

### 3.4. 技术开发与转让机制的原则

#### 3.4.1. “共同但有区别责任”原则

首先，技术开发与转让机制必须建立在公约和京都议定书确定的关于技术转让和资金机制的原则和发达国家的履约责任的基础上。

为通过共享环境有益技术以保护和创造全球气候这一公共财富，在历史上和今天较早和较多占有

温室气体排放容量公共资源、并拥有先进技术的发达国家有责任采取主动措施，向发展中国家转让、扩散环境有益技术。发达国家政府和立法机构应当将保护全球气候的政治意愿体现到促进全球共享环境有益技术上来，主动促进形成激励政策环境，为本国研发机构和企业向发展中国家研发机构和企业转让技术创造有利条件并直接在公有技术的合作方面采取行动。发达国家具有雄厚资金和技术实力的企业也应当切实承担起企业在全全球气候保护方面的社会责任，处理好企业外部成本内部化和技术知识产权的关系，为保护全球公共物品尽到自己的社会责任，率先以多种形式和优惠的条件向发展中国家的企业、市场转让、传播环境有益技术。

#### 3.4.2. 减缓与适应并重的原则

机制并不仅仅针对减缓气候变化的技术，同时也旨在推动适应技术的开发和转让以降低发展中国家应对气候变化的脆弱性，减少其因气候灾害而导致的损失。

#### 3.4.3. 政府主导、企业参与、基于市场的公营私营部门合作原则

政府的公共服务职能决定其要在对企业的引导和市场的监管上发挥主导作用。政府要通过国家明确的政策信号引导私营部门做出有益于保护气候的决策，运用公共财政手段在降低交易费用、减少开拓市场和采用新技术的风险、补偿增量成本等方面为企业开发、转让和部署环境有益技术创造优惠的条件。发达国家公共财政应当率先发挥驱动激励作用。

#### 3.4.4. 技术研发与推广部署并重原则

环境有益技术国际合作可以在技术发展的各个阶段、以多种形式、在多种场合全面展开，既包括联合研发设计，也包括联合制造及直接购买知识产权和设备等多种形式。

The institution's main duties include:

- \_ providing opinions, guidance and suggestions for the international cooperation on environmentally friendly technologies;
- \_ coordinating stakeholders from different countries and government policies;
- \_ promoting the communication and sharing of information/knowledge between countries and organizing dialogue and communication regarding policies;
- \_ organizing technological demand assessment;
- \_ working out international strategies and plans for technological development and transfer;
- \_ making decisions on and providing guidance and management for the raising and use of the special funds for technological development and transfer;
- \_ formulating relevant encouraging, restrictive and punitive policies;
- \_ providing information and legal services, guiding and promoting capability building;
- \_ monitoring and assessing the progress and results of technological development and transfer under the Convention.

#### 4.2. Fund Mechanism

The source of the funds for technological development and transfer has been a focus of debate as well as a bottleneck to technological transfer. Fund shortages have been a major barrier to technological development and transfer in the study of barriers to technological transfer under the relevant climate convention.

The Copenhagen Agreement set the objectives of RMB 30 billion for the short term, and RMB 100 billion for the long term, while the source and usage of the funding are yet to be clarified. In terms of the funding source, the amount of new, extra and expectable funds to be provided by developed countries needs to be clarified, and the specific operation matters regarding the Copenhagen Green Climate Fund need to be determined. In terms of the use of the funds, it should be determined what proportion of funds can be used for technological development and transfer, otherwise further negotiations over financial support for technological development and transfer will be necessary.

The figure 3 illustrates the overall framework for promoting the development, transfer and dissemination of environmentally friendly technologies.

The fund mechanism is about developing public-private partnership (PPP), to link public funds with

the carbon, capital and technology markets and establish a Multilateral Technology Acquisition Fund (MTAF) made up of the funds of the public sectors of developed countries based on the limited funds of the public sectors. The fund can then be used as a catalyst to provide economic *stimuli* to lead and drive greater amounts of funds from private sectors (including capital market funds, regular investment, risk investment and carbon market funds) through tax preferences, subsidies, loan guarantees, investment insurance and provision of services, and links the above MTAF with the capital market to form multiple financial derivatives and attract private funds for the development, transfer and promotion of specific environmentally friendly technologies of the developing countries.

Therefore, the MTAF is a technical fund dedicated to the promotion of the development, transfer and dissemination of environmentally friendly technologies based on the funds from the public sectors of developed countries, as an additional fund source besides the conventional official development aid (ODA) (Fig. 3).

#### 4.3. Supervision/Inspection and Performance Check Mechanism

The performance of technological development and transfer is assessed in terms of the scale, speed, scope, direct effect and impact of technological development and transfer. The ultimate goal of establishing the technological development and transfer supervision/inspection and performance check mechanism is to understand the actual effect of technological development, transfer and difference, to provide *criteria* for assessing the performance of technological development and transfer, share information and ideas related to best practices and experience during the development and transfer of environmentally friendly technologies, provide directions for further reform and adjustment of the mechanism, and keep driving developing countries to rapidly, effectively and efficiently improve their ability to slow and adapt to climate change. To meet this goal, the mechanism should accomplish the following tasks:

- \_ assessing the availability and reliability of data and information by developing an index system, designing the procedure for review and assessment, establishing a methodology framework for assessing the development and transfer of environmentally friendly technologies in a measurable, reportable and verifiable manner, and developing the relevant database;

### 3.4.5. 费用有效原则

机制的投入产出应遵循费用有效原则，其中机制的产出可以以它的减排量，避免气候损失量，推动可持续发展的效果，资本市场、碳市场资金流入环境有益技术市场用于技术开发与转让的资金规模等指标衡量。

### 3.4.6. 全球公共利益驱动原则

机制解决的是保护气候这一全球公共物品问题，是公共利益导向的，和传统机制商业利益导向的模式相区别。

## 4. 技术开发与转让机制的相关要素

如上所述，哥本哈根协议中已经提出建立技术机制来加强技术开发与转让的行动。后哥本哈根时代的气候谈判，仍然需要就以下技术机制的相关要素进行深入谈判。这些要素也是技术开发与转让议题能否取得成效的关键所在。

### 4.1. 机构安排

公约对环境有益技术的开发与转让已经做了一些相关决策，但是目前并没有解决如何在国际合作进程中保证这些决议予以落实的问题，由于缺少相关的操作实体如类似清洁发展机制中的执行委员会之类的专门的执行机构而使得这些决议流于空泛。因此，为强化政府间合作机制的作用，建议在UNFCCC框架内建立专门负责环境有益技术国际合作的常设政府间附属机构，专门负责技术开发与转让活动的规划、协调、组织、审查和评估，促进国际上不同利益相关方之间技术信息、经验的交流。下图是关于技术开发与转让附属机构的设想。

图2. 技术开发与转让机制下的机构安排

技术开发与转让附属机构定位为运行和执行机构。它平行于SBI和SBSTA，直接向缔约方大会负责，下设一个战略规划委员会和若干个专题工作组。该机构的主要职能包括：

- \_ 为环境有益技术的国际合作提供意见、指导和建议；
- \_ 做好不同国家的利益相关者以及各国政府政策之间的协调工作；
- \_ 推动各国间信息/知识的交流和共享，开展组织政策对话、交流；
- \_ 组织技术需求评估工作；
- \_ 制定技术开发与转让国际战略、规划、计划；
- \_ 对下述支持技术开发与转让的专门基金的筹集、使用进行决策、提供指导和管理；
- \_ 制定相关的鼓励、限制和惩罚政策；
- \_ 提供信息和法律服务，指导和促进能力建设活动；
- \_ 监测和评估公约下技术开发与转让的进展和效果。

### 4.2. 资金机制

技术开发和转让的资金来源问题一直是争论的焦点，也是技术转让的一个瓶颈问题，在有关气候公约下技术转让障碍的研究中，“资金缺乏”已成为技术开发和转让的重要障碍。“哥本哈根协议”中提出了短期300亿和长期1000亿的资金目标，但是资金的来源和用途需要进一步明确。资金来源方面，需要明确发达国家缔约方政府提供的新的、额外的和可预期的资金规模，落实“哥本哈根绿色气候基金”的相关具体运作事宜。而在资金的使用方面，也需要明确其中有多少比例的资金可能用于技术开发与转让，否则需要针对技术开发与转让议题的资金支持，继续谈判。

下图是关于用于促进环境有益技术开发、转让和扩散的资金机制的总体框架的设想。该资金机制的基本思想是发展公营私营合作伙伴关系（PPP），将公共资金与碳市场、资本市场和技术市场联系起来，以有限的公共部门资金为基础，建立一个主要来源于发达国家的公共部门资金的多边技术获取基金（Multilateral Technology

- \_ developing relevant work procedures and forms for the concrete implementation of monitoring and assessment;
- \_ establishing guidelines for reporting on institutions and contracting parties, requiring all task forces under technological development and transfer and developed countries contracted to regularly report the activities related to technological development and transfer by institutions and contracting parties.

The report should be linked to the index system. The content and requirements of reporting should be specified in the guidelines. The guidelines should also clearly describe the method for quantifying the relevant indicators and the methodology of acquiring the index data (including benchmark setup);

- \_ the result of monitoring and assessment will be used as a standard for checking the performance of the technological development and transfer mechanism and allocating funds to provide a direction for further reform and adjustment of the mechanism.

#### 4.4. Technological Information

An important goal of the technological development and transfer mechanism is to speed up the sharing of technological information. Some possible measures include developing regional or national information centers or networks, implementing favorable policies for improving information conditions, raising definite requirements for information requesters/suppliers and establishing support institutions etc.

#### 4.5. National Technology Demand Assessment and Technology Roadmap

The technological development and transfer mechanism should be based on the principle of efficiency and effectiveness (the potential and cost of the technology) and promote the development of a roadmap of technologies slowing and adapting to climate change at global, regional and national levels. The roadmap should take into consideration environmental and social impacts. It should be driven by the state, adapted to the local environment and capable of identifying and overcoming barriers to fill the gap between technological, economic and market potential. Based on the roadmap, technology demand assessment is further carried out to help identify the objects of the technological development and transfer mechanism.

#### 4.6. Capability Building

The technological development and transfer mechanism should initiate relevant capability building activities. The mechanism should first define the relations and roles of stakeholders and work out an international human resource development plan, such as developing and strengthening a talent center and establishing an international talent network through talent communication and training.

#### 4.7. Program for the Joint Development of Strategic Environmentally Friendly Technologies

An important goal of the technological development and transfer mechanism is to promote the joint development of strategic environmentally friendly technologies and explore win-win cooperation mechanisms. The joint development mechanism should identify the prioritized fields and establish multilateral and bilateral organizational models with fair, open and just decision-making processes and definite intellectual property rights sharing methods (such as license sharing or allocation by market potential). Besides this, an important *criterion* to determine whether the joint development mechanism is effective is whether it is possible for developing countries to participate in the core development process.

#### 4.8. Policy Instruments

The objectives of the technological development and transfer mechanism need to be fulfilled through a series of policy instruments. Therefore, it is necessary to develop policies for technologies in different fields and developmental stages for stakeholders to establish a policy dialogue mechanism. Policy solutions available include:

- \_ imposition of taxes for use on backward technologies, energy taxes or carbon taxes;
- \_ tax exemptions for developing and transferring, lowering or adapting policies;
- \_ establishment of a carbon market;
- \_ setup of regulations, such as standards and licenses etc;
- \_ elimination of barriers and bans that hinder technology trade.

#### 4.9. Intellectual Property Rights

The current system of intellectual property rights is unable to meet the need of accelerating the development and transfer of environmentally friendly

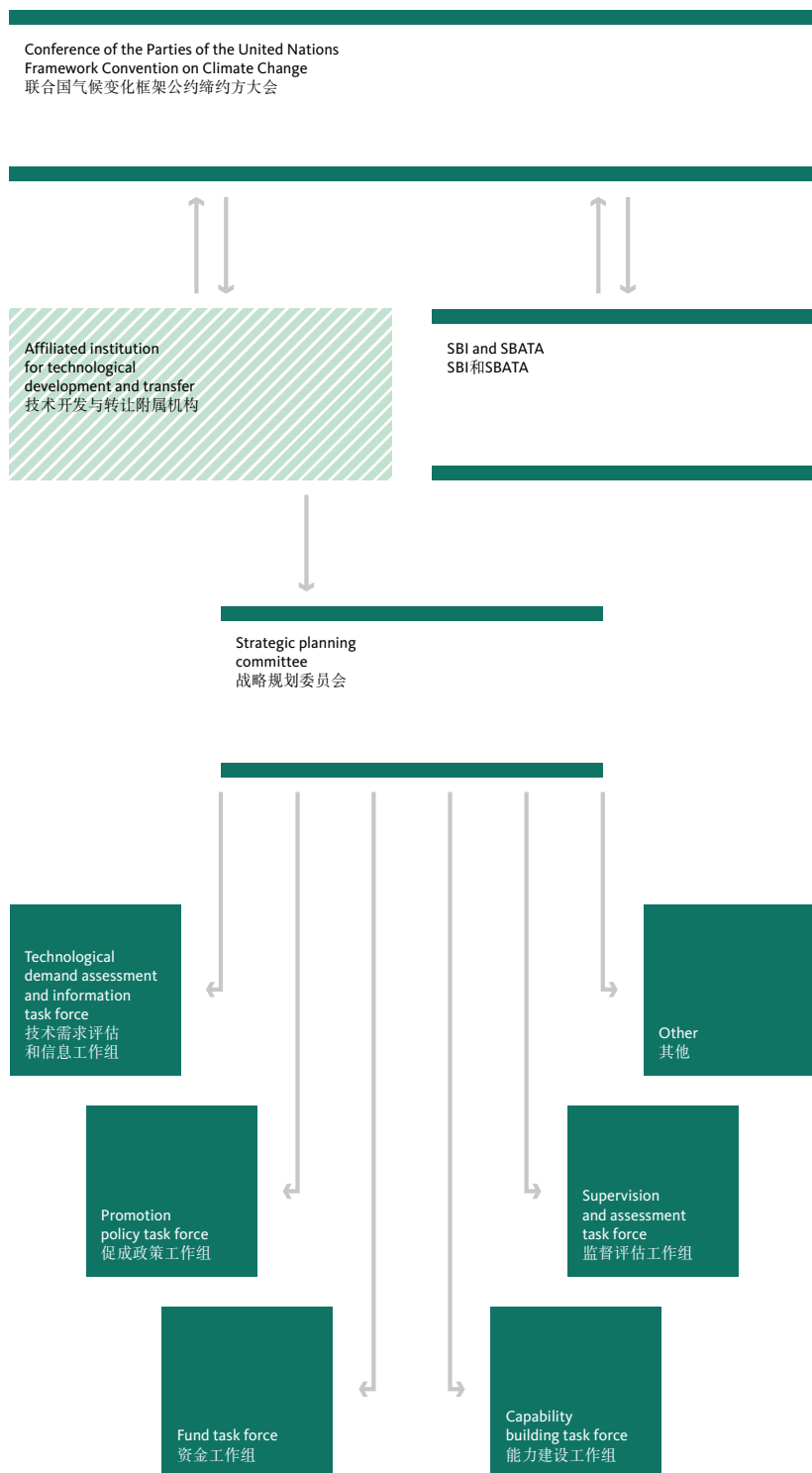


Fig. 2 Institutional arrangements under the technological development and transfer mechanism  
图2. 技术开发与转让机制下的机构安排





Fig. 3 Ideas on the fund mechanism under the technological development and transfer mechanism  
图3 技术开发与转让机制下的资金机制设想

Acquisition Fund, MTAF)。然后以该基金作为催化劑，通过税费优惠、补贴、贷款担保、投资保险、提供服务等政策措施提供经济激励去引导和带动更大数额的私人部门资金(包括资本市场资金、常规投资、风险投资和碳市场资金)，并将上述多边技术获取基金与资本市场建立联系，形成诸多金融衍生产品，吸引私人资金投资于发展中国家特定的环境有益技术研发、转让与推广。因此，多边技术获取基金(MTAF)是建立在发达国家的公共部门资金的基础上的专门用于促进环境有益技术开发、转让和扩散的技术基金，是传统官方发展援助(ODA)之外的新的附加性的资金来源。

### 4.3. 监督核查和绩效考核机制

对技术开发与转让的绩效进行评估，需要从技术开发与转让的规模、速度、范围、直接效果和影响等方面进行。而建立技术开发与转让监督核查与绩效考核机制的最终目标是了解技术开发转让的实际效果和差距，为技术开发与转让机制的绩效考核提供标准，分享环境有益技术开发与转让过程中与最佳做法和经验教训相关的信息和思想，为机制的进一步改革和调整提供方向，从而不断推动发展中国家减缓和适应气候变化技术水平快速、有效、高效得提高。为满足这一目标，机制需要完成以下具体任务：

\_ 通过发展一套指标体系，评价数据和信息的可得性和可靠性，设计审核和评价的步骤和程序，建立以可测量、可报告、可核查的方式评估环境有益技术开发与转让效果的方法学框架，开发建立相应数据库。

\_ 开发相应的工作步骤和形式，用于监测和评估的具体实施。

\_ 建立机构和缔约方报告导则，要求技术开发与转让下属的各工作组以及发达国家缔约方要定期汇报机构以及缔约方与技术开发与转让相关的活动及相应成效，汇报内容应与指标体系挂钩。具体的汇报内容和要求应在导则中有明确规定。有关指标量化的方法以及获取指标数据的方法学问题(包括基准线的设置问题)也应在导则中有明确阐述。

\_ 用监测和评估结果为技术开发与转让机制的绩效考核和资金拨付提供标准，为机制的进一步改革和调整提供方向。

### 4.4. 技术信息

技术开发与转让机制的一个重要目标是加速技术信息的共享。一些可能举措包括发展区域或国家信息中心或网络，实施改善信息条件的有利政策，提出对信息需求方和供给方对明确要求，建立支持机构等。

### 4.5. 国家技术需求评估和技术路线图

技术开发与转让机制需要基于效率和效益原则(技术潜力和成本)，推动在全球，区域和国家层面发展减缓和适应气候变化的技术路线图。该路线图需考虑环境和社会影响，同时需要是国家驱动并适应当地环境的，能够识别和克服障碍以弥补技术潜力、经济潜力和市场潜力间的缺口。在技术路线图的基础上，再进一步开展技术需求评估，从而有助于明确技术开发与转让机制的作用对象。

### 4.6. 能力建设

技术开发与转让机制需要推动相关能力建设活动的开展。首先定义利益相关者的关系和角色，制定国际性的人力资源发展方案，如通过人才交流和培训等；发展和强化人才中心，建立国际人才网络。

technologies to address the challenges posed by climate change. The current focus of the intellectual property rights issue is on how to balance the high profits of the owners of intellectual property rights and the protection of the global climate, i.e. how to urge enterprises to voluntarily give up some their benefits through public policies without damaging their performance and spending on R&D (thus acknowledging the necessity of protecting intellectual property rights and that such rights ought to be reasonably compensated for).

Ownership should be clarified to promote the transfer of common technologies by the state and relevant institutions in Appendix 1; to promote the establishment of a joint development and intellectual property rights sharing mechanism; amend relevant laws and rules to impose compulsory licensing on certain patented technologies; consider adopting differential pricing for developing countries in different regions.

### 5. Prospect for Subsequent Negotiations

Although the establishment of the technological development and transfer mechanism is determined as an objective for subsequent negotiations in the Copenhagen Agreement, there exists great disagreement between developed and developing countries in the definition, objectives and means of implementation of the technological development and transfer mechanism. On some crucial issues, a basic consensus is absent and negotiations will be an arduous task with dim prospects. However, one thing is for sure: the technological development and transfer mechanism is an essential part of the post 2010 international climate system as it concerns developing countries. It will take a constructive attitude and an innovative mind to solve this problem. This paper discusses the objectives, characteristics and basic principles for the technological development and transfer mechanism and specifies some elements of the technological development and transfer mechanism. Subsequent negotiations will focus on these elements, on which the success of the negotiations depends.

#### References:

Zou Ji, Wang Ke and Fu Sha *et al*, 2009, "Study of Innovation Mechanism for International Cooperation on the Development and Transfer of Environmental Friendly Technologies", Beijing: Economic Science Publishing House.  
Zou Ji, Wang Ke and Fu Sha *et al*, 2010, "From Copenhagen to Mexico City: Comment and Reflection on International Climate Negotiations", *Environmental Economics*, 2010(1-2): 24-29.





#### 4.7. 战略性环境有益技术的联合研发计划

技术开发与转让机制的一个重要目标是推动战略性环境有益技术的联合研发，探索双赢的合作机制。联合研发机制需要识别联合研发的优先领域，建立多边和双边组织模型，有公平、公开、公正的决策过程，有明确的知识产权分享方式（如通过分享许可，或按市场潜力进行分配等）。并且衡量联合研发机制是否有效的一个重要标准是，发展中国家是否具有参与核心研发过程的可能。

#### 4.8. 政策工具

技术开发与转让机制的目标，需要通过一系列政策工具来得到落实。因此，需要开发针对不同领域和发展阶段技术及利益相关者的政策并建立政策对话机制。可选的政策方案包括：

- \_ 征收落后技术使用税，能源税或者碳税；
- \_ 对开发和转让减缓或适应政策进行税收豁免；
- \_ 建立碳市场；
- \_ 设立规制制度：如设立标准、许可等；
- \_ 消除阻碍技术贸易的障碍和禁令。

#### 4.9. 知识产权

现有的知识产权制度无法满足加速环境有益技术开发与转让从而满足应对气候挑战需要的要求。目前知识产权问题的焦点在于如何平衡知识产权所有者获取高额利润和保护全球气候的问题，即如何在不影响企业积极性和研发投入的状况下

（即肯定对知识产权的保护和认可知识产权应获得合理偿付的前提下），通过公共政策激励或企业自愿等方式让企业出让部分收益。

需要明晰产权，推动附件1国家和相关机构对共有技术的转让；推动建立联合研发的知识产权共享机制；修改相关的法律和规则，对部分专利技术适用强制许可；对不同区域的发展中国家考虑采用差别定价。

#### 5. 下一步谈判展望

“哥本哈根协议”虽然将建立技术开发与转让机制列为后续谈判目标，但是发达国家和发展中国家对技术开发与转让机制的定义、目标和实施手段，还存在较大分歧。在一些关键性问题上，缺乏基本共识，谈判任务将非常艰巨，前景也不太乐观。但是有一点可以明确的是，技术开发与转让机制是2010年后国际气候制度的重要组成部分，也是发展中国家的关切所在。解决这一问题，需要建设性的态度，也需要创新性思维。本文讨论了技术开发与转让机制的目标、特点、基本原则，提出的关于技术开发与转让机制的一些要素。这些要素将是后续谈判的着力点，也是谈判能否取得成功的关键所在。

#### 参考文献：

- 邹骥，王克，傅莎等，2009. 环境有益技术开发与转让国际合作创新机制研究. 北京：经济科学出版社。  
 邹骥，王克，傅莎，2010. 从哥本哈根到墨西哥城：国际气候谈判评价与反思. 环境经济，2010. 1-2: 24-29.

## VIU training program echo from participants

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 Environmentally Friendly Cities**

Italy, November 1-15, 2009

The VIU-SEPB Environmentally Friendly Cities Advanced Training Course was very well organized in November 2009. Twenty-one trainees from the Shanghai Municipal and District Environmental Protection Bureau participated with fruitful achievements and a deep appreciation for the great hospitality extended by VIU and IMELS.

The training course covered a wide range of interesting topics, demonstrating the Italian counterpart's unremitting pursuit of sustainable development and its great endeavor towards building more environmentally friendly cities, among which a lot of advanced mechanisms like market-based instruments of environmental policy and life-cycle assessment etc, as well as many good practices in, for example, land reclamation and medical waste management etc were very enlightening. Also, the delegation found the extensive application of a great variety of modeling and decision-making facilitating software very interesting.

As a fast-developing mega city, Shanghai is facing many environmental challenges which are similar to what Italy or Venice used to deal with. Since Shanghai shares similar geographic patterns to Venice, it is also under the great threat of global warming.

The restoration and protection of Venice's Lagoon have provided a vivid picture for the trainees to better understand the tremendous challenge Shanghai is facing both in the context of water pollution prevention, which could otherwise lead to irreversible deterioration of the ecosystem, and in the context of the rising sea level.

It's commonly believed by the delegation that further communication and cooperation should be followed up after this training course, focusing on the transfer of advanced technology, equipment, and even management instruments to further enhance the capacity building in environmental management in Shanghai, especially in the area of air pollution analysis and projection, remediation of contaminated soil, and hazardous waste management etc. Last but not least, the above-mentioned mechanisms and good practices should be more comprehensively demonstrated in the upcoming World Expo!



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

Italy, November 21-December 5, 2009

The 2009 United Nations Climate Change Conference in Copenhagen ended with the "Copenhagen Agreement" which does not have any legal restrictions. Faced with such a situation, how will China respond? "Coping with climate change is an internal requirement for China to achieve the sustainable development of the country. Climate change is both



## 威尼斯国际大学培训计划 学员回音

“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。

### 上海环保局

#### 环境友好型城市管理培训项目

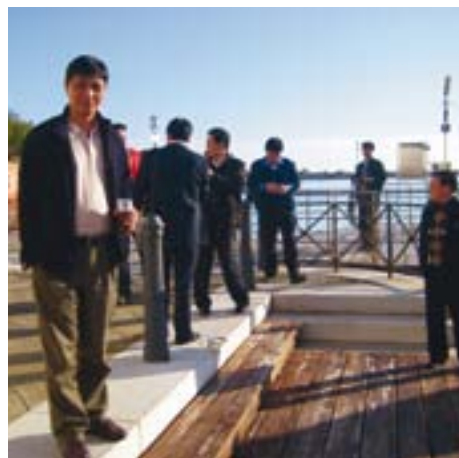
意大利，2009年11月1日至15日

来自上海市、区环保局共21名代表参加了2009年11月在意大利举办的“环境友好型城市”管理培训项目。意大利环境、领土与海洋部以及威尼斯国际大学的精心安排和热情接待让学员们受益匪浅，感受深刻。

培训课程精彩纷呈，充分反映了意大利环保工作者对可持续发展的不懈追求，以及为建设环境友好型城市所付出的巨大努力。其中很多先进的理念，包括环保政策中的市场化机制、生命周期评估，以及在污染土壤修复和医疗垃圾管理等方面的诸多宝贵实践都给学员们留下了深刻的印象。另外，在水污染防治、大气污染防治以及土壤修复等实践经验介绍中，学员们了解到了大量专业的监测、分析、预测模型，以及决策辅助软件的应用，让学员们充分认识到了严谨、细致的科学研究以及扎实、全面的数据收集与分析对环境管理的重要作用。

作为处于快速工业化发展过程中的特大型城市，上海面临的很多环境问题都是意大利或者威尼斯曾经经历过的。特别是和威尼斯一样，上海也面临着全球变暖、海平面升高的巨大威胁。因此，有关威尼斯泻湖的生态修复与保护的介绍给学员们展示了一幅生动的画面，让大家更加清晰地认识到上海在全球变暖大背景下所面临的严峻挑战，同时也让大家深刻地感受到水污染防治的重要性，威尼斯泻湖生态环境的变迁非常生动地揭示了环境污染可能对生态系统造成的难以逆转的改变。

学员们纷纷表示，希望中意合作项目能够进一步加强沟通与交流。作为本次培训的延续，建议进一步探讨引进意大利先进的环保技术、设备，以及管理工具，特别是在大气污染的分析与预测、污染土壤修复以及危险废物管理等方面，从而进一步为上海环境保护领域的能力建设做出贡献。特别值得一提的是，希望借助即将召开的上海世博会，更加全面、综合地展示意大利环境保护的先进理念和宝贵实践。我们衷心地希望中意“环境友好型城市”培训项目能够惠及更多上海的环保工作者，并在不断发展中结出累累硕果！



an environmental issue and a developmental issue. Ultimately though, it is a developmental issue. It will eventually depend on sustainable development to be resolved,” said Mr. Xie Zhenhua, deputy director of the National Development and Reform Commission. This coincides with the training topic “Urban Sustainable Development and Eco-Building” conducted in the Training Program (seventh course) on Eco-Management: Strategies and Policies, from November 21<sup>st</sup> to December 5<sup>th</sup>, 2009. We also expect that through this training, the participants will have a deeper understanding of climate change and the impact of sustainable urban development, and will contribute to the modest efforts made in the sustainable development of China.

After the training, the participants generally agreed that the training content was rich, relevant, practical and flexible, incorporating varied teaching methods. Theory and practice were closely integrated.

The participants learned the following: firstly, in Italy, both the government and public have, to a certain degree, the consensus of urban sustainable development and ecological construction, as far as possible taking into account ecological and environmental protection, renewable resources and new energy use in their urban development planning, traffic management, building construction, waste disposal, water treatment and so on, contributing to the harmonious development of economic and functional values and sustainable urban development of the ecological environment.

Secondly, the above consensus on the one hand is constituted by the government's guidance and norms through the development and implementation of relevant laws and regulations that adopt the fiscal incentives to increase public sector demand for new energy sources, and the implementation of publicity and education activities. In order to promote business, the consumers engender the concept of sustainable development, creating a good social mechanism, changing the behavior of energy-intensive production and consumption. On the other hand, the formation of such a vision and understanding is also driven by private voluntary organizations (such as the union) and some of the elite enterprises in the construction industry. Thus, this is the result of both government and the public consensus.

Thirdly, the Italian government has adopted a variety of policies and measures that are in line with a market-based economic system, promoting sustainable development of the cities through market regulation. Many of these approaches provide salutary lessons for China. For example, in the construction industry, China controls energy consumption mainly through norms and limits the approval within the range framework, while Italy focuses on taxes, financial subsidies and other economic policies to increase the awareness and attention within the building industry of energy-saving environmental protection.

At present, China is highly developed industrially, especially since the explosion of the construction industry. Construction energy consumption accounts for about 40% of the global terminal energy consumption and the carbon dioxide emissions are of a similar ratio. If China can simply improve construction energy efficiency, the global emissions of carbon dioxide could be reduced by 715 million tons in 2010, which is equivalent to 27% of the projected total global emissions in 2010. This shows that low-carbon eco-building plays a decisive role in climate change. Although the Chinese energy-saving building design standards are continuously improving and new environmentally friendly construction materials and new energy systems are continually being used, there have not been very good energy-saving environmental control measures and municipal supervision mechanisms implemented at this stage due to the impact of the construction cost control, selection of materials in the construction process and supply. The EU's practice of issuing “Energy-



## 中国社会科学院 可持续城市发展和生态建筑

意大利, 2009年11月21 - 12月5日

2009年在哥本哈根举行的联合国气候变化大会最终达成了《哥本哈根协议》，没有任何法律约束力。

面对这种状况，中国将如何应对？气候变化既是环境问题，又是发展问题，但归根结底是发展问题，最终要靠可持续发展加以解决。国家发改委副主任解振华曾表示，“应对气候变化最终要靠可持续发展来解决”。

这正好与在2009年11月21日至12月5日期间举办的“生态管理：战略与决策高级培训班（第七期）”的主题相符，即：城市可持续发展与生态建筑。我们也期望通过这次培训，让学员们更深入地认识到气候变化对城市可持续发展的影响，并为中国的可持续发展尽上微薄之力。

培训结束后，学员们普遍认为培训内容丰富、针对性和实用性强，教学方式灵活多样，理论与实践紧密结合。

并得出以下体会：

第一，在意大利，无论是官方还是民众，对城市可持续发展和生态建筑都有了一定的共识；城市的发展规划、交通管理、房屋建筑、垃圾处理、水处理等都尽可能地考虑到了生态环境的保护、可再生资源和新能源的利用，促进了经济价值、功能价值的和谐发展以及城市生态环境的可持续发展。第二，以上这种共识的形成，一方面是依靠政府的引导和规范，包括制定和落实相关的法律法规，采取财政激励政策，增加公共部门对新能源的需求，开展宣传教育活动，为促使企业、消费者形成可持续发展理念，改变高能耗的生产消费行为创造了良好的社会机制；另一方面，这种理念和共识的形成也是民间自愿组织（如联合会）以及建筑行业的一些精英企业自主推动的，可以说这是官民共同作用的结果。

第三，意大利政府采取了多种符合市场经济体制的政策措施，通过市场调节来推动城市的可持续发展，其中很多方法都是值得中国借鉴的。

例如，中国在建筑节能环保上主要是根据规范，并在限定范围内进行审批以控制建筑能耗，而意大利则侧重于采取税收、经济补贴等经济政策，来增加人们对建筑节能环保的认识和重视。

现阶段，中国处于工业高度发展时期，尤其是建筑工业极速发展。建筑能耗约占全球终端能耗的40%，并排放相似比例的二氧化碳，如能简单地提高建筑能效，全球在2010年可以减排7.15亿吨二氧化碳，相当于预计的2010年全球排放总量的27%，可见低碳生态建筑在气候变化中的地位举足轻重。

中国节能建筑设计规范虽然不断完善，新型环保建筑材料、新能源系统逐步应用，但受建筑成本控制的影响，施工过程中材料的选用及供应在现阶段还没有一个很好的节能环保控制措施及市政监督机制，欧盟国家现阶段对竣工建筑采取“能效证书”的机制很值得中国借鉴。



efficiency Certificates” for completed construction projects is worthy of China’s notice. In conclusion, the participants suggested increasing discussion sessions amongst the students and compiling the discussion topics and content into a written format, which would propel the participants’ interest, enhance mutual understanding and awareness, and provide reference materials for future training, as well as the accumulation of training results. Some participants felt that the content of the training was too general and superficial, not meeting the requirements of participants from various professional fields. They would recommend that this general information be given to the participants as supplementary materials for self learning, saving time for more professional and targeted training and improving the overall effectiveness and efficiency of the training sessions.

### Ministry of Science and Technology Capacity Building for Sustainable Development

Italy, December 8-19, 2009

Under the elaborate arrangement of the Italian Ministry for the Environment, Land and Sea (IMELS) and Venice International University (VIU), this training course focused on issues related to the environmental and climactic changes within Venice and the scientific basis for its forestation projects, hydrogen and geothermal energy, CDM projects, agriculture and climate change, and practices aimed at mitigating climate change. The Italian experts systematically introduced Italy and the EU’s environmental policies, laws and regulations with regard to sustainable development. The participants visited Rome, Venice’s lagoon, Turin and relevant university labs. Through the training and investigation, participants were deeply impressed by the harmonious relationship between humanity, society and nature in Italy. It also deepened their knowledge of the current status of sustainable development and climate change, and improved their awareness and commitment to sustainable development. The main points gathered by the 23 participants during the training were as follows:

1. everyone, including the government, research institutions, companies and people in general, should consider different perspectives, exploring and practicing new ways to achieve sustainable development, to fully mobilize the enthusiasm and to balance relationships among the various stakeholders;
  2. as a systematic issue, sustainable development needs the support of all levels of government to coordinate planning and play a strong role in a macro-oriented way through laws, regulations and other means;
  3. companies comprise the main bodies that implement energy-saving measures to reduce emissions and deal with climate change. In addition to tough national laws and regulations, market stimulus incentives are needed and a flexible mechanism within the market needs to be established to ensure effective time and space implementation;
  4. an emphasis on international cooperation between the EU and China is needed, rather than just financial support, to promote the transfer of renewable energy technology;
  5. another key aspect of sustainable development and energy conservation is energy consumption. All citizens need to participate in energy-saving and emission reduction measures and have an awareness of their individual impact on the future.
- Finally, the participants suggested expanding the lectures on solving the transnational pollution problem, and also devoting more time to site visits to gain more perceptual knowledge.





此外，学员们建议增加学员讨论的机会，并将讨论议题和内容写入工作通讯，增加学员的兴趣，彼此加深了解和认识，以及为以后的培训内容提供参考，积累培训成果；也有学员认为培训内容太浅，属于普及和扫盲型，不能满足来自各专业领域的学员需要，建议把类似的普及型内容只作为辅导材料发给学员自己学习，而节约出更多的时间安排更专业、更有针对性的培训内容，提高培训效果和效率。

## 科学技术部

### 可持续发展能力建设

意大利，2009年12月8日至19日

在意大利环境、领土与海洋部和威尼斯国际大学的精心安排下，本次培训围绕威尼斯历史及环境演变、气候变化和造林项目的科学基础、氢能及地热能、CDM项目、气候变化中的农业、缓解气候变化的实践等主题展开，意方专家系统地介绍了欧盟和意大利为保障可持续发展而制定的相关环境政策和法律法规，学员们还实地考察了罗马、威尼斯泻湖、都灵及相关大学实验室。通过培训和考察，学员们深深感受到意大利的人与人、人与社会、人与自然之和谐，加深了对当前可持续发展和应对气候变化态势的认识，提高了坚定不移走可持续发展之路的认识和水平。

通过培训，学员的主要收获和体会如下：

1. 从政府、研究机构、企业乃至普通民众都要从不同角度思考、探索、实践可持续发展的途径方式方法，贯穿其中的是充分调动各方积极性，平衡各利益方的关系；
2. 可持续发展作为一个系统工程，需要各级政府总揽全局、统筹规划，通过法律、法规等手段，发挥强有力的宏观导向作用；
3. 企业是实施节能减排措施、应对气候变化的主体。除了国家制定强有力的法律法规之外，还需要充分发挥市场的激励与刺激作用，通过市场建立灵活的履约机制，来保障其实施时间和空间上的有效性；
4. 通过国际合作机制，促进欧盟与中国之间可再生能源技术转让，而不是仅仅停留在资金支持的层面；
5. 可持续发展、节能降耗的另一个关键在于消费领域，需要广泛调动普通公民参与的积极性，树立每一个公民的节能减排观念以及从我做起、从身边做起的意识。

学员建议增加关于如何解决跨国污染问题的讲座，并适当增加现场参观，以增强感性认识。





## VIU training program activities report

### **Multilateral Environmental Agreements, MEP**

Italy, January 16-30, 2010

23 Participants

A Multilateral Environmental Agreement (MEA) is a treaty signed by more than two countries to achieve the goal of managing environmental protection, which would be unreachable for a single state. Most environmental problems have a transboundary nature and can only be effectively addressed through international cooperation. The MEA's theme therefore hits the heart of global environmental issues, such as greenhouse gas reduction, land degradation and biodiversity loss, waste and chemical management, industrial accidents, marine environment protection and transboundary water and air pollution.

The importance of this tool has been recognized by the Chinese Ministry of Environmental Protection (MEP) which has, for the last three years, asked Venice International University to devote one training session per year to this topic, to be addressed to environmental officials involved in international cooperation. In 2010, the number of training sessions devoted to MEAs will be doubled, with the first session in January and a second one scheduled for October.

The January session agenda is designed to offer an overview of the most important international protocols, especially those with global implications, and to report on their current implementation status.

What emerged in the different lectures is that MEAs are dynamic tools that pass through updates, as in the case of the management of chemicals: scientific research always adds new substances to the list of "dangerous products" but only if a similar substance sufficiently cheap has been found as a replacement.

The agreements on air emissions animated the debate among the participants who discussed the main obstacles in the actual application of international treaties, both in successful cases (i.e. the phase out of methyl bromide, a gas dangerous to the ozone layer) and in less promising ones, like the Kyoto protocol.



## 威尼斯国际大学培训计划 培训活动

### 多边环境协定, MEP

意大利, 2010年1月16日至30日

23名参加者

《多边环境协定 (MEA)》是由两个以上国家为实现单独一个国家无法实现的环保管理目标而签署的条约。大部分环境问题都具有越境性质, 只有通过国际合作才能得到有效解决。

因此, 《多边环境协定 (MEA)》的主题切中全球环境问题的要害, 例如: 温室气体减少、土地退化和生物多样性损失, 废物和化学品管理, 工业事故以及水和空气的越境染污。

中国环境保护部 (MEP) 已认识到这一这类法律文书的重要性, 最近三年请求威尼斯国际大学每年向国际合作相关环境官员提供一次针对该问题的专题培训。2010年将加倍对中国环保部的培训次数, 第一次培训安排在1月份, 第二次培训安排在10月份。

1月份培训日程计划概述最重要的国际议定书 (尤其是那些具有全球意义的议定书), 并报告这些议定的目前执行情况。

不同讲座中, 同化学品管理情况一样, 事实表明签署的多项《多边环境协定》常常是一种“正在发展”的工具: 科学研究始终在向“危险产品”清单添加新物质, 但仅限于发现一种足够便宜的同类物质作替代品的情况。

关于气体排放的协议在学员之间激起强烈辩论, 他们探讨国际条约在实际应用中出现的主要障碍, 包括成功案例 (即逐步淘汰的甲基溴, 这是一种危害臭氧层的气体) 和不太乐观的案例 (如《京都议定书》)。



### Waste Management, CASS

Italy, January 23-February 6, 2010

42 Participants

Despite China's great effort to set up a legislative plan and an integrated waste management system, both at national and local level, there is still quite a lot of room for improvement. Since 2006, waste management has been one of the key issues that the Chinese Academy of Social Sciences would like to address, within the framework of the Advanced Training Program. For this year's edition of the training, the agenda was designed to include even more site visits and best practices for key topics like hazardous waste, landfill, waste water and separate waste collection management. The few lectures that were held in class presented the general framework of the waste management policy in Europe and Italy, and the excellent results achieved by the recycling industry through the CONAI system (Italian National Consortium for Packaging Waste).

In consideration of the size of waste treatment plants in China, two of the biggest treatment plants located in Italy were visited during the training: the first, Acque del Chiampo S.p.A. in Arzignano (Vicenza), works in the field of industrial waste water treatment (mainly the tannery industry), whereas the second site, SMAT S.p.A., provides clean water to the city of Turin. Although most of the companies visited have adopted the best solutions for operating specifically in Italy, it is hoped that the training participants see them as examples that can be adapted to China's various policies and issues in this area.

### Environmental Monitoring Management, BMEPB

Italy, February 27-March 13, 2010

15 Participants

In 2010, the Beijing Municipal Environmental Protection Bureau and Venice International University decided to open their year of cooperation by exploring the issue of monitoring through an exhaustive and rounded approach. Previously the focus had been on specific sectors such as Vehicle Emission Control and Electromagnetic Pollution. This approach to the Environmental Monitoring Management issue comes from VIU and BMEPB's common awareness of the importance to have a reliable assessment of the environment at present in a given place as well as its evolution in time.

The 15 participants, selected from head and senior professional staff at Beijing municipal and district level environmental monitoring centers, were introduced to a complete picture of environmental monitoring at national and regional levels and were offered an explanation of the role of the several Italian institutions in charge of applying regulations and carrying out monitoring activities. For this reason, a large part of the training involved lectures by experts from different Regional Environmental Protection Agencies (ARPA) as well as planned site visits to some regional departments.

As for the legislative framework, the focus was mainly on European legislation and its implementation at local level. In particular, the Integrated Pollution Prevention and Control Directive (IPPC) - recently codified by the European Commission - was discussed in depth. The IPPC Directive aims to ensure that all of the relevant environmental issues for an installation are considered in an integrated way. It therefore takes into account different aspects of industrial and agricultural installations such as air, water and land emissions, generation of waste, use of raw materials, energy efficiency, noise, accident prevention, and restoration of the site upon closure. Some lectures were also dedicated to biological monitoring techniques and continuous dioxin sampling tools – less diffuse monitoring techniques – yet able to provide exhaustive descriptions of a phenomenon.



### 废物管理, CASS

意大利, 2010年1月23日至2月6日

42名参加者

尽管中国大力制订法律计划和综合废物管理制度, 但在国家和地方级别仍然存在大量的改进空间。2006年以来, 废物管理已成为中国社会科学院希望在高级培训大纲框架内处理的关键问题之一。

今年培训的日程设计甚至纳入更多的现场参观以及有害废弃物、填埋场、废水和垃圾分类收集管理等关键主题的最佳实践。少数几堂课堂讲座也介绍了欧洲和意大利废物管理政策的总框架以及回收利用行业通过CONAI体系取得的优秀成果(意大利国家包装废物管理联合体)。

鉴于中国废物处理厂的规模, 培训期间参观了意大利两座最大的处理厂: 第一个是阿尔齐尼亚诺(Arignano)(维琴察(Vicenza))Acque del Chiampo股份有限公司, 从事工业废水处理领域(主要是皮革工业); 而第二个现场是都灵市政水务股份公司(SMAT S.p.A.), 为都灵市提供清洁水。虽然参观的公司大多数采用了具体针对意大利运营的最佳解决方案, 但是希望培训学员将这些案例进行适当调整, 以适应中国在该领域各种政策和具体情况。



### 环境监测管理, BMEPB

意大利, 2010年2月27日至3月13日

15名参加者

2010年是北京市环保局与威尼斯国际大学决定继续开展合作的一年, 并将通过全面而详尽的方法探讨环境监测问题。过去双方更多地将重点放在机动车排放控制和电磁污染等特定部门, 现在威尼斯国际大学和北京市环保局共同认识到及时可靠地评估某地当前环境质量及其发展趋势是非常重要的, 因此加强环境监测管理的问题就被提到议事日程上了。

从北京市、区级环保监测中心的领导和高级专业人员当中选拔的15名学员。他们全面了解了国家、地区级别的环境监测状况, 听取了应用法规、落实监测活动的意大利相关机构的工作介绍。培训主要安排了不同地区环保机构(ARPA)专家的讲座, 并安排现场参观了几个地区部门。

关于立法框架, 主要集中在欧洲立法及其地方级别的实施, 并深入探讨了欧洲委员会最新编纂的《综合污染预防和控制指令(IPPC)》。对于任何建设项目, 《政府间气候变化专门委员会指令》保证综合考虑所有相关环境问题, 因此考虑了工农业设施的不同方面, 例如: 空气、水和土地排放, 垃圾产生、原料使用、能源效率、噪声、事故预防和结束时的现场修复。

一些讲座还专门介绍了生物监测技术和二恶英连续采样工具——该技术尚未得到推广, 但能够全面描述某一现象。





### Water Pollution Prevention and Control, CASS

Italy, March 6-20, 2010

40 participants

In a country like China, where cities are growing so fast, it is necessary to plan its structure and services in advance: for instance, mobility or waste treatment management. Accurate planning of waste and wastewater treatment allows cities to develop economically with respect to the protection of the environment and the health of its citizens. During the advanced training course on Water Pollution Prevention and Control (March 6-20, 2010) the 40 participants, selected by CASS, were made aware of this aspect of sustainable development.

With the aim to share and compare the Chinese and Italian approach, the delegation firstly discussed the policy and legal aspects of water pollution and water control. With the idea of learning from real case studies and best practices, the delegation visited several Italian plants such as the integrated wastewater treatment plant in Treviso, Depuracque (sludge and leachate management), the Acque del Chiampo (industrial waste water management) and SMAT S.p.A. water treatment plant. To foster the networking of Italian and Chinese experts on this topic, important water research centers were involved, such as Thetis S.p.A. which is already carrying out several cooperation projects with Chinese partners, and the ISE - Institute of Ecosystem Study.

The time devoted to the sharing of knowledge was well balanced with leisure activities, such as city tours, which were also appreciated.



### Capacity Building on Climate Change, NDRC

Italy, March 20-April 3, 2010

20 Participants

In this second year of cooperation, the National Development and Reform Commission has once again decided to devote its capacity-building activities to climate change; the main focus of the recent work carried out by NDRC.

The COP15 in Copenhagen proved that a common agreement is difficult to reach for various reasons, one of which involves the fast growth of emerging countries that do not readily want to compromise their own development. China, however, is well aware of the dramatic effects that climate change can have on the country and has already set up a series of policies, under the framework of its National Climate Change Program, issued in 2007.

The training agenda has therefore been designed to offer participants an overview of the main aspects of climate change, with special attention to the policies and actions that can be adopted. In particular, the Italian national policies and projects carried out by our country within this context were presented during the visit to the head office of the Italian Ministry for the Environment, Land and Sea in Rome; whereas the European approach was explained in detail at the University of Siena.

The lecturing sessions in Venice and Turin focused more on specific actions, with regard to mitigation and adaptation to climate change: different policies and tools on energy efficiency and the use of renewable energies, forestation and carbon offset projects, effects of climate change in the field of agriculture, and case studies on adaptation in Venice and Rotterdam were presented.





### 水污染预防和控制, CASS

意大利, 2010年3月6日至20日

40名参加者

在像中国这样城市正在飞速发展的国家, 提前规划国家结构和服务是必要的: 例如, 交通运输或废物管理。只有准确规划废物和废水处理, 城市才能够在保护环境和居民健康方面取得经济上的进步。在水污染预防和控制高级培训期间(2010年3月6日至20日), 中国社会科学院选送的40名学员对可持续发展的水污染预防和控制方面有了了解。

为分享和比较中国与意大利的防治方法, 代表团首先讨论了水污染与水控制的政策和法律状况。代表团抱着通过实际案例研究和最佳实践学习的态度, 考察了多家意大利工厂, 例如: 特雷维索(Treviso)综合废水处理厂、Depuracque公司(污泥与渗漏污水管理)、Acque del Chiampo(工业废水管理)和都灵市政水务股份公司(水处理厂)。为了加强中意两国专家在该领域的合作关系, 不少重要的水研究中心参与了此次活动, 例如: Thetis股份有限公司(已与中国合作伙伴进行多项目合作)和ISE(生态系统研究院)。

在分享知识的同时, 适当安排了城市观光等休闲活动, 对此学员们深表感激。



### 气候变化问题的能力建设, NDRC

意大利, 2010年3月20日至4月3日

20名参加者

在合作的第二个年头, 国家发展和改革委员会再次决定将能力建设活动投入到气候变化(国家发改委最近落实工作的主要重点)。

由于各种原因, 哥本哈根第15次缔约方会议证明难以达成共识, 其中一个原因就是新兴国家正在快速崛起, 不希望影响本国的发展。然而, 中国充分认识到气候变化可能对其带来巨大的影响, 并根据2007年发布的《应对气候变化国家方案》框架制定了一系列政策。

因此, 培训日程旨在向学员概述了气候变化的主要方面, 特别关注可采取的政策和行动。其中, 在意大利环境、领土和海洋部总部罗马考察期间介绍了意大利在这种背景下落实的国家政策和项目, 在锡耶纳(Siena)大学详细讲解了欧洲的做法。

威尼斯和都灵的专家讲座更加集中介绍关于减缓和适应气候变化的具体行动: 关于能效和可再生能源利用的各种政策和工具, 植树造林与碳抵消项目、农业领域气候变化效应, 并介绍了适用于威尼斯和鹿特丹的案例研究。

## around us

### **Sino-Italian Pavilions Stand Out in the Urban Best Practice Area of the Shanghai World Expo 2010**

The construction of the “Sino-Italian” pavilions in the Urban Best Practices Area (UBPA) of the 2010 World Exposition in Shanghai has been completed and the inauguration ceremony held on April 27 in the UBPA celebrated this new important milestone of the cooperation between China and Italy.

The Italian Ministry for the Environment, Land and Sea (IMELS) has supported this initiative for the design and construction of two pavilions, namely “C1” and “B3.2”, and the restoration of a third one, “B2” in the UBPA area.

The ceremony was held in front of one of the three “Sino-Italian” pavilions, where IMELS Director General, Corrado Clini, EXPO Bureau’s Director for International

Affairs, Huang Jianzhi, and UBPA Director, Sun LianSheng – who were joined by other representatives of the Chinese and Italian private and public sector – unveiled the plate acknowledging the contribution from the Italian Ministry for the Environment, Land and Sea for a “better city, better life” in Shanghai.

Dr Corrado Clini has stressed the importance of improving the practices of energy efficiency in the building sector, as was highlighted by other speakers, at the contemporary annual general meeting of CCICED members, gathered in Shanghai during a two-day conference. Dr Clini, also a member of the CCICED, recalled the other projects from the Sino-Italian Cooperation Program aimed at promoting and deploying energy-efficient technology in the building sector, such as the micro-turbine for the efficient generation of heating and cooling developed with the Tongji University of Shanghai, thus responding to the Chinese government pledges for a low-carbon society.

### **BATLAKE Project Starts at Dongting Lake**

The Italian Ministry for the Environment, Land and Sea (IMELS) and the Chinese Ministry for Environmental Protection (MEP) officially launched the “Best Available Technologies for Prevention of Eutrophication in Chinese Lakes (BATLAKE)” project during its kick off meeting, held on February 25 in Changsha. BATLAKE is an 18-month project which

aims at defining specific guidelines and scientific tools in order to support MEP in addressing these sorts of water pollution problems.

Due to water scarcity, overexploitation of fresh water sources and severe discharge of nutrients, most Chinese lakes are currently affected by harmful pollution problems which are among the main causes of the eutrophication *phenomenon* – especially in the most developed areas of the country where water from the same lakes is usually used for drinking purposes. The eutrophication *phenomenon* causes various problems, including in some cases, acute manifestations. As a recent example, the algae blooms episode in the Thai Lake in the spring of 2007 caused a dramatic shortage of drinking water for a week for 1.5 million people.

The core of this proposal will focus on the strategic concept of eutrophication prevention in Chinese lakes by applying the experienced worldwide approach of Integrated Lake Basin Management. The Dongting Lake system in northeast Hunan Province has been chosen as a pilot area for BATLAKE. Based on the project activities, guidelines for all Chinese lakes will be developed.

### **Workshop on Diesel Vehicle Emission Control Technologies**

On March 24, 2010, a workshop on “Diesel Vehicle Emission Control Technologies” was held in Beijing. This workshop was linked to the pilot activities for sustainable



## 在我们周围



### 中意展馆在2010年上海世博会“城市最佳实践区”落成

入驻2010年上海世博会“城市最佳实践区”的中意展馆建设业已竣工，4月27日在城市最佳实践区（UBPA）举行落成仪式，庆祝中意合作迈向了新的里程碑。

意大利环境、领土与海洋部（IMELS）设计和实施的两个展馆分别被命名为“C1”和“B3.2”，并恢复重建了位于城市最佳实践园区内的第3展馆“B2”。

落成仪式在中意展馆前举行，意大利环境、领土与海洋部（IMELS）部长科拉多·克里尼（Corrado Clini）司长、上海世博会事务协调局副局长黄

健之、世博局城市最佳实践区部部长孙联生共同完成揭牌仪式，中意双方公共部门、企业界代表等应邀参加了揭幕仪式，全面肯定了意大利环境、领土与海洋部（IMELS）对此次上海世博会“城市，让生活更美好”主题的贡献。

克里尼博士强调改善建筑行业能源使用效率的重要性，并与在上海参加为期两天会议的中国环境与发展国际合作委员会（国合会）成员们，针对该问题共同发表了重要观点。作为国合会的委员，克里尼博士回顾了中意双方合作开展的一系列旨在推动建筑行业提高能源效率的合作项目，这些项目对促进创建低碳节能社会发挥了积极的作用，包括与上海同济大学共同研发的冷热高效生成微型涡轮机等。

### 中国湖泊富营养化防治最佳可行性技术（BATLAKE）项目在洞庭湖启动

2月25日，由中国环境保护部和意大利环境、领土与海洋部共同合作的“中国湖泊富营养化防治最佳可行性技术（BATLAKE）”项目启动会在长沙市召开。

中国湖泊富营养化防治最佳可行性技术项目（BATLAKE）周期为18个月，

旨在为中国湖泊的富营养化防治提出具体指导方针和科学方法，从而为中国环保部对水污染问题的治理提供支持。

由于淡水资源缺乏、过度开采以及营养物质的大量排放，目前，中国大多数湖泊都受到了严重污染，这是引发富营养化现象的主要因素，特别是在发达地区，因为该地区通常从同一湖区抽取水源用于满足饮水需求。

富营养化现象是由各种营养物质等污染引发的，会造成富营养化的急性爆发。列举近期发生的例子，就不得不提到2007年春季发生的太湖赤潮事件，那次事件导致150万居民饮用水供应严重短缺，并持续了一周。

本项目的核心是运用世界通用的“湖泊流域综合管理”这一战略理念，解决中国湖泊富营养化的问题。湖南省东北部的洞庭湖水系已被选为中国湖泊富营养化防治最佳可行性技术项目（BATLAKE）示范区，基于该项目实践总结出的指导方针将在中国境内所有湖泊实施。

### 柴油发动机汽车尾气排放控制技术研讨会

2010年3月24日，主题为“柴油发动

urban transportation developed within the framework of the Sino-Italian Cooperation Program for Environmental Protection (SICP). Mr Wen Wurui, Director General of the Foreign Economic Cooperation Office of the Ministry of Environment Protection of P.R. of China (MEP), the Ambassador Sessa of the Italian Embassy in China, and Dr Corrado Clini, Director General of the Italian Ministry of the Environment, Land and Sea (IMELS) participated and delivered the speeches. Over 60 of the government officials and experts, from the Pollution Control Department of MEP, the Vehicle Pollution Control Center of MEP, local EPBs, Shanghai Jiaotong University and IMELS, participated in the workshop. During the workshop, the participants discussed the vehicle emission control policies in China and Italy, shared experiences from the Beijing Pilot Project on Diesel Vehicle Retrofit, and listened to the introduction of Italian diesel particulate filter technology. The workshop provided a good basis for the selection of cities to implement the pilot project and the technical testing work. In 2009, IMELS and MEP jointly initiated the project in the field of diesel vehicle control in order to reinforce the cooperation in vehicle pollution control and promote green transportation in China. This project aims to introduce the advanced Italian technologies and products available in vehicle pollution control and to provide effective methods for air pollution control in China through workshops, technical communication and seminars. This project will select three cities to implement the technical testing and look for a suitable technology for China in the field of diesel vehicle emission and implement the demonstration activity.



机汽车尾气排放控制技术”的研讨会在北京召开，围绕中意环保合作项目（SICP）框架下的“可持续城市交通示范项目”进行深入讨论。中国环保部对外经济合作中心主任温武瑞先生、意大利驻华大使Sessa先生和意大利环境、领土与海洋部科拉多·克里尼（Corrado Clini）司长共同出席了该会议，并发表重要讲话。来自环保部污防司、机动车污染控制中心、地方环保部门、上海交通大学和意大利环境、领土与海洋部的60多名政府官员和专家出席了本次会议。

会议期间，与会者讨论了中国和意大利现行的《机动车尾气排放控制政策》，分享了北京机动车改装试点项目经验，并介绍了意大利柴油机微粒过滤器技术的最新进展。这次研讨会为实施试点项目及技术测试工作的城市选择奠定了良好基础。

2009年，意大利环境、领土与海洋部与中国环保部联合发起了机动车尾气控制方面的合作项目，以推动中国绿色交通事业的发展。该项目旨在通过研讨会和技术交流及专题讨论的形式，从意大利引进机动车污染控制方面的先进技术与成果，为中国大气污染控制提供有效方法。该项目将选择3个城市进行技术测试，寻找适合中国的机动车尾气排放控制技术，并实施示范活动。





## what's ON at VIU

After the delegates from MEP, CASS, BMEPB and NDRC have visited Italy between January and March this year, the Distance Learning Program session in Beijing and the TSTC Training Program in Tianjin will mark the opening of the capacity building activities in China for 2010. Ten cities across China take part in distance learning, with 45 attendees in each class and a total of 450 local officials benefiting from Chinese and Italian lecturers, speaking on green economy, water management, contaminated soil, air quality, sustainable mobility, low carbon economy, energy efficiency and energy savings in eco-building, sustainable urban governance, desertification and sustainable agriculture. The tutorial sessions are useful a forum for debating and discussing the addressed topics. "Innovation" and "Environmental Technology" are key words for the session in Tianjin and for those to be held in Italy, in cooperation with the Tianjin Science and Technology Committee. The first session of the Low Carbon Economy training series will open in Italy in April with SEP. Low Carbon Economy will be the focus of many upcoming training sessions in spring 2010, involving Shanghai, Beijing and the Chinese Ministry of Science and Technology.

The VIU Capacity Building Program for the Promotion of Sustainable Development, carried out in cooperation with the Italian Ministry for the Environment, Land and Sea, includes some training activities for Central and Eastern Europe. This year the course on sustainability marks an important new collaboration with the Russian Federation: Director General Corrado Clini will open the course in St. Petersburg in May with a session devoted to "Sustainable Development for St. Petersburg and the Leningrad Region". In September, the St. Petersburg participants will meet again in Venice for the second and last part of the course.

Istanbul is the location for the opening session of the seminar series, Partnerships for Sustainable Development that, as part of the course on sustainability, aims at promoting sustainable public policies and business practices for the countries of the Black Sea region. Business practice is also the focus for the Local Sustainability and Action course, addressed to participants from the Balkan region, which is scheduled for November at VIU.

Director General Corrado Clini's lecture on Climate Change, held at VIU on February 8 (the video of the lesson is available at [www.lezionideuropa.eu/eventi-venezia.asp](http://www.lezionideuropa.eu/eventi-venezia.asp)) attracted a large audience of young university and high school students and was moderated by the journalist Jacopo Giliberto. A number of other schools were connected via the web and the students submitted many on-line questions to Dr Clini. The lecture was part of "Lezioni d'Europa", a project promoted by the Italian government, the EU Parliament and the EU Commission to discuss and disseminate among younger generations current topics of great interest to Europe and the world.

Salvatore Rossi, Director of the Economic Research and International Relations unit of the Bank of Italy, and Enzo Rullani, President of the TeDIS Center at Venice International University, were involved in "A Dialogue on Globalization: Scenarios for Italy beyond the Crisis" on the occasion of the opening of the Spring 2010 edition of VIU's Semester Program and the Globalization Program. Gianni Toniolo, former Dean of VIU and professor of Economic History at Duke University, lectured on "A Long-Run Perspective on Globalization", a *lectio magistralis* on the history of globalization to introduce VIU students to the main topic that characterizes VIU's semester program, namely globalization, in relation to economics, environment and its social aspects.

## 威尼斯国际大学快讯

中国环境保护部（MEP）、中国社会科学院（CASS）、北京环保局（BMEPB）和国家发改委（NDRC）的代表团今年1月至3月相继赴意大利考察之后，北京远程教学计划和天津市科学技术委员会（TSTC）培训计划将拉开中国2010年能力建设活动的序幕。中国有10个城市将实现远程教育，每班40名学员，总共名当地官员将会受益于中国和意大利讲师的培训课程，主题包括绿色经济、绿色工业、污染的土壤、低碳经济、能源效率、可持续城市治理、荒漠化和可持续农业。我们认为，安排在每天的第二部分的辅助课是参加学习的不同听众从不同角度辩论和讨论既定主题的有重大意义的时刻。“创新”和“环境技术”是天津培训以及与天津科技委员会合作举办的培训课的关键词。“低碳经济”培训系列第一次培训课将于4月从上海市环保局开始。低碳经济将是2010年春季许多培训项目的重点，参加单位有上海、北京和中国科学技术部。

威尼斯国际大学促进可持续发展能力建设培训项目，将与意大利环境、领土和海洋部合作实施，包括部分中欧和东欧的培训活动。今年的“可持续性课程”将与俄罗斯联邦展开重要的新合作。科拉多·克里尼（Corrado Clini）司长将于5月份在圣彼得堡开课，课程专门论述“圣彼得堡与列宁格勒地区的可持续发展”。9月份圣彼得堡学员再次会聚威尼斯，参加第二部分和最后部分课程。

伊斯坦布尔是举办“研讨会系列：可持续发展伙伴关系”培训的地点，该培训在可持续性课程的框架内，推进黑海地区国家的可持续公共政策和商务活动。商务活动也是“地方可持续性和行动课程”的重点，面向巴尔干半岛地区的学员，将于11月在威尼斯国际大学的可持续性课程的框架内进行。

科拉多·克里尼（Corrado Clini）司长2月8日在威尼斯国际大学关于气候变化的讲座（讲课录像见网页：[www.lezionideuropa.eu/eventi-venezia.asp](http://www.lezionideuropa.eu/eventi-venezia.asp)）吸引了大批年轻大学生和中学生听众，由记者雅格布·吉尔贝托（Jacopo Giliberto）主持。许多学校通过网络连接，在线和上课的学生向克里尼博士（Dr Clini）提出许多问题。该讲座属于意大利政府、欧盟议会和欧盟委员会发起的“欧洲课程”（“Lezioni d'Europa”）部分，目的是在年轻一代中讨论和宣传欧洲和世界目前最感兴趣的课题。

在2010年春季威尼斯国际大学学期计划和全球化计划开幕时，萨尔瓦托雷·罗西（Salvatore Rossi）（意大利银行经济研究与国际关系处主任）和恩佐·鲁拉尼（Enzo Rullani）（威尼斯国际大学贸易电子数据交换系统（TeDIS）中心主任）参加了“全球化对话：意大利跨越危机的方案”。詹尼·托尼奥洛（Gianni Toniolo）（威尼斯国际大学前任院长和杜克大学经济史教授）演讲了“全球化长期远景”，该全球化历史最高荣

The first stone ceremony for Venice's Suzhou Garden was celebrated by Master Ye Fang, VIU's President Ambassador Vattani and the Province of Venice's President Francesca Zaccariotto. The traditional Suzhou-style Chinese garden is to be built on VIU's campus on the island of San Servolo in Venice, twin town of the Chinese city of Sozhou. "Where better than in a university, and in the very town which was Marco Polo's, to host a place of the soul, a breeding ground for thought, a bridge joining East and West", President Vattani wrote in the book illustrating the project idea. "Whoever sets out to create political or commercial relations with the Chinese cannot afford to ignore millennia of culture and art that, today as in the past, are the pride of that civilization", concludes Tiziana Lippiello of Venice's Ca' Foscari University.

The construction of Venice's Suzhou Garden will be completed this coming fall, so our Chinese delegates visiting VIU for the training program will soon be able to enjoy it.

誉讲座向威尼斯国际大学学生介绍了具有威尼斯国际大学学期计划特征的主题，即与经济学、环境及其社会方面相关的全球化。

苏州国画大师叶放、威尼斯国际大学校长安巴萨多尔·瓦塔尼（Ambassador Vattani）和威尼斯省省长弗兰切斯卡·扎卡廖托（Francesca Zaccariotto）参加了威尼斯苏州园林奠基仪式。该园林是一座将落户于威尼斯市圣塞弗罗（San Servolo）岛（中国苏州城市的友好城市）上威尼斯国际大学校园的传统苏州风格的中国园林。瓦塔尼（Vattani）校长在项目创意说明书中写道：“建造一个灵魂之地、思想之源、东西之桥，还有什么地方能比得上在一所大学和名符其实的马可波罗之城啊！”威尼斯卡弗斯卡利大学（Ca' Foscari University）的蒂齐亚纳·利皮耶洛（Tiziana Lippiello）最后说道：“无论谁开始与中国建立政治和商业关系，都不可能忽视几千年的文化艺术，今天同过去一样，仍然是中华文明的骄傲。”

威尼斯苏州园林工程今秋即将竣工，不久，来威尼斯国际大学参加培训的中国代表团将能够欣赏到园林美景。

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