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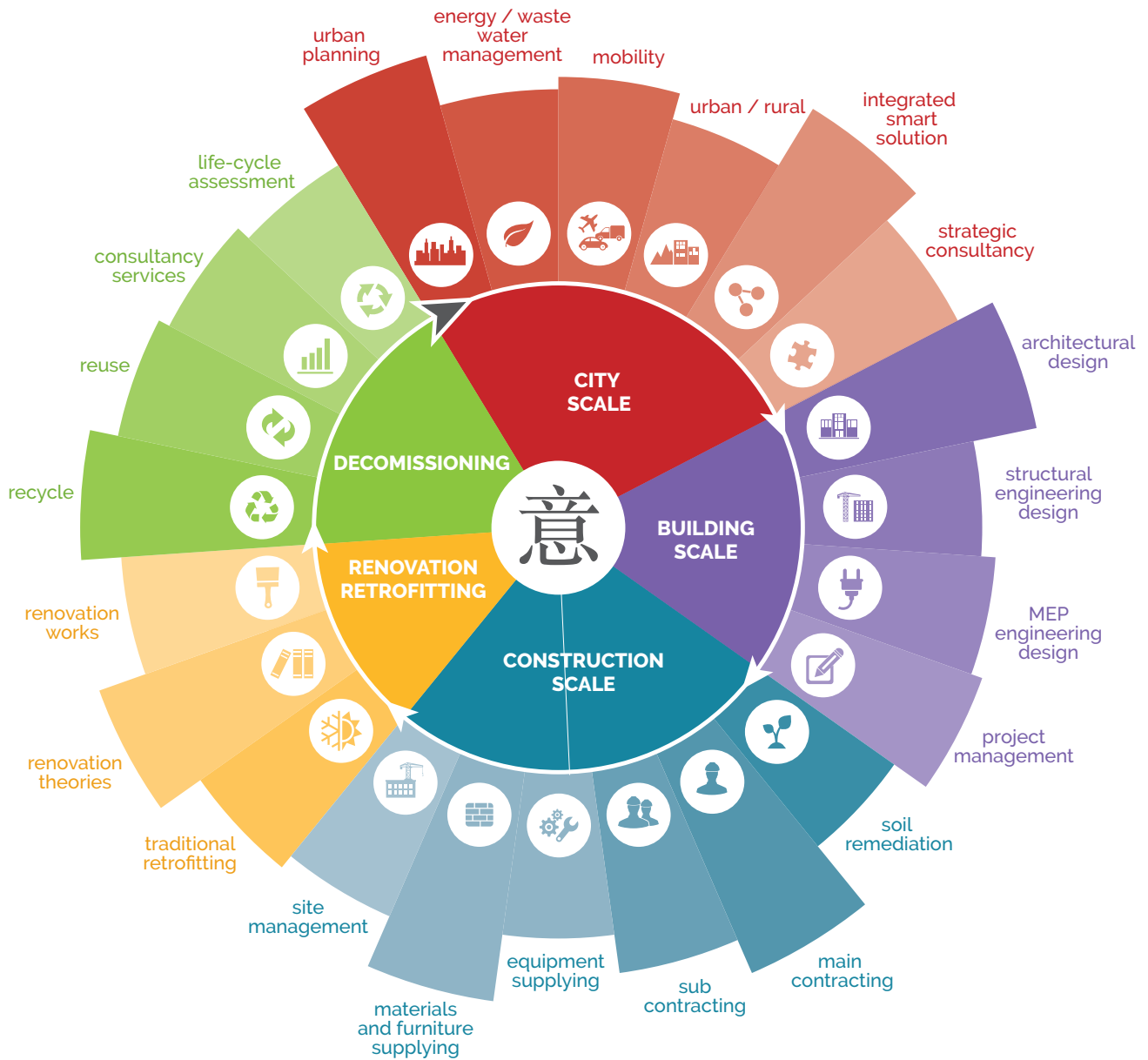
SUSTAINABLE URBANISATION IN CHINA: ITALIAN EXPERTISE AND SOLUTIONS FOR A MUTUALLY BENEFICIAL COLLABORATION

中国可持续城镇化：
 双赢合作 - 意大利的经验和解决方案



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简介

中国可持续发展城镇化进程

1 INTRODUCTION

1.1 THE SUSTAINABLE URBANISATION PROCESS IN CHINA

2014年3月，中国中央政府正式印发了《国家新型城镇化规划》。根据该文件指示，中国有关部门将会踏上新的发展旅程，即到2020年，通过实现一系列远大目标，助力国家在社会和经济上进行转型。新型城镇化规划旨在应对大规模城市化给快速发展的经济体系所带来的重大挑战，同时也为规划管理提供了明确结构以及协调方针。

中国当前所经历的城镇化进程¹，无论是规模还是速度，都是人类历史上前所未有的：据研究表明，中国仅花了24年的时间把城镇化率从1978年的17.9%提高到了2002年的39.1%。与此相比，英国花了120年，美国花了80年，日本花了30年才完成了同样的壮举。近年来，中国高层领导一再表明对大规模城镇化规划的关注，并期望在未来15到20年中，将近3.5亿公民从农村转移到城市。将大部分公民针对性地转移到人口不足两百万的城市，从而缓解当今沿海大都市人口密度偏高的压力。

The launch of the National New-Type Urbanisation Plan (NNTUP) was announced by the Government of China in March 2014. With said document, the Chinese Authorities embarked on a journey that by 2020 should help the country to transform itself, both socially and economically, by achieving a wide range of ambitious targets. The New Urbanisation Plan sets out to tackle the major challenges that large-scale urbanisation poses for a rapidly evolving economic system while providing a defined structure and a coordinated approach to its management.

The speed and magnitude of China's urbanisation are indeed unprecedented¹, it took China 24 years to increase its urbanisation rate to from 17.9% in 1978 to 39.1% in 2002. In contrast, it took Britain, the US and Japan 120, 80 and 30 years respectively to accomplish the same feat. In recent years, the Chinese leadership has repeatedly confirmed its interest in undertaking a massive urbanisation plan that, over the next 15-20 years, should drive nearly 350 million of its citizens to move from rural areas to cities. Most of them will be directed toward urban centres with a population of less than 2 million, thus easing the existing pressure on coastal metropolises which already face high population densities.

《国家新型城镇化规划》旨在为城市化规划管理提供明确结构以及协调方针。

The National New-Type Urbanisation Plan (NNTUP) aims at providing a defined structure and a coordinated approach for the management of urbanization development.

¹ Zhang Y., China: Informality in Urban Villages published in a report from 'LSE Cities – An International Center Supported by Deutsche Bank'.
Zhang Y., 中国：城中村的非正规性，在“伦敦经济学院 – 一个德意志银行支持下的国际中心”报告中发表。





这项城镇化政策的新任务构成了政府经济议程的支柱之一，其目标是在2030年达到70%的城镇化率。事实上，中国很有希望实现这个目标：根据上一次人口普查结果显示，2010年城镇居民人数首次超过农村人口数。当然，为实现此远大目标，需要进行大量的投入来升级城市中心基础设施，为新居民提供基本的服务如：住房，房地产和建设，卫生，医疗保健，娱乐，城市规划以及能源。中国政府预计为实现此目标投资6.8万亿美元，上述基本服务将作为重点投资领域。在《国家新型城镇化规划》实施的过程中，外国企业很有可能在这个进程中发挥重要作用，并获得有趣的机遇。

由于贫困的农村居民为追求更好的生活条件，离开农村迁移到城市中心，中国的城市将继续扩大（百万人口以上的城市现已有170个）。尽管这种趋势会为许多城市社会经济发展态势的改善铺平道路，但是由此所产生的冲击和失衡也需要被妥善管理及控制。因此，实行稳定均衡的城镇化也是中国立法者所面临的挑战之一。外国企业可以此作为切入点提供有价值的解决方案，比如基础设施发展方案，或是随着消费者的不断增长，为其提供商品服务。

This renewed commitment to urbanisation policies constitutes one of the pillars of the government's economic agenda, which aims to reach an urbanisation rate of 70% by 2030. It seems to be well poised to reach this goal: according to the last general census, in 2010 the number of urban residents surpassed the number of rural ones for the first time. Of course, such an ambitious target requires massive investment to upgrade the infrastructure of urban centres and to provide essential services to their new residents: housing, real estate and construction, sanitation, healthcare, entertainment, urban planning and energy are all sectors that should greatly benefit from the US\$ 6.8 trillion that the Chinese Government intends to spend on this effort. It is likely that foreign businesses will also be able to play an important role in the process and to access interesting opportunities related to the implementation of the New Urbanisation Plan.

As masses of poor, rural citizens leave the countryside and move to urban centres in search of better living conditions, China's cities will continue to expand (170 of them now count more than 1 million inhabitants each). While this trend can pave the way for the social and economic status of many to improve, it can also create shocks and imbalances that need to be properly controlled and managed. Pursuing a stable and balanced approach to urbanisation is therefore one of the challenges faced by Chinese lawmakers. It is also an area where foreign businesses can provide valuable solutions – both in terms of the development of infrastructure and provision of goods and services for a growing consumer base.

早在国务院于2013年6月27日颁布的报告中就有所指示，城乡规划是今后工作的重中之重。该文件中引入了“集群”的概念，“集群”被视为一种城市和土地发展的组织模式。这个概念被引用在一个庞大城市规划方案中，包括被列为农村/农业的大都市和次要中心。一直以来，“城市居民”身份广受欢迎，此规划会对授予公民“城市居民”身份的过程产生重要的影响：一个集群的农村居民，在不需要长途迁移的情况下，也可能被授予城市居民身份。这一举措对社会福利制度和相关地方政府的配置也有着重要的意义。此举措的目的也是为了解决城乡历史性的两极分化：城镇化进程的结果之一就是，个体在受到城镇化改革冲击后，把他们的正式身份从“农民”改为“市民”；另有超过221个城市中心，超过一百万居民在全国各地涌现。

为实现上述设想，需要进行所谓的“户口”（住户登记制）改革。户改不仅可以在2020年实现数百万农民工有序转移到城市的壮举，还将为他们提供必要的工作机会，教育及福利服务。对新移民在小城镇和小城市登记的限制应迅速解除，同时在中等城市和大城市登记限制应逐渐放宽。对于一线城市，将引入点制度来规范新居民的涌入。最终，不同类型的户口之间不应该有所区别，不同户口所享受的大范围内社会和经济服务之间的差异也应当被消除。此外，应鼓励海归毕业生，归国技术人员，熟练劳工以及工人在城市落户。为了平衡之前持有农村和城市户口专业人士数量比例，应该将服务业及各类工作向农村地区（新工业/工艺区）逐步转移，甚至包括那些高科技含量的工作。这一举措将产生地方就业机会，也是激励人口留在当地的主要条件。由于“集群效应”，技术，人才以及财政资源的注入也会使得农业产业获益，从而提高生产效率和改善环境可持续性。一些关于将不同经济模式引入农村背景的研究结果证明了上述观点，比如特色农家乐推广地区的建立。

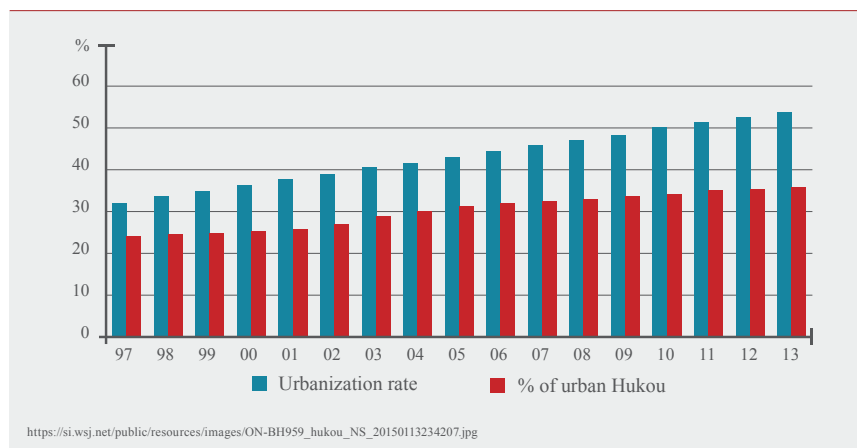
随着人民群众纷纷前往城市中心，中国城市将不断扩大，其中有170个城市承载着约100多万居民。

As masses of people are been moving to urban centers, Chinese cities will keep on expanding, with 170 of them now counting over 1 million inhabitants.

The issue of urban and land planning had already been addressed as a priority by the State Council in a report dated 27th June, 2013. The document introduced the concept of “clusters”, seen as an organisational model for urban and territorial development. Reference is made to them within a vast scheme of urban planning that comprises both metropolitan cities and minor centres, which are classified as rural/agricultural. This approach will have significant consequences on the procedures by which the highly sought-after status of “urban citizen” is granted: it will be possible to assign such a status to the rural population of a cluster without forcing long-distance migration, which is bound to have important implications both on the social welfare system and on the configuration of local governments within the relevant area. The aim is to overcome the historical dichotomy between rural and urban communities: as a result of the urbanisation process, impacted individuals will change their formal denomination from “peasants” to “citizens”, with 221 more urban centres with more than one million residents also emerging across the country.

The scenario described above entails the reform of the so-called “*hukou*” (residential registration) system, which will not only permit orderly migration of millions of rural workers to the cities by 2020 but will also provide them with necessary job opportunities, education and welfare services. Restrictions on registration by new arrivals in towns and small cities should be rapidly lifted and those for medium-to large cities gradually relaxed. For top-tier cities, a point system will be introduced to regulate the influx of new residents. Ultimately, there should no longer be a difference between the various types of *hukou* with related differences in access for a wide range of social and economic services also eventually eliminated. Furthermore, university graduates, technicians, skilled labourers and workers returning from abroad would be encouraged to stay in the cities. By equating the professional figures previously in possession of a rural or urban *hukou*, there should also be a transfer of services and types of jobs, even those with high-tech content, to rural areas (in new industrial/craft zones). This will generate local employment opportunities, which is the primary condition for incentivising a population to remain in place. The agriculture industry will also benefit from this injection of technology, human skills and financial resources due to the “clustering effect” with an increase in productivity and an improvement in environmental sustainability resulting. This is evidenced by research on different economic models that have been inserted into a rural context, such as the establishment of districts focused on the promotion of their peculiar agri-tourism focus.

SHARE OF THE URBAN HUKOU LAGGING BEHIND THE URBANIZATION RATE



《国家新型城镇化规划》的一个重要内容，就是将人民和人民的需要作为核心。城市发展必须与居民生活条件的逐步改善同时进行：这不仅意味着要提供优质服务和高水平的基础设施，加强城乡一体化，还要在假设物质需求的满足不再符合中国公民期望的大前提下，重新思考人与周边环境的关系。也就是说，要更多地关注城市化进程中所涉及的环境，气候，社会和人口因素，加强对可持续发展概念的重视。很明显，事实上城市地区所面临的许多挑战是相互交织的，城市发展的成功只能通过一体化的方法来实现。

One essential element of the National New-Type Urbanisation Plan is that it puts people and their needs at its core. Urban development must proceed on equal footing with progressive improvements to the living conditions of residents: this not only translates into the supply of quality services and high-level infrastructure or in an increased integration between cities and the countryside but also involves rethinking the entire relationship between people and the surrounding environment, based on the assumption that the satisfaction of material needs no longer suffices to fulfil the aspirations of Chinese citizens. Therefore, much more attention is paid to the environmental, climatic, social and demographic aspects of the urbanisation process, with special emphasis attached to the concept of sustainability. It is in fact increasingly clear that the many challenges facing urban areas are interwoven and success in urban development can only be achieved through an integrated approach.



《国家新型城镇化规划》倡导以将人民和人民的需求作为未来发展的核心。城市发展必须与居民生活条件的逐步改善同时进行。

“十三五”规划强调了建筑业健康发展的必要性，并明确了追求可持续发展和创新的恰当措施及手段。

The National New Type Urbanisation plan aims at putting people and their needs to the core of future developments. Urban development and progressive improvements in the living conditions of residents must proceed at the same pace.

The 13th Five Year Plan (13FYP) highlights the needs for a healthy development of the construction industry and the identification of the proper measures and tools to pursue sustainability and innovation.



“十三五”规划的规定也体现了上述观点：在城镇化方面，强调必须立即为生活在城市地区且拥有农村户籍的居民在城市落户；促进城市地区政府补贴住房的建设；促进房地产市场的健康发展；加大力度改善城市规划，发展和管理。更具体地说，结合“三个一亿人”的城镇化目标，（指的是要“在2020年之前使一亿农民在城里定居，成为真正的城市居民”；加快中西部地区城镇化进程，引导1亿农民自愿转移到附近城镇；集中力量重建倒塌区域和不安全建筑群，解决1亿人的住房问题²”），依照“十三五”规划中明确的实现这一目标的一系列方针，以及针对中小城市的出现到其差异化的一系列措施（具有独特特征的小城镇，智能城市，绿色和森林城市，海绵城市等），通过开展先进的公共工程，对旧城区进行彻底改造，加强新城市建设（包括发展园区和地区，地下供水管道网络，污水，雨水，电力，燃气和供热管道，通讯电缆等）。

此外，“十三五”规划强调推进建设环保建筑，扩大绿色建筑材料、钢基础结构和预制模块的应用。同时强调要严格遵守最佳施工标准和做法的重要性，从而使项目建设中的创新性内容和施工总体质量不断提高。不断努力创新，健全城市管理，改善交通条件和公共交通网络的最终目标，是为城市居民提供更加愉快，令人满足的生活条件。通过推进农村集中供水工程，发展可再生能源，促进农村重建，开展抗震改造，设置污水处理和垃圾收集设施，推进农村污水处理，在农村实施河池治理等措施，实现农村的全面改造，也是重中之重。

Such an approach is reflected also in the provisions of the 13th Five-Year Plan (13FYP), which with regard to urbanisation stresses the necessity to urgently granting urban residency to more people with rural household registration living in urban areas; promoting the construction of government-subsidised housing in urban areas; the healthy development of the real estate market; as well as redoubling efforts to improve urban planning, development and management. More specifically, in conjunction with setting out the urbanisation target of the so-called “three 100-million-people” (which refers to the necessity to “enable the 100 million migrant farmer workers to settle down in cities and become real city residents by 2020; to accelerate the urbanization process of the central and western regions, guiding 100 million farmers to enter the nearby towns and cities voluntarily; to concentrate on rebuilding the run-town areas and unsafe buildings in cities to solve the housing problem for 100 million people”²), the 13FYP identifies several instruments for achieving it, going from the emergence of small and medium-sized cities to their differentiation in a range of measures (small towns with unique features, smart cities, green and forest cities, sponge cities, etc.), sustained by the implementation of advanced public works both to overhaul old urban settlements and to enhance new ones (including development parks and zones, underground pipeline networks for water supply, wastewater, rainwater, power, gas and heat supply, communication cables, etc.).

Moreover, the 13FYP stresses the importance of promoting the construction of environmentally friendly buildings, making expanded use of green building materials, steel under-structures and prefabricated modules. It also stresses the importance of ensuring stricter adherence to the best construction standards and practices, so that the innovative content and overall quality of construction projects are constantly improved. The ultimate goal of continuously striving to innovate, sound city management as well as the improvement of traffic conditions and public transport networks is to provide city dwellers with more enjoyable and satisfying conditions for their lives. Equal attention is paid to a comprehensive revamp of the countryside, by promoting centralised water supplies in rural communities, developing renewable energies, fostering rural reconstruction, carrying out anti-earthquake retrofitting, setting up sewage treatment and garbage collection facilities, advancing rural sewage treatment, enforcing river and ponds remediation in rural areas, etc.

² Ministry of Foreign Affairs of the People’s Republic of China, *Li Keqiang Attends and Addresses China-EU Urbanization Partnership Forum 2015*, June 30th 2015.

² 中华人民共和国外交部，李克强总理参加并在2015中欧城镇化合作论坛上发表致辞，2015年6月30日

在宏观层面的主要挑战和可能答案

1.2 MAIN CHALLENGES AND POSSIBLE ANSWERS AT THE MACRO LEVEL

虽然在30年来中国城镇化建设凭借其经验取得了卓越的成效，但是由于城镇化进程的大规模高速发展以及原计划收入与实际结果之间的差异，导致全国人民群众的分配普遍不平衡，并引发了一系列社会问题。20世纪80年代，人口学家预测城市扩张将主要发生在越来越多的中小城镇，而非来自现有大城市尤其是东部地区大城市的进一步扩张。这就形成了从东北哈尔滨开始延伸的城市和工业走廊，通过以北京和天津为中心的地区，向南延伸扩大，到达上海及其周边地区组成的工业大都会综合体。

除了在全国东西部（以及较为富饶的沿海城市和较贫穷更农村的内陆中心之间）之间造成裂缝外，在许多不断扩大的中国城市中，这种不均衡的内部格局和城市发展模式也造成了过度拥挤和交通挤塞问题，并往往伴随着过度污染和当地环境的严重恶化。因此，不难理解政府打算通过实施“十三五”规划应对这一挑战，并改善各地区的发展布局。这包括促进中西部地区的大规模发展，升级东北部和全国其他地区的老工业基地。同时，政府将继续为作为领先地区的东部地区，提供在制度创新、土地协调和海洋扩张方面的支持，并特别重点关注京津冀一体化计划，以及进一步推进长江经济带和珠江三角洲的发展。

Whilst the experience of the last 30 years of China's urbanisation has brought about remarkable effects, it has also been marked by a general imbalance in the distribution of people across the nation and by a series of social problems resulting from both the scale and rapid pace of the process as well as divergences between originally planned outcomes and the actual ones. In the 1980s, demographers were expecting urban growth to happen primarily through an increasing number of small- and medium-sized cities and towns rather than as a result of the further expansion of existing megacities, especially those in the eastern part of the country. This led to the formation of an urban and industrial corridor stretching from Harbin in the northeast, through the region centred on Beijing and Tianjin and proceeding south to reach the vast, industrial metropolitan complex of Shanghai and its surroundings.

In addition to creating fractures between the Eastern and Western regions of the country (and between the richer coastal cities and the poorer, more rural inland centres), this uneven pattern of internal settlement and urban development has contributed to problems of overcrowding and transport congestion in many of China's expanding cities, often accompanied by excessive pollution and significant degradation of the local environment. It is therefore not surprising that through implementing the 13FYP the government intends to address this challenge and to improve the layout of development across regions. This includes fostering the largescale growth of the Western and Central regions and upgrading old industrial bases in the Northeast and other parts of the country. At the same time, it will continue to provide support to the Eastern region as the leading area for institutional innovation and coordinated land and maritime expansion, with a special focus on the Beijing-Tianjin-Hebei integration initiative and the further advancement of both the Yangtze River Economic Belt and the Pearl River Delta.

政府重点期望促进中西部地区的大规模发展，同时改善、升级和扩大中国其他地区现有的基础设施和城市区域。

The Government is particularly willing to foster a large scale growth of the Western and Central regions, while improving, upgrading and expanding the existing infrastructures and urban areas in other parts of China.





近几十年来，中国发生的另一个意料之外的（非期望的）城市化副产物就是所谓“鬼城”的出现。由于一些地方政府官员过于急切地推动城市建设，产生了这些庞大的未完成大都会。之所以建设这些城市，不仅怀有对于未来将要到达（却从未到达）的大批新居民的期望，也是因为政府官员误认为通过投资新的城市中心，可以推动当地经济增长，甚至从相关的财政收入中获益。然而，或因无力支付迁移或犹豫是否离开所处的农村地区，这些期待中的新居民并没有出现；同时经济依然停滞不前，这些已经负债累累的地方当局发现自己处在一个比以前更大的黑洞之中。很显然，在前进的过程中这种模式需要被避免。繁荣和增长并不是野心项目下虚张声势的产物，而是一个精心制定，深思熟虑的战略结果。

“新城镇化计划”认识到追求增长的必要性不仅仅是靠规模和数量作为驱动，而是建立在各个层面的可持续性发展之上，特别是在质量方面。其目标不仅仅是实现经济和社会的可持续性，更是环境的可持续性，而后者也是城市化面临的最大挑战之一。增长是一个合理的目标，只要实现此目标的过程“绿色”，并能有效利用资源，尊重环境。因此，节能减排，材料再利用，绿地保护，可再生能源，水土修复，废物管理等方面必须成为未来城市规划者的新基本原则。

Another unforeseen (and undesired) byproduct of urbanisation that has occurred in China in recent decades is the emergence of so-called ‘ghost towns’, vast unfinished conurbations whose construction has been pushed by overeager local administrators. This has been done both in the expectation of masses of new residents who never arrived and as a result of the misguided belief that by investing in the new urban centres they could drive the expansion of the local economy, eventually benefiting from the associated fiscal revenues. However, when new settlers – who were either unable to afford to move or hesitant to leave their rural communities – failed to appear and the economy remained stagnant, these local authorities, who were already heavily indebted, found themselves in an even larger hole than previously. Such a pattern obviously needs to be avoided going forward, as it has now become abundantly clear that prosperity and growth are not the exogenous products of ambitious projects but the result of a well-articulated and properly thought out strategy.

The New Urbanisation Plan recognizes the necessity of pursuing growth that is not just driven by scale and big numbers, but that is instead based on sustainability at all levels, especially in terms of quality. The sustainability it aims to achieve is not only economic and social, but also environmental, as this constitutes one of the greatest challenges for urbanisation. Growth is a legitimate goal, provided that it is “green”, efficient in the utilisation of resources and respectful of the environment. Therefore, aspects such as energy conservation, recycling materials, protection of green spaces, renewable energy sources, soil and water remediation, waste management, etc. must become the new basic principles for future urban planners.

“新城镇化规划”意识到，可持续性和质量驱动型增长的必要性，不仅仅要从经济方面和社会方面分析问题，更要从环境方面进行多方位考虑。

The New Urbanisation Plan recognizes the necessity of a sustainability and quality-driven growth, considering not only economic and social, but also environmental aspects.

中国立法者在议程上所面临的另外一个挑战就是保护和发扬中国历史文化遗产。城市发展使历史文化遗产面临威胁，就算没有明确的义务，大多数关于城镇化的官方文件都表明了政府捍卫中国丰富历史文脉的意愿。一个可能的解决方法是鼓励建立互不相同的多样化城市，使每个城市都有独特的特征和传统，这也可以帮助缓解过去几十年影响中国城市建设的同类化现象。

An additional challenge that Chinese lawmakers have high on their agenda is the protection and promotion of the country's historical and cultural heritage. Most official documents regarding urbanisation proclaim the government's willingness, if not the precise duty, to safeguard China's rich historical fabric, which urban growth places under threat. One possible answer is to encourage the establishment of multiple cities that are distinct from one another, each with unique characteristics and traditions. This can help to contain the homologation phenomenon that has affected many of the cities built in the last decades.

只有拥有全面的战略，并根据当地具体的运作环境和条件逐案调整，中国城市化进程才可能有效地实施。同时，此战略还应为有效利用可用土地和资源提供蓝图。具有混合功能的高密度城市结构应作为选择的模式；大中小城市在寻求实现自给自足的同时，注定需按照《国家新型城镇化规划》的建议，以“城市群”为模式，紧密相连地发展。此外，城镇化政策也被视为促进经济增长的平台：工业和服务业等城市典型的高生产力部门集中度上升，应成为推动改革中国以前的出口主导型经济模式的力量。随着个人收入的增加，支出将逐步从投资转向消费，从而有利于GDP的结构性调整。

A truly new approach to urbanisation cannot be effectively implemented in China without a comprehensive strategy which also allows for case-by-case adjustments based on locally-specific operational contexts and conditions. It should also provide a blueprint for the fruitful and efficient use of available land and resources. A high density urban structure should be the model of choice, oriented toward a functional mix; small, medium and large cities, while seeking to achieve their own self-sufficiency, are destined to be more closely interconnected, along the lines suggested by the National New-Type Urbanisation Plan with its “city cluster” model. Furthermore, the urbanisation policy is seen as a platform for boosting economic growth: the rise in concentration of high-productivity sectors typical of urban areas, such as industry and services, should become the forces driving the emancipation of China from its previously dominant economic paradigm, which was primarily driven by exports. As individual incomes increase, expenditures will gradually shift from investment to consumption, thus favouring the structural readjustment of GDP.





很明显，中国的新城市推动开辟了一个包罗万象的新境况。在此大背景下，当地公民，民间团体，各级政府，以及最重要的本地和外国企业之间所形成的强有力伙伴关系，成为了不可或缺的元素。

中国需要建设170个新型公共交通运输系统，新建道路500万公里，地铁28000公里，新机场50个。2017年，铁路建设拟投入8000亿元，公路和水路工程1.8万亿元；15个新的重大水利工程将开工建设，数条重大战略轨道，民航和电信基建项目也将被加快推进。

It appears increasingly clear that China's new urban push opens up a scenario encompassing several different aspects and areas of intervention, in which the development of strong partnerships involving local citizens, civil society, the various levels of government and, most importantly, local and foreign business, represents an indispensable element.

China will need to build 170 new systems of mass transportation, 5 million kms of new roads, 28,000 kms of subway lines and 50 new airports. According to the most updated yearly budget, 800 billion RMB will be invested in railway construction and 1.8 trillion yuan in highway and waterway projects; construction will commence for 15 new major water conservancy projects and many major strategic rail, civil aviation and telecommunication infrastructure projects will also be accelerated.

中国新型城镇化的繁荣涉及到不同方面和领域的介入，为当地公民，民间团体，各级政府以及当地和外国企业之间的合作提供了肥沃的土壤。

The thriving phenomenon of Chinese new urbanization involves different aspects and areas of intervention, generating a fertile land for collaborations between local citizens, civil society, various levels of government as well as local and foreign businesses.



在2017年中央财政预算中，为这些项目安排的总投资为5076亿元。政府表明要通过创新来推动国家级新兴地区，开发区，以及工业园区的发展。我们可以从政府的报告读到，“政府将支持具有鲜明地域特色的中小城市和小城镇的发展。推动一批具备条件的县和特大镇有序设市，发挥城市群辐射带动作用。[...]推进建筑业改革发展，提高设计水平和工程质量。统筹城市地上地下建设，再开工建设城市地下综合管廊2000公里以上，启动消除城区重点易涝区段三年行动，推进海绵城市建设，使城市既有“面子”、更有“里子”。³

这是一项艰巨而复杂的任务，但是在这个过程中也会给中外企业带来许多有趣的商业机会。意大利公司可以在多个领域做出宝贵贡献，展示他们的技术专长，先进科技和灵活性管理。

A total investment of 507.6 billion RMB for these projects is earmarked in the central government's most recent budget. The government has claimed that it will boost the development of national-level new areas, development zones, and industrial parks through innovation. As we can read, the report from the government states that “[...] we will support the development of small and medium cities and small towns with distinctive local features. We will help a number of counties and very large towns that meet the criteria to steadily develop into cities, and we will make city clusters better play their role in driving the development of their surrounding areas. [...] More steps to reform and develop the construction industry will be taken, the standard of design and the quality of construction projects will be raised. Urban development above and below the ground will be better coordinated, it will begin the construction on at least another 2,000 kms of underground utility tunnels in cities. Meanwhile a three-year initiative will be launched to remove the risk of flooding in highly vulnerable urban areas; and further progress will be made in the development of sponge cities”.³

It is an enormous, complex task that will offer interesting economic opportunities to Chinese and foreign enterprises that become involved in its realization. Italian companies can make valuable contributions in many sectors where they can showcase their technical expertise, advanced technologies and managerial flexibility.

在这样一个朝气蓬勃的创新氛围中，意大利公司可以在多个领域做出宝贵的贡献，借此还可以展示他们的技术专长，先进科技和灵活性管理。

In such a thriving and innovative atmosphere, Italian companies can make valuable contributions in many sectors where they can showcase their technical expertise, advanced technologies and managerial flexibility.

³ 5th Session of 12th National People Congress, Premier Li Keqiang speech, March 5th 2017

³ 第十二届全国人民代表大会第五部分，李克强总理讲话，2017年3月5日

意大利城镇化模式：城市发展规划和执行中的具体解决办法

2 THE ITALIAN URBANISATION MODEL: SPECIFIC SOLUTIONS ALONG THE WHOLE URBAN DEVELOPMENT PLANNING AND EXECUTION

意大利城镇化模式鉴于其独特的特点和经验，可为当前中国城市发展的需求提供重要的解决方案，从而为当地政策制定者提供明确正确的可持续城镇化道路。

通过研究《国家新型城镇化规划》和“十三五”规划中所制定的目标和战略，尽管在规模上有明显的差异，意大利在城镇化方面的经验对于中国境况来说，仍可看做是一个有效模式。质量是两个文件的基石，因为这两个文件均推崇高质量增长而非单纯的量性发展。这推翻了近几十年来在中国占主导地位的趋势，重新将以人为本作为整个进程的重点。

以人为本发展的重点是两个计划的第一个目标，即：“以人为本，有序推进城镇化：以人为本，公平共享。以人的城镇化为核心，不断提高人口素质，促进人的全面发展和社会公平正义，使全体居民共享现代化建设成果。”

以人为本的发展，一直是几个世纪以来意大利城市发展所坚持的基本原则。这个原则曾被发表在历史上第一篇建筑论文当中：维特鲁威在他的著作“建筑十书De Architectura”（公元前十五世纪）中表示，建筑必须建立在firmitas（坚固），utilitas（功能）和venustas（美观）的基础之上。意大利城市经常围绕着广场而建，而广场既是社会生活的中心也是聚会的中心。直到今天，广场依然作为起始点促进城市周边环境 and 居民更好的融合。

The Italian urbanisation model, thanks to its unique characteristics and experience, can provide key answers to the current needs of urban development in China, thereby supporting local policymakers in identifying the right path towards sustainable urbanisation.

Examining the targets and strategies set by both the NNTUP and the 13FYP,¹ the Italian experience represents an effective model that fits in the Chinese scenario despite tangible differences in terms of size. **Quality** is the cornerstone of both documents, as they promote qualitative growth over mere quantitative development. This overturns the trend that has been dominant in China in recent decades with human beings put at the centre of the process.

The focus on human-scale development is the first goal of both plans, namely: **“Promoting human-centered urbanisation: place people at the centre, fair sharing. Take the urbanisation of the people as the centre, and promote the people’s overall development and a fair and just society, so that all residents will share in the achievements of the construction of modernisation”.**²

Human-scale development has been the fundamental principle on which Italian urban development has been based for centuries. This was expressed in the first essay on architecture ever written. In his “De Architectura” (15 B.C.), Vitruvio stated that architecture must be founded on *firmitas* (solidity), *utilitas* (functionality) and *venustas* (beauty). Italian cities grew around the *piazza* (square), the centre of social life and gatherings. Still today, the *piazza* represents the starting point for promoting better integration between urban environs and residents.

意大利经验代表了一种符合中国境况的有效模式：质量和“以人为本”的概念在整个发展进程中，不仅被中国规划，也被意大利的专业经验和传统所重视。

The Italian experience represents an effective model that fits in the Chinese scenario: quality and the centrality of the human being along the process are traits which are shared both by Chinese plans and the Italian expertise and tradition.

¹ 13th Five-Year Plan of China 2016-2020, 2015

¹ 中国第十三个五年计划2016-2020,2015

² National New-Type Urbanization Plan - Chapter 4, Guiding Ideology, 1st section.

² 国家新型城镇化发展规划 - 第四章，指导思想，第一部分。





一个经过精心设计的城市可以减少拥堵，改善空气质量，减少噪音污染和能源消耗；也能为上至老人下至儿童的各类居民提供愉悦的生活空间，营造一系列不同的日常生活环境；同时使得社区更具吸引力和宜居性，让居民更加有活力，经济更加繁荣。

城市不是孤立的实体；农村对于城市的存在和城市间关系起着重要的作用。对于中国来说，明确促进城乡发展整合的正确方案是一个重要课题。这也是“新型发展”第二个目标背后的动力：“推进城乡发展的进一步融合：创立新型城镇关系和工农关系，利用工业推进农业发展，利用城市促进农业地区开发，在此过程中工业和农业互惠互利，城镇和乡村联系更加紧密。”

意大利对城乡协调发展策略方面具有较强的专业知识。因为在意大利，中小城市完美融合构成了丰富的全国城市脉络。意大利模式基于城乡公共资源的平衡分配，以及在某种程度上通过机械化改善农业生产效率。缩小城乡区域差距，既是调整经济结构的重点，也是释放发展潜力的关键。城市工业与乡村农业应互利互惠，因为城乡地区都属于同一机制。

A well-designed city reduces congestion, improves air quality and decreases noise pollution and energy use. It provides enjoyable spaces for every kind of resident, from children to the elderly, and creates a range of different environments where daily life takes place. It also renders neighborhoods more attractive and livable, which contributes to their vitality and economic prosperity.

Cities are not isolated entities; the countryside plays a major role in their existence and relationship among them. A key topic in China is identifying the right solutions for promoting improved integration between urban and rural development. This is the motivation behind the second target of “new-style development”: **“Promote a greater integration between urban and rural development: build a new-style relationship between urban and rural, between industry and agriculture, which uses industry to promote agriculture and uses cities to drive the development of rural areas, where industry and agriculture are mutually beneficial, and urban and rural areas are unified”.**³

Italy possesses strong knowhow concerning strategies for more coordinated development of urban and rural areas. This is derived from its well-integrated and rich nationwide network of small and medium-sized cities. The Italian model is based on a balanced allocation of public resources between urban and rural areas as well as improvements to agricultural efficiency, in part through mechanization. Reducing the gap between both urban and rural areas as well as between subnational regions is not only a key topic in structural economic adjustment, it is also crucial for unleashing developmental potential. Urban industry and rural agriculture are mutually beneficial as urban and rural areas are part of the same organism.

以人为本的发展，一直是几个世纪以来意大利城市发展所坚持的基本原则。

Human-scale development is the principle on which Italian urban developments have been based for centuries.

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Italy holds a strong know-how in terms of strategies for more coordinated development of urban and rural areas, thanks to its well-integrated and rich nationwide network of small and medium-sized cities and a balanced distribution of public resources between urban and rural areas.

鉴于中国地理环境的特点，提高土地利用效率是非常重要的。意大利的经验一直认为紧凑性是控制理想人口密度的辅助工具。

Due to China's territorial features, improving land use efficiency is essential. Italian experience has always considered compactness as a complementary tool for establishing ideal population density.

虽然中国是一个领土广袤的国家，但考虑到其人口规模和所需资源，可用土地资源的比例是有限的。事实上，中国只有19%的领土适合居住，而且有29%的土地相对来说不适宜居住。因此，如《国家新型城镇化规划》中所强调，对土地进行有效利用的改善具有重要的战略意义：“提高土地利用效率：根据资源和环境的承载能力，创建科学合理的城镇化总体规划。”主要考虑因素包括提高密度和紧凑性，以避免城市扩张，定居人口的密度控制应以人为本，考虑城市脉络、气候和能源之间的关系。意大利的经验表明，紧凑性是控制理想人口密度的辅助工具。通过紧凑性调控，城市不仅可实现其可持续发展的目标，也使城市更加弹性更加宜居。经过精心设计具有混合功能的城市，不仅缩短了交通运输时间，推广了公共交通/步行/自行车等交通方式，还对建筑物的自适应再利用起到推动作用。

在意大利的建筑行业中，受多种因素影响，建筑质量和环境的可持续性受到十分的重视，且受一系列严格把控和认证体系的监管。意大利半岛独特的形态，其山脉，丘陵和平地的混合地形，国家所面临的地震危害，以及它在“如何在损害环境的前提下最有效地使用土地”方面做出的必要投资和研究，创造了叫做意大利的“最佳实践”！

只有通过联合战略和共同愿景，将这些方法进行整合才能使其发挥作用。因此，可持续发展应被理解为所有这些组成部分的融合：环境，经济，民间团体和文化。中国城市发展的宗旨是“环境友好的可持续发展：把生态文明理念全面融入城镇化进程，着力推进绿色发展、循环发展、低碳发展。”⁶

Although China is a huge country in terms of its territory, the percentage of usable land is limited when considered in the context of the size of its population and the resources needed to sustain it. In fact, only 19% of Chinese territory is suitable for living, with 29% of land relatively uninhabitable.⁴ As a result, making improvements in terms of the efficient use of land is of strategic importance, as underlined in the NNTUP: “**Improving land use efficiency: Build a scientific and rational urbanisation macro-layout according to the carrying capacity of the resource environment.**”⁵ Key considerations include the promotion of density and compactness in order to avoid urban sprawl, human scale-based densification of settled populations as well as the relationship between urban fabric, climate and energy. The Italian experience shows **compactness as a complementary tool for establishing ideal population density.** By doing so, cities not only address their sustainability targets, but also become more resilient and suitable places for life. A well thought-out, mixed-use development shortens transportation times and promotes public transit/walking/cycling as forms of transit as well as adaptive re-use of buildings.

A combination of several factors has necessitated careful attention to building quality and environmental sustainability in Italy's construction sector, which is regulated by a strict control and certification system. The unique shape of the Italian peninsula, its mix of mountains, hills and flat land, the seismic hazards faced by the country, and the necessary investment and research for the most efficient ways of using land without damaging the environment have created the “best practice” called Italy!

All these approaches would not work if not integrated by a joint strategy and vision. Sustainable development should therefore be understood as the combination of all these components: environment, economy, civil society and culture. China's urban development aims at “**Sustainable development for the environment: fully integrate the concept of ecological civilization into the urbanisation process, make efforts to advance green development, cyclical development and low-carbon development.**”⁶

³ NNTUP - Chapter 4, Guiding Ideology, 2nd section.

³ 《国家新型城镇化规划》- 第四章，指导思想，第二部分

⁴ China Urban System Planning 2005-2020.

⁴ 中国城市系统规划 2005-2020

⁵ NNNTUP - Chapter 4, Guiding Ideology, 3rd section.

⁵ 《国家新型城镇化规划》- 第四章，指导思想，第三部分

⁶ NNTUP - Chapter 4, Guiding Ideology, 4th section.

⁶ 《国家新型城镇化规划》 第四章，指导思想，第四部分。

可持续发展的概念是由多种成分融合而成：即环境，经济，民间团体和文化。

城市的可持续发展应当按照系统的方法评估各个行业与学科之间的相互作用。

The concept of sustainable development is generated by the combination of several components: environment, economy, civil society, culture.

The sustainable development of cities should follow a systematic approach to assessing the interaction between various sectors and disciplines.

“绿色开发”包括从能源效率和建筑技术到自然灾害预防和管理等多个方面。意大利凭借技术优化的丰富经验在这一领域处于领先地位，这些技术利用了自然资源和应对环境问题的传统经验，也利用了如可持续性“廉价房屋”这样灵活的建筑方式。城市的可持续发展应当按照系统的方法评估各个行业与学科之间的相互作用。所有决策都应在可持续的基础上遵循紧凑和沟通导向的城市形式原则并综合社会、经济、和环境因素。

此外，中国城市亟需能与现有维护计划巧妙结合的气候适应性措施。改善生态环境和保护生物多样性可以为周边社区和城市带来更多的价值。

最后一点也非常重要，保护，翻新和发扬中国巨大历史遗产的需求一直受到广泛的关注。意大利和中国都拥有最古老最丰富的文化历史遗产，对这些遗产进行保护是必不可少的。

《国家新型城镇化规划》呼吁“保护国家历史文化遗产：根据不同地区的自然历史文化禀赋，体现区域差异性，提倡形态多样性，防止千城一面，发展有历史记忆、文化脉络、地域风貌、民族特点的美丽城镇。”

历史和文化遗产包括自然和人造遗址、知识、习俗和传统。历史和文化遗产丰富了市民的个人生活，是文化和创新发展的动力，在增强国家的社会资本方面发挥着关键作用。因此，应当通过对历史地区的精心保护和管理，对历史建筑环境以及通过几个世纪建立起来的基础设施进行维护，对城市的文化资源进行探索和开发。

意大利以其对历史文化遗产的高度重视而闻名于世。它的每一项规划必把保护历史文化遗产放在首位来考虑。凭借意大利在城市再造和建筑翻新方面的专业技术知识，意大利是目前世界上拥有最多世界遗产的国家。

The concept of “green development” encompasses multiple components, from energy efficiency and construction techniques to natural disaster prevention and management. Italy is at the forefront in this field with proven experience in the optimization of technologies which exploit natural resources and a strong tradition of facing environmental issues through innovative solutions, such as sustainable “social housing” using flexible building methods. The sustainable development of cities should follow a systematic approach to assessing the interaction between various sectors and disciplines. All decision processes should be oriented toward sustainability, integrating social, economic and environmental topics. They should also follow compact, transit-oriented urban form principles.

Moreover, Chinese cities display strong demand for climate adaptation measures that can be properly combined with existing maintenance programs. Improvements to the ecological environment and preservation of biological diversity also provide benefits to both surrounding communities and the urban texture.

Last, but certainly not least, the need to protect, refurbish and promote China’s huge historical heritage has been gaining wide attention. Italy and China possess the oldest and richest cultural and historical heritages and their preservation is an imperative.

The NNTUP calls for “*protection of national historical and cultural heritage: according to the natural history and cultural endowments of different regions, give expression to regional differences, promote diversity in form, prevent all cities becoming the same, and develop beautiful towns with historical memory, cultural context, regional features, and ethnic characteristics*”.⁷

Historical and cultural heritage includes natural and built sites, as well as invaluable expressions of knowledge, practices and popular traditions. Historical and cultural heritage enriches the lives of citizens, is a driving force for cultural and creative sectors, and plays a prominent role in creating and enhancing a country’s social capital. The cultural resources of cities should therefore be explored and developed, through careful preservation and management of historical districts as well as the maintenance of the historical built environment and urban infrastructures stratified through the centuries.

Italy is renowned for its unparalleled devotion to preserving its historical and cultural heritage and its protection lies at the core of all of its urban planning strategies. Thanks to its unique knowhow and expertise in urban regeneration and building renovation, Italy is currently the country with the highest number of UNESCO world heritage sites.

⁷ NNTUP - Chapter 4, Guiding Ideology, 5th section.

⁷ 《国家新型城镇化规划》- 第四章，指导思想，第五部分。

基于意大利的发展模式，“意(E)-城市”的概念旨在让意大利经验知识与中国需求相切合，并重点关注中国政府发布的新型城镇化规划发展原则。这个概念也将作为中意联合项目发展的孵化器。

Based on an Italian approach, the “意(E)-CITY” concept aims at making Italian know-how and Chinese needs meet, focusing on the principles set by the Chinese government for the new urbanization process. It will also serve as an incubator for joint projects between Italy and China.

基于意大利知识经验与中国需求的供需模式，意大利驻华大使馆领导了一批专家和学者制定了“意(E)-城市”发展观。从意大利的角度出发，“意(E)-城市”概念将重点关注中国政府为新城镇化进程（以人为本，密集，紧凑，包容，绿色智能）制定的原则。“意(E)-城市”概念将为创建一个综合全面的运营模式提供一个起点，因地制宜，提供最优解决方案。这个概念也将作为联合发展战略的基础，联合项目的孵化器以及中意工业合作伙伴关系的中间人。

Based on this supply-demand model, where Italian knowhow and Chinese needs meet, a group of experts and professionals led by the Italian Embassy in China has formulated the “意(E)-CITY” development concept. Starting from an Italian approach, the “意(E)-CITY” concept will be focused on the principles set by the Chinese Government for the new urbanization process (people-centered, intensive, compact, inclusive, green & smart). The “意(E)-CITY” concept will provide a starting point for creating a comprehensive operational model that will provide solutions by adapting itself to the special characteristics of individual locations. It will also serve as a foundation for developing joint strategies and serve as an incubator for joint projects as well as a broker for industrial partnerships between Italy and China.



新城市规划/城市再生服务

2.1 NEW CITY PLANNING / URBAN REGENERATION SERVICES



城市规划

一个城市的弹性以及其对经济、社会和环境问题的应对能力，可以一个城市对于其土地的发展，转型和更新的指导水平作为参考来评估。城市规划方针包括城市化进程的组织，整套规则和指导方针的制定，以及对城市未来增长和发展的长期规划。其目标是专注于获得更大的共同利益。

意大利的城市规划经验包含了广泛而多样化的模式，在几个世纪以来经过了反复地检验，形成了其独特的特点。意大利城市规划模型中最显著的元素是广场。几个世纪以来，广场被探索发掘出许多变化，它传达了一种独特的氛围，也让意大利的城市环境别具一格。

意大利是中国城市化进程中的领军伙伴。其在城市规划中长期的经验和经过验证的专业知识一直是中国许多城镇规模项目的灵感来源。意大利公司在城市规划领域将非凡的专业知识以及对中国特色市场的了解结合起来。这一专业化使意大利公司成功地将中国的城市化项目推向可持续发展的未来。

意大利公司拥有世界一流的城市规划专业知识，这得益于意大利国家的传统文化，其中包括了几个世纪以来广泛而多样化的模式，同时结合了基于两国合作经验之上，意大利对中国市场的深入了解。

A) URBAN PLANNING

A city's resiliency and responsive to economic, social, and environmental issues can be evaluated how well a city guides the development, transformation, and renewal of land in urban areas. The discipline of urban planning includes the organization of urban processes, establishing a set of rules and guidelines, and long term planning for future growth and development. Its target is to focus efforts towards the achievement of greater shared benefits.

Italian experience in urban planning includes a wide and variegated range of models, with several experimentations and features introduced over centuries. The most distinct element of Italian urban planning models being the *piazza*. With a number of variations having been explored, conveying to a unique atmosphere that has characterized Italian urban environments for centuries.

Italy is a leading player in the field of urbanization in China. Its long experience and proven know-how in urban planning have been the inspiration for many urban scale projects developed in China. Italian companies combine an extraordinary expertise in the field of urban planning with a deep knowledge of the peculiarities of Chinese market. This specialization has helped Italian companies become successful in driving urbanization projects in China towards a sustainable future.

Italian companies boast a world-class expertise in urban planning thanks to a national heritage including a wide and diverse range of models spanning through centuries, combined with a deep knowledge of the Chinese market based on consolidated collaborations and experiences in the country.









能源规划和设施

中国拥有世界上最大的电力装机容量（2013年为1100 GW）。其过去十年平均年增长为9%，至2005年以来，装机容量翻了一番，预计到2030年达到2390 GW。

中国的电力净产量（2013年为4841 TWh）在世界排名第二。其约80%的电力生产来自于化石燃料燃烧。国际能源署预计，到2035年，中国的电力需求将增长40%，约占全球能源总量的40%。从而也会导致二氧化碳排放量同期增长28%。自2005年以来，电力生产和消费都上涨了50%以上，国际能源署预计，到2035年，中国电力净产量将增长到10004 TWh，是2010年的两倍以上。

在发达国家中，意大利的能源密度最低（即单位国内生产总值的能源消耗），仅占中国的三分之一。如果中国的能源密度与意大利相同，那么每年可节省约3000亿至5000亿美元。

意大利能源效率之所以有此卓越表现，是因为国家有明确的能源多样化政策规定。意大利发展了强大的可再生能源基础，其约40%的能源均来自可再生能源。此外，配电和生产的严格供应标准以及较低的城市能源消耗也有助于提高意大利的能源密度。

意大利在城乡电网建设中的专业知识和技术，都为中国的可持续发展提供了强有力的支撑。

在发达国家中，意大利的能源密度表现最好。如果中国的能源密度与意大利相同，那么每年可节省约3万亿人民币。

Among developed countries, Italy has the best energy intensity performance; if China had the same energy intensity as Italy, the country would save up to 3000 billions RMB per year.

B) ENERGY PLANNING AND FACILITIES

China has the largest installed electricity capacity in the world (1.100 GW in 2013). With an average yearly growth of 9% over the last ten years, the installed capacity today has doubled since 2005 and it is expected to reach 2.390 GW by 2030.

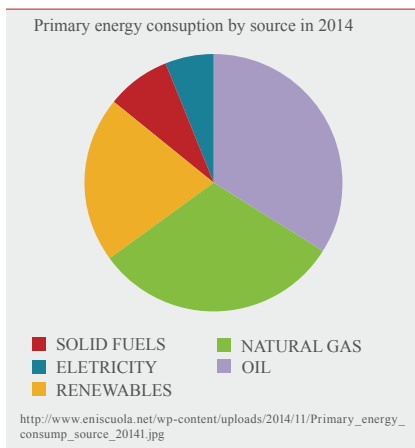
Regarding the net production of electricity (4.841 TWh in 2013), China ranks second in the world. Around 80% of this production comes from fossil fuel sources. The International Energy Agency (IEA) has projected that Chinese electricity demand will increase 40% by 2035, forecasting that China will account for 40% of total worldwide energy. Consequently, CO₂ emissions will grow by 28% in the same period. Both electricity production and consumption have grown by more than 50% since 2005, and IEA foresees a net production's increase up to 10.004 TWh by 2035, more than double the production of 2010.

Among developed countries, Italy has the lowest energy intensity (i.e., energy consumed per unit of GDP) which accounts for a third of the Chinese one. If China had the same energy intensity as Italy, it could save around US \$300-500 bn per year.

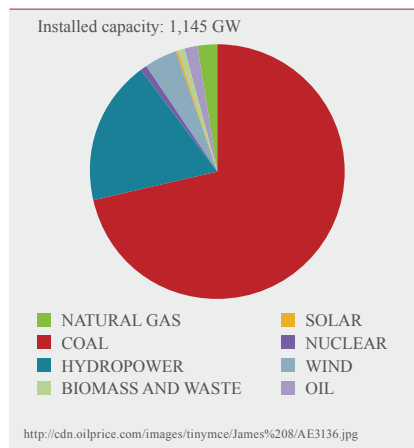
The extraordinary performance of Italy's energy efficiency is the result of clear national policies for diversifying its energy sources. Italy has developed a strong base for renewable energy, with around 40% of energy coming from renewable energy. Furthermore, strong standards providing power distribution and production, and low urban energy consumption help to improve Italy's energy intensity.

Italy's expertise and technologies in the construction of electric grid infrastructure, both in urban and rural areas, could provide strong support for China's sustainable growth.

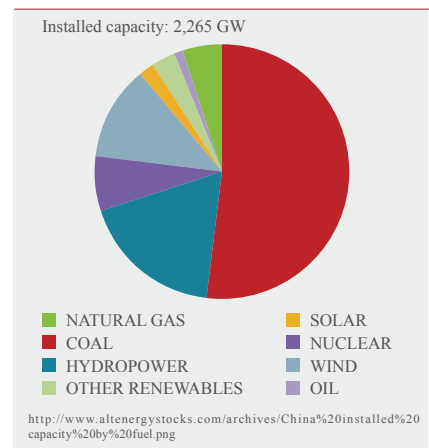
ITALY PRIMARY ENERGY CONSUMPTION BY SOURCE IN 2014



CHINA INSTALLED ELECTRICITY CAPACITY BY FUEL 2012



CHINA INSTALLED ELECTRICITY CAPACITY BY FUEL 2040





废弃物规划及设施

随着城市化进程的加快，废弃物管理对中国来说是一个严峻挑战。目前，基础设施系统需要改进，尤其是废弃物的处理和处置。中国执法当局正致力于推动废弃物分类收集，废弃物回收和废弃物转能源（Wte）计划。在这个过程中，中国当局采用传统的试误方法，在多个城市引入了不同的试点项目。中国废弃物回收利用还处于初级阶段，也就是说外资企业仍有与中国企业合作的巨大机遇。

中国的废弃物转能源技术发展很快，主要是公共资源的重要注资和公私营企业的多重投资。

在发达国家中，意大利人均城市废弃物产量最低，人均工业废弃物产量最低。此外，意大利是欧洲国家中回收利用工业废物率最高的国家，更具体地说，意大利也是循环利用可回收元件（如金属，纸张，塑料，纺织品，木材，玻璃和橡胶）的领军国家。



C) WASTE PLANNING AND FACILITIES

With accelerated levels of urbanization, waste management is a serious challenge for China. Currently, the infrastructure system requires improvements, especially for waste treatment and disposal. Chinese enforcement authorities are concentrating on selective waste collection, waste recycling, and waste-to-energy (Wte) programs. In this process, Chinese authorities have adopted the traditional trial-by-error approach, thus introducing different pilot programs in several municipalities. Waste recycling in China is still at an early stage, and there remains tremendous opportunities for foreign companies to partner with Chinese companies.

Waste to energy technologies have been rapidly developing in China, mainly following the injection of important public resources and the multiple investments of public and private companies.

Among developed countries, Italy has the lowest urban waste production per capita and the lowest production of industrial waste GDP per capita. Additionally, Italy is the European country with the highest rate of recycled industrial waste and, more specifically, Italy is also the leading country in the recycling of recyclable components (e.g., metals, paper, plastic, textiles, wood, glass, and rubber).

意大利在能源效率和资源管理方面的卓越表现，是其国家明确政策和严格把控的结果。

The extraordinary Italian performance in energy efficiency and resources management are the result of clear national policies and strict controls.



水资源规划和设施

中国面临严重的水资源短缺问题。人均水资源可利用量仅为2200立方米，是全球平均水平8800立方米的四分之一。中国有400多个城市面临严重的水资源短缺问题。

其中一个应重点关注的问题是，中国水资源管理的效率极低。目前，在同类工业生产的过程中，中国的用水量是发达国家平均水平的三倍。2011年7月6日，环境保护部部长宣布，只有57%的被监测河流可列为3级以上（即可接受水平）。另有40%的水被列为不适合人类使用的水资源，与2010年43%的比例相比略有改善。

意大利有欧洲最严格的城市和工业用水回收规定，且拥有最多的城市净水器（超过6500台）。意大利在水资源系统设计和管方面的专业知识已经得到了权威而广泛的认可，并可与中国合作伙伴在一体化的服务和技术方面互惠互利。

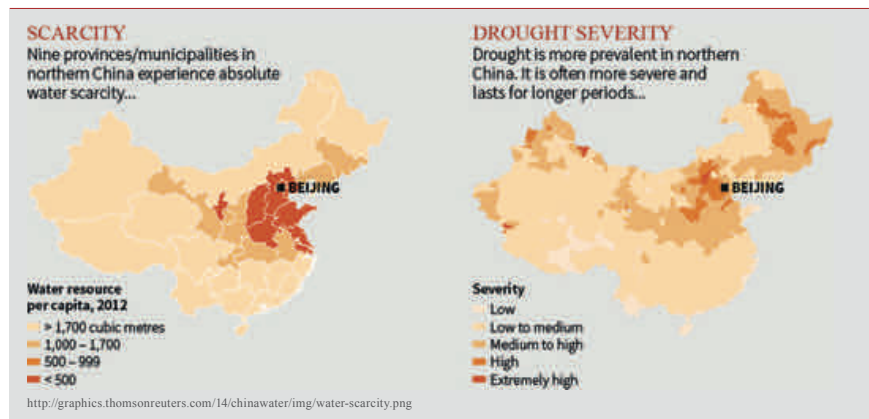
D) WATER PLANNING AND FACILITIES

China is facing a very serious water scarcity problem. The average per capita water availability accounts for 2,200 m³, versus a global average of 8,800 m³, four times higher. More than 400 cities in China are facing serious water shortages.

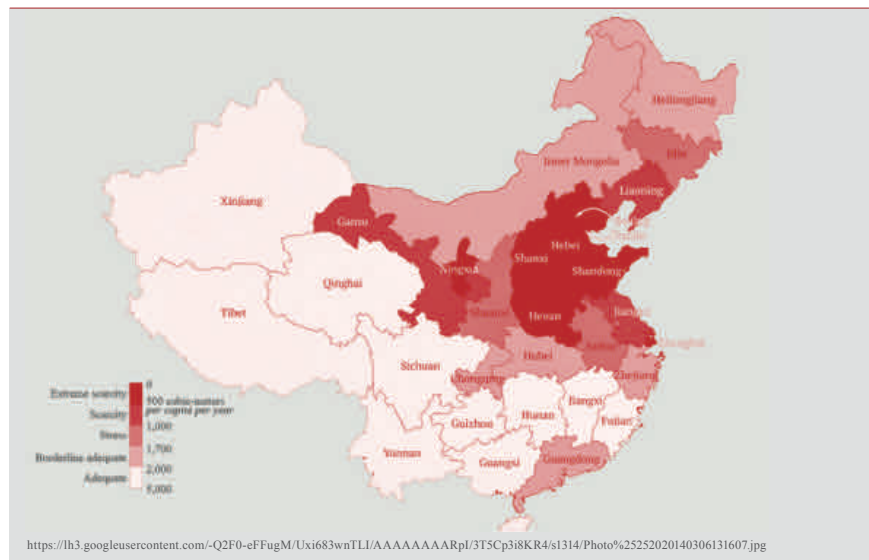
One of the main concerns is the very low efficiencies of water management in China. Currently, China's water consumption is three times the average of developed countries when comparing with similar levels of industrial production. On July 6th, 2011 the Minister for Environmental Protection declared that only 57% of monitored rivers can be classified as level 3 or higher (i.e., acceptable level). Another 40% of water has been declared not suitable for humans, with a slight improvement from 43% from 2010.

Italy has Europe's strictest regulation for recycling urban and industrial water and owns the highest number of urban water purifiers (more than 6,500). Italy's know-how in the design and management of water systems is significant and extensively proved, and could be shared with Chinese partners within an integrated offer of services and technologies.

WATER SCARCITY AND DROUGHT SEVERITY IN CHINA



WATER AVAILABILITY IN CHINA



意大利有欧洲最严格的城市和工业用水回收规定，且拥有最多的城市净水器（超过6500台）。

Italy has Europe's strictest regulation for recycling urban and industrial water and owns the highest number of urban water purifiers (more than 6,500).



交通规划和设施

为了实施可持续交通政策，意大利已在中央和地方采取立法手段。在总体框架下，地方管理者可以自由地实施针对特定环境问题的最佳措施。

这项政策的基石是针对大型集中人群采取可持续交通城市规划以及引入“从家到工作”计划（如工业厂房，医院和公共管理人员）。

国家立法还向针对减少私家车使用而进行投资的市政当局和公共交通公司提供财政奖励，如汽车共享和拼车项目。此外，公司也被鼓励升级新一代公交车（例如电动，混合动力和压缩天然气（CNG）公交车）。

“从家到工作”计划的主要目标是通过推动组织和管理措施来减少个人交通工具的使用，以增加公共交通工具的使用，如汽车共享和骑自行车上班。

一般来说，实现可持续交通的优先举措包括：

- 随着智能交通系统（ITS）和大数据交通项目的发展，公交车队的更新和公共交通服务的扩大；
- 建立基础设施，改进综合运输系统的交替和扩展模式；以及
- 加强和推广汽车共享，拼车，居民和货运的网络平台。

米兰市是可持续交通领域的领军城市，公共交通使用水平很高。同时，米兰还拥有大批低排放量公交车汽车，特别是液化石油气（LPG）和压缩天然气的汽车，占全国总量的9%。此外，去年混合及电力交通运输所占比例增加了38%。排在米兰之后的分别是帕尔马和都灵，均位列全意十强。

意大利在替代燃料汽车（如压缩天然气，混合动力，电动）领域拥有许多业界翘楚。包括依维柯，依维柯巴士和菲亚特动力科技，他们在替代燃料发动机，商用车和客车开发中一直发挥开创性的作用。意大利公司的资源和专业知识使他们有能力提供满足可持续发展各类需求的全面解决方案。

E) MOBILITY PLANNING & FACILITIES

In order to implement the *Sustainable Mobility Policy*, Italy has started using legislative instruments at both the central and local level. With a general framework, local administrators are free to implement the best practices on specific environmental issues. The cornerstones of this policy are the introduction of the Urban Plans of Sustainable Mobility and Home-Work Plans for large concentrations (e.g., industrial plants, hospitals, and public administrators).

National legislation also provides financial incentives for municipalities and public transport companies that invest in initiatives to reduce private car use, such as car-sharing and car-pooling. Furthermore, companies are also incentivized for upgrading new generation fleets of buses (e.g., electric, hybrid and Compressed Natural Gas (CNG) buses).

The main goal of the Home-Work Plan is the reduction of individual means of transport, through the promotion of organisational and managerial measures to increase the use of public transport, car sharing, and cycling to get to work.

Generally, the priority actions for sustainable mobility include:

- The renewal of the bus fleet and the expansion of public transport services, with the development of Intelligent Transport Systems (ITS) and Big Data mobility projects;
- The creation of infrastructure for improving modal interchange and extension of the integrated transport systems; and
- The strengthening and expanding of the car-sharing, car-pooling, web platforms for people, and freight transports.

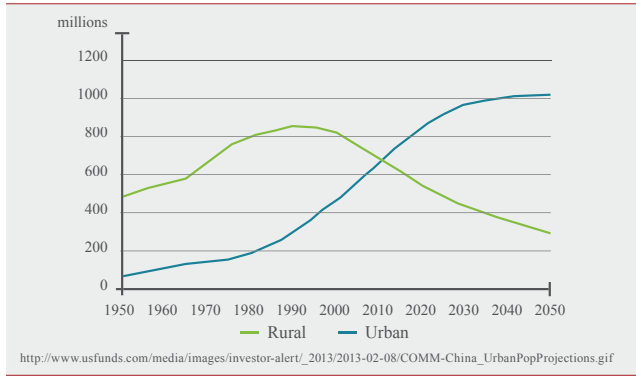
The city of Milan is a leader in sustainable transportation, with high levels of public transportation. Milan also maintains a fleet of buses with high percentage of low emission vehicles, especially in Liquefied Petroleum Gas (LPG) and CNG, which account for 9% of the total nationwide fleet. Furthermore, hybrid and electronic transport in the last year increased by 38%. Milan is followed by Parma and Torino in the national top ten, respectively.

Italy has industry leaders in alternative fuel vehicles (e.g., CNG, hybrid, electric). Through various players, such as *Iveco*, *Iveco Bus*, and *FPT Industrial*, they continue to play a pioneering role in the development of alternative fuel engines, commercial vehicles, and passenger buses. The resources and expertise of Italian companies allows them to offer a comprehensive range of solutions to meet demands for sustainable mobility.

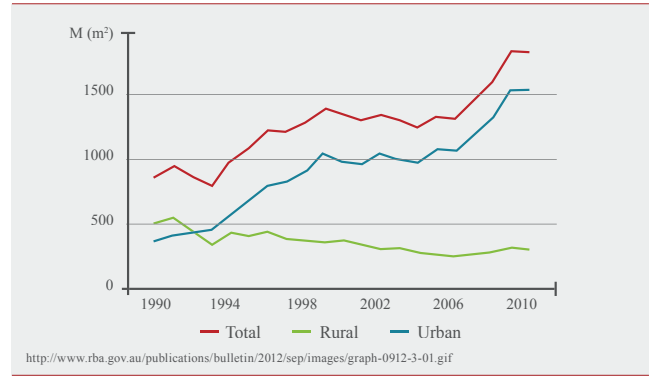
意大利在替代燃料汽车的设计，生产和商业化领域处于世界领先地位，专注于开发创新和替代燃料发动机，商用车和客车。

Italy is a world leader in the design, production and commercialization of alternative fuel vehicles, specializing also in the development of innovative and alternative fuel engines, commercial vehicles, and passenger buses.

CHINA URBAN / RURAL POPULATION - 1950 - 2050



CHINA RESIDENTIAL FLOOR SPACE COMPLETED



城乡关系与城市转型

城乡差距是影响今天城市转型的最大阻力之一。两个实体是互补的，为实现城乡蓬勃发展，城乡两地均需要改善基础设施且促进其一体化。工业革命后，意大利的人口分布发生了深刻的变化。在此之后，城市居民所占百分比持续增长，接近70%的人口居住在城市，远高于世界平均水平的54%。在中国，56%的中国人口已经定居在城市地区，与1990年26%的比例相比，其增长是非常显著的。

尽管当下风云万变，未来的改变也可以预见，传统和历史依然不容易被遗忘。将传统引入日常生活意味着促进更健康的生活方式。品质、幸福感与城乡生活方式的融合：这也是Cittaslow（“慢城”）组织的座右铭，该组织成立于意大利，以维护当地传统，倡导更美好的生活方式为宗旨。该组织于1999年成立，现已扩展至30多个国家（包括中国）。

意大利经验是中国机构在今后发展中解决城乡差距的最宝贵资源。意大利经验成功的根源在于发展了健康的城乡关系，并推动了旨在提高社区生活水平的举措。

F) CITY/COUNTRYSIDE RELATIONSHIP AND URBAN TRANSFORMATION

The rural-urban divide is one of the most powerful forces influencing urban transformations today. The two entities are complementary, with both the city and countryside requiring improved infrastructure and integration to flourish and thrive. Population distribution deeply changed in Italy after the Industrial Revolution. Since then, the percentage of people living in urban areas continued to grow, with close to 70% of the population living in cities, well above the world average of 54%. In China, 56% of the Chinese population has settled in urban areas, an impressive increase from 26% in 1990.¹

Despite the ever changing present and expected changes in the future, traditions and history are not easily forgotten. Bringing traditions back to everyday life means promoting healthier lifestyles. Based on the quality and well-being and the integration between urban and rural lifestyles: this is also the motto of *Cittaslow* (“Slow City”) organization², a movement founded in Italy to safeguard local traditions and to advocate for a better lifestyle. The organization, set up in 1999, is now spread to over 30 countries (including China).

Italian experiences represent the most valuable asset for Chinese institutions to address future developments between the rural and urban divides. Their success happened due to developing a healthy relationship between urban and rural areas, and in promoting initiatives aiming at the improvement of living standards of any community.

¹ Population Reference Bureau, 2016 World Population Data Sheet. 人口资料局，2016世界人口资料

² www.cittaslow.net.

“慢城”是1999年在意大利成立的一项运动，旨在以提高所有社区的生活水平和城乡一体化为基准，将当地传统引入日常生活，同时倡导更健康的生活方式。

Cittaslow (“Slow City”) is a movement founded in Italy in 1999 aiming at bringing local traditions back to everyday life while promoting a healthier lifestyle, based on the improvement of the living standards of any community and on the integration between urban and rural areas.



一体化智慧解决方案

新城市的建立和棕色地带的改造旨在建设更加宜居，高效，环保的空间。“一体化智慧解决方案”一词，涵盖了一个城市为达到以一种智能和协同的方式运作所需的大范围服务及措施。在这个过程中，公民既是推动者，也是最终的服务消费者。意大利的公司和专家在“智慧城市”规划和建设所有关键环节中，都拥有先进的专业知识和经验，如：

- 智慧经济（竞争力）；
- 智慧交通（运输和信息通信技术（ICT））；
- 智慧环境（自然资源）；
- 智慧居民（社会和人力资本）；
- 智慧生活（生活质量）；
- 智慧治理（参与）；
- 智慧设计流程（一体化设计）。

在热那亚，的里雅斯特，贝加莫以及意大利其他城市都推出了许多成功的智慧举措。到2016年1月，意大利共有1308个智慧城市相关项目，覆盖了158个城镇。

在智慧互联城市网络中，大中小城市中心的整合是意大利经验的关键。这些经验可以被转移和实施到不同的规模和环境。意大利在智慧城市方面的专业知识将会改善中国各地当地社区的生活水平。

G) INTEGRATED SMART SOLUTIONS

The creation of new cities and the renovation of brown field sites aim to build more livable, efficient, and environmentally responsible spaces. The expression, “Integrated Smart Solutions”, includes a wide range of services and tools a city needs to hold to work in a smart and synergetic way. In this process, the citizen is both the promoter and the final consumer of services. Italian companies and experts hold an advanced know-how and experience in all the key components for Smart City planning and construction, such as:

- **SMART ECONOMY** (competitiveness);
- **SMART MOBILITY** (transport and Information Communication Technology (ICT));
- **SMART ENVIRONMENT** (natural resources);
- **SMART PEOPLE** (social and human capital);
- **SMART LIVING** (quality of life);
- **SMART GOVERNANCE** (participation);
- **SMART DESIGN PROCESS** (integrated design).

Many successful smart initiatives have been promoted in Genoa, Trieste, Bergamo, and other Italian cities. By January 2016, in Italy there were 1308 ongoing smart city-related projects, involving 158 cities and towns³.

Integration of large to medium and small sized urban centers in a network of smart interconnected cities is the key winning point of Italian experience, which can be transferred and implemented to different scales and contexts. Italian expertise in smart cities solutions would come to hand in improving the living standards of local communities all over China.

³ <http://osservatoriosmartcity.it>

意大利成功地发展了一个涵盖大中小城市的完整智慧互联城市网络。

Italy successfully managed to develop a fully integrated network of smart interconnected cities including large to medium and small sized urban.

意大利在战略咨询领域世界领先，提供城市规划支持服务，其目标是在确定的经济范围内实现宜居的社会目标，从而保证最高的生活质量和最低的环境影响。

Italy is a world leader in the field of strategic consultancy as a support service in urban planning, with the purpose of achieving livable social targets within agreed economic boundaries, guaranteeing the highest quality of life and the lowest environmental impact.



战略咨询

中国的城市发展进程的复杂程度前所未有。在没有对规划本身进行强有力的战略评估之前，任何基于过去经验而提出的规划或评估系统都可能是不足和低效的。

中国的城市规划必须超越简单的城市化设计或技术设计；对于中国城市化进程的复杂性和规模，要从长远角度对经济，环境，宜居方面进行认真的评估。

对于进行目标规划和开发的政府机构的最基本的必要的是，做决定和设计要基于结构性的从多个互相关联层面（如投资，能源生命周期，废弃物产生，资源/土壤开发，污染产生等）和质量层面（例如生活方式，公民的第二和第三需求，福利等）进行的严格分析。通过创新和良好组织的方法，城市化主体生命周期的投资和运行成本是可控的。对环境的影响也是可以管理的，而且“城市主体”的使用者的生命总体质量能够最大化。

这些创新方法不能以试误的过程为基础，而是要经过深思熟虑，对全球社会，经济和环境进行认真的分析，设想和设计。

作为城市规划的支撑，意大利处于战略咨询领域的前沿，其目标是在确定的经济范围内实现宜居的社会目标，从而保证最高的生活质量和最低的环境影响。

H) STRATEGY CONSULTING

Urban development processes in China have reached a level of complexity never seen before. Any planning or evaluation system based on past experiences may thus be inadequate and inefficient without a previous strong strategic assessment of the planning itself.

Urban planning in China must go beyond simple urbanistic or technical design; the complexity and size of the urbanization process in China requires careful evaluation of economic, environmental, livability aspects with a long-term perspective.

This is an essential necessity for political authorities, planning and developing subjects who should adopt decisions and design processes based on structured and interrelated analysis of multiple quantitative dimensions (e.g., investments, energy lifecycle, waste production, sources/soil exploitation, pollution production, etc...) and qualitative dimensions (e.g., lifestyle, second and third citizens' needs, welfare, etc...). Through innovative and well-structured approaches, the investment and operation costs of the "urban entity" lifecycle can be controlled. The environmental impact can therefore be managed, and the overall quality of life of the users of the "urban object" can be maximized.

Those innovative approaches can't be based on a trial-by-error process but must be deeply thought, conceived, and designed upon careful analysis of the global social, economic, and environmental scenario.

Italy stands at the forefront of the strategic consultancy as support for the urban planning, with the aim of achieving livable social objectives within agreed economic boundaries, thus guaranteeing the highest quality of life and the lowest environmental impact.

建筑规模服务

2.2 BUILDING SCALE SERVICES



建筑设计

意大利在建筑设计领域拥有悠久的传统，拥有包括在建筑设计，空间规划，建筑材料和技术创新等方面的广泛专业知识。所有相关技术之间的融合，是实现集成本控制、按时完成和质量控制为一体的可持续设计成果的基本先决条件。以文艺复兴时期的艺术模式为基准，意大利建筑师可以凭借广泛的知识背景，承接各种风格的项目设计，从建筑设计到室内设计，甚至到配件选择为项目提供整体的解决方案。顶级质量标准是意大利建筑师工作的关键组成部分，它自然而又被深深烙印在每个设计细节。

这个悠久的传统传承至今，当下多家意大利建筑公司在全球经营，并因其杰出的设计成果饱受嘉奖。

意大利的传统和审美是无可匹敌的，并且仍然在不断的发展和努力寻找迎接建筑设计的新高峰的方案，随时准备迎来建筑设计的新高峰。

结构工程设计

意大利结构工程对世界的贡献从几个世纪前就已经开始了，最早可以追溯到罗马时代。在公元前1世纪，混凝土就被当做是一种结构材料，并且直到今天仍然在使用。意大利人在一些世界知名的建筑结构中，对混凝土的使用在技术上和建筑上的专业水平达到的完善。其中包括由Pier Luigi Nervi设计的梵蒂冈城维多利亚观众厅，由Riccardo Morandi设计散布在世界各地的一些桥梁项目等等。意大利公司坚信，结合传统或创新材料的使用，当今结构工程设计正确的方向是对先进施工技术的彻底研究。该设计过程配备了最复杂的结构计算系统，涵盖静态和动态，线性和非线性。

A) ARCHITECTURAL DESIGN

Italy boasts a long tradition in architectural design field, including a wide expertise in architectural design, space planning, processing materials, and technological innovation with an integrated approach. Integration among all the technical stakeholders is the essential prerequisite to reach a sustainable design result that controls costs, adhere to deadlines, and quality control. In accordance with the Renaissance model of artistry, Italian architects can count on a wide knowledge background that allows them to take on projects in various styles as well as to provide overall project solutions, starting from the architectural scale to interior design and even until the accessories selection. Top quality standard is a key component of Italian architect work that finds its natural development in the deep definition of each single detail.

This long tradition is being carried on also nowadays, with several Italian architecture firms operating worldwide and receiving awards for their outstanding work.

Italian tradition and taste for beauty are without any equal, and are still constantly evolving and striving to find alternative ways towards new peaks of architectural design.

B) STRUCTURAL ENGINEERING DESIGN

Italian structural engineering contribution to world began centuries ago, starting from the Roman Age. In the 1st century B.C., concrete was conceived of as a structural material that still continues to be used today. Italians have perfected the use of concrete with a level of specialization of technique and aesthetics in some of the most world-renowned structures. Among the others, examples that can be mentioned are Paul VI Audience Hall in Vatican City, designed by Pier Luigi Nervi, Riccardo Morandi's projects for several bridges scattered all over the world, and many others. Italian companies strongly believe nowadays the right direction for structural engineering design is thorough research of advanced construction techniques using either traditional or innovative materials. This design process is equipped with the most sophisticated structural calculation systems, static and dynamic, linear and non-linear.

顶级质量标准是意大利建筑师工作的关键组成部分，它自然而又被深深烙印在每个设计细节。

Top quality standard is a key component of any Italian architectural work, which naturally finds its expression in the deep definition of every single detail.



意大利在结构工程领域世界闻名，在过去几年中，意大利公司受到越来越多的公共工程合同委托。

Italian expertise in structural engineering is internationally renowned, with several contracts for public works assigned to Italian companies worldwide over the last few years.

在过去几年中，意大利公司受到越来越多的公共工程合同委托。著名的新建筑和交通枢纽项目包括纽约市的归零地，伊拉克摩苏尔水坝的修缮，阿布扎比的大清真寺。可以说，意大利在结构工程方面的专业知识，不仅是在意大利，在国际上也是享有盛名。

Over the last few years, an increasing number of public works contract have been awarded to Italian companies. Signature projects for new buildings and transportation hubs include Ground Zero in New York City, the restoration of the Mosul dam in Iraq, the Abu Dhabi Grand Mosque. Italian expertise in structural engineering is therefore renowned, not only in Italy, but also internationally.



机械-电气-水管工程设计

C) MECHANICAL - ELECTRICAL - PLUMBING ENGINEERING DESIGN

意大利工程师们的解决方案使意大利成为机械，电气和管道（MEP）供应系统创新领域的世界领军者。这一成就是通过采取全面一体化的方法达成的。供应系统在任何建筑单体的设计过程中都起着至关重要的作用。在接下来的几年里，意大利将继续致力贯彻一系列准则，即在公共项目投标当中，均采用一体化的机械，电气和管道设计。

Italian engineers' solutions brought Italy to become a world leader in the innovation of Mechanical, Electrical, and Plumbing (MEP) supply systems. This target has been reached through the adoption of a thorough integrated approach. Supply systems play a prominent role all through the design process of any built organism. In the next few years, Italy has committed to a series of codes which envisage the adoption of MEP integrated design for any public project tender.

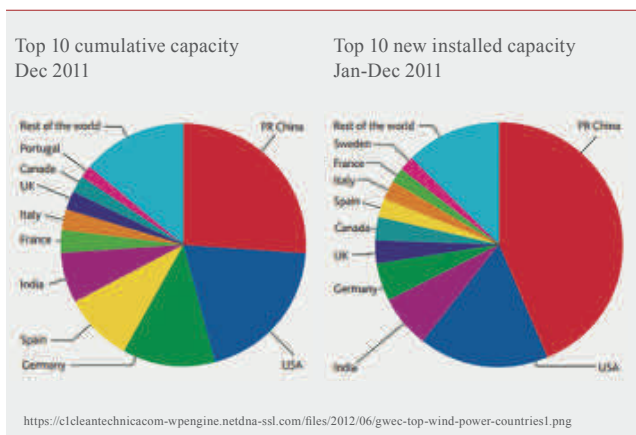
研发工作为公共和私人建筑业创造提供了新的环保技术：模块化建筑系统，光伏面板和地热发电机。

The research and development work created new eco-friendly technologies both for public and private construction industry: modular building systems, photovoltaic panels, and geothermal generators.

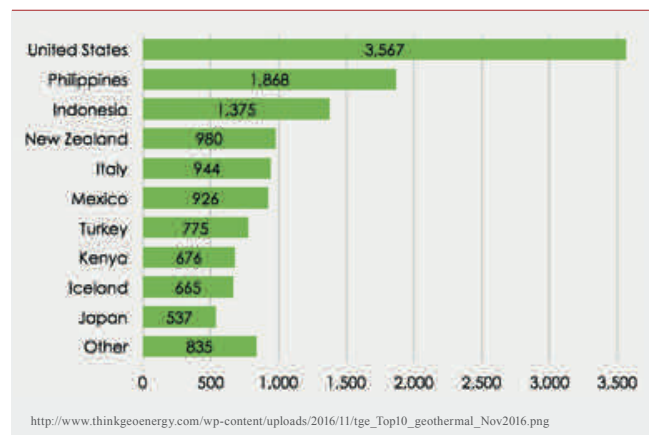
由于意大利的工程师大力推广一体化环境友好的方式，当今，意大利在开发可再生资源领域已然处在前沿。太阳能的全国能源总需覆盖率，意大利在世界范围内排名第一。在地热能源利用上，意大利是欧洲第一，也是二十世纪初第一个利用地热能源的国家。意大利还是欧洲最大的风力发电国家之一。

Through an integrated and environmental friendly approach, promoted by Italian engineers, Italy is now at the forefront for the exploitation of renewable natural resources. Italy ranks first in the world for the coverage of overall national energy demand through production of solar energy.¹ Italy also ranks first in Europe in the utilization of geothermal energy², having been the first country ever to utilize geothermal energy at the beginning of 20th century. Italy also ranks amongst the top countries in Europe for wind power usage.³

TOP TEN WIND POWER COUNTRIES, 2011



TOP TEN GEOTHERMAL POWER COUNTRIES, 2016



意大利的太阳能利用覆盖率，在世界范围内排名第一；在地热能源利用上，意大利是欧洲第一；意大利还是欧洲最大的风力发电国家之一。

Italy ranks 1st in the world for the coverage of overall national energy demand through production of solar energy, as well as 1st in Europe in the utilization of geothermal energy and among the top countries for wind power usage.



项目管理

项目管理的主要目标是按照选定的设计标准以及规划时间表和预算完成项目。在这个领域中，意大利专业人士可以提供附加价值，即卓越的服务质量。这一质量的基础在于将战略商业导向的思维模式与流程，资产和人力资源管理的扎实经验相结合。

中国计划将绿色建筑的比例从2012年的1%提高到2020年的25%以上。意大利是可持续建筑领域的世界领军国家，意大利的专业公司能够把专业知识应用于符合中国市场特色的绿色项目管理当中。

意大利专业人士坚信，一体化的团队合作方式是帮助客户通过咨询，设计，运营管理和维护等方式从绿色领域到停用处理阶段领导项目的最有效方式。他们可以采用最新的技术和措施，对任何具有挑战性的项目从头到尾地进行专业管理。意大利专业人士熟悉当前绿色建筑的发展趋势，也能兼顾中国建筑市场的特殊需求。

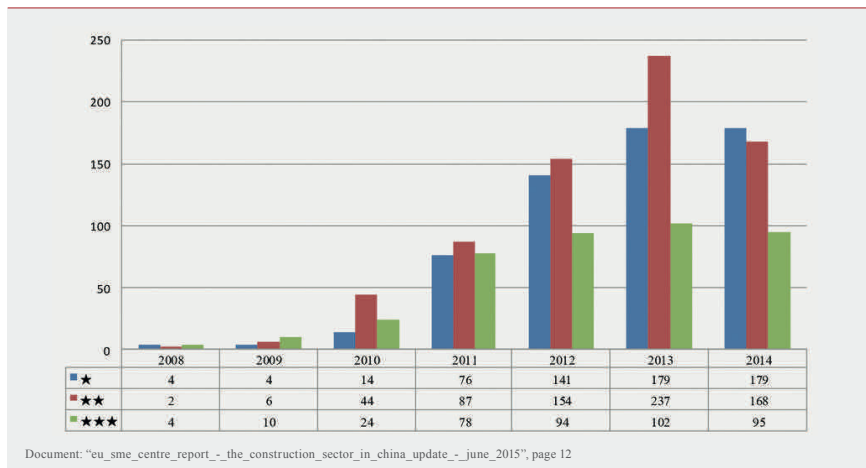
D) PROJECT MANAGEMENT

The primary target of project management activities is to complete projects according to the selected design criteria and the planned schedule and budget. The added value that Italian professionals can provide in this profession is the outstanding quality of service. The foundation for this quality lies in the combination of a strategic business-oriented mindset with a solid experience of processes, assets, and human resource management.

China has planned to increase the share of green buildings from 1% in 2012 to over 25% by 2020.⁴ Italy is a leading world player in the field of sustainable construction, with specialized companies able to apply their expertise on green project management within the uniqueness of the Chinese market.

Italian professionals strongly believe in an integrated teamwork approach as the most effective way to assist clients in leading projects from green field to decommissioning, through consultancy, design, operation management and maintenance. They can professionally manage any challenging project from start to finish, using the most updated technologies and tools. Italian professional are well versed in current trends on green buildings, and also can consider the special needs of the Chinese construction market.

CERTIFIED GREEN BUILDINGS IN CHINA, 2008-2014



¹ IEA International Energy Agency, *Snapshot of Global Photovoltaic Markets*, Report IEA PVPST1-29 2016

¹ 国际能源署，全球光伏市场快报，2016国际能源署PVPST1-29报告

² Data according to UGI (Italian Geothermal Association).

² 数据来源于意大利地热协会

³ EWEA The European Wind Energy Association, *Wind In Power. 2015 European Statistics*, February 2016.

³ 欧洲风能协会，风能，2015欧洲统计，2016年二月

⁴ CBRE, *The New Era of Green Buildings in China*, 2015.

⁴ 世邦魏理仕，中国绿色建筑新纪元，2015

建筑规模服务

2.3 CONSTRUCTION SCALE SERVICES



土壤修复

在中国，土壤污染是个严重的问题。尽管较其他各类污染问题，土壤污染问题没有那么敏感，但是由于缺乏便捷有效的解决方案，加之现有解决方案需要高成本的投入，另外土壤污染问题大范围影响地下水和耕地的可用性（也就是说，根据测算报告，由于土壤污染导致耕地以每年2%的速度减少），解决土壤污染问题依旧面临着巨大的挑战。

土壤污染的主要污染物包括砷，以及矿山和工厂作业产生的各类重金属。近几年，大范围的工业开发已经严重破坏了整个生态系统，同时也导致全中国各地水和土壤的污染恶化。

意大利先进的土壤修复技术全球领先。得益于严格的立法，各污染源头企业必须自掏腰包自行修复地表或地下水。由于意大利工业多元化，意大利已经研发出众多土壤修复技术工序，针对解决各类不同形式的污染。

A) SOIL REMEDIATION

Soil pollution in China is significant concern. Despite it representing a less sensitive problem among the population, soil pollution remains a major challenge due to its lack of easy solutions - requiring huge investments - and to the wide-ranging effects on groundwater and arable land availability (i.e., estimates report that each year 2% of the arable land is lost from soil pollution).

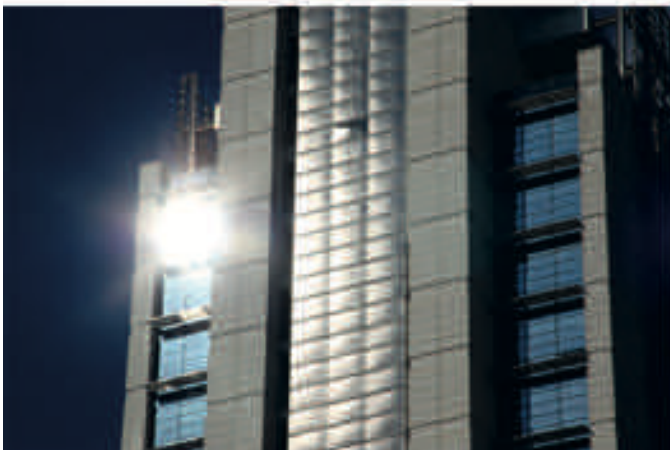
Main pollutants include arsenic and heavy metals from mines and factories. In recent years, large-scale industrial developments have caused destruction of entire ecosystems, and also caused significant deterioration of the overall water quality and soils across China.

Italy's technologies for soil remediation are among the most advanced in the world. Thanks to very strict legislation, polluters are obligated to personally remediate the surface or groundwater. Due to Italian industrial diversification, Italy has developed many technologies and processes for tackling different forms of pollution.

由于意大利工业多元化，意大利已经研发出众多土壤修复技术工序，针对解决各类不同形式的污染。

Thanks to its deep industrial diversification, Italy has been able to develop technologies and processes for soil remediation and purification from many different pollutants.





主要承包商

全球最大的几家大型建筑企业总部位于意大利。这些企业承建了世界各地的大型项目，包括桥梁（例如最著名的有世界第二高的伊斯坦布尔苏丹塞利姆大桥）、大坝（例如全球最高的大坝：位于埃塞俄比亚的碾压混凝土吉尔格尔·吉贝三期水电站）、混合用途高层综合体（例如沙特阿拉伯利雅得王国中心大厦）、住宅和商业建筑。

意大利承包商综合利用各类技术和管理创新，配以优秀技术人才，以改善当地建筑设施、促进经济和社会发展为宗旨，以推广可持续发展福利为目的，针对性地研发各类建筑施工解决方案。

B) MAIN CONTRACTOR

There is several large construction companies ranking among the biggest companies worldwide that are headquartered in Italy. These companies have constructed several large projects across the world, including bridges (i.e., most notably, the Yavuz Sultan Selim Bridge in Istanbul, the second tallest bridge in the world), dams (i.e., the Gilgel Gibe III dam in Ethiopia, the highest dam in the world built on roller-compacted concrete), mixed-use high-rise complexes (i.e., Kingdom Centre in Riyadh, Saudi Arabia), and residential and commercial buildings.

Italian contractors use a mix of technical and management innovations together with skillful human resources. They aim to develop construction solutions aimed at improving local facilities and contributing to the economic and social development, while promoting the benefits of sustainable development.



分包商

意大利分包商承接大型项目的优秀能力也举世闻名，备受瞩目的强大专业人士团队能够高水准领导、组织和完成建筑施工的各阶段工作。

其中，意大利以其在室内设计行业的悠久历史、丰富经验和卓越业绩在全世界范围内备受好评。先进的分包服务包括外立面供应和维护、土工工程服务，以及在工业、住宅和公共建筑等项目中应用安装创新地热系统等。在室内设计领域，意大利有很多成功典范项目，例如布鲁塞尔欧盟委员会新大楼内力包络的曲面玻璃立面，还有不计其数的高层建筑，包括台北101、香港国际商会、伦敦碎片大厦等。

C) SUB CONTRACTORS

Italian companies sub-contractors are also world renowned for large-scale projects by high-profile professionals able to lead, organize, and accomplish every stage of the building process.

Among the others, they have been awarded excellences in interior design, a sector where Italy is globally recognized for its long and rich tradition. Advanced sub-contracting services include façade supplying and maintenance and geotechnical services, through the installation of innovative geothermal systems in several industrial, residential, and public buildings. In this sector there are many successful examples, such as the curved glass façade of the internal envelope in the new building of the European Council in Brussels to countless high-rise buildings, including Taipei 101, Hong Kong ICC, The Shard in London and so on.





设备供应商

意大利建筑工程机械和设备行业不仅是因为其产量高，更因其高技术含量和卓越综合制造水平而在全欧洲名列前茅。

在意大利，建筑工程机械行业有200多家企业，年营业额近30亿欧元，70%的产品出口国外。意大利产品因其高水准的专业性、技术创新和优雅的设计而闻名，受到全世界的褒奖和欣赏（例如：土方机械、附属装置、混凝土设备、塔式起重机、筑路机器和钻机）

意大利很多设计、建筑施工、建筑系统和厂房交付领域的企业都是世界级的领军企业。这些企业提供广泛的服务和解决方案，适用于不同背景、不同建筑，确保成本有效利用，能源高效利用。

D) EQUIPMENT SUPPLIERS

The Italian construction machinery and equipment industry stands out as one of the best in Europe not only in terms of production volumes, but also because of its high technological content and overall manufacturing excellence.

In Italy, construction machinery industry counts some 200 companies, with a turnover of nearly 3 billion EUR and around 70% of its production exported. Italian products are renowned and appreciated worldwide for their high specialization, technological innovations and elegant design (e.g., earth-moving machines, attachments, concrete equipment, tower cranes, road building and drilling machines).

Italian companies are also world-class leaders in the design, construction, and delivery of building systems and plants. These companies offer a wide range of services and solutions through adaptability to different contexts and buildings, cost effectiveness, and energy efficiency.

在意大利，建筑工程机械行业有200多家企业，年营业额近30亿欧元，70%的产品出口国外。

In Italy, construction machinery industry counts some 200 companies, with a turnover of nearly 3 billion EUR and around 70% of its production exported.



“意大利方式”构想了一种深入彻底、一体化的方式，这一方式的基础理念是城市是一个居住环境的有机体，作为城市有机组成部分的每一栋建筑对于城市环境都承担着相应的责任。另外，还包括可靠和可持续的能源，包括可替代能源，例如空气处理和光伏电板系统、风力涡轮机、地热技术、热泵以及产生综合热能和电热能源的热电厂。所有这些能量来源同复杂精细的绝缘系统、高性能裁量和各种装置配合使用。意大利专家除了专门研究内部空间取暖和冷却的多功能机械设备外，还专注于安全耐用的电力系统。

意大利企业拥有的其他专长还包括智能家居自动系统。自动化系统是未来家庭和工作环境的设计里程碑。全球范围内，意大利企业尤为积极地为国内和国际市场研发和改进前瞻性的解决方案，这就为中国的开发商和客户利用意大利在该领域的专长提供了机会。

The “Italian way” envisions a thorough and holistic approach based on the idea of cities as living organisms in which every component is a fundamental component for environmentally responsible behaviour of the whole building. This includes reliable and sustainable sources of energy. This can include renewable energy sources such as air treatment, as well as systems powered by photovoltaic panels, wind turbines, geothermal technologies, heat pumps, and cogeneration plants for combined heat and production of electric and thermal energy. All of these energy sources work together with sophisticated insulation systems, high-performance materials, and fixtures. Italian experts also specialize in safe and durable electrical systems, in addition to mechanical plants for heating and cooling of interior spaces with diversified functions and usage.

Another expertise held by Italian enterprises concerns *smart home automation systems*, or domotics. Domotics represent the milestone of the design of both domestic and working environments of the future. Globally, Italian companies are particularly active in improving and developing forward-looking solutions both for national and international markets, offering a chance for Chinese developers and clients to take advantage of Italian expertise in this field.

意大利的产品以其高度专业化，创新性技术和优雅的设计而闻名于世。

Italian products are renowned and appreciated worldwide for their high specialization, technological innovations and elegant design.



材料和家具供应商

凭借在建筑和施工领域几个世纪的经验，意大利在各类建筑材料生产、完善和利用领域的专业性也无可匹敌。意大利广泛多样的建筑风格是众多不同文化和文明同几千年历史碰撞沉淀的结晶，意大利多样的建筑风格和专业的建筑材料领域相辅相成。

得益于悠久的历史和丰富的经验，当今意大利可以提供多种高品质建筑和施工材料。意大利是瓷砖生产第一大国，意大利瓷砖生产的历史和美学举世闻名。意大利企业在传统建筑产品的生产制造领域在全球绝对首屈一指，包括：意大利大理石、花岗岩、凝灰石、灰斑岩、陶瓷以及其他独一无二的石材在全世界广泛应用并备受好评。意大利在建筑施工材料方面的优势还在于意大利拥有广泛的钢结构元素、混凝土、沥青材料、机械金属零件、纤维复合材料和聚合材料，还有世界知名的意大利玻璃器皿、细木制作和照明系统解决方案。

意大利企业还专门参与研发新型、高科技、生态友好型材料，融合了美学功能、净化空气功能，因而可以造福人类和环境。这一领域的产品包括各类建筑施工材料，如油漆、瓷砖、石膏、水泥等。

意大利家具行业也世界领先，被认为是全世界最优质、最优雅、最受好评的家具。凭借悠久历史、专业知识、传统、融合传统和当代特色的能力，以及最前沿的材料和技术，意大利家具生产商绝对是全球堪称卓越的家具生产商。每年在米兰举行的国际米兰家具展是同类展览中世界最大也是最重要的展览，展览将推出家具市场最新的产品和流行趋势，每年都吸引着来自世界各地的展商，投资商和参观者。

E) MATERIALS AND FURNITURE SUPPLIERS

Drawing upon centuries of experience in building and construction, Italy has been able to develop an unrivalled expertise in the production, improvement, and utilization of a wide range of building materials. This process went hand in hand with the evolution of its broad and diverse architectural style, which is the result of many different cultures and civilizations coming into contact throughout thousands of years of history.

Thanks to this diversified and long-lasting tradition and experiences, today Italy can offer a wide variety of high-quality building and construction materials. Italy is the world's largest producer of ceramic tiles, whose history and aesthetics are globally well known. Italian companies represent an absolute global excellence in the production and manufacturing of traditional building products: Italian marbles, granites, travertine, grey porphyry, porcelain grès and other unique stones are widely used and appreciated all over the world. Italian expertise also embraces a wide range of structural steel elements, concretes, bituminous materials, millwork metallic components, fiber composites and polymers, in addition to the world-renowned Italian glassware, fine woodwork, and lighting solutions.

Italian companies are also particularly involved in the development of **new, highly technological, and ecologically friendly materials** which conjugate aesthetics and beauty with the ability to clean air from pollutants, thus contributing to the safeguard of the environment and people well-being. This category of products includes a wide set of construction materials, from paints to tiles, from plasters to cements, and so on.

The **Italian furniture industry** is also widely recognized as the finest, most elegant, and appreciated in the world. The *Salone Internazionale del Mobile di Milano (Milan Furniture Fair)*, held once every year in Milan, is the largest and most important exhibition of this kind in the world, showcasing the latest trends and products in the furniture market attracting exhibitors, investments and visitors from all over the world. Furniture makers holds a **strong standard of excellence** built upon centuries of history, knowledge, and tradition, and the ability to combine the past with contemporary features with the most up-to-date materials and technologies.

意大利是瓷砖生产第一大国，意大利瓷砖生产的历史和美学举世闻名。

Italy is the world's largest producer of ceramic tiles, whose history and aesthetics are globally well known.

每年在米兰都会举行国际米兰家具展，它是世界最大也是最重要的家具设计展，吸引着来自世界各地的展商，投资商和参观者，展示了意大利在家具设计中卓越无敌的优势。

Every year, the city of Milan hosts the Milan Furniture Fair, the most important exhibition in the field of furniture and design in the world. The fair attracts exhibitors, visitors and investments from all over the world and testifies the absolute excellence of Italy in furniture design.

意大利是第一批家具出口国之一，占中国家具进口市场的15%以上；意大利家具对华出口额超过21亿元人民币；意大利进口家具占中国进口家具总量的70%。

Italy is the first partner of China in furniture import, covering 15% of the Chinese national import market, with a total turnover of over 2100 million RMB. Italy ranks as the first partner in 70% of furniture categories imported in China.



意大利是第一批家具出口国之一，占中国家具进口市场的15%以上，超过德国、日本、美国，自2010年起，总出口量上涨了50%。2015年一月到九月，意大利家具对华出口额超过21亿元人民币，据预测，截止2019年年底，意大利家具的对华出口将进一步增长40%。意大利奢侈家具凭借其精致的手工艺制造、精选的材料、独特的设计和风格，成为市场需求最高的产品。意大利家具对华出口最主要的领域是软垫家具（例如：占中国进口软垫家具总量的64%）、灯光系统（30%）和厨具（20%）。总的来说，意大利是中国在进口家具领域的主要合作伙伴，进口意大利家具占中国进口家具总量的70%。

意大利企业持有最前沿的环境友好型设计、材料应用方面的技术。在建筑施工材料和家具行业的循环应用领域，意大利领跑全球。家具生产商对循环、可再利用材料和组件生产有着详尽的生命周期评估，以降低家具对于总体环境的影响。

Italy was one of the first with regards to foreign furniture import, covering **over 15% of the Chinese national import market**¹, well above Germany, Japan, and the United States, with an increase of 50% in the overall export volumes in the last few years. From January to September 2015, the whole furniture import market from Italy to China moved **over 2100 million RMB**, and it is forecasted that there will be further increases by 40% by the end of 2019. The highest demand products are luxury furniture, thanks to their exquisite artisanal manufacturing, fine materials, unique design and style. Among the strongest sectors in Italian furniture export to China are soft furniture (i.e., representing 64% of the total imported soft furniture in China), lighting systems (30%) and kitchens (20%); all in all, **Italy is the main partner of China for furniture import in 70% of imported furniture categories.**

Italian companies are well aware of the most up-to-date techniques and technologies for environmentally conscious design in the use of materials. **Italy is among the leading countries in the world in the usage of recycled materials in both the construction and furniture industries.** Furniture makers have adopted a complete life-cycle assessment in the production of recyclable, reusable materials, and components to lower their overall environmental impact.

¹ <http://magazine.federmobili.it/asia-cina-fiore-del-mobile-un-po-di-dati/>

多家意大利专业公司拥有广泛而扎实的专业知识，完全符合中国施工现场管理的要求，并能应对各种各样的挑战，特别是在安全和施工质量方面更是技胜一筹。

Several specialized Italian companies hold a wide and solid expertise which perfectly matches the requests and challenges of China's construction site management, especially in terms of safety and construction quality.



现场管理

意大利企业熟练掌握现场管理的各类相关工作任务，包括现场监管、健康、安全和环境管理、汇报、预算和绩效分析、现场作业管理、认证等等。管理工作对于项目最前期的现场分析给予了足够的重视，旨在将其作为一个重要的研究和现有条件分析的有效工具，以最大程度修复一个区域。由于意大利多样化的差异地形，这一做法尤为重要。

在过去数十年内，通过一系列由意大利专业人士操刀的、独树一帜的长期项目，意大利企业已经证明了其高水平现场管理能力。中国在建筑施工现场管理方面，尤其是在安全和施工质量方面所面临的挑战，正是意大利企业的技术和专长所在。在这一领域开展合作还可以大幅提高对项目当地的技能培训。

F) SITE MANAGEMENT

Site management activities mastered by Italian companies include a wide range of tasks such as site inspections, health, safety and environment management, reporting, budgeting and performance analysis, management of site works, certifications, and many others. Management includes a complete project kick-off until its delivery to the client. Particular attention is given to the preliminary process of site analysis, intended as a positive tool of study, research, and implementation of existing conditions in order to remediate and rehabilitate an area at its highest potential. This approach is fundamental due to the heterogeneous and differentiated terrain in Italy.

Italian companies have proved themselves able to execute high levels of site management through a long and distinctive series of works whose site supervision has been carried on by Italian professionals over the past few decades. The challenges faced in China in construction site management, especially in terms of safety and construction quality, already suit the skills and expertise of several Italian specialized companies. This collaboration would also provide considerable benefits to the improvement of local skills training.



翻新改造服务

2.4 RENOVATION / RETROFITTING SERVICES



传统改造项目

将新技术和设备应用到现有建筑是建筑施工领域的一个强有力的工具，尤其有利于中国当今高速城镇化的趋势。

意大利已经形成了管理、监督、促进此类活动的立法框架，和基于建筑能源使用效率和综合测评方法的一套建筑排序系统。一个建筑越节能，该建筑就可以越多地节省能源成本，减少污染物排放。可通过技术提升和对传统组成部分和系统的翻新，实现现有建筑节能性、功能和品质效能的总体提升，包括对现有装置、绝缘涂层、地面/屋顶供暖板、热泵、可再生能源、水回收系统的升级改造。

意大利专家在推广这类技术方面走在世界前沿。改善现有基础设施和建筑物，以实现环境友好型基础设施和建筑。这些翻新包括改善能源利用效率和降低能耗成本、试验新技术、控制各结构的财务成本，最重要还包括降低污染物排放。

意大利企业成功完成的翻新改造项目遍布全世界，在中国各地也随处可见。

A) TRADITIONAL RETROFITTING PROJECT

The implementation of new technologies and equipment into existing buildings represents a powerful tool in the field of constructions, especially during the fast urbanization trends in China.

Italy has developed a legislative framework to manage, monitor, and promote such initiatives, with the codification of a system to rank buildings based on their energy performances through a comprehensive calculation method. The more a building becomes energy efficient, the more it saves in energy costs, and thereby reducing polluting emissions. The improvement of overall energy-savings, functional and quality performances in existing buildings is done through technological enhancements and renovations on traditional components and systems, including the upgrading of existing fixtures, insulation coating, floor/ceiling heating panels, heat pumps, renewable energy sources, and water recovery systems.

Italian professionals are at the forefront in promoting these technologies. Improving existing infrastructure and buildings aim to develop improved environmental friendly infrastructure, one building at a time. These renovations include the improvement of energy efficiencies and lowering of energy costs, experimentation of new technologies, controlling overall financial costs of each structure, and mostly importantly, reduce polluting emissions.

Successful examples of retrofitting projects completed by Italian companies can be found all over the world as well as in China.

意大利公司和专业人士在提供翻新改造服务领域拥有世界一流的专业知识，旨在改善现有建筑物的总体节能，功能和质量表现，同时降低能源成本并减少污染物排放。

Italian companies and professionals hold a world-class expertise in delivering retrofitting services, aiming at the improvement of overall energy savings, functional and quality performances in existing buildings, while abating energy costs and reducing polluting emissions.





历史建筑/文化遗产设计

历史和文化地标项目翻新改造和再开发可能是一个复杂的话题，甚至可能在公众中引起分歧。意大利方法就是首先分析历史遗迹建筑的现有条件，包括文化、社会、艺术和环境因素。

由于意大利历史遗址数量众多，意大利已经对历史性建筑和城市的保护和修复的方法进行了深入的探讨和持续的学术讨论。1964年发行的《威尼斯宪章》（《宪章》）被认为是当今最重要的纲领性文件，在历史性建筑的传统保护和修复领域提供了国际性框架。

自《宪章》发布后，意大利历史性建筑的翻新改造项目都遵循这些原则。在《宪章》的指导下，意大利的历史遗址得以维护，即将被遗忘的建筑也得以留存。意大利在建筑翻新修复领域的专业性形成了高质量、顶尖修建专业人士和相关的产业，覆盖从艺术到建筑修复各领域。

由于意大利在这一领域的专业性和卓越成就，意大利在联合国教科文组织世界遗产列表中遗产数量位居世界第一，共有53处世界遗产，中国位居世界第二，共有51处世界遗产。

在意大利，历史建筑的翻新严格遵守“威尼斯宪章”规定的指导方针和原则。因此，当下在这一领域的意大利专业人士，均拥有超一流的水平以及权威认证的资格。

Renovations on historically relevant buildings in Italy strictly follow the guidelines and principles defined by the Venice Charter. As a result, Italian professionals in this field are today extremely top-skilled and qualified.

B) HISTORICAL BUILDING / CULTURAL HERITAGE DESIGN

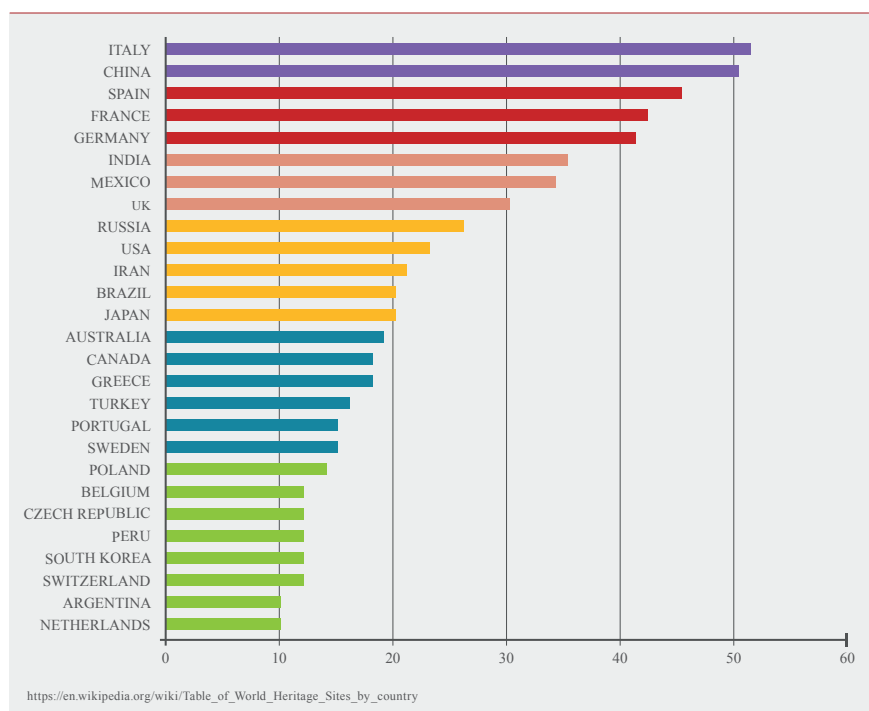
The renovation or redevelopment of any historical and cultural landmarks can be a complicated subject and also can be divisive amongst the public. The Italian approach always starts from the analysis of the existing conditions of the heritage building including cultural, social, artistic, and environmental considerations.

Due to its large number of heritage structures, Italy has had extensive discussions and continued academic debate over methods of conservation and restoration of historical buildings and cities. The *Venice Charter* (The Charter), issued in 1964, is considered the most important modern set of guidelines to provide an international framework in the field of conservation and restoration of historical structures.

Since then, renovations on relevant historical buildings in Italy have followed those principles. The Charter has helped to maintain the country's built heritage and helped to rescue any building which was at risk of oblivion. This focus held by Italian professionals in the field of architectural restoration has led to the formation of highly qualified, top skilled restorers and related businesses, whose competence spans from artistic to architectural restoration.

Due to this focus and level of excellence, Italy ranks 1st in the world for number of total UNESCO World Heritage Sites, with 53 sites, and China in second position at 51 sites.¹

UNESCO WORLD HERITAGE SITES RANKING



¹ <http://whc.unesco.org>; data referring to December 2016. 根据2016年12月数据

意大利在联合国教科文组织世界遗产列表中遗产数量位居世界第一，共有53处世界遗产，中国位居世界第二，共有51处世界遗产。此卓越成果得益于意大利在保存、保护和修复国家历史文化遗产领域无与伦比的专业技术。

Italy ranks 1st in the world for number of total UNESCO World Heritage Sites, counting 53 sites, with China coming second boasting 51 sites. This extraordinary performance could have been achieved thanks to the Italian unrivalled expertise in the preservation, protection and restoration of national historical and cultural heritage.



历史建筑/文化遗产工程

除了意大利几个世纪以来发展的理论框架之外，关于操作程序和如何应对技术问题的争论也一直持续不断。

意大利专业人士对国家遗产保护和修复的程序和技术已经持续改进了数百年。鉴于意大利独特的地理条件 – 拥有平原，丘陵和山脉，以及影响该国大部分地区的地震活动，加上保护历史结构的使命 – 为了子孙后代意大利人不得不深入而广泛地对其历史遗产管理的程序、实践 以及技术进行研究。

意大利专业人士在研究和应用文物的创新操作解决方案方面处于领先地位。其中包括诊断，结构鉴定，文物的无创研究，建筑材料的化学分析和现有建筑的翻新。这样做的目的是为子孙后代妥善地保护历史文物及遗迹。意大利还拥有无可匹敌的建筑遗产翻新和保护方面的专业知识，且渗透到所有意大利著名的建筑历史设计中，从比萨斜塔到梵蒂冈城圣彼得大教堂的圆顶等。意大利对历史保护和修缮的贡献被认为是无价的，从理论框架到引入全球专业人员为现场操作所研发的全新技术和全新技能。中国历史悠久，文化独树一帜，其独幢建筑和建筑群都可以利用这种持久且经受过时间检验的可靠技术专长来进行保护和修缮。

C) HISTORICAL BUILDING / CULTURAL HERITAGE WORKS

Alongside the theoretical framework which Italy has kept on developing for centuries, a thriving debate over operational procedures and how to cope with technical issues continues to persist.

The procedures and techniques through which Italian professionals have conducted conservation and restoration efforts of their country's heritage have been consistently refined for centuries. Given the particular conditions of Italian geography – with plains, hills, and mountains, along with the seismic activity that affects large portions of the country – including protection of historical structures – Italians have had to develop a deep and extensive knowledge of the processes, practices, and techniques for stewardship over its historical heritage for future generations.

Italian professionals are at the forefront in studying and applying innovative operational solutions on artifacts. This includes diagnostics, structural appraisals, non-invasive studies on artefacts, chemical analysis of building materials and renovations on the existing built area. The aim of this is to assure proper preservation for future generations. Italy also boasts an unrivalled expertise in renovation and conservation of built heritage, which includes any well-known historical piece of Italian architectural historical design, from the leaning Tower of Pisa to the Dome of St. Peter's Basilica in Vatican City, and others. Italy's contribution to conservation and restoration is considered invaluable, from theoretical frameworks to the introduction of new technologies and techniques for on-site developments made by professionals operating worldwide. China's precious and extensive history and culture of its single standing buildings and settlements can utilize from this long lasting, reliable technical expertise.

停用服务

2.5 DECOMMISSIONING SERVICES



材料生命周期循环评估和回收

材料和废弃物回收是中国循环经济的支柱之一，也是减少能源和原材料需求的一项战略。意大利是欧洲最先进的材料回收国家，包括城市和工业、危险和非危险的材料。拆迁建筑材料的回收再利用是一个关键问题，特别是在中国，因为在不久的将来将会有大量棚户区被拆除。

纸张回收是意大利纸业的突出特点之一，回收率达93%。在这方面，意大利在欧洲有非常良好的回收记录。

此外，玻璃回收利用和利用粉碎玻璃中惰性/耐火材料再生产是一种动态且发展良好的回收技术。例如，如果不进行回收，生产中就会需要额外的原材料（二氧化硅），回收利用可有助于减少对新材料的需求。不能用于生产新玻璃的碎玻璃可用于生产住宅/工业建筑物中的防火/惰性材料以作为绝缘材料。

A) MATERIALS' LIFE-CYCLE ASSESSMENT AND RECYCLING

Materials and waste recycling is one of the pillars of the circular economy in China and represents a strategy aimed at reducing the energy and raw material needs. Italy is the most advanced European country for material recycling, urban and industrial, both hazardous and non-hazardous. Recycling and reuse of construction materials upon building demolition is a key issue especially in China where a large amount of shanty buildings will be demolished in the near future.

Paper recycling is one of the distinctions of Italy's paper sector, with a recycling index of 93%. Italy has a strong record of recycling in Europe.

Furthermore, glass recycling and production of inert/fireproof material from crushed glass is a dynamic and well developed recycling technology. For instance, a lack of recycling requiring additional quantities of raw materials (silica) for production, recycling can help to reduce the need for new raw materials. Crushed glass that can't be used for producing new glass can be used instead for producing fireproof/inert material as insulating material in residential/industrial buildings.

意大利是欧洲最先进的材料回收国家，开发了最具创新和有效的技术来处理各种类型的城市和工业废物。

Italy is the most advanced European country in terms of materials recycle, having developed the most innovative and effective technologies for the treatment of urban and industrial wastes of any kind.



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中国意大利商会
China-Italy Chamber of Commerce

Authors / 作者

Mr Giovanni Brignone
Mr Massimo Bagnasco
Mr Guido Giacconi
Mr Federico Bullo
Ms Emanuela Falduto
Mr Daniele Marco Marchesin

With contributions from / 鸣谢

Progetto CMR
In3Act
CNH Industrial / FIAT
Cooperativa Ceramica d'Imola
Gruppo Margaritelli
Il Quadrato
Vimar
Giacomini

Graphic design / 平面设计

Advertising Thomas 2

Proof reading/translations / 校对/翻译

Ms Xin Gu
Ms Pei Jin Pan
Mr Lance Noble
Mr Brett Stephenson
Ms Xiaoyi Wu
Ms Bingjiao Cheng



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China-Italy Chamber of Commerce

CHINA-ITALY
CHAMBER OF COMMERCE

Address: Unit 1612, Zhongyu Plaza
A6, Gongti North Road,
Chaoyang District, 100027,
Beijing, China

Tel: 0086-10-85910545

Fax: 0086-10-85910546

Email: info@cameraitacina.com

中国意大利商会

地址：北京市朝阳区工体北路甲6号中
宇大厦1612室
邮政编码：100027

电话：0086-10-85910545

电话：0086-10-85910546

info@cameraitacina.com