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Green Building 绿色建筑特刊

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Foreword

The rapid growth of Chinese cities and the emerging economic, social and environmental impacts of urbanisation present China with enormous challenges. In order to address these challenges the Chinese government adopted the “New-type Chinese National Urbanisation Plan (2014-2020)”. This ambitious urbanisation strategy shall regulate not only the social aspects, but also in particular energy, environmental and climate-related issues of urbanisation in China. Germany also faces various challenges related to urbanisation and its effects. Hence Germany has set course for a sustainable and integrated urban development through the Leipzig Charter on Sustainable European Cities, the National Urban Development Policy and the Climate Action Programme 2020.

Energy efficiency is an important instrument for sustainable urbanisation

In China, buildings take up more than 30 percent of the national primary energy consumption, which is still covered mainly by fossil fuels. With the continuation of urbanisation and rising living standards, this proportion will even increase further. In Germany also nearly 40 percent of the total final energy is consumed in buildings, so the potential and the need for efficiency improvements are similar compared to China. The German government has also set ambitious climate protection goals that can only be achieved if environmental and climate-friendly construction, sustainable urban district development and energy efficiency in the building sector go hand in hand. Through the KfW program “Energetic urban renewal”, the German government supports integrated approaches to improve energy efficiency in districts. The concepts include – but are not limited to – measures regarding the heat supply as well as the conservation, storage and generation of energy. So-called “Renovation Managers” will guide and coordinate the implementation of the measures laid out in the concepts. Investments in energy-efficient heat supply or sewerage and sanitation systems in the districts are further supported by low-interest loans of the KfW.

Climate-friendly construction and housing is an important contribution to emission reduction and energy saving and is hence one of the pillars of climate policy in Germany. The ambitious aim of a nearly carbon neutral building stock by 2050 in Germany re-



Franz Josef Schafhausen
Director General 副司长
German Federal Ministry for the Environment,
Nature Conservation, Building and Nuclear Safety
德国联邦环境、自然保护、建筑和核安全部

城市的快速发展以及在城市化进程下经济、社会和生活生态的变化给中国带来了前所未有的挑战。在此背景下，中国政府颁布了《国家新型城镇化规划(2014-2020年)》。这个城镇化战略不仅涉及了社会，还涉及到了能源、环境和气候保护政策等方方面面。而德国也同样在思考与城镇化相关的问题和挑战。为此，德国在城镇化方面制定和颁发了可持续发展莱比锡宪章，国家城市发展战略，以及2020气候保护行动计划，为国家可持续的和全面综合的发展设置了路线图。

节能是实现可持续城市化的重要手段

在中国，建筑能耗超过全国一次能源消费的30%，而其中大多是化石燃料。随着城市化进程的延续和生活水平的不断提高，这一比例还会逐步提升。而在德国，建筑能耗也接近最终能源消费的40%，因此相比于中国提高能效的潜力和需求也同样很大。

德国政府也提出了雄心勃勃的气候保护目标，而这目标的实现也需要依靠环境和气候友好型建筑，可持续的城区发展，以及建筑节能。通过德国复兴信贷银行(KfW)的“富有能量的城市修复”项目，德国政府支持综合性的提高城区能效发展方针。其中涵盖供热，储能，和能源获取。而负责修复的管理人员也会获得支持，使得他们可以更好的进行节能措施的实施。对于高能效的供热以及污水引导和排放系统，德国复兴信贷银行可以提供低息贷款。

气候环境友好性的建筑和住房会为减排和节省能源做出重要贡献，并因此成为气候保护的支柱之一。为了完成2050年前达到碳中性的建筑目标，德国需要

quires detailed and strategic planning starting today. An important factor – in addition to financial support – is the regulatory law. Thus, from 2021 onwards, all new buildings nationwide must be nearly zero-energy buildings; in order to serve as a role model, public buildings have to fulfil this new standard already two years earlier. This new efficiency standard will be defined during this legislative period until the end of 2016 (under §2a energy conservation law) in the Energy Saving Ordinance (EnEV).

As a step on the way to nearly zero-energy buildings the amendment to the EnEV from 1 May 2014 already contains a tightening of the requirements for new buildings, which will take effect on January 1, 2016: The allowed annual primary energy demand for new buildings is reduced by an average of 25 percent and the rate for the minimum thermal insulation of the building envelope is reduced by an average of 20 percent.

On 3 December 2014, in addition to the Climate Action Programme 2020, the National Energy Efficiency Action Plan was adopted by the German Cabinet. With this step energy efficiency was declared as the second pillar of the Energiewende. Furthermore, in addition to individual buildings, the inclusion of entire districts will be tested. The strategy will contain a mix of instruments to achieve the goals of our government. These include measures on the building envelope and the use of the suitable plant technologies. The remaining required energy will derive from renewable energy sources. In addition, energy performance certificates and the efficiency classes are checked in order to improve transparency and accountability of the measures.

Future cooperation in the framework of the Sino-German Urbanisation Partnership

Germany and China have been working together on energy efficiency and climate protection in buildings for many years. Both countries are facing similar challenges and targets, thus energy efficiency will be a focus area in the context of the Sino-German Urbanisation Partnership. A district approach is a particularly important instrument to increase the use of renewable energy, as well as contribute to the optimised energy-saving renovation of existing buildings. However, these plans are only possible through the interaction between the various actors, including the national level, cities and municipalities. The 11th Green Building Conference does not only give national professionals the opportunity to discuss these issues, but also contributes to the international debate on sustainable urbanisation and energy efficiency.

即刻着手进行详细的战略规划。除了资助政策,法律监管也非常重要。比如2021年起,德国联邦的所有新建建筑必须是低耗能建筑,而公共新建建筑则因其具有的带头作用,将在此的两年内,即2019年就必须达到此标准。而这个新的能效标准将在现任政府执政期结束前,即2016年底之前纳入节能条例(即节能法规第2a条)。

在达到低能耗建筑的目标的路上,2014年5月1日修订的节能条例已经收紧了对新建建筑的要求,并将在2016年1月1日生效:新建建筑的年度一次能源需求量,需要平均降低25%,而外墙体的最小绝热比率则需要平均降低20%。

2014年12月3日,在2020气候行动计划之外,德国联邦内阁也颁布了国家能效行动计划。这也宣布能效已成为了能源转型的第二大支柱。除了对个人住房的要求,整个城区的建设也需要被重新审视。这些策略包括一系列的工具有的组合,来实现德国联邦政府的目标。其中包括对围护结构的有力政策以及对设备技术的投入。剩下所需的能源将来自可再生能源。此外,节能证书和能效级别的认定需要提高透明度和承认度。



Building energy efficiency and urbanisation are important pillars for Sino-German cooperation

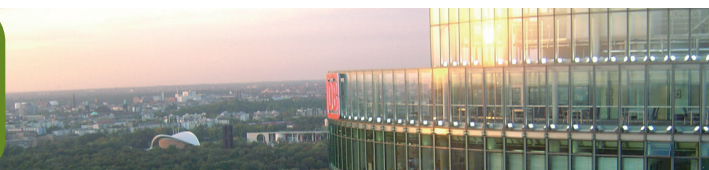
建筑能效和城市化是中德合作中的支柱

Source / 图片来源: BMUB / Inga Wagner

未来中德两国在城市化伙伴关系框架下的进一步合作

德国和中国已在能源效率和建筑领域的气候保护方面合作多年。因为中德两国面临着很多相似和共同的挑战和目标,能效将成为中德城市化伙伴关系中的下一个重点领域。而针对城区方面的重要手段将包含加强可再生能源的应用以及对现有建筑的优化节能改造。这个计划需要与很多机构,尤其是中央和地方方的协同合作。而今年的第十一届国际绿色建筑与建筑节能大会则不仅会为中国在这个领域的专业人士提供交流机会,也将为更多围绕可持续发展和能效话题的国际性讨论做出积极贡献。

Green Building



Investment Opportunities in the Chinese Green Building Market 中国绿色建筑市场的投资机遇

Energy losses due to inefficient materials and inadequate construction are still posing major challenges for China's building sector. Considering the vast amount of new building land that is developed year by year, resolute and prompt action in this area is crucial. Thanks to Germany's advanced building and energy efficiency standards, German companies can put themselves forward as cooperation partners and bring energy efficient solutions and technical expertise to the Middle Kingdom, for instance methods for insulating exterior walls such as external thermal insulation composite systems (ETICS).

Against this backdrop, German Industry and Commerce (GIC) Greater China Beijing in close cooperation with the ETICS Quality Alliance and the Chinese Investment Promotion Agency (CIPA) under the umbrella of the Chinese Ministry of Commerce (MOFCOM), hosted a symposium on "Strategies and Investment Opportunities in the Chinese Building Sector" on 15 December 2014 in Beijing. More than 60 representatives from companies, Chinese governmental organisations as well as experts participated.

Yang Yihang, Vice Director General of the CIPA underlined in his opening speech the strong desire to further expand the collaboration between Chinese and German companies, especially small and medium-sized enterprises (SMEs). In order to make it easier and more attractive for German companies to invest in China in the coming years, MOFCOM established a representative office in Frankfurt am Main, Germany. According to Yang, the reasons for this commitment are based on trustful cooperation with German companies in the past – for example in connection with industrial parks in the eastern Chinese city of Qingdao and the city of Foshan in South China.

In his following speech, Mike Hofmann, General Manager of GIC Greater China Beijing also reinforced Germany's desire to further intensify cooperation with China, especially in the field of environmental protec-

低能效的建筑材料和不当施工产生的能量消耗仍是中国的建筑行业的重大挑战。随着新建建筑的用地量的逐年扩大,在这方面采用果断和迅速的行动是至关重要的。介于德国先进的建筑节能标准,德国企业可以成为中国绿色建筑市场的重要合作伙伴,为中国带来高效节能的解决方案和技术专长,例如墙体保温方法中的外墙外保温系统(ETICS)。

在此背景下,德国商会(GIC)大中国区,及其旗下的外墙外保温质量联盟,与商务部投资促进局(CIPA),共同在2014年12月15日在北京举办了“中德绿色建筑产业政策与投资交流会”。六十多名来自企业和政府的代表出席了会议。

商务部投资促进局的杨依杭副局长在开幕致辞中强调,德国领先的技术优势与中国的市场潜力为双方的交流合作带来了巨大的空间,应进一步扩大中德企业特别是小中小型企业之间的交流与协作。为贯彻落实中德两国总理“推动在德设立投资促进机构”的会晤共识,更好地服务境内外产业对接,投促局在德国法兰克福设立了代表处,即中国国际投资促进中心,而这也由于目前国内有很多开展对德合作的地方机构和产业园区,例如佛山中德工业服务园区和青岛中德生态园,与德国公司已经在过去几年建立了相互信任的合作。



The symposium attracted great interest among businesses and government officials

研讨会吸引了多名来自企业和政府的代表

tion and energy efficiency. The fundamental role of German companies was also emphasised by Han Aixing from the Department of Building Energy and Science & Technology of the Ministry of Housing and Urban-Rural Development (MOHURD). He sees immense market potential in the coming years for German technologies in Chinese cities, especially in the sector for renovating existing buildings. Equipping these buildings with energy efficient technologies such as improved thermal insulation, windows and doors is a largely undeveloped market. Additional subsidies by the Chinese government are expected to be rolled out in this context within the period of the upcoming 13th Five-Year Plan (2016-2020).

Apart from renovating existing buildings, Han expects additional market opportunities in passive house projects and in equipping old and new buildings with photovoltaic systems. However, both fields require further governmental funding and the implementation of supporting market mechanisms.

The topic of passive houses was also addressed in the following speech by professor Song Bo from the Institute of Building Environment and Energy of the China Academy of Building Research. Without dependence on fossil fuels for heating purposes, passive houses require high standards in terms of planning, applied materials and building structure. Passive houses in the long run, however, save much more energy than comparable buildings and therefore justify higher initial costs. A suitable building envelope and systems for heat recovery are crucial for these kind of buildings, said Bo. In order to successfully implement passive houses in the Chinese market, the different regions with diverse climatic requirements must be carefully considered. For this purpose, the China Academy of Building Research is working on a technological roadmap that analyses the building load and energy demand of several pilot projects. Furthermore, key indicators such as strong temperature fluctuations, different building types and overall humidity are also taken into account.

External walls are particularly important for reaching passive house standards. Up to 45 percent of heat losses occur at the exterior walls and an additional 40 percent at the windows. An efficient insulation is therefore indispensable in order to save considerable amounts of energy. There is a promising market and potential for energy efficient systems such as ETICS and related materials in China, since the German

在他讲话之后,德国商会大中华区北京公司总经理迈克也表示德国企业希望进一步加强与中方机构的合作,特别是在环保和节能领域的合作。中国住建部建筑节能与科技司的韩爱兴司长也同样强调了德国企业在中德合作中的重要作用。他谈到了中国拥有对优秀的建筑节能技术强大的市场需求,特别是在改造现有建筑物方面。而这些与建筑节能相关的技术设备,如高保温性能的墙体和门窗材料,还有很大的市场开发的潜力。而中国政府有望在即将到来的第十三个五年规划期间(2016-2020年)推出相应的额外补贴。



Han Aixing from MOHURD informs about market opportunities
住建部的韩司长谈到了建筑节能市场的机遇

除了改造现有建筑,韩司长预计会有更多的被动房项目 and 新老建筑附加光伏系统需求。而正是这两个领域需要进一步的政府资助和支持市场机制的措施。

而对于被动式和超低能耗房的概念,中国建筑科学研究院的建筑环境与节能研究院的宋波主任也加以了突出强调。因为没有对化石燃料用于供暖的依赖性,且供暖能耗极小,被动式房屋对设计,应用材料和建筑结构都有高标准。而从长远来看,被动房因为与同类建筑相比可以节省大量的能量,所以可覆盖其较高的初始费用。宋主任也特别强调了被动房对围护结构,外窗,热回收装置的高性能要求。而为了能在中国市场成功实施被动式房屋,一定要慎重考虑中国不同地区 and 不同气候的要求。为此,建研院正在分析几个试点项目的建筑冷热负荷和能源需求的技术条件。超温频率,计算面积,关键指标的范围,建筑类型的区别和湿度控制等因素也需要被考虑在内。

外墙的性能对达到被动房的标准尤为重要。多达45%以上的热损失发生在外墙和大约40%在外窗。因此有效的绝缘材料对于节省能源是至关重要的。对于节能的技术,产品以及系统供应商,例如外墙外保温质量联盟的合作方而言,在中国是具有广阔的潜在市场

standard in this field is much higher than the Chinese one. For the future development of the Chinese standards, Professor Bo mentioned two key recommendations at the event: First of all, a consistent nationwide indicator for the required energy supply per surface area should be defined. Secondly, depending on the temperature differences in winter and summer, four regions should be differentiated. Such a classification and standardisation would facilitate the adjustment of Chinese standards to different requirements and support the further development of passive houses in China.

The market opportunities in this sector were also addressed by Lu Pan from Baunit. He introduced a passive house project of his company in the eastern Chinese province of Zhejiang. The building has been insulated with premium fire protection materials made of mineral wool which are part of ETICS. Other components of the system include environmental friendly plaster layers, anchors and final coats. Altogether, ETICS are not only able to reduce overall energy demand but also act as efficient air sealing and fire protection measures. Even though insulating materials made of mineral wool rank among the most widely applied insulation materials in Germany since many years, they are rarely being used in China so far.

Xu Hongtao, Rockwool company representative finally pointed out during his presentation that fire protection is not the only valuable feature of mineral wool. It also offers minimum absorbency and outstanding acoustic insulation. One example for this is the renovation of a middle school in the northern city of Tianjin where the construction process had to be interrupted due to heavy rainfall. It was possible to continue within only a week, since the mineral wool transpires very quickly while not allowing surface condensation.

Efficient thermal insulation and high-quality materials are relatively expensive in comparison to what is widely used in the Chinese market nowadays. However, in terms of improved energy efficiency, overall quality and safety in cases of fire, inferior materials cannot match up to advanced systems for external wall insulation. In their concluding remarks, the speakers stated once again that particularly the awareness for positive effects of energy efficiency gains in the building sector as well as the higher environmental compatibility and improved safety aspects of materials in the Chinese building sector must be further increased.

的。由于在这个领域的德国标准比中国高出较多,对于中国未来相应的标准的发展,宋主任提到了两个方案:方案一,全国应设定统一的单位建筑面积累计供热量或设计热负荷指标;方案二,对于不同气候区应设定不同指标,取决于冬夏季温差,中国可划分为四个地区。这样的气候分区便于标准的执行,并将支持被动房在中国的进一步发展。



Energy efficient technologies offer promising market potentials for German companies

德国企业的节能的技术在中国是具有广阔的潜在市场的

而对于被动式低能耗建筑领域的市场机遇,堡密特公司的卢攀先生也加以强调。他着重介绍了公司在中国浙江省长兴的被动房项目。该建筑采用了堡密特外墙外保温系统加岩棉防火隔离带。而外墙外保温系统组成部分包括保温层,胶黏剂,锚栓和抹面砂浆等。总之,外墙外保温系统不仅能够降低整体能源消耗,也可以达到很高的气密性和防火性能。而矿棉作为已多年在德国被广泛应用的保温绝缘材料,在中国的应用至今不是很广泛。

而对于在外墙外保温中的安全应用,洛科威公司的徐洪涛在他的演讲中作出了详尽的分析。他指出岩棉不仅有很好的防火性能,它还可以防止由于湿热产生的建筑问题,具有出色的隔绝噪音的能力,而且没有有害的物质的释放。其中一个例子就是在天津的一个中学改造施工项目因施工期间遇到暴雨而不得不中断,但因为岩棉的蒸腾速度非常快,而不会让在建筑表面形成凝结,工程得以在一个星期后继续进行。

高能效和高品质的绝缘材料与当前在中国市场被广泛应用的材料相比相对昂贵。然而从提高能源效率,防止火灾案件的发生,提高安全度和施工整体质量方面来看,优质的外墙保温系统的优势是劣质材料是无法比拟的。在总结发言中,与会嘉宾们也再次强调,在中国建筑领域,行业的能效意识,建筑材料的环境兼容性和安全性,都仍需进一步提高。

Increasing Energy Efficiency as a Regional Challenge in China's Provinces

A contribution by Nicole Pillen, Deutsche Energie-Agentur (dena)

中国省级地方政府面临提高能效的挑战

来自德国能源署的Nicole Pillen的客邀文章

China's central government has recognised the importance of increasing energy efficiency. From 2005-2010, China succeeded in decreasing its energy intensity by 19%, equivalent to energy requirement savings of 900 MTOE. In this period, an estimated RMB 859 trillion was invested in energy efficiency, 64% of which went to the industrial sector and 30% to the building sector. That makes industry and building the key sectors for energy efficiency.

The Deutsche Energie-Agentur (dena) – the German Energy Agency's activities in the building sector focus in particular on initiating high-efficiency pilot projects (25 German-Chinese efficient houses are currently being implemented) and developing regional building standards. The first technical standard was developed with the Center of Science and Technology of Construction (CSTC/MoHURD) for the Hebei province and is based on the German passive house standard. The first completed pilot project in Qinhuangdao is also in the Hebei province. The province's goal is broader implementation of high-efficiency construction. Hebei serves as a pioneer region for China.

Hebei – a model province

The province of Hebei in China currently has excellent development opportunities, but also faces great challenges. In March 2014, Beijing, Tianjin and Hebei concluded a cooperation agreement, forming China's third urban agglomeration, the Capital Economic Circle, following the Yangtze and Pearl River deltas. In this context, various cooperation projects are to be implemented, e.g. a high-tech park in Tianjin via the Zhongguancun Science Park in Beijing. To achieve the ambitious visions, billions are to be invested in developing industrial parks, the transport infrastructure, manufacturing and logistics centres. This coordinated development of Beijing, Tianjin and Hebei will give Hebei new development opportunities. At the same time, sustainable, green and rapid development in the province is impeded by significant environmental pollution due to the predominance of heavy industry in the industrial sector there, less-than-perfect energy structures and high emission levels. The goal is to reduce emissions in key sectors and to decrease environmental pollution significantly, as well as to improve the environmental ecology and increase the

中国中央政府已经认识到提高能效的重要性。从2005年到2010年,中国已经成功地将单位产值能耗降低了19%,相当于能源需求总量减少9亿吨油当量(经合组织/国际能源署,2013年)。据估测,在此期间,中国政府向能效领域共计投入859万亿元人民币,其中工业领域占总投资的64%,建筑领域占30%(经合组织/国际能源署,2013年),因此,工业和建筑领域是实现提高能效的核心行业。

德国能源署(dena)在中国建筑领域的业务主要是推动高能效示范项目(目前共有25个在建中德合作被动式低能耗建筑示范项目)以及协助编制地区性建筑节能设计标准。其中,将于2015年5月1日正式生效实施的《河北省被动式低能耗居住建筑节能设计标准》作为首部此类技术标准,由中国住房和城乡建设部科技与产业化发展中心(CSTC)与德国能源署在借鉴德国被动式房屋标准的基础上共同编制完成。此外,首个竣工的中德合作被动式低能耗建筑示范项目也位于河北省(秦皇岛市)。河北省希望在省内大力推广高能效建筑,成为国内该领域的先行者。

河北成为试点省份

目前,河北省在发展过程中既存在良好的机遇,又面临严峻的挑战。2014年3月,北京、天津与河北签署合作框架协议,将按照长三角和珠三角经济圈的模式打造中国的第三个城市群——首都经济圈。为此,三省市将在不同领域开展项目合作,如北京中关村科技园区计划在天津设立高科技园区。为实现这些宏伟设想,三地将投入数十亿资金建设工业园区、交通运输基础设施以及制造中心和物流中心。京津冀的协同发展将为河北省带来新的发展机遇。然而,由于产业结构中重工业比例较高,能源结构有待完善,污染物排放量居高不下,环境污染严重等现状,阻碍了河北省可持续绿色快速发展的步伐。因此,河北省确立了实现重点行业减排、大幅降低环境污染、改善生态环境、提高人民群众生活质量的目标。为实现上述目标,必须实施经济结构转型,提高能源效率,加大可再生能源的利用。同时还应抓住机遇,推动具有战略意义的新型产业的发展,如可再生能源、工业装备制造、节能技术及环保技术等。河北省希望在这些领域引入全球领先的技术及管理经验。

standard of living. To achieve this, economic restructuring, increased energy efficiency and more extensive use of renewable energy sources are required. At the same time, the opportunity must be taken to develop strategically important new industrial sectors like renewable energies, industrial plant engineering and energy-saving technology as well as environmental protection technology. The province of Hebei hopes to introduce leading technologies and management experience in these areas.

The Deutsche Energie-Agentur GmbH (dena) – the German Energy Agency – is currently supporting the Government of the Chinese Province of Hebei in establishing an Efficient House Research Centre in Shijiazhuang, which is scheduled for completion in June 2015. The cooperation between dena and the Hebei province aims to set priorities, and make Hebei the national port of call for energy efficient construction. The cooperation is supported by the Chinese Ministry of Construction and its results will be invaluable for the planning of national strategies aimed at saving energy and reducing China's CO₂ emissions. In this context, Hebei and dena signed an MoU during the German-Chinese Government Consultations on 10 October 2014 in Berlin with the objective of enhancing the cooperation as follows:

- Introducing a broad-based subsidy standard and expanding continuing professional development activities in energy-efficient construction
- Lighthouse projects as part of dena's "Eco-City" project, for example in the areas of energy supply systems (heat and electricity), integration of renewable energy sources, water and waste water treatment, waste avoidance
- Reducing the emissions from using coal in power stations, the steel and glass industry and other industry sectors
- Increasing the use of wind turbines
- Developing and utilising renewable energy from biomass, including biogas.

dena's experience has shown that the willingness and abilities of the various provinces are the most important factor when it comes to spreading efficiency standards and reaching goals. In particular, the energy-efficient construction sector is very fragmented with many participants. To increase energy efficiency, all of the relevant stakeholders must be convinced and supported locally. The German institutions and companies in China are available and already involved in working in many provinces.

德国能源署 (dena) 目前正协助河北省在省会石家庄市建设中德建筑节能研究中心。该中心计划于2015年6月全面竣工。



Shijiazhuang Research Centre in Hebei province

位于石家庄的中德建筑节能研究中心

Source / 图片来源: Hebei Academy of Building Research

德国能源署与河北省的合作应设定工作优先领域,力争将河北省打造成国家级建筑节能示范省。双方的合作得到了中国住房和城乡建设部的支持,而项目成果也将被纳入中国政府节能减排措施的设计之中。

在此背景下,河北省与德国能源署于2014年中德政府磋商之际,在柏林签署了相应的谅解备忘录(2014年10月10日),明确在以下方面进一步深化双方的合作:

- 引入具有推广价值的建筑节能标准,全面推动建筑节能领域的系统性培训,
- 在德国能源署“生态城市”项目的框架内实施示范项目,如能源供应系统(供热、供电)、可再生能源的一体化应用、水处理与废水处理、废弃物处理等领域,
- 减少发电厂、钢铁和玻璃制造业及其他工业行业的燃煤排放,
- 提高风能设施利用率,
- 开发、利用生物质可再生能源,包括沼气。

德国能源署的经验表明,推广节能标准、实现节能目标的关键在于各省市要具备充分的参与意愿和足够的实施能力。特别是在节能建筑领域,由于参与方的数量众多且分布零散,要想切实提高建筑能效,必须尽可能地与所有相关主体达成一致目标,获得各方的支持。在华的德国企业和机构已在多个省市参与了相关项目的实施,并愿意继续提供协助。

Sustainable Support for German Building Expertise in China 为了德国建筑节能专长在中国的持续性发展

China's economic growth, dynamic industrial development and ambitious urbanisation plans in recent decades have led to an enormous increase in energy demand. Even though China has shown improvements in terms of reduced energy intensity (roughly by 70% per unit of GDP between 1980 and 2010), the total energy consumption has doubled within the past seven years. In the current 12th Five-Year Plan (2011-2015), the Chinese government decided to reduce energy intensity by another 16 percent per unit of GDP, also by setting a strong focus on efficiency measures in the building and construction industry. Being responsible for roughly one third of primary energy demand, the Chinese building sector offers great potential for these ambitions. Two billion square meters of living space are added annually, whereof one square meter still requires four times more energy for heating and cooling than the European average.

Energy efficient buildings, low-energy projects and eco-parks are therefore supposed to be increased and existing residential and industrial buildings are expected to be refurbished. As Germany enjoys a stellar reputation throughout the world for its high-quality technical products and practical expertise, particularly in the field of green building and energy efficiency, this provides promising market opportunities for energy efficient building technologies and services. Taking the case of eco-parks and reference projects for instance, which are playing an important role in China's environmental policies and reflect the fact that new projects and reforms are often tested on a small scale before being implemented on a broader or even nationwide basis. Eco-parks often represent pilot projects where new technologies can prove their usability and, if applicable, get further comprehensive support in China. This can provide a promising starting position for German companies.

A large number of German small and medium-sized enterprises (SMEs) offer innovative and smart energy efficient solutions to a variety of issues but are still facing many barriers when it comes to capturing foreign markets such as China. In 2007, in order to improve the market and sales potential and support for German products, services and technologies as well as promote global exchange in the field of energy efficiency, the German Federal Ministry for Economic

中国的经济增长,充满活力的工业发展,和城市化的宏大计划带来最近几十年对能源需求的大幅增加。尽管中国在提高能效的方面已有显著的进展(单位国内生产总值的能耗从1980年至2010

年间已增加了近70%),整个能源消耗总量在过去的七年中仍然翻了一番。在十二五规划(2011-2015)当中,中国政府决定,将能耗强度再减少16%,而为此也把建筑行业的能效作为重点。作为占用国家整个三分之一的一次能耗的建筑业也的确具有巨大的减排和提高能效的潜力。每年中国的居住面积都会增加二十亿平方米,而每平米的能耗是欧洲平均水平的四倍。



The fast growing building sector is responsible for roughly one third of primary energy demand in China

不断增长的建筑市场占有了中国近三分之一的一次能源消耗
Source / 图片来源: Wikimedia / Wing1990hk

因此,高效能建筑,低能耗项目,以及生态园区的数目会整体增加,而已建成的居住性和工业性建筑也会有更多翻修的需求。而德国凭借其全球著称的高质量技术产品和实践经验,特别是为绿色建筑和能效领域,可以提供出色的节能建筑技术和相应的完善的服务,为这个领域创造更多减排和提高能效的潜力。就生态园区和示范项目而言,他们在中国的环境政策中扮演着至关重要的角色,而且他们也反映出,在中国的新项目和改革在全国范围内广泛的实施之前,会在一个小范围内进行试验。生态园区常常有示范项目,而新技术可以在其项目上证明其可操作性,如果适用,则会得到进一步的全面支持。而这些可以为德国企业提供很好的起点。

Affairs and Energy (BMW) launched the Energy Efficiency Export Initiative. The programme fundamentally focuses on all relevant foreign markets but special emphasis is placed on countries such as China with high economic growth and an industrial market with strategic importance for the export sector as well as a vast growing building sector. Since its very beginning, German Industry and Commerce (GIC) Greater China has been a reliable partner of the initiative and highly involved in organizing several activities regarding energy efficiency in China on behalf of the BMW.

In an effort to build on actions of past years and increase the sustainability of measures, there is a series of activities implemented by GIC Greater China related to energy efficiency in buildings in 2015:

- Thanks to a one-week fact-finding mission in the second half of May 2015 to Germany, Chinese high-ranking representatives from politics, business, science and administration get the chance to gain practical experience and understanding of German building energy efficiency solutions at first hand, by visiting best-practice projects and leading organisations in Germany in this field. The trip also provides an opportunity to exchange information and develop contacts with experts, decision makers and potential suppliers.
- Moreover, in the fourth quarter of this year, GIC Greater China is organising business trips on building energy efficiency for German companies to North China with focus on building projects and eco-parks, as well as a trip to Eastern China including Shanghai. Several months prior to the two business trips, participating German companies get free access to relevant data by receiving comprehensive target market analyses on the topic of energy efficiency and green buildings in China. These studies include economical and legal frameworks, relevant market players as well as the current implementation state-of-play on the subject of building energy efficiency in China. The market analyses will be introduced at an information event in the German city of Ludwigshafen at the end of June 2015. Several experts at the event will give additional insights on the market potentials and conditions of the Chinese building sector, presenting a suitable preparation for potential export plans and the upcoming business trips.
- In addition to the trade missions, GIC Greater China also plans to promote best-practice reference

大多数的德国中小型企业可以提供多种创新的和智能的节能解决方案,但是就其在国外,尤其是中国的市场比重而言,他们还面临着很多问题和挑战。从2007年起,为了提高德国产品,服务和技术的市场及销售潜力,也同时为了促进能效领域的国际性交流,德国联邦经济和能源部 (BMW) 发起了能源效率出口倡议。这个政府项目特别侧重海外市场,而特别面向如同中国这样具有高经济增长以及对于德国出口具有战略重要性的工业市场,而且中国还是一个具有巨大的不断增长的建筑行业的国家。而自这个项目成立之初,德国商会 (GIC) 大中国区就已经是这个政府项目的合作伙伴,并且已经在中国代表德国经济部举办过多次与能效有关的高级别项目和活动。



The Energy Efficiency Export Initiative provides a useful platform for Sino-German exchange and cooperation in the building sector
能效出口倡议提供了一个中德建筑领域交流合作的有效平台

基于德国商会多年来的政府项目经验的积累以及为了提高这些项目的可持续性,德国商会将在2015年举办一系列建筑能效为主题的活动:

- 在今年五月十七日至二十三日,德国商会将组织中国建筑能效领域的政府,商务,科研及管理高级代表,在德国进行为期一周的考察访问,以了解和获得德国的建筑节能解决方案以及一手实践经验。这次考察活动也包括交流拜访德国领先企业和示范项目。此行将提供独一无二的与专家,决策者和技术供应商交流与互动的机会。
- 在今年十一月,德国商会将为德国企业组织建筑能效领域的代表团拜访位于华北地区的建筑示范项目和生态园区以及参加在上海举办的研讨会。而在参与这个代表团之前,感兴趣的德国企业可以通过德国商会撰写的市场调研报告全面了解中国的建筑能效和绿色建筑行业并且免费获取相关数据。这个报告将会对中国建筑节能领域的经济和法律框架,重要的市场参与者以及其在现行状况作出分

objects on a technology showcase in the fourth quarter of 2015 in North China. A selection of green buildings with German energy efficient solutions that have already been implemented in the Chinese market is presented as the main focus of the one-day event. Besides an on-site-visit, the showcase includes a symposium, providing a forum for exchange and expert discussions on the technologies and solutions applied. In a concluding evening session, opportunities for networking with decision makers and stakeholders of the Chinese building sector as well as project developers, planners, architects and technology suppliers are offered. For further information on the showcase and the opportunities for participation, please refer to the box below.

For implementing the described programme of activities, GIC Greater China works together with the two assigned consultants German Asia-Pacific Business Association (OAV) and Baden-Württemberg International (bw-i) in Germany. Furthermore GIC Greater China relies on synergies and close cooperation with other important players such as Deutsche Energie-Agentur (dena) or Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which also accompanies the Sino-German Energy Dialogue and is responsible for implementing its measures.

The target market analyses, the information event in Germany, the business trips to China and the showcase all bring together relevant stakeholders and offer comprehensive information about the Chinese building sector in terms of opportunities for energy efficient solutions. A technological emphasis is placed on building envelopes (e.g. thermal insulation, windows & doors and insulation glazing), systems for heating, cooling, ventilation and building automation, lighting as well as energy management services.

The linked activities of the Energy Efficiency Export Initiative provide in-depth knowledge and support to exploit the full potential that lies in the Chinese green building sector. In order to do so, a thorough market preparation, recruitment of qualified personnel as well as suitable market strategies and cooperation partners are key factors for success. As an experienced partner, GIC Greater China supports German companies in this endeavour throughout the coming years, with its access to local stakeholders and building market expertise.

析。而在今年六月底，德国商会将结合上述报告的成果在德国路德维希港市举办一次研讨会，届时会上的多位专家会对于中国建筑能效行业的市场潜力和实际情况做出讲解。

- 除了代表团考察和市场调研之外，德国商会还将在华北地区推广建筑能效的示范项目。这类项目应从技术和设计上都采用了德国的节能解决方案，并且已在中国建成。其涉及的推广活动包括对示范建筑的参观，以及以项目执行方，策划方，技术供应商以及规划设计所，特别是中方和德方的建筑能效领域的决策者为主的高峰论坛以及交流晚宴。有关参与此项目的方式请参见文后表格。
- 从项目执行方来讲，德国商会与德方咨询公司 - 德国亚太经济协会以及巴符州经济与科技合作公司紧密合作。除此之外，德国商会还和德国能源署以及德国国际合作机构等组织有多年的项目合作经验，其中包括中德能源对话项目等。



*Sino-German Forum on Building Energy Efficiency held in 2014
2014年中德建筑能效论坛*

市场分析调研报告，在德研讨会，赴华考察代表团以及示范项目的推广等一系列活动，可以把中德建筑能效领域的决策者召集起来，并获得节能解决方案的综合信息。其中的技术重点在于建筑围护（如保温隔热，门窗和保温玻璃），制热和制冷系统，通风设备，楼宇自动化，照明以及能源管理。

能效出口倡议提供的一系列活动可以提供关于中国绿色建筑行业的深入知识和支持。为了挖掘一个市场的潜力，需要在前期阶段就对其市场和合作伙伴进行分析和辨别。德国商会凭借其丰富经验，愿意竭力为德国企业在建筑能效领域提供持续性支持。

Call for proposals / 征集参与项目意向

Is your organisation active in the field of energy efficient buildings or passive houses in China? Do you have innovative reference projects with German technology and would you like to generate more public awareness?

The new “Showcase – Made in Germany” for innovative German energy efficient technologies and services in Chinese buildings offers a unique occasion for you to present your solutions to a broad range of experts, decision makers and media representatives in North China.

Implemented by German Industry & Commerce Greater China Beijing on behalf of the Energy Efficiency Export Initiative of the German Federal Ministry of Economic Affairs and Energy, the project is made-up of a one-day-series of events, taking place in the fourth quarter of 2015, including:

- **On-site visit** and public presentation of selected best-practice buildings in China
- **Expert symposium** demonstrating installed German technologies and building solutions
- **Information brochure** promoting the awarded showcase objects
- **Evening networking event** with stakeholders of the building sector from North China

If you are involved in reference objects in China, which you would like to have considered as part of this project, we kindly invite you to **apply before 31 May 2015**. Up to five buildings will be selected to participate. To discuss this opportunity further please contact us directly.

您的企业在中国建筑能效领域有业务吗？您是否拥有应用了德国技术的创新的节能建筑示范项目，并希望提高其知名度吗？

德国商会的新项目“建筑节能项目展示-德国制造”，会把您的项目中含有的德国建筑节能解决方案，特别是您公司在此节能项目运作中提供的技术，产品，服务，展示给中德两国建筑业的市场决策者。这将是您的独一无二的市场宣传机会。

德国商会受德国联邦经济与能源部的委托，在其发起的“德国建筑能效出口倡议”框架下将在今年第四季度组织举办的建筑能效主题的系列中的中德建筑能效示范项目展示。特别欢迎位于华北地区的项目的参与。入选的项目方可以获得的推广活动包括以下几部分：

- 您的项目将被作为中德最佳建筑能效示范项目用来**现场实地考察**
- 您可以获得在介绍德国建筑解决方案为主题的**专业高峰论坛上的演讲机会**
- 您可以拥有关于针对您的项目制定的**信息介绍手册**
- 您可以参加以中方和德方的建筑能效领域的决策者为主的**交流晚宴**

如果您希望推荐贵机构的项目，请在**2015年5月31日前**联系我们。此次活动最多仅可有五个项目入选。详情请联系：

Mr. Bernhard Felizeter
Head of Department for Environmental Services
German Industry & Commerce Greater China Beijing
Phone: +86-10 6539 6650
Email: felizeter.bernhard@bj.china.ahk.de

傅利泽 先生
环境服务部总监
德中工商技术咨询服务服务有限公司
电话: +86-10 6539 6650
邮件: felizeter.bernhard@bj.china.ahk.de

Challenges and Recommendations for Sustainable Development in the Urbanisation Process in China

A contribution by Li Xiaojiang, President of the China Academy of Urban Planning and Design (CAUPD)

中国城镇化进程中的可持续发展挑战及对其建议

来自中国城市规划设计研究院的李晓江院长的客邀文章

China has been undergoing an enormous urbanisation process in the past 37 years since its opening. On the one hand, this promoted economic development and improved people's living standards, but on the other hand, this process increased the burden on resources and the environment. The characteristics of the development in the current phase can be analysed as follows:

- The present macroeconomic patterns are shifting from the coastal regions to a more balanced development in the whole of China. This provides the central western regions with new development opportunities. Furthermore, the regional disparities are becoming smaller, which has the effect that population flows are adapting from massive and cross-regional to more inter-regional migration flows.
- During the inter-regional development of urbanisation and integration of urban and rural areas, an urban structure with aggregated towns and county-level cities is about to be established. County-level cities offer lower living expenses, affordable housing and concentrated rural employment and are therefore more attractive for settlement.
- Due to the urbanisation process, more rural population will settle in urban areas. This vast migration group and the existing middle class will create immense consumption needs.

The developments resulting from the urbanisation process will cause much more resource consumption, environmental pollution and pressure on public finances for China. By the end of 2014, the Chinese central government has declared the current economic development as the "new normal", which clearly defines the future positioning of the Chinese development. Furthermore, this provides input for the transformation from "construction of the economy" to a more "people-centred" development. The future development path should therefore be evaluated from a resources sustainability perspective:

改革开放37年来,中国经历了快速而规模巨大的城镇化进程,这个进程促进了经济社会的发展与国民生活质量的改善,但同时也带来巨大的资源与环境压力。现阶段中国城镇化的发展特征与趋势主要呈现为如下三个方面:

- 中国当前宏观经济格局由沿海开发转向国土均衡发展,中西部地区迎来新的发展机遇,区域差距的逐渐缩小导致人口流动逐步由大规模,跨区域流动转向区域化流动。
- 伴随城镇发展区域化和城镇密集地区发展的一体化,中国将逐步形成以城镇群和中心城市都市区为主体的城镇化发展格局;另一方面,作为基本行政单位德县级单元,由于可以提供低成本服务、住房和吸纳农村劳动力非农就业的集聚能力也有较大幅度的提升,农村人口城乡双栖、工农兼业现象突出。
- 随着城镇化进程的稳步提升,更多的农村人口将会落户城镇,这个巨大的移民群体和既有城镇人口中迅速增长的中产阶级也将会衍生出多元化的消费需求。



Urbanisation causes high pressure on China's resource consumption, the environment and public finance
城市化给中国的能源消费, 环境和公共财政带来了巨大压力
Source / 图片来源: pp.fengniao.com

- Currently, the National Development and Reform Commission (NDRC), the Ministry of Housing and Urban-Rural Development (MOHURD) and the Ministry of Land and Resources (MLR) are the most important governmental organisations for urban-rural space utilisation as well as urban construction planning and separately in charge of national economy and social development, comprehensive urban system planning and the comprehensive plan for land utilisation. Due to lack of coordination, contradictions appear in the use of space and resources as well as in regulation measures, thus mirroring an ineffective support for environmental protection as well as sustainable land utilisation.
- Following the urbanisation process, local governments are eager to expand urban space and acquire investments. The speed and volume of land development have exceeded reasonable requirements for space, which causes serious damage and security risks. From 2001 to 2010, urban built-up area and the associated land use have increased by roughly 6% respectively, while the average urban population increased by only less than 4%. On the one hand, the local governments profit extensively from the revenues resulting from transferring land-use rights – this is the main financing resource for infrastructure projects and a motivation for urban expansion – on the other hand, this involves the risk of increasing local debts. Since 2001, the annual increase of investments amounts to about 20%, which is much higher than the GDP growth rate. Against the backdrop of high local debts, decreasing exports and strict national land use policies, the large scale growth model with high investment rates will not continue.
- Due to lack of attention paid to the risks of climate change, a large amount of Chinese cities keep expanding without considering the changing environmental situation. The heat island and weak wind effects have an enormous influence on urban populations' health and well-being. Moreover, Chinese cities are characterized by a lack of suitable ecological space, ecological adjustment functions and infrastructure, leading to a relatively low ability for coping with extreme climate conditions and natural disasters.
- In areas with high population growth, public services and infrastructure have not been reasonably allocated. Especially migrant workers do not have the right to enjoy resources such as public services,

随着城镇化进程的稳步推进,上述趋势势必会导致中国将面临更大的资源消耗、环境污染与公共财政压力问题。2014年末,中央明确了经济发展的“新常态”,这不但为中国自身的发展现状做出了清晰定位与解读,同时也为从以“经济建设”导向“以人为本”的城镇化发展模式转变提供了一个宝贵的战略机遇期。基于“新型城镇化”的国家战略,我们应当以可持续和资源环境视角来重新审视中国城镇化的发展途径与问题:

- 现阶段,中国城乡空间资源利用和城镇建设产生重要影响的规划主要由国家发展与改革委员会、住房和城乡建设部、国土资源部三个部门主导,分别对应社会经济发展类规划、城镇体系与城市总体规划、土地利用总体规划。由于部门间缺乏足够协调,在空间与资源利用、引导与管控方式等方面时有矛盾出现,未能对生态环境保护建设和资源可持续利用提供有效支持。
- 城镇化过程中,地方政府追求城市空间扩张和投资拉动来谋求发展,土地扩张的速度和总量均超过城镇化对空间的合理需求,导致对自然环境、生态系统和生物多样性的严重破坏和安全风险。2001年到2010年,全国城市建成区面积和建设用地面积年均增长分别为5.97%和6.04%,而城镇人口年均增长仅有3.78%⁷。国有建设用地出让规模由2001年的1787平方公里升至2010年的4326平方公里,增加1.42倍。全国人均城乡建设用地已从2000年的152.8m²/人快速攀升至2010年的175.5m²/人。一方面,地方政府通过出租使用权获得土地出让金收入,这既是城市建设的主要资金来源,也是城市开展大规模空间扩张的主要动因;另一方面,依赖土地进行融资,而过度融资导致政府债务风险不断增大。2001年以来我国投资增速维持在20%左右,远超过GDP的增速,而万元固定资产投资创造的就业岗位数则由2000年的0.14下降至2010年的0.02。在地方政府负债率高、出口下降和国家严格的土地保护政策下,高投资、大规模土地开发的发展模式将难以为继。
- 由于不重视气候变化带来的风险,中国大量城市在城市规模持续扩张与气候背景发生改变的现状下,热岛效应、弱风效应均对城市居民健康造成极大影响;此外城市缺乏合理的生态空间布局、生态功能调节与基础设施配建,城镇应对极端气候与自然灾害的能力差。

social welfare and housing even though a majority of new houses are being built in newly developed urban areas. Thus, the main challenge in the Chinese building sector is to manage a successful shift from undersupply to affordable housing for middle and low income groups as well as building renovation. However, local governments and real estate companies still try to develop more and more urban areas, leading to large scale construction and dismantlement while increasing the burden on the environment. Besides, the intensity of industrial land use in Chinese cities is very low. Local governments often promote local investments without considering the market value of the land. An increased industrial land use comes therefore often with low economic output.

- The continuous expansion of Chinese cities' dimensions, lack of qualitative green transport services and increasing dependency on automobiles as well as the imbalance of public and private transport altogether leads to high energy consumption and emissions.
- The intensity and volume of governmental regulations are not yet strong enough. There are no functioning resource pricing mechanisms in place for instance. Furthermore, for cross-regional areas there is no effective ecological compensation or control and execution mechanism.

In conclusion, China should focus on resolving its challenges of a growing urbanisation process in view of scarce resources and a widely polluted environment. As sustainable urbanisation is a necessary part of modernisation, China should adopt immediate and active measures. Cities are the core component and motor of economic development and pioneers when it comes to innovation, environmental protection and green building. In the past, some cities in developed European countries had problems similar to the challenges China is struggling with right now and gathered valuable experience over time. From the perspective of globalisation, China should therefore strengthen international and cross-regional networking, pushing forward cooperation and exchange. The targets and limits of urbanisation should be set from a comprehensive space planning perspective, accompanied by a sound taxation system for instance. The strategic conception of urbanisation should be based on people, allowing Chinese cities to take more responsibility in the future development.

- 目前中国常住人口快速增长的地区,公共服务设施与基础设施未能根据人的实际需求及时合理配置,导致服务能力滞后,尤其是大量进城务工人员未能公平享受城镇公共服务和保障性住房;而新区住房和设施建设超前,却未能聚集居住人口,大量商品房空置造成资源浪费。因此,中国住房领域的主要矛盾已经由供给不足转变为住房价格水平与中低收入群体的住房支付能力之间差距不断扩大的矛盾,但目前地方政府和开发商仍未克服以房地产开发启动新城新区建设的冲动,合理改造利用旧建筑,为城市中低收入者提供可以支付的住房的途径也尚未受到足够重视,“大拆大建”的模式在旧城改造仍然十分普遍。大量拆除处于安全使用期的建筑不但在客观上造成资源的巨大浪费,同时也产生大量难以处理的建筑垃圾,对环境造成压力。大拆后的大建,又要重新投入大量难以承受的资源、人力和能源,也与资源节约目标相悖。此外,中国城市中工业用地的低效使用问题仍十分突出,地方政府往往牺牲工业用地的市场价值招商引资,造成工业用地快速增长、占比过高,盲目引入的项目经济产出不尽人意,造成工业用地的长期低效使用。
- 随着城市尺度的不断扩张和高质量绿色交通服务的缺位,居民出行活动对私人机动化交通的依赖性不断加强,公共交通出行比例徘徊不前,城市交通结构失衡导致高消耗高排放。
- 政府层面对可持续发展的管制与引导手段和力度仍然不够充分,尚未建立合理的资源价格机制,跨行政区层面也缺乏有效的生态补偿和监督保障与执行机制,同时缺乏灵活的经济政策手段进行干预与引导。

综上所述,在资源环境的巨大压力下,中国应正视城镇化中的问题与挑战,采取积极的应对措施已经刻不容缓。城镇化是现代化的必由之路,城市是城镇化的核心与社会经济发展的引擎、同时也是创新发展模式的榜样和环境保护的领跑者。欧美许多发达国家的城市也曾经历过中国城市现阶段所面临的问题,并在长期的发展与实践中总结了很多好的经验并取得良好成效。在全球化的背景与视野下,中国应该加强国际、区域与城市间的网络构建,促进在城镇化领域全方位的相互交流合作与学习。如以综合性空间规划来诊断问题,制定发展目标与约束条件;建立健康的财税体制和与其相适应的发展模式;落实以人为本的城镇化等战略构想,促进中国的城市在未来的发展中承担更多的责任。

Integrated Energy Concepts for Chinese Cities

A contribution by Paul Recknagel, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

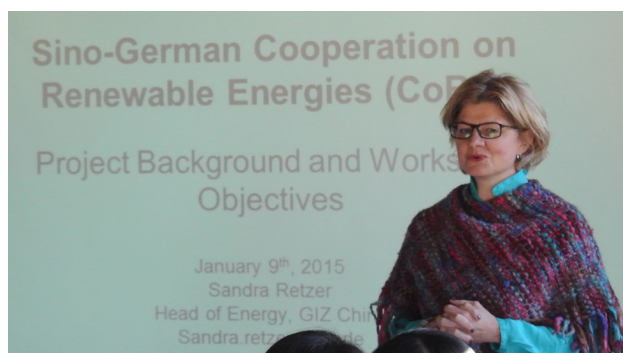
为中国城市制定综合能源规划

来自德国国际合作机构的Paul Recknagel的客邀文章

China is in the process of rapid urbanisation. In the last three decades more than 260 million people from the countryside have been moving to the cities and according to projections, Chinese cities will accommodate up to 1 billion people or 70% of China's population by 2030 – constituting the largest migration movement in human history. Cities have driven much of China's economic growth and at the same time contributed to environmental degradation, e.g. air pollution, water scarcity and soil contamination. Rapidly expanding cities, urban industrial development and increasing urban wealth became the drivers of energy consumption in China. Discovering a more sustainable way for urban development in China's cities is one of the crucial challenges of our time. Hence, developing viable solutions for reducing the reliance on fossil fuels at the city-level by increasing the share of renewables and cutting down energy consumption is essential.

The Sino-German Cooperation on Renewable Energy (CoRE) project implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) aims to address this challenge by facilitating the exchange between China and Germany on renewable energy promotion and system integration as well as innovative urban energy concepts. Cooperating with the National Energy Administration of the P.R. China (NEA) and the China National Renewable Energy Centre (CNREC) the CoRE-project strengthens the Sino-German political dialogue on renewable energies and provides technical and methodological support for selected Chinese pilot cities in developing integrated strategies for raising the share of renewable energy in energy consumption. An integrated energy concept covers the energy supply-side as well as the relevant sectors of energy demand enabling city governments to find the optimal pathway towards an affordable, secure and environmentally sustainable energy system of the future. Only the inclusion of all relevant stakeholders, the coordination between different governmental departments and the execution of in-depth data and scenario analyses, will render this process successful and result in a viable outcome.

中国正经历着快速的城市化阶段。在过去30年间,超过2.6亿中国人从农村转移到城市生活,据推算,到2030年,中国的城市将容纳多达10亿或占中国总人口百分之三十的居民——这将是人类历史上最大的一次迁徙。众多的城市一方面为中国的经济增长做出了卓越贡献,但同时也产生了一系列的环境问题:如空气污染、水资源短缺和土壤污染等。迅速扩张的城市、城市工业的发展及快速增加的城市财富也同时促进了中国能源消费总量的增长。为中国城市探索出一条更可持续化的城市发展之路,是当今时代所面临的重要挑战之一。因此,很有必要制定通过减少城市层面化石能源消耗、增加可再生能源份额并降低能源总消耗的城市能源解决方案。



Sandra Retzer, Head of Energy GIZ China, introducing the project
金彩尔, 德国国际合作机构能源领域负责人, 在介绍项目
Source / 图片来源: GIZ

中德可再生能源合作项目 (CoRE) 受德国环境、自然保护、建筑及核安全部 (BMUB) 委托, 由德国国际合作机构 (GIZ) 负责执行。项目致力于通过促进中德之间在推动可再生能源发展、系统集成及创新的城市能源规划方面的交流, 以协助中国应对这一挑战。项目将通过与中国国家能源局 (NEA) 和国家可再生能源中心 (CNREC) 的合作, 加强中德在可再生能源方面的政治层面对话, 同时为选定的中国试点城市在制定综合战略方面提供技术及方法支持, 以提高可再生能源在能源消费中的占比。综合能源规划涵盖了能源供给方面及能源消费方面的重要领域, 使地方政府可以探索出一条经济可负担的、安全的及环境可持续的未来能源发展之路。只有让所有利益相关者参与进来, 协调政府各部门之间的职责并进行深入的数据和情景分析, 才能制定出可行的方案。

All around the globe, city governments have decided to step forward in de-carbonizing their local energy systems by fostering renewable energy and energy efficiency. As has been demonstrated by several German cities, substantial levers exist on the local level. In 2011, 19 German municipalities, including cities such as Heidelberg, Hannover and Frankfurt started to develop master plans to become 100% climate neutral by 2050. In a number of smaller municipalities in Germany renewable energy generation has already surpassed local energy demand. As the power of local governments is generally limited, cities and towns have come up with remarkably innovative policy programs: e.g. households in Frankfurt can apply for premiums if they reduce their electricity consumption by more than 10 percent, and the city of Flensburg created the “climate pact” – where enterprises and other organizations commit themselves to cutting carbon emissions. In the region of Hannover, the “proKlima” fund sponsors a broad spectrum of innovative energy efficiency and renewable energy projects, for instance solar thermal and CHP plants, low-energy buildings or initial consulting on energy efficiency and conservation. Supported by numerous municipalities in the region and the municipal energy supplier, the fund is unique in Europe.

The Sino-German Cooperation on Renewable Energy project aims to transfer some of these German best practices and innovative solutions, while at the same time building capacities and raising awareness in Chinese pilot cities. The development of integrated energy concepts serves as a foundation for the establishment of innovative local policy measures and viable business models making climate protection an integral part of the local administration and economy.

在全球很多地方, 地方政府已经决定通过推动可再生能源的发展和提高能效来推进地方能源系统中的去碳化进程。一些德国城市已经证明了, 一些小的措施就可以取得很大的成果。2011年, 包括海德堡、汉诺威、法兰克福等城市在内的19个城市开始制定他们的总体发展规划, 其目标是到2050年成为100%碳中和城市。在一些德国小城市, 可再生能源发电量已经超过了当地的能源需求。由于地方政府的权利有限, 许多德国城市及乡镇都制定了一些创新的政策方案, 例如: 法兰克福的家庭如果将其自身的电力消费减少10%便可以申请额外补贴; 弗伦斯堡市成立了“气候公约组织”——企业及其他组织自发约定减少二氧化碳排放; 在汉诺威地区, “proKlima”基金会资助了一系列能效及可再生能源的创新项目, 例如太阳能热及热电联产电厂、低能耗建筑或能效和节能咨询项目等, 基金会得到了许多市政府及城市能源供应商的支持, 这在欧洲是独一无二的。



Dong Xiufen, Division Director at China National Energy Administration, in lively discussion at a planning meeting

董秀芬, 国家能源局局长, 在规划会上参与讨论

Source / 图片来源: GIZ

中德可再生能源合作项目致力于将这些德国的最佳案例及创新解决方案传递到中国来, 对试点城市相关人员进行能力建设培训, 并提高市民的节能环保意识。综合能源规划将会成为地方政府制定地方能源政策和气候保护措施的基础。

Event information / 信息提示

BAU Congress China 2015 will take place on 23-24 June 2015 at the China National Convention Center in Beijing. The congress and accompanying exhibition provides a business, contacts and information platform for high quality design, planning and construction and is supported by strong partners, including econet china, Fraunhofer Building Innovation Alliance, ift Rosenheim, DGNB, bauerlag and Archi-Europe Group.

中国国际建筑科技大会及展览2015将于今年6月23-24日在北京国家会议中心再次拉开帷幕。大会提供了高质量建筑设计、规划和建造相关专业人员商务交流、建立合作和信息交换的平台。同期举办的展览会针对中国市场的需求, 展示建筑、建材及建筑系统领域的高质量产品及前沿技术。大会及展览将得到德中生态商务平台、弗劳恩霍夫应用研究促进协会建筑创新业务联盟、罗森海姆门窗技术研究院、德国可持续建筑委员会、Bauverlag 和 Archi-Europe 等强大合作方的大力支持。

econet china: A Platform For Sino-German Cooperation in Sustainability 德中生态商务平台: 助力中德可持续领域的合作

2014 is widely recognised as a milestone in Sino-German cooperation. The frequent visits by high level politicians and leaders underline both countries' determination to intensify the bilateral relations and create a "comprehensive strategic partnership" and an "innovation partnership". When considering the over 200 cooperation initiatives and projects launched in 2014, environment, energy and climate are always top priorities. For instance, Chancellor Angela Merkel's speech on environment and sustainable development at Tsinghua University drew wide attention from the international community.

econet china is a non-profit initiative of the German industry for the promotion of Sino-German cooperation for sustainability which is coordinated by German Industry and Commerce Greater China. Over the past eight years, econet has been strongly committed to supporting the rich Sino-German cooperation in the field of green buildings and environmental industry. econet is promoting the exchange of information, know-how and enabling an effective networking between all players, including the German and Chinese governments, industries, research institutes and universities.

As a public-private partnership, econet works on a wide range of activities in cooperation with governments and private sectors. Commissioned by the German federal agencies, econet has presided and participated in most Sino-German cooperation projects in the fields of building, energy and environment in China. econet also organises regular technical and networking salons, technical training, energy-efficient study tours to Germany, demonstration projects and other industry technology matchmaking activities in China. Years of professional industrial experience have enabled econet to establish long-term partnerships of mutual trust with local governments, design institutes, developers, industry associations and technical experts.

In 2014, econet salons connected German businesses and organisations in building sectors with key stakeholders in the Chinese government, design institutes and developers in China, such as the Shanghai Municipal Construction Committee, the Greenland Group, AECOM, the Shanghai Branch of China Academy of Building Research Institute. Through technical ex-

2014年被誉为中德关系的一个独特“超级年”，两国最高一级领导人互访频繁，赋予中德关系“全方位战略伙伴关系”和“创新合作伙伴关系”新定位，在双方磋商合作出台的200多项合作倡议与项目中，气候、环境、能源始终是最受到关注并期望进一步保持紧密合作的领域。7月初，德国商会econet china代表也受邀出席并聆听了默克尔总理在清华大学所作的关于环境和可持续发展的演讲。



German Chancellor Angela Merkel delivered a speech at Tsinghua University on 8 July 2014

2014年07月08日德国总理默克尔在清华大学演讲
Source / 图片来源: www.bundesregierung.de

econet china作为德国商会大中华区旗下专职从事绿色技术咨询与服务的专业机构，8年来始终致力于整合德国在节能建筑与环保技术行业的技术资源，从助力中国政府努力实现可持续城市发展的视角，联合涵盖全产业链的德国专家与企业，将德国最前沿的节能解决方案引入中国市场。通过洞悉市场政策与行业发展趋势，不断创造并协调中德政府、企业、科研机构、专业院校间在气候保护、清洁技术、能效和环保领域的合作新机遇。

econet china受德国联邦各部门委托，长期在华主持并参与各项在建筑、能源与环境领域相关的中德合作项目，同时也通过在各地举办定期沙龙、技术培训、德国低碳建筑考察、发起和推广示范性项目、行业技术对接会等各种形式，服务于中国各地方政府、设计院、开发商、行业协会和技术专家，建立长期互信的伙伴关系。

2014年，econet china品牌沙龙组织德国建筑行业企业与上海市建委绿色建筑专家委员会、绿地集团、

change activities, econet helps German technology and service providers to remain highly visible in their targeted Chinese markets.

Last year, a new workshop series “Focus Greentech Series” was first introduced into econet’s existing activity range. With the aim to establish an open platform for exchanges between policy makers and market players, speakers for events of this series are carefully selected from Chinese governments, research institutes and German industries. A wide range of topics is covered, among others: green buildings, renewable energy and energy efficiency. In 2014 alone, the series brought together over 200 professionals to discuss issues such as renewable energy for buildings and heat pumps as well as carbon trading for public building projects. Meanwhile, econet academy, in cooperation with related technology and service providers from Germany, offers customised free technical training for developers and design institutes on a collection of topics, ranging from integrated energy design to German green building technologies and standards.

econet china will continue to organise low-carbon building study tours to Germany this year. With the diversification of demands from the Chinese partners, the study programmes have expanded from office buildings to German corporate R&D centres and factories, German professional green building consultation organisations and commercial real estate projects to hospitals and schools. econet’s cooperation partners in Germany provide a welcoming reception and individual programmes according to visitors needs. In recent years, over 100 design institutes, professional institutions, developers, media and other Chinese partners have participated in the study tours to Germany.

To facilitate Sino-German cooperation projects, econet is actively following and involved in all major industrial platforms. On January 12, 2015 econet china was selected as a member of the standing council of the Passive House Alliance of China (PHA China) during the inaugural meeting held at the Changxing Landsea R&D base. In February 2015, econet china reached a preliminary agreement with Nanjing Hexi New Town Development and Construction Management Committee and Nanjing Eco-Technology Engineering Center on cooperation in the upcoming construction of German demonstration projects.

Last December, econet china received and hosted a delegation of German companies in the field of green

AECOM、中国建筑科学研究院上海分院开展了技术交流活动,从政府、设计院、开发商的不同角度,深入理解德国节能技术在中国市场的需求并协助企业优化推广方式。



econet salon at Greenland headquarters in Shanghai in September 2014
2014年09月在绿地集团上海总部举办德国节能技术交流会

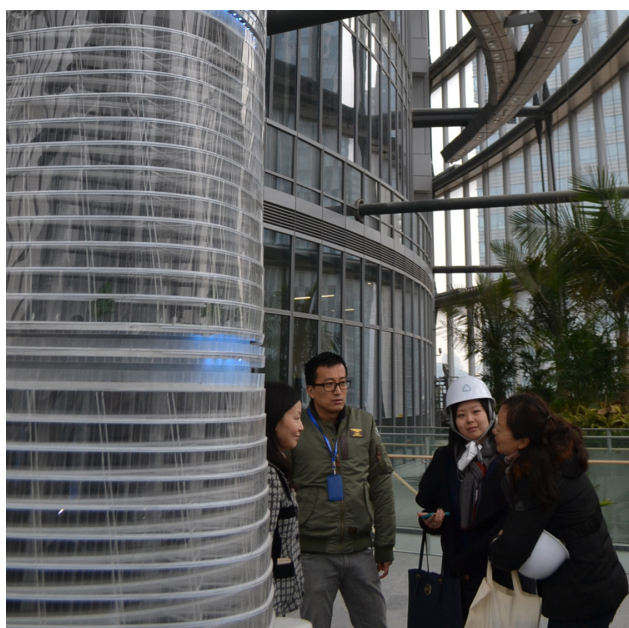
去年最新推出了“聚焦绿色科技系列讲座”(Focus Greentech Series),邀请中德行业权威专家就当下行业热点议题进行解读,主题包括碳排放控制的机制与挑战、德国企业如何参与合同能源管理模式项目等,其中关于最新LEED V4、中国绿色三星与德国DGNB标准的解读专场更是获得了行业同仁的好评与热烈参与!同时,econet学院(econet academy)收录了从整合式能源设计到德国绿色建筑相关技术和标准的培训主题,为开发商和设计院的工程技术人员提供定制式的免费培训,时间灵活,且可预约在受训单位内举办。

econet china今年将继续策划德国低碳建筑考察活动,随着中方伙伴的需求更多元化,考察的项目从办公建筑逐步拓展到对德国企业的研发中心与工厂、德国绿建专业机构的访问,从商业地产到医院和学校等。每一个项目econet china都会安排业主全程接待并根据参观者的专业深度做细致的讲解。近年来,已有超过100名设计院、专业院校、开发商、媒体等中方伙伴参与了econet china组织的德国考察,其专业性和与高效性都获得了中方的高度认可。

econet china积极与行业各平台协作互动,推动中德合作与建设项目。2015年01月12日,由中国建筑节能协会支持的“中国被动式建筑联盟”(PHA China)成立大会在朗诗长兴研发基地召开,econet china被推选为联盟的常务理事单位,发挥整合德国专家与技术的平台优势,与各联盟成员单位通力合作,协助联盟运用市场化的手段,以项目实践为主要方式,通过开

buildings in Shanghai. A forum was organised on the topic of green building standards and energy efficiency in buildings that attracted over 120 professionals from all over China and Germany. In in-depth one-on-one meetings between the visiting German companies and major design institutes, developers and government agencies, German companies were able to network with key market players to guarantee better positioning of their products and technologies prior to the market entry. econet china will receive two business delegations in the field of building and renewable energy in 2015.

As an established professional bridge between German and Chinese industry players, econet china keeps close track of the latest market trends and business opportunities for German companies in China. econet china supports, on the one hand, the Chinese partners to obtain German technology and know-how and, on the other hand, the German enterprises to enter the Chinese market. In 2014, the new health care reform in China and the opening of the market to foreign-owned hospitals brought fresh air into the traditional medical industry. Market demand for advanced hospital design and construction are expected to rise accordingly. Each year, econet china sets a focus on specific market sectors. This year's priorities are among others: smart city, indoor air quality, building industrialisation, energy efficiency for industrial buildings and green construction. We look forward to working together with further interested industry practitioners and creating more win-win cooperation.



econet team at construction site of Shanghai Tower in December 2014
2014年12月econet团队参观上海中心项目施工现场

发商、节能技术企业的参与,联合国内外专家,借鉴德国被动式建筑的设计与施工经验,助力联盟探索出适合中国的低能耗建筑标准。2015年02月,econet china受邀与南京河西新城区开发建设管委会、南京新城生态技术工程中心进行会面,双方就新城内即将建设的中德合作项目达成初步共识。



Founding members of the Passive House Alliance China on 12 January 2015 in Changxing
2015年01月12日中国被动式建筑联盟成立大会暨第一次全体会议在长兴召开

在德国联邦经济与技术部“建筑能效出口倡议”项目框架下,econet china于2014年12月08-10日,接待了来访的德国企业代表团,以绿色建筑标准为主题,在沪举办了规模120多人的中德建筑能效论坛。代表团一行涵盖新能源、照明设计、建筑结构预制构件等领域,econet china还为技术企业组织了一对一会面,通过与感兴趣的研究院、设计机构和开发企业的深入交流,帮助企业对自身的产品和技术在中国市场的定位和应用前景有更充分的认识。2015年,econet china还将陆续接待2个在建筑与可再生能源行业的德国企业代表团访华。

作为中国伙伴获取德国技术知识的重要平台和德国环保企业进入中国市场的门户机构,econet china团队始终坚持洞悉市场发展趋势,立足于发现新的行业机会,积极打开市场,拓展与国内专家沟通的渠道,组织并鼓励德国企业参与行业内务实的活动,将德国在该领域大量的成熟经验及技术衔接到中国新兴市场。比如新医改将为中国医疗市场带来发展机遇的同时,建设可持续的、设施先进的公立医院是改革重要的组成部分。随着外资独资医院试点工作的展开,国外先进医院设计、建设和运营维护管理标准也将加快在中国落地的步伐。econet china每年设定重点关注行业目标,今年的关注重点涵盖智慧城市、室内空气质量、建筑工业化、工业节能与高效施工管理等领域。期待与更多行业同仁紧密交流,创造更多合作共赢的机遇。

Enabling Measurable Sustainable Design – The DGNB System for Districts and Industrial Locations

A contribution by Stephan Anders, Dominic Church, Felix Jansen and Kai Zhang, Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB)

将可持续性变成可以评估的设计工具 – DGNB 城区及工业园区认证系统

来自Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB)的Stephan Anders, Dominic Church, Felix Jansen, Kai Zhang的客邀文章

Cities worldwide are facing major challenges due to increasing urbanisation. Traffic, smog, and polluted rivers are only some of the visible signs. The distinguishing features of today's future-oriented cities are that they offer resource and energy efficient construction and operating systems as well as enduring high living standards and distinctive quality of place. Achieving this offer requires proactive, comprehensive, and transparent planning.

The certification schemes of the German Sustainable Building Council (DGNB) for urban districts, business districts, and industrial locations help consider all aspects of sustainability early in the design phase. Aspects of a district or location's economic, environmental, socio-cultural, and technical qualities are given equal consideration throughout the entire life cycle. The DGNB assessment methodology also addresses the project's process quality and awards certificates in bronze, silver or gold, according to the project's overall performance.

From China to Brazil – The DGNB System's global progress

The DGNB system's unique holistic view of sustainability fundamentally sets it apart from other rating tools. For instance, the DGNB system gauges buildings' and districts' overall performance rather than allocating points for individual measures. This outcome-oriented flexibility promotes innovative and project-tailored solutions. The certification system enables transparency, quality control, and eliminates planning risk from project conception to completion. In applying the criteria, the system evaluates all the relevant sustainability factors, and reflects costs and benefits over the district's entire life cycle. Integrating aspects of sustainability, such as resource consumption, mobility, and future user needs in the early design stages results in greater user comfort and higher living standards as well as adding to the district's financial value. This is sustainability "Made in Germany".

随着城市化的不断推进,人们要面对越来越多的问题与挑战。城市拥堵,雾霾,水污染只是这诸多问题的一角。与此相对的,面向未来的城区和工业园区的特征就在于,它们在中长期范围内始终能够既保证节省资源且高效的建设和运营,又同时提高其区域内的工作和生活环境质量。通过城区、综合商务区和工业园区等系统,DGNB体系可在项目规划过程的初期就为各方提供各方面的可持续性发展的支持。DGNB体系从建筑的全寿命周期出发,将城区的环境、经济、社会文化及功能以及技术等方面的质量放在同等重要的位置上进行综合的评估。另外,建设过程的质量也是评估的重要组成部分。



"Carlsberg City District" in Copenhagen, Pre-certificate in Silver
哥本哈根的"Carlsberg City District"城区获得了银级预认证
Source / 图片来源: Carlsberg Byen p/s

可在世界范围内使用的认证系统

DGNB系统对建筑项目可持续性的各方面综合的评估使其成为,明显区别于其他绿色建筑评价工具的系统。DGNB系统会明确给出建筑可持续性应达到的总体目标,并根据目标达成情况进行评价,而不对每个具体的实施细节都作出规定和要求。目标达成的办法和过程可以灵活选择,这样会在最大程度上保证项目的创造性和灵活性。从项目的开始到最终完成,DGNB系统会在保证项目的透明性,确保质量控制以及提高规划质量等方面起到关键作用。DGNB城区系统可将所有与城区可持续性发展有关的要素进行直观地反映,同时也使生命周期内的费用和成本一目了然。实行可持续发展的城区不止可以提供舒适

The appropriate scheme for each use

The Urban Districts scheme focuses on the spaces between the buildings and the quality of the district's wider location as well as considering overarching concepts for energy, water, and waste, the urban climate, and biodiversity. Buildings within the urban district are only considered in terms of their basic parameters and need not be certified for an urban district to achieve a DGNB certification.

Business districts combine all aspects of an attractive work and leisure environment. Approaches to improve the quality of place, and the worker's child care and retail amenities are just as relevant as environmental performance and energy technology.

Also industrial locations are moving ever closer to the heart of the sustainability debate. DGNB has developed criteria for industry which have been tested in pilot projects for companies such as Volkswagen, Daimler, and Porsche at locations in Germany and abroad.

The use of the DGNB system in China

A unique feature of the DGNB system is its flexible structure, which allows it to adapt to country specific conditions. This is fundamental since a city in China, for example, is in many aspects – such as climatic, cultural, and legal frameworks – not comparable to a city in Europe.

The advantages of the DGNB system are now acknowledged by relevant bodies in the construction and real estate sectors. Particularly in China, the interest for the DGNB Certification System increased in recent years, and up to date several buildings have been certified or have started the certification process. Also, there are many requests for certification of urban districts and industrial locations. One of these projects is the Sino-German Ecopark in Qingdao for instance.

To increase awareness about sustainable construction and the DGNB System in China, the DGNB regularly offers training events on related topics. In addition, the DGNB is continuously expanding its network to governmental and non-governmental organisations in China, such as the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). It also takes part on relevant events such as the "BAU Congress China" and the "China Green Building Conference".

的生活质量,而且由于项目从初始阶段就对耗能,交通,规划等要点的重视,使其更加拥有升值的潜力。

针对不同的项目DGNB可提供不同的认证和解决方案

在城区评级系统重点关注的是建筑物与其所在城区之间的空间,能源与水资源的利用,垃圾处理、城市气候以及生物多样性等的总体规划。城区中的单个建筑物不需进行建筑物认证。DGNB城区系统只对新建城区以及在改建阶段的既有城区(旧城改造)进行评估认证,对单纯的既有城区无法进行认证。综合商务区中应集合有所有与提高工作和休闲环境质量有关的有利因素。所以,在这里旨在改善员工工作及休息环境以及解决诸如托儿和购物等问题的综合规划,与环保和能源技术等问题同等重要。DGNB为工业园区也单独制定出了相应的认证标准。此标准正在德国境内外的诸如大众,戴姆勒,保时捷等公司的多个工业园区进行试用。除了建筑物的质量和能源需求外,开放空间、基础设施和环境的质量以及规划和生产的过程等也是认证的组成部分。



The DGNB certification schemes help consider all aspects of sustainability early in the design phase

DGNB的认证体系帮助建筑在设计初始阶段就考虑到其可持续性

Source / 图片来源: DGNB

DGNB体系在中国的应用

DGNB体系的一大特色是该标准可根据每个国家的具体情况进行调整。因此,中国的城市将不会在DGNB认证中与在气候、文化和法律等方面都截然不同的欧洲城市进行硬性地比较。在中国有多个建筑物已经取得了DGNB体系的认证。另外还有一些城区和工业园区的项目正在认证过程中。其中一个优秀的范例就是位于青岛的中德生态园。DGNB会定期在国内进行各种主题的培训,此外DGNB还积极参与和建立与政府及非政府组织的有关合作。其中包括与德国技术合作公司的合作以及积极参加中国国际建筑科技大会和中国绿色建筑大会等。

Competence Centre for Sustainable Building in China

A contribution by Dirk Schwede, energydesign (Shanghai) Co. Ltd.

中国可持续建筑能力中心

来自energydesign (Shanghai) Co. Ltd.的Dirk Schwede的客邀文章

The social and economic development in China is closely connected to China's built environment. On the one hand the construction sector contributes significantly to China's GDP and is responsible for the large and growing share of the energy, resource and land consumption on the macroeconomic scale. On the other hand the built environment is the formative backdrop of all individual economic practice and all human activity in the professional, cultural and personal context. The design and configuration of the built environment in China is therefore defining for the sustainable development worldwide, the economic and environmental development of the nation and locally decisive for the living and working conditions of every individual.

German companies in China, such as the BASF, employ advanced building standards in their own construction projects, which exceed the local compulsory standards in scope and demanded quality. Thereby it is not the primary goal to reduce energy demand and operation cost, but much more to achieve a sustainable holistic quality, which is able to provide the own employees with a save, clean and productive work environment. The quality of the work environment is a competitive advantage in the fierce competition for the human resource.

Given the ubiquitous pollution, the demand for a more sustainable built environment is evident and it is also obvious that isolated activities in single projects of companies are not sufficient to improve the situation for the own employees and their personal environment substantially. For this reason a public-private partnership (PPP) project between LUWOG CONSULT, energydesign and GIZ has been initiated to identify, extract and communicate examples of advanced sustainable building practices from successful construction projects in China. Experience in projects with advanced sustainability targets are documented and published to inform future prospective building owners, decision makers and designers based on the proven performance of successful projects. Thereby it is the objective to contribute to the overall sustainable development of the construction sector in China.

中国的社会与经济发展与建筑环境息息相关。一方面,建筑行业显著增进了中国GDP总值,在国民经济中大量并且持续增长地消耗能源、资源和土地;另一方面,建筑行业是所有经济实践和人类活动的背景,它奠定产业、文化和个人发展的基础。因此,中国建筑环境的规划与格局影响着全球的可持续发展和中国的经济与环境发展,并且决定当地每个人的生活和工作条件。



The construction sector contributes significantly to China's GDP
建筑行业显著增进了中国GDP总值

Source / 图片来源: blog.sina.com.cn/dfb057

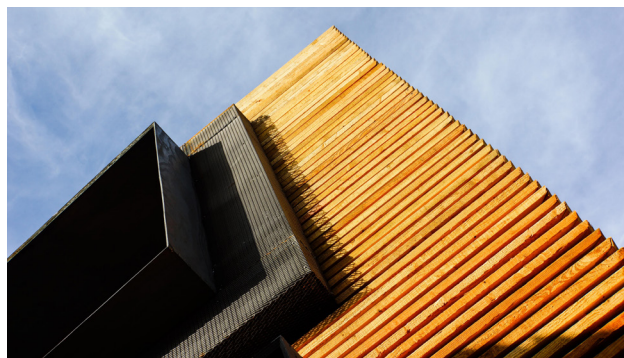
在中国的很多德国企业,比如巴斯夫(BASF),在它们的自用建筑中执行了超越本地强制规范的先进标准。这些项目的核心目标并不都是减少能源需求和运营成本,更主要是力图实现可持续的整体建筑品质,以便为员工提供安全、清洁和高效的工作环境。拥有高品质的工作环境是人力资源激烈竞争中的优势。由于污染普遍存在,对可持续建筑环境的需求显著增长。但不可忽视的是,在企业单体建筑中进行的独立改进并不足以可持续地提高员工的工作环境。因此由LUWOG咨询公司、设能建筑咨询有限公司(energydesign)以及德国国际合作机构(GIZ)联合发起了公私营机构合作项目(PPP),来甄别、选拔和传播中国可持续建筑项目中的杰出案例。可持续项目的先进经验将被记录和出版,这些成功案例的实证表现将为未来的业主、决策者和设计师提供重要信息。此项目力图对中国建筑行业的整体可持续发展做出贡献,通过联结起各个独立发展的最佳实践案例来造福广大民众。

It is the goal to connect and to multiply best practices, developed in individual projects, for the public benefit.

LUWOG CONSULT and energydesign are currently working successfully on the new BASF R&D Centre in Shanghai and employ locally adapted sustainable building measures in the framework of the German rating system for sustainable building (DGNB). Besides the longstanding experience of the partners in sustainable building in China, this project will serve as case study, of which knowledge will be extracted on aspects often neglected in common building projects. Such aspects include holistic energy concepts, acoustics, thermal comfort design, design for all (abled and disabled) and design and material selection for indoor air quality. But also sustainable practice in construction on site as well as effective design methods and integral planning will be addressed.

Further case study projects are to be included and therefore interested clients are invited to contribute with their own project experience to the build-up of the common knowledgebase. The GIZ is involved in the project to support dissemination of knowledge to relevant administration and government stakeholders and thereby extends the reach of the endeavour effectively. In the project a position of an engineer to act as the representative and driver of the "Competence Centre for Sustainable Building" is commonly financed by the industry partners and through funding of the German Ministry for Economic Cooperation and Development (BMZ). The project will produce informative material for public dissemination via websites and presentations, as well as for individual consulting in specific projects and initiatives on local administration levels. It will thereby promote sustainable design and building practice based on proven best practice experience.

在巴斯夫上海研发中心项目中, LUWOG CONSULT 公司与设能建筑咨询有限公司成功地将中国本地可持续建筑措施整编到德国可持续建筑评估体系 (DGNB) 中。此项目不但为中国可持续建筑提供了宝贵经验, 而且作为典型案例, 探究了常规建筑项目中容易被忽视的问题。这些问题包括整体能源概念、声舒适度、热舒适度、通用设计 (正常人和行动不便者) 以及为室内空气质量设计和选择材料, 并且强调施工现场的可持续作业、高效设计方法以及整体规划设计。



German companies in China employ advanced building standards in their own construction projects

在中国的很多德国企业在它们的自用建筑中执行了更先进的标准
Source / 图片来源: Rainer Sturm / www.pixelio.de

还有更多的案例被收录其中。有兴趣的专业人士可被邀请提供他们的项目经验, 共同建构一个常用知识资料库。德国国际合作机构负责向利益相关的机构和政府传播这些知识, 令这些努力更有成效。在此项目中, 将有一位工程师来代表和运营 "可持续建筑能力中心" (Competence Centre for Sustainable Building), 此职位由行业合作伙伴和德国联邦经济合作和发展部 (BMZ) 联合资助。

本项目的成果将通过出版物、网站和讲座等方式向公众传播, 同时也为地方政府的项目和举措提供针对性的咨询。本项目力图通过实证的最佳实践经验, 进一步推动可持续建筑设计与城市发展。

Event information / 信息提示

The 1st Green Building Roadshow Guangdong will take place from 20-22 May 2015 in South China. German Industry and Commerce Guangzhou and the German Consulate General Guangzhou organise this event series for German solution providers which is supported by relevant provincial authorities and the city governments of Foshan and Zhanjiang. Please contact econet china for further information.

首届中德绿色建筑合作广东站路演活动将于2015年5月20日至22日在广州, 佛山, 湛江举行。这次活动将由德国工商大会广州代表处与德国驻广州总领馆主办, 并受到广东省政府和建筑行业主管部门以及佛山和湛江市政府的协助及支持。参加的德国企业将有机会向各地方建筑行业的政府机构, 地产商, 设计院, 协会等潜在客户展示自己的产品及技术。详情请联系德中生态商务平台。

Prospects for Offsets in the Building Sector in China's Carbon Market

A contribution by Constanze Boening, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

中国碳市场抵消机制的前景

来自德国国际合作机构的Constanze Boening的客邀文章

China has been the world's largest emitter of greenhouse gases (GHGs) for several years now, per capita emissions have almost reached the European average, and its share of global energy use and GHG emissions keeps rising steadily. By introducing emissions trading scheme (ETS) pilots in five cities and two provinces and announcing the establishment of a national ETS within the period of the upcoming 13th Five-Year-Plan (2016 – 2020), China has been indicating bold reforms in its governance of energy and environment. Tackling greenhouse gas emissions by introducing a complex market instrument to China's developing economy, which until recently only existed in industrialised economies, is an ambitious objective and sets an important signal on a global scale.

However, China is no stranger to carbon market instruments. When the EU set up its ETS to comply with the commitments under the Kyoto protocol it introduced the Clean Development Mechanism (CDM) as a global offsetting scheme, China became the world leader in this market and CDM projects introduced the private sector to the idea that emissions reduction could bring financial rewards. Along with the market, a community of project developers, financial intermediaries, and verifiers emerged to provide some of the basic capacity for emissions trading in China today. As the international CDM market collapsed, the creation of domestic sources of demand to support what otherwise may have been stranded projects became another motivation for policymakers to consider domestic emissions trading with credits called "Chinese Certified Emission Reductions" (CCERs) as offsets.

Since the offsetting mechanism is a means of connecting carbon markets, its establishment should carefully consider aspects of consistency, integrity and transparency. To date, the National Development and Reform Commission (NDRC) which is the focal point for China's climate policy and the national authority for carbon markets gradually passed and recorded 181 methodologies for voluntary emission reduction projects to be recognised as offsets in the domestic carbon market. 173 of these methodologies come from the international CDM – only 8 are developed speci-

近年来,中国一直是世界上最大的温室气体 (GHGs) 排放国,人均排放量几近和欧洲相等,并且其占全球能源使用量和温室气体排放量的比例也在稳步上升。通过在两省五市引入排放权交易体系 (ETS) 试点和在“十三五”时期内 (2016至2020年)“建立全国性的碳排放权交易体系,中国正在释放能源改革和环境治理的强烈信号。在中国这样一个正处于发展阶段的经济体中引入工业国家新兴的复杂市场工具,是一个雄心勃勃的目标并对全球温室气体排放控制具有重要意义。



China announced to establish a national emissions trading scheme within the period of the upcoming 13th Five-Year-Plan (2016-2020)
中国宣布在即将到来的十三五时期内建立全国性碳排放权交易体系
Source / 图片来源: GIZ

事实上,中国对于碳市场工具并不陌生。当欧盟为了履行京都议定书所规定的承诺建立了欧洲碳排放权交易体系 (EU-ETS) 时,它引入了清洁发展机制 (CDM) 作为全球性的抵消机制。中国逐渐成为了 CDM 市场的领导者, CDM 项目也让私营部门了解到减排可以带来经济回报的理念。在这个市场里,项目开发人员、金融中介机构和核查员出现并在中国建立起初步的排放权交易的能力基础。随着国际 CDM 市场崩溃,处于困境的中国 CDM 项目资源成为政策制定者考虑创建国内排放交易信用额“国家核证自愿减排量” (CCERs) 的一种动力。

由于抵消机制是连接碳市场的一种方式,因此建立抵消机制时要仔细考虑其一致性,完整性和透明性。迄今为止,负责中国气候政策制定和碳市场管理的国家发展和改革委员会 (NDRC),已经逐步通过并备案

cally for the Chinese market – and cover multiple sectors such as energy, chemical, construction, manufacturing, transportation, waste disposal, agriculture and forestry.

In January 2015 China opened the national CCER registry, which will make it possible for CCERs already purchased to be transferred to accounts that carbon market participants hold in the regionally administered ETS. The successful operation of the national carbon registry is a major key to get information on and trading of CCERs. This will ensure that each CCER has been properly recorded and can be traced.

Offsetting approaches in China's ETS pilots

Introducing an offset mechanism into the carbon emissions trading scheme can reduce the compliance costs for emitters. It can promote the use of more low cost emissions reduction approaches, and can stimulate emission reductions in sectors that are not covered by ETS, reducing the overall costs of emission reduction, social impacts etc.

At the same time, the offset mechanism can also have adverse effects. It can influence the environmental integrity of the ETS and affect the market price, thereby affecting the guiding role of the system for low carbon investment. In addition, if the offset credit requirements are not strict enough, the cost will be too low and lead to 'bad money drives out good money', again affecting the market price. If the credit usage is too high, it will affect the actual emission reduction of ETS and the integrity of its targets.

The existing seven pilot carbon markets have allowed the use of CCERs as offsets. At the same time, to ensure environmental integrity, permanent project emission reductions, avoiding an excessive number of offsets which would affect the carbon price, and other considerations, all seven schemes limit the volume of CCERs to 5 to 10 per cent as well as type and local origin of offsetting projects.

However, judging by the market development in the seven pilot regions, China's domestic carbon markets are still direct quota allocation markets, with very limited trading activities on the secondary market. CCERs therefore did not play a substantial role in the first year of operation. It is expected that the demand for CCERs will pick up in the coming years, making it a valuable complementary mechanism to the ETS.

了181个国内CCER方法学。当中173个来自CDM的现有方法学-另外8个是针对CCER的新开放方法学-覆盖多个行业,如能源,化工,建筑,制造,交通,废物处理,农业,林业等。

在2015年1月,国家CCER注册登记系统正式运行,这将使得已产生交易的CCERs可以转移到市场参与者在ETS试点中的碳账户中去。国家碳交易登记系统的成功运作是CCERs信息获取和交易记录的关键,确保每一吨CCER能被正确地记录和追踪。

中国ETS试点的抵消机制

碳排放交易体系引入抵消机制可以减少企业的履约成本。它可以促进使用更低成本的减排方法、能刺激非ETS覆盖行业中的减排,降低减排的总成本和其社会影响等。但与此同时,抵消机制也有其不利影响。它可能影响到ETS的环境完整性和市场价格,从而影响ETS对低碳投资的引导作用。

此外,如果抵消信用额的使用要求不够严格,会使成本太低,导致“劣币驱逐良币”的情况,再次影响了市场价格。如果抵消信用额使用过多,也会影响ETS的实际减排和其目标的完整性。

现有的7个ETS试点都允许使用CCERs作为抵消信用。同时,为确保其环境完整性、确保项目减排量的永久性、避免过多抵消信用量影响市场价格,以及其他方面的考虑,所有7个试点都将CCER的抵消比例限制在5%至10%,甚至有些还限制了项目的类型和发生地。

然而,从七个试点地区的市场发展来看,中国国内碳市场仍是单纯的配额市场,而且在二级市场的活动非常有限。因此,CCERs并没有在第一年的履约中发挥实质性的作用。但预计在未来一年,CCERs的需求将回暖,使它能成为ETS的有效补充机制。

抵消机制是中国的建筑领域的机会吗?

2012年,中国既有建筑面积为510亿平方米,每年新建建筑面积15-20亿平方米。建筑能耗占中国能源总消费的20%左右 – 相对于35%的全球平均百分比要低得多。发达国家如美国、法国、德国和日本,建筑能耗甚至达到40%。但中国增长快速,建筑领域的能效提高仍具有巨大潜力。

Offsetting as an opportunity for China's building sector?

In 2012 there were 51 billion square metres of buildings in China, with an annual increase of 1.5 - 2 billion square metres. The energy consumption in buildings is about 30 per cent of China's primary energy consumption. Rapid growth is expected for China, showing big promise for energy efficiency measurements in the building sector. The 11th Five-Year-Plan (2005 - 2010) puts high attention to energy efficiency in buildings. About 4.9 billion square meters floor space of energy efficient buildings were constructed during this period and resulted in an energy-saving capacity of 46 million tons of standard coal. 182 million square metres of existing buildings in northern China were retrofitted and resulted in an energy-saving of 2 million tons of standard coal.

Energy savings in residential buildings are remarkable when construction standards are in strict compliance with state of the art standards for energy efficiency, but the construction or retrofitting costs will also rise significantly. Reasons for slow progress in China are the low level of awareness in the public, inadequate laws and regulations and lack of enforcement. The most important measure, heating metering, develops slowly and hinders the overall development of energy-efficient buildings. As heating companies charge based on floor space and not on actual consumption, building owners do not have any motivation to save heating energy. During the past 20 years of rapid residential building growth, the demand for energy-efficient residential property stayed very low. As large investments are required for new buildings and renovations, it is difficult to reach the targets when relying solely on the good will of building developers and final users. Relevant economic policies are needed to encourage and guide the market and optimise the allocation of resources. The economic incentive policies for existing energy-efficient buildings are insufficient and no market mechanism has been formed to promote energy efficiency in buildings.

However, there are many obstacles to the application of methodologies in the building sector. The major barriers are complicated methodologies, lack of statistics, differences between design standards and actual performance as well as the high transaction costs. Building projects are already participating in the carbon market. For instance in Beijing there are more than 400 enterprises participating in the regional ETS. Among them, nearly half are associated with the building sector, especially large public buildings. From the

“十一五”计划(2005-2010年)对建筑节能高度重视,约49亿平方米节能建筑在此期间建成,共形成4600万吨标准煤的节能能力。同时,在中国北部地区,对1.82亿平方米既有建筑进行了改造,形成年节约200万吨标准煤的能力。



More than 50 billion square metres of buildings exist in China, with an annual increase of 1.5 - 2 billion square metres

中国既有建筑面积已达到五百亿平方米以上,而每年新建面积仍有十五到二十亿平米

Source / 图片来源: syyy36.com

当建筑能效标准被严格执行时,住宅建筑节能成绩显著,但与此同时施工或改造的成本也显著上升。中国建筑节能进展缓慢的原因在于公众意识不高、法律法规不健全和执法力度不够。最重要的节能措施 - 供热计量 - 发展缓慢,阻碍节能建筑的整体发展。由于供热公司收费是基于建筑面积,而并非实际能量消费,业主没有任何节省采暖能耗的动机。在过去20年,住宅建筑快速增长,但节能住宅物业的需求却很低。

由于新建建筑和改造需要大量资金投入,单靠建筑开发商和最终用户的努力是很难达到节能目标。这需要相关的经济政策去鼓励和引导市场,并优化资源配置。现有建筑节能的经济激励政策不足,没有形成推动建筑节能的市场机制。

建筑领域的减排项目参与抵消机制有不少障碍。主要的障碍是:方法学的复杂性、缺乏统计数据、设计标准和实际性能之间的差异,以及较高的开发成本。实际中,建筑部门已经在参与国内碳市场。例如,在北京,有超过400家企业参与北京的ETS试点,其中,近一半是建筑行业,特别是大型公共建筑。从市场角度来看,所有来自建筑领域的节能和减排项目都可以参

market perspective, all of the energy efficiency and emissions reduction projects from the building sector could join in the carbon market for trading - even on a small scale of several tons. Different types of emissions reduction projects make little difference to the market participants as long as the carbon price is the same as for other CCER projects.

At the same time, the fact must be faced that, under the current rules, the carbon market and carbon trading cannot be the main impetus for energy efficiency and emissions reduction in the building sector. The high costs of building emissions reduction projects compared to the relatively low costs of the power or industry sector, and the fact that the carbon price is probably less than 1/10 of the current building energy efficiency retrofit costs, the market competitiveness of building energy efficiency and emissions reduction projects is obviously low. Attempting to drive building energy efficiency and emissions reduction development totally through carbon market revenue is unrealistic. With the expected reform of national resources and energy prices, in the future the prices of energy will probably rise and government energy efficiency and emissions reduction efforts will increase, so the carbon market price will probably also rise.

Building energy efficiency and emission reduction involves many environmental and external benefits. A market mechanism cannot and indeed, should not, be the only means of promotion and implementation. It needs to be combined with government regulations but simply relying on government regulation might also be insufficient, because ultimately taxes would have to be raised to cover the costs.

From another perspective, many energy efficiency and emissions-reduction projects in the building sector have already received massive subsidies from the government and projects also have already been implemented even without carbon market benefits. In these cases, participating in the carbon market would help raise the public awareness of these initiatives while reducing the burden of government subsidies. The carbon market can provide a platform for demonstration and popularisation of energy efficiency renovation projects and help promote the awareness of energy efficiency and emissions reduction.

This text is an excerpt of a research study conducted by Tsinghua University on behalf of GIZ. The complete study in English and Chinese is available upon request.

与碳市场交易 - 甚至是只有几吨减排量的小规模项目。只要价格和其他CCERs一样,和其他不同类型的减排项目在市场上并没有太大区别。

与此同时,必须面对的一个现实是,在目前规则下,单纯通过碳市场,不可能作为建筑领域节能减排的内在动力。与能源或工业行业相比,建筑节能减排项目成本相对高。事实上,目前碳市场交易价格可能不到建筑领域减排成本的1/10,建筑节能和减排项目的市场竞争力明显偏低。试图完全通过碳市场收益来推动建筑节能和减排的发展是不现实的。不过随着国家资源和能源价格改革,能源价格可能在未来上涨,政府节能减排的力度将加大,因此碳价可能会上涨。

建筑节能和减排涉及到很多环境和外部效益,不能、也不应该完成通过市场机制来推广和实施。它需要与政府法规结合。但单纯依靠政府监管也是不够的,因为最终会导致税收从而增加减排的成本。



The carbon market can increase the awareness and popularisation of energy efficiency renovation projects

碳市场可以提高对建筑节能改造项目的认识及其普及率

Source / 图片来源: GIZ

从另一个角度看,众多建筑节能和减排项目已经得到来自政府的大量补贴,也有不少项目,在即使没有碳市场的收益下也得以实施。这种情况下,参与碳市场将有助提高公众的节能减排意识,能减少政府补贴的负担。碳市场可以提供一个提供的示范和普及节能改造项目的平台并有助于推动节能减排的社会风气。

本文是由清华大学代表德国国际合作机构(GIZ)所进行的一项研究的摘录,中英文报告的完整版可应要求提供。

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Shanghai, China · 30/03/2015 - 02/04/2015
第23届中国国际建筑装饰展览会
上海, 中国 · 2015年3月30日 - 4月2日
www.expocacc.com

Clean Energy Expo China 2015
Beijing, China · 01/04/2015 - 03/04/2015
中国国际清洁能源博览会
北京, 中国 · 2015年4月1日 - 3日
cleanenergyexpochina.com

ISH China & CIHE 2015 - China Intl. Trade Fair for Sanitation, Heating, Ventilation & Air-Conditioning
Beijing, China · 13/05/2015 - 15/05/2015
中国(北京)国际供热通风空调、卫生洁具及城建设备与技术展览会
北京, 中国 · 2015年05月13日 - 15日
bj.ishc-cihe.com

Hospital Build & Infrastructure China 2015
Dalian, China · 23/05/2015 - 25/05/2015
中国国际医院建设、装备及管理展览会
大连, 中国 · 2015年5月23日 - 25日
www.hospitalbuildchina.cn

BAU Congress China 2015
Beijing, China · 23/06/2015 - 24/06/2015
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北京, 中国 · 2015年6月23日 - 24日
www.bauchina.com

Shanghai Intl. Green Building and Energy Efficiency Exhibition 2015
Betontage Asia Congress 2015
Shanghai, China · 04/11/2015 - 06/11/2015
上海国际绿色建筑与节能展览会
上海国际工业化建筑设计、工程与建设峰会
上海, 中国 · 2015年11月4日 - 6日
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Editorial Team / Responsible for Content:

Bernhard Felizeter
(Head of Dept. Environmental Services Beijing / Chief Editor)
Assisted by: Yu Yue, Jonathan Guertler, Susanne Purwins, Lu Wei
With contributions by: Franz Josef Schafhausen, Nicole Pillen, Li Xiaojiang, Paul Recknagel, Stephan Anders, Dominic Church, Felix Jansen, Kai Zhang, Dirk Schwede and Constanze Boening

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内容编辑团队:

Bernhard Felizeter (傅利泽) (北京环境服务部总监/主编)
参与编辑人员: 余乐、Jonathan Guertler (乔纳森)、Susanne Purwins (苏珊)、陆蔚
客座撰稿: Franz Josef Schafhausen、Nicole Pillen、李晓江、Paul Recknagel、Stephan Anders、Dominic Church、Felix Jansen、Kai Zhang、Dirk Schwede、Constanze Boening

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China Energy Web 中国能源网
china5e.com

China Greentech Initiative 中国绿色科技
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China Renewable Energy Society (CRES) 中国可再生能源学会
cres.org.cn

China Renewable Energy Centre 国家可再生能源中心
cnrec.org.cn

German Energy Agency 德国能源署
dena.de

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(BMWi) 德国联邦经济和能源部
bmwi.de

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Sustainable China 可持续发展的中国
nachhaltiges-china.de

Federal Environmental Agency 德国联邦环境局
umweltbundesamt.de

The Guardian 卫报
guardian.co.uk/environment

Climate Protection & CDM 气候保护与清洁发展机制

CDM in China 中国清洁发展机制
cdm.ccchina.gov.cn

China Climate Change Info-Net 中国气候变化信息网
en.ccchina.gov.cn

Chinese Renewable Energy Industries Association (CREIA)
中国可再生能源行业协会
creia.net

Climate Focus 气候聚焦
climatefocus.com

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climateworks.org

CO2 Trade 二氧化碳交易
co2-handel.de

German Emissions Trading Authority
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dehst.de

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cdm.unfccc.int

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jiko-bmub.de

KfW Carbon Fund 德国复兴信贷银行碳基金
kfw.de/carbonfund

Studies & Publications 研究报告与出版物

Asian Development Bank 亚洲开发银行
adb.org/publications

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Environmental Finance 环境金融
environmental-finance.com

econet china team

德中生态商务平台团队



The German Chamber Network

team beijing: / 北京团队:



Mr. Bernhard Felizeter / 傅利泽 先生
Head of Department / 部门总监
Environmental Services / 环境服务部
+86-10-6539-6650
felizeter.bernhard@bj.china.ahk.de



Ms. Yue Yu / 余乐 女士
Project Manager / 项目经理
Environmental Services / 环境服务部
+86-10-6539-6653
yu.yue@bj.china.ahk.de



Mr. Jonathan Guertler / 乔纳森 先生
Trainee / 实习生
Environmental Services / 环境服务部
+86-10-6539-6652
guertler.jonathan@bj.china.ahk.de



Ms. Susanne Purwins / 苏珊 女士
Trainee / 实习生
Environmental Services / 环境服务部
+86-10-6539-6656
purwins.susanne@bj.china.ahk.de

team shanghai: / 上海团队:



Ms. Nadine Ulrich / 邬娜丽 女士
Head of Department / 部门总监
Building, Energy & Environment, econet china
Building, Energy & Environment, econet china
+86-21-5081-2266-1698
ulrich.nadine@sh.china.ahk.de



Ms. Xiao Leng / 冷晓 女士
Manager / 经理
Building, Energy & Environment, econet china
建筑、能源与环境部, 德中生态商务平台
+86-21-5081-2266-1817
leng.xiao@econet-china.com



Ms. Wei Lu / 陆蔚 女士
Strategic Marketing Manager / 战略市场经理
Building, Energy & Environment, econet china
建筑、能源与环境部, 德中生态商务平台
+86-21-5081-2266-1690
lu.wei@econet-china.com



Ms. Ping Tian / 田萍 女士
Project Manager / 项目经理
Building, Energy & Environment, econet china
建筑、能源与环境部, 德中生态商务平台
+86-21-5081-2266-1695
tian.ping@sh.china.ahk.de



Ms. Yiwen Chen / 陈恹雯 女士
Project Assistant / 项目助理
Building, Energy & Environment, econet china
建筑、能源与环境部, 德中生态商务平台
+86-21-5081-2266-1828
chen.yiwen@sh.china.ahk.de

DEInternational Beijing
German Industry & Commerce Greater China | Beijing
Unit 0830 Landmark Tower II | 8 Dongsanhuan North Road
Chaoyang District | 100004 Beijing | PR China
德国工商总会大中华区 | 北京
中国北京市朝阳区东三环北路 8 号
亮马河大厦 2 座 0830 室
邮编 100004
Tel +86-10-6539-6633
Fax +86-10-6539-6689
E-Mail: info@bj.china.ahk.de
www.china.ahk.de

DEInternational Shanghai
German Industry & Commerce Greater China | Shanghai
25/F China Fortune Tower | 1568 Century Avenue
Shanghai 200122 | PR China
德国工商总会大中华区 | 上海
中国上海浦东世纪大道 1568 号
中建大厦 25 楼
邮编 200122
Tel +86-21-6875-8536
Fax +86-21-6875-8573
E-Mail: info@sh.china.ahk.de
www.china.ahk.de