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## 同济与联合国环境规划署续写合作新篇 UNEP and Tongji University Strengthen Cooperation with Renewed Partnership

2月29日，联合国副秘书长、联合国环境规划署执行主任施泰纳（Achim Steiner），同济大学党委书记杨贤金，分别代表双方共同签署新一轮下个五年的《合作谅解备忘录》，决定续写双方合作新篇章。签约仪式在位于肯尼亚首都内罗毕的环境署总部举行。

根据新的合作协议，双方将继续紧密携手，推动双方共建的“联合国环境规划署—同济大学环境与可持续发展学院”更好更快发展，努力将其建设成为全球公认的可持续发展高等教育、科研、南南合作的中心以及可持续发展的全球智库，为全球环境与可持续发展提供专业解决方案。

施泰纳先生表示，作为双方紧密合作十多年的重要载体，环境与可持续发展学院已成为可持续发展的研究中心。同济大学在技术、城镇化、能源、交通等领域有着引领学术研究的传统，我们双方之间这种独特而又长存的密切伙伴关系，将把这些领域的专业经验融入环境署关于绿色经济的愿景和《可持续发展2030议程》。

杨贤金书记表示，“可持续发展研究”在同济大学一直处于优先发展地位，同济大学与环境署之间长期而富有成效的合作，为同济的可持

续发展研究提供了强有力的支撑。此次续约将进一步拓展双方合作伙伴关系，相信必将有利于促进中国的可持续发展、推进与非洲的共同发展，以及加强同济大学的学术研究。

随后，杨贤金书记接受了新华社、中国国际广播电台、《中国日报》的联合采访。在采访中，杨贤金表示：同济大学与环境署的合作对非洲意义非凡。一方面可以促进人才的培养，例如我们在去年就开办了非洲市长培训班，与非洲市长们共同分享同济大学在城市治理方面的理念；另一方面我们也在非洲实施了一些合作项目，例如水资源的示范项目。今后，通过与环境署的合作，同济大学与非洲将进一步互相促进、共同发展。

杨贤金一行还访问了中国驻肯尼亚大使馆，与中国驻肯尼亚大使刘显法进行了亲切深入的交流。我国环保部驻联合国环境规划署代表处副代表刘宁、住建部驻联合国人居署代表处副代表李喆会见时在座。刘显法大使首先向代表团一行表示欢迎，对同济大学多年来与联合国组织的卓有成效的合作表示高度赞赏。刘大使特别指出，自从习近平主席去年12月出席了中非合作论坛约翰内斯堡峰会以来，中非合作开创了一个新的时代，我们和非洲处于同一个命运

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共同体，同济在非洲的一些项目，例如水资源示范项目以及其他的环境项目，与民生息息相关，是中非合作的很好的典范。杨贤金书记表示：同济大学愿意在新的形势下贯彻落实习主席的要求，对已有的中非合作的项目进行总结和提升，同时抓住新的发展契机，力争与非洲在教育、培训、项目建设等方面开展更广泛的合作，促进南南合作，为全球的可持续发展做出新的贡献。

十余年来，“联合国环境规划署—同济大学环境与可持续发展学院”在可持续发展的人才培

养、科学研究等方面不断取得重要成果，业绩突出。迄今已培养来自全球 50 余个国家的 360 多名硕士、博士，毕业生广泛分布于联合国和国际机构、政府部门、科研机构和企业等，其中七成为国际学生，大部分来自发展中国家。在联合国环境署、人居署及国家各部委等支持下，学院还先后开展了四十余个培训和能力建设项目，培训了一千多名政府官员、青年学者等。

在科研方面，学院积极以南南合作推动环境与可持续发展能力建设和技术转移。学院先后翻

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译出版了环境署重要报告《绿色经济》等的中文版，有力推动了可持续发展和绿色经济的传播。学院还深度参与实施以“一河一湖一沙漠一学院”为主题的科技部——环境署——非洲水行动合作项目。

同济大学还在全球可持续发展高等教育领域发挥引领作用。2012年，环境署和同济大学联合发起成立“全球环境与可持续发展大学合作联盟”，目前成员已覆盖全球各大洲近80个国家500多个高校。

“联合国环境规划署—同济大学环境与可持续发展学院”成立于2002年5月，双方已分别于2007年、2012年续签了合作协议

UNEP Executive Director Achim Steiner (R) and Professor Yang Xianjin (L), Chair of the Tongji University Council

Nairobi, 29 February 2016 - The United Nations Environment Programme (UNEP) and Tongji University today pledged to continue a rewarding collaboration by extending and updating a 2012 Memorandum of Understanding (MoU).

UNEP Executive Director Achim Steiner and Professor Yang Xianjin, Chair of the Tongji University Council, signed the updated MoU in a ceremony at UNEP headquarters in Nairobi. Professor Yang Xianjin was in Nairobi with a delegation of university representatives

The updated MoU will build on ongoing efforts to develop UNEP-Tongji Institute of Environment for Sustainable Development (IESD) into a globally recognized institute for environmental and sustainable development education and research,

and South-South and triangular cooperation. The IESD has so far graduated over 300 students from various programmes, with 70 per cent of those coming from outside of China, and many from developing countries.

The renewed partnership will also advance efforts for the IESD to become a globally recognized center of excellence and think tank for sustainable development. Already, IESD has made significant progress in this field in China, facilitating workshops, issuing reports and textbooks, and establishing laboratories and partnerships that further green programmes in conjunction with the Chinese government.

UNEP Executive Director Achim Steiner said, "The IESD represents more than a decade of close collaboration between UNEP and Tongji University and is a centre of sustainable development research. Tongji University has a proud tradition of leading academic research in technology, urbanization, energy and transport. Our unique and longstanding partnership is an opportunity to bring these areas of expertise to bear on UNEP's vision of an inclusive green economy and the 2030 Agenda of sustainable development for all."

Professor Yang Xianjin said, "Research into sustainable development is a priority for Tongji University. Our partnership with UNEP has been long and fruitful and supports these efforts immeasurably. Expanding our partnership is an opportunity to advance sustainable development in China and build on Tongji University's expertise to become a global centre for environmental science research."

The MoU extends the UNEP-Tongji University partnership to 2020, and also solidifies the IESD's role in the rapidly growing Global Universities Partnership on Environment and Sustainability (GUPES).



## 联合国副秘书长访问同济大学并发表演讲 UN Under-Secretary-General and UNEP Executive Director visits Tongji University and delivers a speech



“人类世的故事将会在未来几千年内不断续写，其它生物最终能否有一个圆满快乐的结局，取决于我们能否用一种‘新常态’来替代‘传统的经济模式’。”2月26日，联合国副秘书长、联合国环境规划署执行主任、同济大学名誉教授阿奇姆·施泰纳访问同济大学，并以“人

类世的那些事儿”为题，在同济“大师讲坛”发表主旨演讲，勉励同济青年正视当前人类面临的艰巨挑战，携手多学科协作，创新研发绿色科技，积极付诸有意义的行动，每个人书写人类世时代自己的精彩故事。

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讲演一开始，施泰纳先生从“人类世”说起。他说，人类活动对地球大气层、地质层和生态系统造成了巨大影响，国际上有许多科学家指出我们正生活在人类世时代。也就是说，假设人类还将继续存在数百万年，后人将会清晰地从岩石和冰川上见证人类存在的痕迹。

“人类世时代，人类正在以空前的速度加剧全球气候变暖、生物多样性锐减。”施泰纳先生对青年学子们说，“这个时代也是你们的时代，你们身处其中，将决定是维持塑料星球的‘常态经济’，还是通过提升发达国家和发展中国家人们的生活质量，来塑造你们所选择的事业。”

他说，当今地球上 70 亿人口中有超过一半居住在城市。预计到 2050 年，全球人口将达 90 亿左右，其中将有近四分之三的人口在城市居住，将占有全球 GDP 的四分之三，将消耗地球资源和自然资源的四分之三，并且还会产生全球四分之三的二氧化碳和废弃物排放。人口可以快速增长，可是地球有限的资源却日渐脆弱。

施泰纳先生对同学们说，如同你们正踏入事业的形成期，《2030 年可持续发展议程》和中国“十三五”发展规划汇聚了让我们重新思考如何在人类世时代生存的空前的机遇。从大的层面来说，每一种努力的成败取决于公共和私营部门采取多学科解决问题的能力，但这也同样



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需要个人和企业通过有意义的行动将这些政策付诸实际。

演讲中，施泰纳先生对以 3D 打印技术为代表的绿色科技推崇备至。他说，3D 打印技术能够快速生产产品，成本本低廉，无需运输，能降低成本，减少运输排放量，创造了无限可能，加速了整个新一波技术的到来。随着一座 3D 桥梁在阿姆斯特丹运河上架设，3D 技术开始在中国应用于住宅建设，建筑领域将进入环保新天地，因为过去建筑的建设、作业和拆毁等导致超过三分之一的二氧化碳排放量、废弃物、能源和材料的消耗。3D 打印还可应用于航空领域，为飞机创造更轻巧的零部件，减少排放和噪音，大幅减少材料的浪费。

谈及上海的可持续发展之路，施泰纳先生说，作为全球十大城市之一的上海，已经快速采取了技术措施，比如超级电容车和氢燃料电池汽车的研发、同济大学校园节能节水设施建设等，从而在很大程度上帮助应对这一挑战。但是放眼未来，还会有更多超大城市出现，为此，我们需要看到更多的知识分享，需要公众和个人更为紧密结合的行动，来推动可持续发展的城镇化。“这需要全世界的共同努力，也意味着我们必须从一开始就重新思考我们行事的方式。”

最后，施泰纳先生这样深情寄语同济青年：“现在你必须书写你自己的故事。你可以选择躲在角落里虚度光阴，或把命运交付他人，也可以决定成为建筑师、律师、工程师、科学家、商业领袖中的一员，竭尽全力应对当前中国及全世界共同面临的人类文明巨大挑战。这些故事只能由你们书写，而我期待着发现这些故事。”

在讲演开始前，同济大学党委书记杨贤金会见了施泰纳先生，并进行座谈。杨贤金表示，同济大学将基于过去 14 年来与联合国环境署的成功合作，促进同济更多优势学科共同参与进来，加大智库建设力度，将双方合作提升到一个新高度，共同推动双方共建的同济大学可持续发展学院成为全球可持续发展高等教育、科研与南南合作的中心。施泰纳说，中国正处于生态文明建设和绿色发展转型期，可持续发展理念已列入政府发展战略中，这也为联合国环境署和同济大学合作创造了前所未有的机遇。环境署将在前十多年发展成果的基础上一如既往地继续支持同济大学可持续发展领域的创新发展。

施泰纳先生还参观了双方共建的联合国环境署—同济大学环境与可持续发展学院创办十四年发展成果展。此次“大师讲坛”由同济大学副校长伍江主持。





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“Ultimately the stories from the Anthropocene will be written over thousands of years. Whether they have a happy ending for the elephants or any other living thing will depend on whether or not we can replace 'business as normal' with a 'new normal'.” On Feb. 26th, UN Under-Secretary-General and UNEP Executive Director Mr. Achim Steiner visited Tongji University and gave a speech on “Stories from the Anthropocene” in Tongji’s Global Vision Lecture. He encouraged youth in Tongji to face up to the daunting challenge of human beings, carry out multidisciplinary collaboration, develop innovative green technology, put knowhow into meaningful practice, and write their own fantastic

story.

Mr. Steiner talked about “the Anthropocene” as the lecture started. He said that human activity now has such impact on the atmosphere, geology and ecosystems of the planet that an international team of scientists, including Professor An Zhisheng of the Chinese Academy of Sciences, has confirmed that we are living in the age of the Anthropocene. In other words, assuming there are actually still people around in a couple of million years, they will see very clear traces of our existence in the rocks and ice.



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“There is no debate that this is an age when our actions are indelibly inked on the very fabric of the planet as it warms and it loses biodiversity at over a thousand times the historical rate.” He said to young students, “However, this is also your age. The era in which you will decide whether to maintain 'business as normal' for the plastic planet or to shape your chosen career in a way that improves the lives of people in both developed and developing world struggling with issues like energy and poverty.”

He stated that more than half of the world's seven billion population lives in cities today, compared to just a third in 1950 when the population was just 2.5 billion. By 2050, when there will be around nine billion people, that figure will be closer to three quarters of the population living in urban areas accounting for three quarters of global GDP, consuming three quarters of global energy and natural resources and generating three quarters of global CO2 emissions and waste.

Mr. Steiner said to students that just as you enter the formative years of your careers, the 2030 Agenda and the 13th Five Year Plan converge in an unprecedented opportunity to rethink living in the age of the Anthropocene. To a large extent, the success or failure of each endeavor rests on the ability of the public and private sectors to adopt the kind of multidisciplinary approach reflected in the audience here today. But it will also be determined by the ability of individual citizens and companies to bring those policies to life with meaningful

action on the ground.

In his speech, Mr. Steiner strongly advocates green technology such as 3D printing. He explains that 3D printing is able to manufacture products quickly, cheaply and locally not only cuts costs and transport emissions, but also it opens up endless possibilities for prototyping that will in turn accelerate the arrival of a whole new wave of technology. With a 3D bridge to be printed over a canal in Amsterdam and the first steps into 3D house building in China, architects and urban planners are about to enter a new world of environmental benefits. For transport, particularly areas like aviation, 3D printing will create lighter parts that cut emissions and noise, but will also drastically cut the waste levels associated with traditional metal part drilling from 90 per cent to around 5 per cent.

Addressing the sustainable development in Shanghai, he claims that as one of the world's ten largest cities, Shanghai is already quick to adopt technological solutions that can help tackle challenges on that scale - like super capacitor and hydrogen fuel cell buses, and energy and water efficient facilities like the Tongji Campus. But with the number of mega-cities forecast to grow, we will need to see more knowledge sharing and a more integrated public-private approach to delivering sustainable urbanization, while protecting the ecosystems so vital to sustaining life. And this has to be on a global scale. That means completely rethinking the way we do things from the very beginning.

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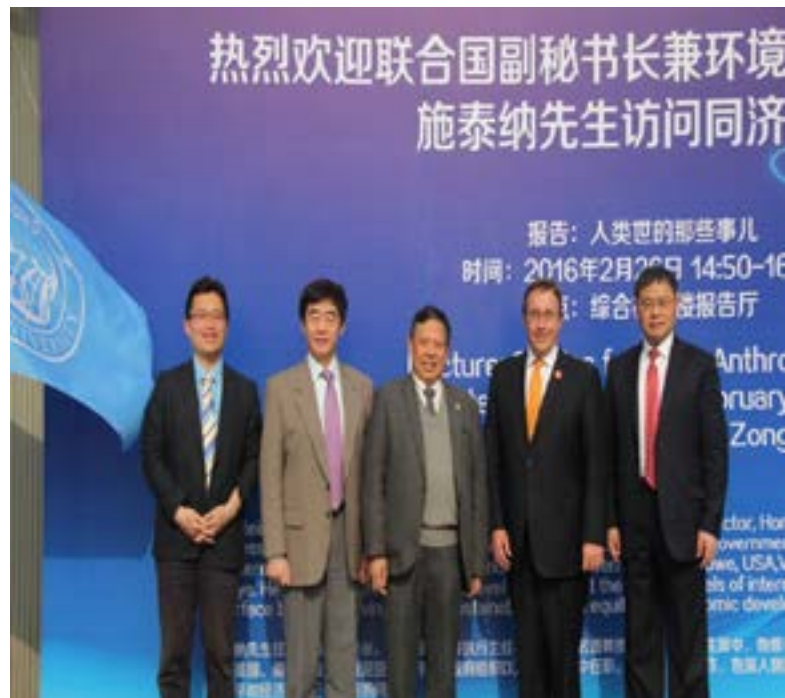
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In the end, Mr. Steiner inspired Tongji students and said that now you must write your own stories. You can choose to fiddle in the corner and trust your fate to others. Or you can decide to be among the architects, lawyers, engineers, politicians, scientists, business leaders and investors that will pool their efforts to tackle the great civilizational challenges faced by China and the rest of the world. These are stories that only you can write, but I for one look forward to discovering

Before the lecture started, Chairman of Tongji University Council Prof. Yang Xianjin welcomed Mr. Steiner and held a meeting. He claimed that based on the 14 years' successful cooperation with UNEP, Tongji University would involve more advanced disciplines and jointly strengthen the development of the Think Tank, elevate the collaboration to the next level, and both promote IESD in Tongji to become the globally recognized center of education for sustainable development, scientific research and South-South Corporation. Steiner stated that China is now in the transition period of ecological civilization construction and green development, the concept of sustainable development has already listed in the developing strategy of the government, which brings unprecedented opportunity for the cooperation between UNEP and Tongji.

University. UNEP shall keep supporting Tongji University on innovative development in the field of sustainable development just as in the past years.

Mr. Steiner also paid a visit to IESD and reviewed the exhibition of milestone of collaboration between UNEP and Tongji. Vice President of Tongji University Prof. Wu Jiang hosted the Global Vision Lecture this time.



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我今天能在同济大学发言，首先要感谢杨贤金教授，伍江教授和李风亭教授的热情邀请。我也要感谢所有在座的各位——因为我需要你们的帮助。

人类活动对地球大气层、地质层和生态系统造成了巨大影响，国际上许多科学家，包括中科院安芷生院士指出我们正生活在人类世时代。也就是说，假设数百万年后人类还存在的话，他们将会从岩石和冰川上清晰地看到我们曾经



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存在的痕迹。

人类世究竟始于农业的发展；工业革命；还是人口、消耗和浪费过度增长的时代，尚存在争议。但是毫无疑问的是，这个时代，全球正以快于历史 1000 倍的速度经历气候变暖，生物多样性锐减的厄运，而这一切都是我们造成的。

然而，这也是你们的时代。你们身处其中，决定是否维持“塑料星球”的“常态经济状态”，或者在某种程度上塑造你的职业，提高发达国家和尚在能源和贫困问题中挣扎的发展中国家的人们生活质量。要知道，8 亿人口经受饥饿的同时却有 1/3 的食物被浪费。1/4 的地球表面面积经受环境退化；6000 万人正在逃离战乱和疾病，这是历史上最大规模的人口迁徙。正如詹姆士·马丁在《有线社会》一书中所说，“为了改变现状，我们必须过渡到新的技术，新的社会形态，新的消费产品，新的生产和花费方式中去”。

“新的方式”正是指可持续发展 2030 议程，去年九月，近 200 个国家在纽约签署了这一协议。它为打造一个健康的星球提供了宏伟但是必要的基础，并且没有人被遗忘在一边。这一议程也极大地受益于中国正在建设的新常态，新常态强调将社会经济发展质量置于第十三个五年计划的中心位置。过去的两个五年计划已经显示了中国有决心改变过去能量密集型增长方式，完成 2030 年所设的排放目标。

然而，新的五年计划通过引入生态文明这一概念进一步重新平衡经济增长，着重于服务、创新、减少不公平和维护环境的可持续性等领域。换

言之，正如你们正在踏入职业生涯的规划之年，2030 议程和第十三个五年计划前所未有地达成契合，两个计划都在重新思考如何在人类世时代生存。从大的层面来说，每一种尝试和努力的成功与否都基于公共和私营部门所采取的综合学科研究方法，这依赖于今天在座的各位，但同样也需要个人和企业通过有意义的行动将这些方法和政策付诸行动。让我举个例子。我还是学生的时候，你们中大多数还没出生，当时，想要弥补对臭氧层的破坏看起来是不可能的任务。大部分人甚至没有听说过臭氧层，而你很难向人们解释清楚一个他们看不到的洞。

因此解决这一问题需要国际社会在科学、政策和行动上协同一致。一方面，这促成了维也纳会议和蒙特利尔协议的诞生，这两者是最早的国际间环境合作条款，我们也希望以后会有更多类似的合作协议出台。另一方面，这也促成了在 T 恤上印信息，搞宣传的时尚。

现在这看起来似乎有一点过时，但在社交媒体和互联网出现以前，任何点滴举动都能起到作用。最初设定目标在 12 年内将 5 种氟氯烷碳化合物减少一半，最终实现了 10 年内消除 15 种氟氯烷碳化合物，臭氧层有望在本世纪中叶之前恢复到 1980 年以前的水平。让数百万人免受皮肤癌或者白内障的侵害，证明了通过全球性大规模协作寻求改变是可能的。

实施 2030 议程和十三五计划，也存在矛盾叠加、风险隐患增多的情况，但幸运的是这一次我们有经验，并非从头开始。

我这次来上海是应邀参加 G20 财长会议。会上

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我们将讨论未来 15 年内在环保领域投资 90 万亿美元，以及为何大部分的资金来源于私营部门。比如，中国人民银行和国务院发展研究中心预测中国每年在环保上需要 4000 亿美元的投入，其中至少 85% 来自私营部门。

环境、社会和财政方面的合作是极其复杂的。这也是为何联合国环境署要花 20 年的时间与全球数百家金融机构商讨以便更好地理解各个问题和机遇，使每个国家的社会和个人投资回报最大化。比如我们协助中国人民银行成立了一个超过百名成员的特别工作组，这个工作组致力于 14 个提案的撰写，旨在建立绿色金融系统，包括债券，税收改革以及排放权交易。

好消息是越来越多的私营部门投资者意识到地球和人类的健康同样意味着良好的收益。以可再生能源为例，国际能源机构的数据显示未来 20 年内对更经济可行的能源进行有效投资将会促进经济累计产量增加 18 万亿美元，这一数量比美国，加拿大和墨西哥经济产量总和还要多。这同样解释了为什么今天清洁能源的产品数量超过了原计划的三倍之多，为什么 2014 年在可再生产品上的投资在全世界范围内增长了 17% 以及在发展中国家增长了 2 倍，为什么在过去 5 年内的就业数量翻了一番，几乎达到 800 万。

你们中的许多人正在考虑未来的职业规划，值得注意的是作为全球最大的氢能、风能和太阳能生产国，中国占到了全球投资总额的 1/3，拥有近 350 万相关工作岗位。

这一趋势为未来 60 年的低碳经济开了一个好头，也是努力落实巴黎气候协议的体现。但是

更大的挑战在于如何以最快的速度最大程度上扭转地球变暖的趋势，将温度上升限制在不超过约 1.5 摄氏度的范围之内。因为科学家告诉我们，如不立即行动，所造成的破坏将是不可逆转的。

谷歌 moonshots 计划中著名的“10-X”文化，强调不追求比原先进步 1/10，而是比原来好十倍。这种精神是我们这个世界所需要的，我们需要比谷歌更谷歌——在方方面面，在每一项研究中，在每一种工作中。

庆幸的是一切都正在发生。来自前沿的创新行动正努力将政策转化成实际的利益，并且引领包容性绿色经济的转型。

回到肯尼亚，联合国环境署的总部，M-KOPA 提供了一种“现购现付”的太阳能模式。在肯尼亚，坦桑尼亚和乌干达，超过 200,000 户人家已经在使用这种太阳能，并且正以每天 500 家的数量增加。这是绿色经济转型中出现的一种新型商业模式。

当然，廉价的清洁电力也带来其他收益。健康和教育就是其中显而易见的两方面，那么交通又如何呢？

重污染两轮摩托车的使用在非洲发展迅速。在中国，超过 1 亿 5 千万的摩托车已经被更经济方便的出行方式所取代。因此，越来越多获取清洁能源的方式为非洲的技术跨越和中国的绿色产业输出打开了一扇大门。

这种绿色技术的飞跃也发生在其他领域。想想

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叠层制造技术——或者 3D 打印。结合大数据的力量和革命性的新产物石墨烯和纳米技术，人类掌握了通往第四次产业革命的钥匙。一系列物质经过转化被再利用，例如将一次性塑料和其他废弃物变为汽车零部件和医疗供材，气象站和太阳能板基地等等。

在交通方面，特别是飞机，3D 打印将创造更轻巧的零部件，以便减少排放和噪音。同时，它也大大减少了传统金属零件的浪费，从 90% 下降到 5% 左右。精细的零部件已经实现标准化生产，但是当结合了工程专业——例如仿生学，所带来的效益将更为巨大。

这种潜在在建筑方面也同样适用。建设、操作和拆毁等作业会造成超过 1/3 的二氧化碳排放、废弃物的产生、能源和材料的消耗。但请注意，这是早期的情况，自从在阿姆斯特丹的运河上架设了一座 3D 桥梁，以及中国首次在住宅建设上使用 3D 技术后，建筑师和城市规划师将进入一个环保的新世界。

快速、廉价地在本地生产这些产品不仅能够降低成本，减少交通排放，如若这种模式被复制，能创造无尽的可能，反过来加速技术新浪潮的到来。

今天，地球上 70 亿人口中，一半多人居住在城市，相比较下，1950 年全球仅有 25 亿人口，那时城市人口占 1/3。但是到了 2050 年，全球预计会有 90 亿左右的人口，其中接近 3/4 在城市居住，占全球 GDP 的 3/4，消耗地球资源和自然资源 3/4，并且产生全球 3/4 的二氧化碳和废弃物。

人口可以快速地增长，可是地球的资源是有限而脆弱的。

作为全球十大城市之一的上海，已经快速采取了技术措施，从而在很大程度上帮助解决这一挑战——比如超级电容和氢燃料电池汽车，以及在同济校园里看到的节能节水设施。但是随着越来越多的特大城市迅速崛起，我们需要鼓励更多的知识共享和公共—私营部门更紧密的合作，保证城市的可持续发展，同时保护人类赖以生存的生态系统。

这需要全世界的共同努力，也意味着我们必须重新思考我们生产的方式。

我相信你们中的许多人已经很熟悉生命周期评价的概念，就是对一个产品从最初设计，生产到最后的报废和回收全过程进行跟踪与定量分析，将环境足迹考虑在内——我希望你们已经有人使用了联合国环境规划署和代尔夫特大学共同编撰的可持续设计指导条例。但我们需要更深一步地推广这一理念——我们要让那些产品设计者知道这个概念，并对他们使用的设计材料和技术进行研究。

比起事后确定、追溯和解决问题来说，自动地采取一种完善的生命周期评估将会更容易实施。环保化学家约翰·华纳和保罗·阿纳斯塔斯为这种前期的评估举过一个很好的例子。他们倡导重新思考培养未来化学家和设计师的教学方法，包括建立机制更好地理解材料的毒性和对环境的影响——这也确保了新一代可持续绿色化学的产生，从而为跨行业进步创造了条件。考虑到保罗研究了 23 年才获得了纯的二氧化钒，



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他知道他在说什么。

回想那个不可思议的成功故事，氟氯碳以及其他臭氧损耗物质的淘汰的扭转了臭氧层的减少趋势。很多物质都被氢氟烃所取代，当时人们认为氢氟烃不会对臭氧层造成直接破坏。但随着时间的推移，科学家发现氢氟烃会加速地球变暖。如今，一些科学家估计氢氟烃所造成的地球变暖的影响是二氧化碳的 10,000 倍。研究表明这种吸收红外线辐射的物质会聚集在平流层中，尽管它不会以同样的方式破坏臭氧层，但也会对环境产生负面影响。因此，如今我们需要新的替代物。

试想一下——全世界有多少高学历的建筑师、工程师、行业设计者、投资家和政策制定者了解化学品选择背后的广泛内涵？或者反之亦然。今天在座的各位同学来自不同的大学——但是除了正式的活动，你们平时多久会找机会合作一次呢？

苹果或许是一个一流的技术品牌，但是史蒂夫乔布斯一再重申，他们最初的成功很大程度归功于合并了字体选择，而他的这一决定源于他无意中上过的书法课。

正是这种结果，显示了为何有必要改用一种更具战略性的合作方法取代不断摸索，反复试验的循环，我们要转变我们前期研究、教育，思考的方式。这也是为何联合国环境规划署如此致力于和同济大学合作创办可持续发展学院，以及发展全球大学环境与可持续发展伙伴关系项目，如今该项目在全球已有 800 个成员。另外，环境可持续学生大会也在日益成长。

出售了贝宝 (PayPal) 公司的股票，埃隆·马斯克建立了环保车公司 Tesla，家用光伏发电项目公司 Solar City 以及太空探索技术公司 SpaceX。埃隆·马斯克非常了解合作的意义，以及重新思考已有的秩序。用他的话来说：“不断思考你如何能做的更好以及不断质疑你自己。”

全世界范围内，很多年轻人也加入了这一行列。以去年地球数据创新之眼的决赛选手为例。“新加坡鸟瞰图”运用了他们收集来的空气质量数据，制定个性化污染指标，指导人们调整他们的行为。“伐木道路”地图阐释了刚果盆地 10,000 多条伐木路的状况，指出违规、毁坏等行为的存在，并强调了潜在的陆地权利冲突。“砍伐热带雨林”项目通过为前线社区赋权，运用电子地图和无人机来对抗亚马逊地区的环境威胁。

这也是我在开始提到需要你们帮助的地方。下周联合国野生动植物日的主题是杜绝偷猎大象，我们也需要运用一些创新性的思考应对非法象牙交易等问题。

习近平主席关于禁止交易的承诺，相关组织和个人发起的运动，以及联合国环境署亲善大使李冰冰的呼吁都对象牙的贬值起到了帮助作用。但是提升公众的意识还有一段很长的路要走。技术在其中起到十分关键的作用，你们中的许多人知道如何将想法变为行动。我们有一个专门的网站，人们可以在上面分享他们采取了哪些行动庆祝世界野生动物日。我希望等我下周浏览的时候，你们中有人已参与其中。

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女士们，先生们，人类世的故事将会在未来几千年内不断续写。大象或者其他生物是否能有一个快乐的结局取决于我们是否能用一种“新常态”来替代“传统的经济模式”。

我们这一代人的故事将在 2030 议程，巴黎协议以及未来的行动中见证成与败。现在你们必须书写你们自己的故事。你们可以选择事不关己，依赖他人。或者你可以成为建筑师、律师、工程师、政治家、科学家、企业领导者和投资家，尽力去解决中国以及全世界人类文明所面临的挑战。这是只有你们能够书写的故事，但是我期待能够看到它们。

谢谢亲爱的同学们！

I would like to thank Professors Yang Xianjin, Pei Gang, Wu Jiang and Li Fengting for their kind invitation to speak here today and I would like to thank all of you for coming along - because I need your help.

Human activity now has such impact on the atmosphere, geology and ecosystems of the planet, that an international team of scientists, including Professor An Zhisheng of the Chinese Academy of Sciences, has confirmed that we are living in the age of the Anthropocene. In other words, assuming there are actually still people around in a couple of million years, they will see very clear traces of our existence in the rocks and ice.

There is still debate about whether the age of the Anthropocene started with the spread of agriculture,

the industrial revolution or the 'Great Acceleration' of population, consumption and waste. But there is no debate that this is an age when our actions are indelibly inked on the very fabric of the planet as it warms and it loses biodiversity at over a thousand times the historical rate.

However, this is also your age. The era in which you will decide whether to maintain 'business as normal' for the plastic planet or to shape your chosen career in a way that improves the lives of people in both developed and developing world struggling with issues like energy and poverty; of 800 million people going hungry while a third of all food is wasted and quarter of the earth's surface is degraded; and the lives of 60 million people fleeing conflict and disaster as part of the biggest human migration of any age.

As James Martin said in *The Wired Society*: "To heal, we have to move to new technologies, new social patterns, new types of consumer products, new ways of generating and spending wealth."

That 'new way' is the 2030 Agenda for Sustainable Development, which nearly 200 nations committed to last September in New York. It provides ambitious, but essential, foundations on which to build a healthy planet with healthy people - where nobody is left behind. And that Agenda will benefit considerably from the so called 'new normal' that China is building, by putting the quality of socio-economic development at the center of the 13th Five Year Plan. The last two plans already showed a determined move away from energy intensive

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growth, in line with emissions targets set for 2030.

However, the new plan goes even further towards rebalancing economic growth with a thriving ecological civilization by focusing on services, innovation, reduced inequality and environmental sustainability.

In other words, just as you enter the formative years of your careers, the 2030 Agenda and the 13th Five Year Plan converge in an unprecedented opportunity to rethink living in the age of the Anthropocene. To a large degree, the success or failure of each endeavor rests on the ability of the public and private sectors to adopt the kind of multidisciplinary approach reflected in the audience here today. But it will also be determined by the ability of individual citizens and companies to bring those policies to life with meaningful action on the ground.

Let me give you an example. When I was a student and most of you had yet to be born, the seemingly impossible task on the table was reversing damage to the ozone layer. Most people had never even heard of the ozone layer and you can't exactly show them an invisible hole to explain the problem.

So tackling this required an extraordinary international alignment of science, policy and action. At one end of the scale this gave birth to the Vienna Convention and its Montreal Protocol, which became the first environmental treaties with universal membership - though hopefully not the last. At the other end, getting the message out

included things like setting a craze for T-shirts with messages on them.

That might seem a bit old school now, but in the days before social media and the internet every little helped. From the original target of halving five CFCs in 12 years, 15 were eliminated in just 10 years and the ozone will be restored to pre-1980 levels by the middle of this century, sparing millions a diagnosis of skin cancer or cataracts and proving that massive globally orchestrated change is possible.

The stakes are just as high for the 2030 Agenda and the 13th Five Year Plan, but the good news is that this time we are not starting from scratch.

I am in Shanghai at the invitation of the G20 Finance Ministers and Governors. We will be discussing the need to invest \$90 trillion in green sectors over the next 15 years and why most of it will have to come from the private sector. For example, the People's Bank of China and the Development Research Centre of the State Council estimate that while China will need up to \$400 billion a year in green investments, at least 85 per cent will have to come from the private sector.

The interaction between environmental, social and financial performance is extremely complex. That's why UNEP has spent 20 years working with hundreds of global financial institutions to better understand the issues and opportunities and to help individual states maximize the return on public and private investment. For example, we helped



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the People's Bank of China to support a task force of more than 100 members. It's working on 14 ambitious proposals to green the financial system, including bonds, tax reforms and emissions trading.

The good news is that private sector players are increasingly aware that a healthy planet and healthy people can also mean a healthy return for shareholders. Look at the renewable energy sector. Figures from the International Energy Agency show that wider adoption of more economically viable energy efficiency investments could boost cumulative economic output by \$18 trillion in the next 20 years. That's more than the combined economic output of the US, Canada and Mexico. It explains why, today, clean energy production is running at more than triple the original targets; why investment in renewables increased by 17 per cent globally in 2014 and by double that in developing countries; and why the number of jobs has doubled to almost eight million in just the last five years.

With many of you thinking about future careers, it's worth noting that as the world's biggest generator of hydro, wind and solar capacity, China accounts for a third of that investment and nearly three and a half million of those jobs.

That approach provides a good start to decarbonizing the economy during the next 60 years and is the kind of effort that will help deliver the Paris Climate Change Agreement. But the big challenge will be to scale it up enough quickly enough to shift the predicted global warming trajectory down to the 1.5 per cent that the science

now tells us is necessary - before the damage is irreversible.

Google is famous for its culture of '10-X' moonshots - in other words aiming not for an improvement that is 10 per cent better, but for an improvement that is 10 times better. That's what we need to the world to do - we need to out-Google Google - in every sector, in every branch of research, in every walk of life.

The good news is that it's already happening. Actions at the frontier of innovation are translating policy into benefits for real people and spearheading an inclusive, green economy.

Back in Kenya, where UNEP is headquartered, M-KOPA offers "pay-as-you-go" off-grid solar energy. Over 200,000 homes in Kenya, Tanzania and Uganda are already connected and 500 more added each day. It's an example of the dynamic new business models emerging in the transition to a green economy.

Of course, clean affordable electricity brings other benefits. Health and education are the obvious ones, but what about transport?

The use of heavily polluting two-stroke motorbikes is growing fast in Africa. Yet in China, over 150 million of them have been replaced with financially and technically viable alternatives. So, the growing access to clean energy could also open the doors to a clean tech-leapfrog for Africa and a green export industry for China.

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That kind of green technology leapfrog is coming in other areas too. Think about additive layer manufacturing - or 3D printing to its friends. Combined with the power of big data and innovative new arrivals like graphene and nanotechnology, it could hold the key to the fourth industrial revolution. It's already transforming a range of substances from single use disposable plastic and other waste into anything from car parts and medical supplies to weather stations and solar panel bases.

For transport, particularly areas like aviation, 3D printing will create lighter parts that cut emissions and noise, but will also drastically cut the waste levels associated with traditional metal part drilling from 90 per cent to around 5 per cent. Small parts are already standard manufacturing practice, but when combined with engineering specialties like biomimicry the benefits are enormous.

The potential will be similar for the building sector, where construction, operation and demolition are responsible for over a third of all CO2 emissions, waste products and energy and material resources. Again, it's early days, but with a 3D bridge to be printed over a canal in Amsterdam and the first steps into 3D house building in China, architects and urban planners are about to enter a new world of environmental benefits.

Being able to manufacture such products quickly, cheaply and locally not only cuts costs and transport emissions, but it opens up endless possibilities for prototyping that will in turn accelerate the arrival of

a whole new wave of technology.

Today, more than half of the world's seven billion population lives in cities, compared to just a third in 1950 when the population was just 2.5 billion. By 2050, when there will be around nine billion people, that figure will be closer to three quarters of the population living in urban areas accounting for three quarters of global GDP, consuming three quarters of global energy and natural resources and generating three quarters of global CO2 emissions and waste.

The population may be increasing rapidly, but the planet has finite and increasingly fragile resources to sustain it.

As one of the world's ten largest cities, Shanghai is already quick to adopt technological solutions that can help tackle challenges on that scale - like super capacitor and hydrogen fuel cell buses, and energy and water efficient facilities like the Tongji Campus. But with the number of mega-cities forecast to grow, we will need to see more knowledge sharing and a more integrated public-private approach to delivering sustainable urbanization, while protecting the ecosystems so vital to sustaining life.

And this has to be on a global scale. That means completely rethinking the way we do things from the very beginning.

I'm sure that many of you are already familiar with the concept of lifecycle evaluation, where you

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take account of the environmental footprint from the design of a new product through operation to final dismantling and recycling - hopefully some of you have even used the Design for Sustainability Guidelines that UNEP's International Resource Panel developed with Delft University. But it's becoming clear that we need to take this idea further - right back into the education of the people who will design the products and the research into the materials and techniques that will be available to them.

This would make it easier to automatically take a full lifecycle approach, instead of having to identify, track and resolve problems after the fact. Green chemists John Warner and Paul Anastas make a good case for this front loaded approach. They advocate a fundamental rethink of teaching methods for the chemists and designers of the future to include a better understanding of issues like toxicity and environmental mechanisms - thereby enabling a new generation of sustainable green chemistry to emerge and to support a whole range of cross-industry improvements. Given that Paul Anastas worked for 23 years to get a single dioxin banned he knows what he's talking about.

Now, think back to the incredible success story, where the elimination of CFCs and other ozone depleting substances reversed the decline of the Ozone layer. Many of those substances were replaced with HFCs, which at the time were not thought to directly harm the ozone. But over time scientists discovered that HFCs could accelerate global warming. Now, some estimates put the

global warming impact of some HFCs at up to 10,000 times that of carbon dioxide and research is emerging to suggest that when you put this much infrared radiation-absorbing material in the stratosphere, it doesn't destroy ozone in the same way, but it does make a difference. So, we find ourselves in need of another substitute.

If you extrapolate that thinking - how many of the architects, engineers, industrial designers, investors and policy makers being educated around the world will understand the massive implication of chemical choices? Or vice versa? There are students here today from several different universities - but outside of formal events, how often do you routinely seek opportunities to collaborate?

Apple might be a leading tech brand, but Steve Jobs said repeatedly that a big part of their initial success was the decision to incorporate font options - a decision that resulted from him casually dropping into a calligraphy class.

That's the kind of result that shows why it makes sense to replace the cycle of trial and error, with a more strategic shift in the way we address research, education and cross-fertilisation of ideas up front. It's also why UNEP remains so committed to working with Tongji University on the Institute of Environment for Sustainable Development (IESD), the Global Universities Partnership on Environment and Sustainability (GUPES), which now has about 800 members around the world, and the Student Conference on Environment Sustainability, which is going from strength to strength.



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Having used his own money from the sale of PayPal to found Tesla electric cars, Solar City and SpaceX, Elon Musk knows a thing or two about collaborating and about rethinking the established order of things. In his words it's about: "Constantly think about how you could be doing things better and questioning yourself."

round the world young people are doing just that. Take last year's finalists from the Eye on Earth Data Innovation Showcase. 'Airscares Singapore' uses crowd-sourced air quality data to create personalized pollution metrics, which help people adapt their behavior. 'Logging Roads' maps over 10,000 logging roads in the Congo Basin to identify violations, degradation and highlight potential land right conflicts. And 'Hack The Rainforest' uses digital maps and drones to combat environment threats in the Amazon by empowering frontline communities.

President Xi Jinping's commitment to ban the trade and campaigning by dedicated organizations and individuals UNEP Goodwill Ambassador Li Bingbing has already helped drastically cut the value of ivory. But there is still a long way to go in raising awareness on these issues and in staying ahead of the poachers. Technology has a key role to play and many of you know how to turn that idea into something tangible. There is a special website

up for people to share their stories about actions being taken for World Wildlife Day. I hope that when I look next week, that some of you will have risen to the challenge!

Ladies and gentlemen, ultimately the stories from the Anthropocene will be written over thousands of years. Whether they have a happy ending for the elephants or any other living thing will depend on whether or not we can replace 'business as normal' with a 'new normal.'

The stories of my generation will be written in the success or failure of the 2030 Agenda, the Paris Agreement and the steps beyond. Now you must write your own stories. You can choose to fiddle in the corner and trust your fate to others. Or you can decide to be among the architects, lawyers, engineers, politicians, scientists, business leaders and investors that will pool their efforts to tackle the great civilizational challenges faced by China and the rest of the world. These are stories that only you can write, but I for one look forward to discovering them.

Thank you.

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## 同济大学与意大利 SUMMA SRL-LOCCIONI 集团签署合作协议 Tongji University and Italian SUMMA SRL-LOCCIONI Group Signed Cooperation Agreement



1月20日，我校与意大利 SUMMA SRL-LOCCIONI 集团在嘉定校区济人楼签署合作协议。校长裴钢，意大利前环境部部长 Clini 先生，LOCCIONI 中国区总经理 Andrea Alcini 先生，

环境科学与工程学院党委书记安娜，可持续发展学院常务副院长李风亭，汽车学院副院长马钧等出席签约仪式。

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未来三年，LOCCIONI 集团将向我校捐赠两台专门用于检测大气污染和汽车尾气排放的实验仪器。此外每学期将支持一名来自环境或汽车方面的学生，赴 SUMMA SRL-LOCCIONI 集团意大利总部进行短期实习，将有利于我校学生更好地了解国外先进的技术，对其未来发展提供帮助。

Summa SRL - Loccioni 集团是一家意大利公司，致力于汽车生产和环境控制中创新解决方案的研究和开发。Loccioni 中国有限公司是一家中国公司，作为 Loccioni 集团的一部分，致力于为 Loccioni 集团的中国客户提供本地的技术和商业支持。

On January 20th, Tongji University signed cooperation agreement with SUMMA SRL-LOCCIONI Group, Italy, in Jiren Building on Jiading Campus. President of Tongji University Prof. Pei Gang, former Italian Minister of the Department of Environment Mr. Clini, LOCCIONI General Manager of China Mr. Andrea Alcini, Council President of College of Environmental Science and Engineering An Na, Deputy Dean of

UNEP-Tongji IESD Li Fengting and Vice Dean of the School of Automotive Studies Ma Jun attended the signing ceremony.

In the following three years, LOCCIONI Group will donate two laboratory apparatus designed to examine air pollution and motor vehicle exhaust. What's more, one student from the College of Environmental Science and Engineering or School of Automotive Studies will have a short-term internship at the headquarters of SUMMA SRL-LOCCIONI Group in Italy each semester, who will have a better understanding of overseas advanced technologies and make better preparations for their future development.

Summa SRL - Loccioni Group is an Italian company, devoted to doing researches on and finding out innovative solutions for automobile production and environmental control. Loccioni (CHINA) Co., Ltd is a Chinese Company and part of Summa SRL - Loccioni Group, devoted to providing technological and commercial support for local Chinese clients.

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来自联合国环境规划署执行主任的新春祝福  
Seasonal Greetings from UNEP Executive Director



联合国副秘书长、联合国环境规划署执行主任阿齐姆·施泰纳从环境署总部内罗毕给各位中国朋友拜年咯！猴年，hold住地球的健康，hold住全球的气温。祝朋友们阖家团圆，幸福美满！

UN Under-Secretary-General and UNEP Executive Director Achim Steiner delivered his seasonal greetings from UNEP Headquarters in Nairobi to all Chinese friends. Wish a HAPPY, HEALTHY and PROSPEROUS Year of 2016! Wish our ONLY planet could HOLD the temperature and SUSTAIN health.



## 2016 世界环境日主题将围绕打击非法野生动植物贸易 2016 World Environment Day to be themed around the fight against the illegal wildlife trade

联合国环境规划署和安哥拉政府 10 日在巴黎气候大会上联合宣布安哥拉为 2016 年世界环境日主办国，安哥拉目前正在积极寻求保护国家的生物多样性并恢复大象数量。

每年 6 月 5 日的世界环境日，是全球范围内最大的采取积极环保行动的一天。2016 年世界环境日的主题将围绕打击非法野生动植物贸易，这也是安哥拉面临的重大问题，偷猎行为正在威胁被数十年内战摧毁的大象数量的恢复。

安哥拉环境部长玛丽亚·德·法蒂玛·雅尔丁 (Maria de Fatima Jardim) 表示：“安哥拉非常高兴作为世界环境日东道主，并关注与我们密切相关的议题。非法野生动植物贸易 - 特别是象牙和犀牛角贸易 - 是非洲大陆共同面临的主要问题。通过主办世界环境日的庆祝活动和提高意识，我们希望传递出一个明确的消息 - 非法野生动植物贸易很快将被终结。”

安哥拉现存的象群规模少为人知，它们一般生活在该国的东南部，也会穿越边境去到邻国。

安哥拉目前正在开展一项大型的空中大象普查活动，以获取 Kaza 区域详细的大象数量信息。收集到的信息将被用于政府的大象库存计划，并保护 Okavango-Zambezi 境外保护区和 Cuando-Cubango 省的野外栖息地。

安哥拉还于今年早些时候修订刑法加强对偷猎者的严惩，努力扭转被破坏野生动物数量。

联合国环境署执行主任阿奇姆·施泰纳表示：“我们今年已经为打击非法野生动植物贸易采取了重要举措，包括联合国对野生动植物走私的首个决议，呼吁把境内外野生动植物走私视为一个非常严重的犯罪行为。2016 年世界环境日将高度关注安哥拉为终结野生动植物走私采取的行动。环境署期待与安哥拉政府合作，提高意识并加速行动，保护物种、生态系统和生计。”

近些年来，每年有超过 2 万头非洲大象被杀害。目前非洲大象的数量约为 42 万 - 65 万之间。《美国国家科学院学报》的数据显示，2010-2012 年间多达 10 万头大象被猎杀。

近些年来，非洲大象被猎杀死亡的数量超过了自然死亡的数量。此外，生活在中西非森林中的大象数量在 2002-2011 年间下降了约 60%。

官方报告显示，2014 年仅南非就有 1215 头犀牛被猎杀 - 即每 8 个小时就有 1 头犀牛被杀害。有组织犯罪的参与和野生动植物制品走私推动了犀牛偷猎数量的激增（2007 年不到 20 头）。

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Paris, 10 December 2015 - Angola, which is seeking to conserve its biodiversity-rich wildlife and rebuild its elephant population, is to host the 2016 World Environment Day (WED) celebrations, the United Nations Environment Programme (UNEP) and the Angolan government announced today at the COP21 Climate Conference.

WED - the single biggest day for positive action on the environment worldwide, which takes place on June 5 each year - will be themed around the fight against the illegal wildlife trade. This is an issue of particular importance in Angola, where poaching is threatening efforts to rebuild an elephant population decimated by decades-long civil war.

"Angola is delighted to host World Environment Day, which will focus on an issue close to our hearts," said Angolan Environment Minister Maria de Fatima Jardim. "The illegal wildlife trade, particularly the trade in ivory and rhino horn, is a major problem across our continent. By hosting this day of celebration and awareness-raising, we aim to send a clear message that such practices will soon be eradicated."

Very little is known about the size of Angola's remaining elephant population, which historically lived in the southeast of the country, also crossing the borders to neighbouring countries.

The Great Elephant Census, the first aerial survey of known elephant ranges in Angola, is underway in an attempt to build a clearer picture of the population in the Kaza Area. The information

collected will be used in the government's elephant inventory programme and for the conservation of wild habitats in the Okavango-Zambezi Transfrontier Conservation Area and the Cuando-Cubango province.

Earlier this year, Angola also committed to revising its Penal Code to bring in tougher punishments for poachers, part of its efforts to reverse the damage to its wildlife populations.

UNEP Executive Director Achim Steiner said, "This year we have seen significant steps to combat the illegal wildlife trade, including the first United Nations resolution on wildlife trafficking, which called for it to be treated as a serious crime both nationally and across borders. World Environment Day 2016 will highlight these efforts in a country itself committed to eliminating this scourge. UNEP looks forward to partnering with Angola to raise awareness of the issue and accelerate the action that will protect species, ecosystems and livelihoods from extinction."

The number of elephants killed in Africa in recent years is greater than 20,000 a year, out of a population of 420,000 to 650,000. According to data from the Proceedings of the National Academy of Sciences, as many as 100,000 elephants were killed between 2010 and 2012.

Across Africa, more elephants have been killed in recent years than have died of natural causes, and for forest elephants in Central and West Africa, the population declined by an estimated 60 per cent

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between 2002 and 2011.

Official reports show that 1,215 rhinos were poached in South Africa alone in 2014 - this translates to one rhino killed every eight hours. The rapid rise in rhino poaching, from less than 20 in 2007 has been driven by the involvement of organized syndicates in the poaching and trafficking of wildlife products.

## NOTES TO EDITORS

Visit the WED site for more information on the celebrations, or contact:

Shereen Zorba, Head of News and Media, UNEP,  
+254 788 526 000, [unepnewsdesk@unep.org](mailto:unepnewsdesk@unep.org)  
Source: <http://www.unep.org/newscentre/Default.aspx?DocumentID=26856&ArticleID=35631&l=en>

联合国环境规划署 - 同济大学  
环境与可持续发展学院

UNEP-Tongji Institute of Environment  
for Sustainable Development

Tel:86-21-65987790

Email: [unep\\_tongji@tongji.edu.cn](mailto:unep_tongji@tongji.edu.cn)

Website:<http://unep-iesd.tongji.edu.cn>