

# 中国水电未来之路： 加快开发与可持续发展

Future of China's Hydropower: Speeding up  
development and sustainable development

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## 联合国水电与可持续发展论坛

一、正确把握水电的功能定位，切实提高对加快水电开发的重要性和迫切性的认识。

I . Properly understanding the special position of hydropower in the energy mix and enhancing our awareness of the importance and urgency of speeding up hydropower development.

二、加快水电开发，必须坚持可持续发展的原则。 II . The principle of sustainable development is essential for expediting the development of hydropower.

## 联合国水电与可持续发展论坛

三、加快水电开发，需要建立水电开发的市场联动机制，完善相关政策。

III. To speed up the development of hydropower, a mechanism of market linkage shall be established and the corresponding policies shall be perfected.

四、中国华电集团公司愿意为加快水电开发贡献力量。

IV. China Huadian Corporation is willing to contribute to speeding up the development of hydropower.

联合国水电与可持续发展论坛

## 一、正确把握水电的功能定位，切实提高对加快水电开发的重要性和迫切性的认识。

I . Properly understanding the special position of hydropower in the energy mix and enhancing our awareness of the importance and urgency of speeding up hydropower development.

（一）正确认识水电开发的综合效益，科学评价水电开发在经济社会可持续发展中的重要作用。

（二）加快水电开发，是提高中国水能资源利用效率的迫切需要，也是中国优化能源结构、实现可持续发展的重大战略选择。

（三）中国目前具备加快水电开发的技术实力和政策条件。

## 联合国水电与可持续发展论坛

(一) 正确认识水电开发的综合效益，科学评价水电开发在经济社会可持续发展中的重要作用。

1.1 Properly understanding the comprehensive benefits brought about by hydropower development and assessing in an objective and scientific manner the import role hydropower development plays in the sustainable development of economy and society.

## 联合国水电与可持续发展论坛

### 水电开发的定位可从以下几个方面来把握——

I hold that factors in the following aspects should be considered so as to position hydropower development in a proper way:

第一，水电是一种重要的能源资源，而且是优质的可再生能源和洁净能源，是天赐的、最应优先开发利用的能源资源。

First, hydropower, a gift endowed by nature, is a quality renewable and clean energy that should be given first priority when it comes to energy exploitation.



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第二，水电开发是重要的江河治理途径。

Second, hydropower development is an important means of river control.

■ 开发大江大河中上游的水能资源，修建控制性水利枢纽工程，可以大大减缓中下游的洪涝灾害，还可以发挥灌溉、供水、航运、跨流域调水、水土资源开发等多种效益。

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第三，水电开发是有益于环境保护的生态工程。

Third, hydropower development is an ecology friendly project that is beneficial for environmental protection.

■ 开发水电不仅可以替代和节约矿石能源，而且对减轻煤炭、石油大量消耗给环境造成的污染压力，贡献巨大。

■ 调节性强的大型水电站，对加强水土保持、改善生态环境有更重要的作用。



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第四，水电开发是具有巨大社会效益的福祉工程。

Fourth, hydropower development is a project that can produce positive benefits for the society.

■ 水电开发不仅能够产生发电效益，具有防洪、灌溉、航运、供水、养殖、旅游等巨大的社会效益，而且可以提供大量的就业机会，带动区域经济发展。

■ 中国西部许多地区加快水电开发的呼声一直非常强烈，他们期待通过修建水电站走出贫困。

## 联合国水电与可持续发展论坛

### 对水电开发功能定位的正确把握 —

— 水电开发是人们充分利用自然资源，为社会、经济和大众提供服务，使人、自然、社会相互协调发展的不可或缺和不可替代的优质能源，是具有巨大社会效益的基础产业和公益事业，在经济社会的可持续发展中具有重要作用。

Hydro power is an indispensable and irreplaceable quality energy for humankind's making full use of natural resources, providing service for society, economy and people, and ensuring coordinative development between mankind, nature and society. Hydropower development is thus a pillar industry and an undertaking aimed at public good which are of great social value.

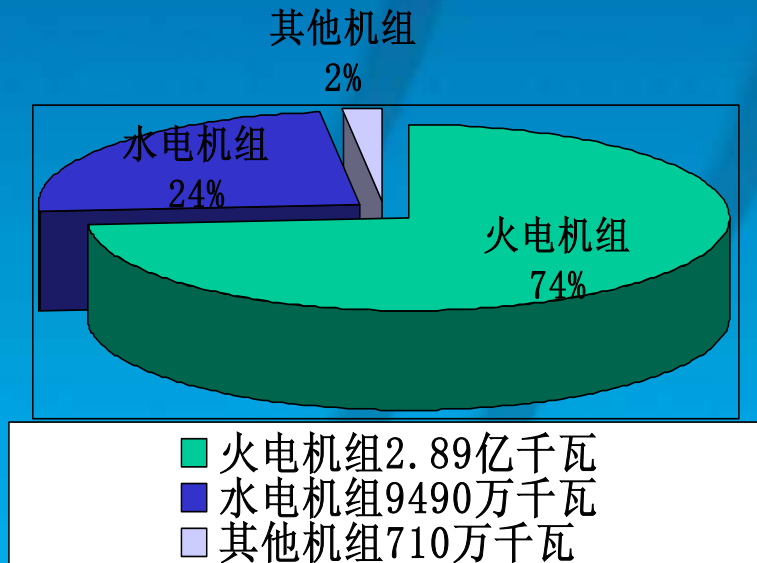
## 联合国水电与可持续发展论坛

（二）加快水电开发，是提高中国水能资源利用效率的迫切需要，也是中国优化能源结构、实现可持续发展的重大战略选择。

1.2 Speeding up hydropower development is the urgent requirement by improving China's water resource utilization efficiency and a crucial strategic choice as required by optimizing China's energy mix and realizing sustainable development.

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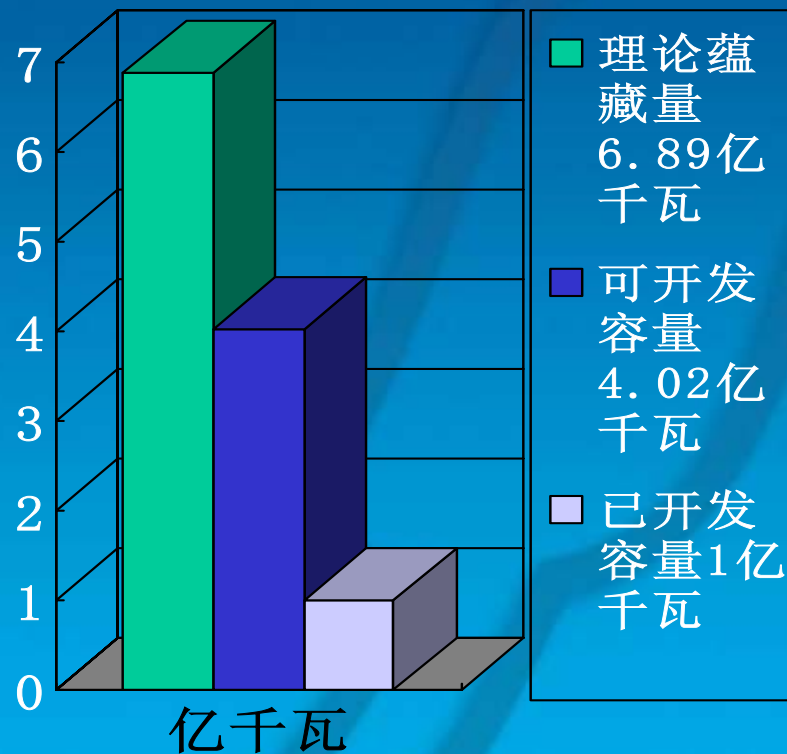
中国水能资源丰富和开发程度较低的国情，决定了加快水电开发的迫切性。 First, the reality of China's richness in water resources against its low degree of hydropower development determines the urgency of speeding up hydropower development.



到**2003**年底，在中国发电总装机容量**3.91**亿千瓦当中，水电机组仅占**24%**。

By the end of 2003, installed capacity of hydropower units was only 94.9GW, accounting for 24% of the total installed capacity of 391GW.

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中国目前水电资源开发程度不足**25%**。

China's hydropower development degree, is less than 25% with hydropower units' total installed capacity of 402GW as the denominator.

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中国能源资源紧缺和结构不合理的状况决定了加快水电开发的必然性。Second, severe energy shortage and unreasonable energy mix makes accelerating hydropower development an irreversible trend.

- 中国目前的能源结构中，化石能源的消耗占据了绝大比例。
- 加快水电开发，不仅是提高资源利用效率的迫切需求，而且是优化能源结构，实现可持续发展的重大战略选择。

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(三) 中国目前具备加快水电开发的技术实力和政策条件。

1.3 China already owns the adequate technological strength and sound policies to accelerate hydropower development.

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■ 中国成功建设了类型各异、技术复杂的众多大型、巨型水电站，标志着中国水电建设步入世界先进行列。成熟的水电开发技术和管理模式，为加快水能资源利用奠定了良好的开发基础。

China's hydropower construction is world-advanced.  
China has become the world center for hydropower technological innovation.

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■ 中国政府确定的“西部大开发”战略和“西电东送”工程的实施，为加快水电开发创造了有利的环境和条件。

The West China Development Strategy set by the Chinese government and the West-East Power Transmission Project have also helped expedite hydropower development.



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联合国水电与可持续发展论坛

对国家加快水电开发的建议——

国家应进一步加快水电开发，不断加大水电装机容量的比重，争取经过20年的努力，到2025年左右全国水电总装机容量达到3亿千瓦，水电在全部发电装机容量中的比重达到30%以上。

China should further expedite hydropower development, try to reach a target of a 300GW of hydropower installed capacity in the whole nation and 30% share of hydropower around 2025.

这既符合中国水能资源丰富的国情，也完全符合经济社会可持续发展的要求。

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## 二、加快水电开发，必须坚持可持续发展的原则。

II. The principle of sustainable development is essential for expediting the development of hydropower.

（一）坚持“科学规划，持续开发，充分利用，协调配套”的原则。

（二）坚持水电开发与环境保护共赢的原则。

（三）坚持“流域梯级滚动综合开发”的原则。

（四）坚持因地、因时区别对待的原则。

## 联合国水电与可持续发展论坛

(一) 坚持“科学规划，持续开发，充分利用，协调配套”的原则。

2.1 Adhering to the principle of scientific planning, constant development, full utilization and coordinated support.

## 联合国水电与可持续发展论坛

水电开发和“西电东送”尚缺乏系统性、操作性均强的统一规划。应尽快完成中国主要大江大河水电开发的规划和规划补充及修订工作。

There is still no highly systematic and practical planning to unified hydropower development and the West-East power transmission project. It is a key task for us to put more efforts on the planning of hydropower development in order to complete and revise the planning on hydropower development of the major rivers in China.

## 联合国水电与可持续发展论坛

中国水电开发的规划应坚持“科学规划，持续开发，充分利用，协调配套”的原则，科学规划水电开发的规模、速度以及相关的配套设施，同时要与全国联网、水资源综合利用、生态环境保护有机结合起来。

To develop hydropower in China, it is essential to adhere to the principle of scientific planning, constant development, full utilization and coordinated support.

## 联合国水电与可持续发展论坛

水电开发规划当前要着重推进以下工作——

- 以国家实施西部大开发战略和“西电东送”工程为契机，抓紧建设一批各方面条件比较适宜的大型水电站，加快西部水电基地的开发力度；
- 集中资金和制订政策支持开发具有战略性的调节性能好、综合功能强的水电站，带动流域梯级滚动综合开发；
- 注意中小水电站的开发，形成功能各具，点、线、面结合的水电开发格局。

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加强水电前期工作，水电前期工作要有足够的设计储备，从而确保水电快速、健康、可持续的开发。

Preliminary work of hydropower lays the foundation of hydropower planning. When the need for hydropower development is completely met, adequate reserve on preliminary work is required to guarantee rapid, healthy and sustainable hydropower development.



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(二) 坚持水电开发与环境保护共赢的原则。

2.2 Adhering to the principle of a win-win solution for both hydropower development and environmental protection.



## 联合国水电与可持续发展论坛

水电开发规划要做到兴利除弊，实现开发与环境保护的共赢，实现利国与惠民的统一。The planning of hydropower development should adhere to the principle of a win-win solution for both hydropower development and environmental protection. Efforts should be made to maximize the benefit of hydropower and minimize its detriments to serve both the country and the people.

■ 对水电开发的环境影响评价要坚持综合、客观、科学的原则。既要看到水电开发对环境的某些不利影响，也要看到水电开发对环境的巨大改善作用。

■ 加快西部水电资源的开发，本身就是利国和惠民的有机统一。

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(三) 坚持“流域梯级滚动综合开发”的原则。

2.3 Adhering to the principle of comprehensive drainage area cascade development

■ 坚持“流域、梯级、滚动、综合”开发，可以最大限度地发挥水电开发的综合效益。

Such a mechanism can help bring about maximum comprehensive benefits of hydropower development.

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■ 规模较大、补偿调节效益显著的水库电站，更需要通过对流域的统一有序开发和流域梯级统一调度，实现调节效益和流域效益的最大化。

The construction of large-scale hydropower stations with obvious adjustment and compensation functions in particular calls for systematic, orderly and coordinative planning with a drainage area viewed as a whole so as to maximize the adjustment benefit and drainage area comprehensive benefit.

## 联合国水电与可持续发展论坛

以由中国华电集团公司控股的乌江水电开发公司为例——

Take Wujiang Hydropower Development Corporation Ltd., a share holding corporation by China Huadian as an example:

- 乌江公司是国务院同意于1992年成立的中国第一家流域水电开发公司。
- 乌江公司以已建成的乌江渡和东风电站作为母体电站，以母体电站的收益和部分折旧作为新项目的资本金进行滚动开发。

## 联合国水电与可持续发展论坛

现在，乌江流域形成了一个流域公司同时开发建设4个大型水电站的良好态势。同时，对流域所在地区，乃至整个贵州的经济发展、环境进一步改善，起到了重大的推动作用。

At present, in Wujiang basin area, the situation is as follows: one basin corporation is developing four hydropower stations simultaneously, boosting the improvement in economy and environment of the region to which the Wujiang basin river belongs and even of Guizhou Province as a whole.

## 联合国水电与可持续发展论坛

### （四）坚持因地、因时区别对待的原则。

#### 2.4 Adhering to the principle of suiting measures to local conditions and timing conditions.

就能源开发而言，不同国家、不同地区、不同的能源资源结构，不同的发展阶段，应该有不同的发展战略和规划。

当前和较长远的中国电力布局和结构的矛盾，在于过分地依靠煤炭。加速水电的开发，加大水电在能源中的比重势在必行。

## 联合国水电与可持续发展论坛

■ 对有条件进行流域开发的江河，要加紧做好能源、水利、环保、经济、社会等多重效益共赢发展的综合规划，及早立项，加快开发。

For the rivers suitable for basin development, the projects shall be initialized after the environmental protection evaluation is done comprehensively, objectively and scientifically. We should waste no time in making a multi-win comprehensive planning of energy, water conservancy, environmental protection, economy and society.

## 联合国水电与可持续发展论坛

■ 对于流域开发不利影响较大的河流，要抓紧做好进一步勘测和论证，采取措施削减不利影响，制订相应问题的解决办法，组织科学、合理的规划和开发。切忌长期争论，久拖不决或坐而论道，贻误时机。

When it comes to the development of the rivers whose basin development may produce a lot of negative influence, we should waste no time in conducting further survey and demonstration and measures shall be taken to reduce the negative influences. The solution shall be found and the development is ought to be scientific, rational and reasonable. Unduly prolonged argumentation needs to be avoided to prevent us from missing the opportunity.

### 三、加快水电开发，需要建立水电开发的市场联动机制，完善相关政策。

III. To speed up the development of hydropower, a mechanism of market linkage shall be established and the corresponding policies shall be perfected.

（一）建立和完善水电开发多元化投资体制，按照综合效益受益情况建立投资分摊政策。

（二）加强电网建设与水电开发的协调发展，优先和优化调度、充分利用水电资源。

（三）尽快制订公正和优惠的水电电价政策。

（四）制订科学合理的水电增值税政策。

## 联合国水电与可持续发展论坛

**（一）建立和完善水电开发多元化投资体制，按照综合效益受益情况建立投资分摊政策。**

**3.1 To establish and perfect the mechanism of diversified investment and to make the policy of sharing the investment in the light of beneficiary.**

■ 水电开发应当充分调动各方积极性，形成国家、企业、地方互动的态势。

## 联合国水电与可持续发展论坛

- 重要河流的水利水电工程，投资开发应该以国有大企业集团为主体，保持国有资产独资或控股的地位。
- 中小型水电的开发，应提倡实行投资主体多元化，吸引地方政府投资和民间投资。
- 水电工程不仅具有发电效益，而且具有防洪、灌溉、航运、供水、养殖、旅游等综合效益，尽快出台水电开发投资分摊政策极为必要。

## 联合国水电与可持续发展论坛

(二) 加强电网建设与水电开发的协调发展，优先和优化调度、充分利用水电资源。

3.2 To enhance the coordinated development of power grid construction and hydropower development, optimize and give priority to the dispatching of hydropower and take full advantage of hydropower.

■ 厂网分开的电力体制下，更要重视电网与电源协调建设问题。国家应该进一步明确，全国大江大河的流域梯级开发要做到电源和电网统一规划、协调发展。

## 联合国水电与可持续发展论坛

优先和优化利用水电是电力调度的一条基本原则。

- 应确保优先利用水电资源，并把电网调度与流域梯级调度结合起来，最大限度地挖掘水电的调节性能，从而实现水能资源的最优综合利用。
- 不断通过跨流域、跨区水电调度，加快推进“西电东送、南北互供、全国联网”的进程。



### （三）尽快制订公正和优惠的水电电价政策。

#### 3.3 To establish as soon as possible the fair and favorable hydropower pricing policy.

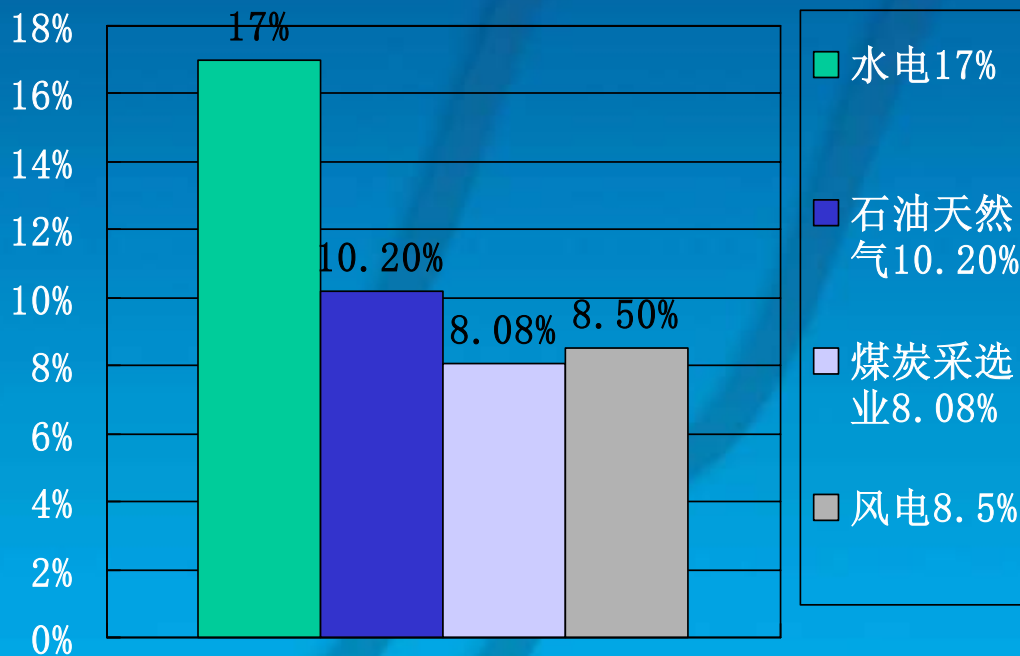
要加快水电开发，不仅要尽快建立合理的投资分摊制度，而且必须有公正、优惠的电价政策做保障。

**建议：**目前正在推行的丰枯电价、峰谷电价要继续执行，并针对不同电站的情况进行科学合理的区分。同时，在电力体制改革和逐步推开的“竞价上网”中，在两部制电价政策中，处于基础部分的容量电价的设置，水电要有别于火电，要适当加大水电容量电价的比重，以体现对投资水电站的投资者及上述的社会公益功能的支持。

联合国水电与可持续发展论坛

## (四) 制订科学合理的水电增值税政策。

### 3.4 To stipulate the policy of value-added tax of hydropower.



一次能源增值税比较

**结论：**从中国一次能源的增值税比较看，水电的税负在能源全行业中最高。Compared with the value-added tax of primary energy, hydropower is 17%, oil and natural gas is 10.20%, coal industry is 8.08%, wind power is 8.5%. And it easily be seen that **hydropower is experiencing the highest tax in energy industry.**

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### 建议：应当降低水电增值税——

对水电行业采取增值税先按17%的税率征收，再根据6%至8.5%生产型增值税计算的增值税，将高出部分由财政给予返还的政策。In order to speed up the development and take advantage of hydropower, the value-added tax of hydropower shall be reduced appropriately, say, the value-added tax of hydropower can be levied at 17%, then the 6%-8.5% of that sum can be returned by government according to its production type.



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## 四、中国华电集团公司愿意为加快水电开发贡献力量。

IV. China Huadian Corporation is willing to contribute to speeding up the development of hydropower.

## 联合国水电与可持续发展论坛

中国华电集团公司愿意在科学发展观的指导下，为加快水电开发贡献自己的力量——

乌江是中国华电集团公司同贵州省共同开发的重要水电基地，其流域梯级开发目前已经进入到关键阶段。

Based on emphasizing the rolling development of Wujiang river basin, China Huadian is to enhance the investment at preparatory period and participate actively in the development of other large rivers.

## 联合国水电与可持续发展论坛

乌江流域梯级开发目前已经进入到关键阶段——

洪家渡水电站：2004年将一年三投

索风营水电站：2005年首台机组投产发电

构皮滩水电站：2009年首台机组投产发电

思林水电站：前期工作正在推进，计划2005年开工

沙沱水电站：前期工作正在推进，计划2005年开工

乌江支流清水河流域：计划于2006年开工建设

## 联合国水电与可持续发展论坛

### 中国华电集团公司乌江流域梯级开发目标——

- **2011年：**完成贵州境内乌江干流梯级开发的任务，总装机容量达到**850万千瓦**。

The cascade development of Wujiang main stream in Guizhou province shall have been completed by the year **2011**, the total capacity installed shall have reached **8500MW**.

## 联合国水电与可持续发展论坛

- **2015年：**乌江干流梯级开发、乌江支流及其他流域的中小水电开发，总装机达**1000万千瓦**。把乌江流域建成南方重要的水电基地和能源基地。

By **2015**, the total installed capacity shall have reached **10GW** and Wujiang basin shall be identified as the hydropower base and energy base in southern China.

## 联合国水电与可持续发展论坛

当前，中国华电集团公司会同合作伙伴，正在国家宏观部门的协调指导下，积极开展金沙江中游和怒江及其他地区水电项目的前期工作，包括开发和环保规划的论证、设计工作的推进，及必要的前期准备工作。

At present China Huadian Corporation together with its partners is aggressively progressing in preliminary work of hydropower projects in the middle reaches of Jinshajiang River, Nujiang River and other regions under the coordinated guidance of state government bodies responsible for macro control, including feasibility argumentation of development and environmental protection planning, promoting design and necessary preliminary preparatory work.

## 联合国水电与可持续发展论坛

华电集团公司还在关注着国际上水电的发展趋势。正在和一些国家、地区的合作伙伴积极推进当地有条件的水电项目。在国内大型、巨型水电站项目的开拓中，也欢迎同国内外有关企业推进资金、技术等方面的合作。

China Huadian is also keeping close track of international develop trend of hydropower. On one hand China is promoting local hydropower projects in cooperation with their local partners in some foreign countries and regions and other hand is more than pleased to promote cooperation with domestic and foreign enterprises concerned in capital and technology in developing domestic large and super-large hydropower projects.

## 联合国水电与可持续发展论坛

让滔滔的江水变成不竭的能源，让秀美的山川在水电工程的滋润中更加秀美，既是人民的期盼，也是国家振兴之途。让我们在科学发展观的指导下，为加快水电开发，促进经济社会的可持续发展做出新的更大的贡献！

Making the running river endless energy and making the beautiful rivers more beautiful while constructing hydropower projects is now both the expectation of people and the way of building stronger china. Let us contribute more for speed uping hydropower development and promote the sustainable development of social economy by the guidance of scientific developing concept.



中国华电集团公司  
CHINA HUADIAN CORPORATION

联合国水电与可持续发展论坛

谢 谢 !

*Thank you!*