

China's Recent Renewable Energy Development:

中国可再生能源的新近发展

In the area of Small Hydro Power

小水电

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**Share of Hydro Power in
Global Energy Scenario is
not more than 20 %**

水电在全球能源的构成中不超过20%

**What is tapped is only half of
what is available**

开发量仅达到了水电可开发量的一半

Hydro Power is categorized as

水电的分类

Large大型 = **Involving huge dams and several 100 MWs**
有大坝，装机达数百兆瓦

• **Medium 中型** = **a few 100 MW**

• **Small中小型** = **1 – 25 MW**

• **Mini小型** = **101 – 1000 kW**

• **Micro微型** = **2⁺ – 100 kW**

• **Pico 微小** = **Up to 2 kW**

40% of all SHP developed is

In China 30,000 MW

中国的小水电开发量达3万兆瓦

占已开发小水电总量的40%

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Compare it with India

Only 1500 MW

印度仅开发了1500MW

SHP serves 300 Million people in China

小水电为中国3亿人口解决了用电问题

Small Hydro Power is 小水电

- **the densest among renewables**
- 能量聚集稳定
- **strongest distributed source**
- 分布最广
- **can be captive 利用简便**
- **excellent for peaking 适合调峰**
- **ideal for low intensity applications**
- 利于分布式供电
- **GHG free**
- 无温室气体排放
- **No forest submersion**
- 无森林淹没

Why Chinese experience in SHP is valuable? 中国小水电开发的经验

- Experience of building the largest number of stations
- 有建设众多小水电站的经验
Currently running 42,221 stations
- 目前有42221座小水电站
- >30,000 MW by end of 2003
- 2003年年底的装机已超过30000MW
- Serving over 300 million people
- 解决3亿人用电

Small Hydro Power 小水电

Chinese Features

中国特色

Standardized Equipment leading to:

标准化的设备带来以下好处:

- Reduced costs, speedy installation
- 降低成本、安装简单
- Known performance characteristics
- 性能明显
- Getting spares easy
- 易获得配件
- Easy maintenance
- 维护方便

Continued...

Small Hydro Power

Chinese Features

中国特色

- Multipurpose Development 多用途开发
- Linkage with

Industry, Tourism, Agriculture,
Fishery, water supply, flood control,
Environmental protection,

Health etc. 工业、旅游、农业、渔业、
供水、防洪、环保、医疗等方面

Small Hydro Power

Chinese Features 中国特色

- Cascade stations concept
- 梯级开发
- Cluster development
- 成批开发
- Mini grid concept
- 小型电网
- People's participation and
- 群众共同参与
- PPP (Public-Private Participation) possible
- 公共、私人共同参与开发成为可能

China's Equipment Capability

- 3000-3500 MW/Year
- Head 1.5 m – 1000 m
- 水头从1.5 m – 1000 m
- Units of: 300 W
to several MW
单机容量：300W到几兆瓦
- Types: Tubular, Axial flow, Francis and Impulse turbines
- 水机类型：贯流、轴流、卧式、冲击式等
- Packaged units also
- 整装机组
- Turbines水轮机
- Generators 发电机
- Governors调速器
- Load Controllers
- 负荷控制设备
- Transformers变压器
- Relays and other accessories also manufactured
- 继电器及其他附属设备都有生产

China's Equipment Capability

中国设备的性能

- The voltage levels : 0.4, 6.3, 10.5, 35, 66 and 110 kV (in SHP)
- 电压等级
- Head 1.5 m – 1000 m
- 水头从1.5 m – 1000 m
- Units of: 300 W to several MW
- 单机容量：300W到几兆瓦
- Types: Tubular, Axial flow, Francis and Impulse turbines
- 水机类型：贯流、轴流、卧式、冲击式等
- Packaged units also
- 整装机组
- Follows IEC criteria
- 符合IEC标准
- Supply time: 8-12 months
- 供货期：8-12个月
- Frequency 50 Hz & 频率：50赫兹
- **New Manufacturers**
- 新的生产商
- **Brisk Modernization**
- 不断进行技术革新

IN-SHP Established in 1994

国际小水电组织成立于1994年

- In view of the significant contributions to SHP by the people of China, UNDP, UNIDO and a number of energy related organizations, jointly with the Chinese Government, established the International Network on SHP (IN-SHP) as an International NGO

鉴于中国在小水电开发上所取得的举世瞩目的成就，UNDP，UNIDO、相关能源组织同中国政府一道建立了中国唯一的国际组织-国际小水电组织

- **Recognized by UN and Chinese State Council**
- **由联合国和国务院批准成立**

Triangular Cooperation Model

三方合作模式

IN-SHP

国际小水电组织

has developed a model of
Triangular Cooperation

三方合作模式
between

Developing Countries, 发展中国家
Developed Countries and 发达国家
International Organizations 国际组织

Most Recent Developments in SHP

小水电的新近发展

- Having seen SHP as Poverty Alleviating, sustainable and environment friendly, China is now pushing for 100% electrification –
- thrust for the last “2 miles”
由于小水电在扶贫、可持续发展和环保的优势，中国正在开始进行全面的电气化建设
- Annual addition of installed capacity has risen to 3500 MW, aiming at 8000 MW/year for the second half of this decade
- 年新增装机达3500MW，未来五年新增装机将达到8000MW

Most Recent Developments in SHP

新近发展

- This has resulted in the need to increase the production capacity and new private enterprises are coming up in this area.
- 产量不断增加，众多私人企业不断进入小水电行业
- That also has pushed the existing manufacturers to expand their plants, modernize them and seek improvements in quality.
- 促使现有企业扩大生产规模，进行技术革新，不断提高产品质量

Going Out Strategy 走出去战略

- China has a large fund of experience and a very successful SHP enterprise scene
- 中国拥有丰富的水电开发经验和非常成功的水电企业
- As per the national call for ‘going out’ with expertise and experience, the Chinese SHP scene is now looking for joint activities abroad
- 根据国家的“走出去”战略，中国更加积极地投身到国外的水电开发

3 Networks Built建成了三个网络

- **International Network on Small Hydro Power with 64 countries as members**
国际小水电网，拥有64个成员国
- **Network of SHP equipment Manufacturers in China and in Europe**
位于中国和欧洲的小水电设备制造商协会
- **Network of SHP users and experts**
小水电用户和专家网
(*SHP Engineering Academy established*)
(小水电工程学会已经建立)

Thank You

谢谢！