促进可持续能源发展的投资政策

Investment Policies to Promote Sustainable Energy Development

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2020年中国能源投资
China's Energy Investment to 2020

- 2005-2020年能源部门投资需求18万亿元
- 节能、新能源、环保和能源需求占40%，约7万亿元

- 18 trillion RMB Invested in the Energy Sector from 2005 to 2020
- 7 trillion RMB invested in energy conservation, alternative energy, environmental protection, and energy demand, accounting for 40% of the total.

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（一）改进政府对能源投资的管理

Improve Government Management of Energy Investment

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1．努力提高政府可持续能源行业的投资监管和宏观调控水平

Improve the government’s supervision and control of investment in the sustainable energy industry.

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- 国家投资主管部门应尽快制定有关可持续能源行业的近期和中长期发展规划；适时制定和调整可持续能源行业的固定资产投资指导目录、外商投资产业指导目录；完善国家可持续能源行业投融资的支持和优惠政策。

- **Government investment departments should**
  - **Establish development plans for the sustainable energy industry**
  - **Formulate and adjust guidance catalogues for fixed assets investment in the domestically- and foreign-funded sustainable energy industries.**
  - **Improve investment and financial support and preferential policies for the sustainable energy industry.**

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2．鼓励民间投资能源建设

要继续放宽民间资本和社会资本对能源建设活动的限制，打破国有经济对能源行业的过度垄断现象。

2. Encourage private capital investment in energy construction.

- **Continue to relax restrictions on private and social capital investment in energy construction**
- **Break up monopolies in the energy industry, including the monopolies of state-owned enterprises.**

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- 对涉及国家垄断资源开发利用、需要统一布局的新能源开发项目，采取向社会公开招投标的方式，选定项目投资者和项目建设与运营业主；
- 要适当降低各类投资者对节能和新能源项建设目的资本金比例；

- **For new energy development projects, government should employ public bidding, and decide the investors, sponsors, and operators of each project.**
- **The government should also reduce the proportion of some types of capital investment in energy conservation and new energy construction projects.**

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- 鼓励社会资本和民营企业与国有企业采取合资、合作、联营、项目融资等多种方式进行传统能源和新能源项目的投资建设和经营；

- **Encourage private investors and enterprises to cooperate with state-owned energy enterprises on both traditional energy and new energy source projects through joint venture, cooperation, joint management, and joint financing.**

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- 国家要采取税收优惠、提供投资担保和发行企业债券等融资支持，给予投资补贴、贷款贴息甚至采取部分资本金注入等综合方式，对民营企业和社会资本进入新能源和节能项目投资活动提供全方位的政策支持。

- **Government should provide financial support using**
  - **favorable taxation**
  - **investment guarantee**
  - **issue enterprise bonds.**
- **Government should also support private investment in new source energy and energy conservation projects using**
  - **investment subsidies**
  - **loan interest**
  - **contribute a portion of the capital investment**

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3. 扩大利用外资建设可持续能源的力度

- 要总结前一时期外商投资能源建设的经验与教训，采取国民待遇，按国际惯例吸引外商采取特许经营、参股、控股、BOT、BT等多种投资方式开发节能和新能源项目的建设，鼓励外商技术投资。

3. Increase the amount of foreign-funded sustainable energy construction.

- **Learn from previous foreign-funded energy construction**
- **Attract more foreign investors by treating them the same as domestic investors**
- **Follow international practices; allow the use of the following investment methods:**
  - **franchise operation**
  - **buying or controlling share**
  - **BOT and BT**

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- 要积极争取国际能源组织、国际金融组织以及具有先进技术、管理经验的国外跨国公司、能源高新技术企业的支持和合作，大力引进国外在新能源开发和节能的新技术和管理经验，不断提高我国新能源和节能项目的技术和投资管理水平，增加投资效益。

- **Seek support and cooperation from**
  - **International energy organizations**
  - **International financial organizations**
  - **Overseas multinational corporations**
  - **High-tech energy enterprises that have advanced technologies and management experience**
- **Introduce technologies and management experience on new energy development and energy conservation from abroad.**

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4．建立有效的信息导向制度

建议在“十一五”时期启动国家可持续能源投资信息系统的建设，并建立严格、通畅的可持续能源信息报告制度，以及可持续能源行业的投资和技术信息发布制度。

4．Establish an effective information system

- **Creation of a national sustainable energy investment information system should begin during China’s *11th Five-Year* period**
- **A strict and smooth sustainable energy information system including investment and technical information should be established.**

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5．针对节能和能源环保建立市场准入机制

- 国家应该对建设项目采用的设备、交通工具和建筑物的生产和使用能耗要制定最高限定标准，立法规定在建设项目的审批、核准和备案申报的材料中增加节能篇章，对达不到节能标准的项目不许其建设和使用。

5．Establish market access mechanisms for energy conservation and environmental protection

- **Establish high energy-efficiency standards for industrial equipment, transportation, and buildings.**
- **Establish laws requiring certain construction materials to be carefully checked and ensuring that projects not meeting energy-efficiency standards will not be constructed.**

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6．尽快制定和完善国家有关可持续能源发展的相关法律法规

- 应针对当前我国新能源和节能投资领域法律法规体系建设滞后和不完善的状况，加快投融资领域的立法工作。

6．Formulate and complete sustainable energy development laws and regulations as soon as possible.

- **Many of China’s current laws regarding new energy and energy conservation investment are poor or incomplete**
- **The government should accelerate legislative work in the investment and financing fields**

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（二）加大政府对可持续能源和节能建设投资力度

Strengthening Government Investment in Sustainable Energy and Energy Conservation

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- 1.政府要加大对一般投资者不愿意投资的新能源、节能和能源环保项目的投资，并在形成市场竞争的条件后，逐步退出；对目前能够运用市场化方式运作的能源领域的投融资活动，政府投资不应再进入。
- **The government's energy investments should focus on projects that general investors are unwilling to invest in**
  - **new energy development**
  - **energy conservation**
  - **energy environmental protection projects**
- **The government should gradually reduce investment when the conditions for market competition are formed.**
- **The government should not interfere with investment activities in the energy field that are currently running smoothly in the market.**

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- 2.政府投资方式应尽量减少资本金注入等直接投资，而应更多地采取投资补贴、贷款贴息等间接投资支持手段，介入新能源和节能建设和经营活动。

- The government should avoid direct investment.
- Instead, the government should introduce more indirect investment measures such as investment subsidies and loan discounts.
- The government should also help construct and operation new energy projects.

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- 3.政府要重视新能源和节能技术的开发。新能源开发和节能工作技术上难以突破或成本太高，一般的企业难以承受，必须以国家投资为主进行开发；同时应该加大对新能源和节能技术工业实验的投资；可采取鼓励的政策吸引各类投资者参与开发和推广。
- The government should help develop new energy and energy conservation technologies
- Barriers to doing so:
  - Technology restriction
  - High cost
- Increase investment in new energy and energy conservation technology in the industrial sector.
- Adopt incentive policies to attract investment in development and promotion work.

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- **4.对边远地区居民就地取材使用新能源给予补贴。对居住在边疆、山区和其他居住分散地区的居民和单位，采取外部供能非常不经济，较好的办法是国家采取投资补贴的办法鼓励他们就地取材，使用太阳能、风能、地热和生物能，用于生产和生活。**

- **Subsidize the development of new energy sources in rural areas.**
- **Uneconomical to extend grid-connected energy to these areas.**
- **It is better to subsidize locals' use of local resources (solar energy, wind energy, geothermal energy, and biomass energy) for production and living.**

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（三）改善可持续能源和节能项目的融资环境

Improve Sustainable Energy and Energy Conservation Project Financing Environment

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1.政策性银行要重点支持可持续能源项目建设。相对常规能源项目，可持续能源和节能项目在内部财务效益方面要差，但社会效益、环境效益等外部效益要好得多，十分符合政策性金融机构贷款的宗旨，国家开发银行应该优先给予这些项目贷款支持；农业发展银行应把支持农牧区的能源建设作为软贷款的重点之一。

- **Policy banks should support the construction of new sustainable energy facilities**
- **Sustainable energy and energy conservation projects have a low profit margin but have high social and environmental benefits, which are important to policy-based financial agencies.**
- **China Development Bank gives priority to such projects in extending credit.**
- **Agricultural Development Bank should regard energy development in agricultural areas as a focus of its soft loans.**

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- **2.为新能源开发企业直接融资提供渠道。政府要充分利用企业建设债券发行和企业股票上市的批准权，支持可持续能源的项目建设；对以可持续能源项目为投资重点的能源企业，应优先核准其发行股票或企业债券。**
- **Provide channels for directly financing new energy development enterprises.**
- **The government should use approval rights for enterprise construction bonds issuance and enterprises' entering into the stock market to support sustainable energy project construction.**
- **Energy enterprises mainly investing in sustainable energy projects should be given first priority for issuing their stocks or enterprise bonds.**

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- 3.为解决新能源开发项目资金不足的问题，建议国家和各地采取电力加价的办法建立专门用于支持新能源建设的基金；为了使新能源建设项目得到金融机构的贷款支持，国家和地方政府可考虑建立新能源项目贷款担保基金。

- **Addressing the shortage of funds for new energy development**
  - **National and local authorities should increase the electricity tariff to accumulate funds to support new energy construction.**
  - **Establish loan guarantee funds for new energy projects urgently acquiring loans from financial agencies.**

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- 4.争取国际金融组织对新能源和节能开发的优惠贷款支持。在有13亿人口的能源消费大国开展节能和开发新能源，对全世界的能源可持续发展具有重要的意义。国家应积极打通国际金融组织的融资渠道，争取为国内的节能和新能源开发项目获得更多的国际金融组织的优惠贷款支持。

- **Seek preferential loan support for new energy and energy conservation development from international financial organizations.**
- **Increasing energy conservation and new energy use in China is important for worldwide sustainable energy development.**
- **Set up a smooth financing channel for international financial organizations**
- **Seek to gain more preferential loans from international financial organizations for China's energy conservation and new energy development projects.**

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(四）加强能源环境保护投资

Strengthen Energy Environmental Protection Investment

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- 1. 为鼓励和引导企业建设和运营相应的环保装置/项目，国家应对能源环保项目给予一定比例的投资补助；为降低能源环保项目的债务负担，对能源环保项目给予一定的贷款贴息资金；要加大对能源环保装置的研制和技术攻关投资力度，减轻企业在使用环保设施上的投资负担。

- To encourage enterprises to develop environmentally-friendly facilities/projects, provide investment subsidies for energy environmental protection projects.
- To reduce the burden of debt on energy environmental protection projects, offer loan discounts for energy environmental protection projects.
- Strengthen development and technical investment in energy environmental protection facilities.

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- 2.鼓励开发清洁能源。清洁能源是资金密集行业，一般开发（勘探、生产）的成本或者运行成本较高，特别是天然气和水电的开发，要投入较多的资金用于前期的勘察和工程建设，核电站的建设则需要大量的投资。为解决资金不足和开发混乱问题，需要建立良好的政策环境和投融资机制。

- **Encourage the development of clean energy.**
- **Clean energy industries are capital-intensive, with high development (exploration, production) and operation costs, especially for natural gas, water, and electricity.**
- **More capital investment is needed in early stages (exploration and engineering)**
- **Constructing nuclear power station requires high investment.**
- **It is necessary to establish sound investment and financing mechanisms.**

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- 3.重视可燃气的利用，减少事故和污染。煤层气、焦炉和高炉煤气等可燃性气体的开发利用在我国是一个新兴的产业，初期需要大量的技术研究、勘探开发和商业化运作实验的投资，需要国家支持其产业的形成和发展。为此，国家要把其纳入能源发展规划之中，并在资金和政策上给予支持。

- **Pay attention to the use of flammable gases to reduce accidents and pollution.**
- **The use of flammable gases (coal bed gas, coke oven, and blast furnace gas) is new in China**
  - **Requires high investment in technical research, exploration, and development**
  - **Requires commercialized operation experiments.**
- **National support for the industry's formation and development is essential.**
  - **Should be incorporated into energy development planning.**
  - **government should provide financial and policy support.**

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- 4.重视城市热电建设。我国应该借鉴国外发展热电的经验，制定热电联产的城市供热规划，对发展热电联产的企业投资项目在融资、折旧、税收、价格、上网等方面给予优惠政策，对把区域供热改造为热电联产的工程给予投资补贴和贷款贴息，由政府承担热力管线的投资等等。

- **Urban thermoelectric construction**
  - **Draw on international experience**
  - **Formulate urban heat supply plans using combined heat and power (CHP)**
  - **Adopt preferential policies (in financing, depreciation, taxation, and pricing) for enterprises investing in CHP.**
  - **Provide investment subsidies and loan discounts for the projects transforming regional heat supplies into CHP**
  - **Establish a thermodynamic pipeline.**

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（五）控制重点行业的节能

Control Energy Conservation in Key Industries

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1．工业节能

工业消费的能源占我国能源消费总量的70%左右，其中钢铁、有色、建材、煤炭、电力、石油化工等行业是耗能的大户，也是污染严重的行业。工业节能首先要以这几个行业为突破口，在投资准入环节上加以控制，并逐渐扩大到其他工业。

1. Industrial energy conservation.

- Energy consumed in the industrial sector accounts for 70% of China's total energy consumption.
- A large amount of this energy is consumed by highly-polluting industries: steel, non-ferrous metals, construction materials, coal, electrical power, oil, and chemicals.
- Controlling investment in these industries is most important.
- Gradually expand to other industries.

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- 一是制定行业设备的设计规范标准，要求提供生产设备的企业停止生产能耗高和污染大的设备，按国家制定的设计规范设计和制造设备，对改产需要投资较大，企业难以承受的，国家给予一定的资金支持。

- **1. Industrial equipment energy consumption**
  - **Formulate design standards for industrial equipment**
  - **Require enterprises to stop producing high-energy-consuming and highly-polluting equipment.**
  - **Provide financial support for enterprises requiring relatively large investments to change production**

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- 二是要求新建生产线的设计必须采用国内的先进节能设备和环保设施；对不符合国家要求的设计不准进行施工建设。
- 三是加快对现有企业节能和防治污染的技术改造，要对耗能和污染大户限期改造，对拖延改造的企业要责令其停产；对缺乏技术改造能力的，国家要在资金和技术方面给予一定的帮助。
- **2. Production lines**
  - **Production lines must use advanced domestic energy conservation equipment and environmental protection facilities**
  - **Those not meeting design standards should not be allowed to commence construction.**
- **3. Reforming current enterprises**
  - **Reform current enterprises to save energy and reduce pollution**
  - **High-energy-consuming and highly-polluting enterprises should be given a time limit to make changes**
  - **those not meeting the time limit should stop operation.**

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2. 建筑节能

中国已建立建筑节能标准，但执行的效果不佳。要改变这种状况，首先要政府部门真正从思想上重视建筑节能工作.

2. Increasing energy efficiency

China set building energy efficiency standards, but they are poorly implemented. The government should do the following:

1. Improve building energy efficiency through actions not words.

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- 其次是要建立并实施有效的激励和处罚机制，使开发商感受到是否执行节能标准对自身利益的影响；
- 三是部门监督必须到位，从投资准入到建设实施都有政府部门把关，认真执行奖惩规定；
- 四是重视节能技术、材料、相关配件的开发和宣传推广工作。

2. Establish incentives and punishments to increase compliance

3. Establish supervision mechanisms:

- **Governmental departments should supervise the whole building process from investment to construction;**
- **They must enforce punishments.**

4. Emphasize the development of energy conservation technology, materials, and equipments.

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3．交通节能

交通节能问题应该以汽车为重点；在汽车的研制方面，国家要有足够的投资支持混合动力和燃料电池的技术研发以及支持，以适应2010年后汽车能源动力系统转型的趋势；

3. Transportation energy conservation.

- **Focus on automobiles.**
- **The government should fund research and development of hybrid and hydrogen-powered automobiles**
- **Aim to transform the automobile industry by 2010.**

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- 在汽车的燃料方面，近期应鼓励车用乙醇、甲醇和二甲醚等汽油替代燃料的生产，并加大推广使用工作；
- 要在城市大力发展轻轨、快速公交汽车系统，无轨电车等公共交通，减少民众在城市出行中的汽车乘用量，国家应分门别类的指导和鼓励城市建设轨道、快速公共汽车系统和普通公交专用道。
- **Encourage production and use of gasoline substitutes, such as ethanol, methanol and dimethyl ether.**
- **Develop public transportation like light rail and buses to reduce automobile use within cities**
- **Continue urban light rail and subway construction.**

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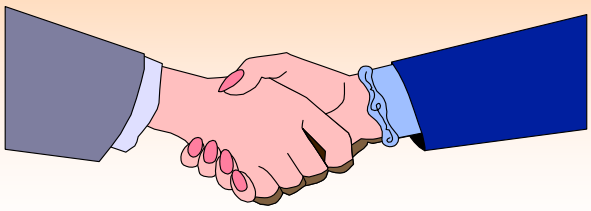
谢谢诸位！

Thank you !

2005年11月16日



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The Importance of Integrated Energy Resource Planning
实施“综合资源规划”的重要性

Peter A. Bradford
彼得 • 布雷德福

November 16-17, 2005

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Quotations to Consider I
中国领导者的观点

- “If China converted all of its incandescent lighting to compact florescent bulbs, we would avoid the equivalent of two Three Gorges dam projects”

— **Xu Kuangdi,** Vice Chairman, Chinese People’s Political Consultative Conference; President and Academician, Chinese Academy of Engineering, China Development Forum, June 26, 2005

- “如果全国的白炽灯都改成节能灯，所节省的电量相当于两座三峡电站的发电量”

–徐匡迪，全国政协副主席，中国工程院院长；摘自2005年6月26日在“建设节约型社会”--2005中国发展高层论坛上的讲话

Similarities between China's Energy Challenges Today and the U. S. in Years Past

中国目前的能源状况与前些年的美国非常相似

- New and increasing oil import dependence in a time of rising prices;
- Projections of high growth for many years;
- Nuclear power construction expected to increase;
- Projections of large capital needs for energy infrastructure at a time when capital is likely to be scarce and expensive;
- Strong belief that every energy source should be used to the maximum.

- 石油进口依赖日益严重
- 能源需求持续增长
- 建设核电厂的呼声高涨
- 能源投资需求激增
- 应该最大限度利用各种能源资源

Important Differences

主要差异

- China has broken the tight link between economic growth and energy use;
- China is experiencing actual rather than projected power shortages;
- China is committed to energy efficiency and renewable energy;
- China is very sensitive about energy price increases;
- China's power industry and its regulation are more concentrated in the national government;
- China can draw upon many years of international experience in choosing its preferred course.

- 中国曾实现经济增长和能源需求的协调
- 中国正在经历实际的电力短缺
- 中国正致力于提高能源效率和发展可再生能源
- 中国对能源价格上涨非常敏感
- 中国电力部门及其监管主要集中在中央层面
- 中国可以利用现有的国际经验和教训，找到最适合国情的解决办法

One Lesson from the U.S.
美国的教训

- In these circumstances, it is possible to waste a lot of money and undergo unnecessary public controversy.
  - U.S. experience building power plants in the 1970s
    - Also occurred during the California crisis in 2000-2001

- 在这些情况下，有可能造成投资浪费和决策过程中不必要的争论
  - 美国在20世纪70年代大规模建设电厂
    - 在2000至2001年间的加州电力危机中也发生过

Another U.S. lesson
美国的教训

- A carefully integrated planning process is vital to avoiding waste.
  - The thought that "IRP sounds like a good idea for when things calm down, but we're too busy now" is plausible but wrong.

- 谨慎的"综合资源规划"对避免浪费至关重要！
  - 可能有人会认为："*IRP虽好，可我们目前没有时间考虑这个。*"

    这是一个错误想法、

Traditional Utility Planning
传统的电力规划

- Projections of demand growth for electricity;
- Survey of supply resources and when they are likely to be needed;
- Production cost ranking of power supply alternatives;
  - Calculation of required revenues, investments and rates

- 电力需求增长预测
- 对发电资源以及何时需要增加供应进行调查
- 对各种供电方案的生产成本进行排序
  - 计算所需的收入、投资和电价

Characteristics of Such a Planning Process
“综合资源规划”的特点

- Compares all generation options with energy efficiency in determining ultimate needs to meet demand for energy services;
- Gives specific weight to important national objectives such as
  - Environmental protection
  - Regional development
  - Fuel diversity
- Considers uncertainties of each resource option

- 将增加装机和提高能效进行比较，然后再决策
- 对重要的国家发展目标赋予权重：
  - 环境保护
  - 地区发展
  - 能源多样性
- 还要考虑各种资源的不确定性因素

Forecasting Demand
需求预测

- Because IRP focuses on demand for energy services (rather than for megawatt hours), it depends on forecasts that look closely at each category of energy demand rather than on aggregate demand growth.

- IRP解决的是能源服务需求，而不是发电量需求；它依赖于对各类能源服务需求的预测，而不是简单的需求总量的增长。

Applying the Plan
实施“综合资源规划”

- Plant licensing and investment approval decisions must be consistent with the plan;
- The end result (based on US experience) will favor building new plants only after all cost-effective energy efficiency;
- Avoids the waste that comes from making large decisions in times of crisis.

- 建设电厂和投资决定必须符合“综合资源规划”目标
- 结果是：优先考虑提高能效的可能性，然后决定是否需要新建电厂（基于美国经验）
- 尽量避免在电力短缺期间匆忙决策而导致资源浪费

Integrated Resource Planning and Industry Restructuring
“综合资源规划”和产业重组

- A society determined to rely on market forces to make resource choices will want to internalize societal values as much as possible.
  - Through taxes or cap-and-trade-type markets
- But IRP remains important
  - For individual licensing decisions
  - For overall resource procurement
  - To guide public policy, including tax and fiscal policy

- 由市场决定资源配置的前提是，所有的社会外部价值和成本被“内部化”
  - 通过税收手段或排污总量控制和交易
- 尽管如此，IRP仍然非常重要：
  - 许可证颁发
  - 满足需求的投资决策
  - 指导公共政策的制定，包括财政和税收政策

California and IRP
加利福尼亚州和IRP

- From the early 1980s through the early 1990s, California had a sophisticated IRP process, producing high rates but low bills and an exceptionally clean electric system;
- Discontinued during restructuring, with the result that DSM was undervalued;
- Reinstated after the crisis, producing renewed growth in DSM and renewables.

- 上世纪80年代初到90年代初，加州利用成熟的IRP建设了电价高、而消费者总花费少的清洁电力系统
- 电力重组期间，IRP中断了，需求侧管理没有得到应有的重视
- 电力危机后，IRP重新发挥作用，推动了需求侧管理和可再生能源的发展

Nuclear Construction and IRP
核电厂建设和IRP

- In the U.S., nuclear construction was often justified in the language of IRP.
  - Even though expensive, it will provide increased independence from imported fuels;
  - It will also emit fewer air pollutants;
  - It will increase regional energy self-sufficiency.
- But when actual IRPs were done, they showed that these benefits could be obtained less expensively in other ways.

- 在美国，核电建设常打着IRP的幌子：
  - 尽管建设投资巨大，但可以减少对进口燃料的依赖
  - 减少污染物排放
  - 促进地区能源自足
- 但是，真正实施IRP后发现，用更低的成本同样可以得到以上“好处”

IRP and Energy Policy
综合资源规划与能源政策

- For choosing between policies in different sectors in a planned economy, IRP is also essential.
  - How else can China compare motor vehicle efficiency to building standards to nuclear power to coal gasification in terms of their costs and benefits in shaping national energy policy?

- 对于计划经济下产业政策的选择，IRP也是至关重要的
  - 制定国家能源政策时，如何比较各个行业政策的成本与收益？如机动车燃油效率标准/ 建筑节能标准/ 核电/ 煤气化

Challenges for IRP
IRP面临的挑战

- Reconciliation with restructuring
- Reconciliation with markets
- Need for prompt decisions

- 如何在重组后的电力体制内实施
- 如何与电力市场衔接
- 需要迅速做出决策时

Quotations to Consider II
中国领导者的观点

- "There is really no good Chinese word for 'integrated'"

–**Qian Yi,** Vice Chairman, Environment and Resource Protection Committee of the NPC, China Development Forum, June 25, 2005

"用中文诠释'integrated',很难找到合适的词"

– 钱易, 全国人大环资委副主任; 摘自 "建设节约型社会" -- 2005中国高层发展论坛，2005年6月25日

The Need to Dramatically Increase Energy Efficiency Investment in China

*Mark Levine**
Director
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

加强中国能效投资的必要性

马克 • 列文 *
环境能源技术处处长
劳伦斯•伯克利国家试验室

*Thanks to Nathaniel Aden for assistance.
*感谢 Nathaniel Aden 所提供 的帮助

Much Greater Energy Efficiency Investment in Needed to Achieve China's Energy and Economic Goals

实现中国的能源和经济目标需要获得更多的能效投资

Review of 2004 Presentation at PAC Meeting (in Kunming)

I. **Role of Public Policy in Inducing Investment**
II. **The Next Steps**
III. **Conclusion**

在2004政策顾问委员会（昆明）所做报告的回顾

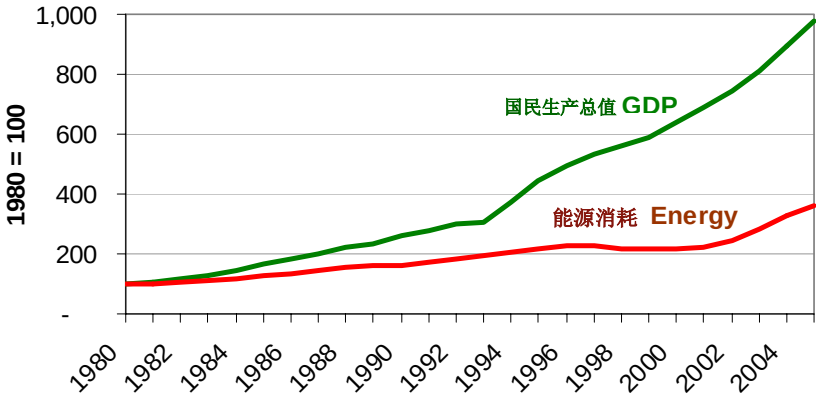
I. 公共政策对吸引投资的作用
II. 后续工作
III. 结论

I Review of 2004 Presentation

一． 2004 年度报告回顾

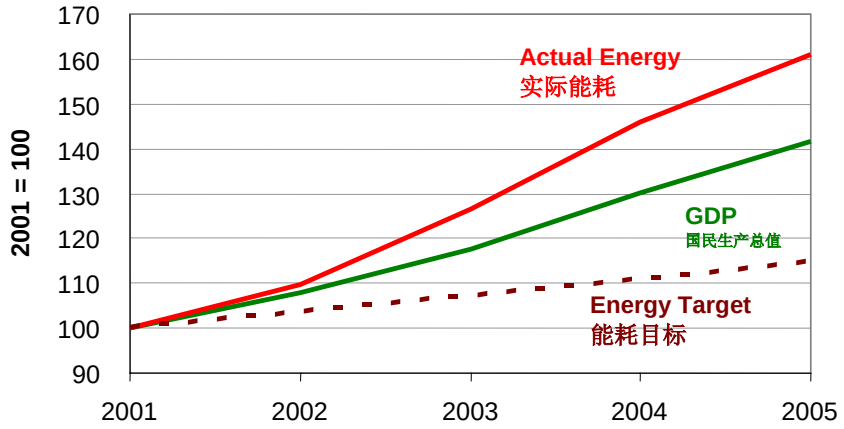
China's bold reform policies of the 1980's showed that energy and GDP growth can be decoupled

上世纪 80 年代中国所实施的大胆改革政策表明，能源消耗与国内生产总值的增长可以不成正比。



Source: NBS, China Statistical Yearbook, various years; China Statistical Abstract 2005; growth estimates extrapolated from mid-year production data for 2005.
资料来源：《国家统计局，中国统计年鉴》，若干年份； 《 中国统计摘要 2005 年 》； "根据2005 年上半年生产资料所作的增长预测"。

However, energy usage has grown much faster than GDP since 2001, a reversal of 20 years of energy efficiency. (Estimate for 2005 shows continuation of trend.)
但是从 2001 年开始，中国的能耗增长速度远远超过国内生产总值的增长速度，与改革 20 年期间的情况正好相反。(对 2005 年的预测显示这种趋势仍将继续)。



Source: NBS, China Statistical Yearbook, various years; China Statistical Abstract 2005; growth estimates extrapolated from mid-year production data for 2005.
资料来源：《国家统计局 , 中国统计年鉴》, 若干年份； 《 中国统计摘要 2005 年 》； “根据2005 年上半年生产资料所作的增长预测”。

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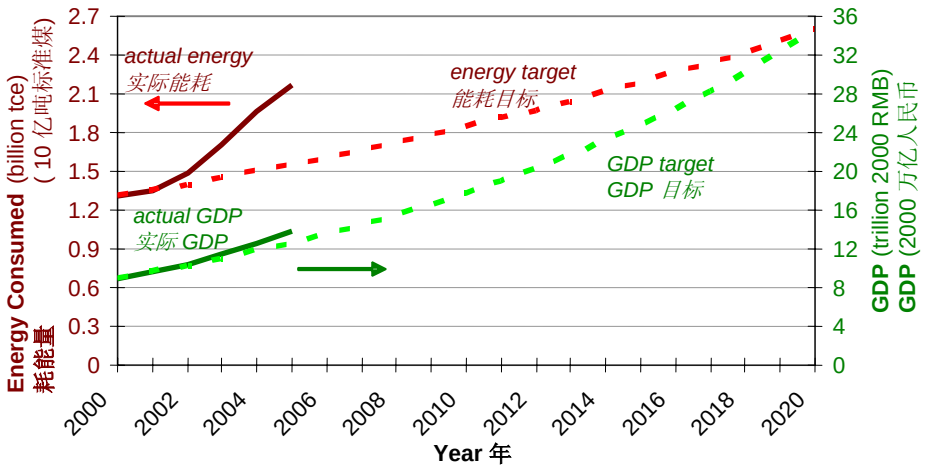
Another way to look at the data from previous graph.
上图数据的另一种表示方式



Source: NBS, China Statistical Yearbook, various years; China Statistical Abstract 2005; growth estimates extrapolated from mid-year production data for 2005; targets announced by NDRC.
资料来源：《国家统计局 , 中国统计年鉴》, 若干年份； 《 中国统计摘要 2005 年 》； “根据2005 年上半年生产资料所作的增长预测”，“中国国家发展与改革委员会公布的目标”。

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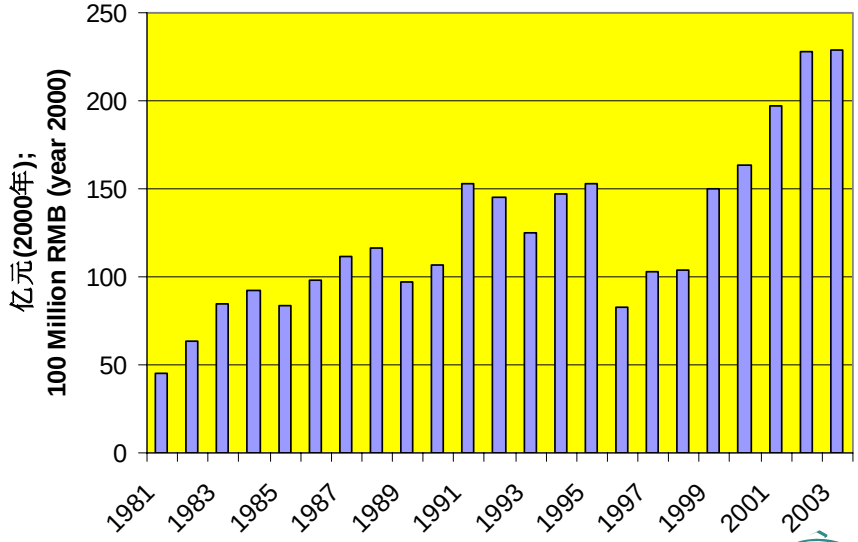
Energy efficiency investment has grown in fits and starts since1980

自 1980 年起能效投资量断续增长



Source: NBS, China Statistical Yearbook, various years; SPC, Handbook of Comprehensive Resource Utilization, 1991; Energy Research Institute

资料来源：《国家统计局，中国统计年鉴》，若干年份；SPC,《综合资源利用手册》，1991年；国家发改委能源研究所

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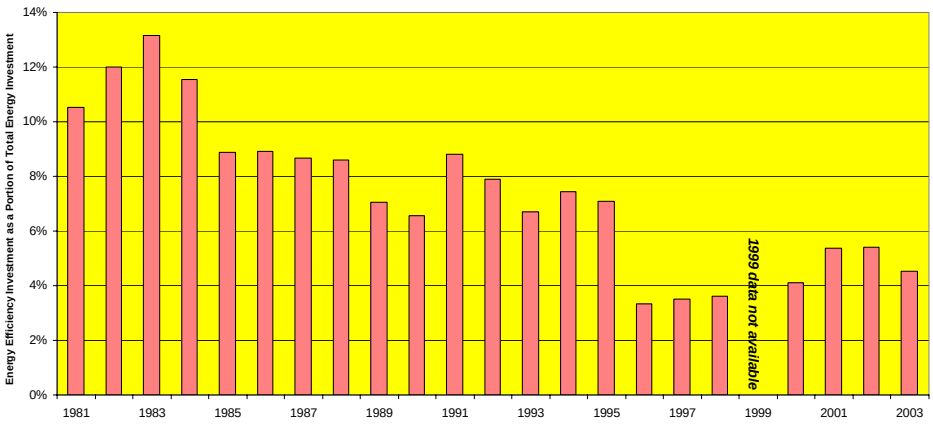
The problem: Declining energy efficiency investment as compared to total energy investment

问题：能效投资额与能源总投资额相比下降



Source: NBS, China Statistical Yearbook, various years; SPC, Handbook of Comprehensive Resource Utilization, 1991; Energy Research Institute

资料来源：《国家统计局，中国统计年鉴》，若干年份；SPC,《综合资源利用手册》，1991年；国家发改委能源研究所

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The solution: increase energy efficiency investment substantially!
解决方案：大幅度提高能源投资！

Investment of 300 B RMB (2006) growing to 475 B RMB in 2020 is needed to cut energy demand growth in half*

- This assumes GDP growth of 7% per year and energy growth of 3.5% per year from 2005 – 2020
- This assumes a 4-yr payback on efficiency investment
- This is to be compared with ~ 25 B RMB investment in 2005. Thus investment in energy efficiency needs to be increased 12 fold!!

2006 年投资 3000 亿元人民币，到 2020 年增长至 4750 亿元人民币可以将能源需求增长减少一半。*

- 假定从 2005 年至 2020 年，国内生产总值每年增长 7%，能源需求增长 3.5%。
- 假定能效投资的投资回收期为 4 年。
- 这是与 2005 年的约 250 亿元人民币的投资额相比较所得出的结果。因此能效投资数量需要增长 12 倍！！

II Role of Public Policy in Inducing Investment

二． 公共政策对吸引投资的作用

II. The Role of Policy in Stimulating Investment
II. 政策刺激投资的作用

- At this time financial markets and government investment are very unlikely to meet the goal of a12-fold increase in energy efficiency investment.
- Policies are needed to induce investment from industrial, and transportation firms, building owners and energy consumers.
- For China to "get back on a sustainable energy path," it is necessary to provide incentives for industry investment and to set obligatory policies that induce investment.

- 就目前而言，金融市场和政府进行的投资很难实现能效投资额增长 12 倍的目标。
- 需要制定政策吸引工业、交通、建筑的拥有者和能源消费者进行投资。
- 如果使中国"重新回到可持续性能源的轨道上"，必须制定吸引投资的激励措施及规范性政策。

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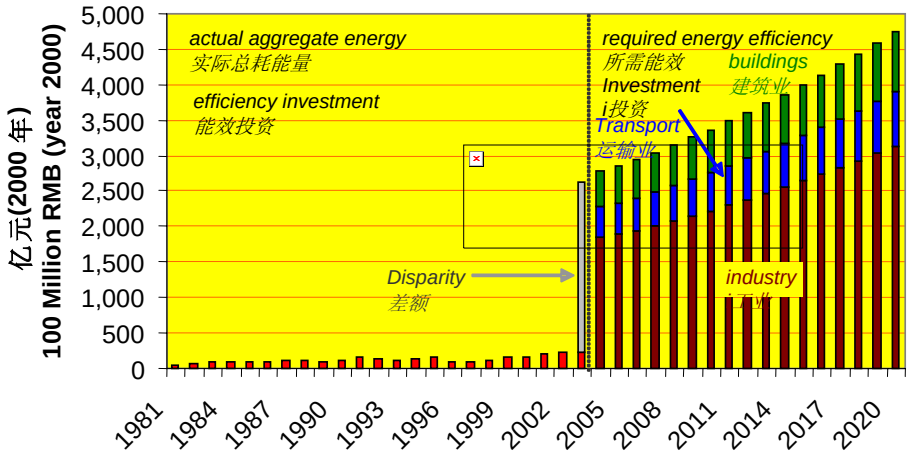
The solution: policies and incentives for investments that go beyond policy requirements
解决方案：制定高于政策要求的政策及激励方案



Source: NBS, China Statistical Yearbook, various years; China Statistical Abstract 2005; growth estimates extrapolated from mid-year production data for 2005; targets announced by NDRC; required investment calculated with **4 year payback**; NPV according to 6.5% discount rate; sector breakdowns are based on China Energy Statistical Yearbook definitions.
资料来源：《国家统计局，中国统计年鉴》，若干年份；《中国统计摘要 2005 年》；"根据2005 年上半年生产资料所作的增长预测"；"中国国家发展与改革委员会公布的目标 "；"投资回收期为四年的所需投资 "；"折扣率为6.5%的净现值 "；行业分析是根据《中国能源统计年鉴》中的说明作出的。

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Policies to encourage energy efficiency investment
鼓励能效投资的政策

Sector 部门	Policy 政策
Industry 工业	·Mandatory 3.5%/year reduction in energy intensity (over all industries) ·In order to meet growth targets, 2.3 trillion RMB must be invested in industrial energy efficiency between 2006 and 2020 for a net present benefit of 5.6 trillion RMB. ·能源消费强度度每年必须降低 3.5%（所有行业） ·为了实现增长目标，2006 年至 2020 年之间必须投入2.3 万亿元来提高工业能效，净现收益为5.6 万亿元人民币。
Buildings 建筑业	·Tight appliance efficiency standards and building energy codes, with enforcement ·Financial incentives that go beyond standards and codes. ·In order to meet growth targets, 600 billion RMB must be invested in energy efficiency between 2006 and 2020 for a net present benefit of 1.2 trillion RMB. ·必须制定并有效地实施严格的设备节能标准和建筑能效标准规范。 ·制定高于标准和规范的经济激励方案。 ·为了实现增长目标，2006 年至 2020 年之间必须投资6000 亿元人民币，净现收益为1.2 万亿元人民币。
Transport 运输业	·Tighter fuel economy standards and promotion of hybrids and diesels ·Bus Rapid Transit promotion through state subsidy ·Increase rail routes/carriers and efficiency for inter-city travel ·In order to meet growth targets, 550 billion RMB must be invested in energy efficiency between 2006 and 2020 for a net present benefit of 1.4 trillion RMB. ·制定实施严格的燃料经济性标准，推广使用混合动力车及柴油车。 ·通过国家补贴的方式推广使用快速公车系统。 ·增加城际交通轨道线路、车次并提高运行效率 ·为了实现增长目标，2006 年至 2020 年之间必须投资5500 亿元人民币，净现收益为1.4 万亿元人民币。

Note: All investment figures are calculated NPV, with 4-year payback, 6.5% discount rate, and a lifetime period of 10 years for building investment (mostly equipment), 15 years for transport, and 15 years for industry.
注: 所有投资数字为计算后所得的净现值，投资回报期为 4 年，折扣率为 6.5%，对建筑行业（主要为设备）、运输业及工业的投资期限分别为 10 年，15 年和 15 年。

III Next Steps
三． 后续工作

Suggestions for the NDRC:
对国家发展与改革委员会的建议：

•Create an **Energy Efficiency Bureau** with adequate seniority, staff, and funding

•Quickly **initiate key policies**: strong **targets for industry (3.5% reduction of energy intensity per year) with investment incentives**; appliance standards, building codes, increased auto fuel economy

•Provide **technical support for policy implementation**; e.g., tools for labeling, technical analysis for energy efficiency in industry, monitoring of energy efficiency in all sectors

•Provide funding for staff to enforce policies; i.e., national level (appliance testing) and local level (building codes, industry monitoring, etc)

•Engage localities with national network including strengthened Energy Conservation Centers

•建立权力适当、人员和资金充足的"节能局"

•迅速制定主要政策：对工业制定高目标（能源消费强度每年降低 3.5%）并制定投资激励方案；制定设备节能标准，建筑能源规范，提高汽车燃料经济性

•对政策的实施提供技术支持，如提供标识制定方法、对工业的能效情况进行技术分析，对所有行业的能效情况进行监测

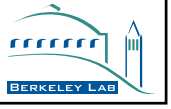
•资助工作人员实施政策；即国家级（设备检测）；当地部门(建筑标准规范，行业监控等)

•建立覆盖各个地区的国家级网络， 包括扩大"节能中心"的职能。

Suggestions for the Ministry of Finance:
对财政部的建议：

• Create an Office that rapidly develops and executes a major energy efficiency investment strategy
•Direct incentives to bring forth investment in industry are essential
– A 15% incentive for industrial loans would amount to 25 B RMB in 2006 growing to 46 B RMB in 2020
– Such incentives should be provided to key sectors and factories to assist them in reaching and exceeding targets
•Provide incentives for buildings and transportation
– 15% for incentives in buildings and auto manufacturers and 33% investment in BRT would amount to ~27 B RMB in 2006 and ~48 B RMB in 2020
– Incentives for exceeding building energy codes and appliance efficiency standards
– Financial support – in concert with municipalities – for bus rapid transit
– Incentives for auto manufacturers that exceed standards

•设立一个迅速制定并执行重大能效投资战略的办事机构
•制定直接的激励方案以吸引工业投资
--对工业贷款提供 15% 的特别奖励金，在 2006 年约为250 亿元人民币， 2020 年将增长至 440 亿元人民币。
--这些特别奖励金应提供给重点部门和工厂帮助它们实现并超额完成既定目标。
•向建筑和运输部门提供激励措施
--向建筑商及汽车制造商发放的15% 的特别奖励金以及用于建造快速公交系统33% 的投资（其余部 分由市政部门负担）在 2006 年约合 270 亿元人民币，到 2020 年将增至 480 亿元左右。
-- 向超额实施建筑能源规划及设备节能标准的部门提供激励。
-- 财政支持 – 与市政部门配合 – 建立快速公交系统
-- 对超额达标的汽车制造商予以特别鼓励



Highest level recognition in government that China must address energy demand growth to achieve economic and other goals
政府最高层领导人已经认识到中国必须要解决能源需求增长的问题才能实现既定的经济及其它方面的目标

•The reform period (1980-2000) showed that energy efficiency was essential to achieve economic goals *(Deng Xiaoping)*

•The current leadership recognizes the same imperative:
Communiqué of the 5th Plenary session of the 16th Central Committee of CPC, Oct 11, 2005 Premier Wen Jiabao: "the energy use per unit of GDP also known as ratio of total energy use to GDP must be reduced by 20 pct from 2005 [to 2010]"
-- This is a call for a 4.4%/year reduction in energy intensity,
which requires a greater investment than we are seeking
(to achieve 3.5%/yr reduction in energy intensity)

•中国的改革（1980 年 -2000 年）表明，能源效率对于实现*邓小平制定的*经济目标是非常必要的。 在 2005 年 10 月 11 日召开的中共 16 大第 5 次全体会议上由温家宝总理所做的报告对未来 5 年的能源需求提出了具体而且宏伟的目标：

"单位国内生产总值的能耗量，即总能耗量与国内生产总值的比率，从 2005 年起（至 2010 年止）必须降低 20 个百分点。"
-- 这要求能源密集度每年降低 4.4%，这样所需的投资额将高出我们所预期的标准
（能源密集度每年降低 3.5% ）

IV Conclusions
四．结论

• China has a history of 20 years (1980-2000) of exceptional control of energy Demand

•However, energy demand has been out of control since 2001

•To solve this problem, a much greater amount of investment capital must be devoted to energy efficiency—12 times current investment

•The problem is urgent and rapid development of governmental structures, policies, loan, investment, and incentive programs, implementation mechanisms, etc, is necessary

•There are many costs for not initiating such an energy efficiency investment program:
- •very serious environmental problems;
- •much higher costs of new supply;
- •distortion of capital markets that will make macroeconomic goals very difficult to achieve

•中国曾经在 20 年中(1980 年 -2000 年) 对能源需求进行了严格的控制。

•但从 2001 年起能源需求已经超出了政府所能控制的范围。

•为了解决这一问题，必须投入更多的资本（相当于现有投资的 12 倍）来提高能源效率。

•这个问题是亟待解决的，必须迅速设立政府机构、制定政策、贷款、投资以及投资激励方案与实施机制的方式予以解决。

•如果不制定上述的能效投资方案，将导致严重的后果：
- •环境问题恶化；
- •新能源成本加大；
- •资本市场扭曲从而导致难以实现宏观目标。

Thank you!
谢谢大家！

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能源价格：政策构建与体制改革

Energy Pricing : Policy Construction and Systemic Reform

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- **Main points in the pricing policy and systemic reform of several major resources industries**

我国能源价格政策构建与体制改革的基本思路
Fundamental Ideas of Policy Construction and Systemic Reform for Energy Pricing in China

- 指导思想：兼顾能源的可持续和国家竞争力的可持续性
- 中介目标：价格与成本相符
- 主要措施：引入竞争、再造监管、强化“外部性”调控

- **Guideline: Consider both resource sustainability and national competitiveness**
- **Intermediate Target: Realize the conformity of price and cost**
- **Main Measures: Introduce system of competition, restructure monitoring system, and strengthen “external” control**

能源价格政策构建——指导思想
Establish an Energy Pricing Policy: Guidelines

- 我国经济与社会发展已进入大量消耗能源阶段，资源赋存不足以支撑预期的经济增长。必须以节能为核心，并鼓励新能源和可再生能源的开发。
- 我国已经形成的能耗较高的经济结构，是当今国际分工条件下自然选择的结果，有其历史必然性。此外，我国能源的资源赋存以煤炭为主，还处于不发达国家行列，能源供给结构不仅要考虑环保，还要考虑国民经济对能源的供给成本是否有可承受力。

- **China lacks the resources to support expected economic growth and energy consumption. It needs to focus on saving energy and exploring new and renewable energy.**
- **The high-energy consuming economic structure is caused by historical international labor divisions.**

Coal is the main source of energy, but China is still developing and its energy structure cannot be compared with developed countries.

We need to consider both environmental protection, and whether the national economy can afford the cost.

能源价格政策构建——中介目标
Establish an Energy Pricing Policy: Intermediate Target

- 成本是价格改革的基础
- 目前我国能源企业的成本构成对社会而言是不完全的

- **Cost is the basis of price reform**
- **The current cost of energy industries does not account for social costs**

能源价格政策构建——主要措施
Establish an Energy Price Policy: Main Measures

- 进一步引入竞争机制
- 再造基于市场经济的能源价格监管体系
- 强化对能源生产、消费的 “外部性” 的控制

- **Further adopt the system of competition**
- **Reconstruct the energy price monitoring system based on a market economy**
- **Strengthen the “external” control of energy production and consumption**

几个主要能源产业的价格政策及体制改革要点
Main Points in the Pricing Policy and Systemic Reform of Several Major Resources Industries

- 煤炭价格
- 石油价格
- 天然气价格
- 电价

- **Coal Price**
- **Gas Price**
- **Natural Gas Price**
- **Electricity Price**

主要能源产业的价格政策及体制改革要点——煤炭
Main Points in Price Policy and System Reform in the Energy Industry——Coal

- 主要问题：电煤价格“双轨制”及由此导致的“以次充好”、变相加价和“重点合同”电煤供应不稳定。
- 解决的途径：电煤价格市场化。完善“煤、电价格联动”机制；实行电煤“重点合同”铁路运力招标分配。

- **Main problems: The “double standard” in electricity and coal prices and the resulting “bad pass for good,” price hikes, and the instability of electricity and coal provision in “emphasis contracts.”**
- **Solutions: Lead the coal electricity price into the market, perfect the system of “linked change in coal and electricity prices”, and implement a distributional bidding system on the use of electricity and coal with “emphasis contract” railways.**

主要能源产业的价格政策及体制改革要点——石油
Main Points in Price Policy and System Reform in the Energy Industry——Gas

- 主要问题：尚由政府管制的汽油和柴油价格与国内市场供求脱节，价、税（费）关系不合理。
- 近期对策：（1）与国际市场接轨由直接改为间接，即由原来的“国际市场成品油现货价格＋海上运、保费＋关税”改为“国际市场原油现货价格＋海上运、保费＋国际市场原油与成品油正常价差＋成品油进口关税”；

- **Main problems: Gas and diesel prices are monitored by the government and separated from the supply and demand of the domestic market. The relationship between price and tax (fee) is unequal.**
- **Short-term solutions:**
  1) Change the link between refined oil with the international market from direct to indirect: change the previous “price of international raw oil + shipping fees and insurance on the sea + the normal price difference between the raw oil and refined oil in the international market + the imported duties of refined oil.”

主要能源产业的价格政策及体制改革要点——石油
Main Points in Pricing Policy and System Reform in the Energy Industry — Gas

- 近期对策：(2) 改变调价边界条件，由现行的月度累计，改为连续 10 个交易日移动平均，或 10 个交易日连续上涨、下降于一定幅度之上。
- 长期对策 (1) 放松成品油批发、零售的市场准入，引入竞争机制；(2) 增加相关税（费）在消费者价格中的比重。

- **Short-term solutions:**
  2) Change the price-adjusting conditions from the current monthly collection to the mobile average price of the base price in 10 consecutive business days, or 10 business days’ continuous increase/decrease above a certain amount
- **Long-term solutions:**
  1) Loosen the control of wholesale and retail-refined oil markets and adopt a competitive system.
  2) Increase the proportion of relevant taxes in the consumer price.

主要能源产业的价格政策及体制改革要点——天然气
Main Points in Pricing Policy and System Reform in the Energy Industry — Natural Gas

- 主要问题：(1) 管制方式缺乏弹性，不能及时对能源供求形势的变化做出反应；（2）用户分类不科学，“交叉补贴”严重；(3）配售价格管制缺乏统一规范。
- 建议：（1）建立与替代能源联动的天然气价格调整机制；（2）按供气成本确定井口及门站价格结构；（3）统一规范配售价格监管办法。

- **Major problems: 1) Monitoring lacks flexibility and is unable to respond in time to changes in energy demand and supply. 2) Classification of users is not scientific so “cross subsidy” problems arise. 3) Regulation of sales prices lack uniform standards.**
- **Suggestions:**
  1) Establish a system that links natural gas price adjustments to changes in replaceable resources.
  2) Determine the well and gate station price structure according to gas provision costs.
  3) Standardize and model sales price partition.

主要能源产业的价格政策及体制改革要点——电力
Main Points in Pricing Policy and System Reform in the Energy Industry — Electricity

- 主要问题：尚未明确地把节能作为核心目标；支持新能源和可再生能源发展的系统性构架尚未形成。
- 建议（1）按照“路、桥分开，各司其职”的原则对确定“煤、电价格联动”幅度的规定进行修改；（2）建立与供电成本相符的用户电价结构；

- **Major concerns: The central goal of saving energy is not clearly established. The structure for supporting new and renewable resource development has not been formed.**
- **Suggestions:**
  1) Regulations regarding how to determine the degree of “linked change in coal and electricity prices” should be revised.
  2) Establish a users’ electricity pricing structure that corresponds to electricity-providing costs.

主要能源产业的价格政策及体制改革要点——电力
Main Points in Pricing Policy and System Reform in the Energy Industry — Electricity

- 建议：

（3）大幅度提高排污费的征收标准，必要的环保成本支出应允许企业通过正常的渠道予以收回。

（4）加快推行“大用户直购”试点，抓紧设计与国情相适应的电力市场模式，逐步引入竞争机制。

- **Suggestions:**

3) Raise pollution fee standards and allow enterprises to regain costs spent meeting environmental requirements.

4) Promote trials of “major clients’ direct purchase”, design an electricity market model that fits China’s characteristics, and gradually adopt the competitive system.

主要能源产业的价格政策及体制改革要点——电力
Main Points in Pricing Policy and System Reform in the Energy Industry — Electricity Power

- 建议：

（5）规范、整合电价中的政府性基金的征收和管理。

（6）按照发展与效率兼顾的原则确立可再生能源电价管理办法。

- **Suggestions:**

5) Standardize the levy and administration of government funds in electricity pricing.

6) Consider development and efficiency when establishing renewable electricity pricing regulation measures.

可再生能源法实施的配套政策设计
Designing Policies to Implement China's *Renewable Energy Law*

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2005年11月16日
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可再生能源立法的基本思路
Basic Ideas for RE Legislation

- 确立可再生能源的重要地位
- 消除市场障碍、营造市场空间
- 建立资金保障体系
- 建立促进可再生能源发展的文化氛围

- **Establish renewable energy as a focus of China's energy strategy**
- **Eliminate market barriers and establish renewable energy development targets**
- **Establish a financing system to guarantee financing for renewable energy development**
- **Form a cultural environment that embraces renewable energy development**

立法所遵循的基本原则
Basic Principles for RE Legislation

- 国家责任和全民义务相结合的原则
- 政府推动和市场引导相结合的原则
- 现实需求和长远发展相结合
- 国内实践和国际经验相结合的原则

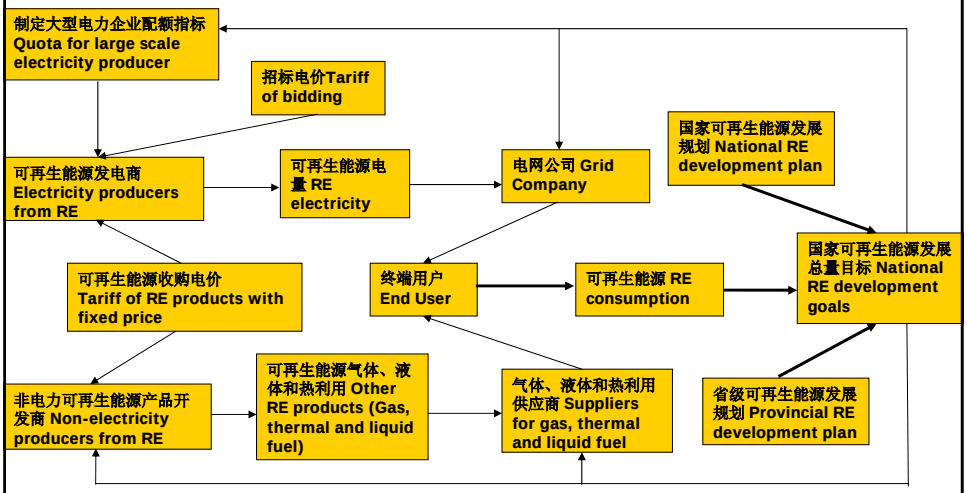
- **Combine national responsibilities and civil obligations**
- **Combine direct government actions and market guidance**
- **Combine current demand and long term development**
- **Combine domestic practices and international experiences**

法律的制度建设
Systems Established by the RE Law

- 规划目标制度
- 强制上网制度
- 分类电价制度
- 费用分摊制度
- 专项资金制度
- 信贷税收政策

- **System for establishing national targets**
- **System for grid connection priorities**
- **System for classifying RE electricity tariffs**
- **Cost-sharing mechanisms**
- **Renewable energy special fund system**
- **Favorable credit and tax policies**

可再生能源法下的政策框架
RE Law Policy Framework



未来中国可再生能源发展政策和战略框架
Future Policy (Strategy) Framework for Renewable Energy Development of China

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可再生能源法实施配套政策和细则
RE Law Implementation Regulations

- 对水力发电适用《可再生能源法》的具体办法作出规定；
- 研究制定可再生能源资源调查的技术规范；
- 研究制定全国可再生能源开发利用中长期总量目标。国务院有关部门会同各省、自治区、直辖市人民政府确定各行政区域可再生能源开发利用中长期目标；

- Make the decision for hydro power how to be applicable for the RE Law
- Study and establish the technology criterions for renewable energy resource investigation
- Study and establish national middle and long-term target of the total volume for the development and utilization of renewable energy. In second paragraph, the related departments of the State Council with the local people's government of province, municipality and the municipality directly under the Central Government develop the local renewable energy development middle and long-term target

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可再生能源法实施配套政策和细则
RE Law Implementation Regulations

- 编制全国可再生能源开发利用规划。各省、自治区、直辖市人民政府管理能源工作的部门会同本级人民政府有关部门编制本行政区域可再生能源开发利用规划；
- 研究制定可再生能源产业发展指导目录；
- 研究制定国家可再生能源电力的并网技术标准和其他需要在全国范围内统一技术要求的有关可再生能源技术和产品的国家标准；

- **Develop the national plan for the development and utilization of renewable energy. The Energy Authority of the local people's government of province, municipality and the municipality directly under the Central Government is responsible for the local plan of the development and utilization of renewable energy**
- **Study and establish the Guide Lines for the Renewable Energy Industry Development**
- **Study and establish the technology standards on renewable energy power grid connection and other national standards on renewable energy technology and product which need uniform requirement in the national level**

可再生能源法实施配套政策和细则
RE Law Implementation Regulations

- 研究制定太阳能利用系统与建筑结合的经济技术政策和技术规范；
- 研究制定有关对农村地区的可再生能源利用项目提供财政支持的具体办法；
- 研究并确定可再生能源发电项目的上网电价；

- **Study and establish the economic technology policies and technical criterions on integrating building with the solar utilization system**
- **Study and establish the concrete methods for providing financial supports to the related renewable energy utilization projects in rural regions**
- **Study and establish the grid connecting electricity price for the renewable energy power generating projects**

可再生能源法实施配套政策和细则
RE Law Implementation Regulations

- 研究制定可再生能源上网发电费用分摊的具体办法；
- 研究制定有关可再生能源发展专项资金的管理办法；
- 研究制定有关可再生能源财政贴息和税收优惠的具体办法。

- **Study and establish the concrete method for the national cost sharing to the grid connecting electricity payments for the renewable energy power generating projects**
- **Study and establish the management method for the Renewable Energy Development Special Fund**
- **Study and establish the concrete methods on interest subsidy from finance and favorable revenue for renewable energy**

影响可再生能源法实施的配套政策
Policies Affecting RE Law Implementation

- 国家发展规划和总量目标
- 可再生能源发电上网电价
- 可再生能源发电收购，高出常规电源平均上网电价部分的费用分摊办法
- 可再生能源发展专项资金和相应的管理办法

- **RE Development Plan and total volume targets**
- **Inter-connection tariffs**
- **Cost allocation schemes**
- **RE special fund**

可再生能源发电定价
Renewable Energy Power Tariff
Application Scope

- 可再生能源发电包括：
  - 水力发电
  - 风力发电
  - 生物质发电（包括农林废弃物直接燃烧和气化发电、垃圾焚烧和垃圾填埋气发电、沼气发电）
  - 太阳能发电
  - 海洋能发电
  - 地热能发电

- **Renewable power technologies include the following:**
  - **Hydropower**
  - **Wind power**
  - **Biomass power, including both the direct combustion and gasification of agricultural and forest waste, municipal incineration power, landfill gas, and biogas power**
  - **Solar power**
  - **Ocean power**
  - **Geothermal power**

电价制定的原则
Principles for Setting RE Power Prices

- 可再生能源发电项目的投资回报率，应高于常规发电项目的平均投资回报率

- **The internal rate of return (IRR) from RE power projects should be more than the average IRR from conventional energy power projects**

风力发电和生物质发电
Wind and Biomass Power

- 实行分地区标杆电价
- 省风电/生物质发电标杆电价=省2005年燃煤电厂标杆上网电价+补贴电
- 各省风电/生物质发电标杆电价范围：0.49-0.69元/kWh
- 自2007年起，新建项目的补贴电价每年递减2%

- Set regional standard power prices
- Provincial wind power/biomass power prices = Provincial coal power price in 2005 + RE power subsidy price
- Provincial wind power/biomass power price range: 0.49-0.69 RMB/kWh (6-8.5 U.S. cents/kWh)
- Starting in 2007, the RE power subsidy price for new RE generation facilities will be reduced 2% each year

风力发电
Wind Power

- 风力发电等效负荷发电小时数达到30000小时前：适用标杆电价
- 30000小时以后取消补贴电价

- For the first 30,000 hours of wind energy production, use provincial wind power set price
- After the first 30,000 hours, the subsidized RE power price will be cancelled

生物质发电
Biomass Power

- 自投产之日起，15年内享受补贴电价
- 运行满15年后，取消补贴电价
- 发电消耗热量中常规能源超过20%的混燃发电项目，视同常规能源发电项目，不享受补贴电价

- **In the first 15 years of operation, biomass facilities should enjoy subsidized biomass power pricing**
- **After first 15 years, this subsidized RE power price will be cancelled**
- **If conventional energy sources contribute more than 20% of the power generated by a multi-fuel biomass power project, the project is not eligible for the subsidized RE power price**

太阳能发电、海洋能发电、地热能发电
Solar, Ocean, and Geothermal Power

- 实行项目定价
- 按照成本加合理盈利的原则制定
- 投资回报率原则上应与风电、生物质发电项目的投资回报率一致

- **Determine power price levels according to project specifics**
- **Price determination principle: cost plus a reasonable profit**
- **The rate of return on investment should be similar to that for wind/biomass power projects**

水力发电
Hydropower

- 执行现有规定
- **Continue implementing current regulations (competitive with conventional energy power)**

招标可再生能源发电项目
Renewable Power Bidding Projects

- 按照中标价格
- 不高于所在地区标杆电价
- **Use bidding prices**
- **Bidding prices should be no greater than Local RE Standard Power Prices**

离网可再生能源公用发电系统
Off-grid RE Electricity Generation Systems

- 对用户的销售电价执行当地省级电网的平均销价
- **The cost of electricity generated from off-grid RE systems should be equal to the average price of that province's grid-connected electricity**

可再生能源发电费用分摊
Cost Sharing for Renewable Energy Power
原则 Principles

- 可再生能源发电价格高于当地电网平均上网电价的差额部分，在全国省级及以上电网销售电量中分摊
- 向电力用户加收可再生能源电量附加
- 全国实行统一电量附加标准
- 附加标准应根据实际需要及时调整
- **The difference between RE power cost and the average price of grid-connection power should be shared by consumers nationwide**
- **Collect "Renewable Power Plus" from end-users**
- **Set one Renewable Power Plus standard for all of China**
- **Adjust the level of Renewable Power Plus as necessary**

费用分摊的范围
Cost-Sharing Scope

- 省级及以上电网公司服务范围内（包括省网公司的趸售对象、自备电厂用户、向发电厂直接购电的大用户）的非农业电力用户
- 西藏地区、地县自供电网、农业生产的电力用户暂时免收

- **Non-agricultural power end-users served by provincial or inter-provincial power-gird companies (this includes large power customers of power-grid companies, users getting electricity from their own power plants, users buying power from power plants directly)**
- **Temporarily not included: power users in Tibet, cities and counties with their own power-grids, agricultural power users**

可再生能源附加计算方法
Calculation Formula

- 可再生能源附加=[（可再生能源发电价格-当地电网平均上网电价）*电网购可再生能源电量+（离网可再生能源公用发电系统运行维护费用-当地省级电网平均销售电价）*离网可再生能源公用发电系统售电量+可再生能源发电项目联网费用]/电网售电总量

- **Renewable Power Plus =**
  [(RE power price – provincial average grid-connection power price) *
  RE power quantity purchased by power-grid companies
  +
  (Cost of operating and maintaining off-grid RE electricity generation systems per unit power – provincial average end-user power price) *
  RE power quantity sold to end-users
  +
  Cost of installing grid-connected RE power facilities] /
  Total quantity of power sold

可再生能源附加计算方法
Calculation Formula

- 其中：
  - 电网购可再生能源电量＝规划的可再生能源发电量－厂用电量。
  - 离网可再生能源公用发电系统运行维护费用=离网可再生能源公用发电系统经营成本*（1+增值税率）。
  - 可再生能源发电项目联网费用是指专为可再生能源发电项目接入电网系统而发生的工程投资和运行维护费用。以政府有关部门批准的设计文件为依据。
  - 电网售电总量＝规划期内全国省级及以上电网企业售电总量-农业生产用电量-西藏电网售电量。

- **In which：**
  - **RE power quantity purchased by power-grid companies = Planned RE power quantity－Quantity of power used by the plant itself**
  - **Cost of operating and maintaining off-grid RE electricity generation systems per unit power = Actual operation and maintenance costs *（1+VAT rate）**
  - **Cost of installing grid-connected RE power facilities is based on formal design documents approved by government**
  - **Total quantity of power sold ＝Planned RE power sold quantity – Quantity of power used in agriculture – Quantity of power sold in Tibet**

费用分摊的操作
Cost-sharing scheme implementation

- 建立中央可再生能源财政专项账户。可再生能源附加纳入财政预算，实行收、支“两条线”管理
- 可再生能源附加由电网公司代收，免征企业所得税

- **Set up a central RE account. Renewable Power Plus will be managed by central financial administrations based on the principle of two lines, IN and OUT**
- **Renewable Power Plus will at first be collected by power grid companies, income-tax free**

可再生能源法的其它配套政策
Other RE Law Implementation Policies

- 税收优惠政策 。根据国家可再生能源产业发展指导目录制定相应的税收优惠政策
- 技术规范和国家标准。可再生能源发电并网可靠性研究、太阳能利用一体化建筑的标准、资源勘查标准等等
- 能力建设。可再生能源技术的研究、应用和推广，以及培训、宣传和教育的能力建设

- **Favorable tax policies**
- **Technology criteria and national standards**
- **Capacity building**

建立实施监督机制
Establishing Supervision Mechanisms

- 中国可再生能源法实施涉及众多政府部门；
- 能源体制和价格机制正处在转轨过程；
- 公众参与和社会监督还很薄弱；
- 全国人大应该建立法律实施效果的监督机制，促进形成良好的政府管理体制、市场体制和社会监督机制的环境，保证法律的有效施行。

- **Many government stakeholders involved in RE Law implementation.**
- **Energy system and pricing mechanism are still being reformed.**
- **Public involvement and social supervision are still weak.**
- **NPC should establish mechanisms to manage and supervise RE Law implementation**

Fiscal Policies to Support Energy Efficiency Power Plants
支持能效电厂的财政政策

David Moskovitz　　马德威

November 2005

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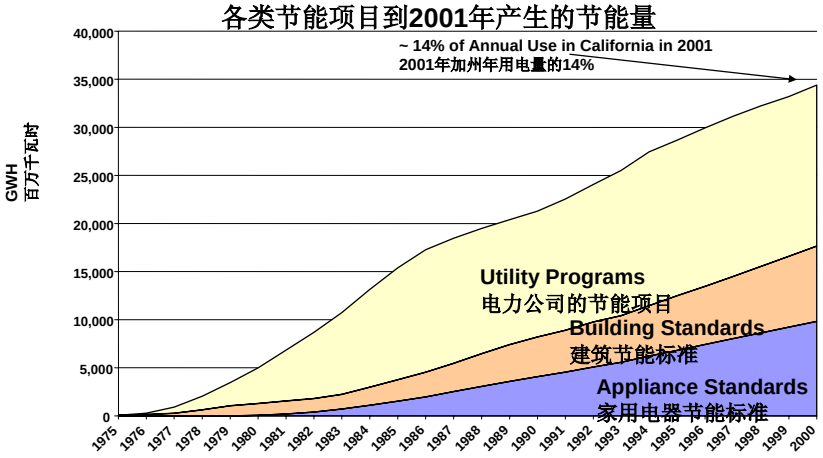
- **International experience shows energy efficiency potential is large and can be tapped by utilities**
- **Every Chinese study confirms international experience applies in China**

- **国际经验显示，提高能源效率的潜力巨大，并且可由电力公司来推动**
- **中国学者的研究证明，提高能源效率的国际经验适用于中国的国情**

DSM Approaches Work Together
需求侧管理的方法组合

GWH Impacts from Programs Begun Prior to 2001
各类节能项目到2001年产生的节能量



Source: Mike Messenger, CEC Staff, April 2003

Integrate DSM in Utility Sector
将需求侧管理纳入电力系统

- **EPP is aimed at energy efficiency in utility sector**
- **Major barriers to significant energy efficiency are institutional and policy**
- **Policy components of EPP are aimed addressing these barriers**

- 能效电厂的目标是提高用电的能源效率
- 提高能源效率的主要障碍来自于体制和政策
- 推行能效电厂可以清除这些障碍

What is an EPP?
什么是能效电厂

- A conventional power plant (CPP) - 300MW coal-fired baseload power plant
- An Energy Efficiency Power Plant (EPP) - group of energy efficiency programs that delivers 300 MW of base load electricity savings
- EPP is a low cost, clean way to meet China's energy needs

- 常规电厂（CPP）—一个300兆瓦的燃煤电厂
- 能效电厂（EPP）—是虚拟电厂，可通过打包实施一批节能项目实现与常规电厂相同的电量和容量服务
- 能效电厂以低成本和无排放的方式满足中国能源需求

EPP versus CPP
能效电厂 与 常规电厂

Need: 300 MW base load energy
需求：300兆瓦基荷电力

Option 1 - EPP 300 MW Cost: 10 fen Pollution: 0 方案 1 成本：10 分钱 污染：0	Option 2 - CPP 300 MW Cost: 40 fen Pollution: 3gr/kwh 方案 2 成本：40分钱 污染：3克/千瓦时

Who wins?
谁赢？

Jiangsu EPP Pilot
江苏省能效电厂试点项目

- **Jiangsu has been the focus of a pilot effort**
- **Many parties involved**

- 江苏省正在设计全国第一个能效电厂
- 多个单位参与：国内外专家、多边机构和非政府机构

Jiangsu EPP Pilot
江苏省能效电厂试点项目

- **Very detailed studies show wide range and large quantity of low cost DSM**
- **Picked a few high priority parts and formed an EPP**

- 研究表明，江苏省存在大量的实施低成本需求侧管理项目的机会
- 选择了几类最重要的项目，组成一个能效电厂

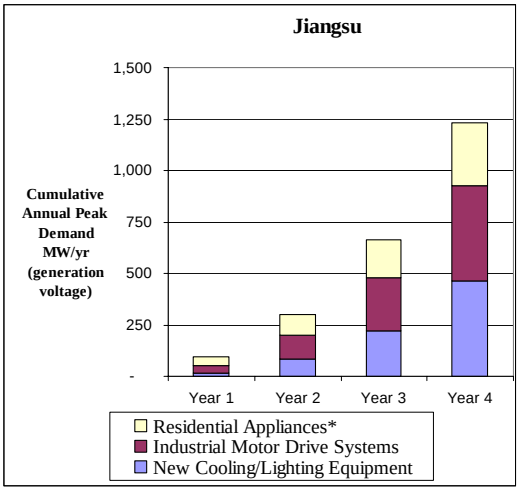
Jiangsu EPP Pilot
江苏省能效电厂试点项目

- **Jiangsu 300 MW EPP in 2 years average cost about 10 fen/kwh**
- **江苏省两年内建成一个300兆瓦的能效电厂，平均成本约10分/千瓦时**

Jiangsu EPP Pilot
江苏省能效电厂试点项目

Jiangsu Province Efficiency Power Plant								
	Electricity Savings (at Generation Voltage)							
	Energy (GWh/yr)				Peak Demand (MW/yr)			
				Lifetime Savings				
Incremental annual	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
New Cooling/Lighting Equipment	26	121	274	486	16	66	139	241
Industrial Motor Drive Systems	141	334	551	821	35	84	138	205
Residential Appliances*	64	103	153	234	41	59	84	122
Total Initiatives	**230**	**558**	**978**	**1,541**	**93**	**209**	**361**	**568**
Cumulative annual								
New Cooling/Lighting Equipment	26	147	420	907	16	82	221	463
Industrial Motor Drive Systems	141	475	1,025	1,846	35	119	256	462
Residential Appliances*	64	166	320	553	41	101	184	306
Total Initiatives	**230**	**788**	**1,765**	**3,306**	**93**	**301**	**662**	**1,230**
* Residential Appliances does not include cooling, which is counted in the New Cooling/Lighting Equipment initiative.								

Jiangsu EPP Pilot
江苏省能效电厂试点项目



Fiscal Issues
资金问题

- **EPP model assumes EPP financing is similar to CPP financing**
- **EPP externally financed and paid for over life of EPP savings**

- 能效电厂的融资模式与常规电厂类似
- 能效电厂投资成本分摊到能效电厂整个生命期来回收

Fiscal Issues
资金问题

- **Financing model allows for rapid "building" of many EPPs without significant electricity price impacts**
- **Similar to international practice of capitalizing and amortizing DSM costs in electricity prices**

- 能效电厂的融资模式允许能效电厂的数量迅速增加，而不会造成电价的明显上涨
- 类似于国际上将需求侧管理的成本资本化并通过分期摊还的方式从电价中回收

Vital Role of the Government in DSM
政府在需求侧管理中的重要作用

- **DSM and energy efficiency will not happen in the power sector without government policies**
- **Power sector reform in China increases the barriers to DSM**

- 没有政府政策，不可能在电力部门实施需求侧管理和能效项目
- 中国的电力改革增加了需求侧管理发展的障碍

DSM: Government and Utility roles
需求侧管理：政府与电力公司的作用

- **Adopt Integrated Resource Planning (IRP) principles**
  - **Power shortage shows the need for better planning**
  - **IRP uses both DSM and power supply to meet energy needs in a least-cost or optimal way**
  - **Require utility to buy 10 fen/kwh EPP before 40 fen/kwh CPP**

- 采用综合资源规划的原则和方法
  - 电力短缺说明中国需要改进电力规划过程
  - 综合资源规划通过供应侧和需求侧两种资源以最低成本或最优化的方案满足社会能源需求

DSM: Government and Utility roles
需求侧管理：政府与电力公司的作用

- **Build DSM into power markets**
- **Make DSM a Utility Obligation**
- **Treat the costs of DSM like any other utility cost: recover them in prices**
- **Adopt performance-based regulatory practice that encourage utility investment in energy efficiency**
- **Government approval of pilots**

- 将需求侧管理纳入电力市场
- 将需求侧管理作为电力公司的义务
- 将需求侧管理的成本同电力公司其他成本一样对待：从电价中回收
- 实施绩效监管，鼓励电力公司投资能效
- 批准能效电厂试点项目

DSM International Experience
需求侧管理的国际经验

- **EPP is consistent with international experience**
- **With restructuring, most jurisdictions assigned the DSM obligation to the unbundled distribution utilities**
  - **California, MA, CT, RI, NJ, Norway**
- **Some jurisdictions assigned the obligation to other entities – governmental or third-party under contract with the government**
  - **NY, OH, ME, OR**

- 能效电厂的机制与需求侧管理的国际经验一致
- 电力重组后，实施需求侧管理义务大多赋予给配电公司
  - 加州、马萨诸塞州、康涅狄格州、罗得岛州、新泽西州、挪威
- 也有一些地区将该义务赋予给其他机构，如政府部门或与政府签订合同的第三方
  - 纽约州、俄亥俄州、缅因州和俄勒冈州

Conclusion
结论

- **EPPs allow the full integration of DSM and energy efficiency in China's evolving power sector**
- **The benefits of EPPs lower cost and cleaner are very large**
- **EPPs translate general government support for energy efficiency into a specific course of action**
- **The risks of experimenting are low**

- 通过能效电厂的机制可以将需求侧管理和能效项目完全纳入正在改革中的中国电力部门
- 能效电厂在节约投资成本和减少污染排放方面具有重大意义
- 能效电厂将政府对能效的支持落实到具体行动
- 对能效电厂的尝试风险很低

建立公共利益基金力促节能和可再生能源发展
Establishing a Public Benefits Fund (PBF) to Promote Energy Efficiency and Renewable Energy

能源研究所公共利益基金研究课题组
Public Benefits Fund Research Group of the Energy Research Institute

2005年11月
November 2005

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内　容　Contents

- 一、什么是公共利益基金(PBF)？
- 二、中国为什么需要建立PBF？
- 三、国外PBF的发展和经验
- 四、中国PBF设立方案的框架建议

1. What is a public benefits fund （PBF)?

2. Necessity and significance of establishing a PBF in China

3. International PBF experience

4. Proposal for a Chinese PBF

2

一、什么是公共利益基金(PBF)? What is a PBF?

1、PBF的含义：

—实质上是为公共利益提供服务的一种公共资金，亦即为了帮助那些不能完全依靠市场竞争达到其目的的事业的一项特殊政策。

2、PBF的具体实施领域多种多样：

—环境保护

—贫困家庭救助

—新技术开发

• A PBF is a public fund supporting certain public goods that do not receive enough support through reliance on market competition.

• PBFs can support

—Environmental protection,

—Poverty relief, and

—Technology development.

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一、什么是公共利益基金(PBF)? What is a PBF?

3、节能和可再生能源PBF是其中的一种，专指用于EE和RE公共资金。

- **这种基金不是单纯的金钱概念，而是同时含有激励和约束的双重含义是一种特殊的金融制度。**
- **其特殊就在于资金的筹集、分配、使用和管理都有其特定的内涵和规范。**

—Energy efficiency (EE) and renewable energy (RE) PBF is one of them, which is referred as a public fund dedicated to EE & RE.

—PBF is not just a money concept, but also a special financial system implying both incentives and restrictions.

The specialty of PBF lies in that there are special contents & rules for its collection, distribution, use & management.

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二、中国为什么需要建立PBF?

Necessity and significance of establishing a PBF in China

1. 缺乏有效的激励政策是当前节能和可再生能源发展的一大障碍。
- 20世纪80-90年代初，中国政府曾制定并实施了一系列节能经济政策，如设立了节能专项资金、节能优惠贷款、企业实行税前还贷，设立企业节能专项奖，奖金计入成本，免征奖金税等，致使节能成效全世界瞩目。

•1. Lack of effective incentive policies is a big barrier for EE & RE development

• In 1980s & early 1990s, China formulated and enforced a series of EE economic incentive policies, e.g., special EE Fund, preferential EE loans, etc., resulting in considerable EE achievements

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二、中国为什么需要建立PBF？

Necessity and significance of establishing a PBF in China

- 90年代中期以后，这些政策趋于弱化；节能专项资金、三电资金先后被取消或停征；现有的经济政策力度又不足，节能市场失灵和市场信息障碍依然存在，致使节能融资艰难。
- 与节能相比，RE的处境更为艰难，只是最近开始有所好转，但资金短缺问题没有根本解决。

- **Since mid 1990s, the special EE Fund and Three-Electricity Fund were cancelled. Existing economic policies are insufficient in addressing EE market failure &information barriers; EE financing is difficult.**
- **Compared to EE, the situation for RE is more difficult. While the situation is improving, lack of capital for RE development remains.**

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二、中国为什么需要建立PBF？

Necessity and significance of establishing a PBF in China

2、经济体制改革，尤其是电力重组使节能和可再生能源面临新的困难。

- 在电力重组的背景下，节电将直接影响电力公司的利益。缺乏适当的激励政策成了电力公司投资节能的阻力。
- 电力重组使**RE**处于更为不利的地位。在竞争性市场中，如果没有适当的政策，**RE**发电势难得到大的发展。

- **2. The on-going reform, especially power sector restructuring is a new challenge to EE & RE development.**
- **Electricity saving has a direct impact on utilities' income. Lack of suitable incentive policies is a big disincentive for utilities to invest EE programs.**
- **Restructuring impacts RE development. RE power has higher costs and weak competitiveness. In a competitive market, RE will not develop substantially without adequate policies support.**

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二、中国建为什么需要立PBF？

Necessity and significance of establishing a PBF in China

3、我国设立PBF的积极意义深远、作用巨大

- **就节能而言：**

—近期我国技术上可实现的节能潜力估计为数亿tce

—2020年我国能源需求情景：

-BAU情景：32亿tce

-强化政策情景：24 亿tce

-削减8亿tce，60%靠强化节能

3.Impact of a PBF in China:

(a) Promote EE and realize China's energy savings potential

—Near-term energy-savings potential estimated to be hundreds of millions tce

—Projected energy demand in 2020:

-"Business-as-usual" (BAU) scenario: 3.2 billion tce

-Strengthened policy scenario: 2.4 billion tce

-60% of this 800-million-tce in energy savings must be achieved through increasing EE

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二、中国为什么需要建立PBF？
Necessity and significance of establishing a PBF in China

- 就可再生能源而言：

—为可再生能源发展提速，建立多样化的、清洁的能源供应体系

—将发展可再生能源综合纳入国家能源发展战略并加以必要扶持，是全面小康社会建设的客观要求

(b) Promote RE development

—To speed up RE development, thereby promoting establishment of diversified, clean energy supply system

—To build a well-off society, it is necessary to support RE development and incorporate it into China's national energy development strategy

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二、中国为什么需要建立PBF？
Necessity and significance of establishing a PBF in China

4、建立基金推动EE和RE的发展，是众多国家成功的共同经验.

•国外利用PBF来支持EE和RE发展有20多年的历史。实践证明，这类公共利益基金的投入和使用，已对EE和RE发展形成了有效的支持，产生了可观的经济效益，环境效益、社会效益和其他效益。

•这说明PBF已成为一种广受欢迎的政策,越来越多的国家正在酝酿采用这一政策来支持本国EE和RE的发展。

4. It is a common successful experience of many countries to establish Funds to expedite EE & RE development.

- **Internationally, more than 2 decades success in using PBF to support EE & RE.**
- **PBF has become a popular policy internationally. More countries are considering to adopt PBF**

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三、国外PBF的发展和经验 International PBF Experience

1、建立背景

- 节能和发展可再生能源不仅符合公众利益，同时也符合国家长远利益：

—提高经济竞争力
—提高国家能源供应的安全性
—改善本国区域环境
—应对全球气候变化挑战

1. PBF establishment background

- **EE and RE development is in a nation's long-term interest. Developing EE and RE will do the following:**

—increase the competitiveness of the national economy;

—improve national energy supply security;

—improve the local environment;

—mitigate climate change.

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三、国外PBF的发展和经验 International PBF Experience

- 支持建立可持续的节能和可再生能源市场

—应对电力重组对节能和可再生能源发展的影响
—支持克服节能和可再生能源发展面临的市场障碍

-信息障碍
-高交易成本
-融资困难

• A PBF supports development of sustainable EE and RE markets

—A PBF will respond to the influence of electricity restructuring on EE and RE

—A PBF will help overcome market barriers facing EE and RE development, including

-information barriers

-high transaction costs

-financing difficulties

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三、国外PBF的发展和经验 International PBF Experience

2、国外PBF的设立情况

- PBF已经成为一种国际流行政策
- 约20个国家有PBF：

—美国、澳大利亚、巴西、法国、德国、印度、日本、韩国、荷兰、英国等

- 美国：

—15个州有PBF支持可再生能源，可用的年资金规模为$2.5亿；

—22个州有PBF支持节能，可用年资金规模为$10亿

2. International PBFs

- Many nations have established PBFs supporting EE and RE
- PBFs have been established in about 20 countries:

—U.S., Australia, Austria, Brazil, France, Germany, India, Japan, South Korea, Holland, U.K., and others

- U.S.:

—15 States have PBFs for RE; annual available capital has reached $250 million.

—22 States have PBFs for EE; annual available capital has reached $1 billion

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三、国外PBF的发展和经验 International PBF Experience

3、使用效果

- 巴西/节能：

—1986-1998年，巴西为节能投入的PBF资金为2.6亿美元

—实现节能量53亿KWh(相当于巴西电力消费的1.8%)

—削减峰荷1560MW

—节约电力投资31亿美元

—效益/成本比达12：1

3. Effectiveness of PBFs

- Brazil/EE:

—1986-1998: $260 million in PBF money used for EE

—5,300 GWh saved, equivalent to 1.8% of Brazil's total electricity use

—Peak load reduced by 1560 MW

—$3.1 billion saved for utilities

—Benefit/cost ratio: 12:1

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三、国外PBF的发展和经验 International PBF Experience

- 美国/节能：对PBF所支持的40个典型节能项目的评估结果.

—PBF资金投入为2.5亿美元

—实现累计节能量200亿KWh

—平均节能成本为1.25美分/KWh

—提高了高效家用电器、高效照明设备、新建节能型住宅等的市场占有率

• U.S./EE: Evaluation results of 40 EE programs supported by PBF:

—$250 million in PBF money used

—20 TWh of energy saved

—average energy saving cost is $0.0125/KWh

—market share of efficient appliances, efficient lighting equipment, and efficient residential buildings increased

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三、国外PBF的发展和经验 International PBF Experience

- 日本：利用PBF支持分布式可再生能源发电

—1994-2001年，日本利用PBF支持了约300MW的联网光伏电池项目(补贴)

—光伏电池装机容量从1994年的1.9MW增至2001年的115MW

—促进了光伏电池市场的快速和持续增长

—住宅联网光伏电池系统项目的安装成本从1995年的$11/瓦降低到了2001年的$7/瓦

• Japan/RE: PBF supporting distributed RE power generation

—1994-2001: PBF used to subsidize the installation of 300 MW in grid-connected photovoltaic (PV) cells

—Installed PV cells capacity increased from 1.9 MW in 1994 to 115 MW in 2001

—Promoted rapid growth of Japan's PV cell market

—Installation costs of residential grid-connected PV cell systems reduced from $11/W in 1995 to $7/W in 2001

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三、国外PBF的发展和经验 International PBF Experience

- 美国：利用PBF支持大型可再生能源发电

—在最近的几年中，美国通过“拍卖+生产激励”方式，累计利用3亿美元的PBF

—预计将形成近2000MW的可再生发电装机容量，其中1600MW为风电

- U.S./RE: PBF supporting large-scale RE power generation

—In recent years, $300 million in PBF money used to support large-scale RE power generation by auction and production incentive approaches

—A projected 2000MW of RE power generation capacity will be installed, 1600MW of which will be wind power.

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（1）

- 融资机制呈多样化：

—系统效益费：美国、巴西
—污染收费或专项税收：荷兰
—政府一般性税收收入：法国
—多种渠道综合利用：英国

- 资金筹集水平和规模：

—视国家不同而有所区别，如系统效益费一般为零售电价的1%-3%

- 征收期限：

—短则5年，长则10年或更长

4. Experience summary (1)

•International PBFs' funding sources: are diversified

—System Benefits Charges (SBC): U.S., Brazil

—pollution fee or taxation: Holland

—general government tax revenue: France

—multiple sources: U.K.

• PBF collection levels:

—vary from country to country

—SBC: 1-3% of retail electricity price

•Duration of PBFs:

— 5-10 years or even longer

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（2）

- **基金使用模式**

在节能方面有二种模式：

—支持“资源获取项目”，即节能视为一种资源，以获得最大节能效果为目的节能项目称为“资源获取项目”。

—支持“市场转化类项目”

在RE方面有三种模式：

—支持项目开发：一般是直接补贴；

—支持基础设施发展：R&D，市场营销、资源评估等；

—直接对企业或项目进行投资。

4. Experience summary (2)

- **PBF application patterns**

Two patterns for EE:

—Support *resource acquisition projects*. i.e., EE is treated as a resource, and EE projects aimed at achieving maximal EE effects are called as resource acquisition projects.

—Support *market transformation projects*.

Three patterns for RE:

—Support RE projects normally through direct subsidy

—Support RE infrastructure development: R&D, marketing, resource evaluation, etc.

—Direct investment in RE enterprises or projects.

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（3）

- **基金使用具体形式：**

—前期投资补贴

一般用于基础设施建设

—合同服务

—生产性激励

—低息贷款

—风险投资

4. Experience summary (3)

- **Specific application models of PBF:**

—Up-front investment subsidy, normally for infrastructure construction

—Contract services

—Production incentives

—Low interest loans

—Venture capital

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（4）

- 基金分配方式

—竞争性招标：效益最大化和成本最小化

—先来先得：即向符合规定条件的项目提供固定额度的激励资金，先来先得，直到所有资金用完为止

—双方协商: 基金管理者与项目申请者通过谈判协商确定资金分配方案

4. Experience summary (4)

- **PBF capital distribution:**

—Competitive bidding

—First-come, First-serve

—Mutual negotiation

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（5）

- 基金管理

目前国际上有三种管理模式：

—政府职能机构

—电力公司

—独立的非政府机构

例：美国

RE方面：15个基金

其中：政府管理 10个

电力公司管理 3个

独立机构 2个

EE方面：22个基金

其中：政府管理 11个

电力公司管理 7个

独立机构 4个

4. Experience summary (5)

- **PBF administration**

3 options internationally:

—Government agencies

—Electric power utilities

—Independent non-governmental organizations (INO)

For example: USA

RE: 15 PBFs, of which:

—Government as administer: 10

—Utility as administer: 3

— INO as administer: 2

EE: 22 PBFs, of which:

—Government as administer: 11

—Utility as administer: 7

— INO as administer: 4

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三、国外PBF的发展和经验 International PBF Experience

4、经验总结（6）

- 基金监管

—建立透明、客观公正的监管十分必要

监管内容包括：

基金的目标

实施计划

实施效果

—不同的基金管理机构，需要不同的监管

政府职能机构管理基金

电力公司管理的基金

独立的非政府机构管理的基金

4. Experience summary (6)

- **PBF monitoring**

—Necessary to establish transparent, objective and fair monitoring

Contents of monitoring:

-PBF objectives

-Implementation plans

-Implementation effects

—Contents of monitoring vary depending on PBF administration agencies.

-Government as administer

-Utility as administer

- INO as administer

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

1、基金来源

- 可能的PBF资金筹措渠道：

—电费附加方式：按每千瓦时用电量计，随电价新加收一项电力附加费—系统效益费

—财政专项拨款方式

—火电厂排污收费支付方式:即将针对火电厂征收的排污费的一定比例作为基金的资金来源

—由现有电力附加费支出方式:即将现有电力附加费的一部分（如10%-20%）作为基金资金来源

1. Funding source

• Potential PBF funding sources:

—System benefits charges (SBC) approach: add a per-kWh surcharge to electricity fees.

—General tax revenue

—A portion of the Waste Disposal Fee levied on power plants

—Existing electricity surcharge: allocate a proportion (e.g., 10-20%) of the existing electricity surcharge to the PBF

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

- **PBF资金筹措渠道选择**

—基于对融资渠道可行性、资金来源的稳定性等诸多因素的综合考察，建议优先选择电费附加方式作为基金的首选融资渠道

—可行性较好

—稳定性较好

—这一渠道在国际上有较多的成功应用

—我国以往有随电价加上若干种基金的实践

- **PBF funding source recommendation:**

—Imposing a new per-kWh electricity surcharge is the best funding option for the following reasons:

—feasibility

—stability

—successfully applied abroad

—precedent: electricity surcharges have been applied before in China to support other funds

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

- **PBF资金筹措渠道选择**

—建议将财政专项拨款方式作为基金融资渠道的第二选择

—建议将政府年新增财政收入的一部分作为基金来源。“十五”头四年，政府财政总收入以近20%的年均增长率快速增长，2004年新增财政收入近5000亿元。试想将政府年新增财政收入的极小部分(如1%)作为基金来源，其现实可能性和可操作性较好。

—火电厂排污收费支付方式和现有电力附加费支出方式作为备选渠道

- **PBF funding source recommendation:**

—Using general tax revenue approach is the second best funding option

—Using a small proportion of the newly increased tax revenue (e.g., 1%) to fund EE & RE

—Part of the pollution levy or existing electricity surcharge are alternative options.

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

2、基金用途

- 支持节能
  —现有的、成熟的节能技术的推广应用，重点是节电技术的应用
  —节能技术的研究、开发和示范应用
  —节能产业的发展
  —节能产品/服务市场的建立和发展

- 支持可再生能源发展
  -现有的、或商业化前景较好的可再生能源技术的推广应用，并重点支持可再生能源发电技术应用
  -可再生能源新技术的研究、开发和示范应用
  -可再生能源产业的发展
  -可再生能源产品/服务市场的建立和发展

2. Purposes of the proposed PBF

• Support EE:

-Spread the use of existing mature EE technologies, particularly electricity-saving technologies

-Support EE technology R&D and demonstration

-Develop EE industry

-Foster EE products/services market

• Support RE development:

-Spread the use of existing or promising RE technologies, particularly RE electricity generation technologies

-Support RE technology R&D and demonstration

-Develop RE industry

-Foster RE products/services market

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

3、基金配置

基金的配置使用应坚持三个原则：

- 一是节能和可再生能源发展兼顾原则。鉴于节能对资金的支持需求较大的实际情况，建议将基金的60%-70%作为支持节能激励资金，另外的40%-30%作为可再生能源发展促进资金。

3. PBF Allocation

Three principles should be following in allocating the PBF:

(1) Funds should be support both EE and RE development. Since EE currently needs more support, we suggest 60-70% of the fund be used for EE and the remaining 30-40% be used for RE development.

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

3、基金配置

- 二是中央和地方兼顾原则。基金的一定比例，应由中央政府统一调度分配。鉴于我国地区间经济、社会发展水平差异较大的现实，由中央政府相对集中地使用资金，有利于节能资源开发和可再生能源资源开发在全国范围内的优化，提高资金的配置效率。另一方面，基金的配置使用应兼顾地方政府的利益，赋予地方政府与其责任相当的资金配置权，这将使资金的配置使用更具灵活性和针对性，有利于提高资金的总体配置效率。

3. PBF Allocation, cont.

(2) Funds should be allocated by both central and local authorities.

Because there different regions in China differ in their social and economic development levels, centralized use of the fund will optimize development EE and RE resources across the country and increase efficiency of fund allocation.

At the same time, local governments interests should also taken into consideration; they should be given the responsibility of allocating part of the fund. This will make fund allocation more flexible, targeted, and efficient.

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

3、基金配置

- 三是公平和效率兼顾原则。基于这一原则，基金在总体配置上，应兼顾城乡；同时应尽可能地引入竞争机制(如竞争性招标)，以保证资金的配置效率。

3. PBF Allocation, cont.

(3) *The equity and efficiency principle*. The fund should support projects in both rural and urban areas. Competitive mechanisms (e.g., competitive bidding) should be used in order to ensure fund efficiency.

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

4、基金管理架构

- 可供选择的基金管理模式：

—政府直接管理

-优点：经验丰富；有利于公平

-缺点：资金配置效率可能较低

—政府委托独立的事业性机构管理

-优点：可兼顾公平和效率

-缺点：可能欠缺管理经验

—政府授权电力公司管理

-优点：经验较丰富；管理能力较强

-缺点：潜在的利益冲突，难以保障公平性

4. PBF administration framework

- **PBF administration options:**

—Government agency administers PBF directly

-Advantage: rich experience; fairness

-Disadvantage: possible low distribution efficiency

—Government chooses an independent non-profit institution to administer PBF

-Advantages: fairness, efficiency

-Disadvantage: possible lack of experience

—Utility administers PBF

-Advantage: rich experience; strong administration capacity

-Disadvantages: conflicts in interest; difficult to ensure fairness

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

- 建议的基金主管部门

—从保障基金配置使用的公平和效率等角度权衡考虑，建议选择相关政府职能部门作为基金主管部门。考虑到基金的资金来源于能源，其支持对象—节能和可再生能源发展也属于能源事务范畴，因此，原则上可选择具有能源、电力或节能管理职能的政府部门作为基金主管部门。

- **Proposed PBF administration body**

To ensure the PBF is allocated fairly and efficiently, we suggest a government agency be chosen to administer the PBF.

Since the PBF funding source is energy use and the targets supported by the fund (EE and RE) are related to energy, a government body whose primary function is already related to energy, electric power, or EE management should be chosen.

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四、关于PBF设立方案的框架建议
Proposal for a Chinese PBF

- 建议的基金管理架构

  —由基金主管部门对资金的配置使用进行总体管理；

  —由财政部门对基金的运作、使用进行监督；

  —基金的具体管理和运作事务则委托专业性的社会中介机构完成。

- **Proposed PBF administration framework**

  —PBF administration body: responsible for overall PBF management

  —Government financial agency: responsible for monitoring the use of PBF moneys

  —Professional social intermediary institutions: chosen by the PBF administration body; responsible for daily detailed management and operation of the PBF

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四、关于PBF设立方案的框架建议
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- 建议的基金管理架构的优点：

  —在这一基金管理架构下，基金主管部门可以对资金的配置使用进行有效的宏观调控，又不至陷于具体事务中；

  — 同时，介入基金管理和运作的机构之间形成既相互支持，又相互制约、监督的局面，有利于保障资金配置使用的公平、公正。

- **Advantages of the proposed PBF administration framework**

  —PBF administration body will control allocation of the fund without becoming mired routine management details

  —All agencies involved in PBF management and operation can support and monitor each other, ensuring PBF funds are allocated fairly and equitably

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四、关于PBF设立方案的框架建议
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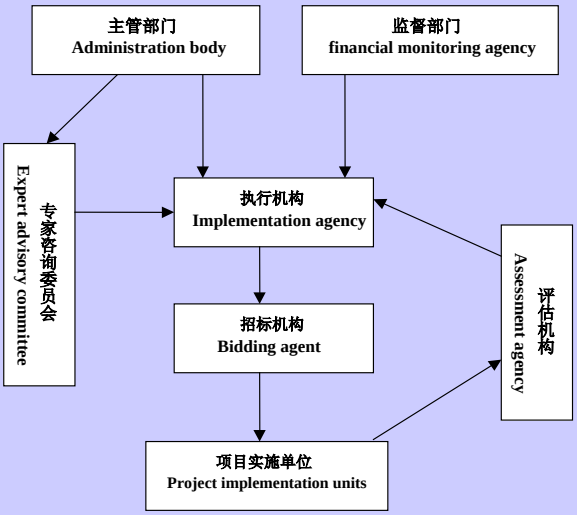

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公共利益基金管理架构示意图 (PBF management framework)

谢谢！
Thank you!

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