The China Sustainable Energy Program
中 国 可 持 续 能 源 项 目

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Background Materials

能源可持续发展财经和税收政策研究

NATIONAL FISCAL AND TAX POLICY RESEARCH FOR CLEAN ENERGY DEVELOPMENT

执行摘要
Executive Summaries

大卫与露茜尔·派克德基金会
威廉与佛洛拉·休利特基金会 合盟
能 源 基 金 会

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SECTORAL REPORTS

主　报　告

实现能源可持续发展的财经与税收政策研究

（主报告执行摘要）

国务院发展研究中心　产业经济研究部

一、对本世纪头 20 年我国能源供求形势的判断

一是当前以及今后一段时间，我国经济、社会发展受能源、资源制约作用十分突出，如何实现能源约束加强条件下的经济持续快速增长是一个具有挑战性的问题。如不采取有力的政策，将很难扭转近年来能源密度提高的不利局面，2020 年以能源消费翻一番支撑国民经济增长翻两番的目标将难以实现，能源的制约作用将难以消除。

二是本世纪头 20 年，进一步提高能源利用效率和降低能源密度的艰巨性大于之前 20 年。近年来出现并有可能维持一段时间的重化工业加速发展情况，是造成能源消费过快增长的主要原因。解决中国能源问题的出路，不能仅局限在能源领域，要在转变经济增长方式上下更大的功夫，即要在需求侧（即用能部门和居民用能领域）提高能源利用效率。

三是从先行工业化国家的情况看，如果我国在快速工业化、快速城市化和人民生活水平快速提高的历史时期，不抓住机遇，增强经济的可持续发展能力，将有可能产生“路径依赖”，经济增长锁定在高能耗的路径上。

四是近期出现的诸多问题，是能源政策缺失并长期矛盾积累的直接结果。必须扭转政策、体制等方面存在的明显缺陷，尽快建立起有效的能源财税政策、能源价格政策、能源投资政策、改革能源管理体制以及法律、标准等，才能使建设节约型社会以及十六届五中全会提出的“十一五”期间将单位 GDP 能耗下降 20%的目标，真正落到实处。

二、改革与完善能源价格形成机制与价格政策

总体而言价格形成机制存在着三个“不反映”：不反映能源资源的稀缺程度；不反映能源产品的国内供求关系；不反映能源生产和使用过程中的外部成本（如环境污染和生态破坏）。

能源价格改革的总方向是，一是尽可能建立起由市场供求决定的价格形成机制，价格要真正起到优化资源配置的作用；二是再造基于市场经济的能源价格监管体系；三是强化“外部性”调控，应使对资源、环境所造成的“外部成本”、“外部收益”均能内部化；四是各种能源类型之间应建立合理的比价关系，以促进能源结构的优化、调整。总

体而言，是将促进节能作为能源价格政策核心目标，并促进新能源的发展。

主要能源产业的价格改革要点是，煤炭价格改革的方向是实行电煤价格市场化和煤炭资源市场化，近期要完善“煤、电价格联动”机制；积极试点推行煤炭资源市场化，并建立完整、科学的资源税、费体系。

石油价格应反映国内市场的供求关系，并逐步由现行办法平稳过渡到市场定价。建议改革现行办法：一是成品油接轨价的构成主体，由国际市场成品油价格改为原油价格；二是大幅度缩短了调价时滞，以加大投机的风险；三是政府价格主管部门的作用，由价格水平的审批改为制定作价办法、相关规则及其执行过程的监督。

天然气价格改革的长期目标，是在“井、网、售”分离的基础上，天然气井口价格和终端用户价格应该市场化，管道运输价格可继续由政府监管。当前应形成天然气价格的合理水平以及与其它能源产业的合理比价关系，以促进天然气的快速发展。

电价改革的总方向是，根据电力体制改革方案和电价改革方案，加快推进电价形成机制的改革，上网、销售电价由市场供求关系决定，输配电价格采取政府管制价格。用户电价总水平应及时反映电力成本和需求的变动，应将环境污染等外部成本内部化。

三、加快能源投融资体制改革

现行的能源投资管理体制存在的问题比较突出（甚于一般的竞争性产业），表现在：政府对能源工业的干预程度要比一般的竞争性产业高得多，企业几乎无投资决策权；审批决策程序不透明，随意性强；过分关注短期的供求平衡，忽视投资项目的节能、环保等社会性管制的内容；所有制结构单一，投资和运行效率不高；节能和新能源等项目没有得到足够的重视。

改革能源投融资体制，力争实现两大目标：一是形成以公有制为主体、多种经济成分共同发展的局面，显著提高投资效益和经营效益；二是建立有效的投资激励机制，促进节能、新能源等技术的开发和市场应用。

近期建议采取的措施，一是采取分类管理，扩大企业的投资决策权。针对政府投资和企业投资两类不同的项目，实行分类管理；对于企业投资项目，减少审批的内容，扩大企业的投资自主权和决策权。

二是建立以节能、资源利用、环保为核心内容的准入机制。对能源项目的准入制度，主要从合理开发自然资源、保护生态环境、优化产业布局、保障公共利益、防止垄断、维护经济安全等方面进行核准。

三是打破国有经济对能源行业过度垄断的局面，鼓励民间资本、外资的发展，引入招投标等制度，鼓励国有、民营等各类所有制企业在公平、公开、公正的基础上进行公平竞争，以竞争的方式获取项目的投资建设与生产经营权。

四是加大政府对新能源和节能的投资力度。政府投资重点支持一般投资者不愿意投资的、仅靠市场机制难以有效运作的领域，加大示范工程的建设。

四、建立和健全财政与税收政策

现行财政、税收政策缺少促进能源可持续发展的系统化设计，政策组合差，激励与惩罚的手段极为缺乏。财政政策应作为市场经济条件下，政府对能源管理、调控的主要手段，采取有效的经济激励与限制政策，双管齐下，优化和引导能源消费，促进节能，促进能源结构的优化与可再生能源的发展。

考虑到公共财政改革的基本模式，可以将能源公共财政与税收政策区分为正向激励政策、逆向的限制政策与“交叉补贴”三大类：

正向激励政策具体包括如下几个方面：增加预算投入政策（包括投入比重和使用方向）；国债投入政策；财政贴息政策；税收优惠政策与建立税式支出制度；在控制总量的前提下，尝试对个别项目恢复政府性基金，或者将原有基金项目进行转型、改造后，嫁接于优质能源项目；政府采购政策。

逆向限制政策包括：建立固定资产投资方向调节税征收的弹性机制；扩大消费税征收范围研究；加快开征燃油税的政策措施；研究推行开征碳税政策的可行性。

“交叉补贴”政策总体思路是，从传统的化石能源（主要是原煤、原油、天然气）中通过某种方式筹集一部分资金，所筹资金全部定向用于节能、可再生能源的发展。

具体建议包括：

一是对资源税制度进行全面调整和改革，由现行的按企业产量征收改为按划分给企业的资源可采储量征收；将税率与资源回采率和环境修复挂钩，按资源回采率和环境修复指标确定相应的税收标准。

二是加大支持可再生能源的发展。调整和完善可再生能源增值税政策，普遍降低水电企业的增值税税率；调整和完善可再生能源企业所得税政策，在未来我国所得税并轨改革中，对所有的可再生能源产品一律规定减按15%的税率征收企业所得税；实行投资抵免制度、实行加速折旧。

三是将鼓励节能纳入政府公共预算支持范围，设立节能支出科目，安排相应的节能支出预算；调整预算支出结构，加大节能投入，用于节能科技的研究与开发、节能技术示范和推广、节能教育和培训、节能管理监督体系建设四个方面。并利用政府采购政策鼓励节能。

四是利用税收政策鼓励节能。参照高新技术企业和资源综合利用企业的税收政策，对节能产品生产企业给予一定的所得税优惠；利用增值税政策对关键性的、节能效益异常显著且价格等因素制约其推广的重大节能设备和产品，国家在一定期限内实行一定的增值税减免优惠政策；尽快开征燃油税等，引导合理使用能源。

五是增加政府能源研发预算投入。加大政府的研发投入；利用财政贴息政策。以少量的政府财政资金引导更多的社会资金投入到能源研发领域。

五、改革政府管理体制与监管制度

我国现行的能源管理体制和监管制度不适应未来能源可持续发展的需要，突出地表现在：综合协调能力不强；政策执行能力不够；社会性监管不足；中央与地方的政策目标不一致；监管职能不到位，存在一定的监管真空；政府管理与监管力量不足，人员严重短缺等问题。

为了完善我国的能源管理体制，增强综合协调能力，提高能源战略和政策的执行力，切实转变政府职能，提出如下建议：

一是按照“政监分离”的原则，改革能源领域的政府管理机构设置。将综合性的能源管理机构（如能源部）和专业性的能源监管机构（能源监管委员会）分设，分工明确，权责清晰。前者专司国家能源战略、能源规划和能源政策的制定，协调各能源部门之间的关系；后者专司市场监管，保证能源行业的健康发展和有序竞争。为了理顺中央与地方的关系，在各大经济区（如东北、华北、西南）分设地区综合能源管理部门和专业监管部门（如华东能源局和华东监管办），作为中央综合能源管理部门和监管机构的派出机构。

二是政府管理能源的方式，应从供应侧转向需求侧。改变以往偏重于能源资源开采、能源加工生产等能源供应侧管理的局面，逐步转向能源资源开发、能源节约、能源效率、能源技术等需求侧的管理。

三是加强事中监管，准入制度科学化、透明化。在前置审批环节，管理重点是着眼于外部性的准入管理，设置合理的资源、环保、能效等准入标准（包括项目的投资转入和部分高耗能产品的市场准入），强调政策的导向性、公开性和透明性。事中管理环节，管理重点是监督、监管和检查，健全能源审计机制，完善机构设置和人员保障，改变当前 “重事前准入，轻事中监管”的局面。在事后管理环节，管理重点是查处违规者，补偿损失。

四是实现监管重点的转变，完善监管制度。由以往的经济性监管为主、社会性监管为辅的旧监管模式，转向以社会性监管为主、经济性监管为辅的新监管模式。包括：完善市场准入监管。公开准入制度，取消所有制歧视，保证政策的透明化，建立合理的申诉制度；完善价格监管。改革价格形成机制，对自然垄断环节实行有限监管，做到保护性监管与激励性监管的有效结合，完善财务制度、成本与信息披露制度和价格听政制度；加强社会性监管。监管重心是提高资源利用效率，确保能源供应安全、提高资源利用效率、保护生态环境等；加强市场秩序的监管，重点是反垄断，促进有效竞争，对可能影响市场结构的重大购并案件进行审查等。此外，完善现行的电力监管制度，将价格监管权赋予电力监管委员会，在适当的时机，将对天然气行业（特别是输气管线）进行专业性监管。

执笔人：国务院发展研究中心产业经济研究部　冯飞

分　报　告

推动能源可持续发展的财税政策研究

（执行摘要）

财政部　财政科学研究所

一、现状与问题

我国目前还没有形成健全的能源财政政策体系，现有零星的财政税收政策措施难以发挥应有的效率，这与新时期全面实施国家能源战略的需要是不相适应的。

1、对节能重视不够。政府在节能投入不足且不稳定。而且，政府的直接投入只局限于研发和生产（技改）领域，在节能产品销售、使用、服务、回收、信息传播等方面几乎是一个空白。

2、对低能效产品和因消耗能源而产生的环境污染问题缺乏惩罚性措施。

3、现有的政策体系中存在着抑制能源结构优化的问题。在能源的开发建设上，增值税的设计在一定程度上抑制了水力发电的建设。根据水电建设的特殊性，进项成本的投入是一次性完成的，应当根据水坝的不同使用年限分摊在各年中，作为增值税计算基数的进项抵扣项，而不应直接按售电收入计征其增值税。否则就加重了水电的税负，不利于水电的发展。

4．对能源的无序开发、回采率极低造成能源资源的浪费现象，缺乏应有的税收政策措施。

5、对开发新能源与可再生能源战略缺乏相应的财政政策支持。

6．能源供应安全特别是石油供应安全问题的应对措施不够。

二、未来财税政策的总体思路

1、正向激励政策

（1）增加预算投入政策。公共预算资金在能源领域中不可能“均匀”地使用，我们认为要把握以下几个重点：①能源管理部门事业费；②节能；③新能源和可再生能源支出；④中央对地方在可再生能源、新能源和节能方面的转移支付；⑤能源体制改革过程中能源企业分离企业办社会职能所需支出以及职工的社会保障费用等；⑥在能源方面的公共预算内投资支出。

（2）国债投入政策。国债投入一般重点投向基础性产业，而能源、节能等在任何国家都属于国民经济的基础，应在国债资金中占一定的份额。

（3）财政贴息和补贴政策。财政贴息和补贴可以通过少量财政资金的投入，引导更多的社会资本投入到政府鼓励的领域。财政贴息一般适用于项目，或者说是与能源供应、转换、储运与节能有关的生产者。财政补贴则不然，既可以补贴给生产者，也可以给下游的消费者。具体到一项政策，究竟是补贴给生产者还是补贴给消费者，其政策效果往往不同，需要具体分析。

（4）税收优惠政策。一般常用的税收优惠政策是，①增值税优惠或实行增值税返还政策，但是这一政策要注意限定范围，不可过多过滥。②所得税优惠政策。③进出口税收政策。这一政策包括进口关税和出口退税两个方面。

（5）政府采购政策。重点是支持可再生能源与节能产品。

（6）财政担保政策。财政担保是运用风险投资的原理支持政府倡导的领域加快发展。

2、逆向限制政策

（1）扩大消费税征收范围。

（2）加快开征燃油税。

（3）开征能源税。

（4）改革矿产资源补偿费的征收办法。

（5）对部分高耗能产业（行业或企业）尽快取消财政补贴制度。

3、“交叉补贴”政策

三、国家能源战略重要方面的财税政策建议

（一）支持节能的财政税收政策建议

1．政府预算投入政策

（1）在经常性预算中，设立节能支出科目，安排相应的节能支出预算。主要用于节能科技的研究与开发；节能技术示范和推广；节能教育和培训；节能管理监督体系建设。

（2）整合预算内投资和国债投资，强化节能投资力度。

（3）建立节能专项基金。

2．企业所得税优惠政策。

（1）鼓励节能产品生产的企业所得税优惠措施：

建议采取税率减半的直接优惠办法：对专门从事节能产品生产的企业，减半征收企业所得税；对非专门从事节能产品生产的企业，就其生产经营节能产品取得的所得，减半征收企业所得税。但要求企业分别核算节能产品生产经营所得，未分别核算或核算不

清的不能享受税收优惠。

（2）促进节能产品使用和消费的所得税优惠措施

建议对企业为达到国家规定的能耗标准进行节能改造而购置的节能产品（设备），按其产品（设备）投资（购置）额的一定比例（如 15%）从企业应纳所得税额中抵免，当年不足抵免的，可用以后年度应纳所得税额延续抵免，但最长不超过 5 年。对形成固定资产的节能设备，可适当缩短折旧年限或采取加速折旧的方法计提折旧。

（3）明确企业所得税节能优惠目录

3．政府采购政策

要加大节能产品认证力度；加快节能产品的政府采购步伐；节能政府采购要实行集中采购模式；试行节能产品的协议，供货制度；加强节能产品政府采购的宣传执行工作。

（二）支持清洁能源的公共财政税收政策建议

1. 促进可再生能源发展的财税政策建议

（1）调整和完善可再生能源增值税政策。

为扶持风力发电，其增值税税率还应降低，至少应与煤电相当或更低。关于小水电的增值税优惠政策，我们建议，一是普遍降低水电企业的增值税税率，至少要与火电大体一致。二是进一步降低小水电的增值税税率，大体保持在 3%左右。

（2）调整和完善可再生能源企业所得税政策。

在未来我国所得税并轨改革中，要从国家层面研究制定促进可再生能源发展的措施。一是对所有的可再生能源产品一律规定减按 15%的税率征收企业所得税；二是实行投资抵免制度，即可再生能源企业的投资可以用新增所得税抵免一部分；三是实行加速折旧，加大研发费用的支出份额。

（3）调整和完善可再生能源设备进口关税政策。

国家为鼓励国内资金投向，今后对利用国内资金进口国外所有可再生能源的设备，应由外商企业一样，免征关税和进口环节增值税，以确保内外资企业保持同等“国民待遇”，并促使可再生能源发展。

（4）明确政府财政支持可再生能源的方向和重点

——加大可再生能源研究开发的政策支持力度。

——完善国家财政对可再生能源的补贴政策。

——着力支持农村的可再生能源建设。

（5）关于财政政策与银行信贷政策配合支持可再生能源发展问题。

2．加快我国核电发展的财税政策建议

加强财税政策扶持力度，促进我国核电发展。考虑到我国核电发展仍处于发展初期，建议加大政策扶持：一是加大财政支持。将支持核电发展列为专项，给予核电足够技术

开发经费，重点支持先进技术的研究开发和设计自动化；政府与核电项目业主分担自主化依托项目的建设风险和“首堆工程费”，对自主化依托项目补贴适量的技术攻关经费。二是加大进口环节税收优惠政策支持。对国内不能生产或制造，需要进口的材料、部件或设备免征进口环节税。三是完善核电增值税政策。建议在2010年前把核电的增值税降低到小水电的税率（6%），以降低核电成本费用，增强核电的优势和竞争力，促进核电发展。

3．支持我国清洁煤发展的财税政策建议

支持洁净煤的基础技术和共性技术研发，支持煤气、煤液化等环保性好、投入大、具有一定风险的洁净煤技术示范项目。对于关键引进技术的消化吸收、示范项目所需进口设备和技术，给予进口关税、进口环节增值税优惠和融资支持；对商业化的洁净煤技术项目，给予低利率贷款或财政贴息支持。支持选煤企业加大技术改造力度，将洁净煤技术项目优先纳入国家重点技改项目，享受节能专项贷款、企业技术创新贷款支持等。此外，要鼓励实施分段式二氧化硫排污收费方式：对于已采用先进技术、排放量很低的企业，降低收费额；对于未采用减排技术、对环境影响较大但又未超标的企业，调高收费标准，刺激企业采用有效的减排技术；对于严重影响环境、超标排放的污染源，实施惩罚性征收标准。

（三）促进能源结构调整、保障能源供应的财政税收政策

1．支持建立国家战略石油储备制度

在建立中国石油储备筹资模式时，既要借鉴国外经验，又要充分考虑国情。具体如何筹集这笔资金？根据国外经验，具体可以采取如下方式：

- 设立专项基金，例如通过对成品油价的加价筹集，或者从某项税收（如石油消费税）收入中按一定比例；
- 开征专门税种；
- 发行专项国债。

2．大力支持国有能源企业开拓海外能源合作市场

从实际情况看，政府应当在统筹、支持国有企业海外能源合作业务方面采取必要的政策措施，除了协调三大油公司的海外业务、在其对外投资审批手续和程序上给予特殊支持以外，政府财政还可以从财务管理、投资风险基金、税收抵免优惠等方面给予特殊的财政支持。

3．积极支持煤炭及传统能源产业的发展。

要进一步调整煤炭资源税政策，扩大资源税的调节作用；要运用税收政策、企业财务政策，促进煤炭安全生产。

（四）支持能源研发与科技创新的财税政策建议

1．增加政府能源研发预算投入

2．要为企业用于能源研发的银行贷款提供财政贴息

3．运用税收优惠政策支持能源研发

（五）改革中央与地方在能源公共财政和税收体制方面的思路和建议

1．国家通过确定有关能源开采最低标准的基础上，将扩大开采或回采比例所征收的税收或费用全额返还当地政府，以此抑制常规化石能源基地存在的短期行为和浪费行为。

2．不分所有制，鼓励技术水平高、开采和生产效率高的大中型企业兼并技术水平低的小型企业，在税收政策上限制浪费资源的小型企业过快发展。

3．对将来可能实行的有关逆向限制政策所出台的税收（如碳税、能源税等），作为中央政府固定收入，或使中央政府在税收分享中占较大比重，增强中央政府在能源生产、消费、节能等方面的调控能力。

（六）分步推出我国能源公共财政政策措施的建议

能源公共财政政策是一个复杂的系统、各类政策措施既独立作用又相互联系。我国能源战略的有效实施对政府公共财政政策提出了迫切的需求，然而我国公共财政制度建设本身尚在完善之中，财政政策能力有限。结合实现我国能源战略的客观需要和公共财政改革与发展的现实，我们认为，上述公共财政政策工具的具体运用、财税政策措施的有效实行，需要全面考虑，统筹规划，分步推出。

	能源战略目标	具体政策措施
近期可以推出的财税政策措施	○推动节能 ○保障能源供应	○鼓励节能产品的企业所得税优惠政策 ○尽快开征燃油税 ○强化政府节能采购政策 ○调整资源税政策 ○加大预算内的能源研发投入和能源监管事业投入
中长期应当考虑的财税政策措施	○全面提高能效 ○优化能源结构 ○确保能源安全	○建立（工业）节能专项基金（资金） ○在税制全面改革的基础上调整涉及能源的各税种（增值税、消费税、所得税、进出口关税等） ○开征能源税或炭税 ○预算支持国家石油战略储备体系的建立

可持续能源发展的投融资体制改革和政策研究

（执行摘要）

国家发展和改革委员会　投资研究所

一、中国能源投融资体制改革的历程

1．改革的主要方面及成效

1979 年以来，为了保证全国的能源供应和资源合理配置，伴随着国家投融资体制改革，中国在能源投融资体制方面采取了一系列改革措施。逐步在投融资管理体制上，拓宽建设资金来源渠道；不断打破国有经济的垄断，外资和民间资本进入能源建设的限制逐渐放宽；投资体制向投资主体多元化、投资方式多样化和资金来源多渠道发展；同时在节能投融资、新能源建设投融资等方面制定了一系列法规和措施；不断加大政府对节能、环保和新能源建设的资金支持力度，并吸引民间投资进入。

这些措施改变了国家独家办能源所造成的资金严重匮乏和渠道单一的状况，大大推进了能源工业的发展，能源基本建设投资规模迅速扩大。1979 年到 2000 年的 22 年间，能源基本建设投资增长了 23.4 倍，年均增长达到 15.6%。2000 年全国的能源投资达到 12,640 亿元人民币。自 2002 年以来，经济增长加快和高耗能产业的无序发展和高投入，导致能源需求过旺以致出现供应短缺，刺激了能源投资的高速增长。2002 年和 2003 年基本建设投资分别达到 17.8%和 16.0%的增长率。尤其是供应能力不足的煤炭和电力在 2003 年其基建投资比上年分别增长 71.8%和 18.4%。

2．中国能源投资需求预测

根据《中国能源发展战略与政策研究》预测，在 2020 年前，为了实现经济和社会發展目标，中国能源中长期供应面临需求快速增长的压力。2004－2020 年的能源生产数量和投资需求预测如表 1 所列。

表 1　能源投资需求预测（2004—2020 年）

	生产能力		投资需求（亿元）	
	2010	2020	2020	平均每年投资
煤炭（亿吨）	22	27	10000	625.0
石油（亿吨）	1.8	1.9	6600	412.5
天然气（含进口LNG）（亿m^3）	1100	2000	4400	275.0
电力装机（亿 kw）	7.2	10.0	51600	5162.5
其中：电网			31000	

能源工业2020年前累计投资总需求10.36亿元人民币，从2004年起每年投资6475亿元。如果考虑油气的海外投资和非化石能源的研制生产，估计总投资将达到18万亿元人民币。

二、我国能源发展投融资体制存在的问题

目前中国的投资体制主要存在以下一些问题

1．投资主体多元化方面的问题：

（1）民营经济和外商投资主体在一定程度上受到国有投资主体的排挤；（2）一些地方政府对外商投资能源项目的履约存在问题，使一批外资电力公司撤离中国电力市场。

2．能源投融资管理方面存在的问题

（1）缺乏可操作性的可持续能源投资规划和配套政策；（2）能源投资项目管理体制不健全。

3．可持续能源建设融资方面存在的问题

（1）政府投入不足；（2）企业投资积极性不高；（3）投融资渠道少。

三、能源可持续发展的投融资体制改革的目标和实施步骤

1．能源可持续发展的投资体制改革指导思想

能源可持续发展的投融资体制改革的目标以及制定和推进相关改革措施，必须坚持如下原则：（1）要体现推进市场化改革的方向，确实保护各类投资者合法权益，调动全社会投资者的积极性。（2）在努力打破当前国有经济在能源行业过度垄断的同时，要确保公有制经济在该行业保持一定的比重，确保国家对该行业的直接和间接控制。（3）国家要充分发挥市场准入、投资监管和宏观调控等多重手段，确保该行业的投融资活动在规范化、法制化的轨道有序运行。（4）要体现能源行业的管理体制和运行机制与国际惯例接轨的要求，同时又要体现鼓励该行业积极参与国际竞争尤其对国际能源资源占有与竞争的要求。

2．能源可持续发展的投融资体制改革的目标模式

能源可持续发展的投融资体制改革的终极目标是实现“市场为主，政府支持，法律约束”的投融资体制。

3．推进投融资体制改革的实施步骤

第一阶段（2005～2010年）：明确划分市场调节和政府调控的范围，放宽民间资本进入能源行业的门坎，提高市场化水平和经济、社会效益。政府要选准促进能源可持续发展的投资支持重点，调动国内投资者对能源，特别是可持续能源建设投资的积极性。逐步制定和完善确保能源可持续、健康、稳定和快速发展的各类法律法规，为实现能源行业投融资领域的规范化、法制化运行奠定基础条件。

第二阶段（2010～2015年）：要逐步实现市场在能源可持续发展过程中的基础性作用，明确规定盈利性的能源开发投资活动完全由企业自主投资；政府只对存在市场“缺

陷”的，如节能项目和新能源项目提供资金和优惠政策等方面的支持。全面推进能源行业的企业投融资活动与市场经济接轨，与国际管理接轨；继续完善相关法律法规，全面推进能源行业投融资领域的法制化进程。

第三阶段（2015～2020 年）：能源投融资体制改革的各项目标基本到位，能源建设已经形成由法律法规保障和规范运作的、满足社会主义市场经济体制要求的新型投融资体制和运行机制，相关的法律法规已经健全，为能源可持续发展提供了体制和法律保证；市场在资源配置中的基础性作用得到了充分发挥。

四、促进可持续能源发展的投融资政策建议

针对我国能源发展中的投融资问题，借鉴国外的经验，可从以下几个方面研究制定促进可持续能源发展的投融资政策和措施。

1．改进政府对能源投资的管理

（1）进一步扩大企业投资自主权。明确企业在能源建设领域的投资主体地位。要不断完善和简化企业投资能源建设项目，特别是对可持续能源项目的核准制度。对内资项目主要从合理开发自然资源、保护生态环境、优化产业布局、保障公共利益、防止垄断、维护经济安全等方面进行核准；对外商投资项目，政府还要从市场准入、资本项目管理等方面进行核准。政府对投资项目的核准范围、内容、程序和办理时限，应向社会公开，提高办事效率、增强透明度，接受社会监督。

（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，打破国有企业和国有经济对能源行业的过度垄断现象。在具体措施上，对涉及国家垄断资源开发利用、需要统一布局的传统能源和新能源开发项目，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；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；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。

（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；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新技术和管理经验。

（4）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。

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。要合理利用税收、价格、利率、证券发行、金融和货币政策等可以由国家控制的经济手段去间接调控投资主体在可持续能源和节能方面的投资行为。

（5）建立有效的信息导向制度。国家要尽快建立可持续能源行业的投资和技术信息发布制度：一是由国家和地方政府有关部门，在其管理范围内定期公开发布有关可持续能源和节能技术发展和应用的信息；二是培训制度，即由政府或政府委托有关单位定期举办企业领导培训班，传达有关可持续能源和节能发展的各种相关信息。同时要鼓励社会团体和中介组织对企业领导者进行公益型的可持续能源和节能信息培训和咨询，政府可以适当予以资助。建议国家在“十一五”时期启动国家可持续能源投资信息系统的建设，要建立严格、通畅的可持续能源信息报告制度。

（6）对节能和能源环境保护建立市场准入机制。国家应该对各类建设项目所采用设备、交通工具和建筑物的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运行。

（7）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，尽快制定已颁布的《中华人民共和国可再生能源法》和《中华人民共和国节约能源法》配套法规和政策，具体落实两法中关于投融资政策的规定；加快政府投资监管和宏观调控与市场经济和国际惯例接轨；要加快《中国节能技术政策大纲》修订工作，并制定《可再生能源技术政策大纲》。

2．政府投资重点转向可持续能源和节能建设

（1）政府对能源的投资要从盈利性项目转向一般投资者不愿意投资的新能源开发、节能和能源环保项目，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传统能源领域的投融资活动，政府投资不应再进入。

（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。

（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。

（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。

3．改善可持续能源和节能项目的融资环境

（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。国家开发银行还应逐步退出技术比较成熟和已经充分市场化的火电项目领域；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。

（2）为新能源开发企业直接融资提供渠道。降低银行贷款等间接融资比例是我国发展资本市场和投融资体制改革的战略取向之一。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。

（3）国家建立新能源开发基金和担保基金。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基金。

（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。

4．加强能源环境保护投资

（1）国家对建设项目的能源环保设施要给予一定的资金支持。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。

（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。

（3）促进水电持续、快速有序开发。中国是世界上水能资源总量最多的国家，由于大型水电工程建设工期长、一次性投资大，业主负债率高且周期长等等，国家要通过流域规划控制合理布局，通过招标吸纳各方资金，包括民间资本和外商投资，可以避免一个项目多家争抢或者无序开发；同时要为多渠道融资创造条件。小型水电工程的优点是工期短，见效快，易于发挥各方积极性，可由地方或民间集资兴建；地方政府要对小水电的建设要在资源合理使用和环境保护方面进行严格的审查。

（4）加大资金投入，加速发展天然气。资金问题是困扰天然气产业发展的一个重要问题，问题的解决要一靠政府、二靠生产企业。政府要在投融资方面对天然气的勘探和开发予以支持。一是直接采取资本金注入、贷款贴息等方式支持企业对天然气资源的勘探和开发；二是要制定相应的政策广泛吸引国内外的资金参与天然气的勘探和开发；要推进油气行业的体制改革，通过组建公司，使民间资本参股甚至控股天然气的开发利用，打破国有经济独占的现象。

（5）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；可重点扶持几个商业开发实验区，总结经验之后推广；要制定准入标准和投融资补贴、税收、价格、发电上网等方面的优惠政策，吸引各类投资者投资开发可燃气；要通过推广循环经济和环境保护政策，要求新建企业必须建立配套的生产线，收集和利用主业生产排放的可燃气体发电、制造煤化工产品，或为居民提供生活用能；政府可为资金能力有限的企业提供资金补助或直接投资居民使用

的设施建设；鼓励其他投资者投资建设下游企业，与主业企业组成联合体或成为客户企业。

（6）积极发展核电。

核能是快速解决能源不足并且不扩大污染的理想能源。核电具有安全技术标准高，地点选择严格，配套设备相对复杂，建设投资量大、工期长，投资回收期长等特点，要快速发展核电，国家应该在投融资方面给予了多方面关注：一是要尽快建立适合我国发展的技术标准和准入标准；二是在核电设备的设计、研制和工业实验方面加大资金投入力度；三是要允许企业采取发企业债券和股票的办法吸引国内外各方面的资金进入核电建设；四是对核电建设的贷款和运行之后的税收、上网和资产折旧等方面给予一定的优惠政策，提高核电站的盈利能力。五是要加大对核废料的收集，储存和处理；六是要设立基金，应付核电退役后巨额核污染处理的成本。

（7）重视城市热电建设。热电联产可以充分利用能源，提高人们的生活质量，并且能有效地减少大气污染，适宜在城市地区建设。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。

5．控制重点行业的节能

（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：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，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；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；四是在建设规模上加以约束，严禁建设平均耗能水平高的小钢铁、小水泥、小化肥等企业。

（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；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。

（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电能混合动力和氢能为动力的汽车研制和开发，以适应2010年后汽车能源动力系统转型的趋势；在汽车的燃料方面，近期应鼓励车用乙醇、甲醇和二甲醚等替代燃料的生产，并加大推广使用工作；要在城市提倡公交优先、大力发展轨道交通、快速大容量公交系统和普通汽（电）公交车系统。支持投资多元化，发展城市快速轨道交通。减少民众在城市出行中的小汽车使用率。

能源价格：政策构建与监管改革研究

（执行摘要）

国家发展和改革委员会　经济研究所

本文以可持续发展为出发点，评析我国能源价格的现状并对今后的政策构建与监管改革提出建议。

一、我国能源价格存在的主要问题

“煤、电、油、气”被称为我国的基础能源，构成了我国能源消费和生产的主体。本文关于现状的评析，也以煤炭、石油、天然气、电力的价格为重点。

1、煤炭价格的主要问题。

除“重点合同”电煤外，绝大部分煤炭价格均已由市场供求关系决定，这两年涨幅很高，但各界认同，市场运行平稳。目前的主要问题是电煤价格的“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。

2、**石油价格的主要问题**。

原油价格也基本上实现了市场调节。目前存在问题的，主要是尚由政府管制的汽油和柴油价格。现行汽、柴油价格形成机制对有效利用国内、国际两种资源，保障国内市场供应，配合国有石油企业改制和提高管理水平，起到了积极的作用。但在这样一个与国际市场关系密切、原本属可竞争的行业，维持甚至加强“中石化”、“中石油”两大国有公司的“主渠道”地位，价格管制与预期目标有差距也是很正常的。目前的主要问题是：

（1）接轨价的确定与国内市场供求脱节；

（2）调价边界条件以事后成本补偿为根据，未能及时体现市场供求的调整要求；

（3）价、税（费）关系不合理。

3、天然气价格的主要问题

（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。

4、电价的主要问题

现行电价政策对发电投资有足够的吸引力，已经具有节能取向，支持新能源和可再生能源发电的力度也在逐步加大，但不能避免常规能源发电供求关系的失衡，对常规能源发电短期供给的调节措施也不够完善，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。

二、我国能源价格政策构建与体制改革的基本思路

到目前为止，我国政府尚没有关于能源价格政策的明确表述。我们的建议可概括为：以兼顾能源的可持续和国家竞争力的可持续性为指导思想，以价格与成本相符为中介目标，以引入竞争、再造监管、强化“外部性”调控为主要措施。

1、兼顾能源的可持续和国家竞争力的可持续性

我国经济与社会发展已进入大量消耗能源阶段，自身的资源赋存不足以支撑预期的经济增长。这就决定了我们必须以节能为核心，并鼓励新能源和可再生能源的开发，才能实现能源消费的可持续。

我国目前已经形成的这种能耗较高的经济结构，主要原因是我们的科技水平和劳动力素质低。外资投向、出口产品较多地集中于制造业，不可避免地提高了我国的“单位GDP 能耗”。所以，我国目前的这种能耗较高的经济结构，总体上看，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，我国也还处于不发达国家行列，因而能源供给结构的选择，也不能简单地与发达国家进行比较，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。

因此，我国现阶段的能源价格政策，一方面，必须把促进节能作为基本取向，并支持新能源和可再生能源的开发，以实现能源消费的可持续；另一方面，也必须兼顾国家经济竞争力的可持续。要尊重我国现阶段高耗能型经济结构及以煤为主的能源供给结构形成的历史必然性，不能盲目追求单位 GDP 能耗的下降和可再生能源的发展规模。

2、各项操作以价格反映成本为主轴

我国新时期能源价格政策既要把促进节能作为核心目标，并支持可再生能源发展，又要确保国家经济竞争力的可持续，两者兼顾的基本途径是能源价格的合理化。而能源价格的合理化的基本标志，就是价格反映成本。实现前述能源价格政策的目标，各项操作应围绕如何使价格反映成本进行。

我国目前能源企业的会计成本对社会而言是不完全的，或是未含所耗自然资源的全部价值，或是未含环境破坏给社会增加的成本开支，即没有实现外部成本内部化。只有能源价格不仅反映企业正常的内部成本，也包含环境、资源等外部成本，能源消费才会自动调整到社会所能承受的合理的水平。

3、以引入竞争、再造监管、强化“外部性”调控为主要措施

（1）进一步引入竞争机制。竞争是加强企业外部约束、扩大消费者选择范围进而

节约资源的最有效的手段。因而在我国，传统的竞争性产业已基本上取消了国家计划，价格由市场竞争形成。煤炭和石油本质上也属竞争性行业，应积极排除障碍，尽快引入竞争机制。天然气和电力传统上属自然垄断行业，但近年来国内、外的理论研究和改革实践均已证明，这两个行业的输送网络业务与输送网络之外的业务在性质上是不同的，前者仍不同程度地具有自然垄断性，而后者本质上属竞争性业务，只要相关条件具备，完全可以建立竞争性的市场结构和由市场供求决定的价格形成机制。在我国能源领域进一步引入竞争机制，当前需重点解决竞争型市场结构的建立、体制改革的整体规划、改革领导责任的落实这三大问题。

（2）再造基于市场经济的能源价格监管体系。我国过去实际上没有经济监管，计划经济中的直接控制或自上而下的命令与市场经济中的监管是两回事。在那些仍存在垄断经营的能源行业，经济主体利益与决策越是多元化，以平衡买、卖双方经济利益关系、基于规则和程序的监管及其现代化就越重要。特别是目前的电力行业，“厂、网”已基本分开，在电力系统内的技术联系依旧而经济关系巨变的情况下，既要提高电力企业效率，又要保电力系统安全、可靠，没有一个现代化的监管体系，决无任何可能。再造现代化的能源价格监管体系，当前的重点是：建立职能完备的能源价格监管机构；完善监管的规则体系；形成利益相关者间的制衡机制。

（3）强化“外部性”控制。能源行业的“外部性”主要表现为对资源和环境的影响。能源价格政策应由有利于实现：①“外部成本”内部化。资源成本内部化的基本途径，是尽可能实行资源价格的市场化。增量国有资源使用权的分配，必须通过规范的招标进行。对存量国有资源的使用，应建立完整、科学的资源税、费体系，如资源税征收标准按产品价格水平分档设计；资源税征收基础改按产量计征为按占用资源量计征等。环境成本内部化的基本途径，是有针对性地建立一整套科学的环境税、费体系，各项环境税、费的征收标准，应以能源企业排污所缴税、费额大于其污染治理支出为标准。在政府仍实行价格监管的能源行业，如企业的资源和环境支出增加，能源价格应相应提高，为资源和环境等“外部成本”内部化创造必要的条件。②“外部收益”内部化。风能、生物质能、潮汐能、太阳能等可再生能源的开发和使用，可以减少化石能源的开采和消费，既实现了不可再生能源的节约，又保护了环境，这些正的“外部性”，应该促其发扬。但现阶段，以会计成本为标准做出的经济性评价，可再生能源明显低于常规能源。其“外部收益”内部化的方法，可考虑以下两种：一是政府定额补贴。即根据可再生能源与常规能源的成本差额，按单位予以定额补贴，但其价格由市场决定。二是政府按可再生资源的实际成本核定价格，并强制经销企业全额收购。前者可用于已建立竞争性市场的行业，后者可用于仍垄断经营的行业。但无论采取那种方式，由于我国国土辽阔，地区间经济社会发展不平衡，都必须在常规能源终端用户价格上加收一个小额“附加”，以用于解决可再生能源与常规能源成本差额的合理分摊问题。

三、几个主要能源产业的价格政策及体制改革要点

1、关于煤炭价格政策的建议

（1）政府不宜压制电煤价格上涨。政府压制电煤价格上涨不利于节能。在当今经济环境下也难执行。

（2）积极创造条件实现电煤价格市场化。许多人认为：“只有电价市场化了，电煤价格才能完全市场化”。其实不然。在 20 世纪 90 年代以前，几乎没有电价市场化的国家，但在绝大多数发达市场经济国家，包括煤炭在内的发电燃料价格早就市场化了。可见，电价市场化并不是电煤价格市场化的必要条件。我国已经确立了“煤、电价格联动”制度，电价所以还会成为煤价市场化的障碍，是因为根据现行的“煤、电价格联动”制度，不管煤价涨多高，都要求发电企业“消化”30%，加之电价联动时滞过长，导致不得不对煤价予以压制。因此，只要“煤、电价格联动”机制得以完善，电价体制将不再是煤价市场化的障碍。

还可考虑对电煤“重点合同”铁路运力招标分配。除“煤、电价格联动”机制不完善外，目前限制电煤价格市场化最主要的障碍，是因铁路运力不足而实行的电煤运力计划分配制度，它使“重点合同”电煤买、卖双方都不能自由选择交易对象。这与竞争性电力市场中的输电网阻塞性质是相似的。可考虑仿照竞争性电力市场中的输电权拍卖和“输电权交易”，对原电煤“重点合同”铁路运力的分配实行招标，并相应建立铁路运力指标的交易制度。

（3）煤炭资源成本形成规范化、市场化。

2、关于石油价格政策的建议

（1）成品油价格与国际市场接轨由直接改为间接。

（2）改变调价边界条件。现行的调价边界条件为月度国际市场价格变动加权平均 8%，建议改为：国际市场连续 10 个交易日移动平均价格与基期相比变动超过一定幅度；或 10 个交易日连续上涨、下降于一定幅度之上。以加强调价的顺势引导功能，并加大投机的风险系数，减少因投机行为而导致市场失衡的可能性。

（3）政府监管的成品油价格形式由中准价改为最高限价。

（4）扩大批发价的执行范围。6、放开航空煤油的出厂价格。“中航油”已获得航空煤油进口权，具备了自由选择供货商的条件，国内采购价格的政府监管已无必要。

（5）放松成品油批发、零售的市场准入，引入竞争机制。

（6）建立科学的价、税（费）关系。在燃油零售环节，应尽早开征与道路使用、环保、资助节能及可再生能源发展有关的税、费。除增值税外，其他税、费应从量计征，以保证相关公共资金来源的稳定与可靠，并减少不必要的价格波幅。

（7）完善石油市场体系。随着放开外资和民营资本在批发市场的准入，应在国内尽快建立包括现货批发市场、期货市场在内的完整的石油市场体系。

3、关于天然气价格政策和监管改革的建议

（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。关于天然气配售成本构成，应在财政部发布的《企业会计准则》基础上，按照国际惯例，由价格监管机构牵头制定出更具体的、适用于监管的成本规则。关于其中争议最大的“开口费”性质归属问题，规范的称呼应是“接入费”。如用户接入共用网络时有特殊支出，可按实际发生额计费；如用户接入共用网络时无特殊支出，则可按统一标准计费。而用于共用网络的支出，应在整个经营期内，分年度摊销。

关于天然气配售价格结构的确定，应以各类用户对配售系统供气成本的影响为依据。而各类用户对配售系统供气成本的影响不同的主要原因，是用户的消费特性不同，如负荷率的差别，管网容量的差别、用气时段的差别等。基于上述因素来设计天然气配售价格的结构，可使用户的价格与系统对其供气的成本相符，从而推动合理的天然气消费结构的形成。

4、关于电价政策和监管改革的建议

（1）用户电价总水平及时反映电力成本和需求的变动。要破除用户电价总水平必须保持相对稳定的传统理念并建立、完善电价总水平适时调整的监管规则和办法。目前，解决实际操作困难的主要突破口是要对确定“煤、电价格联动”幅度的规定进行修改。我们的修改建议可喻之为：“路、桥分开，各司其职”。

所谓“路”，是指对被监管电力企业“效率不断提高”的正常要求。这一要求的实现，国外通行的做法是在电价调整公式中设效率系数（如英国的调价公式“RPI-X”中的 X，就被称为效率因子）。目前我国电价监管只有定价公式，没有调价公式，规则是不完整的。为实现电价调整的规范化、法制化，建议尽快制定电价调整的公式。在我国的电价调整公式中，也应按国外通行做法设立“效率提高系数”或“成本下降系数”，对要求企业“消化”的一般性成本增支因素（包括燃料价格的小幅上涨），可通过此“路”解决。

所谓“桥”，是指特殊性成本增支的解决方式。与调价公式中设定的“效率提高率”或“成本下降率”正、负相抵后的成本增支（对火电机组而言，主要是燃料价格较大幅度上涨），就可视为特殊性成本增支。这种特殊性成本增支，是社会为保持现有能源消费规模所必须付出的代价，应该让消费者准确地感知这种能源稀缺的程度，所以应全部通过提高电价的方式予以解决。

（2）建立与供电成本相符的用户电价结构。电价结构的合理与否，直接决定能否形成合理的电力消费结构，进而，不仅关系能源节约的绩效，还影响一系列相关的资源配置效率。所以，可持续发展的电价政策构架，必须包括“建立与消费者耗用供电系统成本相符的用户电价结构”。

（3）外部成本内部化。排污费的征收标准，应定在明显高于企业达到政府总量控

制目标所必要的成本支出水平之上。我国幅员广阔，各地区间气候、人口密度及名胜古迹的分布等均有很大不同，从而SO_2排污的危害程度也有很大差别，相应的SO_2排污控制目标也不完全一致。因此，SO_2排污费不应实行全国统一的标准。在大幅度提高排污费的征收标准的同时，如果企业采取了必要的防治措施如安装了脱硫装置并投入运营，相应的成本支出应允许企业通过正常的渠道予以收回，以鼓励发电企业增加环保投入。在上网电价仍由政府管制的阶段，上网电价应能够容纳脱硫的合理成本。建议根据老机组改造成本较高的实际，另行制定一个适用老机组的脱硫成本标准，并使之在执行中有适当的弹性。

（4）逐步引入竞争机制。根据国外电力市场运行的实践经验，无论“单边”、还是“双边”交易，竞争的压力都会促使发电企业千方百计降低燃料消耗，从而产生直接的节能效果。特别是“双边”交易制度，由于在电价的形成机制中引入需求方因素，调节对象进一步扩大到消费环节，节能效果更为明显。再说，我国电力行业已基本实现了“厂、网分开”，如不引入竞争机制，则不仅达不到优化资源配置的目的，还徒增交易成本，导致资源配置效率进一步下降。因此，电力行业引入竞争机制的步伐应该加快。近期，除继续完善华东、东北两个区域电力市场试点规则外，建议重点做好以下两项工作：（1）加快推行“大用户直购”试点；（2）抓紧设计与国情相适应的电力市场模式。

（5）规范、整合随电价征收的政府性基金。促进节能（如实行需求侧管理）、支持可再生能源发展，现阶段均需公共资金支持。通过电费附加筹集此类公共资金，符合公平与效率原则。在国外，已有成功经验，我国也有“电力建设基金”、“三峡基金”及“库区移民扶持基金”的操作实践。只要对这些随电价征收的政府性基金进行规范、整合，就可使之成为促进能源可持续发展的政策支撑。

（6）按照发展与效率兼顾的原则确立可再生能源电价政策。可再生能源发电属政府资助项目，为保证公共资金的使用效率，政府必须予以控制。但我国地域广阔，地区间资源禀赋、需求水平都有很大差别，从公共资金的使用效率最大化的要求出发，资源禀赋与开发量并不一定成正比，所以可再生能源发电价格水平也不应全国一致。发展与效率兼顾的办法，就是分省确定可再生能源发电标杆价格（或标底价格）。各省的标杆价格（或标底价格），可在该省常规能源平均上网电价的基础上，加一个全国统一补贴标准。

利用环境税费政策促进节能和可再生能源发展研究

（执行摘要）

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一、环境税费的概念及政策设计

环境税费是对已经证实对环境有害的实体单位征收的税费。自上世纪 70 年代初，OECD 环境委员会首次提出“污染者负担”原则之后，许多国家为防治日益严重的环境污染与破坏，便开始实施排污收费制度，其本意是国家根据“污染者负担”的原则，以筹集污染治理资金为目的，由污染者负担其所造成环境破坏的恢复治理费用，其目的主要在于填补因环境污染所造成的费用，以实现社会公平，不至于将来由国家和社会承担这笔巨大的费用。

从上世纪 90 年代初，西方发达国开始进行“绿色税收”改革，提倡依靠功能完善的市场机制，即应用适当价格机制和环境税费等经济调控政策，达到保护环境和可持续发展的目标。征收环境税费的目的不再仅局限于按“污染者负担”原则筹集环境治理资金，而且要从根本上促进资源节约，促进生产模式和消费模式的转变，促进人与自然的和谐与可持续发展。同时采用多种政策工具的组合，其环境政策法规框架基本上都包含三个部分：其一是强制性的环境法规，例如设定排污标准或环境质量指标，并通过立法手段强制执行；其二是基于市场的经济激励政策，例如排污收费、能源税、排污许可交易等；其三是自愿性环境行为，例如企业节能自愿协议，公众自愿购买绿色电力等。

二、促进节能和可再生能源发展的环境税费政策建议

1．将排污收费收益用于节能和可再生能源技术的开发和利用

我国自 1978 年改革开放以来即开始实施排污收费制度，2003 年以前主要是对废水、废气、废渣、环境噪音和放射性等五大类 113 项污染物实行超标排放收费。在排污费的使用上，主要是用于返还企业治理污染，部份用于有偿贷款。2003 年后施行的排污收费政策，由浓度超标收费改为零起点总量收费，收费标准提高到略高于污染治理设施的运行成本。在排污费使用上，也从着重于排污企业的污染源治理转化为集中使用，纳入国家财政预算，设立“环保专项资金”，用于重点污染防治，区域性污染防治，污染防

治新技术、新工艺的开发示范和应用，以及国务院规定的防治污染项目。

当前的环境收费政策对于促进企业加强管理，减少污染，保护和改善环境起到了积极作用，同时体现了“污染者付费”的原则，使其外部不经济内部化，维护市场公平竞争，对于促进技术创新和环境友好技术的发展起到了积极推动作用。但目前“环境专项资金”的使用仍以污染的末端控制和治理为主要。“环境专项资金”的使用不能只着重于污染的治理和减排（如火电厂增加烟气脱硫系统），而且更应注重支持发展节能和可再生能源技术，以从根本上杜绝污染物的产生。这有利于扭转“先污染，后治理”的环保老路。因此，近期应统筹权衡污染治理与控制源头的关系，将一定比例的“环保专项资金”用于支持节能和可再生能源的开发和应用。

2．逐步提高排污收费标准，使其更能反映污染的全社会成本，有利于提高节能和可再生能源技术的市场竞争力

我国当前排污收费的标准过低，远不能抵偿污染所造成的社会经济损失。根据测算，一个 600MW 煤电厂污染排放的外部成本为 0.0938 元 /kWh，但按照目前的排污收费标准，电厂支付的排污费相等于 0.0096 元 /kWh，只为外部成本的 10.2%。

在现有的排污收费政策下，一个 600MW 煤电厂的上网电价为 0.35476 元/kWh，而一个 4MW 工业有机废水沼气发电工程的上网电价为 0.40030 元/kWh，一个 20MW 风电场的上网电价高达 0.68393 元/kWh，说明现有的排污收费政策对提高可再生能源发电技术市场竞争力的作用微乎其微。但是，如果提高排污收费标准使其反映污染排放的全社会成本，煤电厂的上网电价就会提高到 0.43896 元/kWh，高于沼气发电工程的上网电价，可以使沼气发电变成有市场竞争力的发电技术。

另外，新办法在排污收费标准上虽比原来有所提高，力图使收费略高于治理的运行成本，但总体上仍然偏低，大部份不能抵偿污染减排成本。以 SO2 排放为例，目前的收费标准为 630 元/t，对燃煤电厂折合为 0.0044 元/kWh。如电厂建造脱硫装置，以一个山东电厂的案例分析来看，新建机组的脱硫成本为 0.0145 元/kWh，而老机组改造的脱硫成本则更高，达 0.0172～0.0225 元 / kWh。收费标准不及减排成本的 1/3。环境收费的力度不足以激励企业自动采取减排措施。

因此，为了促进节能技术和可再生能源技术的开发和应用，应该逐步提高排污收费标准，在近中期应使其达到污染减排成本，在远期最终使其反映污染的全社会成本。

3．统筹规划、综合利用各种环境经济激励政策，建立并形成完善的环境税费政策体系，推进“资源节约型”和“环境友好型”社会的建设，促进经济、环境、能源的协调和可持续发展。

中国环境费税政策改革的目的是要建立起一个完善的环境费税综合政策体系，促进生产模式和消费模式转变，促进资源节约和环境友好技术的创新和发展，促进经济与环境的协调和可持续发展。

除了现有的排污收费政策外，我国应适时征收化石燃料消费税。近中期可考虑先征

燃油消费税，使成品油销售价的含税率达 60%左右，这将有效地缓解石油供应的紧张，同时也促进节能环保型汽车和替代燃料的发展。对于节能与可再生能源技术与产品，要给予多种税收减免优惠措施，如减免增值税、减免新能源设备的进口关税、加速折旧等，创造有利于节能和可再生能源发展的政策环境和市场环境。远期可考虑引入 CO2 税等生态税种。

我国应统筹考虑，整合“环保专项资金”和《可再生能源法》规定要建的“可再生能源专项资金”，建立一个一般性的“公共利益资金”，使支持环境污染防治、节能和可再生能源的经济激励政策更加有效地发挥作用。资金的来源除国家财政预算拨款外，可考虑征收电力附加费，使电力消费中包含对化石能源消费污染的税费，支持节能和可再生能源的发展。参考国外电力附加费约为电价的 1～3%的征收标准，我国电力附加费可设计为 0.005～0.01 元/kWh。2004 年全国电力 19031.6 亿 kWh，按此计算每年至少可筹集专项资金 85 亿元。

4. 将环境税费政策与公众和企业的自愿行动相结合，鼓励和提高公众和企业的环境意识和参与意识，在全社会形成保护环境、节约资源的舆论和社会氛围。

解决环境污染和资源紧短这两大难题既不能只依靠市场，也不能过分依赖政府，需要全社会的广泛参与和自愿行动，是要进行一场经济发展模式和社会消费模式的深刻的革命性的变革。除强制性手段和经济激励措施外，需要公众社会理念和消费观念的转变，需要激发公众的社会责任感，自觉抵制污染环境和浪费资源的行为，并自愿为环境治理和节约资源做出贡献。因此需要将环境保护及节能和发展可再生能源的各种信息及时、正确地传播给公众，争取大多数公众的理解和配合，形成积极的舆论导向和社会压力。这种情况下，国家法律法规的执行就有了广泛的群众基础，环境税费等经济激励措施也会变得容易执行并更能发挥成效。

我国要加强节能和可再生能源信息传播和公众意识培养，吸引社会对节能和可再生能源开发利用的广泛参与。国外实践表明，舆论的导向和公众的广泛参与对节能和可再生能源的发展有至关重要的影响。通过信息传播、教育、培训和科技普及等手段，提高和增强公众节能和开发利用可再生能源的意识，促使公众和企业自觉购买节能产品和认购可再生能源电力和使用可再生能源产品，参与节能和可再生能源的开发和利用，吸引社会对可再生能源产业投资，兴办节能和可再生能源生产企业和服务性企业，促进节能和可再生能源的发展，同时使政府和企业在节能和可再生能源开发利用的规划和义务方面受到公众和舆论的监督，形成促进节能和可再生能源发展的健全机制。

加快能源管理体制改革，建立现代监管制度研究

（执行摘要）

国务院发展研究中心　产业经济研究部

中国能源可持续发展离不开政府能源管理体制改革和现代监管制度的建立与完善。在这方面，中国不仅需要借鉴国外的成功经验，更需要从现实出发，以提高政府能源管理效能和监管能力为目标，通过不断的体制和机制创新，逐步建立起符合能源可持续发展要求的现代管理体制和监管制度。

一、中国能源管理体制和监管制度存在的主要问题

总的来看，中国现行能源管理体制和监管制度是不适应未来能源可持续发展的需要的，突出地表现在以下六个方面：

一是综合协调能力不强。主要是不同层次政府之间，以及政府财政、税收、投资、价格、金融、贸易、城市建设、交通、国有资产管理等诸多职能部门之间，存在目标和步调不一致、国家利益和地方利益不一致、眼前利益和长远利益不一致的“三个不一一致”问题。

二是政策执行能力不够。目前政府管理的重点更多地放在前置性审批环节，项目的事中、事后监督与管理则相对较弱，存在“重审批、轻监督”的现象。

三是社会性监管不够。现行的政府能源管理侧重于投资、价格、生产规模等经济性管理，对于环境、安全、质量、资源保护等外部性问题的监管相对较弱，客观造成了重生产轻消费、重供应轻节约的现象。

四是中央与地方的政策目标不一致。能源关乎一个国家和地区经济增长、财政、就业、收入分配、社会稳定等各个方面，由于中央政府与地方政府存在短期目标与长期目标的不一致，导致中央政府与地方政府在能源管理目标、手段、程度等都难以保证上下一致。一个典型的例子是中央与地方政府在经济型汽车的政策上存在明显的不一致。

五是监管职能不到位，存在一定的监管真空。从国外经验来看，监管职能的相对集中有利于监管政策的统一性和执行力，而目前中国能源监管处于较分散状态，监管机构面临职能缺失和监管真空问题，如电监会始终缺乏价格、准入等核心监管手段。

六是监管力量不足，人员严重短缺。中国有 13 亿多人口，能源从业人员多达 1200 多万（仅煤炭从业人员就高达 500 多万），但中央政府仅有几十人专司能源管理之责，相比之下，美国能源部有 1.5 万名联邦雇员从事能源管理。

下图为事前、事中和事后给出的中国现行能源管理和监管重点环节与权重情况。

	经济性	节能	环保	安全
事前	●	○	○	○
事中	○	○	○	○
事后	○	○	●	○

注：● 表示程度高，○ 表示程度中等，○ 表示程度较轻，○ 表示程度微弱。

二、改革目标与重点

未来一个时期，中国要从根本上解决上述六个方面的问题，需要进一步深化能源管理体制的市场化改革。

改革的总体目标是：在借鉴国外成功的建立现代监管体制的国际经验基础上，逐步建立起一个独立运作、政监分离、职能完善和有效监督与制衡的现代监管体制。

保持监管机构的独立性。无论是在政府序列当中还是在政府序列之外来设立监管机构，保持监管机构的相对独立性是建立现代监管体制的基础。

实现“政监分离”。将行政管理职能与监管职能适当分离，将政策制定与执行职能相分离，是保证监管机构的独立性和监管政策连贯性的前提条件。

完善监管职能。在放松经济性监管（投资、价格和市场准入等）的同时，要加强社会性监管，以及对垄断环节的监管，实现监管重点的转移。

加强依法监管。健全能源领域的法律法规，加强依法监管，实现有效监督，建立有效的制衡机制。

在总体目标指导下，中国能源管理体制与监管制度改革宜分阶段推进，按照近期、中期和远期目标的不同要求，来确定未来一个时期的改革重点和步骤。

近期目标（1—2 年）。重点放在完善机构职能，转变管理重点上。增强能源综合管理部门的协调职能，完善监管机构的监管职能（如电监会对于电价的监管职能）。管理重点由能源生产与供应转向更加关注需求，从经济性监管转向社会性监管。

中期目标（2—5 年）。重点放在改革政府机构设置，理顺中央与地方关系上。以增强政府的行政执行能力为主线，改革能源管理机构。

从组织保障、制度保障两个方面，实现中央与地方目标的一致性。

远期目标（5-10 年）。形成依法管理、有效推动可持续发展的新型管理体制和长效机制。形成完善的能源管理与监管的法律法规体系，政策重点放在节能和提高能效、保障能源安全和可再生能源发展等方面。

三、我国能源管理新体制的初步构想

建立我国能源管理新体制，首先需要国家按照“政监分离”的原则，改革能源领域的政府管理机构设置。通过建立能源管理的“双层结构”来实现“政监分离”。具体而言，就是将综合性的能源管理机构（如能源部）和专业性的能源监管机构分设，分工明确，权责清晰。前者专司国家能源战略、能源规划和能源政策的制定，协调各能源部门之间的关系；后者专司市场监管，保证能源行业的健康发展和有序竞争。

表 1 和表 2 分别为长期目标下，中央政府层面上，按行业和按功能设立的能源管理和监管职能设置情况。

表 1　按行业划分的能源管理和监管机构的设置

	煤炭	石油	天然气	电力	核能	可再生能源
能源政策的制定	能源部、发改委					
投资	能源部、发改委、国土资源部	能源部、发改委	能源监管会	能源监管会	能源部	能源部
价格	能源部，价格分析及评估，不直接控制		能源监管会	能源监管会	核电，能源监管会	发电，能源监管会
财政与税收	财政部、税务总局					
科技	发改委、科技部					
信息汇总与分析	能源部、能源监管委员会（电力、天然气的信息分析）					

表 2　按功能划分的能源管理和监管机构的设置

	供应侧	需求侧		
		工业	建筑	交通
节能	能源部	能源部	建设部	交通部(未来运输部)
环保	环保总局			
安全	主要是供应侧，石油安全（能源部），天然气、电力安全（能源监管会），核安全（核安全局），煤炭等生产安全（安监总局）			
质量	主要是供应侧，电力、天然气（能源监管会），其他不做特殊性管理安排。			

纵向地看，可以各大经济区（如东北、华北、西南）为单位分设地区综合能源管理部门和专业监管部门（如华东能源局和华东监管办），作为中央综合能源管理部门和监管机构的派出机构。各省、自治区和直辖市也可以组建相应的综合管理部门和监管机构，作为各大区综合管理部门和监管机构的派出机构。这样的好处是提高了能源管理的综合性和协调性，有利于加强专业化监管，增强国家政策的执行力。

新的能源管理体制将呈现出以下特征：

第一，实现管理职能的转变。表现为管理的重点从供应侧转向需求侧，即改变以往

偏重于能源资源开采、能源加工生产等能源供应侧管理的局面，逐步转向能源资源开发、能源节约、能源效率、能源技术等需求侧的管理。

在前置审批环节，管理重点是着眼于外部性的准入管理和环保、能效等准入标准，强调政策的导向性、公开性和透明性。

在事中管理环节，管理重点是监督、监管和检查，健全能效审计机制，完善机构设置和人员保障。

在事后管理环节，管理重点是查处违规者，补偿损失。

第二，实现监管转型。由以往的经济性监管为主、社会性监管为辅的旧监管模式，转向以社会性监管为主、经济性监管为辅的新监管模式。新监管模式包括：

完善市场准入监管。公开准入制度，取消所有制歧视，保证政策的透明化，建立合理的申诉制度。

完善价格监管。改革价格形成机制，对自然垄断环节实行有限监管，做到保护性监管与激励性监管的有效结合，完善财务制度、成本与信息披露制度和价格听政制度。

加强社会性监管。监管重心是提高资源利用效率，确保能源供应安全，保护生态环境等。

加强市场秩序的监管。监管重心是反垄断，促进有效竞争，对可能影响市场结构的重大购并案件进行审查等。

中长期能源税、碳税的政策设计分析研究

（执行摘要）

国家发展和改革委员会　能源研究所

一、背景

近几年中国的能源消费快速增长，到2004年底，已经接近20亿吨标煤，给能源生产、交通和环境带来巨大压力，同时使得以前没有得到关注的能源安全问题得以高度重视。能源的这种发展已经开始影响社会和经济发展，必须要提出更为明确的能源可持续发展战略，尤其是进一步采用各种降低能源需求的政策。

我国的经济体制已经逐步走向市场经济。能源发展的管理体制的变革相对缓慢，但经济发展的大形势已经为在能源发展中进一步采取财政和经济政策提供了良好的基础。目前国际上已经在能源发展中采取了许多财政和经济政策，并获得了很好的效果。在目前的发展形势下，需要加快财税和经济政策的研究结论，支持国家相关政策的制定。

在中国制定财政和经济政策相关的政府部门主要有国家发改委、财政部、税务局、环保局、科技部等。对财政和经济政策的分析应考虑各个部门的协同，以及可能出现的一些问题。

在进行政策评价时，需要对政策的成本效益进行分析。在财政和经济政策的分析中，定量分析就显得非常有必要。国际上一般均采用一些模型作为工具对财政和经济政策进行分析，积累了一些研究经验。在我国，这方面的研究相对较弱。因此，该研究将着重构架中国的财政和经济政策分析模型体系，并用之分析几项重要的能源税种的研究分析。

二、研究目的

本课题的研究目标是分析我国的财政税收体系，回顾国内相关的能源财税政策，在国际上已经采用的能源税收政策的基础上，提出中国的能源税、机动车燃料税、碳税体系；同时开发构架一个经济能源模型，并利用该模型对我国可能采取的能源财政政策进行定量的成本效益分析。

三、研究方法

为了能够评价能源发展中的财政和经济政策，在该研究中选择了 IPAC－SGM 和 IPAC－AIM/技术模型。IPAC－SGM 是一个一般均衡模型（CGE 模型），考虑各经济活动之间的影响与关联，在 IPAC 模型中主要各种能源环境政策对经济影响，也同时分析了各种中长期能源与环境情景。IPAC-AIM/技术模型是一个详细技术评价模型，采取自下向上方式进行分析，可以进行技术政策和温室气体减排政策的评价，适合于中短期能源与温室气体排放情景分析。定量分析的目标年为 2030 年，分析的区域为全国。

这两个模型是不同的模型类型，为了能够较好的分析财政和经济政策，需要在这两个模型之间建立较好的关联以保持一致性。这两个模型基本采用相同的社会经济、技术参数以保持基本一致的情景设置。同时由于两个模型的理论方法不同，在这两个模型之间保持一定的软连接，即在模型外传递一些参数。所传递的参数和模型的关联见图 1。

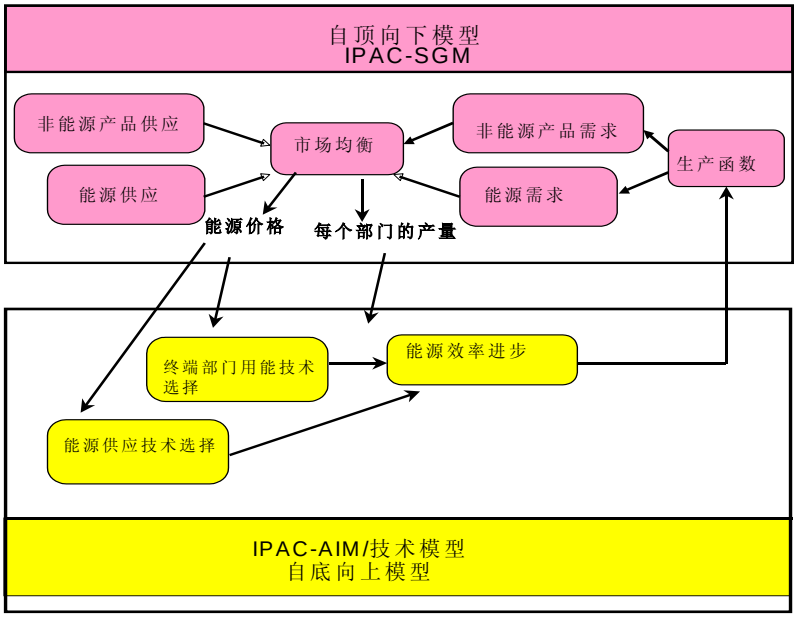


图 1 IPAC-SGM 和 IPAC-AIM 模型之间的关联

IPAC－SGM 模型和 IPAC-AIM / 技术模型的开发目的是进行能源与环境的政策与趋势分析，可以较好的分析能源税和碳税的实施效果。但如果将它们应用于能源税、燃料税、环境税、以及碳税的系统分析，还需要对模型进行扩展。扩展的内容主要包括应用模型进行税收返还和税收中性化分析等。

四、模型参数

根据对财税政策的国内外回顾，及项目要求，中国未来主要能源财税政策的设计主要包括机动车燃料税、能源税、环境税和碳税。为了能够分析未来的政策效果，在模型者中构建了 2020 年中国基准能源情景。研究中构建分析中国 2020 年的参考能源情景，

作为能源发展中的财政和经济政策研究的基础情景。

研究中的主要假定在下列表中给出，包括人口、经济增长和结构。人口的假定来自于其他相关研究，GDP 的增长主要依据政府发展目标和相关研究。

表 1　人口假定（百万人）

	2000	2010	2020	2030
人口	1284	1393	1440	1495
城市	413	531	631	710
农村	872	862	809	785

表 2　GDP 增长

	2000-2010	2010-2020	2020-2030
GDP 增长速度	7.8%	6.6%	5.6%

为了能够分析中国采用能源财税政策的影响，需要设定一个基准情景，用以描述未来发展的趋势。对能源财税政策的分析则建立于这个基准情景之上。

人口、GDP 增长率等主要参数在这些分析中保持一致。技术参数和一些高能耗部门服务量设定见表 3。

表 3　高能耗部门服务量设定

	单位		基准情景	
		2002	2020	2030
钢	百万吨	182.4	410	350
铜	百万吨	1.63	5.2	5.8
铝	百万吨	4.51	12	18
乙烯	百万吨	5.43	14	20
合成氨	百万吨	36.75	50	56
化肥	百万吨	37.9	52	58
水泥	百万吨	725	1100	1100
玻璃	百万重量箱	234.4	520	560
汽车	百万辆	3.25	15	17

模型中的财税政策参数的设定，主要依据目前国内正在讨论中的税率如机动车燃油税，以及国外的税率情况。

1) 机动车燃料税（费改税和进一步的机动车燃料税）

机动车燃料税在第一步首先采取费改税的税率，在之后则进一步进入到机动车燃料税。基本考虑是逐步提高税率，使其在 2030 年左右达到目前欧洲国家的水平（2030 年中国的人均收入开始接近目前的欧洲水平）。机动车燃料税税率设定见表 4。

表 4　　机动车燃料税税率设定　　单位：（元/升）

	2006	2010	2020	2030
汽油	1.1(费改税)	2.4	3.6	4.6

柴油	1(费改税)	2.1	2.7	3.4
GTL		2.1	2.7	3.4
醇类燃料	1	1	1	1
生物柴油		1	1	1

在未来进一步的分析中，需要分析不同的税率的效果和影响，缩短税率变化的时间间距，以确定合适的税率和实施时间表。

2) 能源税

由于能源税在我国还是一个比较新的研究，对于其税率的研究还很少。这里我们根据其他国家的能源税税率，以及在 IPAC 模型研究过程中对能源相关税率的研究结果给出。见表 5。

在下一阶段研究中，确定税率将成为这个课题的研究重点。可以设置不同的税率，通过模型定量分析，得到其不同的效果，再确定最佳税率。

表 5　　能源税税率设定　　单位：（元/tce）

	2006	2010	2020	2030
煤炭	0	50	80	120
石油	0	50	70	100
天然气	0	50	60	80
水电	0	0	0	0
其他可再生能源	0	0	0	0

3) SO2 排放税

SO2 排放税税率的确定，基本遵照国家环保局的规划。见表 6。

表 6　SO2 排放税税率设定案　　单位：（元/tSO2）

	2005	2010	2020	2030
SO2 费	460	700	900	1100

4) 碳税

碳税税率的确定，主要来自于 IPAC 模型组的前期研究，以及国外一些国家所采用的税率，见表 7。

表 7　碳税税率设定　　单位：（元/tC）

	2005	2010	2020	2030
碳税	0	100	150	200

5）税收收入的使用

模型设置的税收收入使用如下：70%用于政府收入, 作为一般政府性支出；30%作为节能和新能源发展支出。

6）税收中性

个人收入所得税：下降 5%；企业所得税：下降 3%。

7） 价格弹性

主要应用于对于我国的机动车燃料税的分析，考虑成本上升对于大众出行的影响。由于目前缺少详细研究，暂时采用其他国家的研究结果，将价格弹性定为-0.25。

五、结果分析和政策建议

分析研究表明，征收能源税对我国未来能源需求的抑制作用非常明显。到 2010 年征收能源税情景与基准情景相比，税率为 50 元 / 吨标煤时，能源需求量将下降 6.3%，约节能 1.26 亿吨标煤，到 2030 年税率为 120 元 / 吨标煤时，能源需求量将下降 16.2%，约节能 4 亿吨标煤。征收能源税也会对 GDP 产生了一定的负面影响，但影响有限。2010 年征收能源税时，与基准情景相比 GDP 损失为 0.4%，2030 年 GDP 下降了 0.36%。这主要是由于能源价格的上升导致了对有关经济部门的抑制作用和能源产业产值下降。但研究中没有充分考虑我国减少进口对经济的促进作用，以及减少国内对能源产业的投资而增加对一些新兴产业投资所带来的效果。如果考虑这些效果，GDP 的损失将非常有限，或为正面影响。同时从 GDP 增长率来看，基本没有变化。另外需要关注的，损失的 GDP 是比较带有“污染”的 GDP，如果考虑绿色 GDP 的话，则这些损失会大大减小。

征收机动车燃料税会对抑制机动车能源需求的快速增长起到明显作用。2006 年征收机动车燃料税情景与基准情景相比，税率为 1.1 元 / 升汽油时，机动车能源需求量将下降 4.1%，约节能 490 万吨油，2010 年征收机动车燃料税情景与基准情景相比，税率为 2.4 元 / 升汽油时，机动车能源需求量将下降 10.3%，约节能 1620 万吨油，到 2030 年税率为 4.6 元 / 升汽油时，机动车能源需求量将下降 20%，约节能 9000 万吨油。机动车燃料税已经是国际上较为广泛采用的能源税制，已经具有比较好的经验。在目前我国石油需求和交通用能快速增长的情况下，采用机动车燃料税有积极的作用。适当的政策可以引导大众的交通消费行为，促进先进交通技术的发展，机动车燃料税就是这样一种较为恰当的财政政策，而且有比较好的效果。

如果考虑到我国能源系统快速发展带来的社会成本，主要包括能源安全成本、扩大国际市场所引发的成本、以及环境成本等，征收能源税的效果将更为明显。特别是最近我国对拟征收机动车燃料税的讨论，为征收能源税带来了很好的契机。我国应该从现在起，比较认真的考虑征收燃油税和能源税。相对于目前所考虑的费改税，直接征收能源税将简单得多。

从长期来看，采用碳税，或者与能源税相结合的碳税是一种可行的选择。采用碳税会实现较好的 CO2 减排效果，同时对经济影响有限。如果考虑征收碳税可能会促进我国一些新兴行业发展的作用,在未来几十年里将促进我国的能源技术进步和产业技术升级,进而促进这些行业的发展。

这些能源相关的税收政策在我国还处于起步阶段，面临一些难题。这些难题在这些政策的初期会出现，但随着认识的深入，以及相应对策的实施，可以得到逐步解决。有一些问题，如机动车燃油税中如何收税，又如何进行返还或补贴，在其他国家或地区也同样存在。在充分研究之后，可以选择一些方案进行实施，虽然还有缺陷，但这些问题

在未来也仍然存在，考虑到其积极作用，需要设立，而且越早越好。另外油价不断上升，其实是尽早引入燃油税的一个好的基础。为了避免大量资金外流，需要强化节能。同时在我国社会经济快速发展阶段，这些明确的政策信号应尽早出台，对社会发展选择产生影响，如城市布局、公共交通发展、基础建设等。这些社会选择的寿命期非常长，具有“锁定”效应，应尽早对这些选择做出决断。能源相关的税率可以采用逐渐提高的方法，以避免对大众生活和经济产生大的冲击。这也是一个学习的过程。

从我国总体财政收入来讲，未来的能源相关税收所占份额较小。按照研究中所考虑能源税率，到 2030 年税收总额约为 5000 亿元，估计为当时全部税收的 5%左右。与其他发达国家一样，能源将成为经济发展的一个重要因素，因此要利用能源税收收入，作为引导性资金，为更为合理利用能源提供基础，如一部分税收可用于支持节能、新能源和可再生能源利用、新能源技术开发。能源产业和能源利用技术将是经济发展中的重要环节，恰当利用这些资金，可以促进经济发展，更好的加强竞争能力，为国家的长期可持续和发展提供基础。此外，这些新的税种的中性，使政府的税收收入由于支持节能、环保、清洁能源的减免税新产生的税收减少，起了补偿作用。

通过定性的政策研究和定量的综合模型分析，我们建议在近期（2006-2007）尽快出台燃油税，在中期（2010 左右）实施能源税和环境税，以及在远期（2020 后）推出碳税。在我们的研究分析结论中，这些税增加了政府利用市场机制的调控能力和手段，对抑制石油的消费、改善环境、促进能源可持续发展有着积极明显的效果。

六、有待进一步研究的问题

该研究中已经初步建立了对能源财税政策的评价体系，构架了评价模型系统。同时确定了能源财税政策的评价指标，通过回顾国际上的经验和国内的各种研究，初步提出了能源税、机动车燃料税和碳税的税率，及使用方式。在国家财政收入的基础上利用模型对这些政策进行了定量分析，给出了建立这些税种对 GDP、能源需求、污染物和碳排放的影响。

但我们也认识到，目前的研究还处于初步阶段，今后在以下几个方面尚需开展进一步的深入研究：

■结合其他课题的研究，系统的提出税收的使用方向，使得税收政策的设计更加完善。

■结合报告中提出的财税政策评价指标，进一步利用模型的定量分析给出指标数据。目前的模型分析中，对一些指标的分析还需要进一步深入，如这些税种的引入对就业的影响等。

■进一步研究合理的税率。在目前模型研究的基础上，利用评价指标，需要对多种税率的效果进行分析，提出可以采纳的税率。

■进一步扩展模型，针对评价指标所需的数据，在模型的部门扩展、数据校核、价格弹性分析、技术进步参数设计、国际市场能源价格影响、消费行为变化方面还要开展进一步的工作。

专题报告

中国建筑节能激励政策研究

（执行摘要）

国家发展和改革委员会 能源研究所

一、建立建筑节能激励政策对建设节约型社会具有战略意义

1. 建筑节能是建设节约型社会的关键领域

（1） 建筑能耗成为我国未来能源消费增长点是必然趋势：近年来，我国每年新建建筑面积高达 16~20 亿平方米，采暖空调普及率大幅度提高。同时，全面小康社会的重要内容之一是改善居民居住环境，这决定了建筑能耗成为我国未来能源消费增长点是必然趋势。

（2） 采暖空调能耗属于季节性能耗，是导致我国出现季节性能源短缺的主要原因。合理提高采暖空调系统能源效率水平，是缓解我国季节性能源短缺问题的关键途径。

（3） 建筑节能分散性、公益性特点突出，是建立节能长效机制的关键领域。

2. 中国存在着巨大的建筑节能潜力。

（1） 能源系统：大型公共建筑单位面积的耗电量是普通居民家庭的 6~10 倍以上，能源系统（中央空调系统、照明设备等）运行效率低下，普遍存在 30%以上的节能潜力。集中供热系统的实际运行效率也普遍存在 15%~30%的节能潜力。

（2） 建筑物：对于新建建筑，建筑节能标准达标率非常低，每年新建的 16~20 平方米建筑物将在未来 50~70 里无节制地浪费大量能源。大量的既有建筑存在着保温隔热、遮阳、密闭性等性能很差的问题。

总体上看，中国北方城镇地区单位面积的采暖能耗是同纬度气候相似国家的 2~3 倍。

3. 建立建筑节能激励政策体系是当务之急

当前正在处于居民消费结构升级、消费需求旺盛的时期，居民的生活正在从“生存型”向“享受型”的阶段过渡，每年新增的住房、采暖空调设施、家用电器都居世界之最。建立起市场经济条件下的节能激励长效机制体系将对建设节约型社会和促进经济社会的可持续发展具有重要的战略意义！

二、国际经验

1. 所有市场经济发达国家给予建筑节能领域的重视程度和政策支持都远远超过我

国。

2. 市场经济国家建筑节能激励政策支持的技术范围、对象、类型、方式以及激励资金来源和使用等方面的思路都有值得借鉴之处。

3. 市场经济国家建筑节能激励政策的实施经验表明，激励政策的设计、实施、监督管理和评估环节都非常重要，确保实现预期的节能效果是政策的关键。

4. 节能中介机构在建筑节能激励政策的制定和实施过程中发挥着重要作用。

三、障碍分析

1. 机制性障碍

（1） 集中供热/供冷计量收费机制

（2） 公共部门管理体制

政府机构的财政预算中没有节能科目，节能改造需要的资金没有正当的来源

政府机构的年度能源费用是根据前几年费用支出的情况确定的，采取节能措施反而会导致下一年拨付给本部门的费用减少，影响节能积极性。

2. 限制性政策障碍

（3） 当前的建筑节能标准实施力度和监管力度远不能满足建设资源节约型社会的需要。

（4） 对具有巨大节能潜力的大型公共建筑缺乏强制性的能源管理要求。

3. 能量计量（末端控制）的硬件设施障碍

能量计量的硬件设施则是影响用户节能积极性的一把尺子。由于能量计量的硬件设施建设存在着大量的问题，是导致一些节能政策无法实施的关键原因。例如，绝大部分采用集中供热的建筑（包括新建住宅）都没有安装热表；公共建筑中没有按照能耗特点分别安装不同类型能耗设备的电表；在许多场合，照明系统未安装分线控制的装置，等。

4. 能效标识体系的政策障碍

能效标识体系是判断某种节能产品或者综合应用一系列节能技术的节能改造是否应该支持的基础。我国的能效标识体系建设刚开始起步，目前仅制定了电冰箱和空调器的能效标识体系，对建筑物以及其它终端用能设备（系统）尚未出台能效标识体系。

5. 节能技术评估、检测市场障碍

第三方节能评估、检测市场是执行建筑节能激励政策的能力建设基础。发达国家的节能评估市场比较健全，对推动实施建筑节能激励政策发挥了重要的作用。但是，目前在我国，节能技术检测和评估市场（尤其是建筑物和采暖空调系统节能评估和检测市场）基本尚未建立。

6. 节能服务体系障碍

在西方国家，大部分节能服务公司都是从商业建筑（尤其是政府机构建筑）节能改造起家的，并且国外的建筑节能激励政策给予了节能服务公司非常大的支持，使节能服

务公司在推动建筑节能的工作中发挥了重要作用。近年来，我国的节能服务公司的业务领域在建筑节能方面已经取得了较大的进展，但是仍然面临着诸多政策性障碍。例如，因为前文所述的机制障碍和对公共建筑节能效果强制性政策的缺失，导致用户对节能改造的积极性不高，影响了节能服务公司的市场空间。此外，节能服务公司还面临着节能融资、税收（应该按照服务业务收税还是按照设备供应收税等）、法律地位等障碍。

7. 能源价格形成机制障碍

基于市场的热价形成机制（对于城市热力，包括热电厂－热力公司和热力公司－用户两个环节） 没有建立，合理的热价政策没有出台，这也是影响“热改”政策失效的一个原因。同时，与发达国家的情况相反，在我国的能源价格体系中，作为零散用户的民用电价比大宗用户的工业电价还低，不利于调动居民的节能积极性。此外，“阶梯电价”、“分季气价”等基于市场的能源价格形成机制也尚未形成。

8. 政府部门之间的沟通、协调障碍

建筑节能涉及到建筑物和能源系统及设备（采暖、空调、照明、家用电器、办公设备等），存在多头管理、职责不清问题，这些问题尤其在地方比较突出。此外，节能政策、能源价格、财税政策、环境保护等涉及多家政府部门，也需要节能主管部门进行大量的沟通、协调工作。

9. 资金障碍

目前在我国建立建筑节能激励政策体系的最大障碍是资金障碍。首先是缺乏长期性财税激励政策方面的支持。例如，当时发挥了较好效果针对建筑物的固定资产调节税已经取消了多年。同时，新型墙体材料改造基金到 2005 年底也就要停止了。而针对节能型建筑物、高效节能技术和设备的财税激励政策基本没有。其次，对于短期性的建筑节能改造项目和对高效节能新技术的支持，缺乏节能专项基金支持。

四、中国中长期建筑节能激励政策框架体系思路

1. 目标

建立起适应社会主义市场经济要求的建筑节能激励政策框架体系和长效机制，全面推动包括建筑物和建筑能源系统（设备）能源效率水平的提高。

2. 思路框架

从三个层面逐步推动建筑节能激励政策的开展：一是理顺节能管理及能源费用征收机制：建立健全节能管理的机制，理顺各方关系、明确各方责任、使节能与各方利益直接挂钩来促进各方的节能积极性；二是加强限制性政策：对建筑物、能源系统（设备）的能效水平及节能管理（尤其是公共建筑节能管理）提出强制性要求；三是加大鼓励性政策的力度：对高效的节能技术、产品（建筑）给予经济激励，抵消部分由于采取高效节能技术而带来的增量成本，并支持中介机构参与建筑节能的活动。

按照建筑物类型（大型公共建筑、中小型公共建筑和住宅）、气象条件类型（5 大

热工分区）、建筑特点（新增建筑和既有建筑）、能源系统（设备）类型的特点（采暖空调系统、照明设备、家用电器、办公设备等），并综合考虑我国的实际管理体制（例如“热改”、政府机构的能源费用征收机制、强制性节能政策的实施体系、能源价格形成机制等）逐步推动建筑节能工作的全面开展。

强制性最低能效标准是市场准入的“门槛”。当性能超过强制性节能标准一定程度时给予经济激励。以市场需求方的用户为激励政策的主要激励对象，以得到建筑终端能源系统（设备）的节能量为激励政策的出发点。

对新增建筑物和安装简单的建筑设备，采用长期性激励方式；对既有建筑的节能改造，尤其是大型公共建筑中的能源系统节能改造，采用短期性的节能改造激励政策支持方式；此外，对先进的采暖、空调技术方式及可再生能源利用方式给予支持。

有效解决资金障碍。一是加大公共财政对建筑节能的支持力度，公共财政预算设立节能科目，同时加大减免税、补贴、贴息、加速折旧等激励政策的支持范围。二是建立节能专项基金，将其中大部分资金用于支持建筑节能。

五、近期建议优先实施的建筑节能激励政策

1. 优先领域

（1） 加强对新建住宅节能标准的贯彻实施和监督管理力度。

（2） 加大对大型公共建筑（包括政府机构建筑）能源系统的节能管理和节能改造。

（3） 加大对节能型的采暖空调系统新方式（先进节能技术）的支持力度。

（4） 对节能型建筑设备（包括家用电器及办公设备等）给予激励政策支持。

2. 激励政策建议

（1） 减免购房契税，鼓励用户选购节能住宅。

给予购买超标节能型住宅的用户 1%的减免购房契税（目前一般为 1.5%~3%）优惠，以鼓励用户选购高效的节能住宅，间接鼓励了开发商建造超前节能住宅。这种措施虽然激励资金的额度并不是非常大，但是可以提高广大消费者对节能型住宅的关注程度，从而促进节能型住宅市场的发展。

（2） 实行建筑物能耗性能信息标识制度。

建议在夏热冬冷地区（夏季有空调，冬季部分有采暖，并且没有“热改”障碍，进行节能激励的基础较好）开展城市居民住宅能耗信息标识制度，克服节能信息不对称的障碍，以简单、易懂的能效标识信息，引导消费者购买节能型住宅。建议提供资金支持建筑节能设计院所、建筑节能评估能力的建设，鼓励开发商采用能耗信息标识作为营销的主要手段。

（3） 使用正在研究的的“高效节能产品的企业所得税优惠政策”的成果，鼓励节能高效建筑设备的使用。

建议增加电冰箱、节能灯、热泵型热水器等设备进入节能产品第一批优惠目录。

实施购买者投资 30%抵扣，生产者所得税减半的优惠政策，成为“高效节能产品的企业所得税优惠政策”的受益者。

（4） 使用“高新技术产品所得税税制改革”的成果，促进开发商选用高新技术含量高的采暖空调技术系统形式。

建议尽量享受高新技术产品的财税优惠政策，鼓励开发商以建筑节能领域的高新技术和产品，促进建筑物能源供应系统提高能源效率。例如，支持选用地源热泵技术替代传统化石燃料采暖和空调技术、高效的空气源热泵技术、独立除湿空调技术等高效节能技术的推广应用，实行减免所得税 30%的优惠政策。

（5） 支持安装建筑能源系统（设备）的能耗计量装置。

在大型公共建筑（尤其是政府机构建筑）中，建议公共财政部分补贴按照能源系统（设备）的用能特点进行分类安装电表的活动。

建议公共财政部分补贴安装热表的活动。

（6） 通过节能服务公司推动政府机构节能改造。

因为政府机构的能源费用由公共财政承担，改造后的节能效益相当于降低了公共财政支出，所以公共财政对该活动的支持是非常合理的。建议筛选并确定一批实施政府机构节能改造的节能服务公司目录清单，并给予节能服务公司减免税、贴息、节能融资担保等方面的支持。

3. 克服建筑节能激励政策资金障碍的建议

（1） 在公共财政预算中设立节能科目，并对相关节能型建筑、建筑设备及节能改造加大补贴、贴息、减免税等激励力度。

（2） 通过各种相关渠道加快建立节能专项基金，本着“取之于民，用之于民”和“专款专用”的思路，将大部分资金用于支持建筑节能。

（3） 延长“新型墙体材料专项基金”的征收时间，并将支持建筑节能纳入基金的支持范围。

（4） 使用公共维修基金支持建筑节能改造。

4. 限制性政策及节能管理政策建议

（1） 建立达标监督机制，强化建筑节能标准的执行力度。

对新建建筑，建议建立设计、施工、监理、验收、运行 5 个主要环节的监督机制，落实强制性建筑节能设计标准的达标工作。

（2） 加大对大型公共建筑的节能管理力度。

建议出台基于“能源定额管理”的“阶梯能源价格”体系，采用行政与市场结合的思想引导大型公共建筑的节能管理。

加大对大型公共建筑的节能管理力度，强制性要求能源消耗报告、节能审计等制度。

（3） 加大新增建筑及建筑设备能效信息标识体系的管理力度。

能效信息标识是引导消费市场、克服“信息不对称”的有效措施，建议对建筑物和

建筑设备大面积出台强制性的能效信息标识制度。

（4） 加大对节能中介机构的资金支持力度，加强建筑节能队伍的能力建设。

加大公共财政及其它方式的节能资金对中介机构开展节能政策研究、节能标准编制、能源审计、节能评估、节能信息传播等节能活动的支持力度，充分发挥公共财政“四两拨千斤”的杠杆效益，健全完善节能政策、标准、标识体系基础工作。

加快支持和培育建筑节能第三方节能评估、检测机构市场的建设，为实施建筑节能激励政策奠定扎实的节能效果评估及检测工作基础。

从机构职能、人员编制、资金投入等方面加大对建筑节能队伍建设的支持，加快地方建筑节能监察和服务体系建设，确保相关的建筑节能政策能够得到贯彻实施。

（5） 加快基于市场的能源收费机制改革。

加快推广供热/冷计量收费机制

改变当前的政府机构的能源费用征收和缴纳机制，采用能源费用“定额管理”或者“承包制”的方法。

六、课题下一步研究工作的建议

（1） 相关鼓励性激励政策的成本效益分析。

（2） 公共建筑和住宅中“能源定额管理”指标和“阶梯能源价格”体系的政策研究。

（3） 配合“热改”工作的“热价”形成机制研究。

（4） 利用“新型墙体材料专项基金”支持建筑节能的政策研究。

实施建筑节能激励政策的监督管理体系研究。

促进中国工业节能的财政和税收政策研究

（执行摘要）

中国节能投资公司
财政部　财政科学研究所

本专题研究是美国能源基金会资助进行的中国“可持续能源发展财政和经济政策研究”项目的一个子项目，项目的宗旨在于研究促进中国工业节能的经济政策，包括财政、税收和金融方面的政策，保障工业节能的可持续发展，构建中国能源整体的可持续发展财政税收政策框架。

工业、交通和建筑是世界多数国家能源消费的主要部门，对中国而言，工业能源消费在相当长时期都将是最大的耗能部门，研究实施促进中国工业节能的经济政策，对全社会的节能具有巨大推动作用、对中国政府“节能中长期专项规划”的实施将起到保障作用，对完成规划目标将做出重要的贡献。

“促进中国工业节能的财政和税收政策”项目研究的内容包括研究促进工业节能对财政经济政策支持的需求，需要支持的节能重点领域，评估分析以往有关节能的经济政策实施中的经验与教训，指出今后若干年内激励工业节能的需要；同时，研究工业发达国家促进节能的成功经验，分析对我国工业节能的适用性，研究和提出促进工业节能的经济政策与我国现行的财政、金融、税收等经济政策的适应性与相关性。

本项目的研究重点为耗能工业部门中的四个基本原材料工业，包括钢铁、有色、建材、化工等。这几个行业在能源消费总量、能源成本、及能源消耗水平等整个工业领域都具有足够的典型性。能源消费对这几个行业的持续发展、对提高它们的市场竞争能力具有决定性意义的影响。这些行业 20 多年来一直是我国节能工作的重点，也是“节能中长期专项规划”的节能重点，通过对这些行业的分析研究所得出的结论，对于财税政策研究具有普遍推广的意义。

本项研究将充分论证制定与实施节能财政、税收政策的必要性和依据。结合基本材料工业节能管理、节能技术、节能奖惩等领域的特点，就实施经济激励政策的可能性开展分析，并相应提出政策建议。

一、利用财税政策支持工业节能的整体思路和原则

（一）财税政策是促进工业节能的重要手段

工业部门是能源消耗的重要部门，20 世纪 90 年代工业部门能源消费占全国能源消费总量的比重一直保持在 70%左右。在工业生产活动中最大限度地节约能源和提高能源的利用效率无疑是实现人与自然和谐相处的重要内容。

据世界银行研究，市场力量对实现节能潜力的贡献率只有 20%。为了更好的规范市场经济主体在能源使用和节能行为中的外部效应，促进工业节能的顺利、协调发展，需要政府采取一系列经济、法律以及必要的行政手段来对其进行干预和调控。而财税政策作为国家进行宏观调控的重要政策手段之一，在其中扮演着重要角色。合理的财税政策，能够规范、引导和调节市场主体的经济行为，使之朝着有利于整个社会效益改善和提高方面发展，实现政府的宏观调控意图和发展战略目标。

解决这一问题不仅需要政府提供适当的政策优惠与扶持，还需要政府直接增加投入。我国财政收入的较快增长也为利用财税政策支持工业节能提供了财力保障。

国外资料显示西方工业国政府预算非常重视节能研发并保持了不断增长。与美国和日本相比，中国通过预算渠道安排的节能研发投入少得可怜。令人欣喜的是，我国财政收入连续多年保持了高速增长。2004 年全国财政收入达到 26355.88 亿元，比上年增加 4640.63 亿元，增长了 21.4%。据有关预测，2007 年我国财政收入将突破三万亿元大关。财政经济实力的不断增强为我们利用财税政策促进工业节能提供了日趋稳固的财力基础。

（二）总体思路考虑和基本目标

工业节能具有鲜明的外部性，最直接的表现就是工业企业在节约能源使用中所得到的经济利益小于整个社会因此而获得的利益。正是这两者之间的不一致，使得企业在节能方面的投入总是小于社会所需要的最优量。那么利用财税政策促进工业节能的着力点就是通过制定激励性的财税政策弥补企业节能中的个体经济利益与社会利益的差异，使工业节能产生的社会效益与市场主体自身的经济效益相一致。显然，促进工业节能的具体财税政策的制定应该围绕这一点而进行。

财税政策作为国家进行宏观调控的重要政策工具，在促进能源节约及可持续开发和利用上具有其他经济手段难以替代的功能。参照国际惯例，结合我国实际，在制定和调整促进工业节能的财税政策中，既要立足我国能源政策的目标导向和节能战略的现实需求，同时也要考虑我国财税政策体系的现状和发展方向，做到既有利于促进节能战略的实施，又符合财税改革发展的整体要求。只有这样，才能使制定的政策发挥出最大的效

益，并保证政策本身的稳定和可持续。

利用财税政策促进工业节能应支持国家《节能中长期专项规划》，达到如下节能目标：

1. 宏观节能量指标：到 2010 年每万元 GDP（1990 年不变价，下同）由 2002 年的 2.68 吨标准煤下降到 2.25 吨标准煤，2003—2010 年年均节能率为 2.2%，形成的节能能力为 4 亿吨标准煤。

2. 主要产品（工作量）单位能耗指标：2010 年总体达到或接近 20 世纪 90 年代初期国际先进水平，其中大中型企业达到本世纪初国际先进水平；2020 年达到或接近国际先进水平。

3. 主要耗能设备能效指标：2010 年新增主要耗能设备能源效率达到或接近国际先进水平。

（三）需要坚持的几项原则

1. 统筹兼顾，抓住重点

2. 市场导向与政府适当干预相结合

3. 财政政策和税收政策并用

4. 既要有长远规划，又要立足当前面临的紧迫问题

5. 注重政策的成本效益分析

6. 重视财税政策与其它政策措施和手段之间的协调配合

7. 支持工业节能的财税政策的制定应坚持动态原则

二、促进工业节能的税收政策研究

（一）促进工业节能的税收政策调控重点

根据我国现阶段工业发展的特点和税收的内在功能，在促进工业节能方面，税收政策的调控重点应主要突出以下几个领域：

1、优化工业结构，形成有利于促进节能的产业布局。

就优化工业内部结构而言，当前税收调控的重点应突出以下几个方面：一是促进工业技术水平的提升。这是降低工业生产能耗、提高资源利用效率的重要途径。二是抑制低水平重复建设。三是优化外商投资的结构。

2、促进节能投资，鼓励社会资金向节能领域合理流动。

投资是经济增长的重要驱动。在工业领域，税收促进节能投资的重点有三个方面：一是促进节能产品的生产。二是促进节能设备的应用。引导企业在机器设备的更新改造与升级换代中，更多地注重节能降耗的要求，加大对节能设备投资的税收支持力度，促

进企业降低生产能耗、提高资源利用效率。三是促进节能技术的投入。激励企业通过自主开发、委托开发、对外引进等多种渠道来提高节能降耗的技术水平，增强节能降耗的创新能力。

3、引导节能消费，依托节能型消费结构带动节能型产业结构的发展。

4、加大对资源环境的保护力度，降低工业发展所带来的外部成本。

（二）完善促进工业节能税收政策体系的基本原则

在调整和优化促进工业节能的税收政策体系中，既要立足我国能源政策的目标导向和节能战略的现实需求，同时也要考虑我国税制的结构现状和发展方向，既要有利于促进节能战略的实施，又要符合税制发展的整体要求，主要遵循间接引导与直接激励相结合的原则、鼓励性政策与限制性政策相结合的原则、全方位促进与多环节引导相结合的原则、及税种的功能定位与节能政策目标相结合的原则。

（三）促进工业节能的税收政策建议

根据上述税收在促进工业节能领域的调控重点和基本原则，将从以下几方面建立和完善促进工业节能的税收政策体系：

1、构建有利于节能的工业产业布局的税收政策建议

（1）促进高技术产业发展的税收政策建议：一是尽快在高新技术企业全面推进增值税由生产型向消费型转型，减轻企业购置机器设备的增值税负担。二是取消对高新技术企业税收优惠的区域性限制，将现行针对高新技术开发区的税收优惠政策，统一适用于区内区外所有的高新技术企业，扩大政策的适用范围，公平不同高新技术企业的税收待遇。三是取消现行对企业技术开发费用加计扣除政策中的10%年增长比例限制，对企业为开发新产品、新技术、新工艺所发生的研究开发费，无论是否比上年增长10%，未形成无形资产的，可以按实际发生额的150%在计算企业所得税时扣除；形成无形资产的，可以按实际发生额的150%计入无形资产原值，按照有关规定摊销。四是完善促进科技型风险创业投资的税收优惠政策，引导社会资金向初创型高新技术企业流动，促进高技术产业的培育和壮大。

（2）抑制低水平重复建设的税收政策建议

以流转税为主体的税制结构所导致的税收收入对工业生产的高度依赖性，是地方政府盲目开展低水平重复建设的主要税制诱因，需要通过税制的完善来将其对抑制低水平重复建设的负面影响压缩到最低限度，以有效缓解低水平重复建设所带来的资源环境压力。

一是完善税收收入地区间归属机制，弱化地区间财政利益不均衡所带来的低水平重复建设倾向。二是构建合理的地方税主体税种，消除地方政府财力汲取途径不规范而导

致的低水平重复建设现象。三是规范税收优惠政策，防止有害税收竞争所引发的低水平重复建设现象。

（3）优化外商投资结构的税收政策建议

运用税收手段优化外商投资结构关键一点就是要将对外资企业的税收优惠与我国的产业政策有机地结合起来，避免目前对生产型外商投资企业给予普惠型税收优惠的做法。目前最为紧迫的就是要按照统一税法、公平税负的原则，统一内外资企业所得税，消除目前对内资和外资企业在税收上的不平等待遇，为各类市场经济主体创造公平竞争的税收环境，促进吸引外资的税收政策取向由数量型向质量型转变。改革的重点之一就是要突出国家产业政策导向，引导外资资本和外国技术加快向包括资源节约型产业在内的国家鼓励的投资领域和项目流动。

2、促进节能投资的税收政策建议

（1）促进节能产品生产的税收政策建议

——低税率优惠。对专门从事节能产品生产的企业，减半征收企业所得税；对非专门从事节能产品生产的企业，就其生产经营节能产品取得的所得，减半征收企业所得税。非专门从事节能产品生产的企业需要分别核算节能产品生产经营所得和非节能产品生产经营所得，未分别核算或核算不清的不能享受税收优惠。

——定期减免优惠。对企业生产节能产品取得的所得，自生产经营起，免征企业所得税 3 年。如果企业生产多种节能产品且生产经营起始日期不同的，应该分别核算同一起始日期生产的节能产品所取得的所得，并相应计算可享受定期减免的期限。

——再投资退税优惠。对于节能产品生产企业的投资者，以其取得的缴纳企业所得税后的利润，直接投资于本企业用于生产节能产品或投资新办其他节能产品生产企业，经营期不少于 5 年的，按 40%的比例退还其再投资部分已缴纳的企业所得税税款。对国内其他经济组织作为投资者以其在境内取得的缴纳企业所得税后的利润，作为资本投资于节能产品生产企业，经营期不少于 5 年的，按 80%的比例退还其再投资部分已缴纳的企业所得税税款。

——加计扣除优惠。一是对专门从事节能产品生产的企业支付给职工的工资，可按实际发放的工资总额，在计算应纳税所得额时全额扣除。对非专门从事节能产品生产的企业，可按其生产节能产品所实现的销售收入占企业当期全部产品销售收入的比例，计算可予以全额扣除的工资金额，企业的工会经费、福利费和教育经费支出可按准予税前扣除的工资总额，依照规定的标准计算扣除；二是对企业发生的节能产品广告费和业务宣传费支出，可在计算应纳税所得额时据实扣除。非专门从事节能产品生产企业应分别核算节能产品和其他产品所发生的广告费和业务宣传费支出，未分别核算或核算不清的

不能予以全额扣除；三是对社会力量通过国家节能、环保组织向节能生产企业的捐赠，可以比照公益、救济性捐赠，在计算企业所得税或个人所得税时给予一定比例的扣除。

——减计收入优惠。对企业以资源综合利用目录内的资源作为主要原材料，生产符合国家产业政策规定产品所取得的收入，可减按一定的比例计入应纳税所得额。

此外，对符合一定标准的节能生产企业，在城镇土地使用税、房产税方面也可适当给予一定的减税或免税优惠。

（2）促进节能设备应用的税收政策建议

——所得税投资抵免优惠。对企业为生产节能产品而购置的机器设备，其设备投资额的 10%可从企业当年应纳所得税额中抵免，当年不足抵免的，可用以后年度应纳所得税额延续抵免，但最长不超过 5 年。

——加速折旧优惠。企业用于生产节能产品的关键设备，可适当缩短折旧年限，但最短为 3 年，或者可采取加速折旧的方法计提折旧。

——进口环节税收优惠。一是对境外捐赠人无偿捐赠的直接用于节能产品生产的仪器、设备，免征进口关税和进口环节增值税；二是在合理数量范围内，进口国内不能生产的直接用于生产节能产品的设备，免征进口关税和进口环节增值税。

（3）促进节能技术研发和推广的税收政策建议

——直接减免优惠。对企业为生产节能产品服务的技术转让、技术培训、技术咨询、技术服务、技术承包所取得的技术性服务收入，予以免征营业税和企业所得税。

——加计扣除优惠。对企业为生产节能产品而发生的技术引进、技术服务和技术培训支出，可比照研发费用开支，按照 150%的比例加计扣除。

——缩短无形资产摊销年限的优惠。对企业外购和自主开发的节能产品生产技术支出，可在实行加计扣除的基础上，对形成无形资产的部分，可根据现行摊销年限的规定，按照一定的比例缩短摊销年限。

3、促进节能消费的税收政策建议

从调整消费税政策、调整车辆购置税、车船使用税政策、及尽快开征燃油税等方面考虑。

4、促进资源环境保护的税收政策建议

主要从完善资源税制、健全完善环境保护税制等方面加以考虑。

三、支持工业节能的财政政策研究

这里重点从财政投资、公共预算、政府采购等三个方面展开分析。

（一）财政投资政策

1、支持工业节能与财政投资的政策导向是一致的

从我国实际情况看，由于工业能耗占整个国家能耗的大头，工业节能潜力巨大，工业节能对整个国家的节能具有举足轻重的影响。因此，国家财政理应支持节能，而且应把支持工业节能作为重中之重，这与国家财政的投资政策也是完全一致的。但我国实际情况表明，工业领域节能投资少，资金和节能任务不匹配，是长期以来我国工业节能工作面临的一个主要问题。由于缺乏政府财政投资的有效支持，工业节能技术改造主要由企业承担。企业作为节能投资的主体，投资能力较弱，也缺乏有效的融资途径，大量节能技改项目难以及时实施，很多好的节能新技术、新工艺、新产品难以得到推广和普及。这说明，投资缺失是我国工业节能技术进步缓慢的症结所在。因此，通过采取有效措施切实加强工业节能投资实属必要。

2、整合预算内投资和国债投资，强化工业节能投资力度

我国从1998—2004年实行积极财政政策，累计发行长期建设国债9100亿元，主要用于基础设施投资、环保与生态建设、企业技术改造、西部大开发等方面，对于贯彻国家的宏观政策意图，促进国民经济的稳定协调发展，发挥了至关重要的作用。

我们提出以下具体建议：一是预算内投资和国债投资应由国家发改委有关机构集中分配管理，根据国民经济和社会发展的轻重缓急统筹安排使用。二是加大节能投资在国家能源投资的比重，同时要把工业节能投资作为节能投资的重点。三是国家的工业节能投资要更多地运用贷款贴息办法，以带动更多的银行贷款对工业节能项目给予扶持。四是要选择一些特殊重要的、投资数额巨大的国家级大型工业节能项目，国家可采取直接投资的方式（如投资补助）予以支持。五是设立中央对地方的工业节能专项拨款。设立中央对地方的工业节能专项拨款非常必要。

（二）政府公共预算政策

1、政府预算应重视支持工业节能

公共财政预算反映和体现了政府的政策意图，是国家宏观调控的重要手段，在未来预算结构调整和改革中，应该从政策到财力重视和加强节能投入，为逐步建立一个节能型社会做出应有的贡献。

2、政府公共预算支持工业节能的方向和重点

政府公共预算支出的工业节能投入主要用于以下四个方面：一是节能科技的研究与开发。二是节能技术示范和推广。三是节能教育和培训。四是节能管理监督体系建设。

四、当前中国工业节能需重点关注的几个问题

（一）鼓励工业企业签订“自愿协议”的财税政策措施

税收优惠政策：国外特别是市场化国家采用能源税或与能源有关的碳税来刺激工业部门通过管理者行为的改变和增加能效设备的投入来改进能源管理。通常，对于签订节能自愿协议或达到设定的能效标准的企业，这类税收会有税收抵扣。

财政赠款和补贴政策：赠款和补贴一般用于给那些非常适合的用户，适合于那些回收期长但节能效果好的设备，也可以对项目进行成本效益评估。补贴的企业应该是在高耗能行业或者是签订了节能自愿协议的企业。

3、推进我国工业节能自愿协议的设想和财税政策建议

（1）制订整体规划，扩大试点范围。建议下一步国家应对工业领域推广节能自愿协议作出整体规划，明确政策措施，确保不同时期规划目标的实现。现在当务之急是要扩大工业节能自愿协议的试点范围，一是在我国钢铁全行业推开节能自愿协议，二是选择其它高耗能行业（如有色、建材、化工等）的部分企业进行试点。在上述工作的基础上，力争在“十一五”期末在我国工业领域的大部分行业或主要高耗能企业基本实施节能自愿协议。

（2）制订财税优惠政策，促进工业节能自愿协议的有效实施

关于税收优惠政策：国外一般是通过减免能源税或碳税的方式激励签订自愿协议的企业。我国未来开征与能源直接相关的税收也是大势所趋，到那时候也应对签订自愿协议的企业酌情减免这方面的税收。从目前情况看，建议凡是签订节能自愿协议的企业，可享受加速折旧，加计研发费用扣除、投资抵扣以及所得税减半征收等所得税优惠政策；此外，对于为了节能降耗需引进技术的企业，实行一定程度的进口税收优惠。

关于财政支持政策：财政政策对节能技术进步具有重要作用，对促进企业自愿协议实施的刺激作用也相当明显。建议一是对签订自愿协议企业的节能降耗投资由财政部门给予一定幅度的补贴；二是节能项目贷款可以考虑由财政贴息。

（二）节能专项资金问题研究（有待进一步讨论研究）

鼓励高效节能产品的企业所得税优惠政策研究

（执行摘要）

财政部　财政科学研究所
中国标准化委员会

前　言

当前，中国正在酝酿新一轮税制改革，其中一项重要内容就是实施“两税合并”——将以前主要为吸收国外投资而对内外资企业实行两套不同的企业所得税制统一起来。鉴于长期以来两套不同的内外资企业所得税制度中优惠措施不统一、政策目标不清晰，中国政府打算趁“两税合并”改革之机，对已有的所得税各类优惠政策进行全面的清理、整顿和规范。其基本原则是由以前以区域性及投资来源（内外资）作为优惠基准，转为主要以国家产业政策、社会经济政策作为优惠基准，并且强调符合 WTO 的基本规则和要求。

根据目前我国产业政策和经济社会政策导向，建立节约型社会、鼓励和推动节能，已经成为未来中国政府宏观调控的重要政策目标之一。所以，力求在新的企业所得税制改革中明确体现节能政策，成为政府、企业、社会公众各方关注的重点。2005 年初，财政部和国家税务总局等主管部门已经正式启动“两税合并”改革方案细化研究和具体制定工作，要求相关方面及时提出企业所得税改革中实施节能产品优惠政策的具体措施。本项目正是在这一背景，根据**财政部税政司**和**国家发改委环境与资源司**的要求立项，并在**能源基金会**资助下展开研究的。期望通过本项目研究，促进节能政策在即将出台的企业所得税制改革中得到切实体现，并保障企业所得税节能优惠政策的有效性、可行性。

本项目由**财政部财政科学研究所**和**中国标准化研究院**共同负责承担，联合相关政府主管部门、研究机构的能源问题专家和财税问题专家共同组成课题组完成。本文系阶段性研究成果，一些内容有待进一步深入研究。

一、企业所得税制度中设立节能优惠政策措施的必要性

（一）概述

促进和鼓励节能能源、提高能效利用水平是一个国家和政府有效利用资源、维护能源安全以及实现经济社会自然可持续发展的重要方面。但是，节能能源与提高能效利用水平（以下简称节能）需要企业和机构大量的资金、技术以及人力资源的投入，需要大量的成本，其收益却具有很大的正外部性，单独依靠市场手段会存在一定的“市场失灵”

现象，因此需要政府综合利用各种政策手段积极推进。

在政府的各种政策工具中，税收政策具有特别的意义。税收政策是国家宏观调控的重要工具。有效的税收政策，可以发挥引导节能投资、改善节能消费、调整节能产品、服务进出口和鼓励有关节能技术推广与扩散的目的。一般而言，鼓励节能的税收政策既有有利于我国能源发展与节能战略的实施，又要符合我国的国情、税制结构的现状以及未来改革的总体目标，并需要做到“三结合”，即间接引导与直接激励相结合、鼓励性政策与限制性政策相结合、全方位促进与多环节引导相结合。

（二）利用企业所得税优惠政策鼓励节能的理论依据

在税收政策中，企业所得税居于较为重要的地位。鼓励节能产品的企业所得税优惠政策主要体现在，利用所得税对资源配置的调节作用，提高投资回报率，提高投资能力，降低投资风险，最终提高资本投资效率，引导社会资本的投资方向，从而扩大节能产品的生产和供给。

投资是维持经济增长的一个重要因素，但是有多种因素直接影响着投资行为，如投资回报率、投资能力、投资风险等。所得税对投资的影响，主要是通过对投资回报率、投资能力和投资风险等诸多因素的影响来实行的。所得税的原理是，通过在税法中规定可以在税前扣除的费用项目和标准，来规范应纳税所得额的计算，然后再限定所得税率，借以计算应交所得税。如果对不同行业的所得税实行相同的费用扣除项目和标准，同时实行相同的比例税率，那么从理论上讲所得税对资源在行业以及产品间的配置基本上没有影响。但是，如果不同行业、产品的费用扣除标准不同，税率也不同（如典型的是实行行业差别税率和累进税率等），则所得税对资源配置有很大的影响，能够在一定程度上引导投资方向。

从投资的资本回报率角度看，在市场经济条件下，资本回报率的高低是资本所有者在项目投资前考虑的重要因素。在企业所得税制度中，通过实施较为优惠所得税税率、增加费用扣除、实行加速折旧以及投资抵免等优惠措施，必然会提高投资的资本回报率。

从投资能力角度看，实行所得税优惠政策提高了企业（或公司）的投资能力。实行优惠的所得税率会增加企业的税后留利，增强企业的积累能力。实行加速折旧政策会提高企业的资本积累能力。而实行投资抵免政策则会直接提高企业的投资能力。

从降低投资风险角度看，实行所得税优惠政策能够有效地降低投资者的投资风险。投资回报率越高，则企业以及项目的投资回收期就越短，相应地风险也就越小。

从产品的生命周期来看，一般而言可以分为四个阶段，即研究开发阶段、试点试范阶段、早期商业化但仍需政府支持阶段、大规模商业化阶段。研究开发阶段面临的最大风险是新技术能否成功本身就具有很大的不确定性，根本就无利润可谈；试点示范阶段尽管可能有少许收入，但是无法弥补费用，也基本上没有利润；早期商业化阶段开始有少量利润，但是不太稳定；大规模商业化阶段开始出现较为稳定的利润。因此，所得税优惠政策切入的最佳时机是从第三阶段开始，即在早期商业化阶段开始实行所得税优惠

政策，直到大规模商业化的前期，而大规模商业化经过了一段时期后，基本上项目技术已经非常成熟，而这时往往更为新型的技术也可能产生，因此也就是实行正常所得税的时候，再实行所得税优惠政策的效果往往已经不太明显。

（三）对节能产品与技术在进行所得税优惠政策支持的注意事项

总体而言，对节能产品实行所得税优惠政策以前，需要明确以下两点：（1）对节能产品与技术进行相应的技术甄别。技术甄别相当于是实行所得税优惠政策的前提和首要条件。（2）规定所得税优惠政策的时限。由于产品节能是一个相对的概念，因此所有的节能产品都具有动态的概念，一个产品在某时期是节能产品，仅仅是相对于当时的技术水平下较之其他同类产品的能源利用效率较高而已，并不意味着该产品永远是节能产品。因此，只有限定某时期的节能产品使用所得税优惠政策的时限，才能更好地保护和鼓励更为新颖的、技术水平更高的节能产品走向市场，才能体现出政策的代际公平。

三、我国企业所得税节能产品优惠政策设计的基本原则和总体思路

（一）基本原则

1、着眼全局。就是要求充分认识节能工作对于保障我国社会经济可持续发展的战略意义，以及政府积极运用财税政策措施支持、促进节能的必要性。企业所得税作为我国重要税种之一，是政府财税政策体系中的一个重要工具，运用企业所得税的优惠措施鼓励促进节能是国家财税政策的重要选择。企业所得税节能优惠政策不是权宜之计，而是从我国节能现状及财税政策的实际情况出发做出的长远考虑，是一种促进节能的长效激励机制。

2、把握重点。节能工作任务重，需求大，涉及面广，情况复杂。企业所得税优惠政策是政府利用财税政策支持和促进节能工作的手段之一。所以，企业所得税节能优惠政策必须把握重点，抓住关键环节，充分发挥财税政策的示范和引导作用，力求用较小的税收优惠成本取得尽量大的节能效果。从目前来看，应当重点从节能产品的生产环节和使用环节采用企业所得税优惠措施。尤其在首批目录中要真正做到“优中选优、重中选重”，根据能效标准、市场占有率等指标从严把关。

3、直接优惠与间接优惠相结合。从优惠的方式来看，要根据我国企业所得税改革的发展方向，借鉴当前国际上的通行做法，更多地采用间接优惠的手段，同时也要适当采取一些必要的直接优惠手段，以更好地体现国家鼓励节能的政策导向。

4、简便易行，方便操作。根据我国节能认证工作现状以及企业所得税征管规律，企业所得税节能优惠政策措施的设计应当注意简便可行，这有利于降低政策的制定成本和政策实施成本。

（二）可供选择的企业所得税节能优惠政策措施

1、促进节能产品生产的企业所得税优惠政策措施

（1）直接优惠措施

当前，我国对高新技术企业、资源综合利用企业均从所得税方面通过减低税率或定期减免的直接优惠方式给予了较大的鼓励。节能产品生产企业不仅具有促进能源节约的战略功能，而且大多数节能产品往往是技术较为先进，具有一定科技含量的产品。因此，有必要参照高新技术企业和资源综合利用企业的税收政策，运用直接优惠的方式对节能产品生产企业给予一定的所得税优惠。

——低税率优惠

对专门从事节能产品生产的企业，减半征收企业所得税；对非专门从事节能产品生产的企业，就其生产经营节能产品取得的所得，减半征收企业所得税。非专门从事节能产品生产的企业需要分别核算节能产品生产经营所得和非节能产品生产经营所得，未分别核算或核算不清的不能享受税收优惠。

——定期减免优惠

对企业生产节能产品取得的所得，自生产经营起，免征企业所得税 3 年。如果企业生产多种节能产品且生产经营起始日期不同的，应该分别核算同一起始日期生产的节能产品所取得的所得，并相应计算可享受定期减免的期限。

——再投资退税优惠

对于节能产品生产企业的投资者，以其取得的缴纳企业所得税后的利润，直接投资于本企业用于生产节能产品或投资新办其他节能产品生产企业，经营期不少于 5 年的，按 40%的比例退还其再投资部分已缴纳的企业所得税税款。

（2）间接优惠

——投资抵免优惠

企业为生产节能产品而购置的机器设备，其设备投资额的 10%可从企业当年应纳所得税额中抵免，当年不足抵免的，可用以后年度应纳所得税额延续抵免，但最长不超过 5 年。

——加速折旧优惠

对企业用于生产节能产品的关键设备，可适当缩短折旧年限，但最短为 3 年，或者可采取加速折旧的方法计提折旧。企业可在上述两种方法中选择，并报经税务机关备案后执行。

——加计扣除优惠

具体包括以下几个方面：

一是对企业为开发节能产品而发生的研究开发费，未形成无形资产的，研究开发费可以按实际发生额的 150%在计算企业所得税时扣除；形成无形资产的，研究开发费可以按实际发生额的 150%计入无形资产原值，按照有关规定摊销。

二是专门从事节能产品生产的企业支付给职工的工资，可按实际发放的工资总额，在计算应纳税所得额时全额扣除。对非专门从事节能产品生产的企业，可按其生产节能产品所实现的销售收入占企业当期全部产品销售收入的比例，计算可予以全额扣除的工

资金额。

三是企业发生的节能产品广告费和业务宣传费支出，可在计算应纳税所得额时据实扣除。非专门从事节能产品生产企业应分别核算节能产品和其他产品所发生的广告费和业务宣传费支出，未分别核算或核算不清的不能予以全额扣除。

四是对其他企业通过中国境内非营利组织、国家机关向非关联的节能生产企业资助的研究开发经费，在计算资助者的企业所得税时允许全额扣除，但当年不足抵扣的部分，不得结转抵扣。

2、促进节能产品使用和消费的所得税优惠政策措施

（1）对企业为达到国家规定的能耗标准进行节能改造而购置的节能产品或设备，可按其产品或设备投资额的一定比例从企业的应纳所得税额中抵免，当年不足抵免的，可用以后年度应纳所得税额延续抵免，但最长不超过 5 年。

（2）对于不直接从事节能产品生产而仅从事节能产品销售的商贸企业，其销售的节能产品收入可减按一定的比例（如 90%）计入企业当期应纳税所得额计算缴纳企业所得税。

3、促进节能技术推广和运用的所得税优惠政策建议

（1）对企业为生产节能产品服务的技术转让、技术培训、技术咨询、技术服务、技术承包所取得的技术性服务收入，予以免征企业所得税。

（2）对企业为生产节能产品而购买的技术服务支出，可按照 150%的比例加计扣除。

（3）企业外购的节能产品生产技术形成无形资产的，可在现行规定摊销年限的基础上，按照不高于 40%的比例缩短摊销年限。

在实施上述税收优惠过程中，需要严格对企业享受优惠资格的认定，切实加强税收监管，既要有利于促进节能产品的生产，又要注重防止税收上的漏洞。一方面，要严把初始审核关，就节能产品、节能技术以及从事节能产品生产所需的设备制定严格的认定审核标准和程序，税务机关和相关部门要共同参与企业享受优惠政策资格条件的认定；另一方面，要严格加强跟踪管理，对于随着时间和标准的变化不再属于节能产品、节能技术以及不再属于从事节能产品生产所需设备范围的，应该及时取消其享受税收优惠的资格，以确保优惠政策能真正有效地运用到节能产业中去。

（三）建议近期重点采用的企业所得税节能优惠政策措施

根据我国企业所得税制度改革的基本要求，以及目前节能产品生产、使用的现状特征，我们认为，在近期应重点从节能产品的生产环节、和使用环节入手，主要采用“投资抵免”和“直接优惠”两种方式：

1、投资抵免。对企业购置节能产品（设备），可按其产品（设备）投资（购置）额的 15%（或者 30%）从企业应纳所得税额中抵免，当年不足抵免的，可用以后年度应纳所得税额延续抵免，但最长不超过 5 年。

2、直接优惠。生产节能产品（设备）的企业，给予必要的所得税直接优惠，其中

专门从事节能产品生产的企业，减半征收企业所得税；对非专门从事此类节能产品生产的企业，就其生产经营节能产品取得的所得，减半征收企业所得税。非专门从事此类节能产品生产的企业需要分别核算节能产品生产经营所得和非节能产品生产经营所得，未分别核算或核算不清的不能享受税收优惠。

此外，可以同时采用“加速折旧”、“费用加计扣除”等辅助措施。

五、企业所得税优惠的节能产品目录清单及其评价指标

根据我国节能中长期规划的基本要求和企业节能产品生产的现状，有选择、有重点、有针对性地确定企业所得税优惠政策的节能产品目录清单及其评价指标。基本要求：现状问题清晰，数据情况准确，选择原则明确，确定理由充分，政策标准合法，科学简明可操作。

（一）企业所得税优惠政策所指的节能产品定义

节能产品（设备）是指符合与该种产品（设备）有关的质量、安全和环境标准要求，在社会使用中与同类产品或完成相同功能的产品相比，它的能源利用效率（能效、能耗）指标符合相关能效标准中 I 或节能评价值的规定，达到国际先进水平，并且具有合理的用户增加投资回收期。

（二）确定国家鼓励发展的节能产品（设备）的原则

1、符合当前和今后一个时期的市场需求和节能工作需要，有比较广阔的发展前景；

2、产品的使用量大面广、节能潜力明显、能源利用效率高；

3、技术成熟、可靠，具备推广条件；

4、由于价格因素，存在一定的市场推广障碍；

5、目前市场占有率较低，不超过市场份额的 10%；

6、有较高的技术含量，有利于企业的设备更新和技术改造，能促进产业的结构优化和升级，提高企业经济效益；

7、优惠政策实施成本较低，综合经济效益显著。

（三）节能潜力及效益分析

针对各种不同产品，分析预测未来 10 年（2006－2015 年）实施企业所得税优惠政策将带来的节能效益、环境效益和经济效益。

1、分析步骤

企业所得税收优惠政策节能潜力及效益分析基于对一些参数的收集、分析和模型预测。

第一步，首先收集和整理产品价格、历年产量、产品年运行时间、产品能效和补贴率等数据；

第二步，进行初步分析，其中包括价格分析、产量预测分析和节电量分析，通过初步分析得出生产成本的增加量、年节电预测量和财政支出预算；

第三步，通过效益分析、节约电费预测分析和减排预测分析，最终得出税收优惠政策实施效益和减少污染气体的排放量。

2、分析模型输入数据

（1）主要输入数据

年产量；

纳入优惠政策目录的产品市场份额；

产品年净增量预测；

高效产品在总产量中所占的比例预测；

产品年平均运行时间；

产品平均寿命；

电价增长率及每年的电价；

单位产品年能耗；

单位产品成本增加量；

（2）共性数据的确定

2006 年电力价格：0.6元/kWh。

未来 10 年电力价格增长率：2%。

投资抵免比例：15%；直接优惠所得税比例：50%。

CO_2和SO_2碳排放系数取自《中国重点耗能产品节能潜力分析》所用排放系数，分别为 0.953kg/kWh和 0.053kg/kWh。

3、建议纳入第一批优惠《目录》的产品基本描述和预测分析结果

鉴于企业所得税优惠政策作用的特点以及上述节能产品的具体情况，在研究过程中我们进一步筛选了首批列入《目录》的节能产品（设备）。我们认为，选择中小型三相异步电动机、配电变压器等工业设备，单元式空调、冷水机组等商用设备，共计 2 类 4 种用能产品作为第一批《目录》，是符合客观实际的。下面是具体的测算分析结果：

（1）中小型三相异步电动机

电动机是工业社会的动力之源，中国所有工业用电的近 70%都是通过电动机消耗的。其中，中小型三相异步电动机被广泛应用于工业、农业、商业、建筑和交通等领域中，是量大面广的用能设备。提高中小型三相异步电动机效率可以带来巨大的节能量，对整个中国的节能具有重要的意义。此外中小型三相异步电动机的使用寿命相对长久，对于工业企业来说，在整个电动机生命周期内运行它的成本一般为其最初购买成本的 50 多倍，提高电动机效率也可为企业带来实质性的节能收益。

我国于 2002 年发布了 GB18613《中小型三相异步电动机能效限定值及节能评价值》。目前，我国中小型三相异步电动机市场竞争焦点在降低产品价格上。许多企业具有生产高效电动机的能力，但由于高效电动机价格较高，严重影响了市场销售，企业对生产高效电动机具有很大的顾虑，不愿开发高效电动机。同样电动机使用企业考虑到使

用高效电动机会增加设备购置费用，不愿购买高效电动机。据统计，目前高效电动机在市场中的份额只有 1%。所以将中小型三相异步电动机纳入优惠政策目录，将有效地促进高效电动机市场发展。

（2）配电变压器

电力变压器(包括输电变压器和配电变压器)是国民经济各行业中广泛使用的电气设备。由于使用量大、运行时间长，变压器在选择和使用上存在着很大的节能潜力，尤其对量大面广的 10kV 中小型变压器(即配电变压器)而言,更为显著。降低变压器损耗，提高供配电效率，是目前世界各国普遍关注的问题，也是我国政府抓工业产品节能的重点。

虽然我国变压器节能技术不断提高，但是一些具有巨大节能潜力的高效变压器发展因价格问题受到市场的制约，这类高效节能变压器技术的推广也十分艰难。而在发达国家或一些发展中国家，这类高效变压器具有较大的市场，1995 年美国就有 70～80 万台，印度有 10 万台，目前我国所生产的高效变压器也就是印度 1995 年的 1%。《配电变压器能效限定值及节能评价值》已完成制定，即将发布。因此，配电变压器是适于纳入税收优惠政策的产品之一。配电变压器与其他产品相比，具有价格高、使用周期长的特点，对它实施税收优惠政策的净效益，在几年后才表现出来。

（3）单元式空调

单元式空气调节机（俗称“柜式空调机”）系一种量大面广的产品，广泛应用于医院、学校、餐厅、会议室、客厅、影剧院等人员集中的场合。随着人民生活水平的提高，单元式空调机已越来越广泛地进入家庭。欧美发达国家统计，在用空调和热泵制冷设备耗电量约占各国总发电量的 30%（欧洲）至 40%（美国）。中国制冷空调工业协会统计结果显示，1999 年新增单元式空调机容量约 375 万 kW，2005 年的产量预计将达到 15 万台。目前我国在用制冷空调和热泵制热设备耗电量约占我国总发电量的 20%左右，而且每年正在以 10%～15%的速度增长。如能将制冷空调产品的能效提高 5%，其节电的绝对值是非常惊人的。GB19576－2004《单元式空调机能效限定值及能效等级》国家标准已于 2004 年 8 月颁布，因此具备了纳入优惠政策产品目录的基本条件。

（4）冷水机组

中央空调用冷水（热泵）机组含以电力为能源的蒸汽压缩循环冷水（热泵）机组和以燃油、燃气和热水为能源的溴化锂吸收式冷（热）水机组，主要应用于宾馆、饭店、医院、学校、会堂、展览馆等场合，80 年代中后期，在我国获得了广泛的应用。目前，我国在用制冷空调和热泵制热设备耗电量约占我国总发电量的 20%多一些，而且每年在以 10%～15%的速度增长。

2004 年 8 月，GB19577-2004《冷水机组能效限定值及能效等级》国家标准由国家标准化管理委员会颁布，因此冷水机组具备了纳入税收优惠政策产品目录的基本条件。

具体分析测算过程（略）。

上述分析表明，如果对所选择的 4 种产品实施“投资抵免”和“直接优惠（税率减

半）”优惠措施，未来 10 年间政府税收收入减少大约 63.37 亿元，但累积可节电 962 亿度，节约电费 658 亿元，累积减排CO_2：9181 万吨，SO_2：509 万吨。详见表 9。

表 9　企业所得税优惠节能产品（设备）目录（第一批）及测算结果

产品名称	评价指标	指标要求	能效标准编号	能效水平	目前市场份额	实施企业所得税优惠政策后的影响预测				用途
						10 年节能潜力预测/亿度	10 年国家税收减少额度预测/亿元	累计节约电费预测/亿元	累计减排预测/万吨	
中小型三相异步电动机	效率	能效标准中的节能评价值	GB18613-2002	国际先进水平	1%	累计节电量：689	21.26	474.4	CO_2：6573 SO_2：365	电力拖动
配电变压器	空载损耗、负载损耗	空载损耗比能效标准中的节能评价值下降 64%	报批稿	国际先进水平	1%	累计节电量：22	15.08	15.1	CO_2：208 SO_2：11	电力输配电
单元式空调机	能效比	能效标准中能效等级的 1 级	GB 19576－2004	国际先进水平	1%	累计节电量：40	18.5	28	CO_2：382 SO_2：21	商用
冷水机组	能效比	能效标准中能效等级的 1 级	GB19577-2004	国际先进水平	1%	累计节电量：211	8.53	145	CO_2：2018 SO_2：112	商用
共计						962	63.37	658	CO_2：9181 SO_2：509	

五、企业所得税优惠的节能产品认定管理

（一）申请条件

申请节能产品及其税收优惠认定的生产者或使用单位，必须具备以下条件：

销售或使用的节能产品能实行独立核算；

节能产品在《目录》范围内；

销售或使用的节能产品符合国家产业政策、符合有关标准要求。

（二）认定内容

节能产品是否在《目录》范围之内；

节能产品是否符合《目录》要求；

生产者或使用单位是否符合国家有关企业所得税优惠政策文件所规定的享受优惠政策的条件；

适用享受企业所得税优惠政策的种类和范围。

（三）认定与申诉程序

凡申请享受节能产品优惠政策的生产者或使用单位，应向所在地地(市)级人民政府的发展改革委（计委、经委、经贸委，以下简称地级发展改革委）提出书面申请并抄报主管税务机关。申请享受节能产品优惠政策的生产者或使用单位，应按规定格式填写申请书，并提交以下书面材料：

——生产者或使用单位的营业执照或者登记注册证明复印件；

——申请节能产品的能源效率检测报告；

——销售或购买的节能产品的数量与价格的有关证明材料；

——生产者或使用单位的税务证明材料；

——其他有关文件等。

上述材料应当真实、准确、完整。

生产者或使用单位应委托国家认可的国家级产品质量监督检验中心出具节能产品的能源效率检测报告。各省、自治区、直辖市成立节能产品认定委员会，认定委员会由省级发展改革委牵头，同级税务局、财政厅(局)及有关行业管理部门参加。认定委员会对申请材料进行认定。

获得认定证书的生产者或使用单位向税务主管机关提出减免税申请报告，税务主管机关根据认定证书及有关材料，办理有关减免税事项。

生产者或使用单位对认定委员会的认定结论有异议的，可向原作出认定结论的认定委员会提出重新审议，认定委员会应予受理。生产者或使用单位对重新审议结论仍有异议的，可在六个月内直接向上一级发展改革委、税务主管部门提出申诉；上一级发展改革委、税务主管部门根据调查核实情况，有权改变下一级发展改革委和税务主管部门的认定结论。任何单位和个人，有权向有关部门检举揭发通过弄虚作假等手段骗取税收优惠的行为。

（四）监督管理

国家认可的第三方的国家级检测机构接受生产者或使用单位的委托进行检测，应当客观、公正，并保守受检产品的商业秘密。检测机构对受检产品的能效指标准确性负责。

对产品能源效率指标发生争议时，应当委托经依法认定的第三方检测机构重新进行检测，并以其检测结果为准。《目录》中节能产品的生产者或使用单位应当接受监督检查。

建立节能及可再生能源发展专项资金研究

（执行摘要）

国家发展和改革委员会　能源研究所

节能和发展可再生能源是关乎公共利益和社会主义和谐社会建设的重大政策问题。所谓节能及可再生能源发展专项资金，特指其来源与能源有关、专项用于支持节能和可再生能源发展的公共资金。

节能和可再生能源发展对构建社会主义和谐社会的多重现实和长远意义在于：促进能源可持续发展；支持满足经济翻两番的能源需求；提升国民经济整体竞争力；支持实现环境小康目标、减少温室气体排放；提高能源普遍服务水平；创造新的就业机会。

从维护上述两项重大公共利益、服务于和谐社会建设这一国家长远发展目标着眼，客观上要求政府在财政、价格、税收、投资等方面制定和实施综合性的节能和可再生能源发展支持政策。从必要性、有效性和可行性综合考察，设立节能及可再生能源发展专项资金是较佳的政策选择。

从必要性看，一是缺乏有力的经济激励政策支持是节能和可再生能源发展面临的重大障碍。当前及今后相当长的时期内我国将处于市场经济初级阶段，节能的推进面临投资、技术风险、信息等诸多市场障碍。另一方面，节能市场失灵客观存在。由于市场障碍、市场失灵的客观存在，我国巨大的节能潜力难以自行实现，需要政策干预和引导，特别是对节能投资的拉动需要有强力经济激励政策。虽然近年来政府在建立和完善节能经济激励政策上进行了有益的探索，但总的来看，符合国情的、与社会主义市场经济相容的节能经济激励政策还比较缺乏。与节能相比，可再生能源的处境更为艰难。长期以来可再生能源建设项目没有常规能源建设项目那样的固定资金渠道；政府虽然编制了长远规划和年度建设计划，但缺少必要的资金支持，资金短缺一直是制约可再生能源发展的关键性因素，至今未能获得较好的解决。当前我国可再生能源正处于发展的关键时期，今后能否实现突破性发展，形成规模效益，关键就在于强有力的经济激励政策支持。

二是电力重组使节能和可再生能源发展面临新的挑战。国内正在进行的以建立竞争性电力市场为主旨的电力重组，使节能的推进面临新的挑战。在电力重组背景下，电力市场的主要行为方—电力公司缺乏节能投资积极性。节能项目将减少电力消费，同时对

电价造成下调的压力。在当前的电价体系下，电力公司的收入和利润直接地与电力销售量挂钩，电力消费的减少、电价的下调将直接地影响电力公司的收入和利润，这客观上有悖于电力公司的利益。由于缺乏有力的经济激励政策支持，电力公司缺乏投资节能项目的动力。电力重组也使可再生能源的发展处于更为不利的地位。竞争性电力市场的基本特征是：发电企业的收入基于电力市场价格而非发电成本。可再生能源发电技术的发展在时间上远滞后于常规发电技术，其发电成本通常明显高于常规发电的成本。我国可再生能源发电尚处于发展初期，市场竞争力弱，面对发电成本较低的常规能源发电的竞争，客观上处于劣势。在一个竞争性的电力市场环境中，如果没有适当的政策、特别是经济激励政策的支持，可再生能源发电势难得到大的发展。

从有效性看，一方面，这可由国际上众多国家节能/可再生能源发展专项资金的使用效果预证。事实上，建立专项资金以推动节能和可再生能源发展，是众多国家的成功经验，在国际上已成为一种较受欢迎的节能和可再生能源发展支持政策。美国、英国、日本、法国、德国等主要发达国家以及巴西、印度等主要发展中国家都建立了节能/可再生能源发展专项资金。这些国家的实践表明，专项资金的建立和投入使用，对节能和可再生能源的发展形成了有效的支持，产生了可观的经济效益、环境效益以及其它社会效益。特别是在英国、美国等已实施电力重组的国家里，专项资金在竞争性电力市场环境下对节能和可再生能源发展的支持取得了明显的成功，实现了可观的节能量，促进了可再生能源发电容量的增长。另一方面，本课题组的分析和预测结果表明：一旦节能及可再生能源发展专项资金在我国建立起来、并适当加以运用的话，将从以下诸方面强有力地推动节能、促进可再生能源长足发展：带动节能和可再生能源投资；促进节能和可再生能源技术的发展和推广应用；促进节能和可再生能源产业化；促进节能和可再生能源市场的建立和发展；实现显著的经济、环境效益以及其它社会效益。

从可行性看，与价格、税收等其它可能的节能和可再生能源发展经济激励政策选择相比，建立节能及可再生能源发展专项资金的设想易于在短期内实现。首先，此前政府已有随电价加收若干种专项资金的实践经验，政策上易于把握。其次，拟建立的专项资金的支持对象是事关全社会福祉和国家长远利益的节能和可再生能源发展，易于为公众理解和支持，实施的社会阻力较小。第三，专项资金易于体现政府的意志，有利于实现与市场手段以及其它节能和可再生能源发展支持政策的结合。因此，建立专项资金的设想是较为现实可行的。

借鉴国外节能/可再生能源发展专项资金和国内有关专项资金设立、管理等方面的相关经验，基于我国的现实国情，本课题组就我国节能及可再生能源发展专项资金的设立及其具体设立方案提出了以下政策建议：

(1)研究建立节能及可再生能源发展专项资金

从强力推动节能和可再生能源发展、服务于和谐社会建设这一国家长远发展目标出发，政府节能和可再生能源发展主管部门应将建立节能及可再生能源发展专项资金列入优先议事日程，着手组织开展相关研究，加强与财政、税收、立法等部门的协作，推动建立节能及可再生能源发展专项资金的决策进程。包括：

① 研究制定可再生能源发展专项资金设立方案

《中华人民共和国可再生能源法》已经出台，将于 2006 年 1 月 1 日起施行。《可再生能源法》第六章：经济激励与监督措施之第二十四条明确规定：国家财政设立可再生能源发展专项资金，用于支持可再生能源发展。政府可再生能源发展主管部门应据此与财政等部门协调，组织研究制定可再生能源发展专项资金设立方案。

② 将设立节能专项资金明确纳入《节能法》

国内外经验表明，节能/可再生能源发展专项资金的设立应建立在相关法律法规规定的基础上，这有利于减少其设立时可能遭遇的社会阻力，其资金来源及稳定性方能得到较好的保障。然而，我国现行的《节能法》尚无有关设立节能专项资金的规定。有鉴于此，政府节能主管门应加强与立法等部门的沟通和协调，争取将来在《节能法》的修订中，明确纳入有关设立节能专项资金来支持节能的内容。

③ 组织开展节能及可再生能源发展专项资金融资渠道专项研究

就节能及可再生能源发展专项资金的设立而言，资金的可获得性是首要考虑。政府节能及可再生能源发展主管部门应会同财政、价格、税收等部门，组织开展节能及可再生能源发展专项资金融资渠道的专项深入研究。可能的节能及可再生能源发展专项资金融资渠道有多种，参照国际经验，并考虑到我国的具体实际，建议重点研究以下两种可能的融资渠道作为节能及可再生能源发展专项资金融资渠道的现实可操作性：

一是电费附加方式。这一方式在国外节能/可再生能源发展专项资金的设立中的应用较多，我国以往也有随电价加收若干种专项资金的实践。根据本课题组的初步分析，认为采用这一方式作为我国节能及可再生能源发展专项资金的融资渠道较具合理性和现实可能性。

二是财政拨款方式。这一方式在国外节能/可再生能源发展专项资金的设立中也有不少应用。研究重点是将政府年新增财政收入的一部分作为节能及可再生能源发展专项资金的可行性。“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%)作为节能及可再生能源发展专项资金，其现实可能性和可操作性较好。

(2)关于节能及可再生能源发展专项资金设立方案的具体建议

① 目标

建议设立的节能及可再生能源发展专项资金的基本目标，旨在通过专项资金的投入和有效使用，达到促进节能和可再生能源技术进步和推广应用、有效降低全社会能源成本、支持建立可持续的节能和可再生能源产业和市场的目的，从而为支持国家“十一五”节能目标和可再生能源发展目标和 2020 年远景目标的实现、以及构建社会主义和谐社会这一长远国家发展目标的实现提供多方面的支持和重要保障。

② 用途

专项资金将用于支持节能和可再生能源发展两项重大公益事业，支持内容原则上包括：

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

③ 规模

基于对国家宏观的节能和可再生能源发展目标、节能和可再生能源供应的投资和运行成本、可能的融资渠道、相关利益方的态度、对相关产业部门的影响、资金配置使用方式等因素的初步综合考虑，现阶段专项资金规模保持在 30-35 亿元/年的水平比较合适。随着时间的推移、节能与可再生能源产业的发展，专项资金规模可做相应的调整。专项资金规模的最终设定，需要由政府部门在综合考虑上述各种因素的基础上，与各相关利益方协商确定。

④ 来源及征收期限

可供选择的专项资金融资渠道主要包括：电费附加方式，即针对电力这一公共消费品设立专项附加费，按每 KWh 用电量计,对所有电力用户征收专项附加费来筹集资金；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专项资金；财政专项拨款方式；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%）作为专项资金。基于对融资渠道的可行性、资金来源的稳定性、可能的集资规模、对相关产业和部门的影响等诸多因素的初步综合考察，建议优先选择电费附加方式作为专项资金融资渠道；其它三种融资渠道可作为专项资金的备选融资渠道。

从对节能和可再生能源发展形成较长期的、持续的支持考虑，建议将专项资金的征收期限暂定为 10 年。10 年期后，可根据专项资金的使用效果、节能和可再生能源发展是否仍需要专项资金的支持等因素来决定是否需要延长征收期限。

⑤ 使用方式

从实现专项资金的支持目标、保障资金的使用效率的角度考虑，专项资金用于支持节能时，可采用三种使用方式：一是支持可形成较大节能能力的节能(基建/技改)项目；二是支持量大面广的小型节能技改项目；三是支持节能产业和市场发展。专项资金的使用以前两种方式为主，并适当选择采用贷款贴息、折让、部分/全额资助等激励机制。

专项资金用于支持可再生能源发展时，也可采用三种使用方式：一是支持可再生能源项目开发，即支持大型可再生能源建设项目，以及支持小型分布式可再生能源利用产品/设备安装；二是支持可再生能源产业和基础设施发展，即专项资金作为发展资助金支持可再生能源商业发展、市场营销扶持、资源评估、研发和教育以及示范项目等活动；三是可再生能源项目投资，即以投资形式扶持可再生能源企业和项目。专项资金的使用以第一种方式为主，并适当选择采用包括直接补贴、折让、贷款贴息、资本金投入、部分/全部资助等激励机制。

⑥ 配置

专项资金的总体分配要有相应的法律依据或行政手段作为保障，并应坚持三个原则：一是节能和可再生能源兼顾原则。鉴于节能对专项资金的支持需求较大的实际情况，建议将专项资金的 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。二是中央和地方兼顾原则。专项资金的一定比例，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专项资金，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，专项资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。基于这一原则，建议将专项资金的 70%作为各省支持节能和可再生能源发展的资金，由各省自行管理；其余的 30%由中央财政直接掌握，由国家统筹安排和配置使用。三是公平和效率兼顾原则。基于这一原则，专项资金在总体配置上，应兼顾城乡；同时应尽可能地引入竞争机制，以保证资金的配置效率。

专项资金的具体分配可采用二种方式：一是竞争性招标方式。这一分配方式有利于提高资金使用效率，并主要适用于投资需求较大、资助要求较高的项目。二是“先来先得”，即专项资金管理机构向任何符合资助条件的项目提供固定额度的资助，先申请资助者先得到资助。这一分配方式主要适用于投资需求较小、资助要求较低的项目。在条件允许的情况下，专项资金的具体分配应尽可能采用竞争性招标方式。

⑦ 管理架构

从有利于实现专项资金支持的各种目标、合理性和监督考虑、保障资金的配置使用

效率等角度考察，建议选择相关政府职能部门作为专项资金管理机构。考虑到专项资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专项资金主管部门。

考虑到政府职能部门人力资源有限、淡化对具体事务的管理和干预的政府管理职能改革取向、以及专项资金的管理任务较为繁重等因素，建议的专项资金管理架构为：由专项资金主管部门对资金的配置使用进行总体管理；由财政部门对专项资金的运作、使用进行监督；专项资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。采用这一管理架构，既使专项资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，介入专项资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。

促进节能与可再生能源发展的电价政策研究

（执行摘要）

国家发展和改革委员会　经济研究所

改革开放以来，我国的电价政策总体上适应了国民经济与社会发展的要求，能够吸引常规能源发电投资，节能逐渐得到重视，对可再生能源支持的力度也在逐步加大 。但现行电价政策不能避免常规能源发电供求关系的失衡，对短期供给的调节措施也不完善，未能把节能作为核心目标，支持可再生能源发电的系统性政策构架尚未形成，因而仍有进一步调整和完善的必要和空间。

以可持续发展为目标的电价政策框架，主要包括：

1、以兼顾能源的可持续与国家经济竞争力的可持续为指导思想

我国经济与社会发展进入大量消耗能源阶段，自身能源贫乏，围绕能源而形成的国际政治、经济环境日益复杂，这就决定了我们必须重视节能、支持可再生能源，才能实现能源消费的可持续。

但另一方面，促进节能，并不等于高耗能产业越少越好。发展可再生能源，也不是越多越好，更不能“一哄而上”。“能源浪费”与“耗能型经济”是两个不同的问题。前者说的是能源的使用效率低，可用“单位产品的能耗”等类似的指标来表示；后者说的是需要较多的能源消耗来支撑的经济结构，可以用“单位 GDP 能耗”等类似的指标来表示。因此，当说我国存在能源浪费及其程度时，用“单位产品能耗”的国际比较为依据是可以的，但不能用我国与美欧等发达国家的“单位 GDP 能耗”差别说明问题。我国与美欧等发达国家在单位 GDP 能耗上的差别，只能证明我们的经济结构比它们更耗能，如此而已。而我国目前已经形成的这种能耗较高的经济结构，首先是因为我们的科技水平和劳动力素质低。像美国那种以高科技、服务业为主的经济结构，单位 GDP 能耗确实低，但我们有那个能力吗？其次，我国现阶段的经济增长，外来投资、对外贸易是主要的动力之一，而“外资、外贸”有如此高的绩效，又是与我国低端劳动力资源的无比充沛和价格低廉有直接的关系，因而外资投向、出口产品也就较多的集中于制造业，从而不可避免地提高了我国的“单位 GDP 能耗”。所以，我国目前的这种能耗较高的经济结构，总体上看，是当今国际分工条件下自然选择的结果，有其历史必然性。

因此，我国现阶段的电价政策，一方面，必须促进节能，支持可再生能源，以实现能源消费的可持续；另一方面，也必须兼顾国家经济竞争力的可持续。要尊重我国现阶段高耗能型经济结构形成的历史必然性，不能盲目追求单位 GDP 能耗的下降。

2、用户电价总水平及时反映电力成本和需求的变动

近两年，与燃料价格大幅度上涨和需求的剧增态势相比，用户电价总水平的上调显的迟缓，不足以对电力总体需求产生预期的抑制作用。主要原因，一是国家发展改革委担心突破通胀率控制目标，对各地电价上调用户电价总水平限制偏紧；二是何时调整、调整幅度如何确定，相关规则也有欠缺。

（1）必须破除用户电价总水平必须保持相对稳定的传统理念。从降低社会交易成本的角度看，如果电力成本或需求变动不明显，用户电价总水平不益频繁调整，应该保持相对稳定。但对近两年这种燃料价格大幅度上涨和需求的剧增态势，则电价总水平就必须及时做出足够的反应，若此时还追求电价的相对稳定，其结果必然是短期供给的相对萎缩，市场需求更加旺盛，进而是供电可靠性进一步下降，整个电力系统更加不稳定。此外，宏观经济的不稳定是国民经济的总量关系出了问题，电价政策解决的是局部均衡问题，即使冻结电价，通货膨胀的势头也不可能得到遏制。尤其是去年以来，对投资需求进行抑制的主要理由是存在资源约束，而资源约束又以煤、电、油供应不足为主要标志，在此情况下，要电价总水平保持相对稳定，就不能有效刺激能源供给、抑制不合理的能源需求，这岂不是与宏观调控的目标南辕北辙！可见，即使要求电价政策配合宏观调控，也要讲辩证法，不要机械地抑制电价，应通过提高电价来抑制需求、解除资源约束。

（2）建立、完善电价总水平适时调整的监管规则和办法。目前，解决实际操作困难的主要突破口，要对煤、电价格联动”幅度的有关进行修改。根据现行的《煤、电价联动方案》，煤价上涨的 30%要由发电企业自己“消化”。如果只在短期（例如 1 年）内，煤价上涨是在 8%或再高一些比如 10%，此规定是可行的。但如果是涨幅高达 20%、30%或连续上涨几个 8%，发电企业自己如何去“消化”其中的 30%呢？去年以来的煤价恰好就是这样的涨势。这就不可避免地使政府电价主管当局陷入两难的境地。这也是虽然去年电价上调幅度最大而批评意见反而最多的主要原因之一。

我们的修改建议可喻之为：“**路、桥分开，各司其职**”。

所谓“路”，是指对被监管电力企业“效率不断提高”的正常要求。这一要求的实现，国外通行的做法是在电价调整公式中设效率系数（如英国的调价公式“RPI-X”中的 X，就被称为效率因子）。目前我国电价监管只有定价公式，没有调价公式，规则是不完整的。为实现电价调整的规范化、法制化，建议尽快制定电价调整的公式。在我国的电价调整公式中，也应按国外通行做法设立“效率提高系数”或“成本下降系数”，对要求企业“消化”的一般性成本增支因素（包括燃料价格的小幅上涨），可通过此“路”解决。

所谓“桥”，是指特殊性成本增支的解决方式。与调价公式中设定的“效率提高率”或“成本下降率”正、负相抵后的成本增支（对火电机组而言，主要是燃料价格较大幅度上涨），就可视为特殊性成本增支。这种特殊性成本增支，是社会为保持现有能源消费规模所必须付出的代价，应该让消费者准确地感知这种能源稀缺的程度，所以应全部通过

提高电价的方式予以解决。

3、建立与供电成本相符的用户电价结构

所谓用户电价结构，是指因用电方式、用电时间、用电电压等因素的差异所形成的用户之间单位用电价格的差别及其比例关系。用电方式、用电时间、用电电压等因素的差异，所以会形成的用户之间单位用电价格的差别及一定的比例关系，是因为上述因素导致了用户对电力系统不同的成本耗费。因此，电价结构的合理与否，直接决定能否形成合理的电力消费结构，进而，不仅关系能源节约的绩效，还影响一系列相关的资源配置效率。所以，可持续发展的电价政策构架，必须包括“建立与消费者耗用供电系统成本相符的用户电价结构”。从我国现阶段的实际出发，完成此项任务应做好以下两方面的工作：

（1）调整用户分类及其差价。对目前的用户分类及其差价关系，各地已不同程度地进行了调整，但总体上看，仍与实际的供电成本不符，“交叉补贴”过多，一个突出的表现，就是大工业用户与居民用户电价基本相同。此外，商业用户电价普遍处于最高水平，且超过平均水平达 70%以上，显然也不反映用户对电力系统实际的成本耗费。所以，应尽快按电压等级、用户负荷特性调整用户分类。特别是那些缺电严重的地区，更应抓住机会调高居民电价，彻底解决居民用户与其他用户“交叉补贴”过多的问题。

（2）改进分时电价结构。2003 年以来，我国已全面推行峰谷电价制度，现阶段继续改进的内容包括：

- 进一步扩大峰、谷分时电价制度执行范围；
- “因地制宜”地调整各时段价差；
- 负荷季节性强的地区实行“季节性电价”；
- 鼓励设立“尖峰电价”；
- 水电比重大的地区全部实行“丰、枯电价”。

4、外部成本内部化

我国发电用原煤现已占全国原煤产量的 50%左右，燃煤电厂排放的SO_2占工业排放SO_2总量的 56%。据专业人员测算, 基于我国发电用煤含硫量的实际情况，在 30 万千瓦燃煤机组安装烟气脱硫装置, ,脱硫成本约为 0.88—2.8 元/公斤。而目前国家规定的SO_2排污费征收标准仅为 0.21--0.63 元/公斤，环境成本远未进入电力企业的会计成本。因而发电企业大多不愿安装脱硫装置，有的即使安装了脱硫装置，也不运行。为从根本上遏制火力发电污染环境越演越烈的趋势，必须坚决实施外部成本内部化措施：

（1）大幅度提高排污费的征收标准。要根本解决我国SO_2污染及酸雨问题，SO_2排污费征收标准，应定在明显高于企业达到政府总量控制目标所必要的成本支出水平之上。这样算来，SO_2排污费征收标准，须相应提高 4--10 倍，即达到 1.0 元--2.8 元/公斤。我国幅员广阔，各地区间气候、人口密度及名胜古迹的分布等均有很大不同，从而SO_2排污的危害程度也有很大差别，相应的SO_2排污控制目标也不完全一致。因此，SO_2排污

费不应实行全国统一的标准。例如人口密度高的华东地区、空气湿润且酸雨严重的西南地区，应按较高的标准征收。而内蒙、新疆及部分北方沿海人口密度低且气候干燥地区，SO_2排污费的征收标准就可适当降低，以促进电源结构的合理布局。

（2）上网电价须能容纳脱硫的合理成本。在大幅度提高排污费的征收标准的同时，作为配套政策，如果企业采取了必要的防治措施如安装了脱硫装置并投入运营，相应的成本支出应允许企业通过正常的渠道予以收回，以鼓励发电企业增加环保投入。在上网电价仍由政府管制的阶段，上网电价应能够容纳脱硫的合理成本。不久前，国家发展改革委已经公布了每千瓦时 1.5 分的全国统一的脱硫成本标准，该标准对于新建机组基本适用，但对老机组则明显补偿不足。而老机组改造正是降低SO_2污染的关键措施。为此，建议根据老机组改造成本较高的实际，另行制定一个适用老机组的脱硫成本标准，并使之在执行中有适当的弹性。

5、逐步引入竞争机制

在可竞争领域，市场机制是节约资源的最有效手段。根据国外电力市场运行的实践经验，无论“单边”、还是“双边”交易，竞争的压力都会促使发电企业千方百计降低燃料消耗，均可有直接的节能效果。如果是实行“双边”交易制度，还可以在电价的形成机制中引入需求因素，节能效果更为明显。再说，我国电力行业已基本实现了“厂、网分开”，不引入竞争机制，则不仅达不到优化资源配置的目的，还徒增交易成本。因此，必须逐步引入竞争机制，用市场机制实现经济与社会的可持续发展。近期的相关措施可考虑：

（1）加快推行“大用户直购”试点。目前，国家发展改革委和电监会批准的大用户直购，只有吉林碳素厂一家。今后，在大的能源基地周围，都应允许大用户与发电企业直接交易，以减少电能的输送损耗。根据先期进行电力体制改革国家的经验，发电企业向大用户直接供电，属电力交易中的“双边”模式，其核心内涵是发电企业同大的电力买主直接交易，而这些大的电力买主则以是配、售电公司为主。因此，我国进行电力市场的“双边交易”试点，不应仅限于发电企业同用电量大的终端用户间的直接交易，而应把发电企业向独立供电公司“直供”作为主要的发展方向。这些独立供电公司的产权结构也可有多种选择，可由现在的省电力公司与其他投资方合资，也可由民营资本独资；供电业务的运营，可考虑委托省电力公司，也可由独立供电公司自营。对于“直购”区域内用户负荷特性要求，应以高用电负荷率企业为主。至于“直购”方式，尽可能过网“直购”，但专线“直购”也不排除。

（2）抓紧设计与国情相适应的电力市场模式。这一轮的电力体制改革以引入竞争机制为核心，国外共同的做法是先确定电力的交易方式及相关规则，再设计相应的行业分解及企业重组方案。“厂、网分开”一旦完成，发电侧或用户侧的竞争性市场交易立即开始。我们的做法却正相反：“厂、网分开”一年多了（“分”也不到位，如电网公司仍拥有相当规模的常规发电机组，且“主、辅”至今未分），但电力市场的基本形式及电力市场布局这一改革的核心问题，相关决策部门却仍在研究和争论之中。此外，中国地域辽

阔，电网构架及以此为依托的电力市场必然是区域性的，加之现阶段地区间经济、社会发展很不平衡，“竞价上网”（属“单边”市场模式）作为电力行业引入竞争的方式之一，不可能适用于所有地区。因此，要真正通过市场机制解决中国电力的可持续发展问题，前提是做好与国情相适应的电力市场模式设计。

6、规范、整合随电价征收的政府性基金

促进节能（如实行需求侧管理）、支持可再生能源发展，现阶段均需公共资金支持。通过电费附加筹集此类公共资金，符合公平与效率原则。在国外，已有成功经验，我国也有“电力建设基金”、“三峡基金”及“库区移民扶持基金”的操作实践。只要对这些随电价征收的政府性基金进行规范、整合，就可使之成为促进能源可持续发展的政策支撑。这种“规范、整合”的主要内容包括：

（1）名副其实。目前各项随电价征收的政府性基金 ，均以公共利益为目的，为避免消费者误解，应使之名副其实，统一称为“电力公益基金”。

（2）扩大应用范围。增加节能、支持可再生能源发展的支出项目。

（3）基金由目前的价内转为价外。目前的政府性基金均为价内收取，在很多地区形成各电力公司的销售收入，用于地区间的转移支付比较困难，不利于形成“全社会分摊”机制。应改为价外征收，直接形成政府性收入。

（4）由电量消费者负担。促进节能、支持可再生能源发展的主要资金来源，固然应是电力消费者的“付费”。但同是电力消费者，如果用电方式不一样，对于化石能源消耗的责任是不一样的，消费者对于化石能源的消耗，主要是通过对电量的消耗实现的，而使用容量多的，不一定消耗电量也多。因此，从公平和有利于节能的原则出发，主要的“付费”者不应是“容量”的消费者，而应是“电量”的消费者。所以，用于支持节能和可再生能源发展的政府性基金，不宜与电费总额挂钩，而应从量计征。

（5）实行中央与省两级的资金分摊体制。 以中央与省两级衔接的可再生能源发展规划为基础； 属中央战略性布局范围内进而由中央政府审批的，全部在全国范围内分摊； 由地方规划且由地方政府审批的，“标杆价”下的资助金额在全国范围内分摊，“标杆价”上的资助金额在当地分摊；建立中央与省两级财政专项账户；收支“两条线”；能源主管部门商电价主管部门审核资助申请，确定资金分配方案，经财政部门复核后拨付。

7、建立规范化的可再生能源电价管理办法

我国地域广阔，地区间资源禀赋、需求水平都有很大差别，不同地区、不同种类的可再生能源发电价格应有合理的差价。问题在于合理的差价如何确定。在上网电价仍由政府管制的情况下，我们的建议是：

（1）确立不同种类可再生能源发电价格差别，应以正常的成本差别为基础。正常成本的确定，应以项目管理部门认可的技术为前提，并考虑：普遍的设备购进价格；统一的设备安装标准；统一的人均工资水平；统一的财务费用和投资回报率标准。

（2）以公共资金效率最大化为原则确定可再生能源发电价格的地区差别。按照《可

再生能源法》的求，政府有关部门正考虑分区制定可再生能源发电的标底价格。由于绝大部分可再生能源发电项目规模较小，因而大多接入独立的地方网或低压配网，如果中央政府直接规定各地区可再生能源发电的标底价格，一是缺乏信息支撑，二是工作量太大，且与目前的电价分级管理的体制不符。因此，可考虑，中央政府对可再生能源发电与常规能源发电的价格差额规定统一的标准，各地电价主管部门可在由此统一标准决定的“标杆价”内，分别核定本地区具体的可再生能源发电价格。

8、给予地方政府筹集 DSM 短期资金适度的空间

需求侧管理急需资金支持，但短期内中央尚无政策使之具备规范的资金来源。为避免中途夭折，应给予地方政府筹集 DSM 短期资金适度的空间，如设置尖峰电价的地区，电网公司由此增加的收入部分，就可用于支持需求侧管理。

中国机动车及燃料相关税收政策研究

（执行摘要）

中国汽车技术研究中心

从 2004 年 10 月开始，中国汽车技术研究中心课题组在美国能源基金会的资助下，开展了“中国机动车及燃料相关税收政策研究”的课题研究工作，现将前一阶段的主要工作内容总结如下。

2005 年 2 月 5 日，课题组在北京召开了课题启动会。2005 年 3 月 21-22 日，由中国汽车技术研究中心主办，能源基金会、威廉与佛洛拉·休利特基金会协办的“促进汽车节能和环保技术发展的税收政策”国际研讨会在京召开，来自政府部门、研究机构、企业等共一百多名代表参加了会议。会上专家们对中国目前所面临的能源和环保的形势进行了讨论，并对中国需要采取的各种可能的税收政策进行了分析。

课题组结合我国国情以及汽车产业发展的实际和新技术的应用状况，提出了具有可操作性的我国机动车相关税收制度的短期与中长期调整方案以及奖惩性税收的初步方案。

（一） 消费税的调整（短期方案）

1、 调解汽车消费税促进节能和环保汽车的普及与使用

基本思路如下：

乘用车消费税征收方案的调整原则：

- 与燃油经济性和排放水平相结合；
- 税基不变，税收总额可略有增加；
- 近期征收阶段不变，依然为生产阶段；
- 征收对象的区分与细化；
- 利用转移支付的手段，增加对环保车辆的扶植。

调整方案的选择：

- 统一轿车、越野车、9 座及以下客车为乘用车分类，按同一标准征收。乘用车是指小于等于 9 座的车辆，涵盖了轿车、SUV、MPV，因此可以考虑按照国际通行的排量来划分征收标准；

2、 燃料消费税的调整方案

建议对清洁能源给予较低的消费税税率，或减免部分消费税。

（二） 调整车购税的征收方式与结构

调整原则：

- 总体税基不变，并可适当增加；
- 征收方式不变，依然在销售阶段的上牌前；
- 鼓励节能型小排量汽车的销售与使用；

- 对达不到燃油经济性限值标准征收惩罚性税收，并以此建立奖励基金制度；
- 鼓励新能源汽车的销售与使用，可考虑适当减免；
- 尽可能与消费税采用动态平衡的方式协调一致；
- 车型分类标准可考虑参考消费税调整方案的分类标准。

（三） 汽车税收制度中长期调整方案的选择

假定开征燃油税的条件下，汽车相关税收的中长期调整方案与相关政策建议。

- 将消费税为从生产阶段征收调整为在销售阶段征收；
- 调整车购税征收标准；
- 降低生产阶段和销售保有阶段的税负比重，适当增加使用阶段的税负比重；建议将车船使用税改为汽车重量税，扩大税收总收入；
- 继续对于节能型和环保型汽车采取激励政策，以期汽车产业的可持续发展。

随后，课题组对消费税和车购税的调整方案进行了细化。2005 年 3-5 月，课题组经过讨论提出了如下税收调整和税收奖惩方案：

A. 消费税

（一） 消费税税收调整方案

将乘用车消费税税率由原来的 3 档，调整为 7 档，税率也随之改变。目前，税率的 7 档方案已经基本确定，但各档税率尚未最终确定。目前的分档及税率方案如下表。

排量	≤1.0	1.0～1.5	1.5～2.0	2.0～2.5	2.5～3.0	3.0～4.0	＞4.0
建议税率	1%	3%	5%	8%	11%	15%	20%

（二） 消费税税收奖励和惩罚方案

- **消费税税收奖励方案**

1. 优惠性税收征收标准的确定

a) 对提前达到第二阶段燃油消耗量限值且我国第三阶段排放标准的车辆予以税收优惠。

b) 在生产环节对上述车辆减免汽车消费税，原征缴体系和环节不需改变。

2. 优惠性税收税率或税额的确定

对于消费税的优惠性税率，课题组提出以下四种方案：

a) 按照新确定的消费税税率对提前达到第二阶段燃料消耗量限值且通过我国第三阶段排放标准达标车辆统一减半征收消费税。

b) 按照新确定的消费税税率对我国第三阶段排放达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定的百分比，如 10%，减征一定百分比，如 10%的税收。

c) 按照新确定的消费税税率对我国第三阶段排放达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定的值，如 0.5 升，减征一定百分比，如 10%的税收。

d) 按照新确定的消费税税率对我国第三阶段排放达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准百分比或值，如 10%或 0.5 升，减征固定额，如 200 元的优惠性税收。

- **消费税税收惩罚方案**

1. 惩罚性税收征收环节的确定

a) 在消费税的征收环节加征与汽车燃料经济性相关的惩罚性税收，原征缴体系和环节不需改变。

b) 该项税收隐含在车价中，消费者不能自主和主观的感受到车价的变化与汽车燃料消耗量的关系。

c) 制造商可以将与汽车燃料经济性相关的罚款摊在车价中，模糊燃料消耗量惩罚性税收。

d) 进口车在海关的特别消费税中征收，对不能达标的车辆征收与汽车燃料经济性相关的惩罚性税收。

2. 惩罚性税收税率的确定

对于消费税的惩罚性税收税率，课题组提出以下三种方案：

a) 按照新确定的消费税税率对不达标车辆加倍征收消费税。

b) 按照新确定的消费税税率对不达标车辆所处等级，如每高出一个 0.2 升，加征 10%的惩罚性税收。

c) 按照不达标车辆所处的重量段的限值进行计算，如每高出一个 0.5 升，加征 1-2 个百分点的税率。

2005 年 6 月，有关政府部门在与课题组研究的基础上，提出了如下的税收惩罚方案：

对于规定时间内未达到 GB 19578—2004 《乘用车燃料消耗量限值》中规定的第一阶段燃料消耗量限值的乘用车加征相应的消费税。基本计算公式如下：

惩罚方案 1：加征消费税税率=应征消费税税率×50%

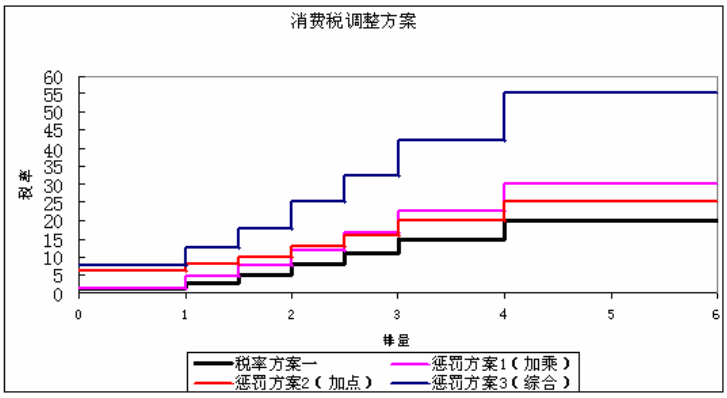
惩罚方案 2：加征消费税税率=应征消费税税率+5%

惩罚方案 3：加征消费税税率=应征消费税税率×50%+5%

其中，应征消费税税率为该车型发动机排量所对应的消费税税率。

应征消费税总税额=应征消费税税率+加征消费税税率

排量（L）	~1.0	1.0~1.5	1.5~2.0	2.0~2.5	2.5~3.0	3.0~4.0	4.0~
税率方案	1	3	5	8	11	15	20
惩罚方案 1（加乘）	1.5	4.5	7.5	12	16.5	22.5	30
惩罚方案 2（加点）	6	8	10	13	16	20	25
惩罚方案 3（综合）	7.5	12.5	17.5	25	32.5	42.5	55



B. 车购税

（一） 车购税税收奖励方案

1. 优惠性税收征收标准的确定

a) 对提前达到第二阶段燃料消耗量限值且通过国家第三阶段排放标准的车予以税收优惠。

b) 在车购税的征收环节加征与汽车燃料经济性相关的优惠性税收，原征缴体系和环节不需改变。

2. 优惠性税收税率或税额的确定

a) 针对达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定的百分比，如 10%，减征一定百分比，如 10%的税收。

b) 针对达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定值，如 0.5 升，减征一定百分比，如 10%的税收。

c) 针对达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定的百分比，如 10%，减征固定额，如 500 元的税收。

d) 针对达标车辆所处重量段的限值等级，每低于第二阶段燃油经济性限值标准一定值，如 0.5 升，减征固定额，如 1000 元的税收。

（二） 车购税税收惩罚方案

1. 惩罚性税收征收环节的确定

a) 在消费环节加征与汽车燃料经济性相关的惩罚性税收，原征缴体系和环节不需改变。

b) 该项税收由于体现在车价之外，消费者能亲身感受到车价和汽车燃料消耗量对其购买行为的影响。

2. 惩罚性税收税率的确定

a) 对不达标车辆所处重量等级，油耗每高出一个固定值，如 0.1 升，加征一定百分比，如 10%的惩罚性税收。

b) 对不达标车辆所处重量等级，油耗每高出一个固定值，如 0.1 升，加征一定百分点，如 2 个百分点的惩罚性税收。

此外，为了更加科学合理的对我国汽车税收制度调整效果进行评价，课题组与日本丰田公司和现代文化研究所将采用可计算一般均衡(CGE)模型，对各种方案进行评价和比选。CGE 模型主要研究政府实施汽车和燃料等相关税收政策，如实施乘用车燃油消耗量限值标准、减征环保车辆消费税、购置税、实施燃油税以及现金补贴等单一或组合政策，对汽车燃料的消耗量、各种车型的保有和需求量产生的影响进行评价。目前，日方已基本完成模型的构造，课题组也通过召集各相关企业代表将模型所需数据整理完毕，模型结果将于 2005 年 11 月完成。此外，美国相关研究机构采用的嵌套式多项逻辑斯悌模型（National Nested Multinomial Logit，简称 NMNL 模型），也可以对政府实施燃油消耗量限值标准以及税收奖惩政策进行量化评估。下一阶段，课题组将对电动汽车、燃气汽车等替代燃料汽车的消费税减税问题、车购税的改革方案等进行研究，以期提出切实可行的方案。

Main Report

National fiscal and tax policy research for clean energy development

[Executive Summary]

Department of Industry and Economic Research,
Development and Research Center of the State Council

I. Assessment of China's energy supply and demand over the next 2 decades

First, China's economic and social development will be severely constrained by energy resources in the foreseeable future. How to sustain rapid economic growth under such energy resources constraint has become one of the most formidable challenges facing China. Without effective policies, it will be very difficult to stem recent years' unfavorable increase in energy intensity. Moreover, the energy situation in China makes it unlikely that China will realize its goal of quadrupling GDP by 2020 while only doubling energy consumption, and it is difficult to remove the constraint of energy any time soon.

Second, it will be more difficult to further boost energy utilization efficiency and reduce energy intensity in the first 20 years of this century than it was in the prior 2 decades. High energy consumption is primarily due to recent years' accelerated development of heavy industry, a situation unlikely to change any time soon. Solving energy issues will include actions taken not only in the energy sector; a large focus must be changing China's mode of economic growth, i.e., increasing energy utilization efficiency on the demand side (enterprise and residential energy consumption).

Third, the experiences of industrialized countries indicate that China may be prone to "path dependence"—having its economic growth locked into a path of high energy consumption—if it fails to seize opportunities to enhance the sustainability of its economic growth in the period of accelerated industrialization, rapid urbanization, and rising standards of living.

Fourth, numerous recent problems are a direct result of a lack of energy policies and buildup of chronic contradictions among policies. We must patch gaping policy loopholes; rapidly establish effective energy-related financial and taxation, energy pricing, and energy investment policies; restructure energy regulation; and update laws and standards. Only by taking these actions can we move towards the goal of building an energy-saving society and 5th Plenary Session of the CPC Congress's target of cutting unit GDP energy consumption by

20% over the next five years.

II. Reforming and refining energy price formation mechanism and pricing policy

In general, the price formation mechanism has 3 "non-reflects": it does not reflect (1) the degree of energy scarcity, (2) the supply and demand relationship of energy products, (3) the external costs of energy production and consumption (i.e., environmental and ecological damage).

Energy price reform should do the following: (1) establish a price formation mechanism dictated as much as possible by market supply and demand, allowing price to optimize resource allocation; (2) reconstruct the energy price control system based to fit the market economy; (3) strengthen "external" control to internalize the "external costs" and "external benefits" associated with resources and environment, promoting energy structural optimization and adjustment. In generally speaking, we should take energy conservation as the central goal of energy pricing policy, and also promote new energy development.

Coal pricing

Energy price reform should reform coal pricing as follows: set coal and electricity prices based on the market rules; refine the "coal/electricity linkage" mechanism; allow coal resources to enter the market; and establish a scientific system of resources taxes and charges.

Oil pricing

Oil pricing should be reformed to reflect actual supply and demand in the domestic market; the current mechanism should be gradually shifted to a market-based pricing system. We propose to reform the current price system by (1) linking the price of domestic oil to crude oil prices rather than oil product prices in the international market; (2) significantly reducing price adjustment lags to increase the risk of speculation; (3) shift the role of government from reviewing and approving prices to formulating pricing methods and rules and supervising their implementation.

Natural gas pricing

The long-term goal of natural gas pricing reform is to allow the market determine wellhead and end-user gas prices based on the separation of "production, transportation, and sale." Pipeline transport fees may still be subject to government control. At present, the priority is to keep natural gas prices at a reasonable level and set a reasonable price relationship between natural gas to other energy products so as to promote the rapid development of natural gas use.

Electricity pricing

Electricity pricing reform should focus on accelerating the reform of electricity tariff-setting

mechanisms according to the electricity system reform scheme and electricity price reform arrangement. The "ex-plant" price and retail price should be subject to market supply and demand, while power transmission fees will still be under government control. In general, retail prices should match changes in electricity cost and demand and internalize social and environmental costs.

III. Accelerating energy investment and financing system reform

The energy investment regulatory system has the following problems (to a more acute degree than other competitive industries): (1) there is more governmental intervention needed in the energy sector than in other competitive industries; (2) investors lack decision-making power; (3) review and approval procedures are opaque and arbitrary; (4) short-term supply and demand balances are given too much attention while energy conservation and the environmental impact of investment projects is neglected; (5) there is a monolithic ownership structure and substandard investment/operating efficiency; and (6) there is a lack of attention to energy conservation and "new energy" projects.

Reform of the energy investment and financing systems should have the following two objectives: (1) diversify the currently-state-ownership-dominated ownership structure in industry and significantly boost return on investment (ROI) and operating profitability; and (2) establish effective investment incentive mechanisms and promote the development and use of energy conservation and new energy technologies.

We recommend adopting the following measures in the near future. First, regulate by category and expand corporate investment decision-making power. Government investment projects and corporate investment projects should be regulated separately. Governmental approval of corporate investment projects should be streamlined, with more decision-making power delegated to enterprises.

Second, establish an access mechanism based on energy conservation, resource utilization, and environmental protection. The energy project access system should focus primarily on developing of natural resources in a reasonable way, protecting the ecological environment, optimizing industrial structure, safeguarding public interests, preventing monopolies, and ensuring economic security.

Third, break up state monopolies in the energy industry, encourage private and foreign capital involvement, introduce project bidding systems, let state-owned enterprises and private companies to compete on a fair, equitable and open basis, and allow them to win project investment and operating licenses through competition.

Fourth, boost governmental investment in new energy and energy conservation. Government investment should focus on areas in which general investors do not wish to invest or in which the market mechanism fails to work properly. At the same time, the government should support pilot projects.

IV. Establishing and refining financial and taxation policies

Existing financial and taxation policies are devoid of system design, coordination, incentives, and penalty measures for sustainable energy development. In a market economy, financial policies should be the principal means by which the government regulates energy. At the same time, the government should adopt effective economic incentive and penalty policies to help optimize and guide energy consumption, promote energy conservation, optimize energy structure, and stimulate renewable energy development.

Considering the basic treasury restructuring approach, we can divide energy financial and taxation policies into the 3 categories: *positive incentive policies*, *negative restriction policies*, and *"cross-subsidizing" policies*.

Positive incentive policies include (1) budget policies increasing investment (including the proportion and purpose of investment); (2) government bond investment policies; (3) interest rate discount policies; (4) preferential taxation policies; (5) tax-based disbursement systems; and (6) government purchase policies. While holding the total volume under control, we can support individual pilot projects with government funds on a case-by-case basis or bundle existing government-funded projects with top-quality energy projects after reorganization and renovation.

Negative restriction policies include (1) establishing a flexible system of levying fixed assets investment regulation taxes; (2) expanding the scope of excise or consumption taxes; (3) levying fuel taxes; and (4) conducting research on the feasibility of imposing carbon taxes.

"Cross-subsidizing" policies are intended to raise money from conventional fossil-fuel-based energy (primarily raw coal, crude oil and natural gas) through a specific method, and earmark such proceeds for energy conservation and renewable energy development.

We propose 5 specific "cross-subsidizing" policies. First, completely reform the resources tax system, levying a resources tax based on the recoverable reserves allocated to enterprises, rather than on their output. Link tax rates to resources recovery rate and environmental reclamation and determine tax rates based on specific indices of recovery rate and environmental reclamation.

Second, further support renewable energy development. In specific, we should (1) adjust and refine the renewable energy VAT policy, uniformly reducing VAT rates for water and electricity suppliers (public utilities); (2) adjust and fine-tune renewable energy enterprise income tax policy, uniformly reducing income tax rates for renewable energy products to 15% in the prospective income tax convergence reform in China; and (3) implement an investment tax refund system adopting the accelerated depreciation method.

The third set of policies relate to energy conservation: (1) support energy conservation with government appropriations, setting up an escrow account for energy conservation and making

budgetary arrangements for energy conservation; (2) adjust the budgetary expenditure structure, increasing investment in the energy conservation technology research development, energy conservation technology demonstration and promotion, energy conservation education and training, and energy conservation regulatory system construction; and (3) encourage energy conservation through government purchasing policies.

Fourth, encourage energy conservation through taxation policies. With reference to the taxation policies for high-tech enterprises and comprehensive resource utilization enterprises, offer certain income tax breaks to energy conservation product manufacturers; temporarily reduce or eliminate VAT on major equipment and products that are superior in energy conservation but not price competitive; and levy fuel taxes as soon as possible to encourage rational energy consumption.

Fifth, increase government budgetary investment in energy research and development. In specific, boost governmental investment in research and development; adopt an interest rate discount policy; and use a moderate amount of government money to attract more private investment in energy research and development.

V. Reforming government administrative and regulatory systems

China's existing energy administrative and regulatory systems are unfit for sustainable energy development, because of their weak coordinating capability, inadequate policy enforcement ability, insufficient social supervision, inconsistent central and local policies, substandard regulation entangled with loopholes, inadequate administrative and regulatory effort, and severe personnel shortages.

To refine China's energy regulatory system, boost its comprehensive coordination capacity, effectively implement energy strategies and policies, and transform governmental functionality, we recommend the following 4 changes.

First, restructure energy regulatory organizations according to the principle "separating macro-regulation from micro-enforcement." China should establish a comprehensive energy administrative organization (i.e., Ministry of Energy) and a specialized energy supervisory organization (Energy Supervisory Commission) with distinct responsibilities.

The Ministry of Energy should be dedicated to formulating national energy strategies, energy plans, and policies, and coordinating the actions of all energy departments. The Energy Supervisory Committee, on the other hand, should be solely responsible for market supervision and inspection in order to ensure healthy development and orderly competition in the energy industry. To streamline the relationship between central and local governments, China should establish regional comprehensive energy administrative organizations and regional specialized energy supervisory organizations (e.g., East China Energy Bureau and Supervisory Office) in the major economic regions (e.g., North, Northeast, and Southwest China). Such regional agencies should be the local offices of the central government's

Ministry of Energy and Energy Supervisory Commission.

Second, government regulation should shift from the supply side to demand side, avoid focusing on supply side control--resources development and energy production--, and gradually move toward demand side control--energy development, energy conservation, and energy technology development.

Third, strengthen ongoing supervision and make the access system scientific and transparent. The priority in reviewing and approving projects is to formulate reasonable access standards for resources, environmental protection, and energy efficiency (including market access for project investment and high-energy- consumption products), and emphasize policy guidance, openness, and transparency. In the ongoing administrative phase, the top priority is to refine the energy audit system through supervision, regulation, and inspection; fine-tune organizational setup and staffing arrangements; and change the current situation of "focusing on market access, but neglecting ongoing supervision." After this phase is completed, the regulatory priority should be to investigate and punish perpetrators, with losses compensated.

Fourth, shift the regulatory focus and refine the regulatory system. In specific, (1) shift the old regulatory approach dominated by economic regulation complemented with social supervision into a new regulatory system dominated by social supervision complemented with economic regulation, refining market access control; (2) make the access system open and transparent, eliminating discriminatory treatment of different ownerships, ensuring policy transparency, establishing a reasonable complaint system, and improving price regulation; (3) reform the price formation mechanism, imposing limited control on natural monopoly sectors, integrating protective control measures with incentives, refining the financial, cost, information disclosure, and price hearing systems, and strengthening social oversight.

The regulatory priority should be (1) boosting resource utilization efficiency, ensuring energy supply security, and protecting the environment, and (2) strengthening market inspection with a focus on anti-monopoly cases, promoting efficient competition, and investigating and reviewing major mergers and acquisitions that will have a significant impact on market structure. Additionally, we should refine the existing electricity regulatory system, give the China National Electricity Supervisory Commission price control powers, and regulate the natural gas industry (especially pipelines) at the appropriate time.

Sub-reports

Public Fiscal Policy and its Use in Promoting Energy Development

[Executive Summary]

Research Institute for Fiscal Science, Ministry of Finance

I Status quo and emerging problems

In China today there is still not a system of sound fiscal policies supporting energy development. The existing ineffective and fragmented fiscal policies fail to meet the needs of energy development and cannot meet the requirements set forth by the national strategy for energy development in the new era.

i. The government has not attached sufficient importance to energy conservation. Public investments have been uneven, and limited to such fields as R&D and production (technological innovations), leaving areas like marketing, utilization, services, recovery, information dissemination, and others in lack of sufficient resources.

ii. Inadequate punitive measures for use of low energy-efficiency products and of pollution of the environment resulting from energy consumption.

iii. Problems obstructing energy structural optimization in the current policy system.

With respect to development of electrical power, the current design of VAT has constrained the development of hydropower generation. The particularity of hydropower development lies in the fact that investments as input cost are done all at one time. This system is inefficient and the cost should be distributed across different years of usage of the dams, and should be treated as an input discount item when calculating VAT, rather than directly basing VAT on electricity sales revenues. This has put an undue burden on water power plants and directly obstructed the development of hydropower development.

iv. Inadequate restrictive policy measures regarding disordered exploitation and low extraction rates which waste energy resources.

v. The government has not fully established a corresponding policy framework for developing new energy resources and renewable energy resources.

vi. No effective measures to counter energy safety problems, especially oil safety problems, are in place.

II. Recommendations for next steps to be taken

i. Positive incentives

(1) **Increase budgets**: Public funds are not being "equally" utilized. The following key areas should be focused on: 1 Operating expenses for energy management units; 2. Energy-saving; 3. Expenditures on new energy and renewable energy resources; 4. Earmarked fiscal transfers from the central government to local governments specially targeting renewable and new energy resources and energy-saving objectives; 5. Expenses incurred in the energy industrial restructuring process by energy enterprises to separate their social responsibilities as well as funds needed for social security settlement of the employees; 6. Public investment in energy development.

(2) **National debt investments**: Investments deriving from national debt revenues normally target basic industries. In every country, energy development and saving serve as the basis for the national economy and therefore they are earmarked for a certain proportion of national debt investments.

(3) **Financial interest subsidies and other subsidies**: By means of small amounts of financial interest subsidies and other subsidies, the government can guide more social capital to areas of interest. On one hand, the interest subsidies generally work well with projects and with the manufacturers related to the supply, transfer, stock and transport of energy products or energy saving. On the other hand, financial subsidies can be given to both manufacturers and down-stream consumers. For a specific policy, the effects will depend on whether the subsidy is made to consumers or to manufacturers. Therefore, detailed analysis is still required.

(4) **Taxation incentives and the establishment of a tax expenditure system**: Commonly used tax incentives are: 1 VAT incentives or VAT returns (This, however, calls for prudent use and abuses need to be avoided); 2. Income tax incentives; and 3. import and export tax incentives, including import tariffs and export tax refunds.

(5) **Government procurement policy**: The focus should be on supporting renewable- and energy-saving energy products.

(6) **Financial guarantee policy**: This is to expedite the development of prioritized areas based on risk investment rationale.

ii. Negative restriction measures

Extend the scope of excise duties;

Speed up the levy of fuel taxes;

Levy energy taxes;

Reform the compensation fee charges on mineral resources;

Remove fiscal subsidies to high energy-consuming firms (or industries) that cannot meet industrial policy standards.

iii. "Cross-subsidy" policy

III Fiscal policy recommendations to promote prioritized areas in national energy development strategy

1. Fiscal policies to improve energy efficiency Government budgetary investments

(1) Establish an expenditure item on energy saving when planning budgets and arrange the corresponding funds, which should be primarily used for the R&D of energy-efficient science and technology, demonstration and popularization of energy-efficient technologies, education and training in energy efficiency, and construction of an energy-saving management and monitoring system.

(2) Consolidate budgetary investments and national-debt investments and have an overall increase in investments in energy–saving activities

(3) Establish a special fund for energy saving.

2. Corporate income tax incentives to promote energy efficiency

(1) Corporate income tax incentives to encourage production of energy-saving products

The current corporate income tax rate should be halved for certain enterprises, most particularly for those fully engaged in the production of energy–saving products. For enterprises not fully engaged in the production of energy-saving products, their revenues deriving from the production and sales of energy-saving products should also enjoy a tax rate at 50 percent of the current level. In this case it would be necessary for enterprises to separate their revenue accounts into energy-saving products and non-energy-saving products.

(2) Corporate income tax incentives to promote the use and consumption of energy-efficient products

It is recommended that for products and equipment purchased by enterprises to reach the energy-consumption standards set by the state, a certain percentage (e.g. 15 percent) of the purchase amount should be deductible from the taxable amount. If the taxable amount of the current year is not sufficient for the deduction, the taxable amount for the following years (a maximum of 4 successive years) can be accumulated for the deduction. For energy-saving equipment that has become fixed assets for enterprises, shortened depreciation periods or accelerated depreciation should be allowed.

(3) A catalogue for *Corporate Income Tax Incentives to Promote Energy Efficiency* should be developed.

3. Government procurement policies

The authentication of energy-efficient products should be improved, and government procurement of energy-efficient products should be accelerated. The procurement process should use a centralized model for its operation, and the development of a contract supply system for energy-efficient products should be initiated. The government should dedicate more resources to ensuring that enterprises are fully aware of the procurement process and incentives behind energy-efficient products.

ii. Fiscal policy recommendations to support the development of clean energy and renewable energy resources

1. Fiscal policy recommendations to promote the development of renewable energy resources

(1) Adjust and implement preferential VAT policies on renewable energy resources

In order to more vigorously develop wind power, wind power plants should receive preferential VAT treatment, at least lower than or equivalent to that of coal electricity plants. With respect to VAT incentives for hydropower plants, we suggest that: 1. VAT rate for all hydropower plants be lowered to a level that is at least equivalent to that of coal electricity plants; 2. VAT rate for micro hydropower plants should be maintained at about 3 percent.

(2) Adjust and improve corporate income tax for firms engaged in producing and marketing renewable energy resources

With respect to consolidation of corporate income taxes, consideration must be given to the development of renewable energy resources at the national level: 1. For all firms manufacturing or selling renewable energy products, a 15 percent corporate income rate should be used; 2. Investments made in renewable energy firms can be deducted by a certain amount in calculating income taxes; 3. Accelerated depreciation should be used and expenses on R&D increased.

(3) Adjust and improve import tariffs on equipment used in the production of renewable energy resources

To encourage domestic investment in renewable energy, future purchases of renewable energy equipment by domestic firms should be subject to preferential tariffs and import VAT exemptions, just as are foreign-funded. This ensures that domestic and foreign firms are treated equally while renewable energy development is promoted.

(4) Clarify the directions and focuses of financial support for the development of renewable energy resources

Increase policy support for R&D in renewable energy resources as well as improve state subsidies for renewable energy resources. A greater emphasis should also be placed on renewable energy development in rural areas of China.

(5) Integrate fiscal policies with banking credit policies to support the development of renewable energy resources.

2. Fiscal policy recommendations to accelerate nuclear power development in China。

Fiscal support is a necessity in accelerating the development of nuclear power in China. In view of the current stage of development of nuclear power in China, we suggest the following fiscal measures be taken:

(1) Establish earmarked funds to support nuclear power generation to allow for sufficient resources for relevant R&D activities. R&D should focus on advanced technologies and design automation. The government should share the construction risks and "initiation expenses" of the automated projects with the nuclear power plant owners, and provide appropriate amounts of subsidies for their technological development.

(2) Exempt import taxes for imported materials, components or equipment that cannot be domestically produced.

(3) Reduce VAT on nuclear-power plants to the same level as that of micro hydropower plants (6 percent), so as to minimize the cost of nuclear power and to allow nuclear power to compete on an even playing field.

3. Fiscal policy recommendations to accelerate washed coal development in China

(1) Support R&D in basic and common clean coal technologies as well as clean coal technology demonstration projects such as coal gas and environmentally-friendly liquid coal. These types of projects require large investments;

(2) Incentives should cover tariffs, export VAT and financing support, as well as low-interest-rate loans or financial interest subsidies;

(3) Encourage enterprises that rely on coal to promote technological innovations, and to include clean-coal technologies into key national innovation projects that can enjoy energy-saving special loans, loan supports for technological innovations, etc;

(4) Encourage the implementation of a "discriminatory" fee on SO_2 emissions: Lower charges on low-emitting firms that utilize advanced technologies while simultaneously increasing charges for firms causing environmental problems but that are still operating within the set emission standards. Punitive measures should be taken against firms causing serious environmental problems and exceeding emission standards.

iii. Fiscal policies to promote energy structural adjustment and to ensure energy supply

1. Establish a national strategic oil reserve system

The experiences of foreign countries in establishing national oil reserves should be taken into account while still considering aspects unique to China. Foreign experience suggests the following methods for financing a national energy reserve:

(1) Establish a fund to be used exclusively for the energy reserve. Such a fund could be generated from taxes on finished oil products or set aside from existing tax revenues, such as

oil consumption tax revenues.

(2) Levy other special taxes.

(3) Issue earmarked national bonds.

2. Strongly encourage state-owned energy enterprises to develop an overseas energy cooperative market

Cooperation between overseas enterprises and state-owned energy enterprises is vital and the government should play a strong role in this. The government needs to not only coordinate the overseas' business of its three large oil enterprises but also streamline approval formalities and procedures. It should also provide special fiscal support in terms of financial management, investment risk funds, taxation deduction incentives and so forth.

3. Support the development of traditional energy industries such as the coal industry

The current tax system in place for coal resources should be further adjusted and the adjusting role of the resource tax instruments should be reinforced. Taxation policies and corporate financial regulations should also be utilized to promote safe development of the coal industry.

iv. Fiscal policy recommendations to support energy R&D and technological innovations

1. Increase budgetary investments in energy R&D.

2. Provide interest discounts for bank loans supporting enterprises' energy R&D activities;

3. Use tax incentives to support energy R&D

v. Suggestions on reforming the central-local fiscal system for energy development

1. Based on the minimum standards for energy exploitation set by the state, the central government should return tax revenues or fee charges collected for raising exploiting or retraction rates to local governments. Putting these revenues back in the hands of the local governments will hopefully minimize the short-term vision and wasteful behavior of China's primary conventional fossil fuel production sites.

Use tax incentives to encourage large and medium-sized enterprises that consume high amounts of energy to develop and use energy-saving technology. This would prevent high energy-consuming small-sized enterprises from developing too quickly.

2. Tax revenues stemming from negative restrictive measures (Carbon tax, energy tax and etc.) should be retained as central government revenues or shared with local government with the central government taking a majority of the money. This would reinforce the central government's control over energy production, consumption and saving.

VI Recommendations for a phased strategy in using fiscal policies to promote energy development

Public finance policies to promote energy development constitute a complicated system in

which various policies function independently and interact with one another. The effective implementation of energy strategy in China has set urgent requirements for public fiscal policies for the government. At this current stage when public finance framework is still under construction, however, the capacity of fiscal policies is limited. In line with both objective demands of energy strategy and the realities of public finance reform and development in China, we propose comprehensive planning and a phased strategy in utilizing fiscal policy instruments to promote energy development.

Fiscal Policy Recommendations	Strategic Objectives	Specific Policy Measures
To be implemented in near future	● To promote energy economization ● To ensure energy supply	● To use enterprise income tax incentives to encourage the production and consumption of energy efficient products; ● To introduce fuel levy; ● To strengthen energy efficient government procurement policies; ● To reform resource tax measures; ● To increase budgetary investments on energy R&D and energy supervision operation.
To be implemented in the middle or long term	● To generally improve energy efficiency; ● To optimize energy structure ● To ensure energy security	● To establish a special fund for industrial energy economization; ● To adjust various energy-related tax instruments (VAT, consumption tax, income tax, and import and export tariff and etc.) on the basis of overall tax reform; ● To introduce energy tax or carbon tax; ● To use budgetary funds to support the establishment of National Oil Strategic Reserve.

Investment and Financing System Reform and Policy Study on Sustainable Energy Development

[Executive Summary]

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I History of Energy Investment and Financing System Reform in China

1. Main Reforming Aspects and Achievements

Since 1979, China in cooperation with the state's investment and financing system reform, has adopted a series of reforming measures to guarantee nationwide energy supplies. The main focus of the reform is on investment, financing management system and expanding construction fund sources. The monopoly of the state-owned economies is gradually been broken, and the restrictions on investment of foreign and private capitals in the energy construction field are continued to be relaxed, making the investment system developing towards diversified investment organizations and means, as well as multi-channels of fund resources. Meanwhile China has formulated a series of regulations and measures in order to increasingly enhance the government's financial support on energy saving, environmental protection and new energy construction, and absorb private capital investment.

These measures have improved this condition of serious lack and single channel of fund on solely state-run energy, greatly promoted the development of energy industry, and rapidly increased the investment scale for basic energy construction. During 22 years from 1979 to 2000, the investment in basic energy construction has a 23.4-fold increase, with an annual average of 15.6%. The nationwide energy investment reached to RMB 1.264 trillions in 2000. After 2002, the rapid economic growth, and disorderly development and high investment in high energy consumption industry led to a overheat of energy demand and shortage of energy supply, thus stimulated the rapid growth of energy investment. The basic construction investments in 2002 and 2003 reached to 17.8% and 16.0% of increase rate, respectively. Particularly, basic construction investments in coal and electricity fields which are short of

supply capacity were separately increased by 17.8% and 18.4% in 2003 than in previous year.

2． Anticipation on China's Energy Investment Demand

According to *China National Energy Development Strategy and Policy Study*, in order to achieve the goals of social and economic development, China's mid-long term energy supply will face a heavy pressure resulted by the rapid increase of demand by 2020. The anticipations of quantity and investment demand for energy production between 2004 and 2020 are listed in Table 1 below.

Table 1. Anticipation of Energy Investment Demand (2004—2020)

	PRODUCTION CAPACITY		INVESTMENT DEMAND (billion Yuan)	
	2010	2020	2020	Annual Average
Coal (billion ton)	2.20	2.70	1000	62.50
Oil (billion ton）	0.18	0.19	660	41.25
Natural gas (including importing LNG) (billion m^3)	110	200	440	27.50
Electric-motor (billion kw)	0.72	1.00	5160	516.25
Among which: power grids			3100	

By 2020, the total demand for accumulative investment in the energy industry will be RMB 1.036 billion Yuans, with a investment of 647.5 billion Yuans each year beginning from 2004. Taking overseas investment of oil & gas and production of non-fossil energy into account, the total investment is expected to reach to 18 trillion Yuans.

Ⅱ Problems in China's Investment and Financing System for Energy Development

At present, China's investment system mainly has the following problems:

1．Problems in Diversified Investment Organizations：

(1) Private economy and foreign investors suffer from being supplanted by state-owned investors; (2) Some local governments fail to fulfill contract items of energy projects which are invested by foreign investors. Consequently a group of foreign-funded electrical companies withdrew from power market of China.

2． Problems in Energy Investment and Financing Management

(1) Lack of executable investment plans and corresponding policies on sustainable energy；

(2) Management system for energy investment projects needs be reinforced.

3． Problems in Financing Sustainable Energy Construction

(1) Insufficiency of governmental investment; (2) Lack of enterprises' enthusiasm for investment； (3) Lack of investment and financing channels.

Ⅲ. Overseas Experience of Investment and Financing in Sustainable Energy and Energy Conservation (Omitted)

Ⅳ. Objectives and Implementation Procedures of Investment and Financing System Reform on Sustainable Energy Development

1．Guidelines for Investment System Reform on Sustainable Energy Development

During establishing objectives of investment and financing system reform on sustainable energy development and relevant reform promoting measures, we should adhere to the following principles: (1) The reform should embody the overall trend to market economy, protect the legal rights and interests of various investors, and mobilize the enthusiasm of all the investors of society. (2) While striving to break the excessive monopoly of state-owned economy in energy industry, we should also make sure that public economy occupies a certain proportion in this industry in order to guarantee the state's direct and indirect control over this industry. (3)The state should take multiple measures (including market access permission, investment supervision and macro-control) into full play to make sure that all the investment and financing activities in this industry are standardized and legal. (4) It should embody the requirement that our management and operation system of energy industry meet international conventions, meanwhile reflect the requirement on encouraging active participation in international competition, especially in occupation and competition for international energy resources.

2．Objective Mode of Investment and Financing System Reform on Sustainable Energy Development

The ultimate objective of investment and financing system reform on sustainable energy development is to actualize this kind of investment and financing system characterized by "Dominated by market, Supported by government, Restricted by law".

3．Implementation Procedures for Pushing Forward Investment and Financing System Reform

Stage I (2005-2010): Make a clear distinction between the range of market adjustment and governmental control, relax the restrictions on the private-capital investment in the energy industry, and enhance the market level as well as economic and social benefits. The

government should properly choose and support key investment targets in promoting sustainable energy development, and mobilize domestic investors' enthusiasm in energy investment, especially in sustainable energy construction investment. In addition, gradually establish and complete various laws and regulations to make sure energy develops continuously, healthily, stably and rapidly, so as to create basic conditions for a standardized and legal investment and financing field.

Stage II (2010-2015): Gradually actualize the foundational role of market in sustainable energy development, and clearly define the enterprise's capability of self-investment in profitable energies development and investment activities. Government only supports those projects with market "disadvantages", such as energy conservation and new energy source development, by providing funds and offering favourable policies. Fully promote the integration of enterprise investment and financing activities in the energy industry with market economy as well as international management. In addition, keep on improving relevant laws and regulations to speed up the jural process of investment and financing field of energy industry.

Stage III (2015-2020): All the objectives for energy investment and financing system reform are basically put in place, and new investment and financing system and operation mechanism are formed in energy construction which are protected by laws and regulations, operated by standards, and meet the requirements of socialistic market economic system. The relevant laws and regulations are completed, providing systematic and legal guarantees for sustainable energy development. The foundational role of the market in resource allocation is put into full play.

V. Suggestions to Investment and Financing Policies for Promoting Sustainable Energy Development

Against investment and financing problems in China's energy development and taking overseas experience as reference, the investment & financing policies and measures for promoting sustainable energy development should be formulated from the following aspects:

1. Improve the Government's Management on Energy Investment

(1) Further reinforce enterprise's capability of self-investment. Nail down enterprise's main position of investment in energy construction field. Continuously consummate and simplify the energy construction projects invested by enterprise, especially the approval system for sustainable energy project. For approval of domestic funded projects, the government should take some aspects into consideration, mainly in rational developing of natural resources, protecting ecological environment, optimizing industrial arrangement, protecting public interests, preventing monopoly, and maintaining economic security. For approval of

foreign-funded projects, the government should consider the aspects of market access permission and capital project management. The scope, content, procedure and time requirement for approval of investment projects should be publicized. The government should improve the working efficiency, enhance transparency, and be willing to accept supervisions coming from society.

(2) Encourage private capitals to invest in energy construction. Keep relaxing the restrictions of private capital and social capital investing in energy construction, and break the excessive monopoly over energy industry by the state-owned enterprises and stated-owned economy. Concretely, for traditional energy and new energy development projects developed and utilized by the state's monopoly resources which need a whole allocation, the government should adopt public bidding approaches towards society, and decide the investor, sponsor and operator of the projects. It should properly reduce the percentage of various types of capitals investing in energy conservation and new energy source construction projects. Encourage social capital and private enterprises to cooperate with state-owned enterprises and undertake investment construction and operation of traditional energy and new energy source projects by diversified ways, such as joint venture, cooperation, pooling operation and project financing. The state should provide financing supports by several measures, including favorable taxation, investment guarantee and issuing enterprise bonds. Besides, should also support investment activities of private enterprises and social capitals in new source energy and energy conservation projects by offering investment subsidy and loan interest, even by inputting a partial of capital.

(3) Expand the utilization of foreign-funded sustainable energy construction. The government should summarize experience and lessons in previous period of foreign-funded energy construction and attract more foreign businessmen by giving them national treatment and following international practices so that they could develop energy conservation and new energy project construction in various investment methods like franchise operation, buying or controlling share, BOT and BT. The government should make proactive efforts to acquire the support and cooperation of international energy organizations, international financial organizations, overseas multinational corporations and high-tech energy enterprises that have advanced technologies and management experience, and greatly introduce new technologies and management experience on new energy development and energy conservation from abroad.

(4) Strive to enhance the investment supervision and macro-control level of the government on the sustainable energy industry. The state's competent investment department should work out short, middle or long-term development planning on sustainable energy industry and properly formulate and adjust guidance catalogues for fixed asset investment in the

sustainable energy industry as well as for foreign-funded investment industry. At the same time, it needs to strive to improve its investment and financing support and preferential policies for the sustainable energy industry. It should indirectly adjust and control the investment behavior of the main investment bodies on sustainable energy and energy conservation by taking rational economic measures controllable by the state such as taxation, price, interest rate, security issuance, and finance and currency policy.

(5) Establish effective information oriented system. The state should establish investment and technical information issuing system on sustainable energy industry as soon as possible. Firstly, the relevant departments of the state and local government regularly publicize information on development and application of sustainable energy and energy conservation technology within their scope of management. Secondly, the government should establish a training system in which the government or relevant units entrusted by the government should regularly organize enterprise leader training class to convey information on the development of sustainable energy and energy conservation. Meanwhile, social bodies and intermediary organizations are encouraged to provide free information training and consultation services on sustainable energy and energy conservation for leaders of enterprises, and the government could offer funds when necessary. It is suggested that the construction of the state's sustainable energy investment information system should be started during the "11^{th} Five-year Plan" period, and strict and smooth sustainable energy information report system should be established.

(6) Establish market access mechanism for energy conservation and environmental protection. The state should set up highest restriction standard for energy consumption of equipments, transportation tools and buildings in various construction projects. It should also work out laws to have certain construction materials carefully checked and projects not up to energy conservation standard will not be allowed to undertake construction and operation.

(7) Rapidly formulate and complete the state's relevant laws and regulations on sustainable energy development.

Targeting at China's current problem of backward and incomplete laws and regulations on new energy and energy conservation investment, the government should quicken the legislative work in the investment and financing field and rapidly formulate the coordinated regulations and policies for *The Renewable Energy Law of the People's Republic of China* and *Energy Conservation Law of the People's Republic of China* which have been promulgated. Those regulations in these two *Law*s on investment and financing policies are to be strictly complied with in the later practice. The government should step up the integration of its investment supervision and macro-control with the market economy and international practices, quicken the amendment of *National Policy for Saving Energy Technology* and

formulate *National Policy for Renewable Energy Technology*.

2．The Focus of the Government's Investment Transfers to Sustainable Energy and Energy Conservation Construction

（1）The government's investment on energy should transfer from profitable projects towards new energy development, energy conservation and energy environmental protection projects that general investors are unwilling to invest upon, and should gradually reduce investment when the conditions for market competition are formed. It is wise for the government not to interfere with the regular investing and financing activities in the traditional energy field that run smoothly under the market mechanism at present.

（2）The government should try to avoid direct investment such as capital input while providing enough support by introducing more indirect investment measures such as investment subsidy and loan discount. It is also its duty to participate in the new energy and energy construction projects as well as operation activities.

（3）The government should put adequate emphasis on the development of new energy and energy conservation technology, which involves various difficulties including technology restriction and high cost unbearable by general enterprises .Therefore, it is the government who plays the major role in the state investment. Meanwhile the investment on industrial experiment for new energy and energy conservation technology should be increased. It may adopt incentive policies to attract various investors to participate in the relevant development and promotion work.

（4）Offering subsidies for remote residents who utilize local new energies is another good approach. It is extremely uneconomical for residents and enterprises in remote and border areas to rely on outside energy supply. It would be better for the governments to set up certain investment subsidy systems as to encourage people to use local materials (solar energy, wind energy, terrestrial heat and bio-energy) for production and living.

3．Accomplish a better Financing Environment for Sustainable Energy and Energy Conservation Projects

（1）Policy banks should focus on supporting sustainable energy project construction projects. Unlike the regular energy projects, sustainable energy and energy conservation projects gains low inner fiscal benefits but high external benefits such as society benefit and environment benefit, which is recognized by the Policy-based financial agencies as its orientation. Thus the China Development Bank gives priority to offer credit support for these public projects and gradually withdraw from the field already crowded with relatively mature technologies and sufficient market Thermal Power Station Projects. Agricultural Development Bank should regard energy construction in the agricultural and pastoral areas as one of the focuses

of its soft loan.

（2）Provide channels on direct financing of new energy development enterprises. Reduce bank loans as well as other indirect financing percentage is one of China's strategic orientation for developing capital market and investment and financing system reform. The government should make full use of the approval rights for enterprise construction bonds issuance and the enterprise's enter into the stock market so as to support sustainable energy project construction. And the energy enterprises mainly investing on sustainable energy projects should be given first priority for issuing their stocks or enterprise bonds.

（3）The state establishes new energy development funds and guarantee funds. To solve the funds-shortage problem on new energy development project, it is suggested that the state and local authorities adopt the measure of increasing electricity tariff to accumulate funds specially used to support new energy construction. For new energy construction projects urgently acquiring loans from financial agencies, it is acceptable for the state and the local governments to establish loan funds on new energy project.

（4）Strive for preferential loan support from international financial organizations for new energy and energy conservation development. Developing energy conservation and new energy in China — the big energy consuming country with a population of 1.3billion — is of great significance for worldwide sustainable energy development. The state should actively set up a smooth financing channel to international financial organizations, making efforts to gain more preferential loan supports from international financial organizations for China's energy conservation and new energy development projects.

4． Strengthen Energy Environmental Protection Investment

（1）The state should give certain fund support for energy environmental protection facilities of construction projects. In order to encourage and guide the enterprise to construct and operate corresponding environmental protection facilities/projects, the state should provide investment subsidy for a certain percentage for energy environmental protection projects. In order to reduce burden of debt for energy environmental protection projects, the government should offer certain loan discount for energy environmental protection projects and strengthen development and technical investment on energy environmental protection facilities, so as to reduce the enterprise's burden from investment on such facilities.

（2）Encourage the development of clean energy. Clean energy industries belong to the capital-intensive industry, with relatively higher development (exploration, production) or operation cost, especially for natural gas, water and power. More capital is involved in the prophase exploration and engineering construction while the construction of nuclear power station requires large amount of investment. To solve the capital shortage and disorderly

development problem, it is necessary to create sound policy environment and establish investment and financing mechanism.

（3）Promote a rapidly and continuously developed hydropower project. China is famous for its highest total amount of water energy resources in the world. Due to the long period for large-scale hydropower project construction, high lump-sum investment and high risk for the owner，the state should make reasonable arrangements in valley planning and control and in various funds absorption (including private capital and foreign investment) through invitation of bid, so as to avoid the phenomenon of one project vied by many owners or disorder development. Meanwhile, various conditions to facilitate the multi-channel financing are also necessary. Small hydropower project extends a short construction period, very efficient and easy to exert the role of various parties, and could be established through the collection of local or private funds. The local government should carry out strict examination on small hydropower construction in the aspects of rational usage of resources and environmental protection.

（4）Increase fund investment and step up the development of natural gas. Fund is an important issue that would probably disturb the development of the natural gas industry. The key to solve this issue lies on the government as well as the production enterprises. The government should provide supports for exploration and development of natural gas from the aspect of investment and financing. Direct fund input and loan discount is one approach while the formulation of corresponding policies to attract funds at home and abroad in the exploration and development of natural gas is another. It also proves a good way to boost system reform in the oil and gas industry and allow the private capitals share and even control the exploration and utilization of natural gas, so as to break the monopoly of the state-owned economies.

（5）Pay attention to the utilization of flammable gases and reduce relevant accidents and pollutions. The development and utilization of flammable gases such as coal bed gas, coke oven and blast furnace gas is a new topic in China, the primary stage of which requires quantities of investment on technical researches, exploration and development as well as commercialized operation experiments. Also, the state’s support for the industry’s formation and development is of high importance. Therefore, the state should bring this task into the energy development planning and provide financial and policy supports. It would be a good way for the government to support several experimental zones for commercial development at first and more after getting familiar with this field. It shall also formulate access standard and preferential policies in the aspects of investment and financing subsidies, taxation, and power grid, so as to attract various investors to join in the investment and development of inflammable gases. Through promotion of cyclic economy and environmental protection

policies, it requires newly built enterprises to establish coordinated production lines, collect and utilize inflammable gas electricity emission from the process line to generate electricity, manufacture coal-related chemical products or provide energy for residents' daily use. The government may provide fund subsidy for enterprises with limited funds or make contribution to the facility construction projects targeted at citizens and encourage more investors to put capital into the establishment of downstream enterprises and have them combined with the major enterprises or become customer enterprise.

（6）Actively develop nuclear power.

Nuclear power is the ideal energy which is perfect to solve the energy shortage and increasingly serious pollution problems. Nuclear power is characterized by high technical security standards, sensitive choice of location and comparatively complex associated facilities. It requires huge amount of construction investment, long time limit for the project, and long investment payoff. In order to rapidly develop nuclear power, the state should show more concern on investment and financing: firstly, establish technical and access standards suitable for China's development as soon as possible; secondly, increase capital investment in design, development and industrial experiment of nuclear electronic equipments; thirdly, allow the enterprises to attract Chinese and overseas capital investment in nuclear electricity construction by issuing enterprise bonds and stocks; and fourthly, provide certain preferential policies for the loans of nuclear power construction and taxation, power grid and asset depreciation after the operation, so as to increase the profit from nuclear power station.

（7）Attach importance to urban thermoelectric construction. Combined heat & power project could make full use of energy, improve the quality of people's life, and effectively reduce the atmosphere pollution, suitable for urban construction. China should take overseas experience on developing thermoelectric project as reference, formulate urban heat supply planning characterized by combined heat & power and adopt preferential policies for enterprise investment project on developing combined heat & power from the aspects of financing, depreciation, taxation, price and power grid. It should also provide investment subsidy and loan discount for the projects on transforming regional heat supply into combined heat & power and invest on establishment of thermodynamic pipeline.

5．Control Energy Conservation in Key Industries

（1）Industrial energy conservation. The energy consumed in the industry accounts for about 70% of China's total energy consumption, a large amount of which is consumed in the seriously polluted industries of steel, non-ferrous metal, construction material, coal, electrical power, oil and chemistry. To carry out industrial energy conservation, these industries should be put on the top agenda and investment access process should be controlled, and gradually expanding to other industries. Firstly, it should formulate the design standard for industrial

equipments, and require enterprises that provide production equipments to stop producing high energy consumption and serious polluted equipments.And for those requiring relatively large sum of investment on change of production which is unbearable by the enterprise, the state should provide fund support. Secondly, the design of new production line must adopt advanced domestic energy conservation equipments and environmental protection facilities, and those not up to the design standard regulated by the state are not allowed to undertake the construction. Thirdly, it should step up the technical reform of current enterprises to save energy and prevent pollution, and those enterprises characterized by high energy consumption and pollution should be reformed within the time limit, and those delaying the reform will be ordered to stop operation, while for others lack of technical reform capacities, the state should provide certain help in the aspects of assets and technology. Fourthly, it should restrict the scale of construction, and prohibit the construction of small steel, cement or chemical fertilizer enterprises the energy consumption of which is higher than the average.

（2）Building energy efficiency. China has set up a standard on building energy efficiency, but the effect of execution is far from satisfactory. To change such a situation, firstly, the governmental department should attach importance to building energy efficiency from action instead of the surface or oral expression; secondly, it should establish and carry out effective stimulation and punishment mechanism to allow the developers realize the influence of carrying out energy conservation on their own interests; thirdly, department supervision must be in place, and the governmental department should supervise the whole process from investment to construction implementation, and earnestly abide by reward and punishment regulations; and fourthly, the government should emphasize the development and promotion of technology, material and relevant equipments on energy conservation.

（3）Traffic energy conservation. Traffic energy conservation should focus on the automobile. On development of the automobile, the state should provide sufficient investment to support the research and development of automobiles driven by power energy and hydrogen energy so as to adapt to the trend of transforming towards automobile energy power system after 2010. On the fuel of automobile, it should encourage the production of gasoline substitutes like ethanol, methanol and dimethyl ether and promote the usage of such substitutes. It should vigorously develop public transports like light rail and trolley bus to reduce the using rata of automobile during the trip within cities while it should not restrict the enthusiasm on the construction of urban light rail and subway.

Energy Pricing: Policy Establishment and Enforcement Reform

[Executive Summary]

Institute of Economic Research, National Development and Reform Commission

This paper analyzes China's current energy pricing framework and recommends energy-pricing and enforcement reform measures.

1. Major Problems in China's Energy Pricing

"Coal, power, oil, and gas" are recognized as China's basic energy sources. Therefore, we begin by analyzing current coal, oil, natural gas, and power pricing in China.

1.1 Major Problems in Coal Pricing

Except for the price of coal used in power generation, which is guaranteed by "key contracts," most coal prices are decided by market supply and demand. In the past two years, despite quickly rising coal prices, the coal market is nearly universally regarded as running smoothly. Currently, the major problems in the coal market are the "dual system" of power and coal pricing, as well as the "use of substandard products as standard ones," disguised inflation, and the unstable coal supply for "key contracts."

1.2 Major Problems in Oil Pricing

The major current problem in oil pricing is that, although the price of crude oil is basically market determined, gasoline and diesel fuel prices are still controlled by the government. To its merit, the current gasoline and diesel fuel price formation mechanism helps effectively utilize resources at home and abroad, guarantees the domestic market supply, and promotes the reform and enhances the management ability of state-owned oil enterprises.

But in such a competitive industry with such a close relationship to the international market, it would be quite normal to see a gap between actual and target price if China keeps maintaining or even strengthening the "major channel" status of its two big state-owned oil

companies, SINOPEC and China Oil. At present, the main problems in oil pricing are as follows:

(1) The price is inconsonant with domestic market supply；

(2) The price adjustment boundary condition is based on cost recovery, so it cannot rapidly adjust to changing market conditions;

(3) The price and tax (charge) relationship is irrational.

1.3 Major Problems in Natural Gas Pricing

There are three major problems in natural gas pricing:

(1) Pricing control methods lack flexibility and cannot quickly respond to energy supply and demand changes;

(2) User classification is often incorrect, creating a serious "cross-subsidization" problem；

(3) There is a lack of unified distribution of price control standards.

1.4 Major Problems in Electricity Tariffs

There is increasing support for new and renewable energies, and China's current electricity tariff policy encourages investments into the **renewable** power generation industry. This is a very effective way to promote energy conservation. However, current general power supply still cannot meet current demand, and short-term energy supply adjustment measures both are insufficient and fail to target energy conservation as a solution. Also, there is still no systematic framework for supporting new and renewable energy development.

2. Recommended National Energy-Pricing Policy and System Reform Principles

The Chinese government has never made a clear declaration of its energy pricing policy. We suggest that an ideal pricing policy would be one with the following three parts, which we look at in more detail below: (1) balancing energy sustainability and state competitiveness, (2) setting energy prices **that** reflect true costs, and (3) combining a competition mechanism with a supervisory system and "external" control.

2.1 Balancing Energy Sustainability and State Competitiveness

China's improved social and economic status has led to booming energy consumption; domestic resources are insufficient to sustain anticipated economic growth. Energy conservation and the development of new and renewable energies are essential for China's sustainable energy development.

However, a high "energy-consuming economy" is not necessarily an economy with high "energy waste." China has a relatively high energy-consuming economic structure, mainly due to many industries' poor labor quality and low scientific and technological levels. Foreign capital investment and China's export products are concentrated in manufacturing

industries characterized by high energy consumption per unit GDP. The high energy consuming economic structure in China is a natural result of current international labor division.

In addition, China is still considered a developing country, with coal as the major energy resource. Thus, China's energy supply structure cannot be directly compared to those of developed countries; in taking environmental protection measures, we must consider not only environmental benefit but also the capacity of China's economy and energy structure to bear energy supply costs and energy structure change.

We must first and foremost promote energy conservation and support the development of new and renewable energies, giving China a more sustainable energy future. At the same time, though, we must maintain China's economic competitiveness, and accept that China's economic structure is characterized by high energy consumption and coal use. We must take care to not blindly pursue decreases in energy consumption per unit GDP and larger scale development of renewable energy.

2.2 Setting Energy Prices that Capture True Costs

China's energy price policy should promote energy conservation and support renewable energy development while ensuring China's sustained economic competitiveness. The way to do so is to set a rational energy price–that is, a price that reflects true costs.

China's current energy price does not reflect the full costs incurred by society. Current energy pricing fails to internalize external costs: it leaves out some of the value of consumed natural resources and the cost of environmental damage. Only when energy price reflects both internal and external (such as environmental and resource) costs will energy consumption shift to a rational level that can actually be borne by society.

2.3 Introducing Competitive Mechanisms, Creating an Energy Price Supervision System, and Strengthening "External" Control of the Energy Industry

2.3.1 Increasing competitive mechanisms

First, competition in the energy industry and the market determination of energy prices should be allowed to increase. Competition is the most effective method to strengthen enterprises' external constraint and increase consumers' choices, thus economizing resources. Traditional competitive industries in China have basically shaken off state planning, and their prices are market-determined.

The coal and oil industries are traditionally competitive industries, and the government should remove market obstacles and introduce competitive mechanisms. The natural gas

and power industries are traditionally categorized as natural monopoly industries. However, recently both theoretical research and practice in China and abroad have shown that while the natural gas industry still has many features of a natural monopoly, the power industry can be a competitive business.

As long as relevant conditions are met, it is possible to establish a competitive market structure and price formation mechanism determined by supply and demand in the power industry. To further introduce competitive mechanisms into China's energy field, a competitive market structure needs to be established, an overall system reform plan needs to be created, and visionary leaders must take charge of the reforms.

2.3.2 Creating a market-based energy price supervision system

In the past, there was virtually no economic supervisory system in China; direct control and orders from superiors to inferiors in the planned economy are completely unrelated to supervision in the market economy. In a monopoly such as China's current energy industry, the more diverse the economic interests involved and decisions that need to be made are, the more necessary such a modern supervisory system becomes to balance the economic interests of buyers and sellers based on objective procedures and rules.

In China's power industry, "the factory and the network" have been basically separated; technical connections within the electric-power system remain unchanged but there have been great changes in economic relationships. In this setting, it is impossible to improve the industry's efficiency and maintain the security and reliability of the electric-power system unless a modern supervision system is established. In building a modern energy price supervision system, we must establish energy price supervisory agencies, improve regulation systems, and form a system of checks and balances among involved parties.

2.3.3 Strengthening "external" control of the energy industry

"External" control in the energy industry refers to the influence of resources and the environment. To strengthen such external control, energy price policy must internalize both "external costs" and "external benefits."

Internalize external costs. The basic approach for internalizing external resource costs is to have resource prices enter the market. The right to utilize state-owned resources must be granted through standardized bidding invitations, and a scientific resource tax and charge system must be established. Resource tax collection standards should accord with product prices, and resource taxation levels should be based not on output, but on the amount of occupied resources.

The basic method of internalizing environmental costs is to establish an environmental tax and charge system, in which emission charges are higher than the cost of adopting

environmentally-friendly processes. If the resource and environmental expenditures of energy industries still under government price supervision increase, the price of energy they generate must be raised correspondingly to internalize environmental costs.

Internalize external benefits. The development and utilization of renewable energies, like wind, biomass, tidal, and solar energy, could reduce the exploration for and consumption of fossil fuels, not only saving non-renewable energies but also protecting the environment. Such positive "external benefits" should be promoted. The methods for internalizing such external benefits are as follows:

(1) Provide government quota subsidies in order to address the cost difference between renewable and general energies. Subsidy levels should be based on energy unit but adjusted to the different market conditions in different areas.

(2) Require energy distribution enterprises to purchase some renewable energy at its real cost.

Method (1) is better used for industries operating in competitive markets, while method (2) is more suitable for industries that are monopolies. Regardless of which method is adopted, due to China's large size and unbalanced economic and social development, the cost of final energy should be increased by a small "additional" amount in order to distribute the cost difference between renewable and general energies.

3. Pricing Policies and System Reform of Major Energy Industries

3.1 Recommendations for Coal Pricing Policy

The government should not suppress the rising price of coal used for power generation, an action that would be unfavorable for energy conservation. However, it is difficult to prevent the government from doing so in the current economic environment. It is commonly regarded that the price of coal used for power generation should not enter the market before electricity tariffs enter the market.

This is wrong. Introducing electricity tariffs to the market is not necessary for the introduction of coal and power to the market. Before the 1990s, almost no countries in the world had electricity tariffs, but in most countries with developed market economies the price of power fuels (including coal) were market-controlled.

China has established the *Coal-Electricity Price Linkage Mechanism*, a way to allow the price of coal used in electricity generation to rise, passing rising coal costs onto electricity end users. However, this mechanism is far from perfect. While the mechanism stipulates that 70 percent of coal price increases will be transferred to end users, power enterprises must "absorb" the remaining 30 percent of fuel cost rises. Because of this and the fact that the

electricity tariff is still capped, the mechanism makes it possible for electricity tariffs to control coal price market. Also, the time lag for such linkage (six months) is too long, which could also lead to the suppression of coal prices.

China should also consider the use of bid invitations and allocations of rail transport capacity for power-generating coal "key contracts." Apart from the incomplete Coal-Electricity Price Linkage Mechanism, the most serious obstacle to the marketization of power-generating coal is the lack of rail transport capacity for transporting power-generating coal. This lack of rail capacity makes it impossible for both parties exchanging "key contract" power-producing coal to freely choose their trade partner, a situation similar to power transmission network blockages in a competitive power market.

We recommend imitating power transmission rights auctions and the "power transmission trade" in the power market. This will invite public bidding on the allocation of railway transport capacity for power-producing coal "key contracts," establishing a railway transmission capacity trade system.

Finally, coal resource costs should be standardized and introduced into the market.

3.2 Recommendations for Oil Pricing Policy

We have the following oil pricing policy recommendations:

Create an indirect linkage between refined oil product prices and the international market in place of the current direct linkage.

Change the price adjustment boundary. The current price adjustment boundary is 8 percent of the weighted average of the monthly international market price change. We suggest this price adjustment boundary is changed to being either a certain degree of change in average price or a certain level of rise or fall in daily price over ten consecutive trading days in the international market. The purpose of this change is to strengthen the guiding function of price adjustment and increase the risk of speculation, so as to reduce the possibility of the market becoming unbalanced due to speculation.

Change the price control form of refined oil products from medium level to price ceiling.

(1) Expand the executive range of wholesale price, and open the factory price of aviation coal oil. China Aviation Oil (CAO) has acquired right to import aviation coal oil and is ready to freely choose its suppliers; government controls on domestic purchasing price have become unnecessary.

(2) Loose the market accession of wholesale and retail of refined oil products, and introduce competitive mechanisms.

(3) Add specific fuel taxes. Taxes and charges for road utilization, environmental

protection, and the funding of energy conservation and renewable energy development should be levied on fuel as soon as possible. Apart from value-added taxes (VAT), all taxes and charges should be collected according to the amount of product purchased so as to guarantee the stability and reliability of relevant public funds and reduce unnecessary price change.

(4) Improve the oil market system, establishing a complete domestic oil market system including a cash wholesale market and futures market. This is necessary due to the impending opening of the oil market to foreign funds and the wholesale market to private capital.

3.3 Recommendations for Natural Gas Pricing Policy and Supervision Reform

We recommend the following changes in natural gas pricing and supervisory system:

(1) Establish a natural gas price adjustment mechanism connected to substitute energy.

(2) Set a reasonable gas price structure that reflects actual costs and gas supply.

(3) Standardize natural gas distribution price supervision methods. Price supervision agencies should develop more specific natural gas distribution cost regulations on the basis of international best practice and the *Enterprise Accountant Rules* promulgated by the Ministry of Finance. The standard name for the so-called "opening fee" should be "connect fee." If the user incurs special expense when connecting to the public network, the fee should be that actual amount; otherwise, the fee should be based on the unified standard. The expenses for the public network should be amortized over the entire operation period on a per year basis.

The natural gas distribution price structure should be based on the impact respective users have on the total cost of the gas supply distribution system. Different users have different influences on the distribution system because they have different volumetric loading rates, pipeline network capacities, gas using periods, etc. Each user's price should reflect that user's actual natural gas distribution system usage.

3.4 Recommendations for Electricity Tariff Policy and Supervision Reform

Adjust electricity tariff levels to reflect true electricity cost. Electricity tariff levels should not be kept steady but rather adjusted to reflect true changes in electricity cost. Making this change will be difficult and require amending the Coal-Electricity Price Linkage Mechanism. We recommend an amendment to this Mechanism that we call *Keeping Road and Bridge Separate with Disparate Functionality*.

The "road" refers to the normal requirement for regulated enterprises to "constantly raise efficiency." In foreign countries, this is typically done through adding an efficiency coefficient to the tariff adjustment formula: for example, X in Britain's price adjustment formula $RPI\text{-}X$ is an efficiency factor. The Chinese government has adopted an electricity

pricing formula but it has no electricity tariff adjustment formula and specific rules still need development. To implement an electricity tariff adjustment, a tariff adjustment formula is needed as soon as possible. In our proposed tariff adjustment formula, we add an "efficiency increase coefficient" or "cost decrease coefficient." The general cost increase that enterprises must absorb through this "road" must still be addressed.

The "bridge" is a solution to special (ad hoc) cost increases. Cost increases after deducting "the rate of efficiency increase" or "the rate of cost reduction" in the tariff adjustment formula (mainly significant fuel price hikes for thermal power generators) are considered such a special cost increase. These cost increases are the price society must pay to maintain existing energy consumption levels. Such cost increases should be completely passed on to consumers through electricity tariffs. This will have the side-benefit of raising consumer consciousness of energy scarcity.

Establish an electricity tariff structure that reflects power supply costs. The rationality of an electricity tariff structure directly affects the sustainability of electricity consumption, degree of energy conservation, and resource allocation efficiency. Thus, an electricity tariff policy for sustainable development must reflect true power supply costs.

Internalize external costs. Emission charges should be set higher than the cost of meeting government-stipulated environmental requirements for the power generation sector. China encompasses a huge territory with regional differences in weather, population density, cultural relic distribution, etc. Among these differences is a difference in the hazard of SO_2 emission; these different hazard levels, in turn, dictate different SO_2 emission control targets.

Along with significantly raising emission charges, policies should give enterprises channels to recover the installation and operation costs of desulfurization units, so as to encourage additional environmental-protection investment. In order for the power grid tariff to cover the cost of desulfurization, we recommend setting a separate rate for old generators because of the higher cost of refurbishing old units and building in measures to allow for appropriate elasticity in implementation.

Gradually introduce competitive mechanisms. Market mechanisms are the most effective means for saving resources in any competitive area. Based on international experience in electric power market operation, competitive pressure from both unilateral and bilateral trade compels power generation enterprises to employ all available means to minimize fuel consumption and conserve energy. If bilateral trade is adopted, a demand factor can be incorporated into the tariff calculation mechanism to further promote energy conservation.

Moreover, the Chinese power industry has basically separated power plants from grids. The absence of a competitive mechanism will increase transaction costs and hinder optimal

resource allocation. Therefore, the electrical power industry should introduce competitive mechanisms as soon as possible.

In the near future, in addition to completing pilots in electrical-power markets in East and Northeast China, we suggest undertaking the following: (1) speed up the "large account user direct purchase" pilot program; and (2) start to design an electric power market model that fits China's domestic situation.

Regulate and consolidate tariff-generated government funds. Currently, public funds are required to promote energy conservation—i.e., supply-side management—and renewable energy development. The use of tariff surcharges to raise such funds is fair and efficient. There are many successful international examples—as well as the successful domestic "Electric Power Construction Fund," "Three Gorges Fund," and "Reservoir Area Immigration Support Fund"—of such public fund use. Government funds generated from the electricity tariff should be regulated and consolidated to support sustainable energy development.

Establish a non-uniform renewable energy electricity tariff policy to reflect regional development levels. Renewable energy power generation should be supported and controlled by the government in order to ensure efficient utilization of public funds. However, as noted earlier, China is a vast country with great regional differences in resource endowment and demand. Regional resource endowments and level of development do not necessarily correspond; renewable energy electricity tariff levels should vary accordingly. The target price (base price) of renewable energy power should be determined province-to-province. A uniform nationwide allowance could then be added to this provincial target price based on the average price of general energy in the province.

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Environmental Levy Policies that Promote Energy Conservation and Renewable Energy Development in China

[Executive Summary]

Energy Environment Economy Institute, Tsinghua University

1. Environmental tax policy design

Environmental taxes are collected from entities/firms which are proven to cause environmental damage. The principle that "polluters pay" was first raised by the Environmental Committee of the Organization for Economic Cooperation and Development (OECD) in the early 1970s. Since then, an increasing number of countries have implemented an emissions-charges system to control pollution and to prevent environmental damage. Based on the "polluters pay" principle, the objective of this system is to charge entities/firms causing environmental damage a fee, the revenues of which are then collected in an environmental fund. Such a system promotes social justice and reduces the financial burden of environmental protection undertaken by the government and society.

Since the 1990s, "green taxation" reform has been the trend in environmental tax policy design in many developed countries. This type of reform promotes environmental protection and sustainable development through market mechanisms, i.e. by using economic measures such as price mechanisms and environmental taxes and charges. These environmental taxes and charges not only aim to generate funds for environmental preservation and restoration on the principle that "polluters pay," but also aim to promote resource conservation and changes in production and consumption patterns that will steer economies down a path of more sustainable development. At present, three approaches to environmental damage and pollution control have been implemented in developed countries: (1) command-and-control or direct regulation, such as enacting pollutant emission standards or environment quality guidelines that are enforced by legislation; (2) market-based economic instruments, such as taxes and charges on pollution, an energy tax or tradable permits; and, (3) voluntary

agreements, such as voluntary energy-saving agreements between companies and governments, voluntary purchase of energy-saving products and of electricity produced with clean energy, and so on.

2. Suggestions for the reform of environmental levy policies promoting energy conservation and renewable energy development in China

1) Mobilize environmental levy revenue to support the development and deployment of renewable and energy conservation technologies.

China has had pollution emission charges since 1978. Before 2003, China already assessed charges if wastewater, exhaust gas, waste residue, noise, or radioactivity exceeded certain standards. Revenue from these charges was then used mainly for pollution control or onerous loans. In 2003, this system was changed to charges being assessed for all pollutant discharges, whether they exceeded previous standards or not. According to the new regulation, revenue from these charges then enter the newly-established Environmental Protection Fund. This fund is used for (1) preventing and mitigating significant point and regional pollution; (2) supporting research, development, demonstration, and deployment of new pollution treatment technologies; and (3) subsidizing pollution control projects.

China's current environmental levy policy could play an instrumental role in encouraging enterprises to reduce pollution and protect the environment, introducing the principle of "polluters pay," internalizing externalities, and promoting environmentally-sound technology development and innovation. However, it is still largely "terminal control" oriented. In the short term, policy reform should be focused on improving the allocation of the Environmental Protection Fund. The Environmental Protection Fund should not only be used in pollution treatment and emission mitigation (such as installing desulphurization sets in thermal power plants); it should also be used to support the development and deployment of renewable and energy efficient technologies that reduce or avoid pollutant emissions upstream. This is better than the old environmental protection approach, "treatment after pollution."

2) Raise pollution charges gradually so the levy reflects the social cost of emissions and improves the market competitiveness of renewable and energy efficient technologies.

China's present emission charges are too low to compensate for pollution's large social and economic costs. For example, for a 600MW coal-fired power plant's emissions, the present charge standard is equivalent to 0.0096 RMB/kWh, but the external cost of emissions is equal to 0.0938 RMB/kWh for the coal-fired power plant. The levy is only 10.2% of this cost.

Under present emission charge levels, the feed-in tariff for a 600MW coal-fired power plant is 0.35476 RMB/kWh while that for a 4MW industry effluent based biogas power plant and

for a 20MW wind farm are 0.40030 RMB/kWh and 0.68393 RMB/kWh. Present pollution charge levels do little to improve the market competitiveness of renewable electricity production. If the levy is increased to reflect the full external cost, the feed-in tariff for the coal-fired power plant will be 0.43896 RMB/kWh, which is higher than that for the biogas power plant, making the biogas power plant become competitive.

The present emission charge level is even lower than emission mitigation costs. Taking SO_2 emission for example, the present charge standard is 630 RMB/t, equal to 0.0044RMB/kWh for a coal-fired power plant. A case study in Shandong province showed that the cost of the construction of a desulphurization unit in a new coal-fired power plant is about 0.0145RMB/kWh; the cost is even higher, about 0.0172-0.0225 RMB/kWh, in already existing plants. The levy is less than one third of this cost and not sufficient enough to stimulate enterprises to adopt such mitigation measures. As a result, the present pollution charge levels should be raised to equal the emission mitigation cost in the short and mid-terms, and eventually to the full social cost of emissions for the long run in order to promote energy saving and the adoption of environmentally-sound technologies like renewable energy.

3) Formulate a complete environmental tax and charge policy framework by integrating different economic-based environmental policy instruments.

China's environmental levy policy reforms should aim at developing an integrated environmental tax and charge system that encourages changes in production and consumption patterns, and promotes the development and deployment of environmentally-sound technologies, protecting the environment and sustaining economic growth.

In addition to the current emission charges policy, fossil fuel excise taxes should be introduced in the short and mid-terms, starting with a fuel consumption tax equal to 60 percent of respective fuels' price. For the long run, CO2 tax or ecological taxes should be considered.

The government should also consider setting up a general Public Benefit Fund integrating environmental protection, energy conservation, and renewable energy development incentives. Together with the Environment Protection Fund and the Renewable Energy Fund, which will be established under the Renewable Energy Law, electricity surcharges should recover the environmental costs incurred through fossil fuel consumption in electricity generation, and create incentives for pollution reduction, energy conservation, and renewable energy development. Electricity surcharges are usually set at 1-3 percent of the price of electricity; an electricity surcharge of 0.002-0.005 RMB/kWh is appropriate here in China. Total electricity consumption in 2004 was about 1,903 billion kWh; had an electricity surcharge

been assessed during 2004, 3.5-8.5 billion RMB would have been generated for the Public Benefit Fund.

4) Integrate environmental tax and charge policies with voluntary agreements.

To reduce pollution and resource shortage, market-based and direct regulatory policy tools are not enough. Wide social participation, as well as life-style and consumption pattern changes, is also very important. Voluntary agreements can encourage such participation. Voluntary agreements are agreements between the government or other agencies and industries or specific enterprises in which the enterprise or industry promises to increase energy-efficiency or reduce SO2, CO_2 and other emissions. Volunteer agreements generally last 5 to 10 years, during which enterprises can use a variety of means to reach pollutant emission and energy saving targets and often receive tax breaks and other economic benefits such as public fund subsidy.

China must disseminate energy-savings and renewable-energy information to raise social awareness and attract more people and enterprises to participate in energy-saving and renewable-energy programs. Abroad, public participation has contributed to renewable energy development. Information dissemination, education, training, and science and technology popularization can increase social awareness of energy-saving and renewable-energy development. This can increase the voluntary purchase of energy-saving products and electricity from renewable resources, stimulating investments in energy saving and renewable energy by manufacturing and service companies. An educated public can also serve as a watchdog of the government and private enterprise, further stimulating energy conservation and renewable energy development.

Accelerating the Reform of China's Energy Management System and Establishing a Modern Regulatory System

[Executive Summary]

Department of Industry and Economic Research,
Development and Research Center of the State Council

The sustainable development of energy in China can be achieved through reforms in the government energy management system, as well as through the establishment of a modern regulatory system. China needs to not only draw on the successful experiences of foreign countries but also apply them in the actual current conditions in China. Establishing a modern management mechanism and system is also within our goal, which aims to improve the efficiency and regulation of governmental energy management and achieve sustainable energy development through continuous innovation.

I. Major Problems in China's Energy Administrative Mechanism and Regulatory System

In general, the existing energy management mechanism and energy regulatory system in China fails to meet the requirements of sustainable energy development. There are six reasons for this:

1. Lack of coordination capability. The "3 discrepancies" problem, i.e. discrepancy between objectives and pace, discrepancy between national interest and local interest, and discrepancy between short-term benefits and long-term benefits are common throughout all levels of governments and functional departments responsible for finance, taxation, investment, pricing, economy, urban construction, communications, state assets management, etc.

2. The implementation of policies is unsatisfactory. The government management system is putting more emphasis on the examination and approval of policies, rather than their

regulation and management.

3. Inadequate social regulation. Existing government energy management focuses more on the economic side, such as investment, pricing, production scale, etc., than on the regulation of external issues such as environment, security, quality, and resource conservation. This imbalance has resulted in more emphasis on production than on consumption, and more emphasis on supply than on conservation.

4. Discrepancies between central and local government policies. Energy is playing an important role in economic growth, finance, employment , and distribution of income, as well as the social stability of the country and regions within it. The long-term objectives of the central government conflict with the short-term objectives of local governments. This conflict in objects creates disagreements between the central government and locals governments regarding the target, actions to be taken by, and intensity of energy management. A typical example is the difference in opinions regarding the regulation of economical automobiles.

5. Regulation is inadequate . By looking at foreign countries, one can see that the centralization of the regulatory power facilitates the enforcement of regulatory policies. However, the power to regulate the energy sector in China is decentralized. Regulatory organizations lack clear functions. In some cases, even regulatory power is lacking. For example, the National Electricity Regulatory Commission lacks essential regulatory powers regarding pricing, accession of administration, etc.

6. Severe understaffing of energy management agencies. The population of China is 1.3 billion and there are 12 million workers in energy sector (over 5 million in the coal industry alone). However, only a few dozen people are now work in the energy management department in the Chinese central government, in comparison to 150,000 federal employees engaged in energy management full-time in the U.S. Department of Energy.

The figure below lists the key components and foci of the existing energy management and regulation system in China. Three time periods are included: prior to, in the midst of, and after projects.

	Economic Returns	Energy Conservation	Environmental Protection	Security
Before	●	○	◉	○
In the Midst	○	○	○	○
After	○	○	●	◉

Note：● high，◉ moderate，○ below average，○ low

II. Objectives & Focus of Reform

To fundamentally solve the previously stated 6 problems China needs reform its energy management system and leave it to market forces.

General Objectives of Reform:

The main objectives for reforming the energy management system are as follows:

1. Establish a modern regulatory system by absorbing successful international methods in building up a modern regulatory system. This system should be independently operated, administration and regulation should be separated, and adequate authority should be ensured. Checks and balances of power should be effective.

2. Ensure independence of the regulatory body. Whether the regulatory authority is under direct government administration or not, keeping the regulatory authority independent is the foundation of building the modern regulatory system.

3. Separate the administrative body from the regulatory body. Administration should be separated form regulation; the formulation of a policy should be separated from its implementation. This is essential to ensure the independence of the regulatory body and consistency of regulatory policies.

4. Improve regulatory function. In conjunction with loosening economic regulations (e.g. regulations on investment, pricing, market access, etc.), we should strengthen social regulations, especially regulations on monopolized sectors. The focus of the regulation should be shifted accordingly to changing needs.

5. Strengthen regulations through the law. We should improve the connection between law and regulation in the energy field. Strengthen regulatory law, carry out regulations effectively, and establish an effective checks-and-balances system.

Under the guidance of these general objectives, China's reform of its energy administration mechanism and regulatory system can be carried out step by step. The different requirements of short-term, mid-term, and long-term targets will work as reference to specify the reform focus and steps to be taken.

Short-Term Target (1-2 years): The focus in this period shall be improving regulatory function, shifting management focus, strengthening coordination capability of energy management departments, and improving the regulatory function of the regulatory body (e.g. regulatory function of State Electricity Commission on the electricity pricing). The focus of the regulation is shifted from the energy production and supply to demand, and economic regulation is shifted to social regulation.

Mid-Term Target (2-5 years): The focus in this period will be restructuring the government bodies by clarifying the responsibilities of central and local governments. The energy administrative bodies shall be reformed with a focus on strengthening the administrative ability of the government. The targets of the central and local governments regarding organization and system security will be integrated.

Long-Term Target (5-10 years): The new management system and long-term mechanism for sustainable development will be developed according to current laws. While carrying out energy management regulations, the focus will be on saving energy, improving energy efficiency, ensuring energy safety, and developing renewable resources.

III. Initial Concepts in China's New Energy Administrative System

First of all, the "separation of administration from regulation" shall be adopted to restructure the energy administrative bodies when establishing the new energy administration system in China. The "separation of administration from regulation" will be realized by establishing a "two-tier structure" in energy management: comprehensive energy management bodies (e.g. Ministry of Energy) will be separated from specialized energy regulatory agencies. The division of labor will be clear since the power and responsibility shall be well defined. The comprehensive energy management bodies will mainly be responsible for the formulation of national energy strategies, proposals and policies, and coordination between energy departments; the specialized energy regulatory agencies will be responsible for market regulation, so as to ensure the healthy development of and orderly competition in the energy industry.

Tables 1 and 2 below show the functions of the energy administration and regulation at the government level. These functions are distributed according to the specific trades, their functions, and their aim to meet long-term objectives.

Based on China's geographic economic zones (e.g. Northeast China, North China, Southwest China), it is feasible to establish some regional energy administrative and specialized regulatory departments (e.g. East China Energy Bureau and East China Regulatory Agency). These departments shall work as representative agencies of the central comprehensive energy administrations and specialized regulatory departments. The provinces, autonomous regions, and municipalities could also establish their own comprehensive energy administrations and specialized regulatory departments, working as representatives of the corresponding departments in their economic zones. This practice will enhance integrity and congruity in energy administration, effectively carrying out specialized regulation and enforcing the national policies.

Table 1. Energy Administrative and Regulatory Departments and Agencies by Industry

	Coal	Gasoline	Natural Gas	Electric Power	Nuclear Energy	Renewable Resources
Formulating Energy Policies	Ministry of Energy (MOE), National Development and Reform Commission (NDRC)					
Investment	MOE, NDRC, Ministry of Land Resource (MLR)	MOE, NDRC	Energy Regulatory Commission (ERC)	ERC	MOE	MOE
Pricing	MOE，Price Analysis and Evaluation without Direct Control		ERC	ERC	Nuclear Power and Energy Regulatory Commission	Electric Power and Energy Regulatory Commission
Finance & Taxation	Ministry of Finance (MOF), State Administration of Taxation (SAT)					
Technology	NDRC, Ministry of Technology (MOT)					
Information Collection & Analysis	MOE, ERC (Electric Power and Natural Gas Information Analysis)					

Table 2. Energy Administrative and Regulatory Departments and Agencies by Function

	Supply Side	Demand Side		
		Industry	Construction	Communications
Energy Efficiency	MOE	MOE	Ministry of Construction (MOC)	Ministry of Communications (Future Transportation Department)
Environmental Protection	State Environmental Protection Administration (SEPA)			
Security	Mainly production safety on supply side, including gasoline (MOE), natural gas and electric power (ERC), nuclear energy (Nuclear Safety Center) and coal (State Administration of Work Safety)			
Quality	Mainly on supply side, including electric power and natural gas (ERC), without special requirements for the others.			

The following are the features of the new energy administration system:

1. Shifting the administrative functions. The focus of the administration will be shifted from supply side to demand side. Conventional supply-side management focuses on exploitation,

processing, and production of energy resources, while demand-side management focuses on energy resource development, conservation, efficiency, technology, etc.

During the examination and approval periods, the focus of management will be on market access management and accession of standards in terms of the environment, efficiency, etc. More emphasis will be placed on the direction, openness, and transparency of policies.

In the midst of projects, managerial focus will be mainly on regulation, administration, and examination. In addition, the energy efficiency auditing system, organizational structure, and manpower security should be improved.

During the post-project period, the focus of the management will be shifted to the punishment of regulation violators and loss compensation.

2. Transforming the regulation mode. The conventional regulation mode, in which social regulation takes a back seat to economic regulation, will be transformed into a new one focusing more on economic regulation. The new regulatory mode includes:

(a) Improvements in market access regulation. This will be done by publicizing market access regulations, abolishing discriminatory opinions on ownership, ensuring the transparency of policies, and formulating a proper complaint system.

(b) Improvements in pricing regulation. This can be done by reforming the pricing mechanism, and by regulating naturally monopolized sectors effectively. In addition, it is also necessary to integrate protective regulation with incentive regulation and improve the financial, cost, price hearing, and information notification systems.

(c) Strengthening of social regulations. This will be carried out by focusing on improving resource utilization efficiency, safeguarding the energy supply, protecting the environment, etc.

(d) Reinforcement of market order regulations. This can be achieved by focusing on countering monopolies, encouraging efficient competition, and examining merger and acquisition cases that would influence market structure.

Modeling of Fiscal Mechanisms for Energy System Development in China

[Executive Summary]

Energy Research Institute, National Development and Reform Commission

1 Background

Due to rapid economy growth, total primary energy consumption in China increased from 400 Mtce in 1978 to 1300 Mtoe in 2004, increasing at an annual average rate of 4.3 percent. Coal is the major primary energy consumed in China, accounting for 70.7 percent of total primary energy use in 1978 and 70 percent in 2003. The recent rapid increase in energy use in China has already caused environmental, transportation, energy security, and production safety problems. China has started to worry about its energy future. With both environmental and energy supply concerns, China must find a sustainable energy development path.

There is a large need for energy policy research. Recently several important energy policies were promulgated. But further research into energy policies is needed, particularly research into policies that before lacked support in China, e.g. energy taxes, emission caps.

This study addresses questions that are being asked by policy makers; we develop a modeling framework for the quantified assessment of fiscal mechanisms for energy system development in China.

2 Research Objectives

This study will develop a modeling framework to assess several fiscal mechanisms-including energy taxes, gasoline taxes, and emission taxes--for energy system development in China. We extensively analyze each fiscal mechanism, including its effects, the obstacles its facing, and its impact, in order to provide a systematic framework to guide the use of such taxes in China.

3 Modeling Framework

In this study, IPAC model was used. IPAC model is a model group that includes both bottom-up and top-down modeling. We targeted two models from IPAC: IPAC-AIM/technology model and IPAC-SGM model.

IPAC-AIM/Technology Model

IPAC-AIM/Technology model is a single region model for China, composed of 3 modules, an energy service demand projection module, an energy efficiency estimation module, and a technology selection module. It is a typical bottom-up type model.

The demand sector is divided into the industrial, agricultural, service, residential and transportation sectors; these sectors are further divided into sub-sectors, as shown in Table 2. On both demand and supply sides, a total of more than 400 technologies, including technologies both already in-use and still in-development, are considered.

Future sector outputs (such as steel output) are key drivers. The model calculates the energy demand of producing a certain output using each of a number of different technology mixes. The model then finds the least-cost technology mix that meets that output's energy demand. Policies and countermeasures influencing technology selection, progress, energy prices, etc., can be added to the model. Data for each of these technologies were collected from a large amount of reports, journals, and publications, as well as through consultation with experts. Data were continuously updated as new information was collected. Even now we are still working on providing the model with the most updated data.

IPAC-SGM model

IPAC-SGM was selected from IPAC model family. The CGE model has the advantage of understanding overall economic activities by implantation of policies or countermeasures. The CGE model plays an important role in policy assessment throughout the world. Many modeling teams have used the CGE model for the simulation of economic activities and policy implementation.

IPAC-SGM is basically extended from the second generation model (SGM),developed by the United States's Pacific North-West National Laboratory (PNNL). The SGM is a computable general equilibrium (CGE) economic model that projects economic activity, energy consumption, and carbon emissions for twelve world regions. IPAC-SGM is basically SGM extended to include China. To do so data for China and some non-market based sectors, such as biomass and hydro power, were added.

The model has nine producing sectors and eleven consuming sectors, and it focuses on energy production detail, vintages capital stocks, and a suite of anthropogenic greenhouse gases.

The model was developed with the recognition that energy production and use is the most important set of human activities associated with greenhouse gas emissions.

Linkage between two models

Both models will use same package of scenario parameters, such as population, GDP, technology efficiency, energy resource, energy price, and sector output, in order to keep the two models in line with same analysis framework. Despite having different analysis mechanisms and different input and output parameters, the two models we designed to share data effectively.

In order to make best of both models, a soft linkage was established between them to pass data in following ways (see Figure 1):

- The rate of technological progress after the adoption of various energy policies is calculated by the IPAC-AIM/technology model and then inputted into the IPAC-SGM model.
- Sector activity levels, steel output, cement output, etc., are calculated by the IPAC-SGM model and then input into the IPAC-AIM/technology model.
- Energy Price is calculated by the IPAC-SGM model, and then input into the IPAC-AIM/technology model.
- Subsidies for energy-efficient technologies and renewable energy are simulated in the IPAC-SGM model and then input into the IPAC-AIM/ technology model.

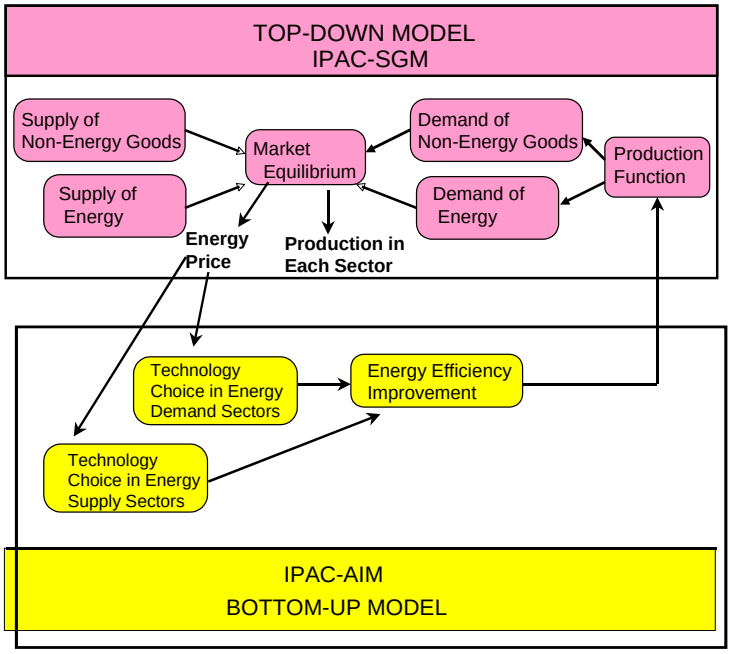

Figure 1. Linkage between the two models

4 Model parameters

Some key parameters for this study used in the models are given in table 1 to 5.

Table 1. Vehicle fuel tax rate, RMB/liter

	2006	2010	2020	2030
Gasoline	1.1	2.4	3.6	4.6
Diesel	1	2.1	2.7	3.4
GTL		2.1	2.7	3.4
Ethanol/Methanol	1	1	1	1
Bio-diesel		1	1	1

Table 2. Energy tax rate, RMB/tce

	2006	2010	2020	2030
Coal	0	50	80	120
Oil	0	50	70	100
Natural gas	0	50	60	80
Hydroelectric	0	0	0	0
Renewable	0	0	0	0

Table 3. SO2 emission charge rate, RMB/t-SO2

	2005	2010	2020	2030
SO2 emission charge rate	460	700	900	1100

Table 4. Carbon tax rate, RMB/t-C

	2005	2010	2020	2030
Carbon tax rate	0	100	150	200

Table 5. International energy prices, US$/GJ

	2005	2010	2020	2030
Oil	5.02	5.87	8.16	9.66
Gas	1.63	1.6	1.81	2.09
Solids	1.5	1.51	1.53	1.48

5 Results and policy recommendation

In order to report the effects of energy fiscal policies, indicators were designed, including energy saving(by energy type), emission reduction by gases or pollutants, GDP loss, change

of employment, change of output of various sectors.

This analysis shows use of energy tax have significant impact on energy use. By 2010 with tax rate 50yuan/tce, energy demand will decrease 6.3%, around 123 million tce, compared with baseline scenario. By 2030 with tax rate 120yuan/tce, energy demand will decrease 16.2%, around 400 million tce. There will be some negative impact on GDP, but the impact is limited. In 2010, loss would be 0.4% and 0.36% in 2030. Main reason is the reduction of output from energy Industry due to energy saving, and impact on other sectors due to energy price increase. But this modeling study did not fully reflect the impact of reduced energy import, and new economic activities due to more investment on other new sectors. If these factors could be considered, the negative impact on GDP development could be abated. In the meantime, such a GDP loss could not be reflected in change of GDP growth rate. And more important thing is green GDP concept could be further abate the negative impact.

Levy of vehicle fuel tax could have strong impact on fuel demand in road transport. By 2010 with tax rate 2.7yuan/litter gasoline, energy demand for vehicles will decrease 10.3%, around 16 million ton oil, compared with baseline scenario. By 2030 with tax rate 4.6yuan/litter gasoline, energy demand will decrease 20%, around 90 million ton oil. Vehicle fuel tax is commonly used in developed countries with valuable experience. Seeing rapid increase of oil demand and vehicle fuel demand in China, use of vehicle fuel tax could have very active effects. Properly use of fiscal policies on energy could guide public consumption preference, promote clean and new vehicle technology development. Vehicle fuel tax is such kind of policy option and could have good effects.

And thinking about the social cost of rapid energy system development in China, such as cost of energy security, cost of extending international market, environmental cost, benefit of energy tax levy could be more significant. Especially recent widely discussion on vehicle fuel tax, provide very good basis for energy tax application. It is necessary to think about adoption of energy tax from now.

From long-term view point, use of carbon tax, or combined energy tax and carbon tax, could be a good choice. Use of carbon tax has good effect on carbon reduction and optimization of energy system in China, and has limited impact on GDP. Use of carbon tax could stimulate new technology manufacture sectors such as clean coal technology, new and renewable energy, energy services, and also upgrade technology in China. Therefore promote economy development.

These energy related fiscal policy options are still in initial period for discussion, and faced some difficulties. These difficulties could appear in beginning period, but could be removed with adoption of some countermeasures and further studies. Some difficulty for vehicle fuel such as how to collect taxes, how to return tax revenue or subsidy for non-road transport

users including farmers for agriculture production use. These difficulties also exist in other countries. Some options could be selected after detailed study even though this is not perfect. Vehicle fuel tax should be adopted at early time because the policy has quite good effects and the difficulty could not perfectly removed. Early use of fuel tax could avoid large amount of money used for oil import. Recently increased oil price could be good basis to introduce vehicle fuel tax. During rapid social-economy development period in China, clear policy options should be announced by government to influence social choice such as city layout, public transport development, infrastructure development. All these choice options has very long life span and has lock-in effects. It is necessary to introduce these policy options in early time to start the influence. The tax rate could start from lower rate and generally increase, to avoid strong impact on public consumption and economy development.

Share of revenue from energy related taxes takes small in total government tax revenue. According to energy tax rate used in the modeling study, total tax revenue will be around 500billion yuan in 2030 with share of around 5% in total government tax revenue. Same with other developed countries, energy activities will be a major source for economic growth. Therefore energy tax revenue should be properly used to be initiative budget for rational utilization of energy. Some energy tax revenue could be used to support energy conservation, new and renewable energy development, new technology development etc. Energy industry and energy utilization are important part of economic activities, properly use of tax revenue could contribute to economy development, enhance national competition, provide foundation for long-term sustainable development.

6. Further Studies

It is realized the limitation so far done in this study, following studies should be extended in future:

(1) Design an energy tax system based international best practice and China's tax reform experience, and provide detailed information for the design of the energy tax system, including tax rate, obstacles, implementation issues, effects, and revenue use;

(2) Based on the indicators given in the study for assessment of taxes, more results should be given, such as impact on employment.

(3) Analyze suitable tax rate, by using more taxes exercise.

(4) Continue to improve model parameters, including price elasticity, private consumption behavior, import and export impact, and use of government revenue;

Sectoral Reports

A Study on China's building energy efficiency incentive policy

[Executive Summary]

Energy Research Institute, National Development and Reform Commission

I: A building energy efficiency (BEE) incentive policy has strategic significance in establishing an energy-saving society.

1. BEE has become the key field for establishing an energy-saving society.

(1) It is an inevitable trend that building energy consumption will become the major component of China's future energy demand.

At present, the annual newly built buildings in China are about 1.6~2 billion m^2, and the building energy service level demand on HVAC is growing fast. This has resulted in the continuous increase in building energy consumption. At the same time, improving people's standard of living is one of the key parts of "establishing an all-round well-off society," making it inevitable building energy consumption will only continue to increase.

(2) Energy consumption of HVAC facilities is seasonal, and it is the major reason for seasonal energy shortages in the past few years. Improving the energy efficiency of HVAC facilities is one of the key measures in solving the imbalance between energy supply and demand.

(3) As BEE is easily implemented, marketable, and benefits all of society, it should become the key method in establishing a long-term energy conservation mechanism.

2. There exists great energy saving potential for China's BEE.

(1) **Energy** system**:** Electricity consumption and operating efficiency of the energy system (central air conditioning systems, lighting facilities, etc.) is quite low, and in general, energy saving potential is more than 30%. For the district heating system, energy saving potential is also about 30%.

(2) **Buildings:** Few newly built buildings reach their related building energy efficiency

standards. At present, annual newly built buildings in China total about 1.6~2 billion m2, and will waste incalculable amounts of energy in the next fifty years. In addition, thermal performance for most existing buildings, including insulation, shelting, and wind tight performance, is very poor.

In general, energy consumption for heating in Northern Chinese cities is about two to three times more than the consumption levels in developed countries with similar weather.

3. China urgently needs to establish a BEE incentive policy scheme.

Currently, China is updating its residential consumption structure. Annual newly built buildings, and HVAC facilities and appliances all rank first in the world. Establishing a BEE incentive policy scheme based on the market economy iss important for establishing more energy efficient lifestyles.

II: International experience

1. Compared with China, most developed countries have paid much more attention and provided more policy support to BEE.

2. China should learn from developed countries about BEE incentive policies, such as the supported technology range, stakeholders, type, and financing resources.

3. BEE incentive policy implementation experiences show that policy design, implementation, management, and supervision are all very important in realizing the projected energy savings.

4. Third parties in developed countries play an important role both in BEE policy implementation and management.

III: Barrier analysis

1. Mechanical barrier

(1) Metering the central heating/cooling system

(2) Public sector administration barriers

- Government agencies have no energy-efficiency financing item, resulting in funding shortages for energy efficiency retrofits.
- Government agencies' energy expenses are based on the previous expenditure. If energy efficiency measures are adopted and the energy saving effect is achieved, public finance will decline, negatively influencing enthusiasm for the policy.

2. Mandatory policy barrier

（6） Implementation and supervision on the mandatory BEE standards are very weak.

（7） Large public buildings with great energy saving potential have few compulsory energy efficiency administrative policies.

3. Hardware infrastructure barrier on metering energy consumption

Energy consumption metering directly affects the clients' willingness to increase energy efficiency. In China, there is a lack of energy consumption metering facilities, and many policies cannot be implemented. For instance, most buildings with central heating have no heating meters or terminal adjustment facility, and electric meters based on energy facility type have not been installed.

4. Energy efficiency labeling policy barrier

An energy efficiency labeling system is required for judging if energy efficienct products or technologies provide financial support. In China, the energy efficiency labeling policy only recently began, and energy efficiency labeling policies for refrigerators and air-conditioners were issued in 2005. However, energy efficiency labeling policies on buildings and other energy consuming facilities have not yet been issued.

5. Energy efficiency technology evaluation and inspection barrier

Energy efficiency technology evaluation and inspection by a third party is the foundation for the capacity building necessary in executing BEE incentive policies. In most developed countries, energy efficiency technology evaluation and inspection is quite strong, playing an important role in implementing BEE incentive policies. In China, evaluation and inspection, especially for the building and HVAC system, has not been established.

6. Energy efficiency service barrier

In western countries, ESCOs have obtained policy support and played an important role in promoting BEE, especially for government buildings. In China, the ESCO industry is developing, but because of mechanical and administrative barriers, many clients do not want to perform energy conservation retrofits, limiting business markets of ESCOs. There also exist many other barriers for ESCOs in China, such as energy conservation financing and revenue problems.

7. Energy price shaping mechanism barrier

The price of energy is fundamental to the clients' willingness to increase energy efficiency.

Currently in China, reasonable heating price shaping mechanisms based on the market have not been established. In addition, other kinds of incentive energy prices have not been issued, such as a *laddering electricity price* and a *natural gas price based on season*.

8. Coordination barrier among different government agencies

Many kinds of energy facilities (HVAC, lighting, and appliances) are involved in BEE. However, administrative confusion among different government agencies exists, especially among local governments. Because many issues are involved in BEE, such as energy efficiency policy, energy pricing policy, financial and tax policy, and environmental protection, government agencies must work together. The government agency in charge in energy efficiency work should coordinate the rest of the agencies.

9. Financial barrier

At present, financial barriers are the biggest barriers to implementing BEE incentive policies. There are few financial incentive policies and energy conservation public benefit funds to support BEE.

IV: Medium and long-term BEE incentive policy scheme

1. Goal

Establish a BEE incentive scheme and long-term mechanism according to the demand of the market. Significantly improve the energy efficiency level of the buildings and energy systems.

2. Scheme

（1）Promote BEE incentive policies in 3 levels: 1) Form a reasonable energy efficiency institutional system and energy consumption expense-paying mechanism so all related stakeholders benefit from increased energy efficiency. 2) Strengthen mandatory policies: propose more mandatory requests for the energy efficiency level of buildings and energy facilities, and stricter energy conservation administration. 3) Strengthen positive incentive policies for efficient buildings and energy facilities. Provide financial support for third parties carrying out BEE activities.

（2）Implement BEE policies step-by-step and according to the building type (large public building, small public building, and residential building), climate condition (5 regions in China), building characteristics (newly-built and existing), and characteristics of energy facilities (HVAC, lighting, appliances, etc.).

（3）The mandatory minimum energy efficiency standards are the lowest “threshold” for entrance into the market. The positive incentive policy can be provided only if the energy efficiency level has exceeded a certain degree over the mandatory minimum energy efficiency. The suggested major stakeholders who should gain incentive policy support are the final clients pulling the market demand on energy efficiency technologies. The incentive policy should be stipulated based mainly on the energy saving result.

（4）For newly built buildings and energy facilities, it is suggested the long-term incentive policy with high energy efficiency be adopted. For the existing building energy conservation retrofits, especially the large public building energy conservation retrofits, it is suggested the short-term incentive policy (such as the one financed by an energy conservation fund) should be adopted. In addition, the incentive policy should also support the advanced new-type heating and cooling technologies, and renewable energy applications.

（5）Solve the funding source issue. Firstly, strengthening public financing support on BEE should be listed in the public financial budget, and the supported technology range of the incentive policies including subsidy, tax deration, accelerating depreciation, and lower interest loans should be extended. Secondly, an energy efficiency special fund should be established.

V: Suggested BEE policies for the near future

1. Priority fields

(1) Strengthen the implementation and supervision of the mandatory BEE standards for residential buildings.

(2) Strengthen the energy efficiency administration and retrofits on large public buildings (including governmental buildings).

(3) Strengthen financial support for the advanced new-type heating and cooling technologies, and renewable energy applications.

(4) Stipulate incentive policies on efficient energy facilities (including HVAC, lighting, and appliances).

2. Recommendations for the incentive policy

(1) Derate the purchasing revenue for clients and encourage consumers to buy beyond-code residential buildings.

Derate the purchasing revenue for clients by 1% (at present, purchasing revenue is usually 1.5%-3%) to pull in the beyond-code residential building market. Although the incentive amount is not very big for the consumer, this measure may increase attention given to beyond-code residential buildings.

(2) Implement the energy consumption labeling policy for newly built residential buildings in the "hot summer and cold winter" regions.

It is suggested to implement the energy consumption labeling policy for the newly built residential buildings in the "hot summer and cold winter" regions where there is already a good incentive foundation for incentive policies (there exists cooling demand in summer and heating request in winter, with no "metering heating" mechanical barrier). This information labeling policy may provide enough energy consumption information for the consumers so that they understand the importance of efficient residential buildings. It is suggested to provide financial support for the building energy consumption evaluating agencies and encourage the real estate developer to use the energy consumption label as one of the vending measures.

(3) Use the achievements in the "incentive policy on income tax on the efficient products manufactures" to encourage the application of efficient energy equipment.

- It is suggested to add energy efficient refrigerator, lighting, and heat pump water suppliers into the first efficiency products list for incentive policies.

- It is suggested to provide 30% offset of investment for buyers and waive half the income tax for the producer.

(4) Make full use of the achievements of the "incentive policy on income tax on the efficient products manufactures" to promote real estate developers to use new-type advanced HVAC technologies. For instance, for the advanced air/geothermal source heat pump and independent dehumidification air conditioning technologies, it is suggested to provide a 30% income tax deration.

(5) Support installing energy consumption metering for building energy systems.

- It is suggested to provide subsidy from the public financial budget to encourage the activities of installing electric meters on the basis of of the energy systems' characteristics (air conditioning, heating, lighting, appliance, hot water supply, etc) in large-scale public buildings, especially governmental buildings.

- It is suggested to provide subsidy from the public financial budget to encourage the activities of installing heating meters in central heating regions.

(6) Encourage ESCOs to promote government-building retrofits.

Since the energy bill is paid by the public financial budget, and energy saving achievements will decrease the public financial budget, it is reasonable to carry out government-building retrofits supported by the public financial budget. ESCO should be used to implement government-building retrofits. It is suggested to identify ESCO's list by agencies implementing government-building retrofits and providing financial support for ESCOs with tax deration, low interest, and energy efficiency financing guarantees.

3. Recommendations for overcoming the financial problems of BEE incentive policies.

(1) It is suggested to set an energy efficiency item in the public financial budget, and strengthen support for related energy efficiency buildings/energy systems and retrofits by using incentive policies such as subsidy, tax deration, and low interest.

(2) It is suggested to establish an energy efficiency special fund to support BEE under the principle of "collecting from the public citizens and supporting the public citizens" and " special capital with special use."

(3) It is suggested to prolong the collection plan of the "*Innovative Wall Material Special Fund*," and use part of the fund to support BEE.

(4) It is suggested to use public maintainance funding to support BEE.

4. Recommendations on mandatory policies and energy efficiency administration.

Establish a matching-standards supervisor mechanism and strengthen the implementation of (1) mandatory BEE standards.

For newly built buildings, in order to carry through the mandatory BEE standards, it is suggested to establish the supervisor mechanism on all processes including design, construction, inspection, and operation.

(2) Strengthen energy efficiency administration for large-scale public buildings.

- It is suggested to stipulate "ladder energy prices" based on the principle of " energy ration management."

- Strengthen energy efficiency administration for large-scale public buildings with mandatory measures, such as energy consumption reporting and energy auditing.

(3) Strengthen the energy efficiency labeling system on newly built buildings and energy equipment.

(4) Strengthen financial support for third parties and capacity building for BEE agencies.

- Strengthen financial support for third parties related to fundamental work on incentive policies, such as energy efficiency policy study, energy efficiency standards compiling, energy auditing, evaluation, and information dissemination.

- Strengthen financial support for cultivating the third party market on energy efficiency evaluation and inspection.

- Strengthen support for capacity building of BEE agencies, including agency function, staff, and financial input. Quicken capacity building for local energy efficiency inspection and service systems.

(5) Quicken market reform for the energy bill shaping mechanism.

- Quicken implementation of the metering heating/cooling mechanism.

- Change the present energy bill payment method in government agencies. It is suggested to use the "energy ration management" or "contracting" mechanism.

VI: Suggestions for the next step

(1) Study the cost benefit analysis on related energy efficiency incentive polices.

(2) Study a "ladder energy prices" system based on the principle of " energy ration management" in both commercial and residential building.

(3) Study the heating price shaping mechanism to promote "heating reform" policy.

(4) Study supporting BEE with the "*Innovative Wall Material Special Fund*."

(5) Study the overall supervision and management system for implementing the BEE incentive policy.

A Study on Fiscal Policy Improving Industrial Energy Conservation

[Executive Summary]

China Energy Conservation Investment Corporation
&
Research Institute for Fiscal Science, Ministry of Finance

This study is a sub-project under the framework of "Fiscal Studies on China Sustainable Energy Development". The purposes of the project are to study fiscal policies on improving industrial energy efficiency including financial policies and tax policies, and to construct the framework of fiscal and economic policies of China sustainable energy development.

Industries, transportation and buildings are three main energy consumption sectors in most of the countries in the world. Industrial energy consumption will be the largest energy consumption sector in China for a long run. Fiscal policy studies on improving industrial energy efficiency will be a big push on the energy conservation for the whole society, and will be a guarantee to the enforcement of "Special plan for energy conservation for medium and long run" issued by Chinese NDRC.

The contents of policy study on improving industrial energy efficiency include the need study of industrial energy conservation on fiscal policies, priority industrial sectors analyses to be considered, experiences conclusion and analyses in past years, study on the experiences in industrialized countries, and policy recommendations some on industrial energy conservation promotion.

The study will pay attentions to four basic raw material industries, which account for more than 50% percent of energy consumption of all industrial sectors, they are iron and steel, building materials, chemical industry and non-ferrous metal. The energy consumption, energy cost and energy efficiency of the four sectors are typical in industrial sectors. Saving energy and improving energy efficiency is significant for the improving competitiveness and the healthy development of the industries. The sectors, having been the important areas of China's energy conservation for the past 20 year, are also the importance for the "Special plan for energy conservation for medium and long run" issued by Chinese NDRC. The research

and analyses to the four sectors are meaningful for the study and enforcement of fiscal policies.

Ⅰ Overall thoughts and principles of fiscal policies facilitating industrial energy conservation

1. Fiscal policies are important measures facilitating industrial energy conservation

Industrial sectors are big consumers of energy. In 1990s, energy consumption accounted for 70% of all energy consumption of the country. Saving energy and improving energy efficiency is no doubt an important aspect for realizing the harmony between human beings and nature.

It is assumed that market force could contribute only 20% to the realization of energy conservation. Government needs to take policy and legal instruments to adjust and convene. Financial and taxation policies, as important measures of adjusting macro-economy, play crucial roles during the process of promoting energy conversation. Well-designed and reasonable financial and taxation policies can guide, regulate and adjust the economic behaviors of main players in market to steer the industries and market developing to the direction of beneficial to the whole society.

Not only proper favorable policies from financial and taxation aspects to industrial energy conversation, governmental direct input is also needed to solve the problem. Data show that the government budget in western countries takes great attentions to the R&D of energy conservation. The input to energy conservation from government budget is much less compared with Japan and the USA. In 2004, Chinese government revenue is 2635.59 billion yuan, and it is projected that the revenue will exceed to 3000 billion yuan in 2007. The rapid increase in recent years of the government fiscal revenue provides a guarantee to the financial policies supporting industrial energy conservation.

2. Overall considerations and main goals

Industrial energy conservation is of obvious character of externality. A direct reflection of the point is that the benefits getting from the energy conservation by enterprises are much less than the benefits for the whole society. Just the difference makes the input from enterprises for energy conservation usually less than that the society needed. The starting point of fiscal policy formulation is to compensate the gap and to stimulate industrial enterprises to invest in energy conservation.

The formulation of fiscal policies supporting industrial energy conservation will reach to following goals as targeted in “Special plan for energy conservation for medium and long

run":

- macro energy saving target: to 2010, energy conservation capacity reach to 400 million tce.
- Energy consumption per unit product reach to the international level in early 1990s.
- Energy efficiency of main energy consumption equipment access to or reach to international level in 2010.

3. Principles followed by the policy study

- making overall plans and take all factors into consideration, meanwhile, pay attentions to key factors
- combination of market guide with proper adjustment of government
- using both financial and taxation policies
- having long term plan and starting with urgent problems
- paying attentions to cost-benefit analyses
- paying attentions to the matching and coordination with other policy measures
- sticking to a dynamic principle in the formulation of fiscal policies

Ⅱ Studies on Taxation Policies for Improving Industrial Energy Conservation

According to the characteristics of industry development and internal function of the tax in this period, the regulating and controlling of tax policies on improving industrial energy conservation will put emphasis on spheres as follows:

- Through promoting the industrial technology, restraining low-level and repeated constructions and optimizing the framework of foreign capital to optimize industrial structure which is propitious to improve industrial energy conservation
- Through facilitating the output of energy conservation product, accelerating the application of energy conservation equipment and increasing the input to energy conservation technology, to promote energy conservation investment and encourage social capital to flow into energy conservation field.
- By guiding consumption, to induce industries switching to energy efficiency structure
- Strengthening the protection to resources and environment, reducing the external cost caused by industrial development

III Taxation policy recommendations to foster industrial energy efficiency

As the target areas and basic principles of macro-control are above clarified, we suggest the following policy measures be taken to establish and improve the taxation policy framework fostering industrial energy efficiency.

1. Policy recommendations to establish an industrial structure favoring higher energy efficiency

(1) Tax policy suggestions to foster hi-tech industrial development:

- To accelerate full transformation from production-based VAT to consumption-based VAT in hi-tech enterprises, so as to ease the enterprises' burden in purchasing machinery equipments.

- Regional blockade of tax incentives for hi-tech enterprises should be removed, and the current incentives targeting only hi-tech development zones should be extended to cover all hi-tech enterprises in and outside the ones, so as to ensure all hi-tech firms receive equitable preferential treatments.

- Currently only when the expenses on technological development increase 10% annually can the enterprises enjoy augment deduction incentive of the income tax. The 10% growth requirement should be abolished, so that all the firms' expenses on new products and new technologies that do not form intangible assets can be deducted by 150% from taxable incomes, and those forming intangible assets should be calculated into intangible assets' value by 150% and be amortized according to relevant regulations.

- Tax incentives for technological enterprises engaged in venture investments should be restructured to guide social capital into the hi-tech enterprises at initial development stage.

(2) Tax policy suggestions to minimize low-level repeated construction

The current taxation structure centered on turnover taxes has led to over-dependence of tax revenues on industrial production, which in turn results in the blinded low-level repeated construction by the local governments. The taxation structure should be adjusted to minimize its negative impacts on low-level repeated construction, and in turn the environmental damages caused by these constructions.

- To adjust the tax-revenue dividing mechanism across jurisdictions, so as to break up the linkage between imbalanced regional interests and the subsequent low-level repeated construction.

- To set up reasonable and principal tax instruments for localities, to eliminate the

low-level repeated construction caused by illegal fund-raising activities by the local governments.

- Tax incentives should be rationalized to avoid low-level repeated construction as a result of hazardous taxation competition.

(3) Tax policy suggestions to optimize foreign investment structure

The key is to soundly integrate the tax incentives for foreign firms and the industrial policies in China. The current practice of generalized preferential treatments to all manufacturing foreign firms should be abolished. The most urgent option is to consolidate the enterprise income tax for both domestic and foreign firms and eliminate the discriminatory tax measures. An equitable tax environment should be established for various market agents, and the tax incentives focusing on quantity should be transformed to those focusing on quality. One of the reform priorities is to highlight the national guidance of industrial policies, to direct foreign capital and foreign technologies to flow into investment areas and projects encouraged by the state.

2. Policy recommendations to foster energy-efficient industrial investments

(1) Tax policy suggestions to encourage the production of energy efficient products

- Lower tax rate

The enterprise income tax for the firms specially engaged in the production of energy efficient products should be halved; For the firms not specially engaged in the production of energy efficient products, the tax rate for incomes deriving from the production and sales of energy efficient products should halved. The firms not specially engaged in the production of energy efficient products should separate their business accounting for incomes deriving from the production and sales of energy efficient products from other incomes. Otherwise they cannot enjoy this incentive.

- Tax credit within a fixed time period

Enterprises' incomes deriving from the production of energy efficient products should be exempted from income tax for three years' time from the first day of its production. If an enterprise starts to produce more than one kind of energy-efficient products from different time frames, the incomes deriving from each product should be separately accounted and the corresponding tax credit period for each of them should be worked out.

- Tax rebates for reinvestment

If an investor of energy-efficient products uses his/her after-tax profits to directly re-invest in

the further production of the products or to start a new firm producing other energy efficient products and that firm will at least run for 5 years, 40% of the income tax already paid for the re-invested proportions should be returned to the investor. Other domestic economic organizations using after tax profits obtained within the country to invest, for at least 5 years, in the enterprises producing energy efficient products, should get back 80% of the income tax revenue paid for the reinvested proportion.

- Augment deduction

Firstly, for employers specially engaged in the production of energy efficient products, the total wage bill covering salary payment to employees can be deducted from taxable incomes. For employers not specially engaged in the production of energy efficient products, the proportion of the wage bill to be fully deducted can be calculated by referring to the percentage of sales revenues from energy-efficient products in the firm's total sales revenues.

Secondly, the actual expenses on advertising and promotion of energy efficient products can be deducted from taxable incomes. Enterprises not specially engaged in the production of energy –efficient products should separate the advertising and promoting expenses for energy-efficient products from those of other products. Otherwise they would not be able to enjoy the full-amount deduction incentive.

Thirdly, for donations from social forces via national energy-saving and environment protecting organizations can be deducted from taxable incomes for personal or enterprise income taxes by a certain proportion.

Besides, the enterprises producing products that meet certain standards should be offered some incentives of reduction or exemption in Tax for Urban Land Use, Real Estate Tax instruments.

(2) Suggestions on tax policies to promote the utilization of energy-efficient equipments

- Investment deduction

If an enterprise purchases any equipment for the purpose of higher energy efficiency production, 10% of the invested funds can be deducted from the taxable amount for its enterprise income tax. If the taxable amount for the current year is not sufficient for the deduction, taxable amounts for the following years (within 5 years) can be used as the deduction basis.

- Accelerated depreciation

For key equipments used for energy saving production, the depreciation period can be duly

reduced, but the minimum length should be three years. An alternative would be to use accelerated depreciation method for the equipments.

- Import incentives

Firstly, for the devices or equipments donated by overseas donars that can be directly used for the production of energy efficient products, import tariffs and import VAT should be exempted.

Secondly, within a reasonable scope, for imports of equipments that can be directly used for the production of energy efficient products, tariff and import VAT should be exempted.

(3) Tax policy suggestions to promote the R&D and popularization of energy efficient products

- Direct reduction. The revenues deriving from technological transfers, technological training, technological consultancy, technical services, and technical contracting that provide services for the production of energy efficient products, can be exempted from business tax and enterprise income tax;

- Augment deduction. The expenses spent for the purpose of production of energy efficient products on technology introduction, technical services and trainings can be deducted by 150% from the taxable incomes, with reference to the expenses on R&D;

- Shortening the amortization period for intangible assets. For technical expenses on the out-contracted or self-developed production of energy efficient products, besides augment deduction, the proportion that has formed intangible assets can shorten the amortization period based on the current amortization arrangements.

3. Tax policy suggestions to promote the consumption of energy efficient products

The policy measures may include adjustments in consumption tax, vehicle purchase tax and tax for vessel usage, and the introduction of fuel levy in the near future.

4. Tax policy suggestions to promote the protection of resources and environment

Policy suggestions mainly include measures to improve resource tax regime, to establish and perfect the environment protecting tax regime.

IV Fiscal policies to foster industrial energy efficiency

The fiscal policies analyzed here are primarily the policies of fiscal investment, public budgeting and government procurement.

1. Fiscal investment

The policy directions of fostering industrial energy efficiency and fiscal investments are consistent.

The Chinese practice suggests that, energy-efficient investments are not large in industrial fields, and the investment volumes are not matching with energy-saving tasks. This has been a long-term problem confronted by the Chinese government in industrial energy saving work. Since there have been no effective supports from the government in fiscal investments, the technological innovations in industrial energy saving are primarily borne by the enterprises. As the investors in energy efficiency, the enterprises do not have strong investment capacity. Nor do they have effective financing channels. A large number of technological innovations for higher energy efficiency cannot be realized in a timely manner, and many good new technologies, new techniques and new products are difficult to popularize. This reveals that the investment insufficiency has been the crux that delays the progress of technological innovation for higher energy efficiency in industrial sector. Therefore, effective policy measures should be taken to practically foster higher energy efficiency in industrial sector.

2. The budgetary investments and investment by national debt revenues should be consolidated to increase energy efficient investments in industrial sector

The following specific recommendations are provided:

- The budgetary investments and national debt investments should be centrally managed by National Development and Reform Commission, and be arranged in line with the prioritization of sequencing of national economic development needs and social development needs.

- The energy efficient investments as a share in total investments should be increased, while the energy efficient investments in industrial sector should be made the top priority in all energy efficient investments.

- Government discount loans should be more often used to guide more bank loans to support energy efficiency in industrial sector.

- For some particularly important, large-sized energy efficient projects in industrial sector, state direct investments should be used.

- Earmarked transfers from the central government to local governments for the uses of energy saving activities in industrial sector should be arranged.

3. Public budget

(1) The government budget should attach importance to energy saving in industrial sector

The public fiscal budget reflects the policy intentions of the government, and serves as a significant instrument of national macro-control. In the future structural adjustment and reforms of the public budget, energy efficient inputs should be emphasized in terms of both policy supports and financial supports.

(2) Directions and priorities of fostering industrial energy efficiency in government public budget

The industrial energy saving investments arranged in government public budget should target the following four areas:

- R&D on energy efficient sciences and technologies;
- The demonstration and popularization of energy efficient techonolgies;
- Education and training on energy efficiency; and
- The establishment of a supervisory and regulatory system for energy efficiency promotion.

V Several issues to be handled with care in fostering industrial energy efficiency in current China

1. Fiscal policy measures to encourage the industrial enterprises to sign "voluntary agreements"

(1) Tax incentives: In foreign, especially the market economies, energy tax or energy-related carbon tax is levied to stimulate the industrial sector to improve energy management by shifting the behaviors of the managers and by increasing investments in energy efficient equipments. Normally, for the enterprises that sign energy saving voluntary agreements or those reaching designated energy efficiency standards, tax deductions would be offered.

(2) Fiscal grants and subsidies: Both grants and subsidies are normally targeting those very relevant users, and those equipments with long period of return but very sound energy saving effects. Sometimes cost-effective evaluations on the projects are conducted. The subsidized enterprises should be those in highly energy-consuming industries or those having signed energy-saving voluntary agreements.

Conceptions and fiscal policy recommendations for extending voluntary agreements on industrial energy saving

- Overall planning and extending the pilot scope.

We suggest that the state should formulate an overall plan for popularizing voluntary agreements on energy saving in industrial sector. Specific policy measures should be taken to ensure planned objectives for various stages be actualized. The current top priority is to extend the experimenting scope of the voluntary agreements: Firstly, energy-saving voluntary agreements should be fully extended in the steel industry. Secondly, experiments should be carried out in such highly energy-consuming industries as non-ferrous metal, construction materials, and chemistry. The general objective is to popularize energy saving voluntary agreements in most industrial sectors or major highly energy-consuming enterprises.

- Fiscal incentives should be worked out to promote the effective implementation of the energy-saving voluntary agreements in industrial sector

Tax incentives: The foreign practice is to exempt or reduce energy tax or carbon tax for enterprises signing energy-saving voluntary agreements. In China, it is necessary and inevitable to levy such tax instruments directly related to energy. By then such tax reduction or exemption measures can also be exercised. Currently, we suggest that all enterprises signing the agreements should be offered the incentives of accelerated depreciation, augment deduction for R&D expenses, investment deduction, 50% off for income tax and etc. In addition, import tax incentives should be offered to those firms importing technologies for higher energy efficiency and lower energy consumption.

Fiscal supports: Fiscal supporting policies play a vital role in promoting progress in energy saving technologies and urging enterprises to sign the voluntary agreements. When enterprises signing voluntary agreements invest for higher energy efficiency and lower energy consumption, we suggest the financial authorities should provide some subsidies. Moreover, the government should consider offering discount interests for loans on energy efficient projects.

2 Earmarked funds for energy saving activities

This calls for further in-depth studies.

A Study on Policy Options for Enterprise Income Tax Incentives

[Executive Summary]

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&
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I General framework for enterprise income tax incentives

i. Enterprise income tax incentives to promote the production of energy efficient products

a. Direct incentives

Currently, China's hi-tech enterprises and those comprehensively utilizing resources are offered great incentives in terms of a lower income tax rate or income tax credit within a fixed period of time. Enterprises producing energy efficient products can strategically promote higher efficiency in energy utilization. Meanwhile, most of their products have advanced technological contents. It is necessary to also offer direct incentives to enterprises producing energy efficient products, with reference to preferential fiscal policies for hi-tech firms or firms engaged in the comprehensive utilization of resources.

- Lower tax rate

The enterprise income tax for firms specially engaged in the production of energy efficient products should be halved. For firms not specially engaged in the production of energy efficient products, the tax rate for incomes deriving from the production and sales of energy efficient products should be halved. Firms not specifically engaged in the production of energy efficient products should separate their business accounting for incomes deriving from the production and sales of energy efficient products from other incomes. Otherwise they cannot enjoy this incentive.

- Tax credit within a fixed time period

Enterprises' incomes deriving from the production of energy efficient products should be exempted from income tax for three years time from the first day of production. If an enterprise starts to produce more than one kind of energy-efficient products in different time frames, the incomes deriving from each product should be separately accounted and the corresponding tax credit period for each of them should be calculated

- Tax rebates for reinvestment

If an investor in energy-efficient products uses his/her after-tax profits to directly re-invest in the further production of the products or to start a new firm producing other energy efficient products, and that firm will at least run for five years, 40% of the income tax already paid for the re-invested proportions should be returned to the investor.

b. Indirect incentives

- Investment deduction

If an enterprise purchases equipment for the purpose of higher energy efficiency production, 10% of the invested funds can be deducted from the taxable amount for its enterprise income tax. If the taxable amount for the current year is not sufficient for the deduction, taxable amounts for the following years (within 5 years) can be used as the deduction basis.

- Accelerate depreciation

For key equipments used for energy saving production, the depreciation period can be duly reduced, but the minimum length should be three years. An alternative would be to use an accelerated depreciation method for the equipment. The firms can choose from the two options, and report to tax authorities for approval before execution.

- Augment deduction

Specifically, this involve:

Firstly, if R&D expenses spent for the development of energy efficient products have not formed intangible assets, 150% of the actual R&D expenses would be deducted from the taxable incomes; If they have formed intangible assets, 150% of the actual expenses should be accounted into the original value of intangible assets, and be amortized afterwards in line with relevant regulations.

Secondly, for employers specially engaged in the production of energy–efficient products, the total wage bill covering salary payment to employees can be deducted from taxable incomes. For employers not specially engaged in the production of energy–efficient products, the proportion of the wage bill to be fully deducted can be calculated by referring to the percentage of sales revenues from energy-efficient products in the firm's total sales revenues.

Thirdly, the actual expenses on advertising and promotion of energy efficient products can be deducted from taxable incomes. Enterprises not specially engaged in the production of energy–efficient products should separate advertising and promoting expenses for energy-efficient products, from those of other products. Otherwise they would not be able to enjoy the full deduction incentive.

Fourthly, for R&D expenses funded by other unassociated firms through non-profit organizations or government agencies, the expenses should be deducted in full from the funding firm's taxable incomes. If the taxable income for the current year is not sufficient, the deduction cannot be carried over the following years.

ii. Income tax incentive measures to stimulate utilization and consumption of energy efficient products

a. Actual investments can be deducted by a certain proportion from the taxable income for energy-efficient products or equipments purchased by firms to help reach the national energy consumption standards. If the taxable incomes for the current year are not sufficient for the deduction, the deduction can be carried over the following years, but not beyond five years.

b. For business trading firms that do not produce, but trade energy efficient products, a certain percentage (90% for example), rather than the full amount, of the sales revenues from energy efficient products are to be taxed.

iii. Income tax incentive measures to promote the popularization and utilization of energy-efficient technologies

a. The firms' incomes deriving from the technical services for energy efficient production such as technological transfer, technical training, technical consultancy, and technical contracting should be exempted from enterprise income taxes.

b. The firms' expenses on the purchase of technical services for the production of energy efficient products can be deducted by an augment of 150%.

c. If the firms purchase energy-saving technologies from outside and form intangible assets afterwards, the amortization period for these intangible assets can be shortened by no higher than 40%.

In practicing these incentive measures, assessment and approval for the firms' eligibility for the incentives should be tightened. Taxation supervision should be strengthened, so as to promote energy-saving production while avoiding taxation leakage. The preliminary examination should be tightened. The appraising and examining standards and procedures for energy efficient products, energy-saving technologies, and equipments needed for energy-saving production should be determined. Both taxation authorities and other authorities should work together in checking and approving the firms' eligibility for various incentive measures. Additionally, the follow-up management and supervision should also be strengthened. The products, technologies, or equipments no longer categorized as energy-efficient as time or standards vary, should be excluded from the tax incentives, so as to ensure the incentives do effectively promote the energy economization in real terms.

iv. Enterprise income tax incentives to be carried out in near future

In line with current basic requirements of enterprise income tax reform, as well as China's realities in the production and utilization of energy-saving products, we believe the immediate incentive measures should focus on "investment deduction" and "direct incentives":

a. Investment deduction. 15% (or 30%) of the firms' investment on the purchase of energy saving products (equipments) should be deducted from taxable incomes for the firms. If the

taxable incomes for the current year are not sufficient for the deduction, the deduction can be carried over the following years, but not beyond five years.

b. Direct tax reduction. Direct income tax reduction should be offered to firms producing energy-efficient products. Income taxes for firms specially engaged in the production of energy-efficient products should be halved. Firms not specially engaged in the production of energy efficient products should separate business accounting for incomes deriving from the manufacture and sales of energy efficient products from other incomes. Otherwise they cannot enjoy the incentive.

Supplementary measures such as accelerated depreciation and augment deduction should also be used.

II The Catalogue for energy efficient products eligible for enterprise income tax incentives and its evaluating indexes

In line with the basic requirements of China's medium and long-term energy development strategies, and the realties of the energy-saving production in China, the state needs to be selective in determining the Catalogue for Energy Efficient Products Eligible for Enterprise Income Tax Incentives and its evaluating indexes. The basic requirements should be:

- The Catalogue should reflect reality.
- The data should be precise.
- The selecting principles should be clear.
- The determining basis should be rational.
- The policy standards should be legal.
- Both the Catalogue and indexes should be scientifically based, simple, and feasible.

i. The definition for "energy-efficient products" eligible for enterprise income tax incentives

The energy-efficient products (equipments) refer to those products meeting the relevant standards on quality, safety and environmental protection, the Energy Efficiency Standard I or the Energy Efficiency Assessing Value, reaching international competitive levels, and those having reasonably long periods during which the users can increase their investment returns.

ii. Principles in deciding on the product (equipment) catalogue

- Products that meet current or future market demands and requirements of the energy economization strategy, and have broad development prospects.
- Products used in large volume, and that have obvious potential for energy economization and higher efficiency of energy utilization.
- Products with mature and reliable techniques, and conditions for popularization.
- Products that have marketing difficulties due to price.
- Products currently accounting for a low market share (10%).
- Products that have high technological contents and potential to promote equipment updating and technological innovations, the optimization of industrial structure, and the economic efficiency of the firms.
- Products with low incentive implementation costs and and greater comprehensive

economic benefits.

iv. Energy saving potentials and efficiency analysis

The analysis aims to forecast energy-saving, environmental, and economic benefits of implementing the enterprise income tax incentives in the coming 10 years (2006-2015).

a. The analyzing steps

Analysis of the energy-saving potentials and benefits gained from implementing the enterprise income tax incentive is based on the collection of key parameters, as well the modeling estimation.

Step 1: Data on the products' prices, annual production volumes and operating length, energy efficiency, and subsidizing rate should be collected and processed

Step 2: After the preliminary analysis on prices, forecasts on volumes, and energy to be saved is done, then the estimation on production cost increment, annual electricity saved and fiscal expenditures can be calculated.

Step 3: Through efficiency analysis, estimates of electricity cost savings and emissions reductions, the benefits of implementing these incentives, and air pollution reductions can be calculated.

b. Input data for analyzing the model

- Major input data

---annual volume of the product.
---the market share of the product included in the Catalogue.
---forecast on the net annual volume increase for the product.
---forecast on the volume of the highly efficient product as a share of total volume.
---average annual operating length for the product.
---average life expectancy for the product.
---growth rate of electricity price and yearly electricity cost.
---annual energy consumption per unit product.
---cost increment per unit product.

- Determination of common data

---electricity price in 2006: RMB 0.6 / kwh.
---annual growth rate of electricity price in the following 10 years: 2%.
---ratio of investment deduction: 15%.
---direct income tax reduction ratio: 50%.
---The emitting coefficients for CO_2 and SO_2 are quoted from the emitting *Coefficients for Analysis on the Energy Efficiency of Key Energy Consuming Products in China*: 0.953kg/kwh and 0.053 kg/kwh respectively.

iii. Basic descriptions of the products to be included in the first group of the Catalogue and the computing results

In view of the enterprise income tax incentive policy effects, and the specificities of energy-efficient products in China, we further select a group of four products to be included

in the Catalogue. The calculation and analysis results are as follows.

- Medium and small-sized three-phase asynchronous electromotor

Electromotor is the driving force of industrial society. In China, almost 70% of the industrial electricity is consumed by electromotor. Medium and small sized three-phase asynchronous electromotor is a kind of energy-consuming equipment widely used in such fields as industry, agriculture, commerce, construction and telecommunication. To improve the efficiency of medium and small-sized three-phase asynchronous electromotor can save energy in great quantities, thus having significant implications to the energy economization of the whole country. Moreover, a medium and small-sized three-phase asynchronous electromotor normally can work for a very long time, and the cost of operating it during its whole life circle will usually be 50 times as much as its initial cost of purchase. Therefore, to improve the energy efficiency of electromotor will bring substantial benefits for the firms.

In China, the GB18163 *Energy Efficiency Limits and Energy Saving Assessing Value for Medium and Small-sized Three-phase Asynchronous Electromotor* was released in 2002. Now the key problem in the market for medium and small-sized three-phase asynchronous electromotor is whether the high price can be reduced. Many firms have the capacity to manufacture high-efficient electromotor, but the high price for this product seriously affects its marketing. The firms began reluctant to manufacture or to develop this equipment. In the meantime, the firms using electromotor will hesitate to buy the costly highly efficient electromotor. Statistics shows that currently the highly efficient electromotor only accounts for 1% of the electromotor market share. We therefore would suggest that the medium and small-sized three-phase asynchronous electromotor be included into the Catalogue, so as to vigorously develop the market for highly efficient electromotor.

- Transformers for electricity distribution

Electricity transformers are the most widely electricity equipment used in the industry sector. There are two basic kinds of electricity transformers: transformers for electricity transmission and transformers for electricity distribution. Given the widespread and large volume of use, as well as the long operating time of the equipment, there are great potentials for energy saving in the selection and usage of the transformers, especially those 10kv medium and small sized transformers (for electricity distribution). To reduce the loss of transformers and to improve the efficiency of electricity distribution is an important issue being addressed worldwide. It is also one of the top priorities of industrial energy saving work for the Chinese government.

Despite the gradual improvement of energy saving technologies for transformers in China, there are always a few highly efficient transformers whose market is constrained by price factors. In developed, and some developing countries, such transformers usually have a large market. In 1995, there were already 700-800,000 energy efficient transformers in the US, and 100,000 in India. Currently, the volume of highly efficient transformers manufactured in China is only 1% of that in India in 1995. The *Energy Efficiency Limits and Energy Saving Assessing Value for Transformers for Electricity Distribution* has been formulated and will be released soon. Therefore, the transformers for electricity distribution can be included in the Catalogue. Compared with other products, the transformers for electricity distribution are

costly, and have longer usage life. The net benefits from offering it tax incentives can only be observed in a few years.

- Unit-type Air Conditioner

Unit-type air conditioners (so called cabinet-type air conditioner) are a type of product widely used in crowded places like hospitals, schools, dinning-halls, meeting-rooms, drawing rooms, and cinemas. As living standards improve, the unit-type air conditioners have gradually penetrated into to ordinary households. Statistics in both the US and Europe show that the electricity consumed by air conditioners and heat pump refrigerating equipment is about 30% (Europe) and 40% (USA) of total electricity generated. Statistics conducted by China's Association of Refrigerating and Air-Conditioning Industry reveal that, in China, the newly increased capacity for unit-type air conditioners was about 3.75 million kw, and the volume is expected to reach 150,000 sets by 2005. So far, electricity consumed by air conditioners and heat pump refrigerating equipment is about 20% of total electricity generated, and is growing at an annual rate of 10%-15%. If energy efficiency for refrigeration and air-conditioning products can be improved by 5%, the absolute value of electricity saved will be astonishing. The national standards of GB19576-2004 *Energy Efficiency Limits and Energy Saving Assessed Value for Unit-Type Air Conditioners* was promulgated in August, 2004, so the pre-conditions for including the unit-type air conditioners into the Catalogue are mature.

- Water Chiller Set

Water chiller (heat pump) sets for centralized conditioning are mainly used in hotels, restaurants, hospitals, schools, halls, and exhibition centers. Since the mid and late 1980s, these sets became widely used in China. The refrigerating air conditioners and pumps heating equipments in China consume more than 20% of total electricity generated, and consumption is growing at an annual rate of 10-15%.

In August 2004, the national standards of GB19577-2004 *Energy Efficiency Limits and Energy Saving Assessing Value for Water Chiller Sets* was promulgated by the Standardization Administration of China. The pre-conditions for including the water-chiller sets into the Catalogue are thus mature.

The analysis and calculation details are omitted.

It can be seen from the analysis and calculations that, if the four selected energy-efficient products can enjoy the incentives of "investment deduction" and "direct tax reduction (tax rate halved)" in the coming 10 years, the tax losses for the state will be approximately RMB 6.337 billion, while electricity saved would be accumulated at 96.2 billion kwh, saving electricity cost of RMB 65.8 billion. The emission reduction for CO_2 would be 91.81 million tons, and SO_2, 5.09 million tons. Please see the following table for details.

Table: The Catalogue for Energy Efficient Products (equipments) Eligible for Enterprise Income Tax Incentives (The First Group) and the Computing Results

Name of the Product (equipment)	Evaluating Indexes	Index Requirements	Code of Energy Efficiency Standard	Energy Efficiency Level	Current Market Share	Forecasted Policy Effects				Uses
						10 years' Energy-saving potential forecasting (in 100 million kwh)	10 years' Fiscal Revenue Losses Forecast (in RMB 100 million yuan)	Total Electricity Cost Saved Forecast (in 100 million yuan)	Total Emitting Reduction Forecast (in 10 thousand tons)	
Medium and small-sized three-phase asynchronous electromotor	Efficiency	The Assessing Value in Energy Efficiency Standards	GB18613-2002	International competitive level	1%	Total electricity to be saved: 689	21.26	474.4	CO_2: 6573 SO_2: 365	Electrical towage
Transformers for electricity distribution	No-load loss, and at-load loss	The no-load loss should be 64% lower than the Assessing Value in Energy Efficiency Standards.	To be approved	International competitive level	1%	Total electricity to be saved: 22	15.08	15.1	CO_2:208 SO_2:11	Electricity transmit and distribution
Unit-type Air Conditioners	Energy efficiency ratio	Level I in Energy Efficiency Levels, as stipulated in Energy Efficiency Standards	GB 19576 - 2004	International competitive level	1%	Total electricity to be saved:：40	18.5	28	CO_2: :382 SO_2:21	Commercial uses
Water Chiller Sets	Energy efficiency ratio	Level I in Energy efficiency levels, as stipulated in Energy Efficiency Standards	GB19577-2004	International competitive level	1%	Total electricity saved: 211	8.53	145	CO_2：2018 SO_2：112	Commercial uses
Totaling						962	63.37	658	CO_2: 9181 SO_2: 509	

A Study on Establishing An Energy Conservation and Renewable Energy Development Fund

[Executive Summary]

Energy Research Institute, National Development and Reform Commission

Energy conservation and the development of renewable energy are significant policy issues related to both public interest and the building of a harmonious society. The ***Energy conservation and Renewable Energy Development Fund*** (PBF) is a public fund sourced from energy related activities and specifically supports energy conservation and renewable energy development.

The far-reaching significance of energy conservation and the development of renewable energy for constructing a harmonious society include: promoting sustainable energy development, supporting the energy required for quadrupling China's 2000 GDP level, upgrading overall competitiveness of China's national economy, supporting a well-off environment so as to reduce GHG gases emissions, improving the general energy service level, and creating new job opportunities.

To reach the long-term national development goal of *building a harmonious society,* conserving energy, and developing renewable energy, the government must formulate and implement comprehensive energy conservation and renewable energy development policies relating to finance, pricing, taxation, and investment. In terms of necessity, effectiveness, and feasibility, the best policy option is to set up a PBF.

With respect to its necessity, the lack of powerful incentives supporting policy is a key barrier to energy conservation and the renewable energy development. At present and in the future, China will still be in the initial stages of a market economy. Promoting energy conservation will be faced with such market barriers as investment, technical risks, and information. Due to market barriers and failures, it is difficult to realize the huge energy saving potential in China. Policy intervention and guidance, especially powerful economic incentive policies are required to promote energy saving investment. In recent years, the government has explored

meaningful attempts on establishing and perfecting energy saving policy. However, there is still a lack of incentive policies compatible with the domestic situation and the socialist market economy. In comparison, renewable energy is in an even more difficult position. Compared to conventional energy projects, renewable energy projects do not usually have stable investment sources over long time periods. Although long-term and annual construction plans have been formulated, there is no funding to support them. The key factor constraining renewable energy development has always been lack of funding. Renewable energy development in China is in a critical period. The key is to provide powerful incentive policy in order to achieve breakthroughs and form a economy of scale in future.

Secondly, restructuring the power sector creates a new challenge for energy conservation and renewable energy development. The ongoing restructuring focusing on a competitive electricity market creates a new challenge for promoting energy saving. The key stakeholders, power companies, are not active in energy saving investment. Energy saving projects will reduce electricity consumption and tend to decrease electricity price. In the current electricity price regime, the income and profit of power companies are directly linked to the amount of electricity sold. Reduction in power consumption and electricity price is not in the interest of the power companies. When economic incentive policy is not provided, there is no motive from power companies to invest in energy saving projects. Power sector restructuring puts renewable energy development into a disadvantageous position. The feature of a competitive electric power market is that the income of power companies is dependent on electricity price, rather than power generation cost. In terms of time, the renewable power technology has been developed far behind that of conventional power technology, with generation cost obviously higher than that of conventional power. Renewable power generation is still in its initial stage of development in China, characterized by weak market competitiveness. In a competitive electricity market, without proper and incentive policy support, it will be difficult for renewable power generation development greatly.

In the view of its effectiveness, there have been many years of verified international results using of public funds to support energy conservation and renewable energy development. Special funds for supporting energy conservation and renewable energy development have been established in developed countries such as the US, UK, Japan, France, and Germany, and developing countries, such as Brazil and India. The practice in these countries show that the establishment and use of the PBF have provided effective support and produced considerable economic, environmental, and \ social benefits. Especially in the UK and US, where the power sector has been reformed, PBFs have achieved success in supporting energy conservation and renewable energy in a competitive power market. A significant amount of energy is saved and renewable power generation capacity has been increased. On the other

hand, analysis and projected results made by a study team show that if an energy conservation and renewable energy special fund is established and properly operated in China, it could strongly promote energy conservation and the development of renewable energy by leveraging investment in energy conservation and renewable energy, promoting energy conservation and renewable energy technology development and application, promoting the industrialization of energy conservation and renewable energy, promoting the establishment and development of energy conservation and renewable energy, and realizing benefits to the economy, environment, and society.

With regard to its feasibility, the proposed concept of establishing the fund to promote energy conservation and the development of renewable energy is easily reachable in a short time. First, the government already has the practical experience to channel various funds via the surcharge of an electricity fee, so it is easy for the government to control it. Secondly, the targeted objectives supported by the proposed fund are related to social welfare, making it easier to be understood and accepted by the general public. Thirdly, it reflects well on the government to implement the fund.

Learning from the fund establishment and management experiences of foreign countries and domestic projects, and considering China's domestic situation, the project group proposes the following policy recommendations:

(1) Study the establishment of a PBF to promote energy conservation and renewable energy development.

The government agencies mainly responsible for energy conservation and the development of renewable energy should prioritize the establishment of the PBF on the agenda. They should start to organize and carry out relevant research, strengthen the coordination among financial, tax and legislative departments, and advance the process for decision-making.

① Research and formulate the renewable energy development fund design

The "China Renewable Energy Law" has been released, and will be enforced on January 1, 2006. Article 24 of Chapter Six of the "Renewable Energy Law" clearly provides that the national finance committee set up the renewable energy development. The government agency chiefly in charge of the development of renewable energy should, according to this, coordinate with other relevant departments such as the Ministry of Finance, and organize relevant departments to do research on the formulation of a design scheme for the renewable energy development fund.

② Integrate the establishment of the energy conservation fund into the "Energy Conservation Law"

International and domestic experiences show that an energy conservation/renewable energy development fund should be established on a legal and regulated foundation. This legal basis can reduce initial resistance from the public, and also guarantee the source of capital and stability. However, the "Energy Conservation Law," includes no specific provisions on establishing an energy conservation fund. Government agencies involved in the management of energy conservation should strengthen communication and cooperation with related departments, such as the legislative department when "Energy Conservation Law" is revised.

③ Organize relevant departments to implement the study on sources of funding for the PBF.

Researching funding sources for the establishment of the PBF is a priority. The department responsible for the management of energy conservation and renewable energy development should coordinate with financial, pricing, and taxation departments to implement funding studies. Considering both international experience and the domestic situation, it is recommended that coordinated efforts should focus on two possible funding-raising options:

1) Surcharge electricity fee. This option is the most widely used approach at home and abroad. China has had similar experiences in implementing a surcharge electricity fee for multi-purposed funds. According to the preliminary analysis made by the project group, this is the most rational and practical option.

2) Special government finance allocation. This method of collecting capital is also commonly applied in China and foreign countries. Using this approach, research will focus on the feasibility of taking out a small proportion of capital from newly added annual government revenues to put in the PBF. In the first 4 years of the "10th Five-year" plan period, the annual average growth rate for total financial revenue of the government was nearly 20%. Newly added financial revenue was approaching about 500 billion RMB yuan in 2004. It is feasible for the government to take a minor percentage (for instance 1%) of the newly added financial revenue for the financing of the PBF.

(2) Recommendations for the design of establishing an energy conservation and renewable energy development fund

① Objectives

The objectives of the fund are aimed at promoting the progress, application, and dissemination of energy conservation and renewable energy technologies; reducing the social cost of energy use; and supporting the establishment of sustainable energy conservation and renewable energy industries and markets. These objectives will guarantee the realization of the 11th Five-year national energy conservation and renewable energy development goals, 2020 and beyond goals, and the long-term development goal of building a harmonious socialist.

② Application

The fund will focus on two significant public causes: energy conservation and renewable energy development. In principle, areas to be supported by the fund include:

- Support the application and dissemination of existing, well-established or good commercial prospective energy conservation/ renewable energy technologies, while emphasizing its support on the spread and application of electric power saving and renewable generation.
- Support the research, development, demonstration, and application of new technologies of energy conservation/renewable energy.
- Support the development of energy conservation/renewable energy industries.
- Support the establishment and development of energy conservation/renewable energy products/service markets.

③ Size

Based on preliminary considerations of national macro objectives for energy conservation and renewable energy development, investment and operational costs of energy conservation and renewable energy supply, possible fund raising channels, stakeholder attitudes, the impact on relevant industries, and the application and arrangement of the fund, it would be appropriate to keep the size of the fund to be ranging from 3 to 3.5 billion RMB per year. Over time, the size of the fund can be adjusted. The final decision on the size of the fund should be based on the above-mentioned factors, and coordinated and decided by the government agencies with stakeholders.

 Funding sources and collection duration

A surcharge electricity fee is an alternative fundraising option. The fee establishes a special surcharge for electricity that is considered a public product according to energy use per kWh, and collects a surcharge imposed on all electricity users. It will also gather a pollution discharge fee from thermal power plants. A special financial allocation will change the allocation method for the existing power fund. For instance, it will take out a certain part (10-20%) of the agricultural power fund, and use this percentage as a funding source. Based on research of different elements such as feasibility of fund raising, stability of the fund source, possible scale of the fund collection, and impacts on related industries and departments, it is suggested an electricity surcharge fee be the priority in financial channeling for the PBF. The other three methods can be used as alternatives.

Since the support for energy conservation and renewable energy development should be long term and sustainable, it is suggested that the fee collection period for the fund should be 10 years. After 10 years, the effect of the fund and whether there is more need to support energy conservation and renewable energy will be evaluated to decide if the fee collection should be extended or not.

⑤ How to use the fund

In order to achieve the fund objectives and efficiency, the fund can be used in three ways: 1) to support energy conservation infrastructure/technology renovation projects with large energy saving capacity; 2) to support large quantities of small-scale energy conservation retrofit projects with extensive sector and geographic coverage; 3) to support the energy conservation industry and market development. The former two are the main targets that should be supported by appropriate incentives such as discounted loans, discounted transfer, and partial/full funding.

For renewable energy, the fund can also be used in three ways: 1) to support the development of large-scale renewable energy projects and the application/ installation of distributed renewable energy equipment; 2) to support the development of industry and infrastructure, such as business development, marketing assistance, resource assessment, R&D, education, and demonstration; 3) to support the investment of enterprises and projects. The first category should dominate the fund distribution, combined with appropriate incentives such as direct subsidy, discounted transfer, discounted loans, equity input, and partial/full funding.

⑥ Arrangement

Arranging the application of the fund should follow three principles: 1) give consideration to both energy efficiency and renewable energy. Given energy efficiency needs a relatively large quantity of the funding support, it is recommended that it take 60-70% of the fund as an incentive fund to support energy efficiency. The other 30-40% should be used to promote the development of renewable energy; 2) provide equal consideration to the central and local governments. A certain proportion of the fund should be allocated by the central government. Due to disparity in economic and social development levels between regions in China, the centralized application of the fund by the central government is beneficial to energy efficiency and optimization of the development of renewable energy within China. However, consideration must also be given to local governments for fund arrangement and application, allowing for greater flexibility and effectiveness; 3) Give consideration to both equity and efficiency in urban and rural areas, insuring the inclusion of a competition mechanism in the fund.

The application of the fund can also be based on a competitive bidding process or a “first come, first gain” process. Bidding is beneficial to improving energy utilization efficiency, and mainly suitable for projects that demand large investment and financial assistance. The “first come, first gain” process is when the fund management organization provides a fixed amount of financial assistant to projects eligible for funding and the first projects applying will be funded. This manner would tend to favor projects that need relative small investment and small financial requirements.

⑦ Framework for fund management

In order to achieve the objectives, monitor of the fund, and ensure efficiency, it is recommended that a government agency act as the management body for the fund. Since the fund comes from energy charge and supports a public energy cause, it is suggested that a government agency engaged in energy, electricity, or energy conservation administration should be the fund authority.

Under the circumstances that resources in the government agency are limited, the framework will suggest that the government only perform the overall management of fund use. Financial agencies will monitor the fund operation and utilization, while the routine management and operation of the fund will be entrusted to a social intermediary organization. This proposed framework allows for effective macro-adjustment and control, and avoids micro-management from the fund authority. This structure will mutually support, constrain, and monitor the organizations involved in the management and operation of the fund. Thus, equity and high efficiency of the PBF will be insured.

A Study of Electricity Tariff Policy for Promoting Energy Conservation and Renewable Energy Development

[Executive Summary]

Economic Research Institute, National Development and Reform Commission

Ever since reform and opening to the outside world, China's electricity tariff policy met the requirements of national economic and social development, attracted investments in conventional power generation, highlighted energy conservation, and boosted support for renewable energy. The existing tariff policy, however, cannot avoid the supply and demand imbalance in conventional energy-based power generation. It does not have well-defined measures to regulate short-term supply and fails to single out energy conservation as the core objective. Until now, there has been no systematic policy framework in support of renewable energy-based power generation. Therefore, there is still necessity and scope for further readjustment and refinement.

The electricity tariff policy framework for sustainable development includes:

1. A guiding principle for increasing sustainable energy while maintaining national economic competitiveness

Chinese economic and social development has entered a phase of mass energy consumption. Given e scarcity of domestic energy resources and the growing complexity of international politics and economics centered on energy, we must support renewable energy. Only by focusing on renewable energy can we reach sustainable levels and methods of energy consumption.

Promoting energy conservation does not mean the fewer high energy-consuming industries the better. "Energy waste" and an "energy-consuming economy" are two different issues. The former refers to low energy utilization efficiency that can be measured in such indices as "unit product energy consumption". The latter refers to an economic structure that needs to be

bolstered by more energy consumption and measured in such indices as "unit GDP energy consumption." Therefore, while alluding to energy waste and the extent of waste in China, it is fine to use "unit product energy consumption" to make international comparisons, but it is inadvisable to leverage the difference of "unit GDP energy consumption" between China and developed Euro-American economies. The difference of "unit GDP energy consumption" between China and developed Euro-American economies can be used only to prove our economic structure consumes more energy than theirs. First of all, the high energy-consuming economic structure in China is ascribed to our low technological level and poor labor force quality. For an economic structure like the US, dominated by high-tech and service industries, the unit GDP energy consumption is low. But does China have the capability to match the US? Secondly, FDI and foreign trade primarily drive China's economic growth in the present phase. The impressive performance of FDI and foreign trade is directly related to the low-end labor resources that are ample in supply and cheap in price. However, foreign investments and export products are concentrated in the manufacturing industry that unavoidably raises the "unit GDP energy consumption" in China. Therefore, the high energy-consuming economic structure in China is an outcome of natural selection in the current condition of international division of labor, and has its own historical necessity.

The current electricity tariff policy in China must promote energy conservation, support renewable energy, and make energy consumption sustainable. Moreover, it also must pay equal attention to the sustainability of the national economy. It is imperative to respect the historical necessity of forming a high energy-consuming economic structure in China in the present phase, and it is inadvisable to pursue unit GDP energy consumption minimization in a blind manner.

2. An overall consumer tariff level reflecting changes in electricity cost and demand

In the past two years, the overall consumer tariff increase has lagged behind and failed to inhibit the upsurge in fuel price rise and demand. This is primarily because i) the NDRC sets a tight ceiling on price hikes across all localities for fear of sparking excess inflation, and ii) tariff adjustment rules, and rule on how to determine the extent of adjustments, are defective.

(1) *It is imperative to overturn the traditional concept of keeping the overall consumer tariff level relatively stable*. From the perspective of minimizing social and transactional costs, the overall consumer tariff level should be kept relatively stable instead of making frequent readjustments given the lack of marked changes in electricity cost and demand. However, in light of the fuel price spike and demand upsurge in the past two years, the overall tariff level

must be adjusted on a timely basis. If we still pursue tariff stability at this time, the inevitable upshot is to cause a relative contraction in short-term supply, a more burgeoning market demand, a further decline in power supply reliability, and an increased instability in the overall power system. Additionally, macroeconomic instability reflects problems in the total economic volume relationship, while the electricity tariff policy is intended to resolve local imbalances. Even with frozen electricity tariffs, it is still unlikely to suppress the inflationary momentum. The primary reason for investment control, especially since last year, is related to the existence of resource constraints as indicated by the insufficient supply of coal, electricity, and oil. If the overall electricity tariff level has to be kept stable in such circumstances, it does a disservice to effectively stimulating energy supply and suppressing irrational energy demand. The current practice goes against the macro-control objective. Evidently, we have to follow the dialectic method instead of mechanical tariff suppression even if the electricity tariff policy is required to fluctuate with macro-control. It is advisable to inhibit demand and relieve resource constraints by means of raising electricity tariffs.

(2) Establish and refine the regulatory rules and methods for timely tariff adjustment. At present, the key way to resolve complications in operation is to make revisions in linking the coal and electricity tariff. According to the prevailing "Coal and Electricity Tariff Linkage Proposal," the power generation enterprises shall absorb 30% of the coal price increase. The regulation works if coal prices rise by 8% or 10% in the short term (i.e., one year). But, how can the power generation enterprises absorb 30% of price hike given a magnitude of 20%, 30% or several sessions of 8% price increase in a row? This is exactly how the coal price has been moving since last year. The electricity tariff regulatory authority has unavoidably been trapped in a dilemma. This is one of the major reasons why last year, the electricity tariff rose by the largest magnitude ever, resulting in heavy criticism.

Our recommendation for amendment is called: "**keeping the road and bridge separate with different functions**". *The so-called "road" refers to the normal requirement by the regulator for enterprises to "constantly raise efficiency*." This requirement has been met through the generally adopted practices of adding an efficiency coefficient in the tariff adjustment formula in foreign countries (for example, X in the British price adjustment formula "RPI-X" is called an efficiency factor). Currently, the Chinese government only adopts an electricity pricing formula without any tariff adjustment formula in place. To regulate and legislate electricity tariff adjustment, it is recommended to formulate a tariff adjustment formula as early as possible. In our prospective tariff adjustment formula, we should also follow the generally adopted international approach to set an "efficiency increase coefficient" or "cost decrease coefficient." It is advisable to resolve the general cost increase that enterprises are required to absorb through this "road."

The so-called "bridge" is a solution to special (ad hoc) cost increase. The cost increase after

offsetting/deducting "the rate of efficiency increase" or "the rate of cost reduction" (mainly referring to significant fuel price hikes for thermal power generators) in the tariff adjustment formula can be considered a special cost increase. Such special cost increases are a price society must pay to maintain the existing level of energy consumption. It is imperative to keep consumers aware of energy resource scarcity. Therefore, any such cost increase shall be completely passed through to electricity tariffs.

3. Establish a consumer tariff structure compatible with power supply cost

The consumer tariff structure refers to the unit price differential and proportional relationship between consumers as a result of the difference in manner, time, and voltage of power usage. The electricity tariff structure directly dictates whether a reasonable power consumption structure can be formed. It not only has a bearing on energy conservation performance, but also affects a series of resource allocation efficiencies. Consequently, the sustainable development tariff policy structure must include "establishing a consumer tariff structure compatible with the incurred power supply costs." To fulfill this mission, we should do the following work:

(1) *Reclassify consumers and adjust their price differentials*. In general, the present consumer classification and price relationship is still out of step with actual power supply costs. Even though the classifications different in all localities, it still results in excess "cross subsidization." For example, cross subsidization is reflected in the similarity between residential and industrial consumer tariffs. In addition, commercial consumers are charged the highest tariff, which is more than 70% above the average rate. Apparently, this deviates from the actual costs incurred by consumers on the power system. We should reclassify consumers based on the voltage level and user load characteristics. Especially in the power shortage areas, it is advised to raise residential tariffs and completely resolve the issue of excess cross-subsidization between residential and other consumers.

(2) *Improve the time-of-day tariff structure*. In 2003, China fully implemented the peak/valley tariff system. The system should be improved as follows:

- Further expand the scope of implementation for the peak/valley tariff system.
- Adjust time-of-day price differentials according to the "unique circumstances of each locality."
- Implement "seasonable tariffs" in necessary areas.
- Encourage the use of a "peak tariff."
- Fully implement "high water/low water tariffs" in hydropower dominated areas.

4. Internalize external costs

Power generation consumes approximately 50% of the total national coal production in China, and coal fired power plants emit 56% of industrial SO_2. As estimated by experts, the cost of

desulfurization is approximately RMB 0.88—2.8/kg for installing fluid gas desulfurization units in 300 MW coal fired units, based on the actual sulfur content of coal for power generation. The state levied SO_2 emission charges, however, are merely RMB 0.21--0.63/kg. The environmental costs are far from being included in the accounting costs of power generation enterprises. As a result, power generation enterprises are reluctant to install desulfurization units. Some installed units are even left idle. To decrease thermal power generation pollution, we must adopt measures of internalizing external costs.

(1) *Significantly increase emission charge rates*. To fundamentally solve the emission and acid rain problems in China and reach the government control target, the SO_2 emission-charging rate should be set at a level in excess of the costs incurred by enterprises. The emission SO_2 charging rate should be raised 4-10 times, to RMB 1—2.8/kg. China has markedly different areas in terms of weather, population density, and cultural heritage. Significant differences in the extent of SO_2 emissions results in varied SO_2 emission control targets. For example, a relatively high rate should be imposed in the populous eastern areas, and humid, yet acid rain plagued southwest China. The SO_2 emission-charging rate can be set lower in Inner Mongolia, Xinjiang, and northern coastal areas with sparse populations and dry weather.

(2) *The power grid tariff must cover reasonable costs of desulfurization*. While significantly raising emission-charging rates, associated policies should be put in place to allow enterprises to recover costs of installing and operating desulfurization units through normal channels. This will encourage additional investments in environmental protection. In the current stage where the government sets the grid tariff, the tariff should cover the reasonable costs of desulfurization. NDRC has recently released the uniform 1.5 *fen*/kWh desulfurization cost recovery rate in China. This rate is appropriate for newly built turbo-generators, but insufficient for old generators. Old generator refurbishment is a key measure to reduce SO_2 pollution. To this end, we recommend setting a separate rate appropriate for old generators based on the higher costs of refurbishment, and allowing for appropriate elasticity in implementation.

5. Gradually introduce a competitive mechanism

The market mechanism is the most effective means of saving resources in any competitive arena. Based on international practice and experience in electric power markets, the competitive pressure from “unilateral” or “bilateral” trade compels power generation enterprises to employ all available means to minimize fuel consumption, directly benefiting energy conservation. If the “bilateral” trade system is adopted, a demand factor can be incorporated into the tariff formation mechanism to conserve more energy. Moreover, the Chinese power industry has basically separated power plants from grids. Without introducing a competitive mechanism, it will increase transactional costs while frustrating efforts to optimize resource allocation. We must introduce the competitive mechanism, and employ

market mechanisms to achieve sustainable economic and social development. The following near-term measures should be taken:

(1) Speed up the "large account user direct purchase" trial endeavor. At present, Jilin Carbon Factory is the only large account enterprise approved by the NDRC and the State Electricity Regulatory Commission for direct power purchase. In the future, all large account consumers for the big energy bases should be allowed to trade directly with power generation enterprises, minimizing power transmission losses. According to the previous international experience in electric power system restructuring, the supply of electricity from power generation enterprises to large account users relates to the "bilateral" approach of electricity trade. In essence, power generation enterprises trade directly with large account power users, most of which are power distribution and sales companies. Therefore, piloting "bilateral trade" in the power market should not be limited to the direct trade between power generation enterprises and large end-users. Instead, for future development, it should be targeting the direct supply from power generation enterprises to independent power supply companies. These independent power supply companies may have many forms of ownership structures to choose from, extending from the joint venture between an existing provincial power company with other investors, to wholly owned private enterprises. The power supply operation can be entrusted to the provincial power companies, or undertaken by the independent power supply companies. Requirements for users in a "direct purchase" area should be based on those for high power usage rate enterprises. As for the "direct purchase" approach, "direct purchase" through grids is preferred, without excluding private line "direct purchase."

(2) Attach top priority to designing an electric power market model in line with domestic situations. This round of electric power system restructuring is centered on introducing a competitive mechanism. The common international practice is first to determine an electricity trade model and related rules, and then design the corresponding industry and corporate restructuring options. Once power plants and grids are completely separated, the power generation side or user side competitive market will be in effect. The practice in China is quite the opposite. Over a year after "power plant/grid separation," separation is still incomplete: the power grid companies still own a considerable size of conventional power generation capacity, and "core/supplementary operations" are still not separated. Additionally, the related decision-making authority is still researching and debating core reform issues of the basic electricity market form and distribution. Given the vast expanse of China's territory, the power grid structure and electricity market must be regional. Considering the uneven regional, social, and economic development at the present stage, "competitive bidding" (a "unilateral" market method) may not apply in all areas as an approach to introduce competition into the power industry. It is required to design the electric power market model well, and in line with the domestic situation, before being able to actually solve the sustainable power development issue through market mechanisms.

6. Regulate and consolidate tariff-based government funds

At the present stage, public funds are required to promote energy conservation (i.e., supply side management) and support renewable energy development. Raising such funds through tariff surcharges is in congruence with the principle of fairness and efficiency. China has experience in operating the "Electric Power Construction Fund," the "Three Gorges Fund," and the "Reservoir Area Immigration Support Fund." These tariff-based government funds can be regulated and consolidated to support policy for sustainable energy development. Regulation and consolidation methods mainly include:

(1) Funds should reflect their name: Currently, there are many tariff-based government funds raised in the public interest. To avoid consumer misunderstanding, these funds should reflect their name and be uniformly called "Electricity Public Interest Fund."

(2) Expand the scope of application by increasing the expenditure items of energy conservation and renewable energy development.

(3) Change funds from price inclusive to price exclusive. Current government funds are collected price inclusive and included in the sales revenue of many localities' power companys. This makes it difficult to regionally transfer payments or form a "social sharing" mechanism. Such funds should be collected exclusive of price, and directly become governmental revenue.

(4) Funds should be borne by power consumers. Payments from power consumers are the funding sources for promoting energy conservation and supporting renewable energy development. Power consumers may have different responsibilities for fossil energy consumption if they consume power in a different manner. Consumers consume fossil energy primarily through the quantity of electricity consumed. However, a higher electricity bill does not necessarily mean more electricity consumed. Therefore, from the perspective of fairness and energy conservation, the major "payers" should be the actual electricity output consumers instead of capacity consumers. It is inadvisable to link government funds for supporting energy conservation and renewable energy development with total electricity charges. Instead, such funds should be levied on a unit basis.

(5) Adopt a two-tier central and provincial fund sharing mechanism. Based on the central and provincial renewable energy development programs, funds within the scope of central strategic planning and subject to approval by the central government should be shared nationwide. For funds under local planning and subject to approval by local government, the amount of funds under the "target price" should be shared nationwide while the amount above the "target price" should be shared in the localities. We recommend setting up central and provincial escrow treasury accounts and keeping "revenue and expenditure separate." The energy regulatory authority should consult their electricity tariff regulatory counterpart in reviewing fund approval, determining the funds allocation proposal, and disbursing funds

after review by the treasury department.

7. Establish standardized renewable energy based electricity tariff administrative measures

Given the vast expanse of territory in China, and the substantial differences across regions regarding the reserve of and demand for resources, there should be a price differential for electric power generated in different regions using different kinds of renewable energy. The question is how to set a reasonable price differential. Recommendations for if the government regulates the tariff on electricity to power grids:

1). Set a price differential for electricity generated from different kinds of renewable energy based on normal cost differences. Normal costs shall be determined with technology recognized by the project regulatory authority as a precondition, and considering: universal equipment purchase prices, uniform equipment installation standards, uniform per capita salary levels, uniform financial expenses, and ROI standards.

2). The principle of public fund efficiency maximization should be observed when setting a regional price differential for electricity generated from renewable energy. According to the requirements of the "Renewable Energy Law," related government authorities are considering setting the base price of electricity from renewable energy per region. Because most renewable energy based power plants are small in scale, they are connected to the standalone local power grid or low voltage distribution grid. If the central government directly sets the base price for electricity generated from renewable energy, information support is absent, workload is excessive, and it deviates from the hierarchical tariff management system currently in use. Therefore, it is advisable to consider that the central government only prescribe a uniform standard for the price differential between renewable energy generated electricity and conventional energy generated electricity. On the basis of the uniform standard, the local electricity tariff regulatory authorities can decide on the specific base price for electricity generated from renewable energy in their respective localities.

8. Grant local government's considerable latitude to raise DSM short-term funds

Demand side administration is in dire need of funding support. In the near term, the central government does not have a policy establishing a stable channel of funds. Local governments should be given latitude to raise DSM short-term funds. For example, in the areas where a peak tariff is set, the revenue raised by the power grid company can be used to support demand side administration.

+A Study of Fiscal Policies for China Auto Vehicle Development

[Executive Summary]

China Automotive Technology and Research Center

Since October 2004, the project group of the China Automotive Technology and Research Center (CATARC), has researched and launched a *Study of Tax and fiscal policies for clean fuel and energy efficient automobiles*, support by funding from the Energy Foundation.

On February 5, 2005, the initial meeting was held in Beijing. From March 21-22, 2005, supported by the Energy Foundation and The William and Flora Hewlett Foundation, and sponsored by CATARC, an international conference of *Fiscal Policies For Promoting Cleaner And More Efficient Vehicle Technologies* was held in Beijing. More than one hundred representatives from different government departments, research institutions, and enterprises participated in the meeting. The experts discussed China's energy and environmental protection needs, and analyzed possible tax policies for adoption.

Combining research on China's domestic conditions and new technology in the automobile industry, the project group put forward short, medium, and long-term tentative schemes for motor vehicle and fuel tax systems, and proposals to reform tax rewards and punitive measures.

1 Adjustment of the automobile consumption tax（Short-term scheme）

1) Adjust the consumption tax to promote the popularization and use of cleaner and more efficient vehicles

Adjustment principles for the passenger car consumption tax are as follows:

- The consumption tax rate will combine the vehicle in question's fuel economy and emission levels.
- Do not change the tax base, but slightly increase the total value of the tax revenue.
- Do not change the taxation target; i.e., continue to tax manufacturers.
- Differentiate taxation targets in more detail.

- Utilize transfer payment to foster cleaner vehicles.

Adjustment proposals are as follows:

Levy consumption taxes according to categorization as a passenger car. A passenger car is defined as a passenger vehicle with no more than nine seats and which complies with international vehicle classification standards, including sedans, SUVs, and MPVs.

2) Adjustment scheme of the fuel consumption tax

Propose to reduce or remit the consumption tax rate for cleaner energy.

2 Adjust the structure and levying method for the vehicle purchase tax

Principles of adjustment are as follows.

- Keep the total tax base and enhance properly.
- The tax will be still levied during purchase of the vehicle, and before registration.
- Encourage the purchase and use of energy-saving vehicles.
- Levy a punitive tax for vehicles unable to reach the fuel economy standard, and for those that the government has established an encouragement fund system for.
- Reduce the tax to encourage the sale and usage of vehicles using new energy sources.
- Adjust vehicle purchase tax in time to correspond with the consumption tax rate.
- Vehicle classification should refer to the consumption tax adjustment scheme.

3 Medium and long-term adjustment scheme for the vehicle taxation system

The following medium and long-term vehicle tax adjustment scheme and related policies are proposed after the fuel tax has been implemented.

- Adjust the consumption tax collection phase from the production to the distribution stage.
- Adjust the vehicle purchase tax criterion.
- Reduce the vehicle tax rate at the production and distribution stages, and increase the tax rate at the purchase stage. To extend revenue gross income, propose constructing a vehicle weight tax, instead of one based on vehicle type and use.
- To achieve sustainable development in the automobile industry, continue adopting polices promoting energy-saving and environmentally friendly vehicles.

Subsequently, the project team subdivided the adjustment schemes of the consumption and vehicle purchase tax. From March to May 2005, the project team proposed the following schemes:

A. Consumption tax

1. Adjustment scheme of the consumption tax

Change the consumption tax of passenger cars from the original three phases to seven phases, and shift the respective tax rate. This scheme is in the last stages of confirmation. However, each phase's tax rates have not been finalized. The present phases divided tax rate scheme are shown in the following table:

Displacement (L)	≤1.0	1.0～1.5	1.5～2.0	2.0～2.5	2.5～3.0	3.0～4.0	＞4.0
Proposal tax rate	1%	3%	5%	8%	11%	15%	20%

2. Reward and punishment scheme for the vehicle consumption tax

1) Reward scheme

a) Levying criterion

c) Rewards passenger cars that have reached the second stage fuel consumption standard and the third stage emission standard.

d) Decrease or remove the consumption tax for vehicles mention above. However, still levy a tax at the production stage.

b) Tax rate confirmation and application

There are four schemes proposed by the work team:

i) Halve the consumption tax for passenger cars which, according to the new consumption tax rate, have reached the second stage fuel consumption standard and the third stage emission standard.

ii) Apply the consumption tax reward to passenger cars that have reached the second stage fuel consumption standard and the third stage emission standard. The amount of the reward should be based on the percentage of how much lower the actual rate is than the standard (if lower than the fuel consumption standard by 10%, reward with a 10% tax).

iii) Apply the consumption tax reward to passenger cars that have reached the second stage fuel consumption standard and the third stage emission standard. The amount of the reward should be based on the amount of how much lower the actual rate is than the standard (if lower than the fuel consumption standard by 0.5 liter, give 10% tax reward).

iv) Give fixed taxation exemption to passenger cars that have reached the second stage fuel consumption standard and the third stage emission standard. The amount of the reward should be based on the amount of how much lower the actual rate is than the standard (if

lower than the fuel consumption standard by 0.5 liter or 10%, give 200 *yuan* tax reward).

2) Punishment scheme

a) How to set the levying stage

i) Levy a punitive tax related to fuel consumption standards at the production stage.

ii) Levy a punitive tax on cars and conceal it in the price of the car so that consumers cannot feel the relationship between price and fuel consumption.

iii) The manufacturer should conceal the tax punishment in the vehicle price.

iv) Imported cars not complying with the standard should also be subject to a punitive tax.

b) Punitive tax rate

There are three schemes proposed by the work team:

i) Double the excise on vehicles not reaching the first stage fuel consumption standard.

ii) Apply a punitive consumption tax to passenger cars not reaching the first stage fuel consumption standard. The amount should be according to how high the actual rate is as compared to the standard. For example, if higher than the fuel consumption standard by 0.2 liter, apply a 10% punitive tax.

iii) Give punishment tax to the passenger cars that have not reached the first stage fuel consumption standard. The amount should be according to how high the actual rate is as compared to the standard. If the rate is higher than the fuel consumption standard by 0.5 liter, apply a 1 or 2 % punitive tax.

With the aid of the project team's research, in June of 2005 the related government department brought forth the punishment scheme.

Apply a punitive tax to passenger cars not reaching the first stage fuel consumption standard prescribed by GB 19578—2004. The calculating formula is below:

Punishment scheme 1: the additional excise rate = excise rate × 50%

Punishment scheme 2: the additional excise rate = excise rate + 5%

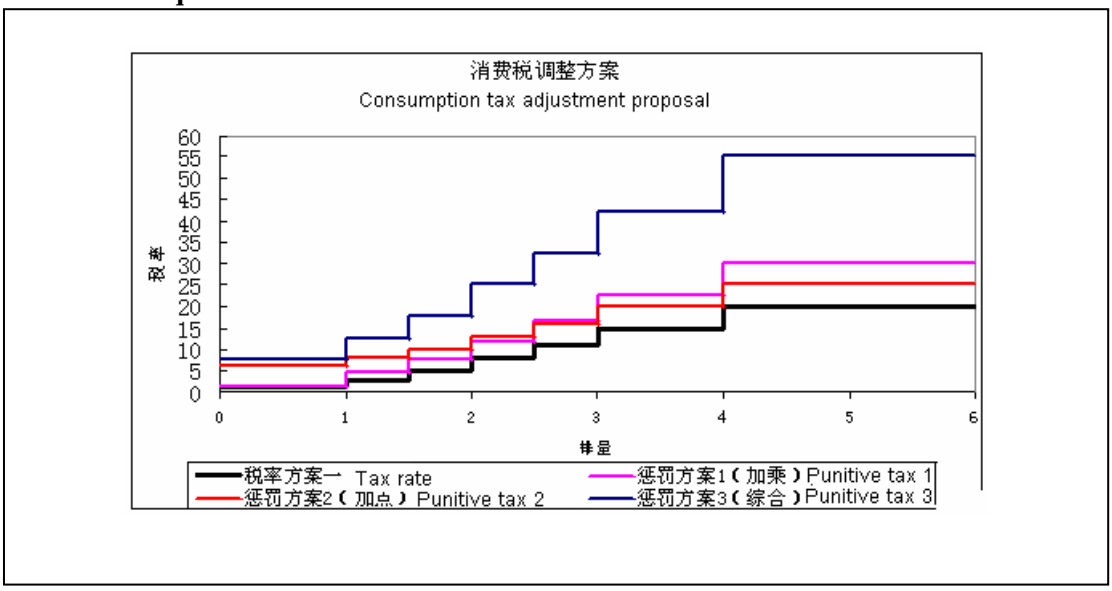
Punishment scheme 3: the additional excise rate = excise rate× 50% + 5%

The excise rate should correspond to the tax rate for the engine displacement of the passenger car.

The total consumption tax rate = consumption rate + the addition consumption rate

Displacement（L）	~1.0	1.0~1.5	1.5~2.0	2.0~2.5	2.5~3.0	3.0~4.0	4.0~
Tax rate	1	3	5	8	11	15	20
Punishment scheme 1	1.5	4.5	7.5	12	16.5	22.5	30
Punishment scheme2	6	8	10	13	16	20	25
Punishment scheme 3	7.5	12.5	17.5	25	32.5	42.5	55

B. Vehicle Acquisition Tax



1. Revenue encouragement scheme for the Vehicle Acquisition Tax

1) Taxation standard for preferential revenue

i) Preferential revenues will be imposed on vehicles reaching the limited fuel consumption of the second phase ahead of schedule, and reaching the national emission standard of the third phase.

ii) Preferential revenues related to auto fuel economy will be imposed in conjunction with the vehicle acquisition tax. The former taxation system and phases do not need to change.

2) Preferential tax rate and ration Every limited grade of vehicle complying with its weight zone is a given a percentage less than the limited fuel economy standard of the second phase. For example, for 10%, the revenue will be decreased 10%.

i) Every limited grade of vehicles complying with its weight zone is given a ration less than the limited fuel economy standard of the second phase. For example, for 0.5 liter, the revenue will be decreased a given percent, such as 10%.

ii) Every limited grade of vehicles complying with its weight zone is given a percent less than

the limited fuel economy standard of the second phase. For example, for 10%, the revenue will be decreased a given ration, such as 500 *yuan*.

iii) Every limited grade of vehicles complying with its weight zone is given a ration less than the limited fuel economy standard of the second phase. For example, for 0.5 liter, the revenue will be decreased a given ration, such as 1000 *yuan*.

2. Revenue Punishment Project for the Vehicle Acquisition Tax

1) Taxation phase of the punishment revenue

i) Punishment revenue related to auto fuel economy will be added and imposed during the vehicle consumption phase. The former taxation system and former taxation phase do not need to change.

ii) The punishment revenue is not included in the auto price. Thus, consumers will be able to perceive the punitive effects of low fuel efficiency.

2) Definition of the punitive tax rate

i) Impose a punitive tax, such as 10%, on vehicles that cannot reach the standards of their weight level, and if their fuel consumption is higher than a certain numerical value such as 0.1 liter.

ii) Impose a punitive tax, such as 2 %, on vehicles that cannot reach the standards of their weight level, and if their fuel consumption is higher than a certain numerical value such as 0.1 liter.

In order to scientifically evaluate the effect of auto tax system regulation, the Toyota Motor Company and Gendai Advanced Studies Research Organization will use the Computable General Equilibrium (CGE) model to appraise and compare the projects. The CGE model will focus on researching how the government applies the tax policies for autos and fuel. Tax policies to research include, the Passenger Car Fuel Consumption Limit Standards, the consumption tax decrease and purchase tax for environmentally friendly vehicles, the fuel tax, and the cash allowance. Members of the team have finished designing the model and dispersing related data to deputies of relevant companies. The results of the model will be finished in November 2005. Additionally, the American National Nested Multinomial Logit can also be used to evaluate the government's application of the Passenger Car Fuel Consumption Limit Standards and Tax Encouragement and Punishment Policy. In the next stage, the work team will research the use of consumption tax rebates and vehicle purchase tax reform to increase the purchase of electric- and gas-powered cars.