

20%节能目标的地区和部门分解及管理
措施和政策建议

**Disaggregation of the 20 %National Energy
Intensity Target to the Provinces and Sectors:
Management Mechanisms and Policy
Recommendations**

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围绕地区分解的几个发现
Findings on Regional Disaggregation

- 调研发现
- 方法论研究发现
- **Findings from Investigation and Research**
- **Findings from Methodology Study**

山东、山西、江苏调研的发现 Findings from Shandong, Shanxi, and Jiangsu

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| <ul style="list-style-type: none"> • 节能组织机构得到加强 <ul style="list-style-type: none"> - 山东省政府成立了“节约能源办公室”，下设3个处 - 山西、江苏节能中心升格为“节能监察中心” • 节能指标已分解到市、主要行业和重点用能企业 <ul style="list-style-type: none"> - 扩大了千户企业的范围，如山西千家企业86家，扩展到200家。 - 与企业签订了节能目标责任书 | <ul style="list-style-type: none"> • Strengthened Energy Conservation Institutions: <ul style="list-style-type: none"> - Shandong provincial govt. set up an energy conservation office, overseeing three divisions. - Shanxi and Jiangsu upgraded their energy conservation centers to energy supervision centers. • Disaggregated energy conservation targets into cities, major industries, and major energy-intensive enterprises: <ul style="list-style-type: none"> - Top-1000 Enterprises Program expanded (Shanxi Top-1000 expanded from 86 to 200). - Energy conservation responsibility agreement signed with enterprises. |
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山东、山西、江苏调研的发现 Findings from Shandong, Shanxi, and Jiangsu

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| <ul style="list-style-type: none"> • 加强了节能管理工作，完善了管理机制 <ul style="list-style-type: none"> - 普遍建立了GDP能耗定期公报制度 - 山东率先尝试实施能耗总量控制制度，建立GDP增长与能耗总量挂钩的联动调控机制 - 山东组织实施三个“节能100项”，即在全省推广100项重大节能技术、100项重大节能装备，实施100项重大节能示范工程 - 山西开展200户重点用能企业的能源审计和监测 | <ul style="list-style-type: none"> • Enhanced energy conservation management and improved management mechanisms: <ul style="list-style-type: none"> - Regular reporting systems on energy consumption per unit GDP (most regions). - Shandong has piloted the implementation of a total energy consumption control system, and established a mechanism to link the growth of GDP with energy consumption. - Shandong implemented three province-wide “energy conservation 100 projects”, promoting 100 major energy conservation technologies, 100 major energy conservation facilities, and implementing 100 major energy conservation demonstration projects. - Shanxi started energy-auditing and monitoring of 200 major energy-consuming enterprises. |
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发现的主要问题 Major Problems

- 地方追求更高GDP的压力巨大，结构调整的目标难以实现
- 越往基层,对上项目、追求高增速的积极性和盲目性越高，而对节能越不重视，越缺乏节能的具体想法
- 分解指标缺乏科学和优化方法
- 节能信息服务严重缺位，难以满足地方政府和企业对节能技术、产品的需求
- 高耗能、高污染的小企业分布广、难治理，工业化过程造成的环境污染已从城镇转移到乡村
- Higher GDP growth = greater difficulty in achieving structural adjustment goals.
- Lower levels of government have greater motivations to pursue a higher growth rate, and pay less attention to energy conservation.
- Scientific and optimal methods for disaggregating the targets are lacking.
- Energy-conservation information services cannot meet the demand of local government and enterprises for energy-saving technologies and products.
- High energy-consuming and high-polluting small enterprises are widespread and hard to oversee; environmental pollution from industrialization has spread from cities and towns to rural villages.

解决问题的建议 Suggested Solutions

- 尽快研究制定实施固定资产项目实行节能评议的标准体系，建立新上项目节能评估一票否决制。
- 分解指标应省市县区别对待，遵循越基层越具体的原则，将节能目标考核与优惠和限制政策挂钩。
- 赋予地方政府采取节能经济激励政策的灵活性，充分利用市场杠杆加大技术创新和结构调整的驱动力。
- 加大节能执法能力建设的力度，建立节能和环保执法联动的检查制度。
- **Study and formulate standards** for the energy conservation evaluation of fixed-assets projects, with one-vote veto system for new projects.
- **Dissaggregate targets** to provinces, cities, and counties should be differentiated; the lower the level, the more concrete the targets should be; link the evaluation of energy conservation targets to preferential and restriction policies.
- **Empower local governments** with the flexibility to use economic incentives to encourage energy conservation, fully utilize the market to drive technology innovation and structure adjustment.
- **Enhance capacity-building** for enforcing energy conservation regulations, establish an inspection system that links energy conservation with environmental protection enforcement.

关键在于地方如何落实节能目标

Local Implementation Is Key

- 今年完成节能目标不乐观
- Meeting the energy-conservation target for 2006 is unlikely.
- 要完成2010年的目标，关键在于帮助地方政府制定行动计划
- To meet the 2010 targets, helping local governments set up action plans is key:
 - 分析节能潜力
 - Analyze energy conservation potential.
 - 确定政策着力点
 - Determine the policy focus.
 - 绘制路线图（含时间段）
 - Create a roadmap.
 - 条件和环境需求
 - Examine local conditions and environmental requirements.

方法论研究 Methodology Study

1. 按照目前分解方案的结论
1. Based on conclusions of the current disaggregation plan:
 - 收集了全国30个省市区的“十一五”规划纲要
 - Collected the 11th five-year development plans of 30 provinces and municipalities.
 - 汇总了各地经济发展和单耗下降指标
 - Created economic development and energy intensity indicators for all regions.
 - 根据各地GDP占全国的比重和变化情况，测算了在规划目标指标下，全国是否能实现单位GDP能耗下降20%的目标
 - Predicted the probability of achieving the 20% target based on the current development plans and according to the proportion of the region's GDP within the national total.

各地GDP单耗下降目标 Regional Energy Intensity Reduction Goals

地 区	GDP单耗下降幅度(%)	地 区	GDP单耗下降幅度(%)	地 区	GDP单耗下降幅度(%)
西 藏	12				
海 南	12	上 海	20	四 川	20
福 建	16	江 苏	20	贵 州	20
广 西	16	浙 江	20	陕 西	20
云 南	17	安 徽	20	甘 肃	20
青 海	17	江 西	20	宁 夏	20
北 京	20	河 南	20	新 疆	20
天 津	20	湖 北	20	山 东	22
河 北	20	湖 南	20	山 西	25
黑 龙 江	20	重 庆	20	吉 林	30

2010年可能实现降耗20%的目标 It is possible to achieve the 2010 20% target

按照目前各地的规划目标: **According to the current planning goals for the regions:**

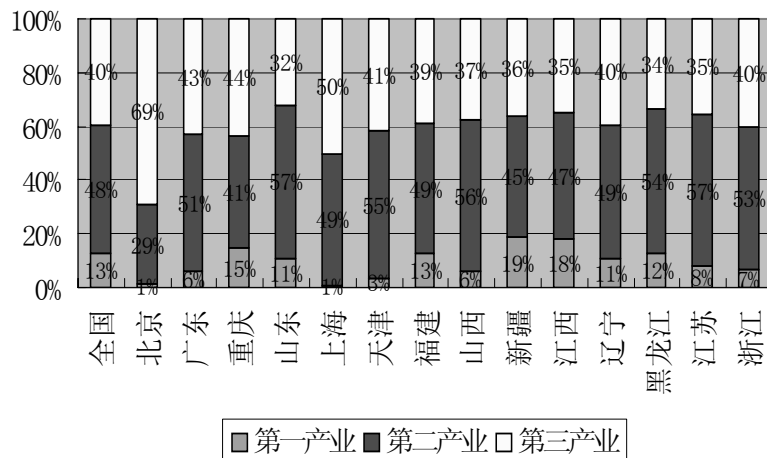
- 到2010年全国GDP增长速度为9.9%.
- 单位GDP能耗下降19.7%.
- 2010年能源需求总量为33.6亿吨标准.
- 能源消费弹性系数0.52.
- By 2010, the national GDP growth rate will be 9.9 %.
- Unit GDP energy consumption will decrease by 19.7%.
- Total energy demand in 2010 will be 3.36 billion tce.
- Energy consumption elasticity will be 0.52.

采用虚拟结构分析的方法 Adopting a Virtual Structure Analysis Method

- 分析不同类型地区的节能潜力分布
- 决定不同类型地区的政策取向
- Analyze the energy-saving potential for different types of regions.
- Determine the policy direction for different types of regions.

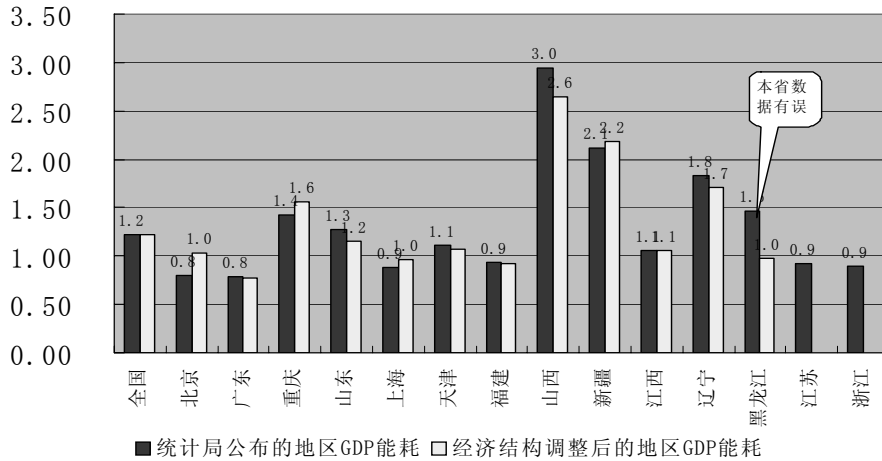
部分省市三次产业结构差异 Industrial Structure Comparison

直辖市一产比重低：北京、上海、天津<3%
北京、上海三产比重高：北京比重最高(69%)
大部分省份二产比重在55%左右：山东57%，天津55%，山西56%，江苏56%，浙江53%

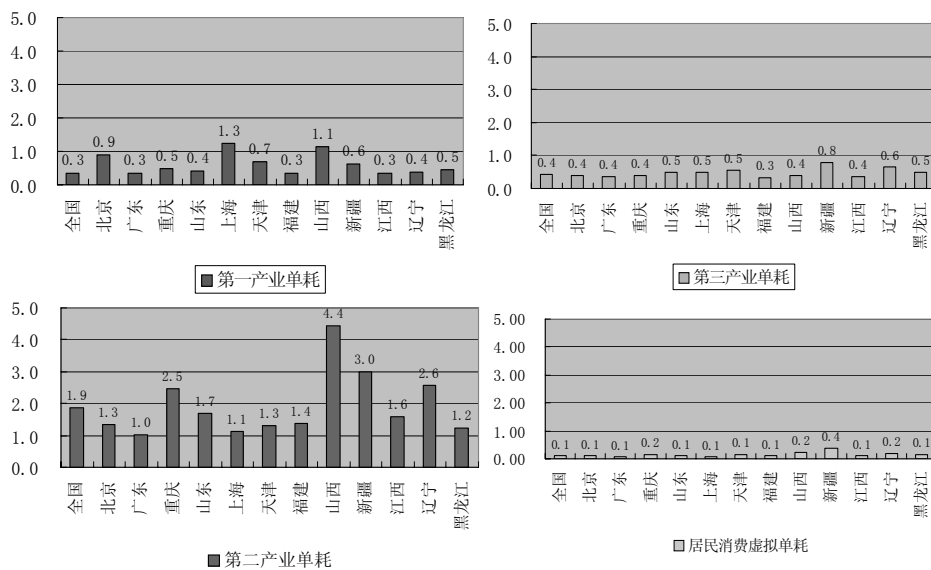


按全国经济结构（13:47:40）调整后的“虚拟万元GDP能耗” Energy Intensity After Industrial Structure Adjustment (13:47:40)

三产比例高的省市和一产比例高的省市“虚拟万元GDP能耗”增加；
二产比例明显偏高的省市（山东、山西、辽宁）“虚拟万元GDP能耗”降低



典型省份单位GDP能耗公报数据的分项研究及 各省三次产业与居民消费的单耗（虚拟单耗）的比较 Analysis of Energy Intensity in Certain Provinces and Comparison of Energy Intensity of the Three Industries and Residential Use



背后隐藏的“规律”? Patterns Behind the Numbers?

- 处于工业化初级阶段的省份（山西），资源型工业和粗放型发展导致当地单位GDP能耗明显偏高。
- 处于工业化中期的省份（山东），对工业发展质量的提高和产品产业链的延伸使其向摆脱资源束缚的方向发展，单位GDP能耗可以下降。
- 处于工业化中后期的省市（北京），这些地区有条件率先实现第三产业比重快速提高，给进一步下降万元GDP提供了保障。
- 偏重外向型经济的发达省份（广东？据称广东GDP比GNP多20%？需数据支持），背负了较重的国外包袱，对资源消耗的依赖程度仍比较大。
- **Provinces in the early stages of industrialization (e.g. Shanxi):**
Resource-intensive industries and extensive development patterns have caused high energy intensity.
- **Provinces in the middle stages of industrialization (e.g. Shandong):**
The proportion of resource-intensive industries is declining due to improvement in industrial development quality and extension of the products chain; energy consumption per unit GDP will possibly decrease.
- **Provinces in the middle or late stages of industrialization (e.g. Beijing):**
Rapid growth of the tertiary industry guarantees the further decline of energy consumption per unit GDP.
- **In export-oriented developed provinces (e.g. Guangdong):**
Economic growth largely depends on resource consumption due to the heavy reliance on exports.

目前分解指标的做法和依据 Methods and Basis of Current Target Disaggregation

- 以地方提出节能目标和中央政府微调相结合的办法，已有各地区指标初步分解的方案。
- **A draft disaggregation plan has been created by combining the targets proposed by the provinces with adjustments from the central government.**
- 依据：产业结构、技术改进和管理水平、能源消费总量、能源产地因素、人均能源消费量。
- **Basis: industrial structure, technology and management, total energy consumption, energy production regions, energy consumption per capita**

回顾气候变化减排方案的做法

Review of Global Warming Mitigation Approaches

回答谁来减排:

- 经济性: 最小成本法
- 减排能力: 资金、技术
- 排放责任:
 - 发达国家/发展中国家
 - 历史、未来、积累、人均水平等因素

Who will mitigate global warming:

- Economics: lowest cost
- Mitigation capacity: capital, technology
- Mitigation obligations:
 - Developed countries/developing countries
 - History, future, accumulation, per capita level

解决多目标决策问题

Solution to Multi-Goal Decision-making

- | | |
|---|--|
| <ul style="list-style-type: none"> • 经济性 <ul style="list-style-type: none"> – 不计代价 – 地区间最小成本 (能源价格、劳动力价格、技术选择等) • 公平性 <ul style="list-style-type: none"> – 沿海/内地, 东中西部 – 资源省/消费省 • 其它问题 (民族) | <ul style="list-style-type: none"> • Economics <ul style="list-style-type: none"> – At any cost – Lowest regional cost (energy price, labor price, technology path) • Equality <ul style="list-style-type: none"> – Coastal regions vs. inland areas
Eastern, Western, and middle China – Resource supply regions vs. resource consumption regions • Other Issues (minority nationalities) |
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指标分解方法论研究

Target Disaggregation Methodology Study

- 选取能源经济类、资源环境类和社会发展类等指标建立指标体系
 - 可获得性
- 指标分解应在各地经济和社会发展水平的基础上，围绕节能潜力、节能动力和节能压力
- 遵循的原则应反映各地的：
 - 节能潜力（技术、管理、结构方面的节能潜力，以及经济水平、能力高低等）
 - 面临的难度障碍（社会经济发展水平、经济发展的惯性、科技水平和能源管理水平等）
 - 节能的必要性（经济总量和能源消费的地位、面临的结构过重、产业落后状况等）
- Establish an indicator system: energy, economy, resource, environment, social development, etc.
 - Availability
- Target disaggregation should be based on regional economic and social development, status and focus on energy potential, energy saving motivation, and energy saving pressure.
- Target disaggregation should reflect:
 - **Energy saving potential** (technology, management, structure, economic development, capacity)
 - **Difficulties and barriers** (social and economic development stage, inertia of economy, science and technology, energy management capacity)
 - **Necessity** (scale of economy, total energy consumption, heavy industry-dominated structure, lagging industry development)

相关指标

Indicators

- | | |
|--|---|
| <ul style="list-style-type: none"> • GDP（总量、人均、增速） • 能源消费（总量、人均、增速） • 弹性系数变化率 • 能源结构 • 能源输入/输出 • 产值能耗 • 能源价格 • 投资率 • 人均收入 • 环境容量 | <ul style="list-style-type: none"> • GDP (total, per capita, growth rate) • energy consumption (total, per capita, growth rate) • elasticity coefficient • energy mix • energy input/output • energy consumption per 10,000 RMB • energy price • investment rate • per capita income • environmental capacity |
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原则 Principles	具体指标 Indicators
节能潜力 Energy Saving Potential	单位GDP能耗水平 energy consumption per unit GDP
	工业增加值能耗 energy consumption per unit industrial value added
	人均能耗 energy consumption per capita
	人均GDP per capita GDP
	工业增加值占GDP的比重 industrial value added / GDP
	高耗能产业增加值占工业增加值的比重 energy-intensive sectors value added / industrial value added
	高耗能产业单位增加值能耗 energy consumption per unit value added in energy-intensive sectors
	节能资金占财政收入比重 energy saving expenditure / tax revenue
	科技活动人员占人口比重 S & T personnel / total population
	科技活动经费支出 S & T expenditure
难度和障碍 Difficulties and Barriers	人均GDP per capita GDP
	工业占GDP比重 industrial value added / GDP
	高耗能产业增加值占工业增加值的比重 energy-intensive sectors value added / industrial value added
	能源自给率 self-supply of energy
	煤炭占一次能源比重 coal consumption / primary energy consumption
	外贸出口比重 export / GDP
	每万人口在校学生数（高等教育） number of university students / 10,000 population
	科技活动人员占人口比重 S & T personnel / total population
科技活动经费支出 S & T expenditure	
节能必要性 Necessity	地区生产总值占全国比重 regional GDP / national GDP
	能源消费量占全国比重 regional energy consumption / national total
	SO2排放占全国总排放量比重 regional SO2 emissions / national total
	空气质量处在三级及劣三级以下城市占该省城市数比重 number of cities whose air quality is below level 3 / total number of cities in the region

分不同的类型区 Classification of Regions

第一类——经济发展相对发达型
Category 1 - Developed regions

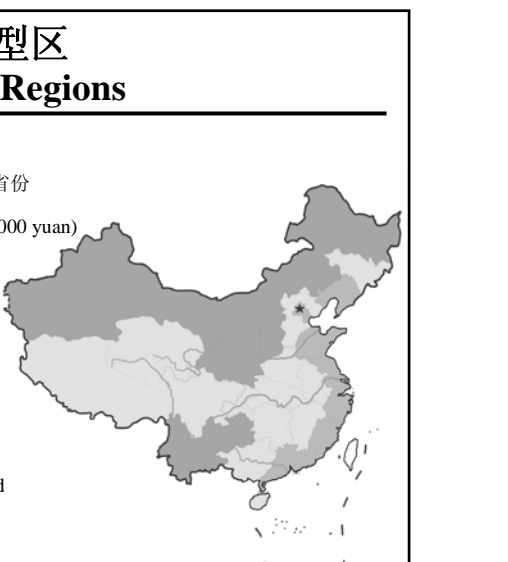
- 主要指标：经济比较发达省份，人均GDP前9名省份 (>1.8万元)
Key indicators: per capita GDP ranking first 9 (>18,000 yuan)
- 经济总量在全国占据重要地位
Economy scale ranks high
- 也是人口大省 Large population
- 均为能源进口省份 Energy import regions

第二类——能源基地型
Category 2 - Energy production base

- 主要指标：已是或将是能源输出型省份
Key indicators: is or will be energy export regions
- 规律：经济不够发达
Other characteristics: economy is not very developed

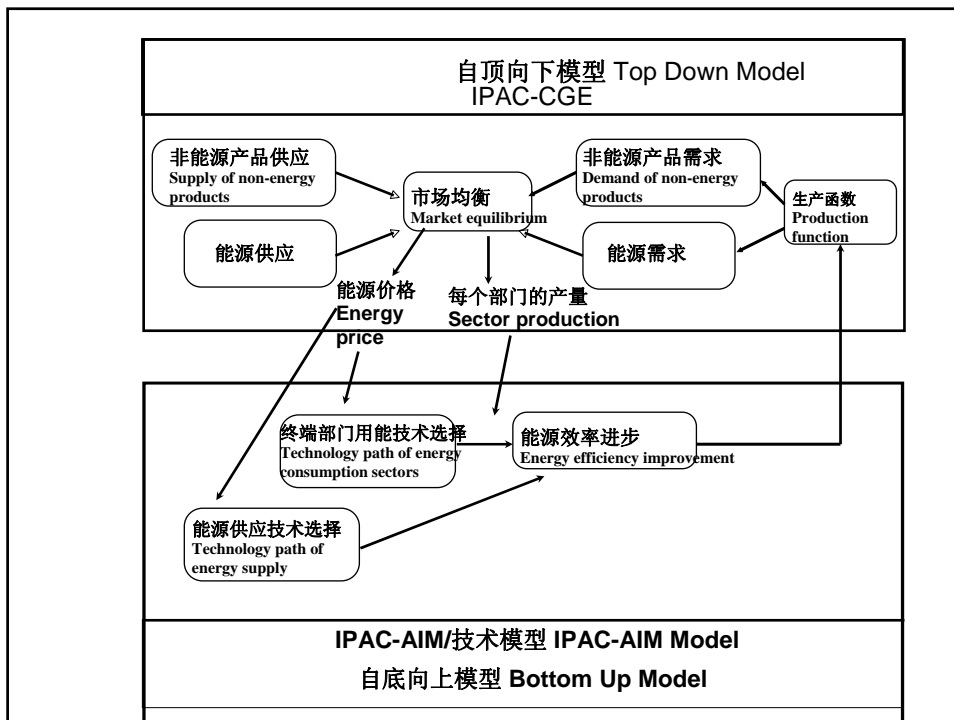
第三类——经济欠发达、能源也较匮乏型
Category 3 - Undeveloped, energy-scarce regions

- 经济相对不够发达
Economy is relatively undeveloped.
- 经济总量在全国的重要性低
Economy scale ranks low.
- 本地能源资源相对比较匮乏，目前和今后发展需能源输入
Energy resource is scarce, needs energy import.

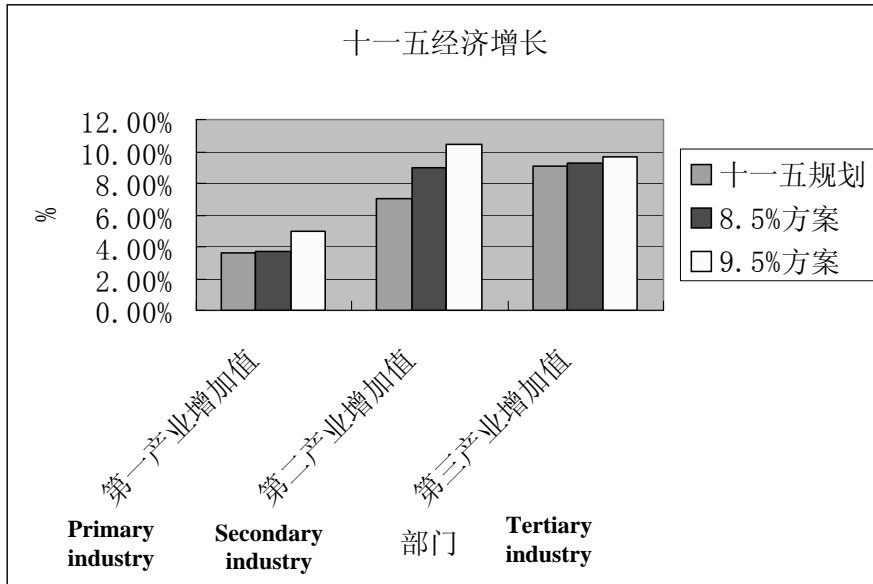


20%节能目标部门分解研究方法 Research Method for Target Disaggregation

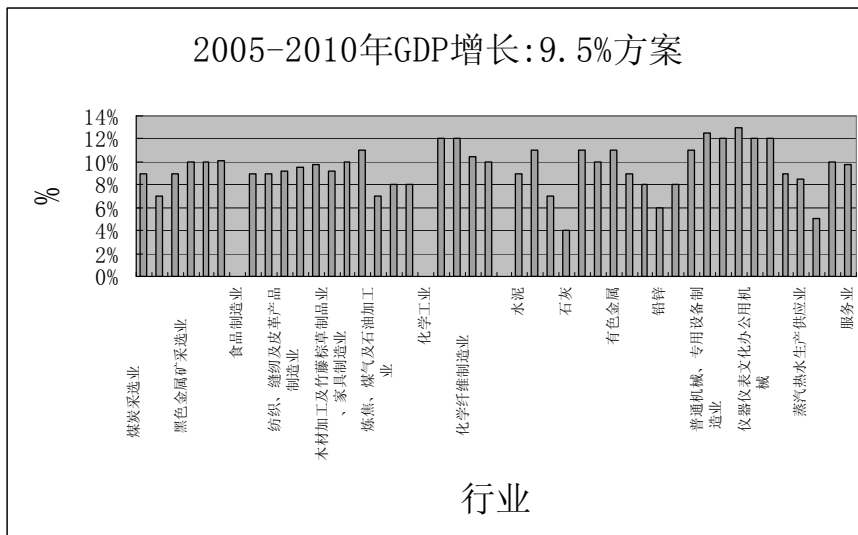
- 分解经济增长:十一五规划,8.5%增长方案,9.5%增长方案.利用IPAC-CGE模型得到分部门经济发展.
 - 分部门实物量(产量)增长:部门实物量增长与增加值增长的关系,产品结构,价格变化(可比价格).
 - 分部门能源需求:利用IPAC-AIM/技术模型分析提供产量增长的耗能技术构成,获得能源需求
 - 确定各部门对20%节能目标的贡献
 - 提出实现20%目标的政策
- Disaggregate economic growth: 11th Five-year Plan, 8.5% growth rate scenario, 9.5% growth rate scenario.
 - Sector production growth: increase of quantity of goods vs. increase of value added, products structure, price.
 - Sector energy demand: use IPAC-AIM model to analyze the technical constitution of energy consumption that meets the demand of production growth, and calculate sector energy demand.
 - Determine the contributions of each sector to the 20% target.
 - Propose policy options to achieve the 20% target.



Economic Growth in 11th Five-year Plan

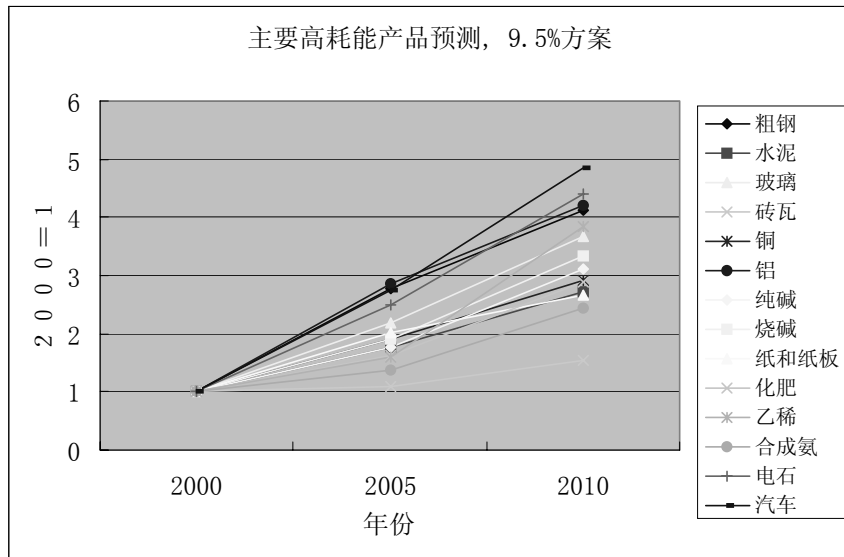


2005-2010 GDP Growth Rate: 9.5% Scenario



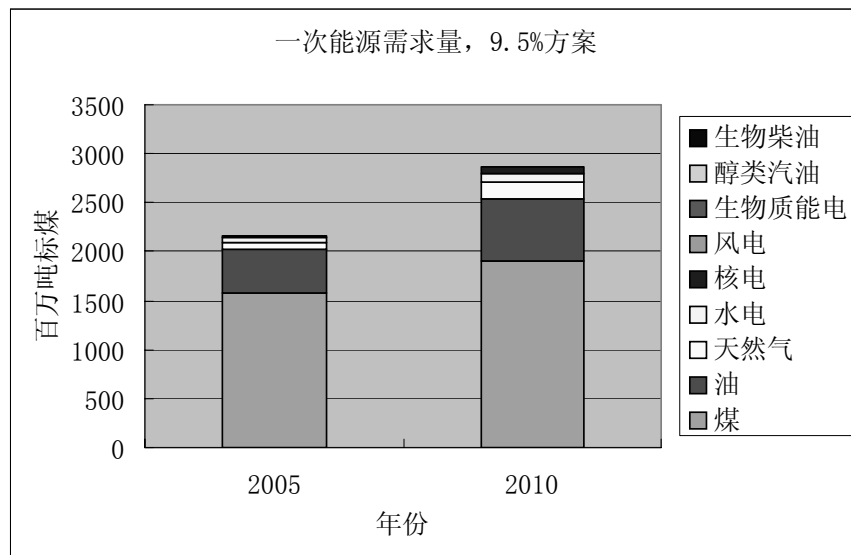
Predictions for Key Energy-Intensive Products: 9.5% scenario

主要高耗能产品预测, 9.5%方案

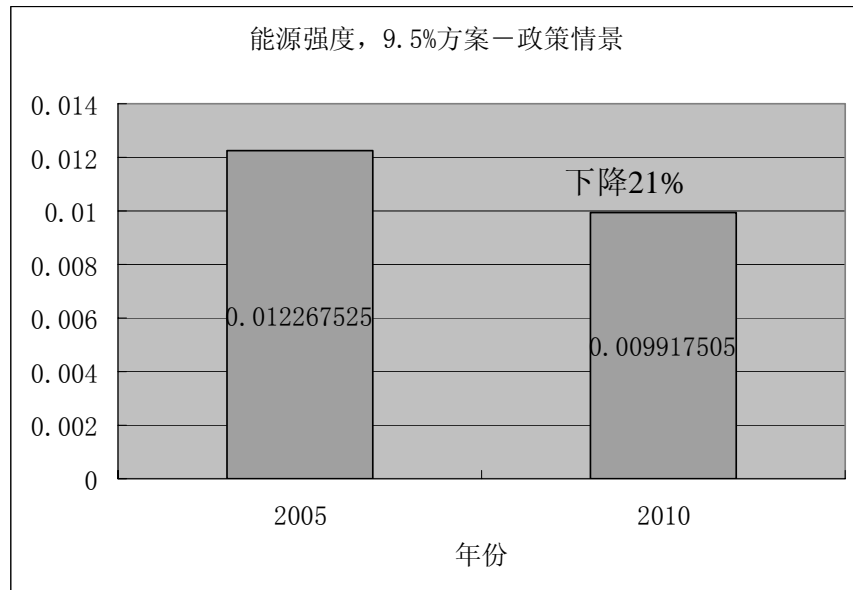


Primary Energy Demand: 9.5% Scenario

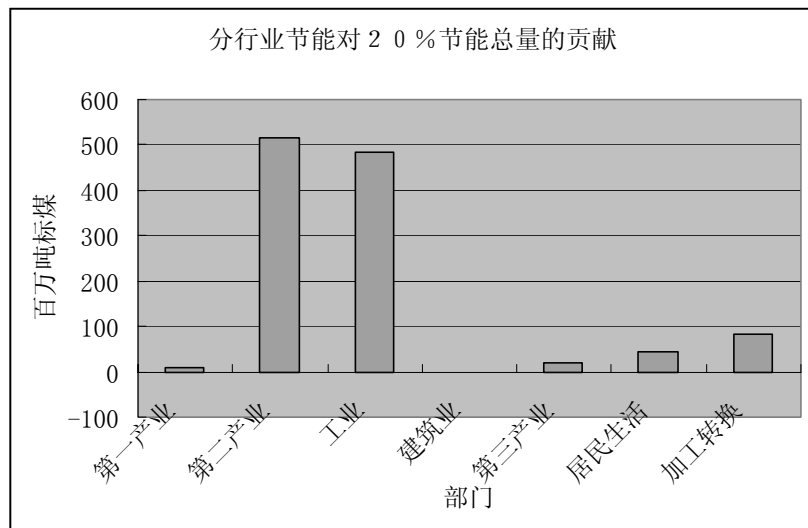
一次能源需求量, 9.5%方案



Energy Intensity: 9.5% scenario

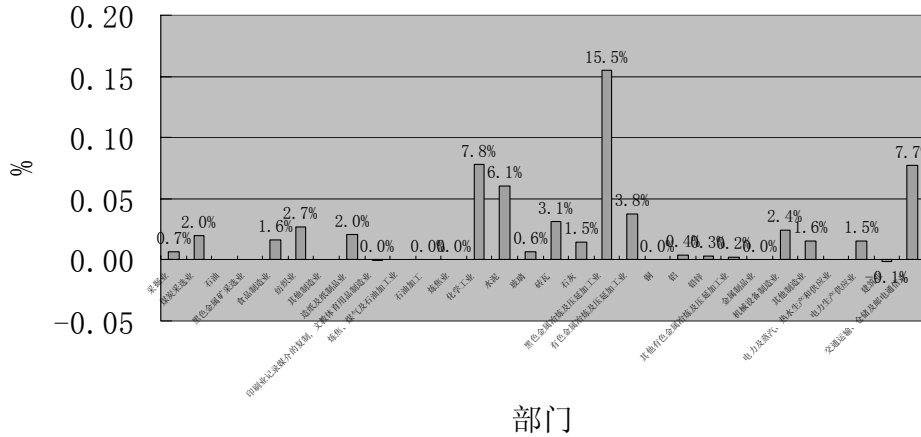


Industry Contributions to 20% Target



Sector Contributions to 20% Target

分部门对 20% 的贡献



政策建议

Policy Recommendations

财政政策:

- 尽早采用燃油税. 同时提前公布采取能源税的日程.
- 在已经采取减少出口退税的基础上, 公布进一步措施的时间表, 使企业早有准备, 并影响未来近期的投资

Fiscal Policies:

- Adopt fuel tax, announce agenda for adopting energy tax.
- On the basis of reducing the export tax rebate, announce agenda for taking further measures to enable enterprises to make preparations for future investment.

投资政策:

- 加大对促进城市环境友好设施的建设投入力度(垃圾处理, 污水处理), 在可以建立的城市均要建立. 可以通过提高收费来实现赢利, 这样可以吸引非政府投资.
- 大幅加大构建公共交通的投入, 特别是轨道交通. 北京已经有比较好的吸引民间资本的经验.
- 加大国家对技术开发的投入. 采用债券等多种途径进一步吸纳民间资金.

Investment Policies:

- Increase investment in environmentally-friendly facilities (e.g. waste treatment, sewage treatment), attract private investment through price increase.
- Increase investment in upgrading public transportation systems, particularly railways; Beijing has had success in attracting private capital.
- Increase government investment in technology R&D; attract private capital through issuing bonds

政策建议(续) Policy Recommendations (Cont'd)

节能政策:

- 大力强化行业的节能, 实现部门节能目标.
- 大幅度提高已有技术的能耗标准, 采取市场准入制度.
- 严格实施建筑节能标准, 使新建建筑的节能普及率明显提高. 如北京方式, 青海方式.

新能源和可再生能源政策:

- 建筑太阳能热水器大力普及. 如秦皇岛的对策.

环境政策:

- 需要进一步强化的环境政策. 环境政策可以影响工业和能源发展, 但也会增加能源消耗. 环境政策会促进新型产业, 这对经济发展有益.
- 鼓励东部已经发达但已经失去优美环境的省份加大产业结构调整, 和恢复环境的投入

Energy Conservation Policies:

- Strengthen energy conservation in energy-intensive industries; achieve sector energy saving goals.
- Largely improve EE standards of existing technologies; adopt market access mechanism.
- Strictly enforce EE standards for buildings and increase the construction of EE buildings, such as in Beijing and Qinghai.

New Energy and Renewable Energy Policies:

- Promote the application of solar water heaters in buildings, such as in Qinghuangdao.

Environmental Policies:

- Enhance environmental policies to impact industrial and energy development and promote the formation of new types of industries that benefit the environment.
- Encourage the developed regions in the East that suffer most from environmental pollution to adjust their industrial structure and increase investment in environmental protection.