

CHINA'S ENERGY POLICIES: CONSEQUENCES FOR U.S. CONSUMERS AND REGULATORS

能源



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ANNUAL CONVENTION
PALM SPRINGS, CA
NOVEMBER 13, 2005

Overview

- China's economic surge and how its energy demand growth is driving energy costs worldwide
- Challenges in achieving sustainable development
- Underpinnings of its current energy policy
- Implemented and planned reforms to grapple with supply and demand forecast
- How its policies will affect U.S. energy policies regarding energy affordability, among other areas

China's Economic growth: Driving Energy Demand

- China's economy → has grown an average of 9 percent per year over last 25 years
- China consumes:
 - Half of the world's cement
 - Quarter of all steel
 - Two-fifths of all copper

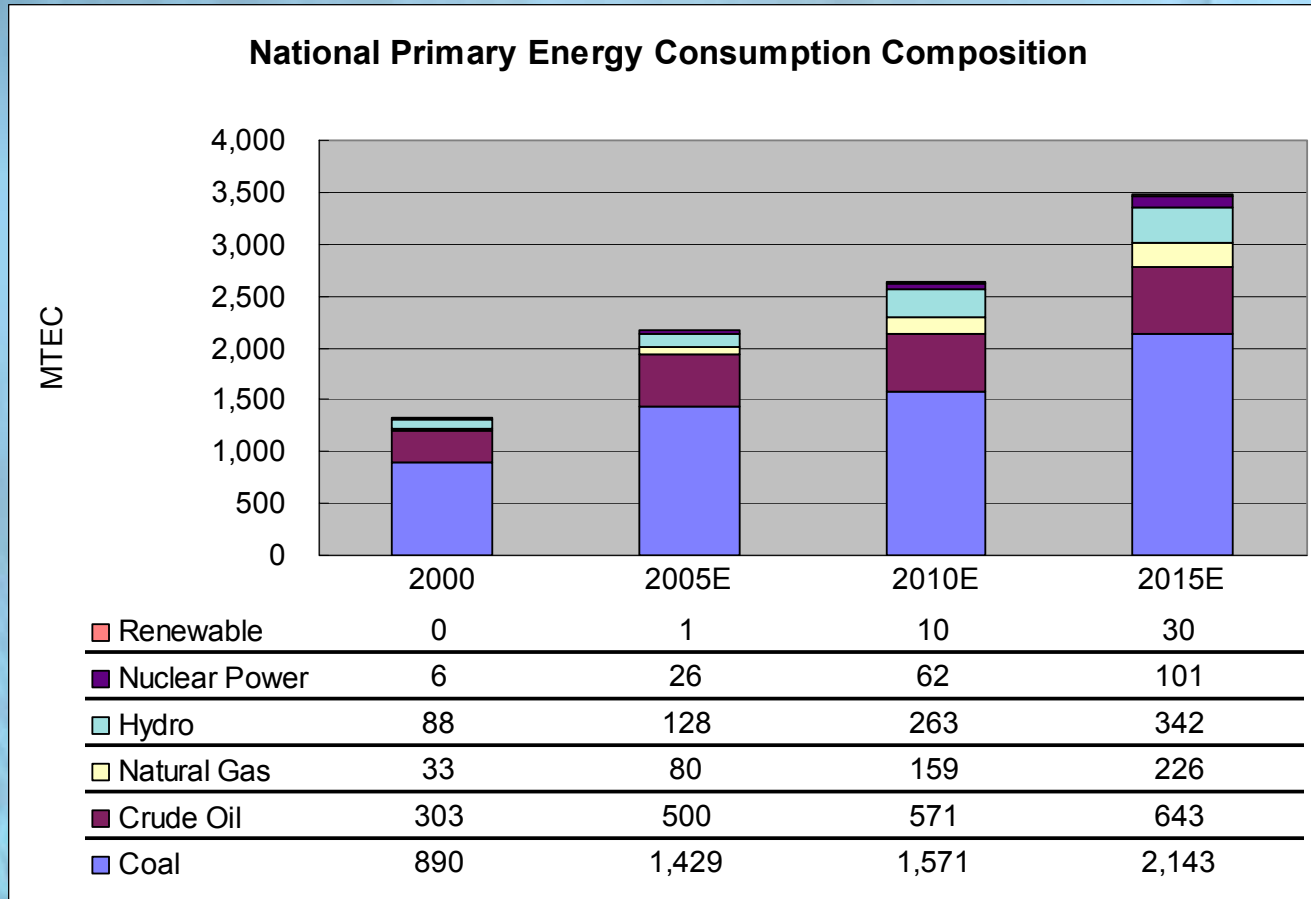
One illustration of this economic expansion



- In 2005 alone, Shanghai will complete towers with more space for living and working than there is in all the office buildings in New York City.
- Shanghai has 4,000 skyscrapers, double the number in New York, with plans to build 1,000 more by the end of the decade.

Source: New York Times, "China Builds Its Dreams, and Some Fear a Bubble", October 18, 2005

Current and Projected Resource Mix

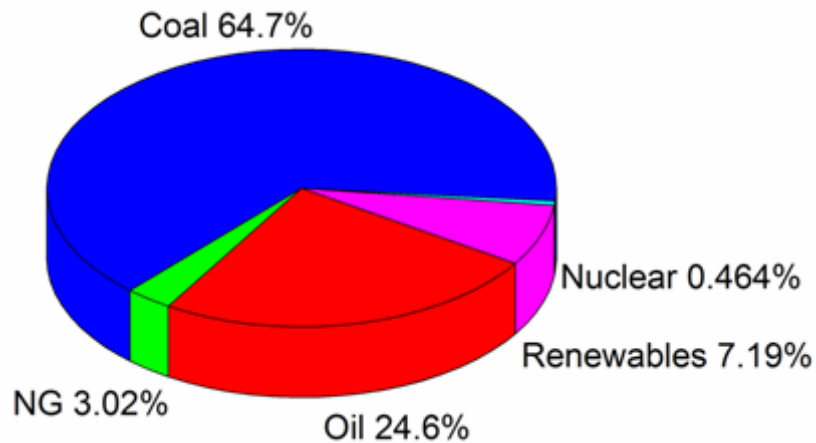
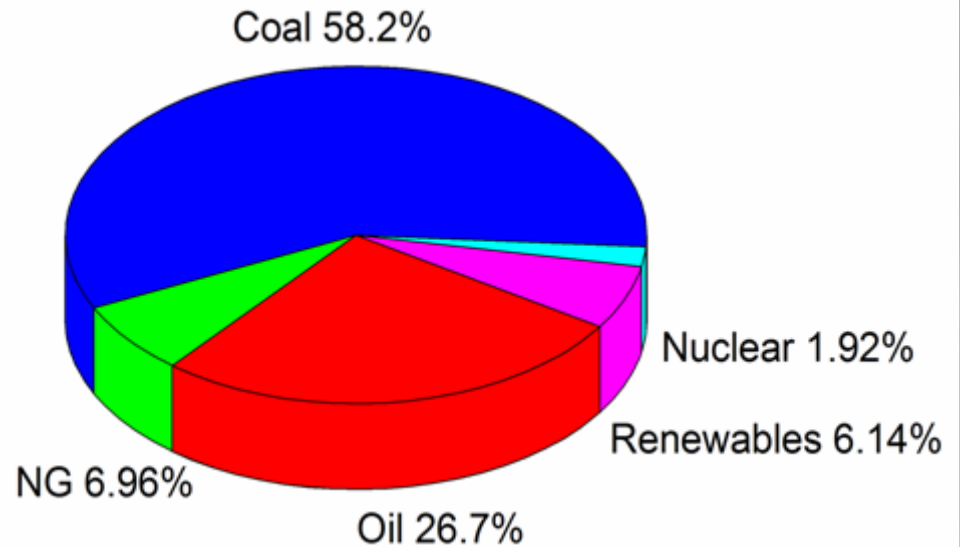
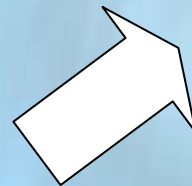


Source:: Xiaolin Li, Managing Director
Songlin Group

China's Energy Consumption: EIA's Forecast

China 2025
Total: 2752 Mtoe

China 2002
Total: 1089 Mtoe



Source: DOE/EIA, Int. Energy Outlook, 2005

Energy Demand

- Since 1980, China's energy demand has grown 4.3 percent annually
- Historically, China's energy intensity per unit of GDP has been low, but in most recent years has been 3 times that of the world's average
- Reasons:
 - Low proportion of high value-added products
 - Higher proportion of industries with high energy intensity in GDP (driven by investment)
 - Low energy efficiency

China Is Heavily Dependent Upon Coal. . .

- Coal consumption: one-third of the world's total and twice that of U.S.
- Coal makes up 65 percent of China's primary energy consumption
- By 2025, China could account for one-quarter of all CO2 emissions
- Each week, China builds one additional, coal-fired 1 GW power plant
- This year, this rate of growth will equal the total installed thermal generation of the United Kingdom (~ 60 GW)

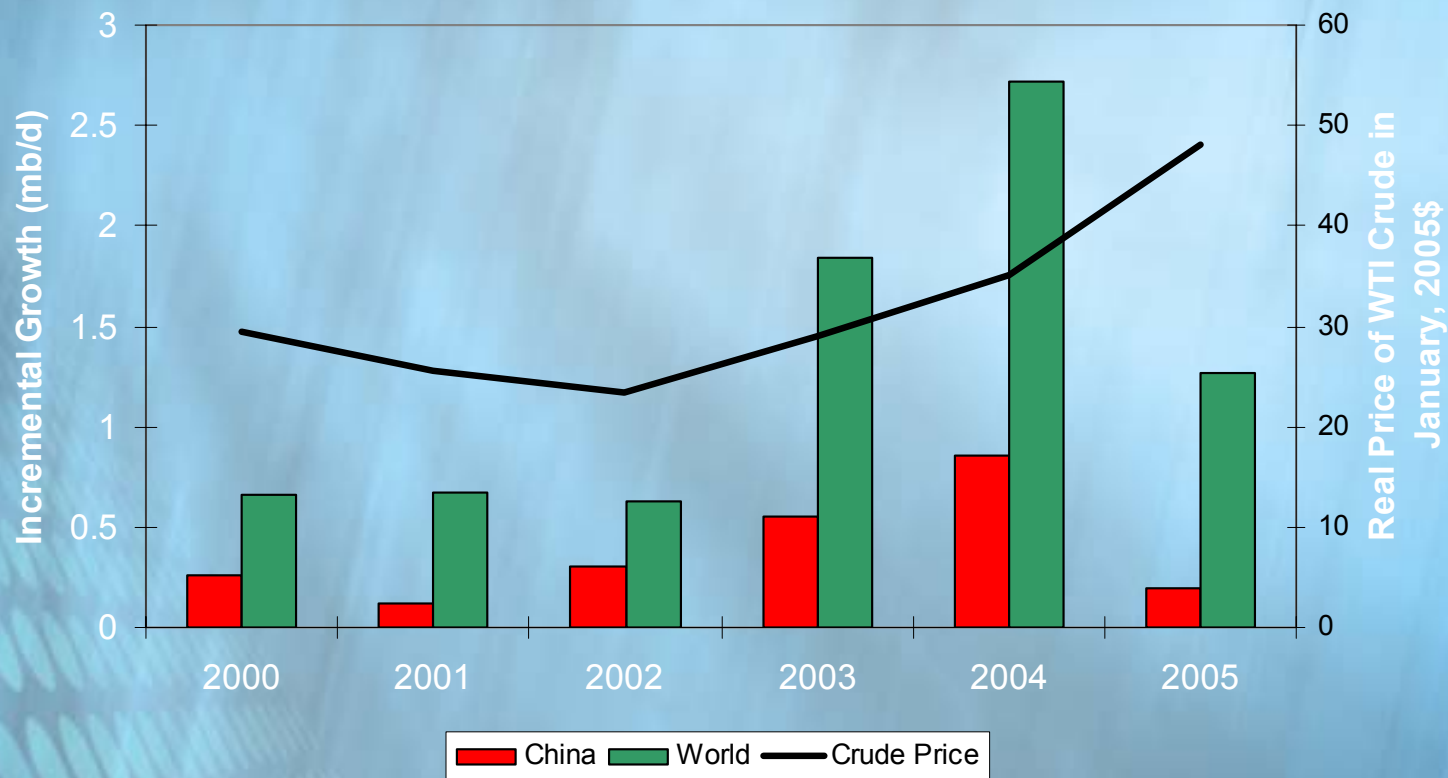


. . . and Oil, Particularly Imports

- Prior to 1993, China was a net exporter of oil
- In 2003, China replaced Japan as the second largest consumer of oil
- By 2005, it consumed 6.4 million b/d, one-third of U.S. consumption
- Prices for retail petroleum products are still regulated, causing economic dislocations
- Now relies on importing 40 percent of oil needs (3 million b/d)
- This trend has contributed to upward price pressure on global oil markets
- IEA forecast: imports will increase by 2030 to 10 million b/d, or 80 percent of needs

But this year, China's share of global oil demand actually fell

Chinese Crude Demand and Global Prices



Sources: Oil Market Report, IEA, 11 October 2005.;
Jeff Logan, World Resources Institute

The Impact Of China's Economic Growth on Energy Use


- Resource intensive, wasteful and inefficient
- Emphasis on speed and scale
- Poor or no coordination between planning and execution
- Environmentally damaging
- Unsustainable


Major Challenges to Energy Sector


- Imbalance of energy supply and demand with increasing dependence on foreign supply
- Irrational energy portfolio with over-reliance on coal
- Unsafe coal production facilities
- Inadequate power grid
- Low energy utilization efficiency

China's Current Energy Policy

- Accelerate energy exploration and production
 - Increase the reserve and production capacity of domestic energy resources
 - **Cooperate in energy resources development worldwide (“Go Out” strategy of National Oil Companies)**
- Optimize the energy resource mix
 - Develop hydroelectric power (e.g., Three Gorges Dam)
 - **Promote the development of nuclear power – additional 27 GW by 2020**
 - Increase natural gas use from 3 percent currently to over 7 percent by 2025 (including LNG)
 - **Passage of *Renewable Energy Law* mandating 10 percent of all of China's energy to come from renewable sources by 2020**

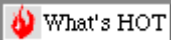
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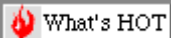
China's Current Energy Policy (con't)

- Bolster energy efficiency



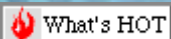
- Emphasize both production and conservation but **give greater priority to conservation**
- By 2020, have GDP quadruple while energy consumption only doubles

- Emphasize environmental protection



- **support R&D and application of clean coal technology**
- Impose greater controls on discharge of traditional pollutants (SO₂; NO_x)

- Safeguard energy security



- phase in **strategic oil reserve** and emergency response mechanism
- pay greater attention to the coal mine safety
- **construct a reliable energy transportation system**

Energy Regulatory Reforms

- Over the past several years, government reorganizations have been implemented seeking to reform the decision-making process
- But progress is still hampered by
 - interagency infighting over jurisdiction
 - Battles between market-oriented officials and state-enterprise supporters
 - Lack of transparency in decision-making process
- In 2002, State Electricity Regulatory Commission formed
 - But still not a independent regulator
 - Tariff jurisdiction still shared with National Development and Reform Commission (NDRC)

Power Sector Reforms Have Been Underway. . .

- Reorganization of State Power Corporation's generation assets into five national generation companies – encouragement of independent power producers
- Formation of two grid corporations, establishment of four auxiliary groups for construction, maintenance and design
- Creation of a power pool to promote competition -- pending
- Tariff reforms -- ongoing but still problematic (e.g., lack of full cost pass through for higher coal costs)

. . . But Not Without Difficulty

- Foreign investors in independent power projects, some lured by oversized return expectations, have been disinvesting (AEP, Sithe, Alstom, Siemens, Alliant Energy)
- Underdeveloped rail transport has impeded coal carriage
- Lack of adequate transmission infrastructure has hampered west (resource) to east (market) power delivery
- Severe power shortages have arisen in 24 provincial grids
- Remedies:
 - Accelerated construction of 65 GW of new generation
 - Increased coal mining capacity
 - Closure of factories with high energy intensity
 - Promotion of new and upgraded grid construction
- But surplus capacity anticipated by 2007

China's Energy Policies: Implications For The U.S.

- China's power grid delivery limitations has affected global oil prices
 - In 2004, China required additional 800,000 b/d, of which 200,000 was for fuel oil and diesel for power generation
 - This increment contributed to tightness in the global supply/demand balance
 - Oil demand is slackening as greater coal-fired generation has been added
 - Big unknown is rate of fill of Strategic Petroleum Reserve: will this place price pressure?

China's Energy Policies: Implications For The U.S. (Con't)

- Sustained upward pressure on global oil prices will keep commodity costs of energy high for U.S. consumers
 - Immediately seen in residual fuel oil and diesel used for power generation
 - Higher natural gas prices still correlate with higher oil prices, even allowing for diminishing fuel switchability among generators (Federal Reserve analysis)
 - Demand for coal, attributable to natural gas price increases, will in turn prompt increasingly higher coal prices

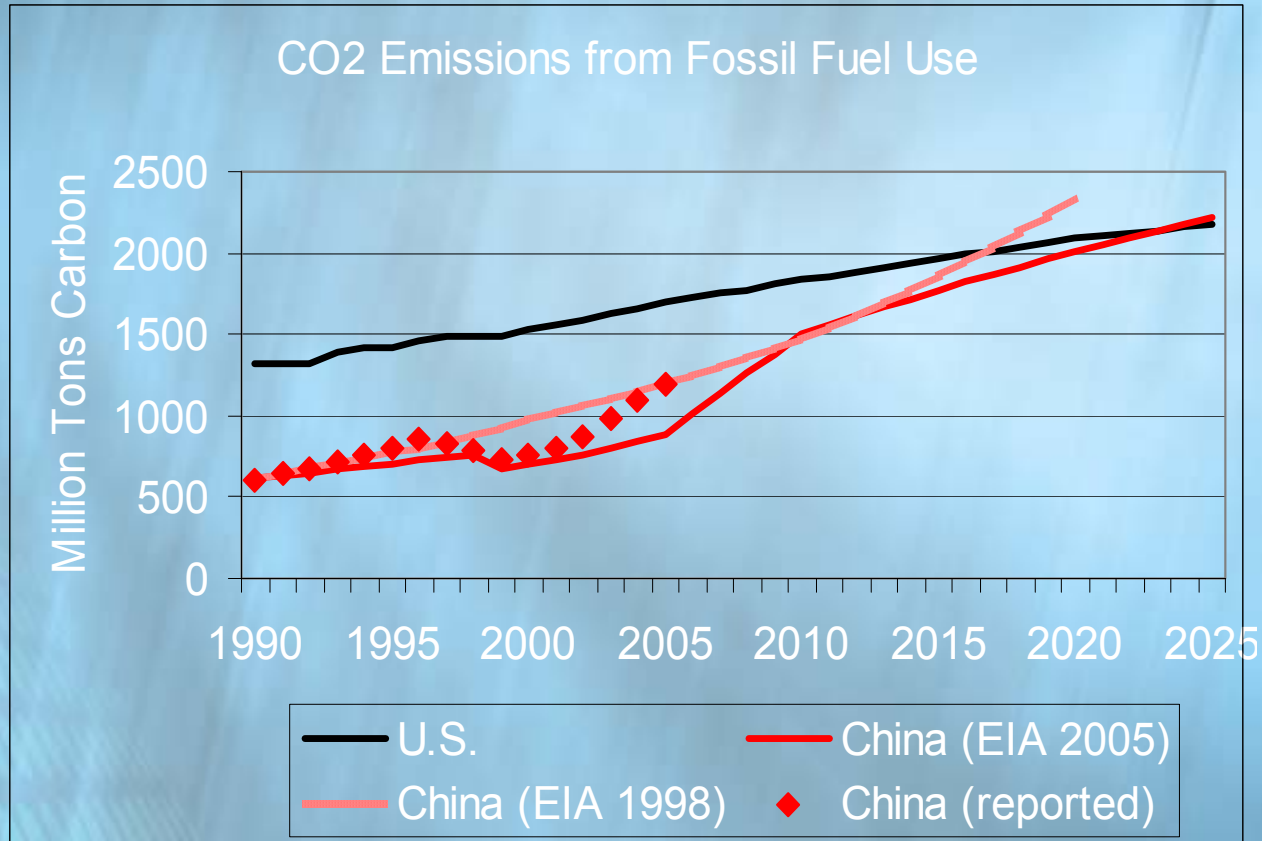
China's Energy Policies: Implications For The U.S. (Con't)

- As commodity costs constitute increasing share of delivered cost of power, retail suppliers will need to sharply delineate service distinctions to maintain market share in competitive retail power markets
- Regulators will be required to acknowledge supranational market forces affecting delivered prices for natural gas and power
 - Will arise as utilities seek to adjust fuel costs
 - Consuming public will need to be convinced -- a difficult and uneasy task

China's Energy Policies: Implications For The U.S. (Con't)

- U.S. and China will become increasingly “joined at the hip” in fashioning future energy policy
- This is already the case in the quest for overseas oil reserves which raises the issue of energy security for both countries
- Also will be the case under any future carbon-reduction scenario
 - Pressure will increase for U.S. to link its policies on greenhouse gas emissions with China's policies
 - Bilateral clean coal technology cooperation is active, but much more needs to be done

China and U.S. Carbon Dioxide Forecasts



Source: EIA. Reported values are estimated after 2002 based on preliminary energy growth rates

Acknowledgements

Special thanks to
Dr. Xiaolin Li, Songbin Group
and
Jeff Logan, World Resources Institute
for their assistance

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