China's Future Energy Needs and the Outlook for Developing Countries

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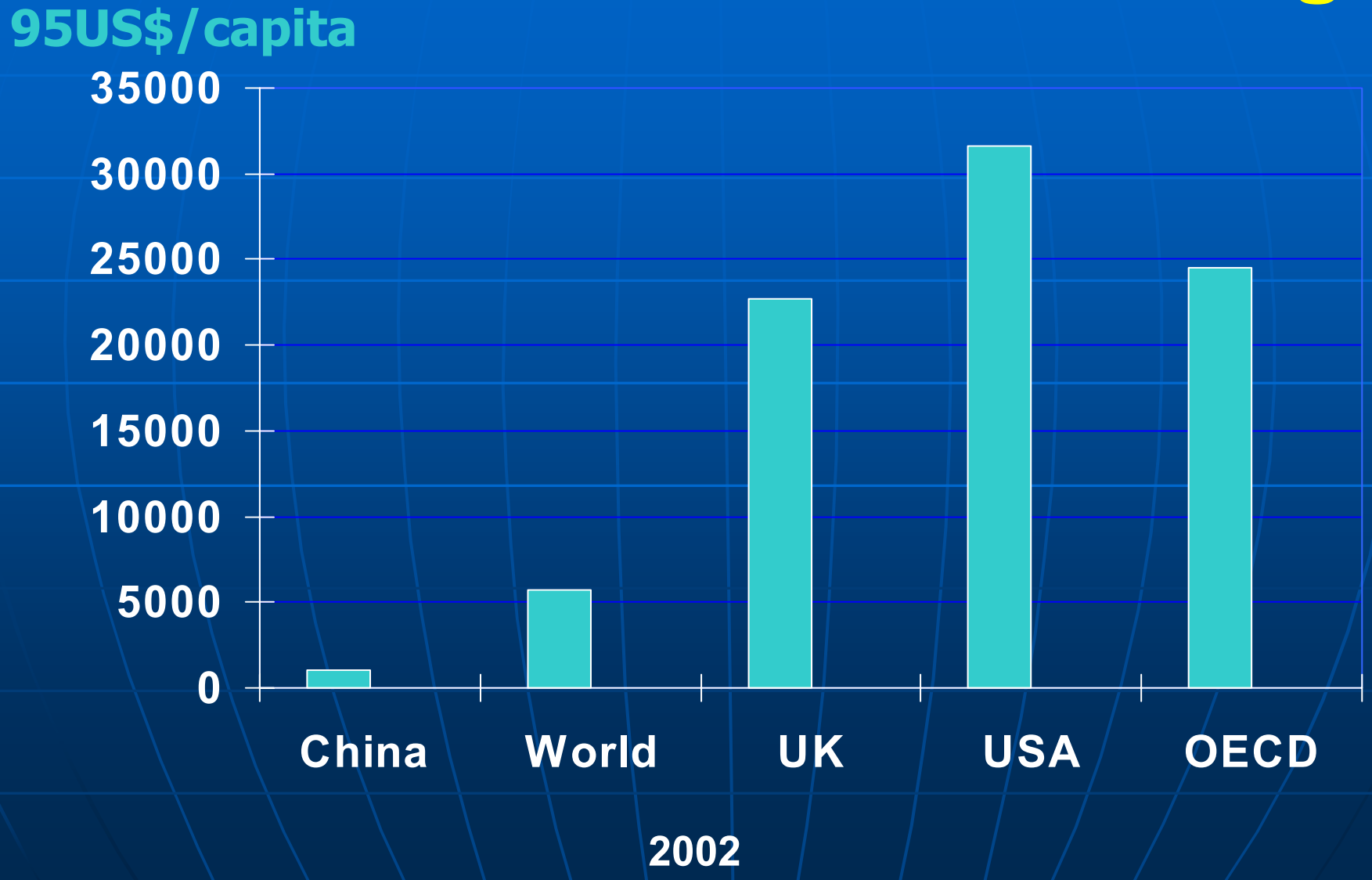
Overview

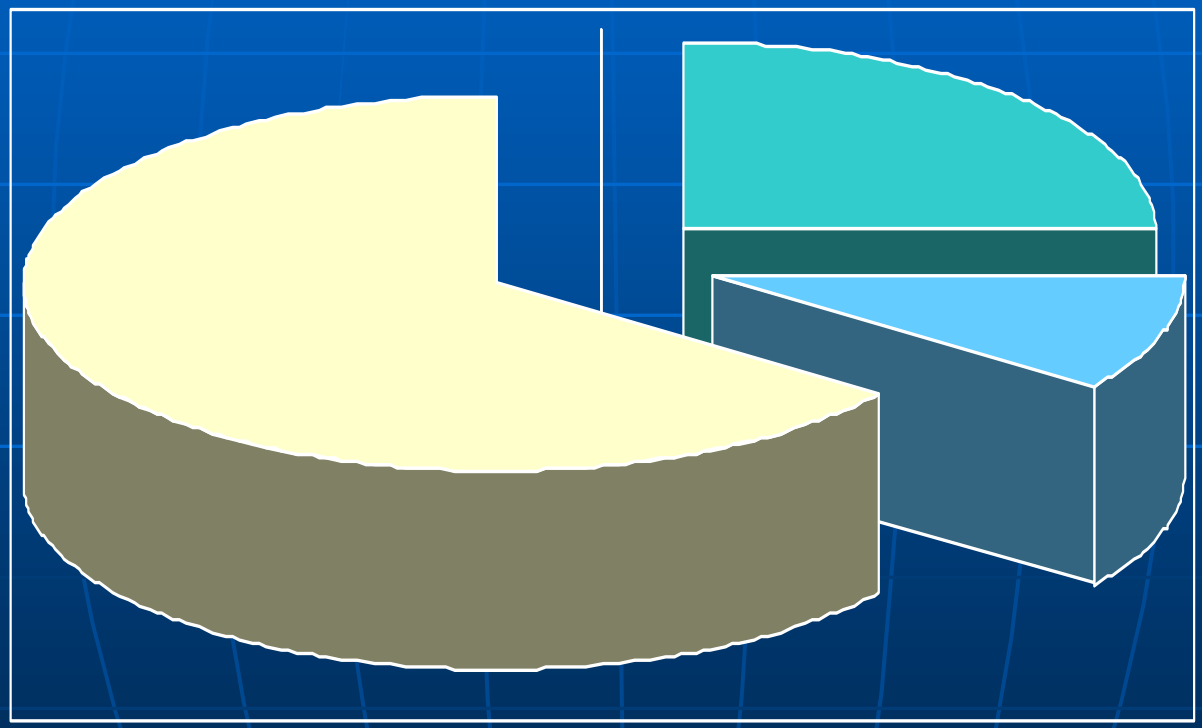
- China's Current Situation
- China's Future Energy Needs and Outlook for Developing Countries
- Challenges Facing China
- China's Sustainable Energy Development Strategy
- Conclusions

China's Current Situation

Per Capita GDP
Less Than 1/5 World Average



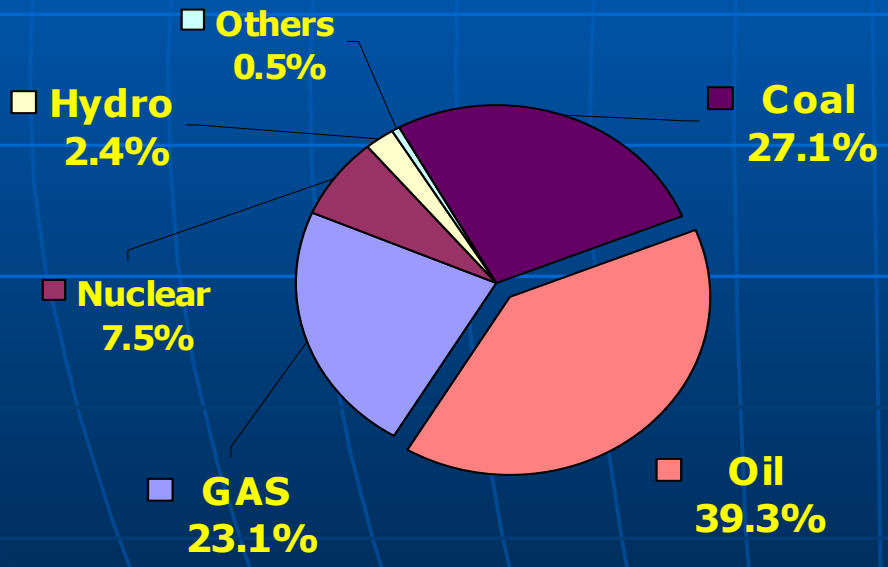
Primary Energy Consumption 10% of the World Total



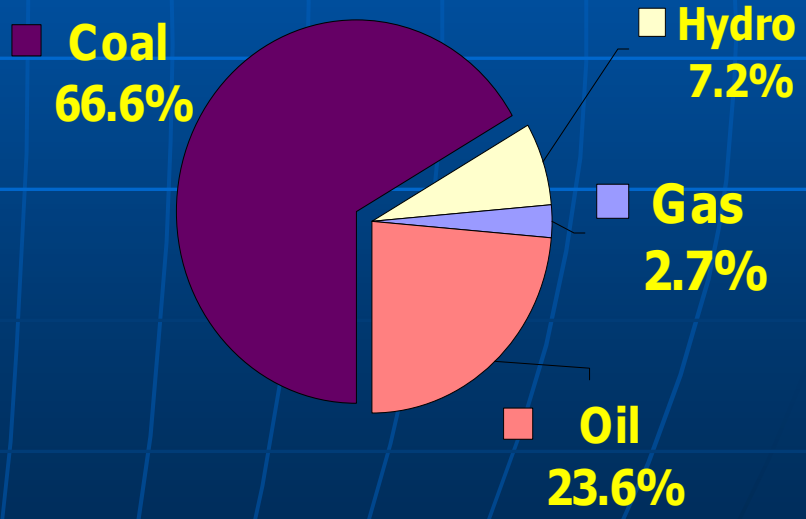
1037 Mtoe of China in 2002

Coal–Dominated Primary Energy in China

World

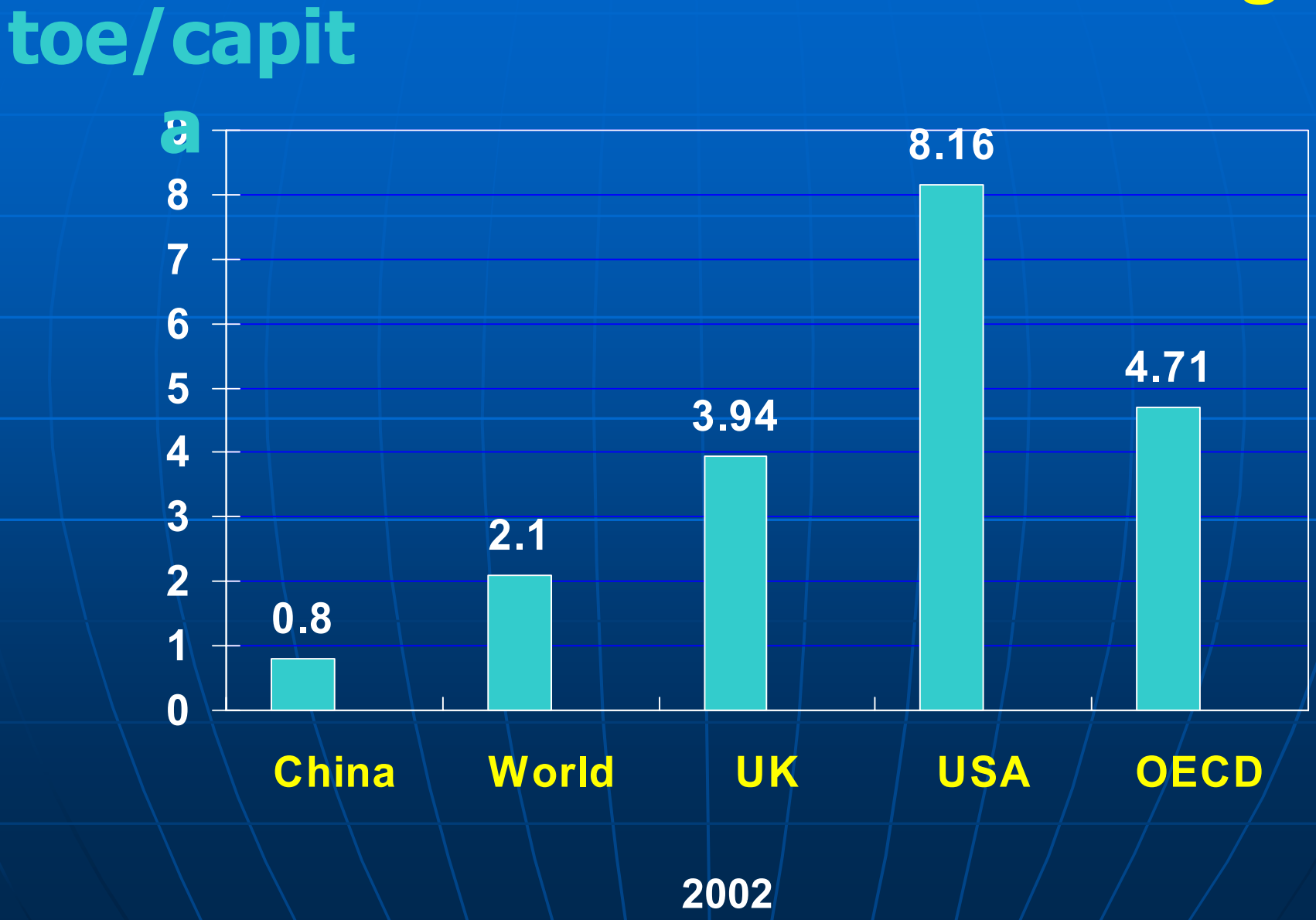


China

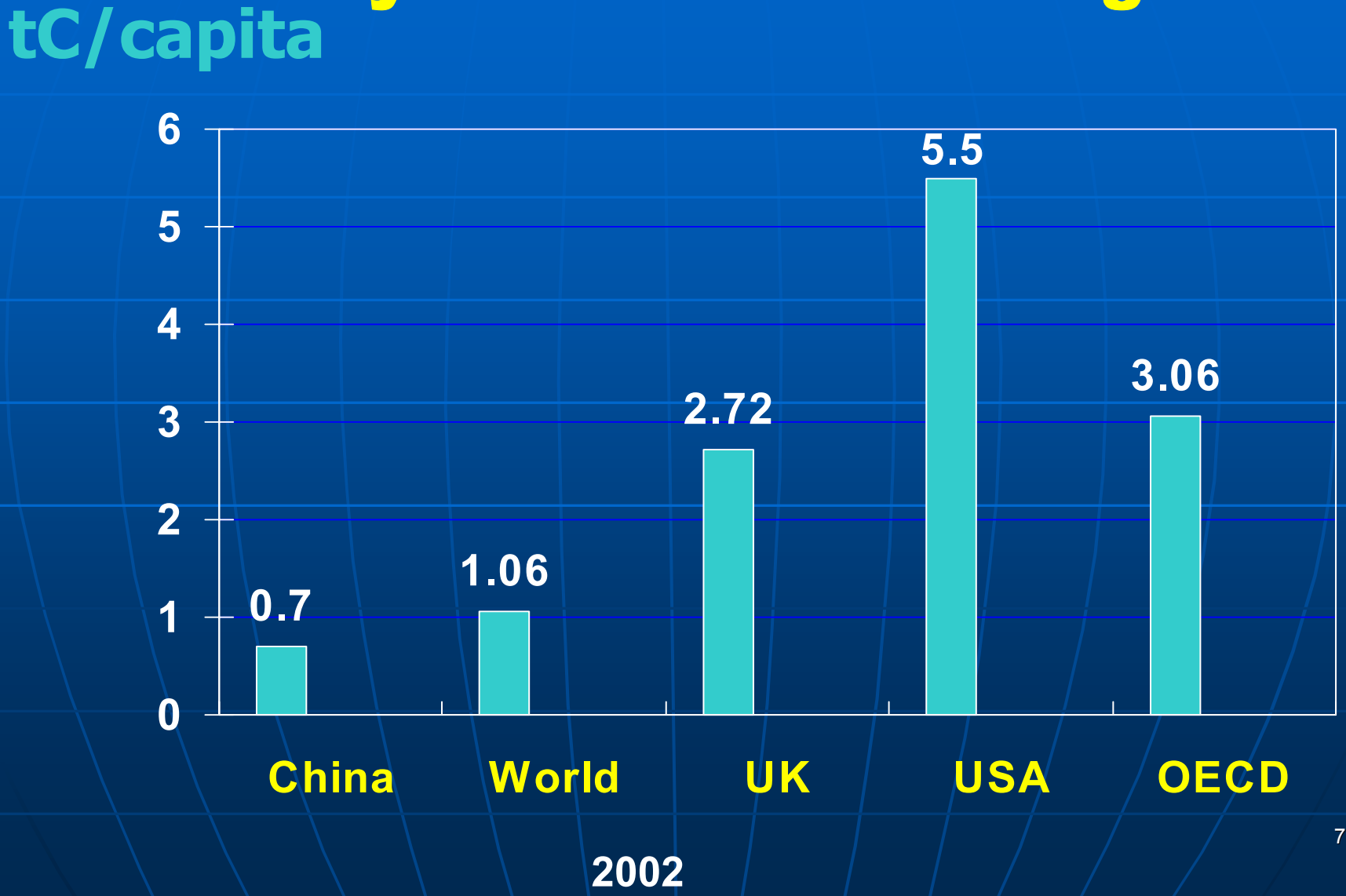


2002

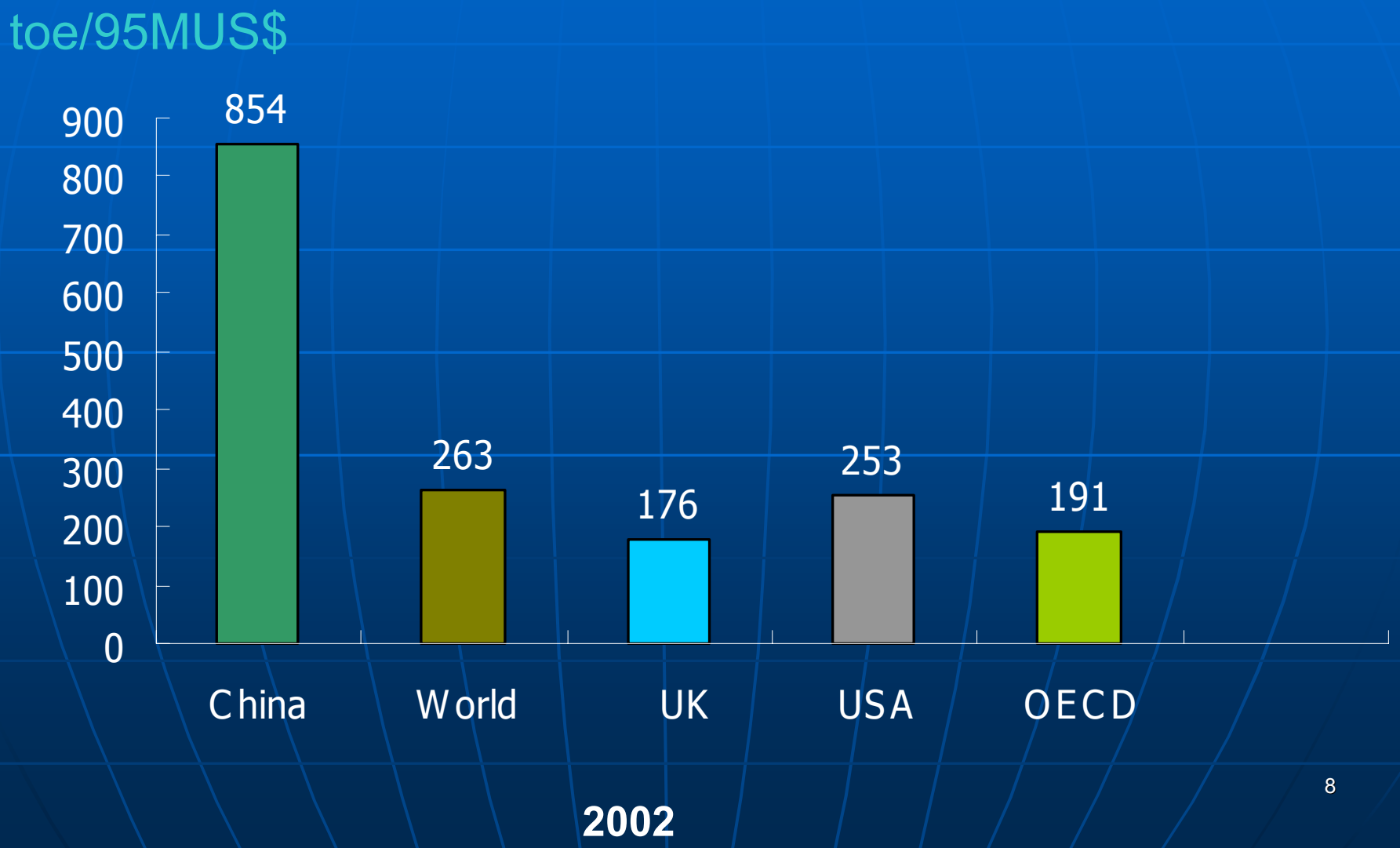
Energy Consumption Per Capita Less Than Half of World Average



CO_2 Emission Per Capita only 2/3 of World Average



High Energy Intensity



2002

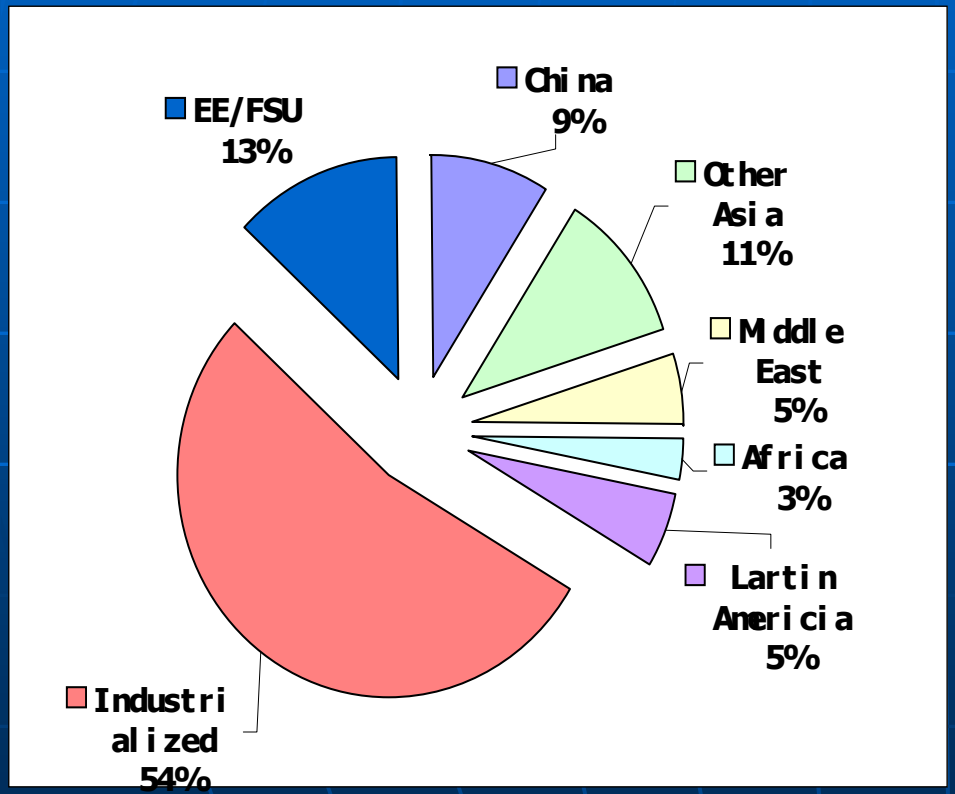
China's Future Energy Needs and Outlook for Developing Countries

China's Future Energy Needs

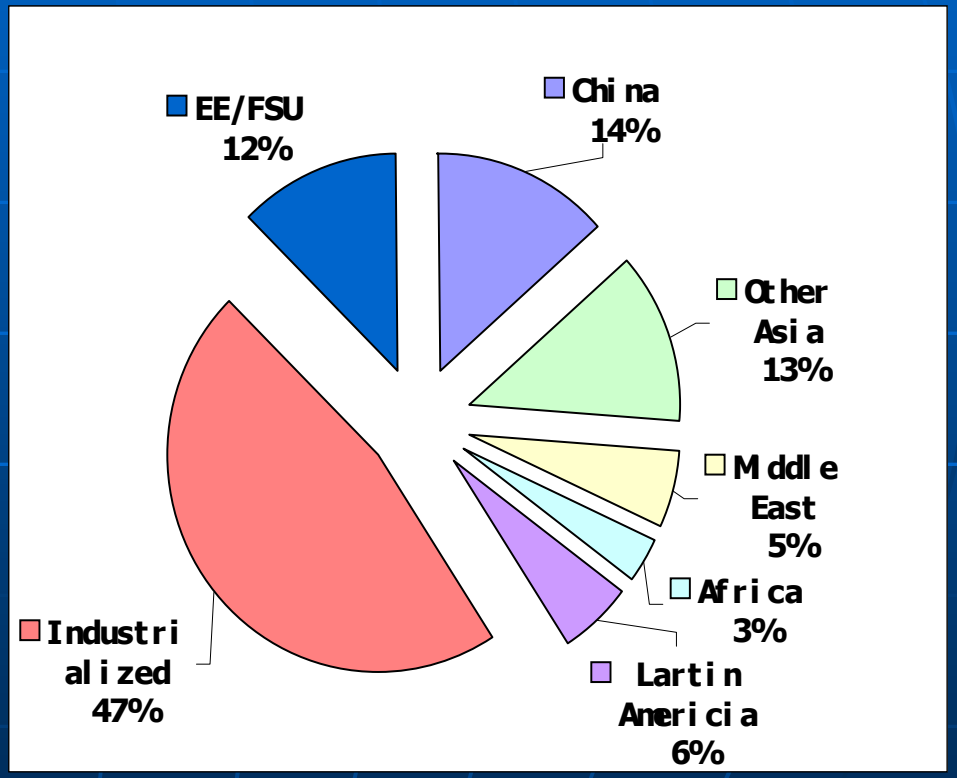
- The total energy demand in 2020 will range 1750-2310Mtoe
  - Coal□2100-2900Mt
  - Oil□400-500Mt
  - Natural gas □160-200 Bm^3
  - Power generation capacity□860-950 GW
- In 2050 the total energy demand will be beyond 3500Mtoe

Outlook for Developing Countries

2000 World 10052Mtoe

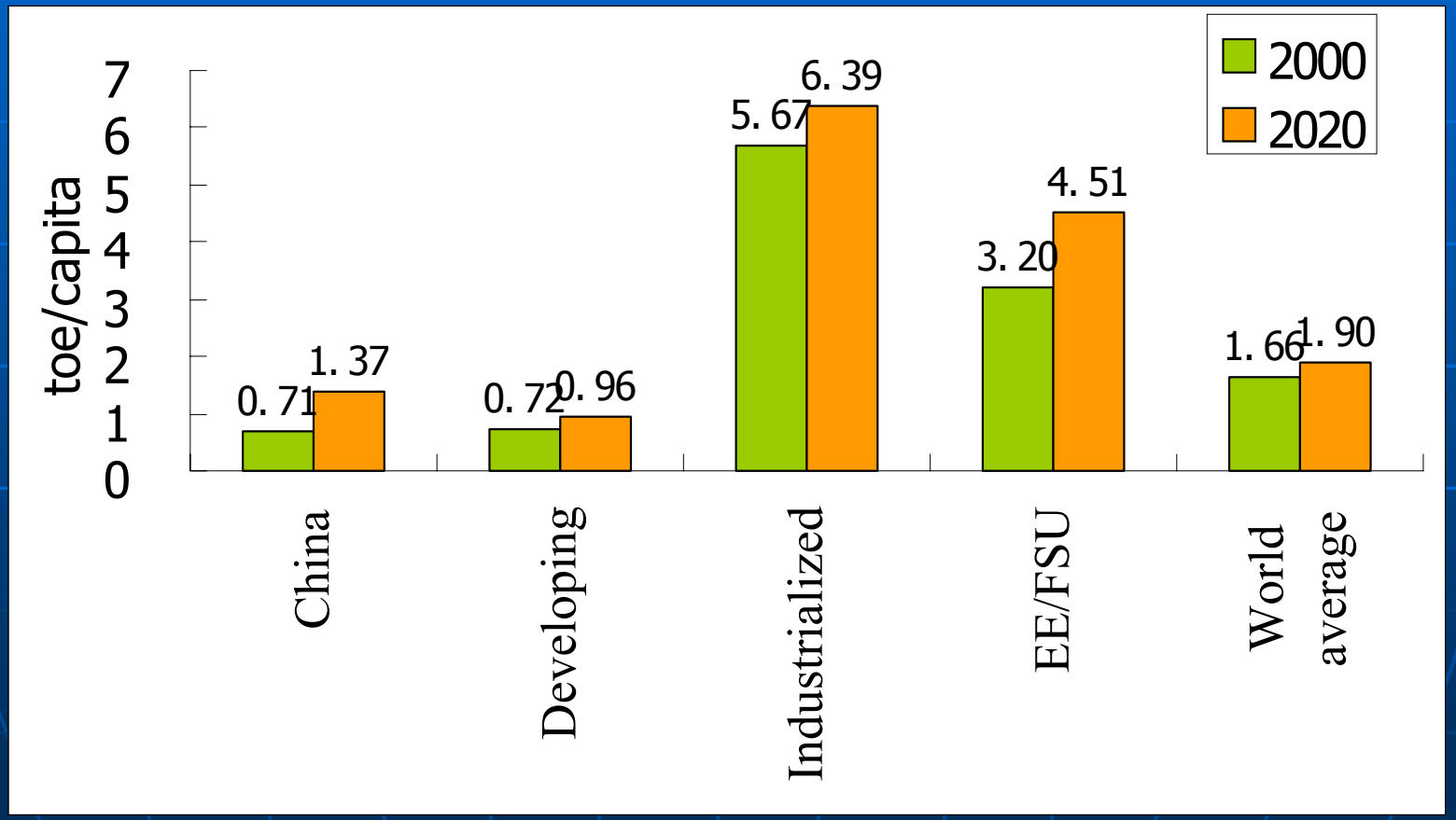


2020 World 15697Mtoe



Source: IEO2004:Energy Information Administration (EIA), USDOE

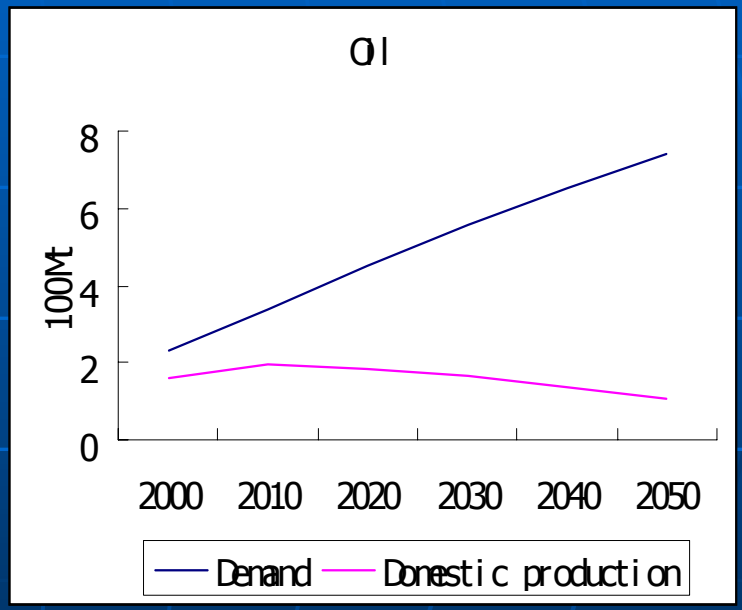
Per-capita Energy Consumption Comparison



Challenges Facing China

Energy Security

- The per capita energy reserves of China are much low, especially for the oil and natural gas.
- Oil will reach the peak production around 200Mt in 2020, after then the production will decrease.
- 60% oil and natural gas in 2020 will depend on import.
- 100Mt new coal production capacity will be set-up before 2020.



Energy Efficiency Improvement

- The energy consumption intensity of GDP of China in 2002 was 3.2 times of world average level and 4. 5 times of OECD average attributed to as high as 51% industrial proportion in GDP and low value added for most products, and low energy efficiency.
- The specific energy consumption for most energy intensive products are 20-50% higher than that of the industrialized countries.

Environmental Protection

- Largest SO_2 emission
- Second largest CO_2 emission
- Only 1/3 cities meet the national second grade standard for air quality
- Acid rain area accounts for around 30% of the national area

China's Sustainable Energy Development Strategy

Roadmap

2020: Fourfold GDP with double energy consumption

- Prioritizing energy conversation by adjusting industrial structure, upgrading products, and energy efficiency improvement.
- Meet increasing energy demands by fundamental role of coal supply and application of high efficient and environmentally-sound technologies.
- Tackling the needs of oil and natural gas by efficiency improvement, fuel substitution, exploration of new reserve, diversifying supply sources, and oil emergency reservation.

Roadmap

2035: Diversified energy supply

- Fostering nuclear power development and increasing proportion of nuclear in total power generation to 16% around 2035.
- Accelerating renewable energy scaling-up application.
- Commercial application of hydrogen fuel cell vehicle in main cities.

Roadmap

2050 towards to sustainable development

- Reducing coal proportion in total primary energy below 50%.
- Providing new increasing energy demands mainly by nuclear and renewable energy which will occupy over 30% in total primary energy after 2035.
- Hydrogen becoming one of the main components of transportation and substantially reducing dependence on oil import.

Priority Programs for Science & Technology Development

- Technologies for energy efficiency improvement
- Clean coal technologies
- The support technologies for protecting oil security
- Advanced nuclear technologies
- Long distance electricity transmit and grid reliability
- Application of renewable energy
- Hydrogen & fuel cell

Conclusions

- Compared with the developed countries, the developing countries' per-capita energy consumption is still much lower, the developing countries need to increase energy consumption in order to develop economy and to eliminate poverty.
- Apart from energy efficiency improvement, and development of new and renewable energy, carbon sequestration technologies may play an important role to reduce carbon emission.
- It is necessary for the developed and developing countries to cooperate on the research and development of carbon sequestration technologies in order to achieve earlier commercial application of the technologies in the world.

Thanks!