An Outside Perspective on China's Energy Scenarios

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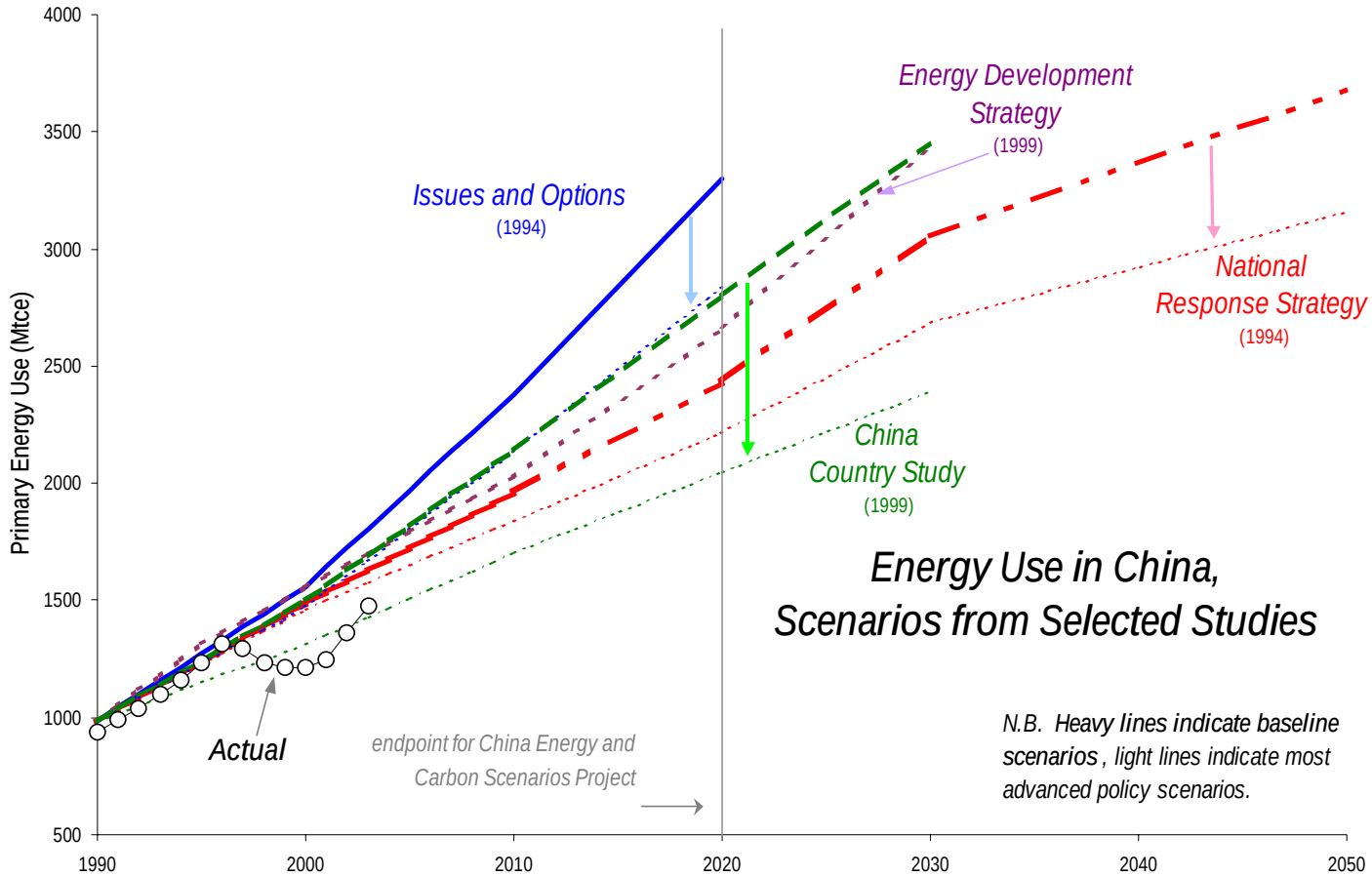
May 2004

Scenarios of the 1990s

Long-Term energy Growth Expected to be 3-5% to 2020



What recent scenarios tell us

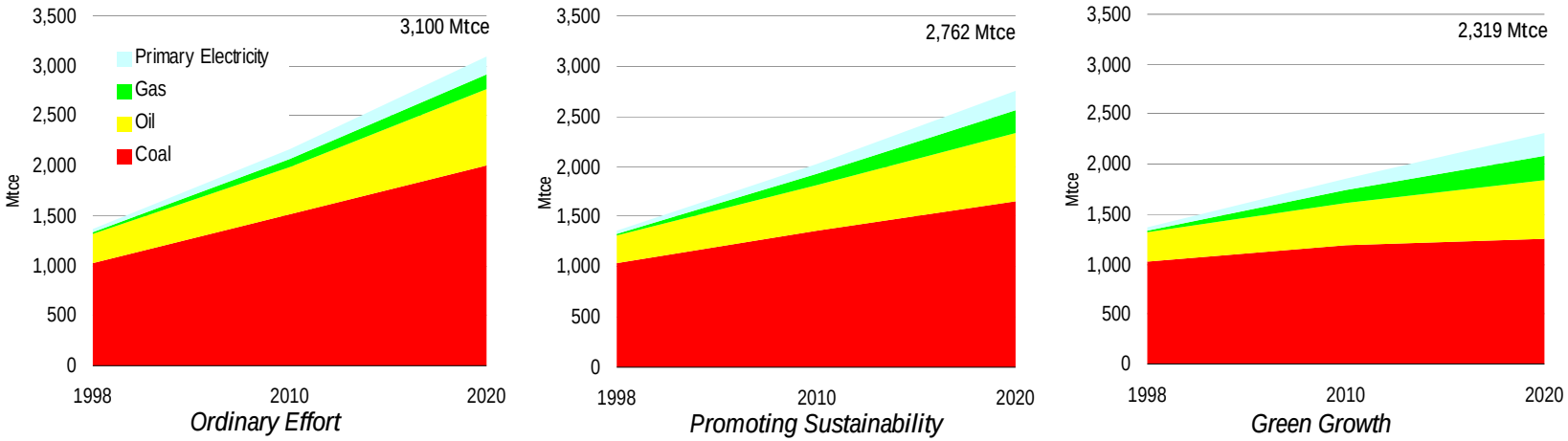
- China Energy and Carbon Scenarios, research performed 2000-2002
- Scenario analysis for China's Energy Strategy, research in 2003-2004
- In the apparent chaos of China's energy experiences of the last several years, what do we learn from these exercises?

"Old"
China Energy and Carbon Scenarios, Analysis from 2000-2002

China faces serious challenges to improving welfare in socially and environmentally sustainable manner.

- Low per capita GDP and energy consumption
- Industrialization and urbanization
- Transformation of domestic political economy
- Integration into world markets
- Changing role of government
- Environmental protection enforcement
- High uncertainty regarding improvement of energy structure (move away from solid fuels)

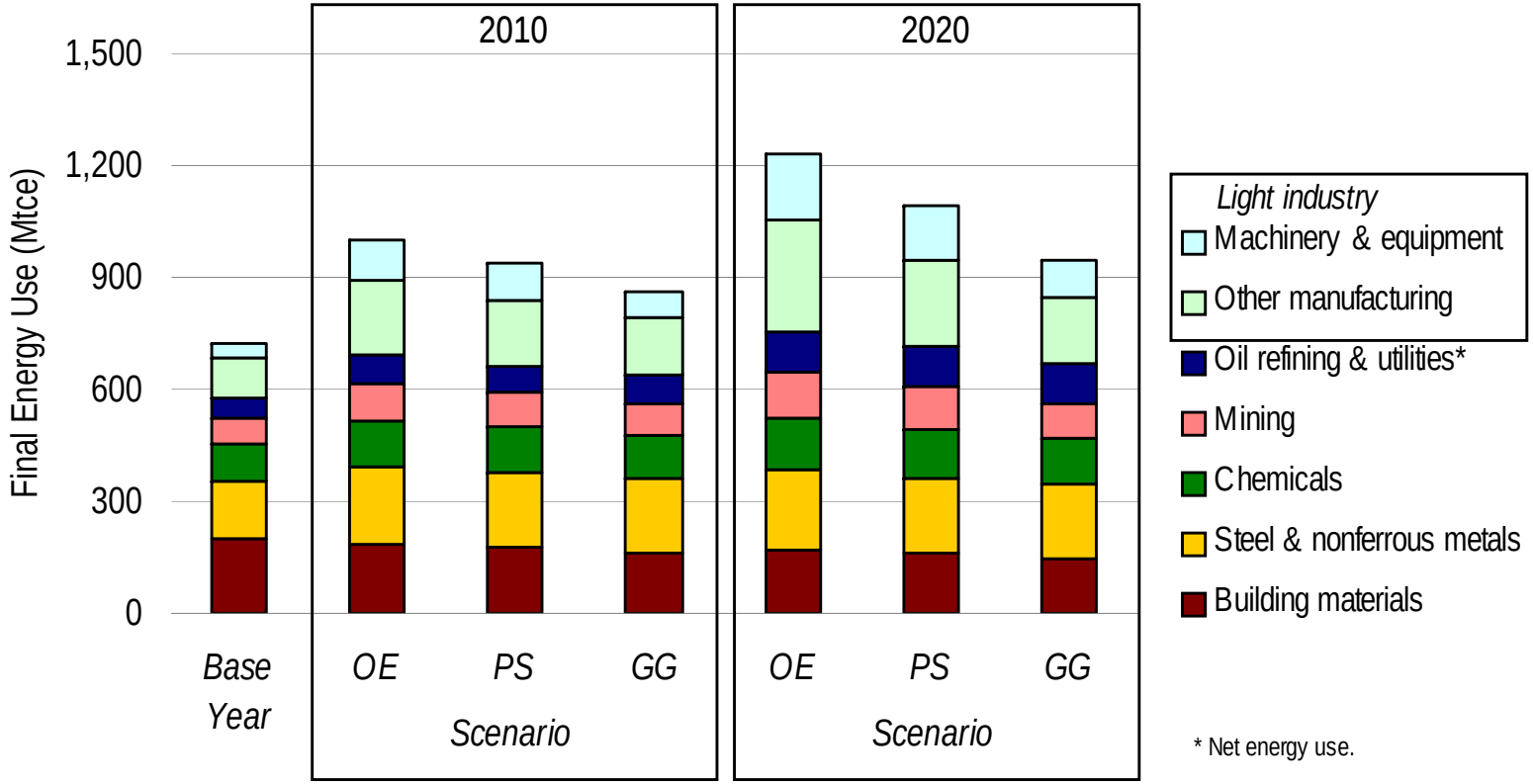
Comparison among scenarios shows potential for substantial energy demand reduction



- Greater progress in efficiency.
- Restructuring of economy, energy-using activities.
- More natural gas, nuclear, renewables.
- Strong push for more-sustainable practices.
- Quadruple GDP while doubling energy, and raising carbon emissions by half.

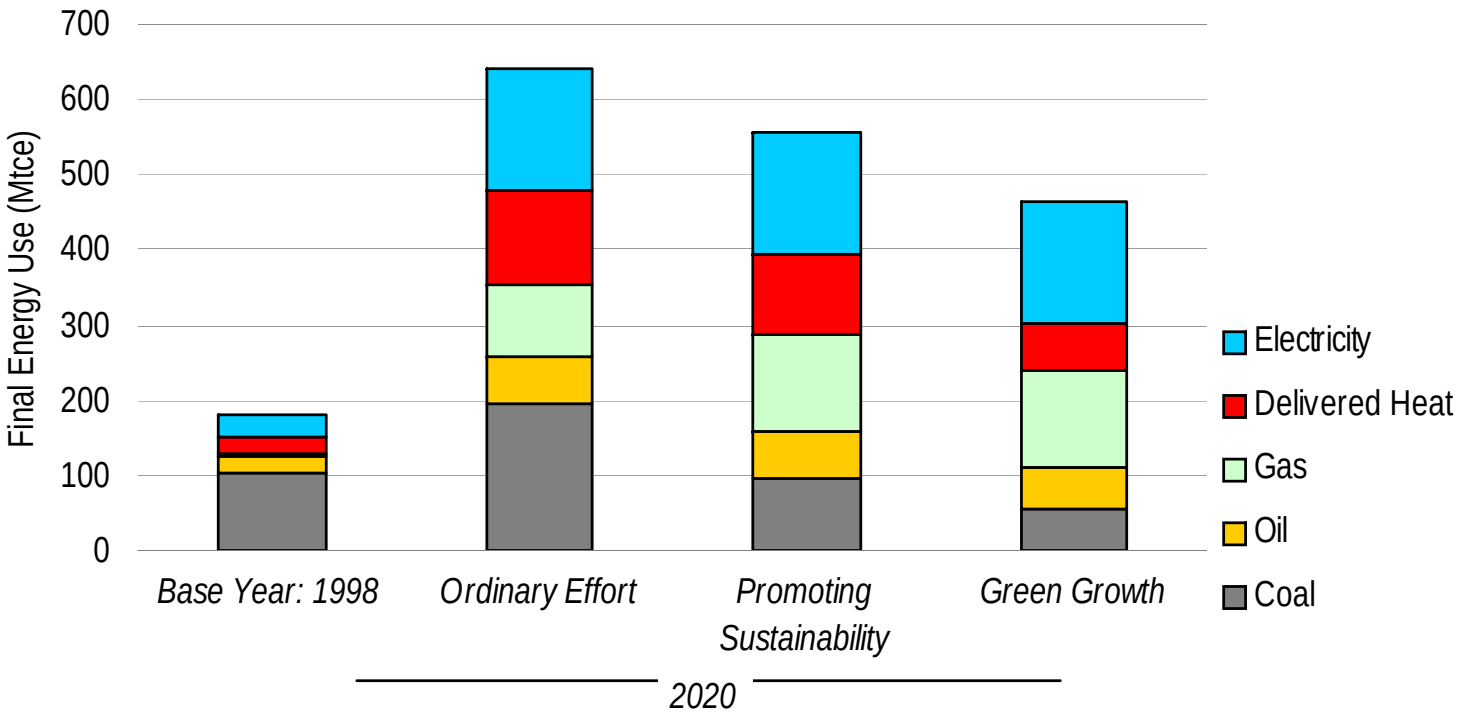
Source: ERI, 2003.

Efficiency improvements in heavy industries can hold down energy growth, but light industries cannot be ignored since they will grow to 30%-40% of the total.



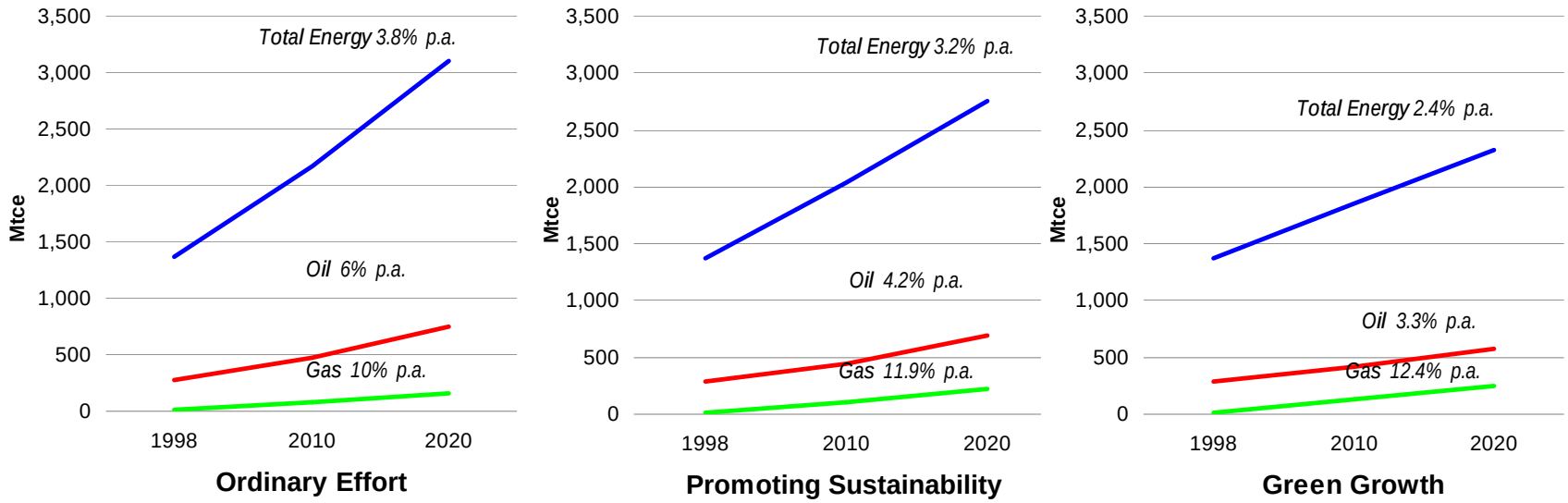
Source: ERI, 2003.

Growth in building energy use could be substantially reduced through improved efficiencies of equipment and systems and greater use of gas.



Source: ERI, 2003.

Significant difference in energy growth in the three scenarios.



Source: ERI, 2003.

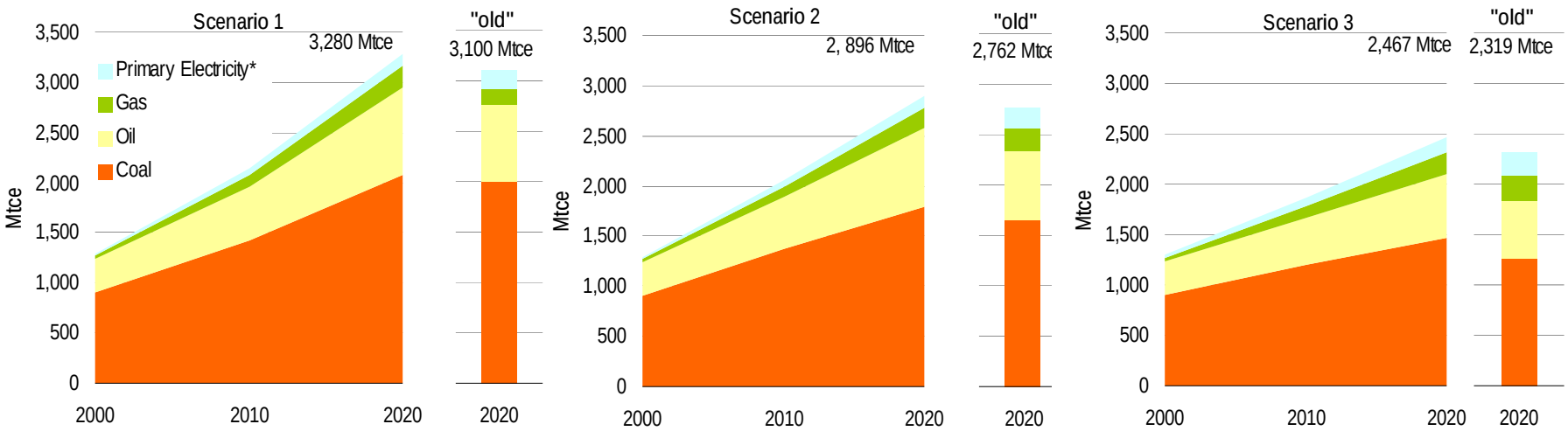
- In the "greener" scenario, use of natural gas is 60% higher than in the "business-as-usual" scenario. In all scenarios, both oil and gas demand grows faster than total energy.

"New"
Scenario for China's Energy Strategy, Analysis during 2003-2004

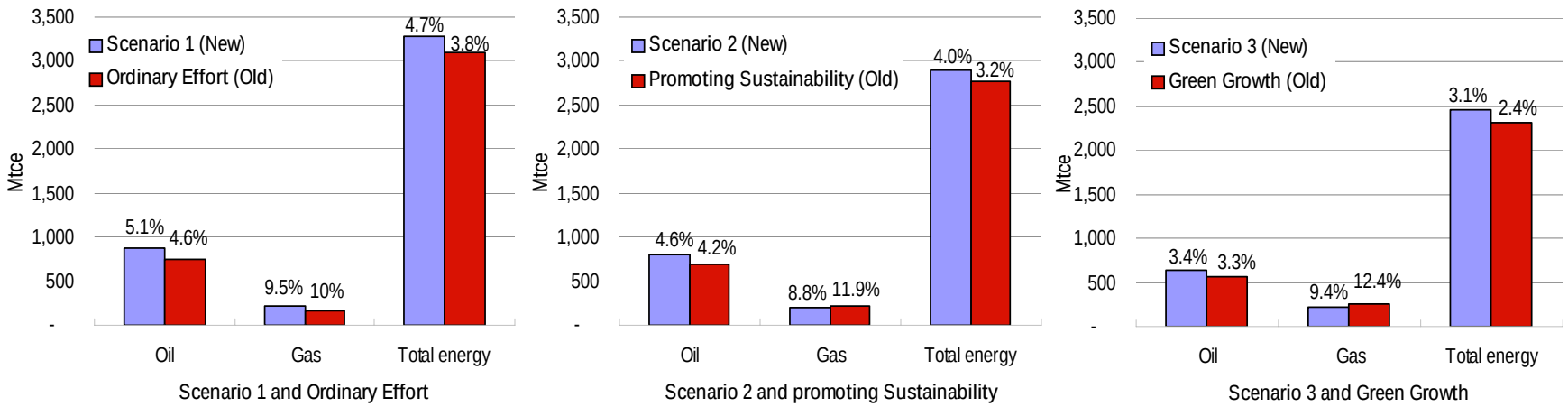
Why a New Analysis?

- Major changes in energy situation of China – mostly unexpected and with great rapidity
  - Electricity glut turned into a serious shortage
  - Large increase in auto sales
  - "Overheated" growth of economy led by construction
    - ➔ Increased output of steel and concrete
  - Energy growth faster than economic growth for two years – first time in a quarter century

Total primary energy consumption is greater than in the “old” analysis.



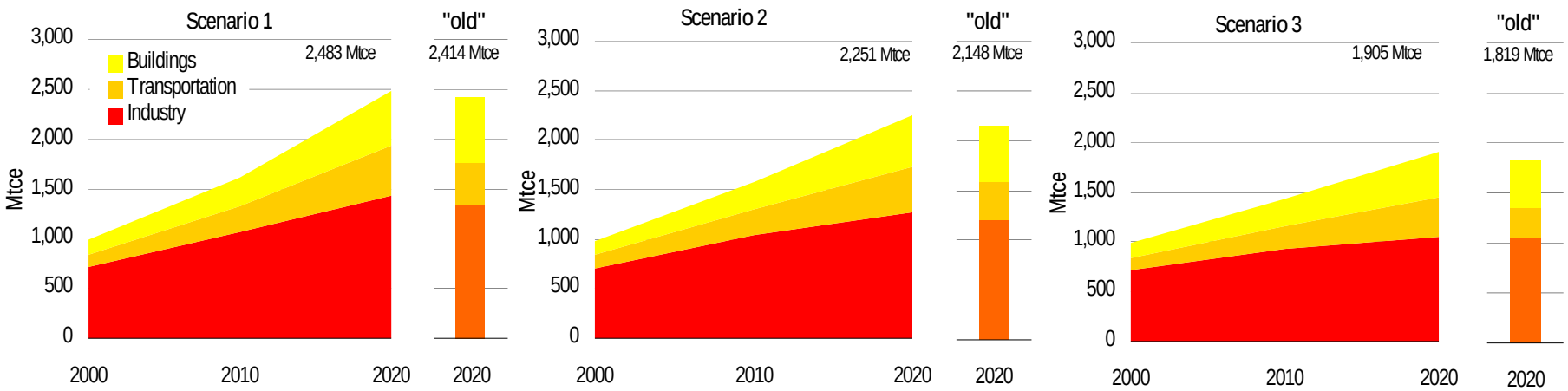
Total energy use rises faster than in the "old" analysis.



Source: ERI, 2003.

N.B. Base year for "old" analysis was 1998, and for "new" analysis was 2000. Natural gas use in 2000 was much higher than in 1998.

The “new” analysis of final energy demand by sector in 2020 is slightly more than in the “old” analysis.

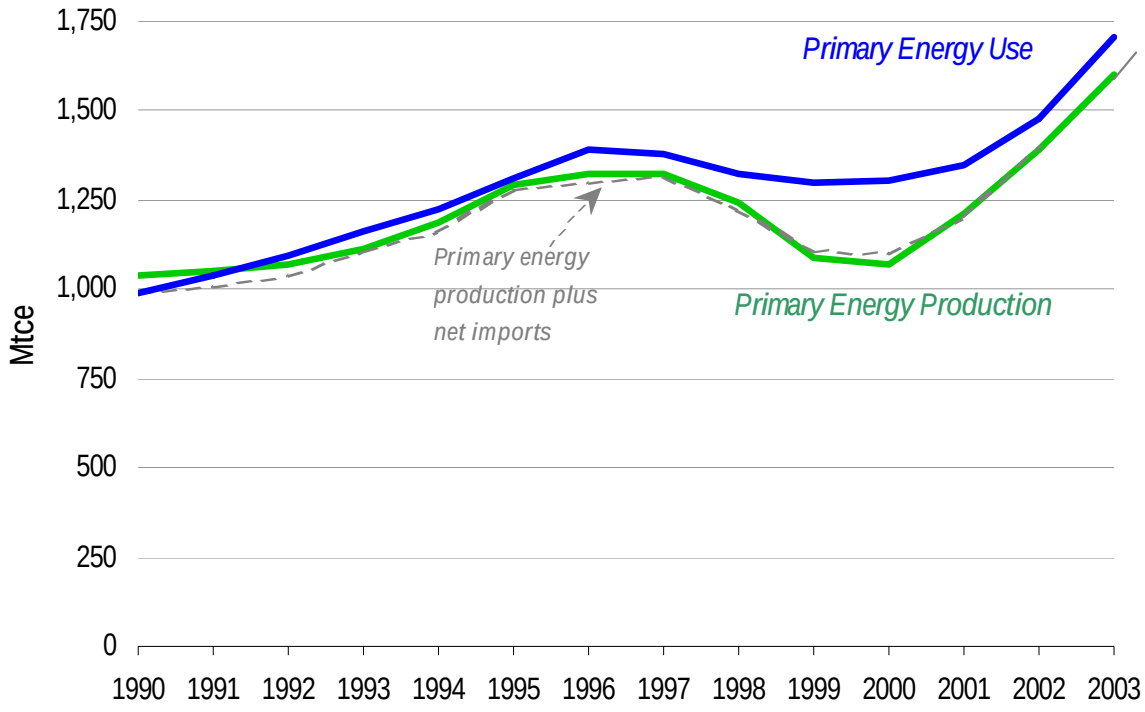


- Transportation sector shows the largest difference between old and new analysis, 26% higher than in old analysis.

Note: Industry includes construction, agriculture and industry, buildings sector includes households and services.

Source: ERI, 2003.

China's official statistics show a rapid drop in primary energy production in the late 1990s and a speedy recovery. Energy consumption showed a less-drastic dip.



Source: NBS, 2003. 2003 figures are estimates based on preliminary reports.

Observations

- Possible energy futures not greatly different, even though short-term energy situation changed dramatically
- How good are energy data?
- Concern about change in energy elasticity, but better data needed to determine how real this is.

➔ Very compelling case to invest in much improved energy data gathering system for China