

Energy Use in Commercial Building in China: Current Situation and Future Scenarios

ECEEE

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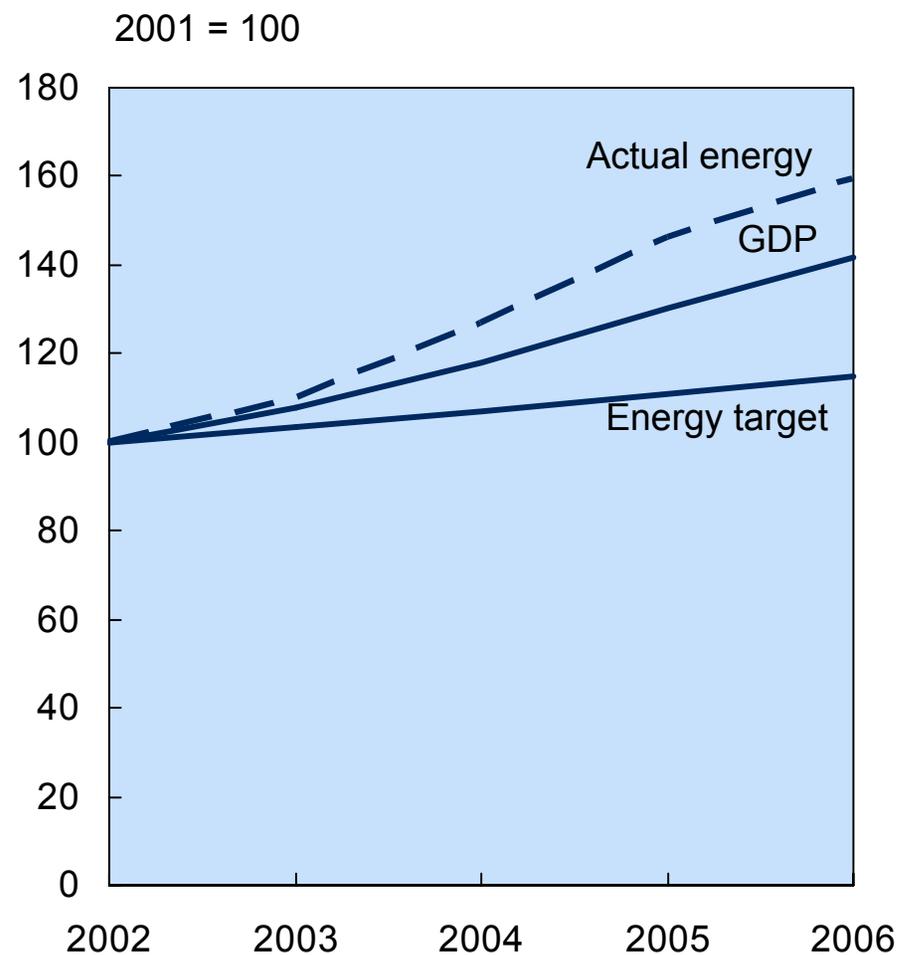
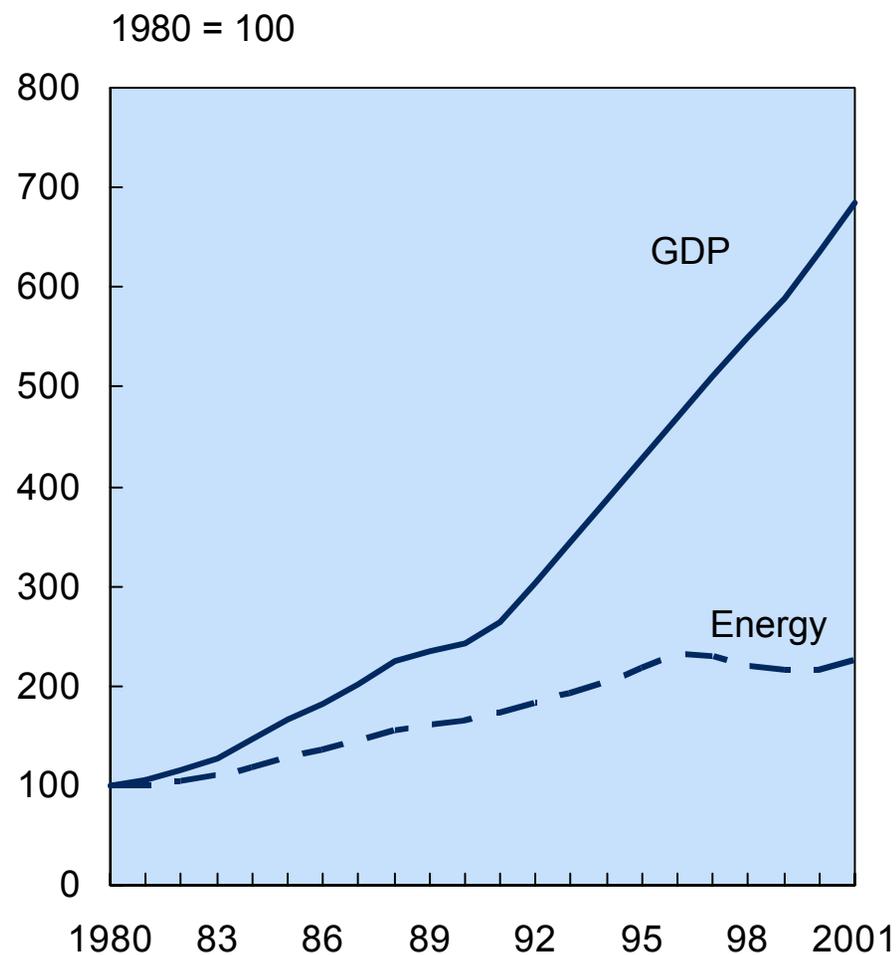
OUTLINE

- Background
- Commercial Building Energy Consumption in China
 - Current
 - Base case projection
- Drivers of demand
- Alternative Scenarios

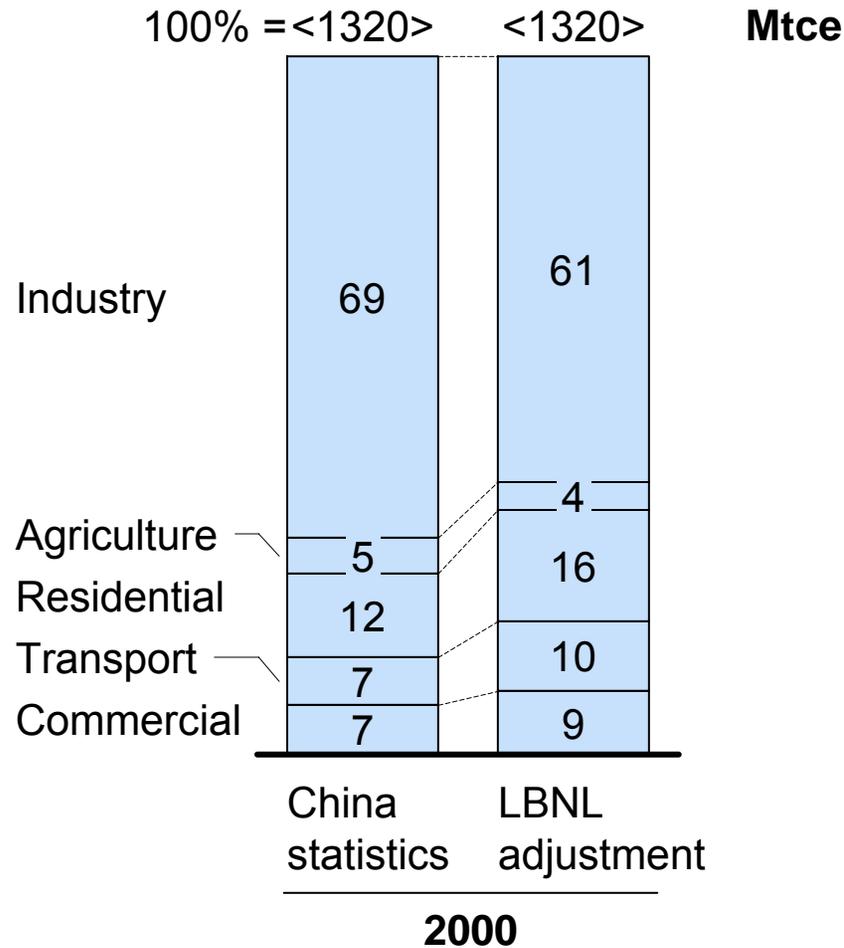


FOR TWO DECADES, ENERGY AND GDP GROWTH WERE DECOUPLED, BUT NO LONGER

Evolution of real GDP and total energy demand



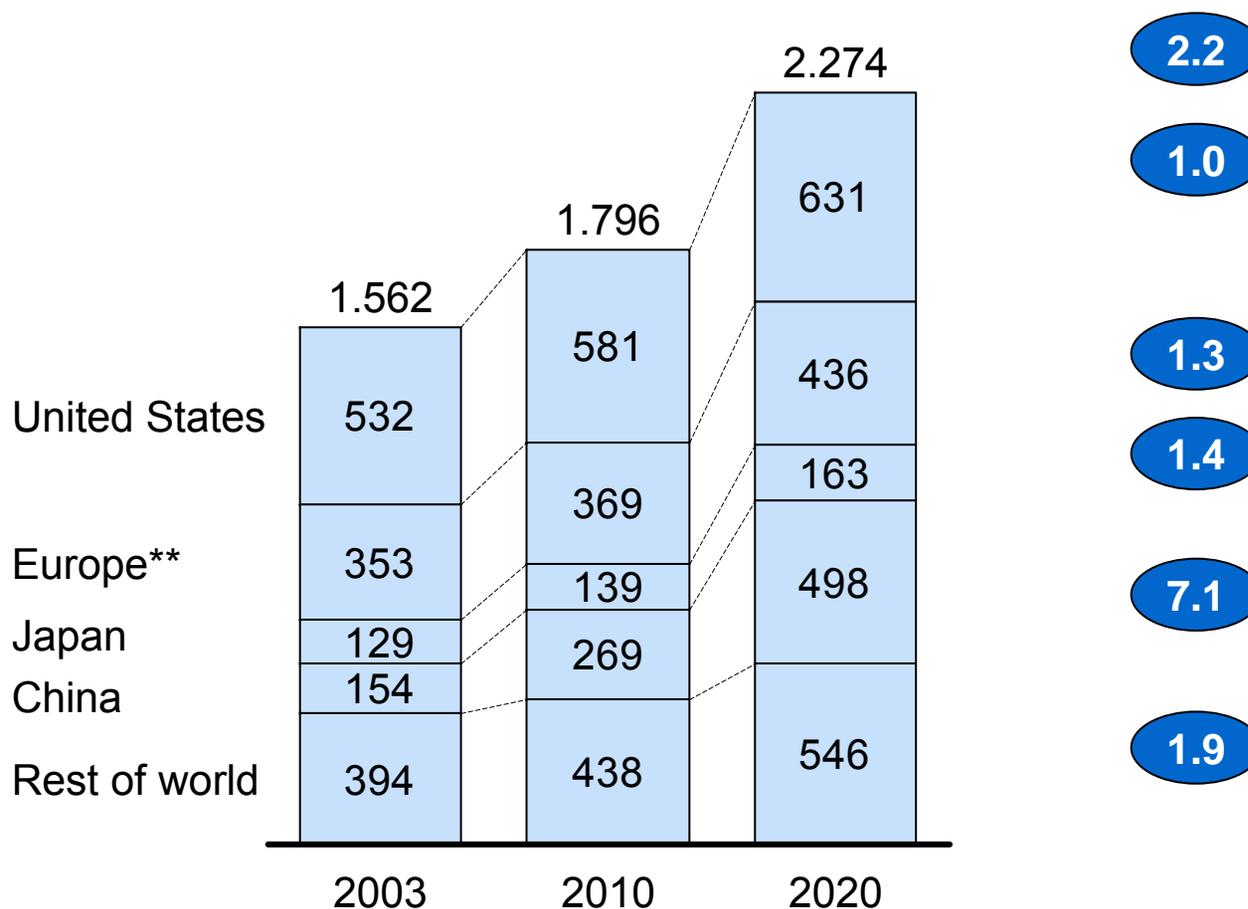
COMMERCIAL PRIMARY ENERGY CONSUMPTION BY SECTOR



CHINA'S COMMERCIAL SECTOR WILL SEE THE FASTEST GROWTH AT OVER 7 PERCENT A YEAR TO 2020

End-use energy demand*
Million tons of coal equivalent

CAGR 2003-20
Percent

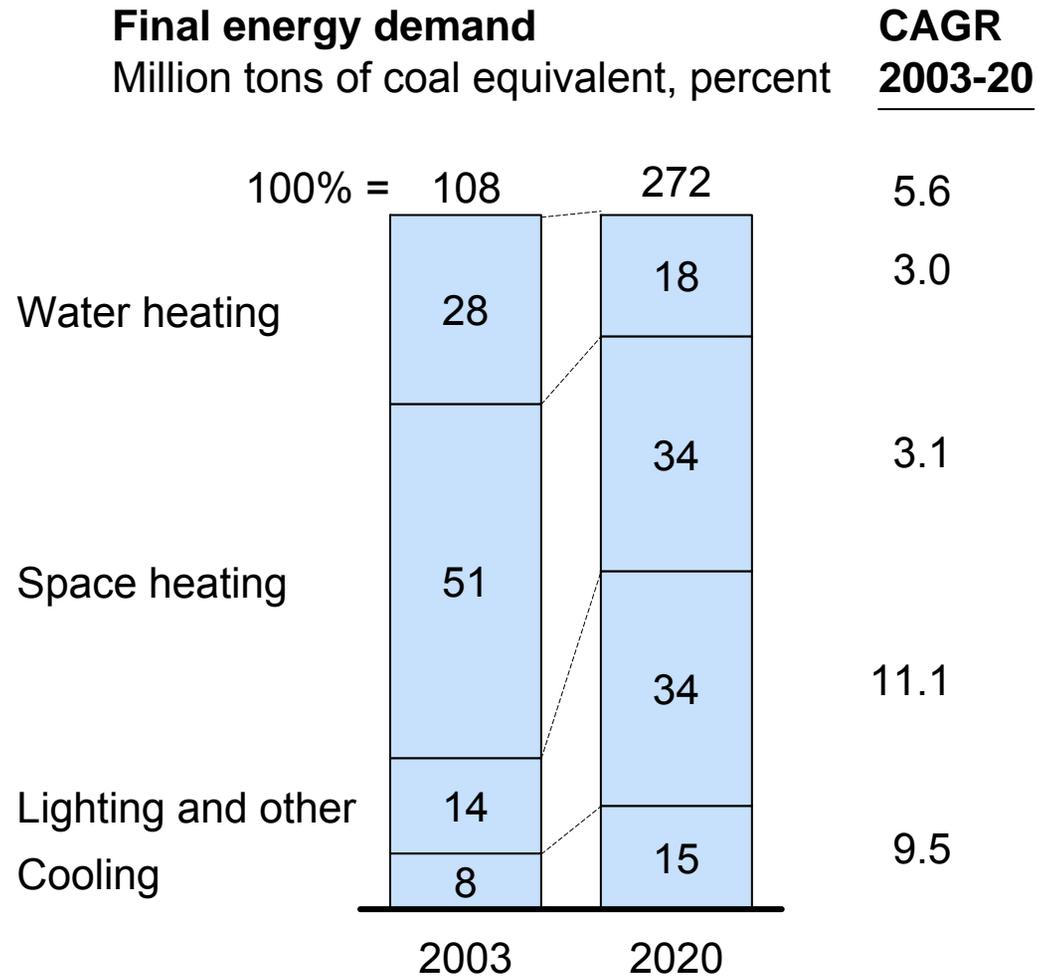


* Transformation losses (power generation and refining) allocated to end-use segments.

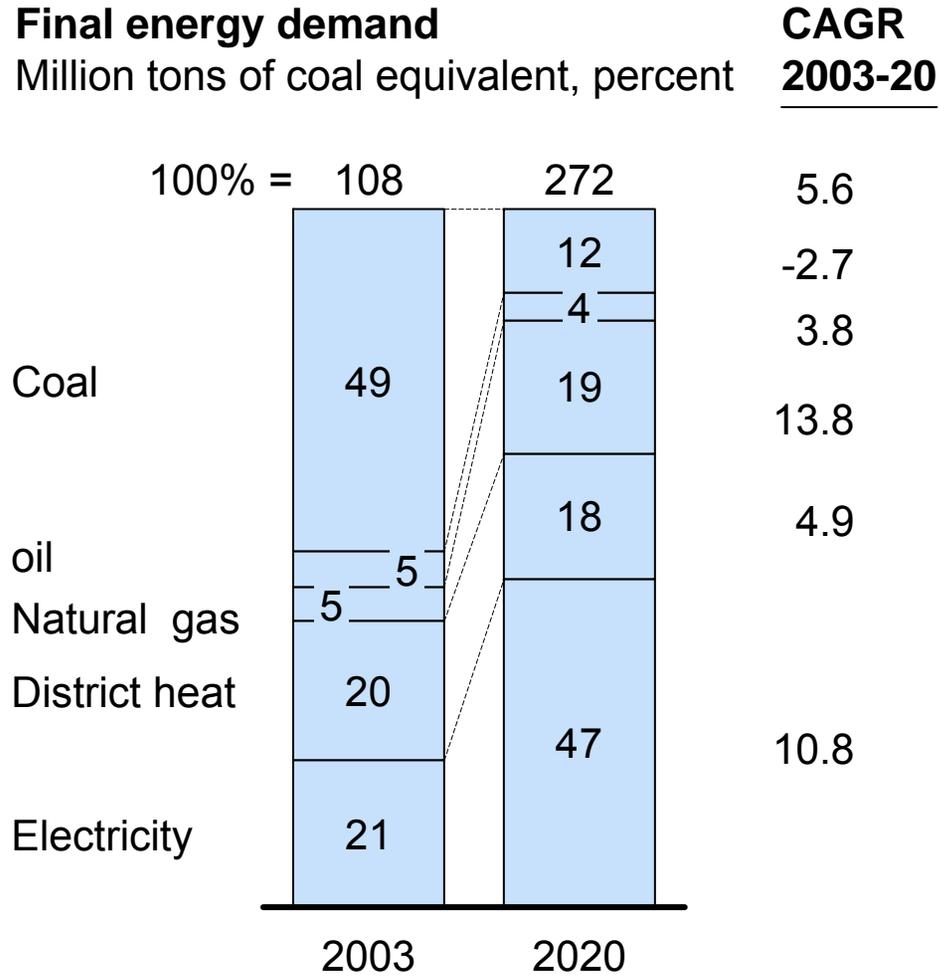
** Including Northwest Europe, Mediterranean and North Africa, and Baltic/Eastern Europe.

Source: IEA; McKinsey Global Institute Global Energy Demand Model

THE MIX OF END-USES WILL SHIFT STRONGLY TO 2020...

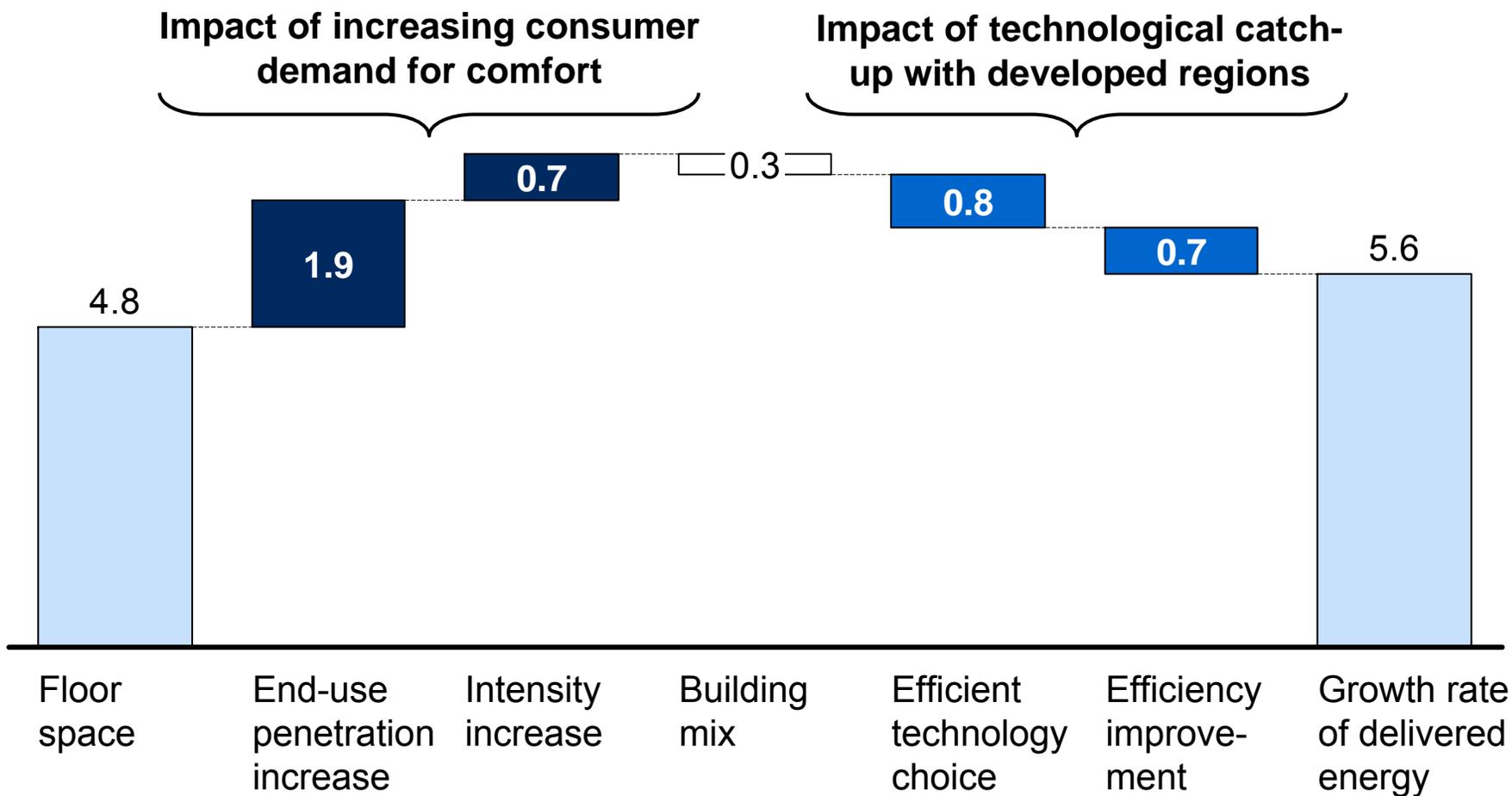


... AS WILL THE FUEL MIX



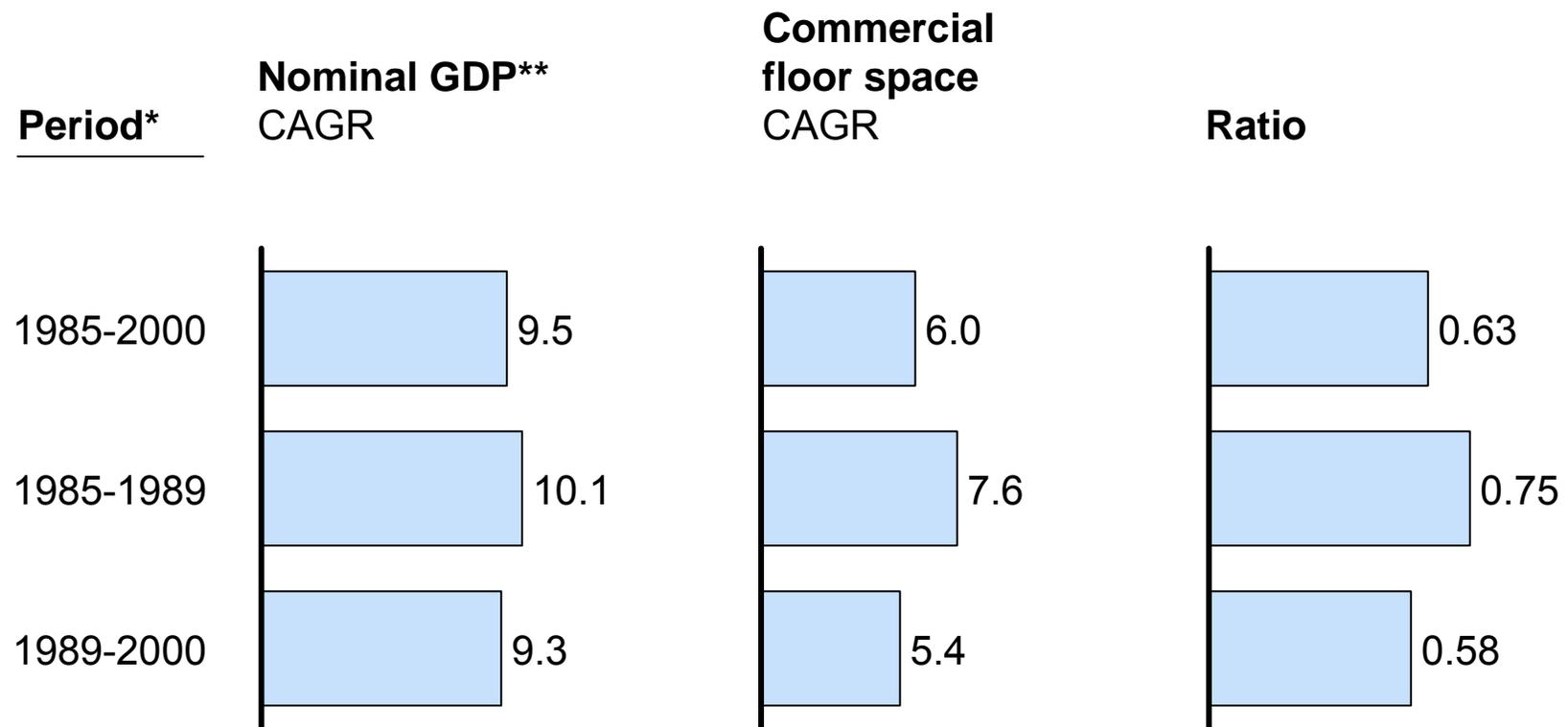
INCREASED PENETRATION AND INTENSITY WILL MORE THAN OFFSET PROJECTED ENERGY-EFFICIENCY IMPROVEMENTS

Key drivers of China commercial sector energy demand growth, 2003–2020
Percent



Source: LBNL, China Energy Group; MGI analysis

IN CHINA, THE ELASTICITY OF FLOOR-SPACE GROWTH TO GDP GROWTH HAS DECLINED OVER TIME



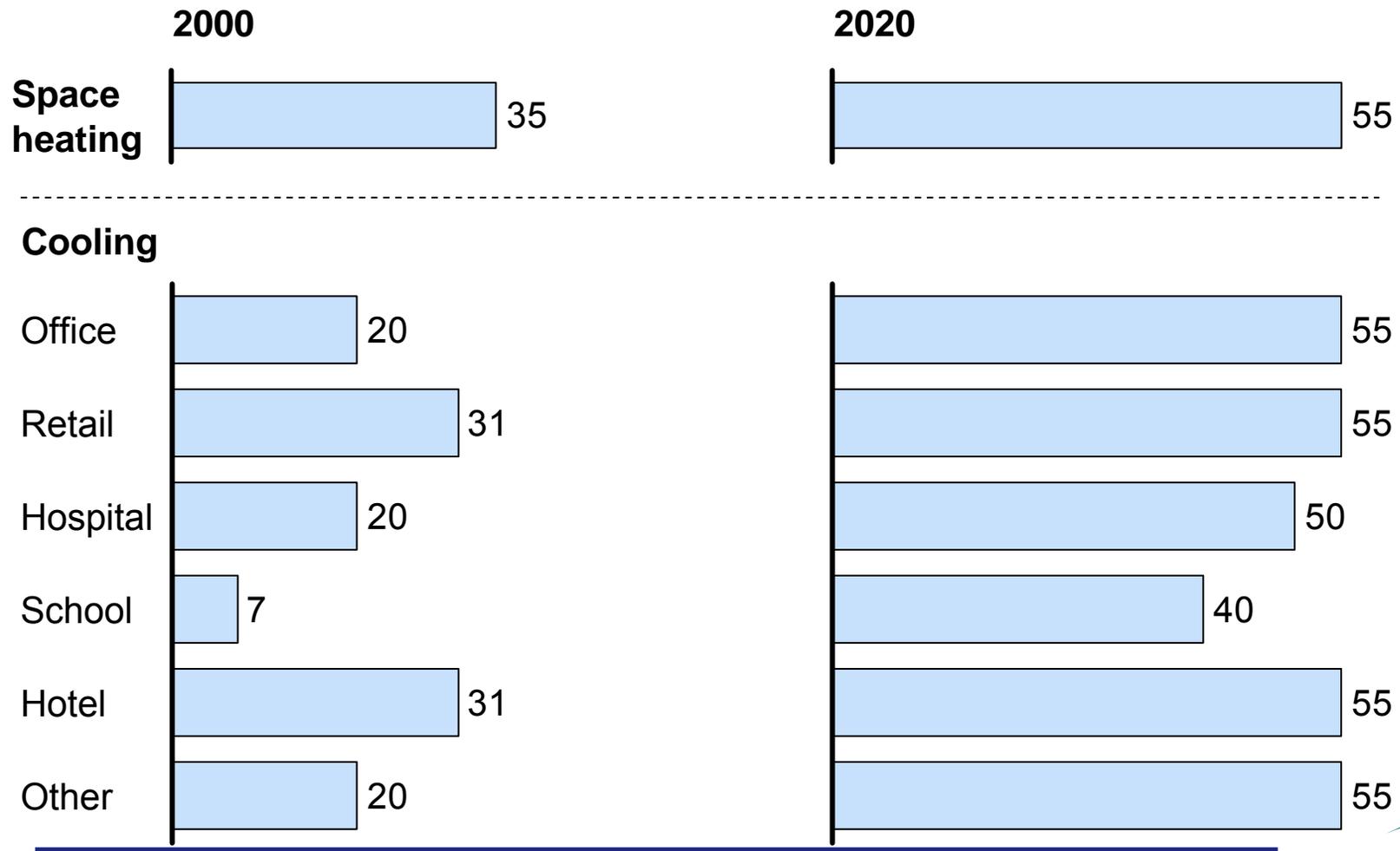
* Total commercial floor area could be derived only for 1998 and 2000 from existing research. The rest of the years were estimated based on China's statistical yearbook. **) Due to data limitations, nominal GDP was used as a proxy for services GDP in this analysis.

Source: LBNL; Global Insight; MGI analysis

IN CHINA, PENETRATION OF MAIN-BUILDING ENERGY END USES IS PROJECTED TO INCREASE SIGNIFICANTLY ACROSS ALL SECTORS...

End-use penetration in China commercial sector, 2000–2020

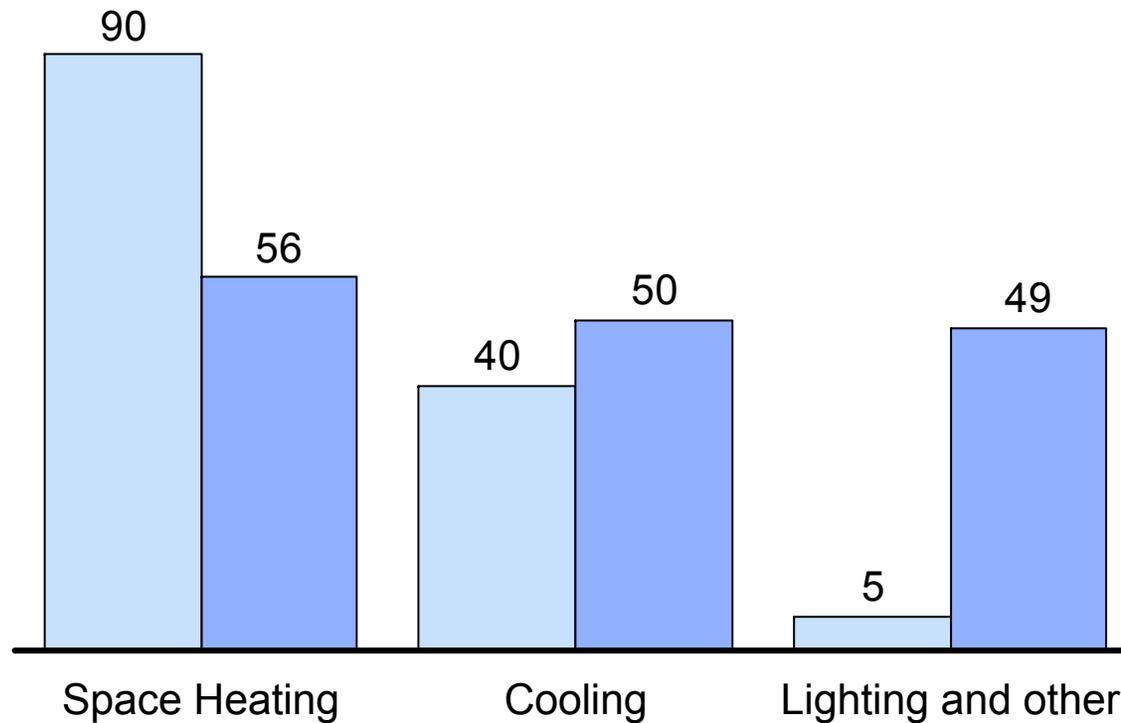
Percent



ENERGY INTENSITY OF A BUILDING WILL INCREASE TO MAINTAIN A SUITABLE WORKING AND LIVING ENVIRONMENT, EXCEPT FOR SPACE HEATING

Energy intensity

Kilowatt-Hour per Square Meter



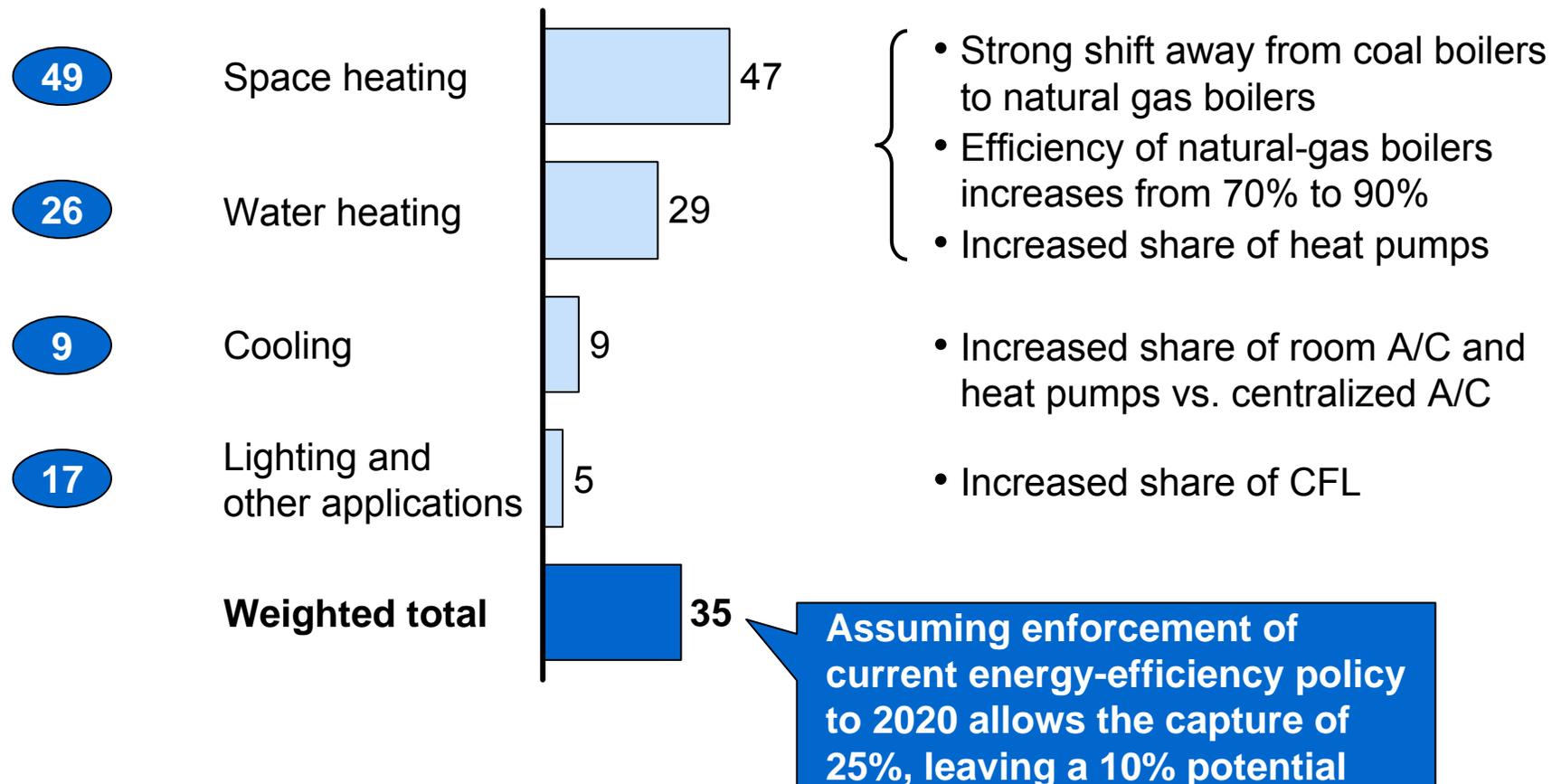
CHINA'S ENERGY EFFICIENCY POTENTIAL REACHES 35 PERCENT

Percent

Share of demand, 2005

Energy demand abatement potential*

Examples of efficiency improvements

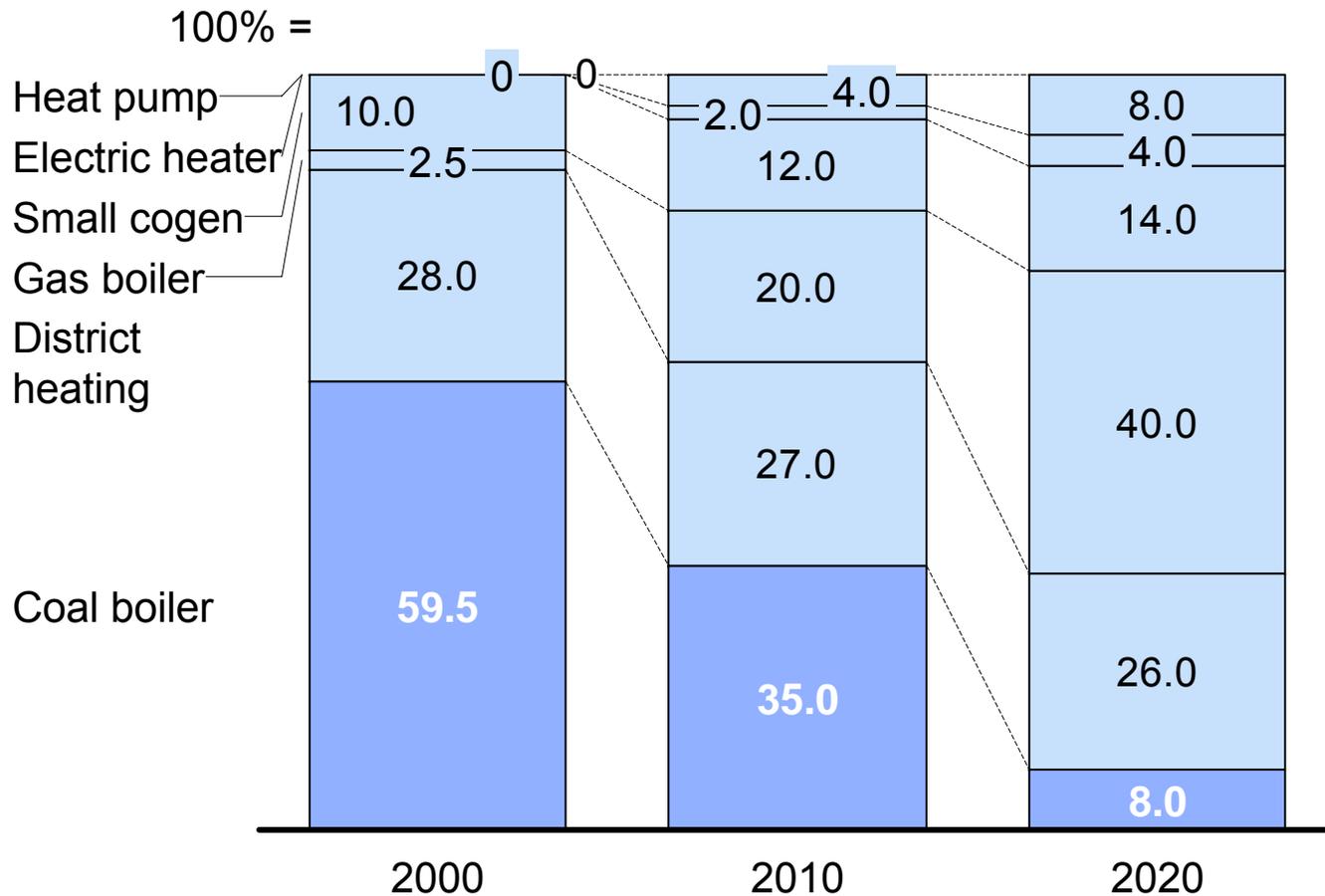


* As an example, doubling energy efficiency for a given end use leads to a demand reduction of 50%.

Source: LBNL, China Energy Group; MGI analysis

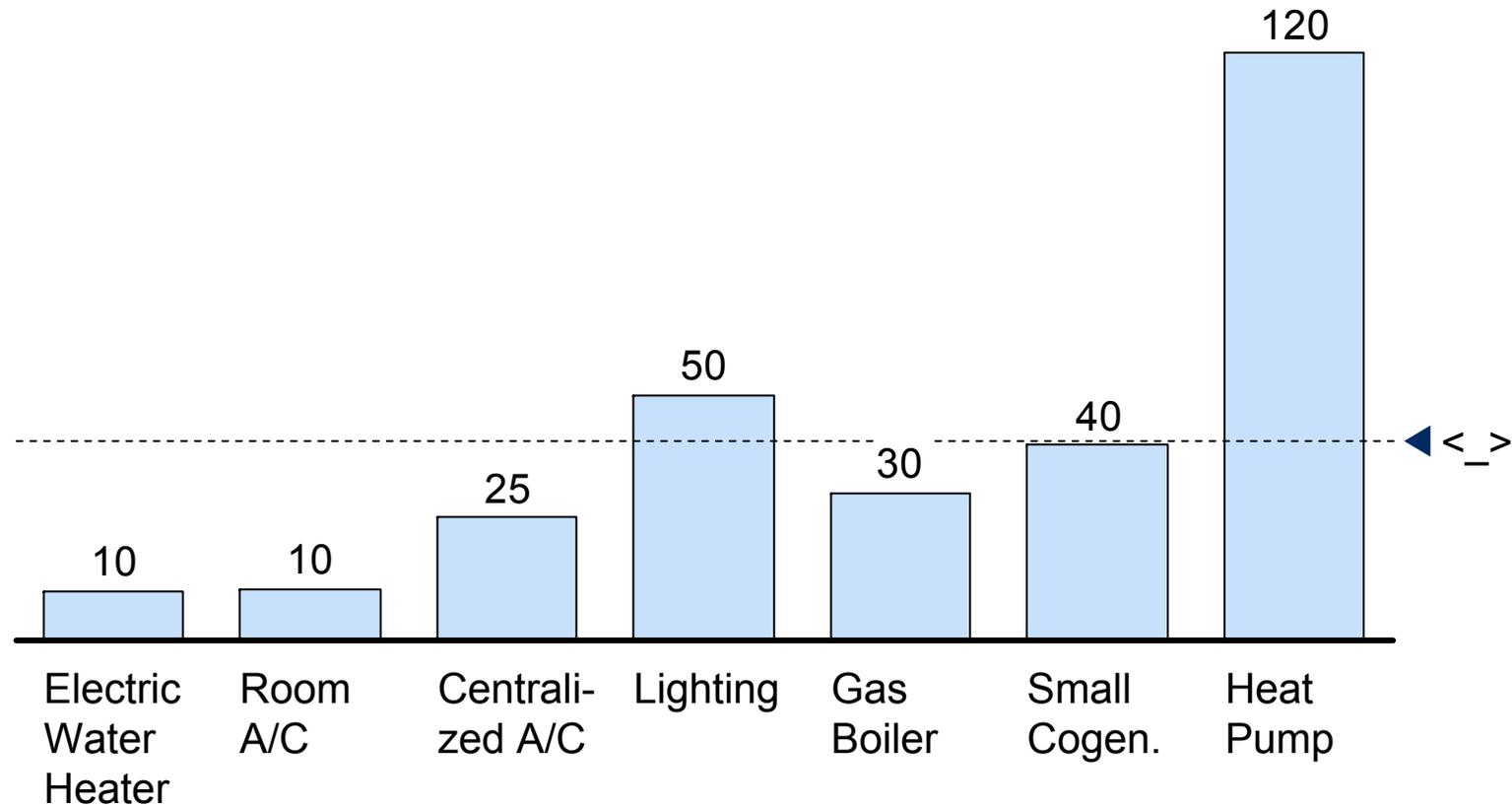
A RADICAL SHIFT IN CHINA'S SPACE-HEATING TECHNOLOGY CHOICES WILL LEAD TO A DRAMATIC CHANGE IN FUEL MIX ...

Share of space-heating technologies in Chinese office buildings
%

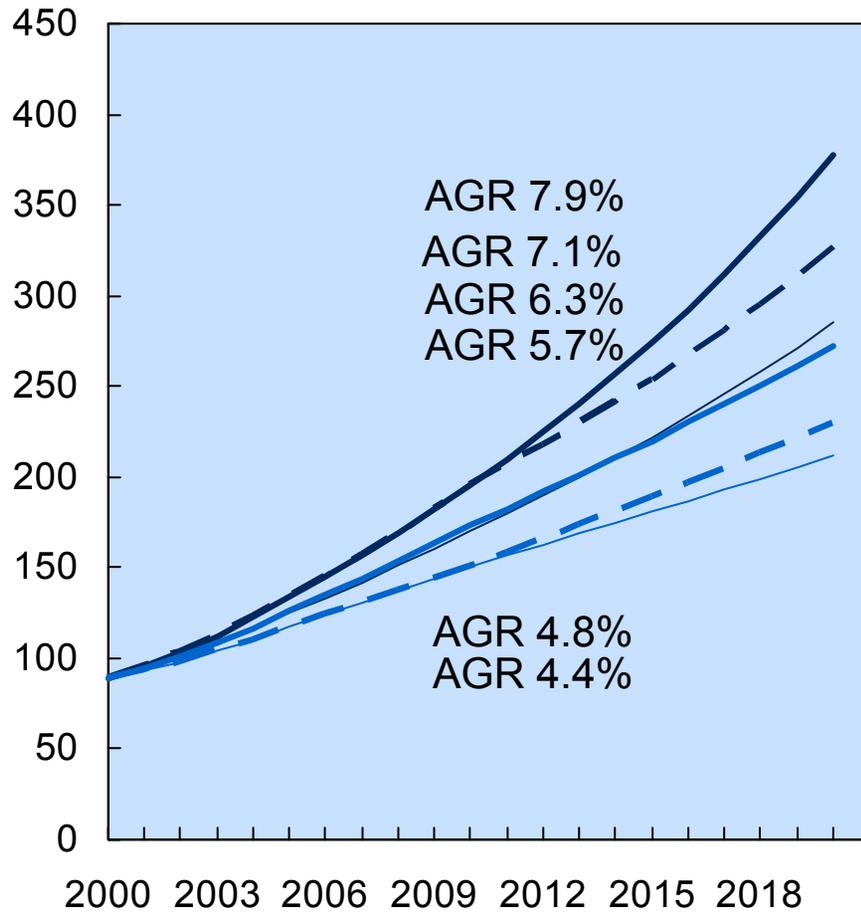


EFFICIENCY IMPROVEMENTS BY TYPE OF EQUIPMENT

Technical efficiency improvement, 2003-2020
Percent

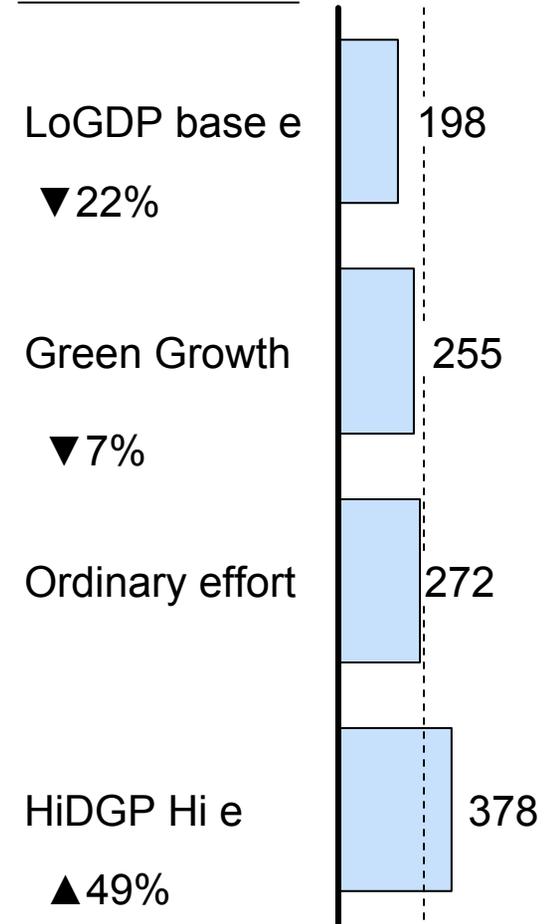


OTHER SCENARIOS



HiGDPI e
 HiGDP base e
 BaseGDP Hie
 Baseline
 LoGDP Hi e
 LoGDP base

Mtce



DIFFERENT TYPES OF POLICY INSTRUMENTS

Examples

Building codes

- New building codes, with increasing industry involvement
- 35% to 50% target energy savings at less than 10% extra cost
- Implementation implies upgrading envelope insulation and installing advanced window, HVAC and lighting technologies
- Currently low compliance rate in new constructions (~5 percent)

Efficiency standards and Labeling

- China already has minimum standards for HVAC equipment...
- ... as well as labeling program for air conditioners and office equipment
- Standards remain lower than in several developed countries

Reform of heat system

- Heat metering
- Heating technology improvements
- Combined heat and power

Government procurement

- Government buildings account for an estimated 5% of China's energy consumption. Energy-saving retrofits in these building could reduce energy intensity and set an example for other buildings

Thank you!

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