

Efficiency and Economic Growth

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Themes the seem to work

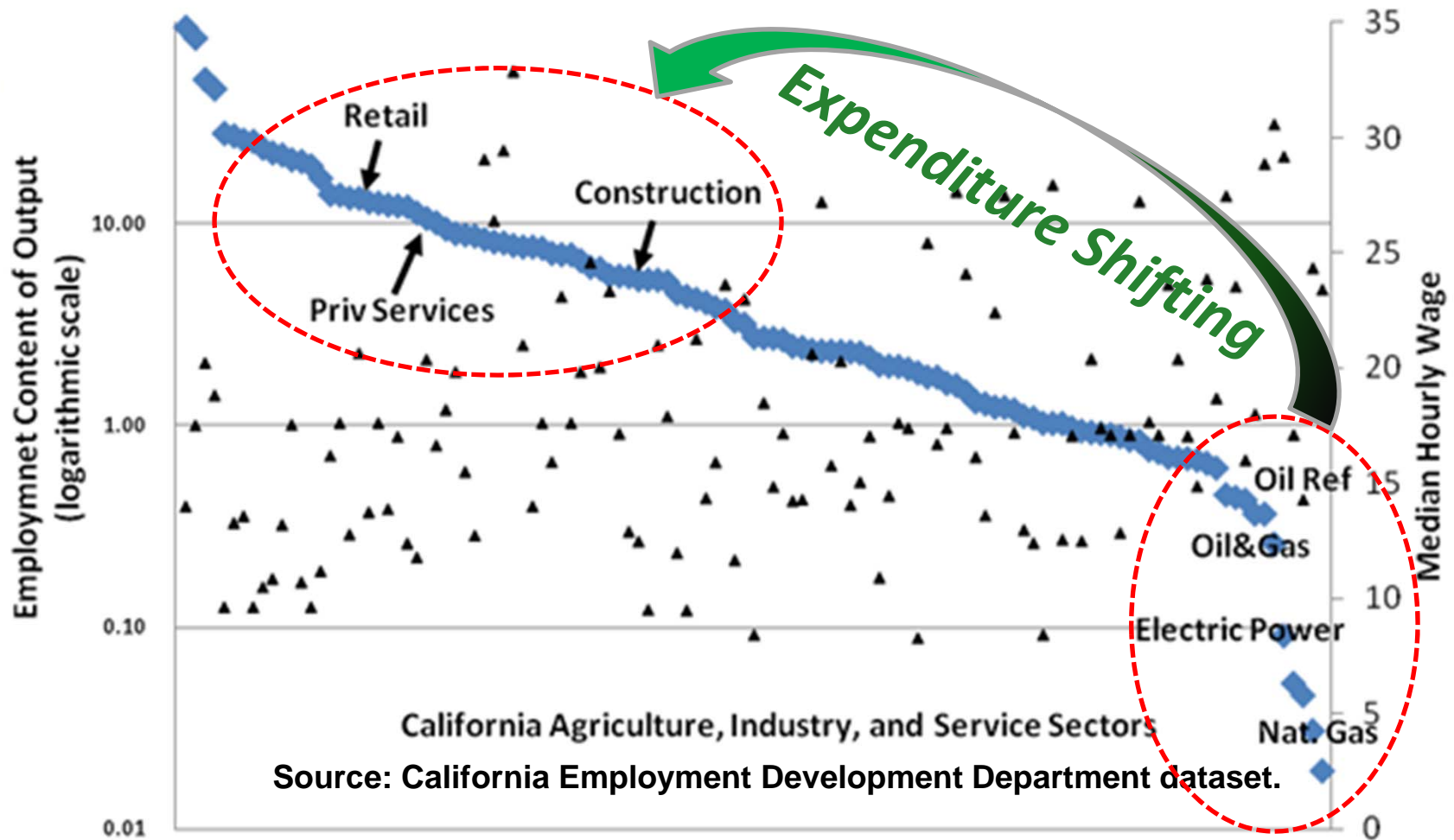
- Efficiency
- Energy security
- Competitiveness



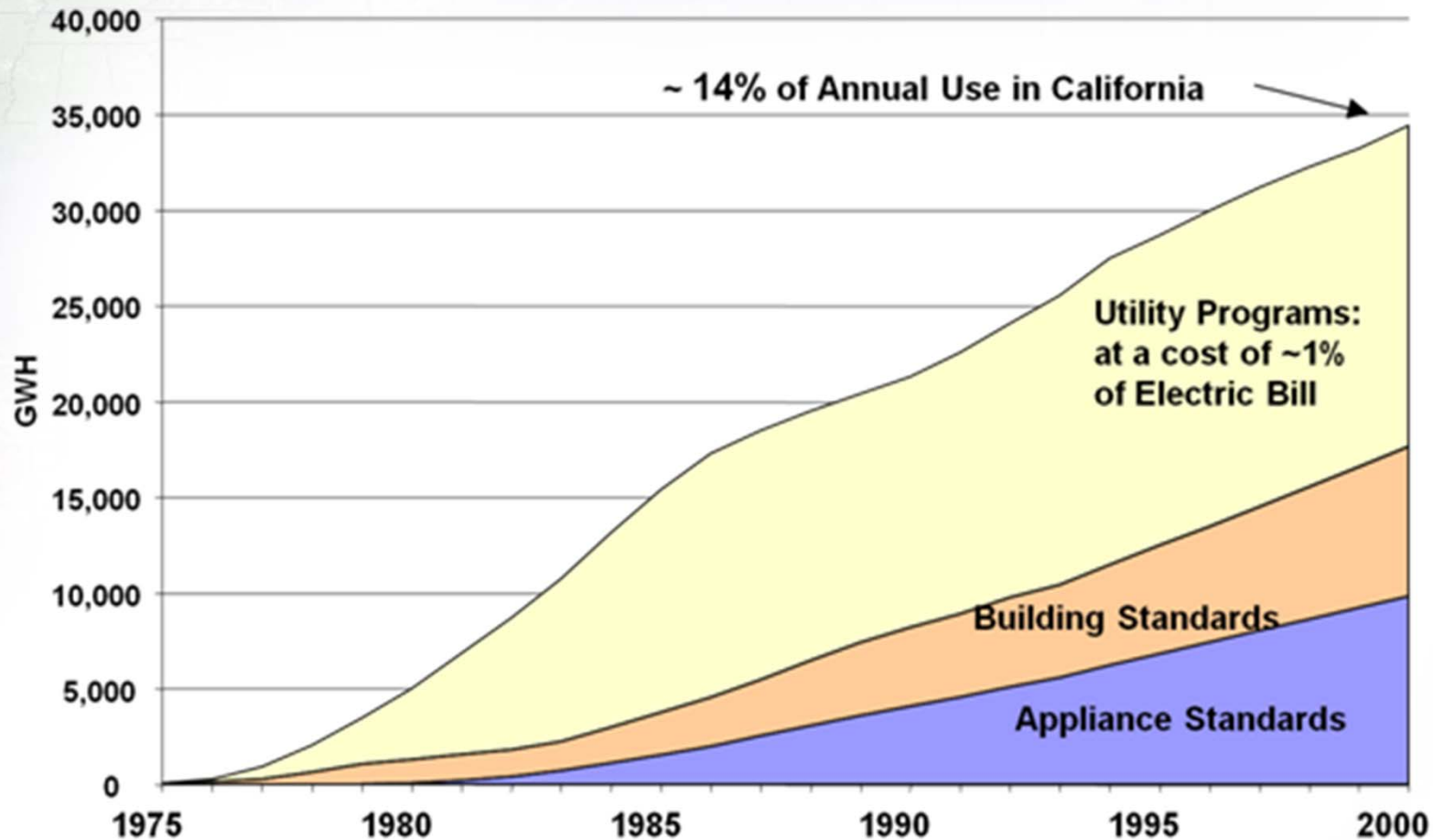
Efficiency

- Benefits – obvious
 - Saves money, stimulates the economy
- Challenges
 - Growth – often confused with the rebound effect, but much more dangerous
 - Temperature (A/C), last year was the hottest since 1880, 19% more cooling degree days than the decadal average
 - Adoption cost,
 - Macro – lack of fiscal nerve and business cycle - recession stalled investment, reversing EE for the first time since 1991
 - Micro – capital market failures

Why this works...

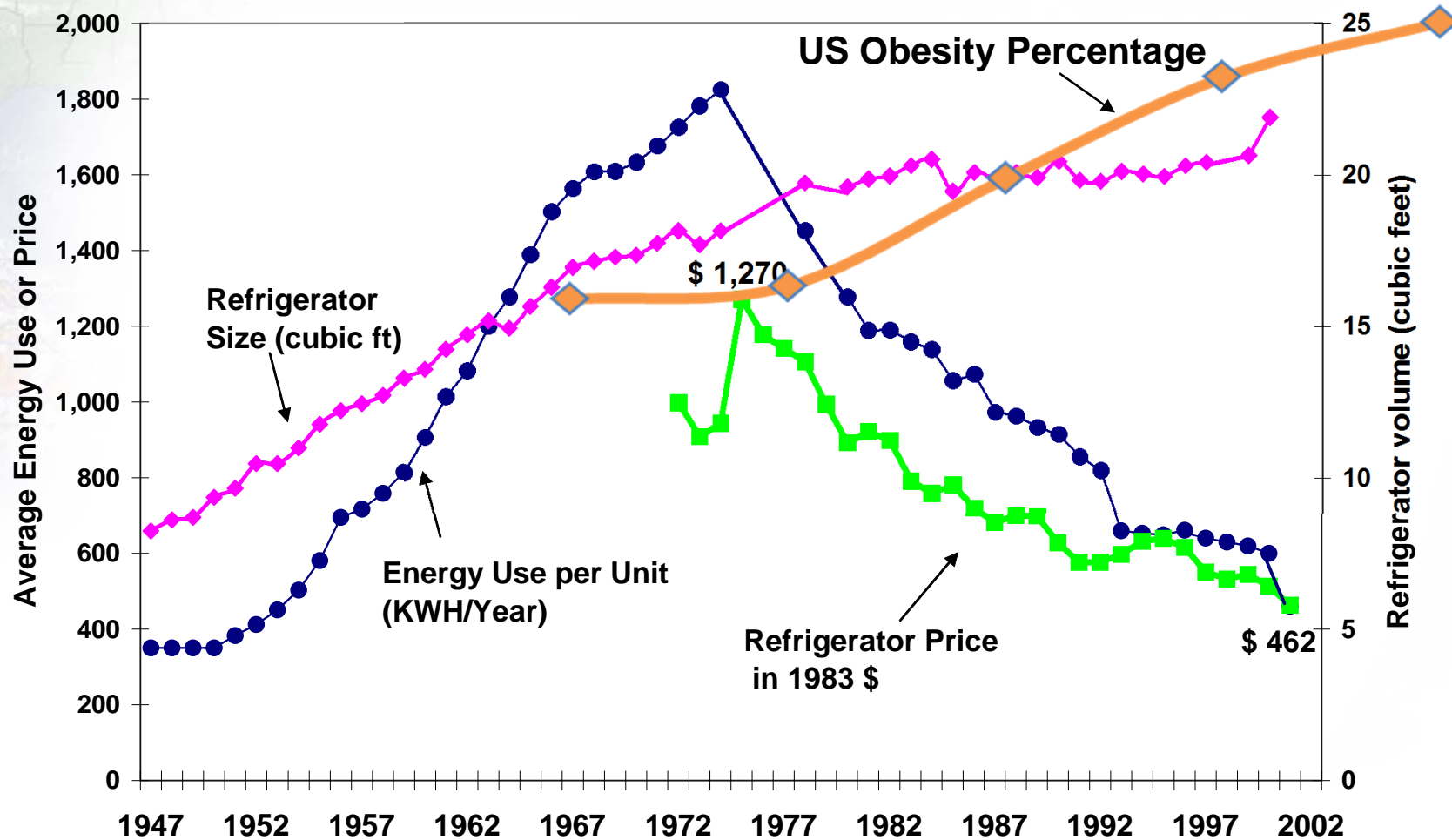


Evidence from California: Energy Efficiency Gains Since 1975

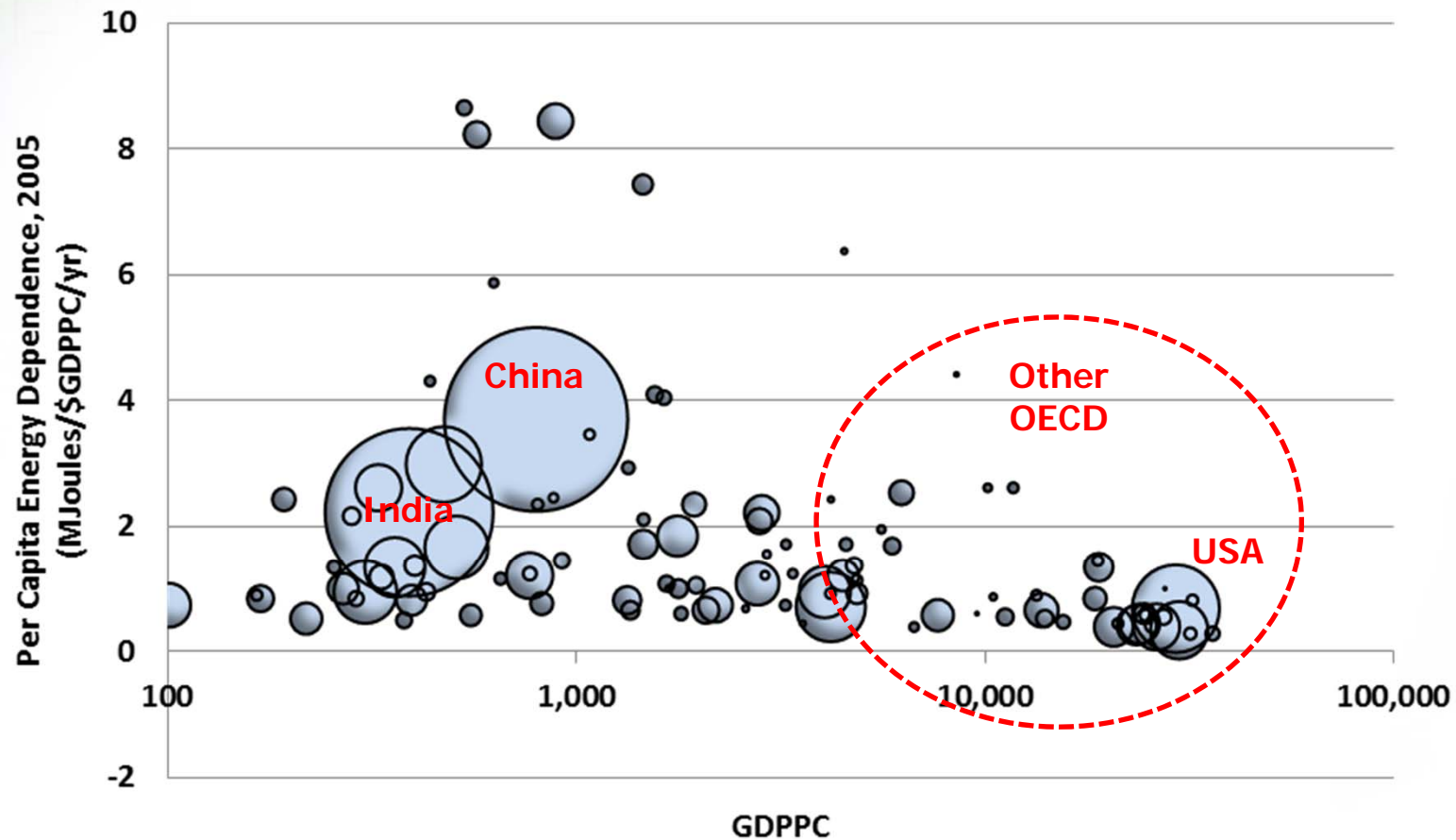


We can do this: The Fruit is Ripe and Low Hanging

United States Refrigerator Use v. Time

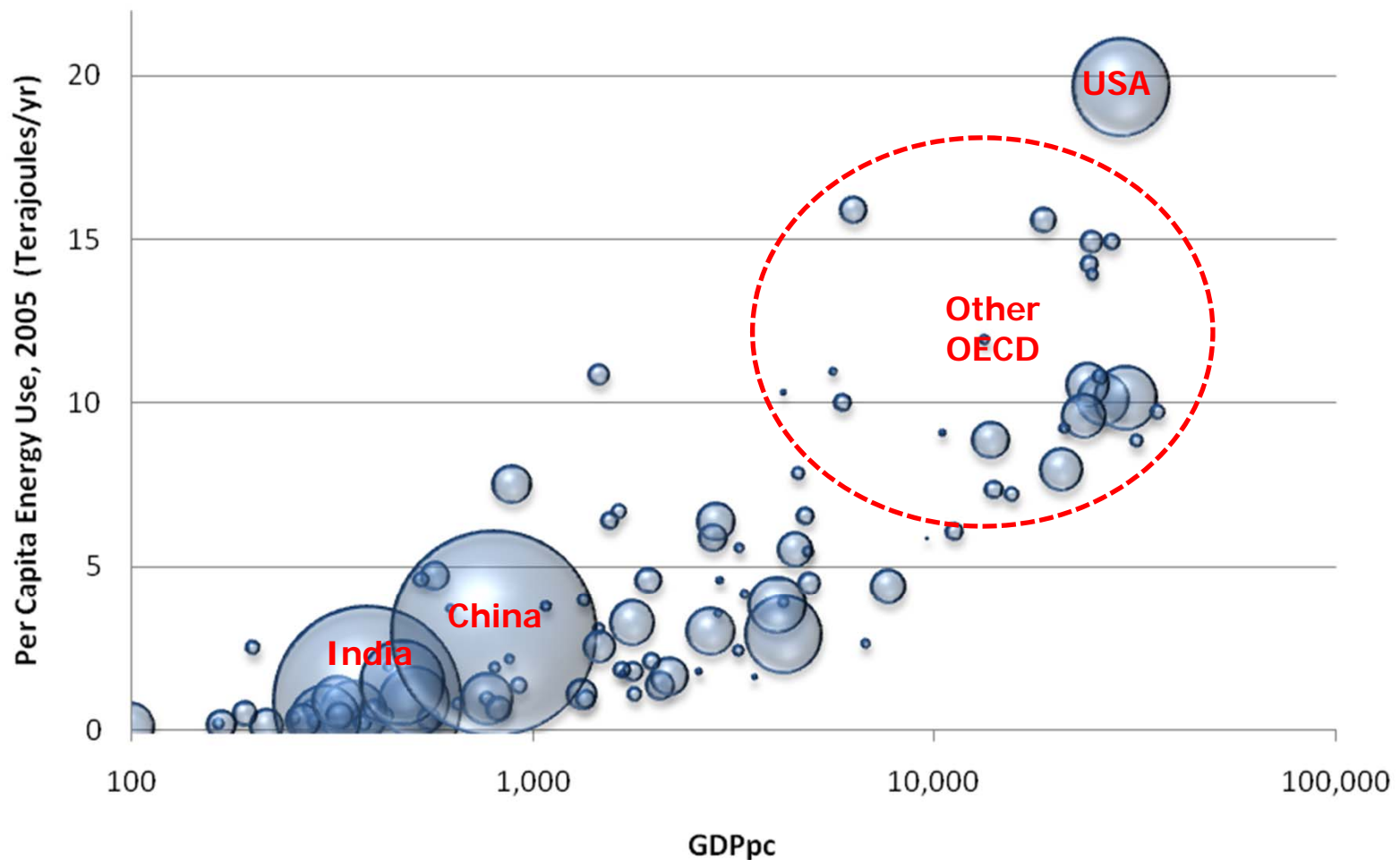


Looks Good: Energy Intensity by Country, Income, and Population



Source: Author estimates from International Energy Agency and World Bank data. Bubble diameter is proportional to population, 2005

Look Out: Energy and Income, by Country, Income, and Population



Source: Author estimates from International Energy Agency and World Bank data. Bubble diameter is proportional to population (2005)

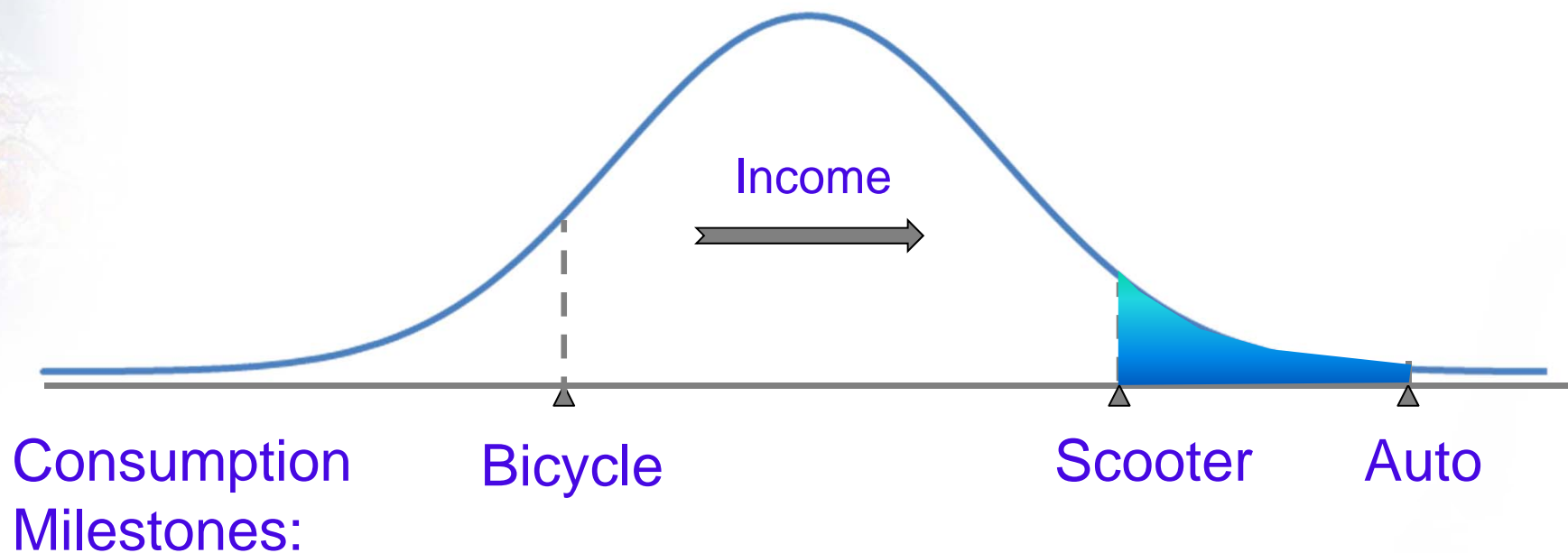


Efficiency for Growth

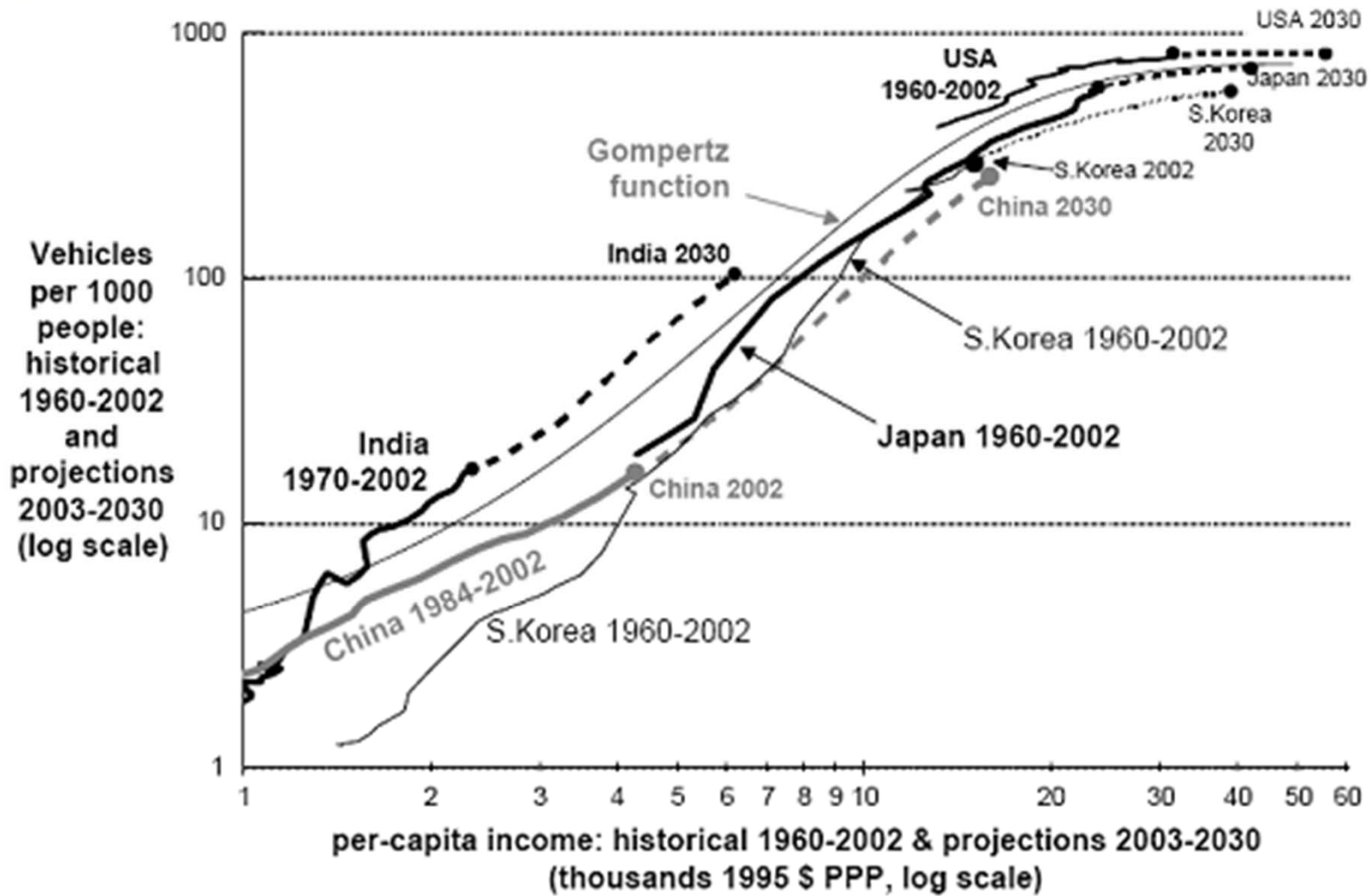
- Promoting efficiency saves money for individuals and enterprises, liberating resources for more job-intensive growth
- Standards and incentives have been more effective in California than market mechanisms
- Energy efficiency is the next breakout technology sector, and domestic standards will promote innovation to capture global markets

Be afraid: Explosive Global Growth of Middle Class Consumer Goods...

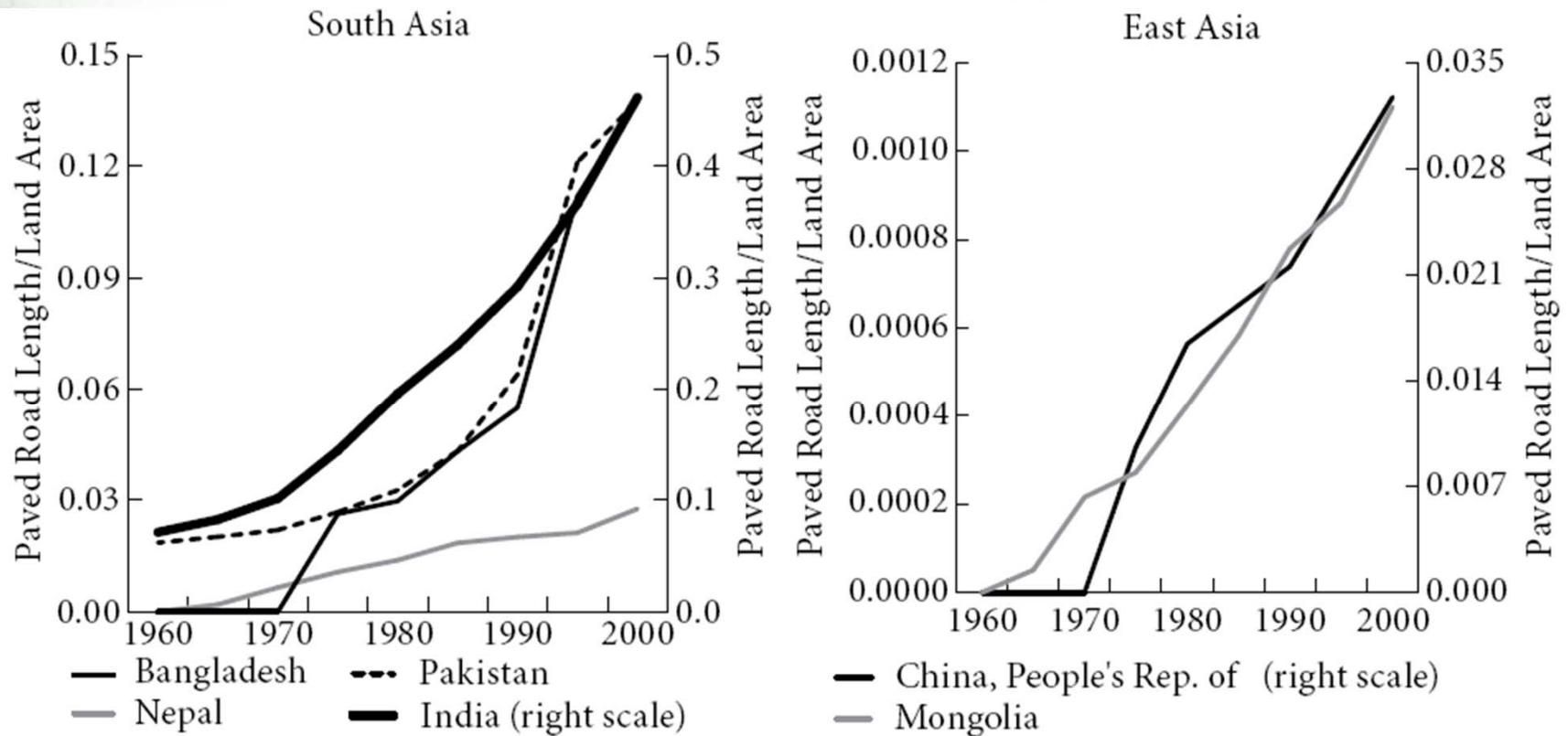
Durable Goods: Linear Growth of Average Income Induces Exponential Growth of New Demand



Vehicles: A sentinel commodity 1960-2030

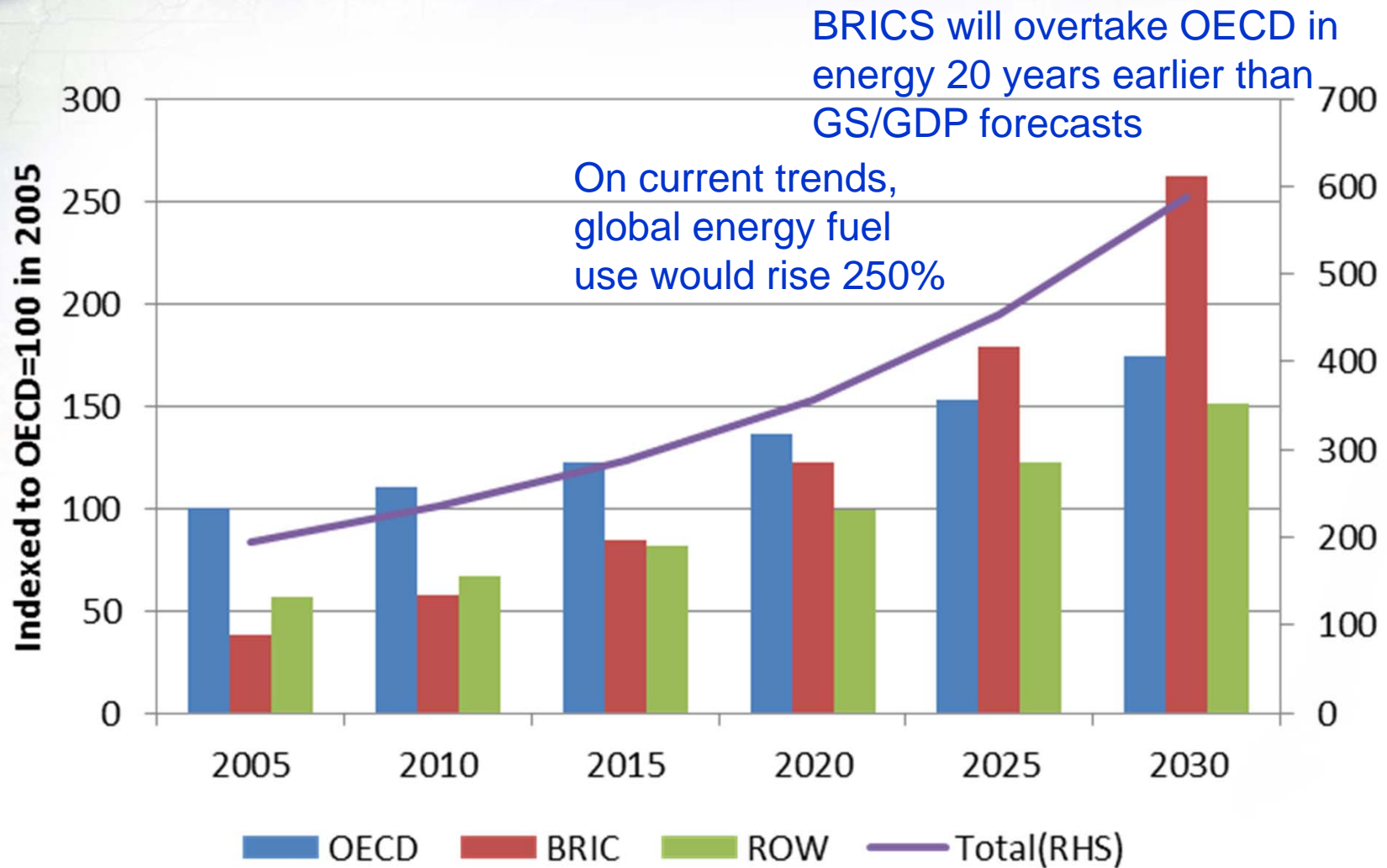


Policy Facilitation: Paved Road Systems

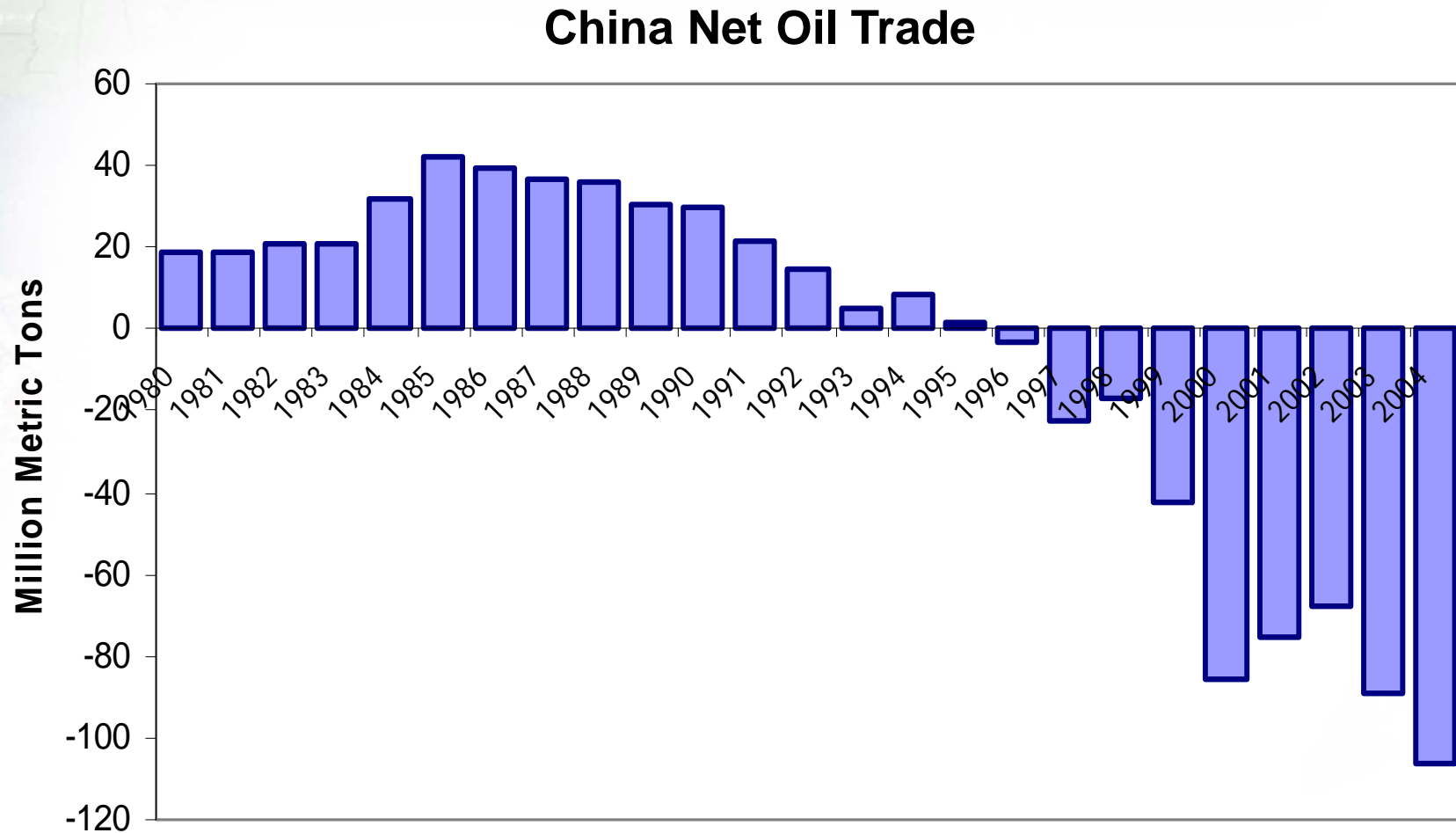


Source: Fay and Yepes (2003).

Meanwhile, Emerging Markets are Redefining Global Energy Use

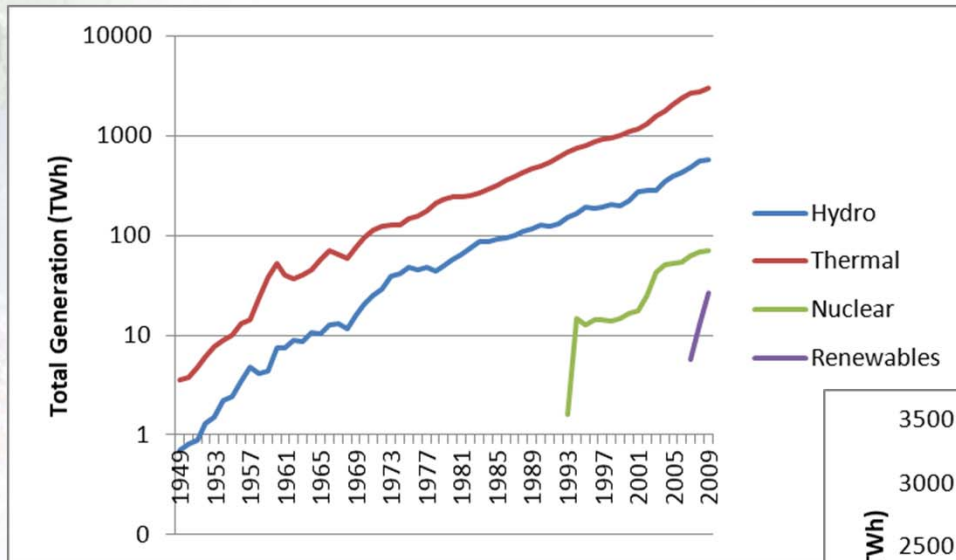


China's Petroleum Tsunami



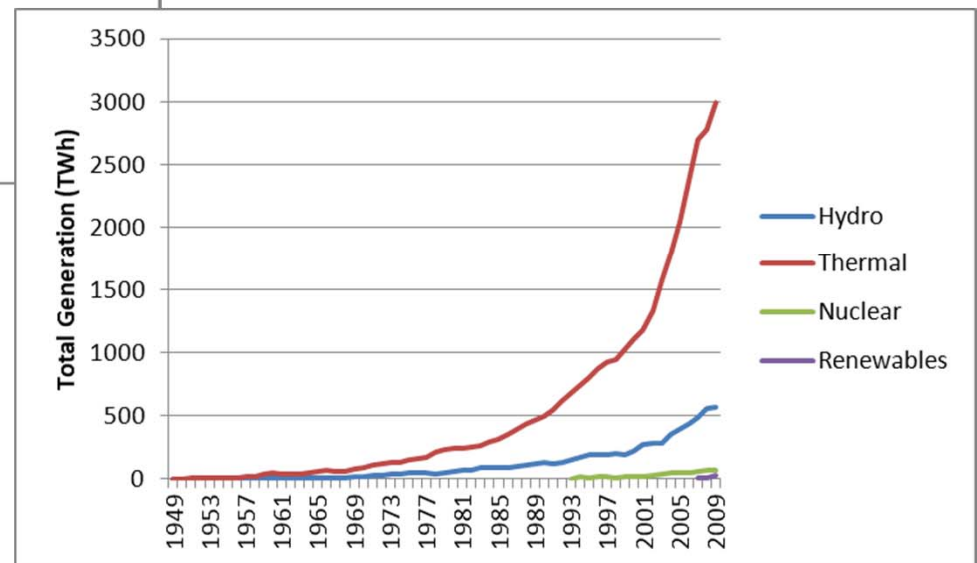
Source: IEA.

Supply Side Solutions: China's Electric Power by Energy Source



Yes, renewables are growing very fast.

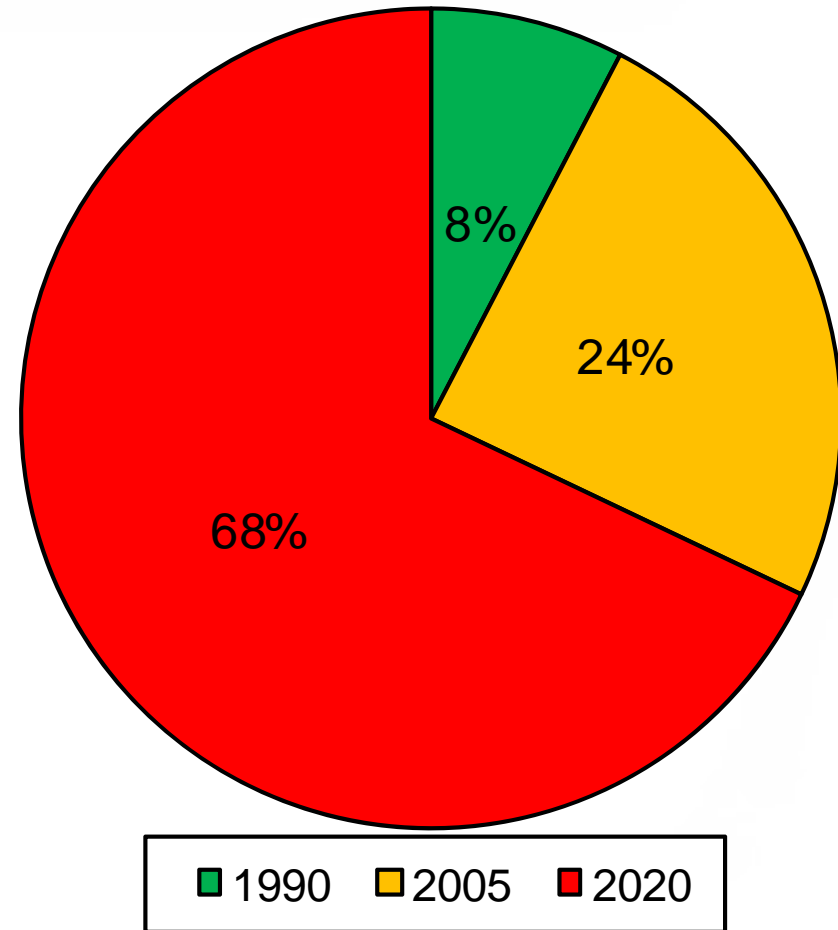
Their overall contribution, however, remains negligible.



Source: Roland-Holst:2010.

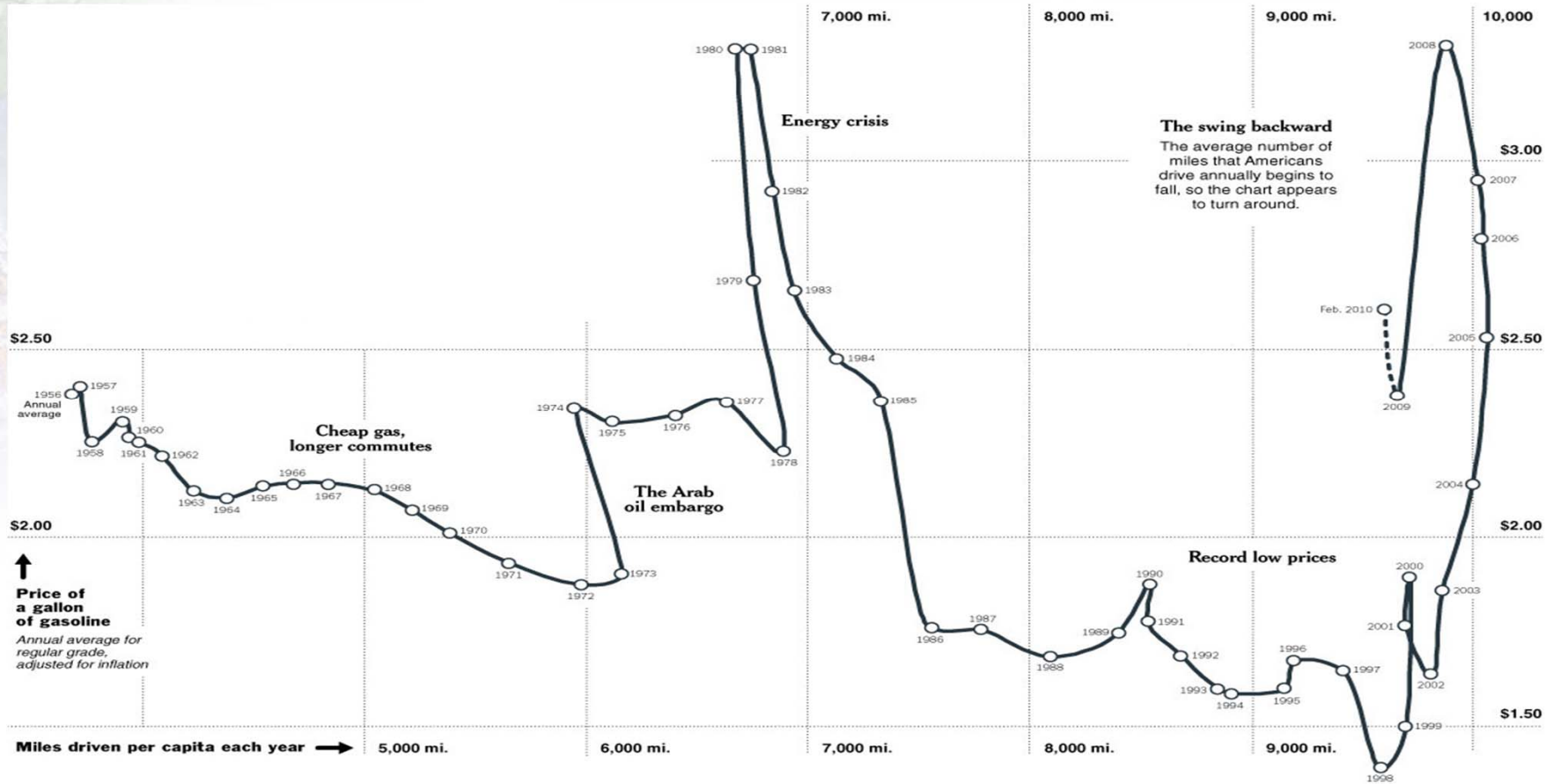
China's Future Electric Capacity

- Between now and 2020, more new capacity will be added than the entire installed capacity of the EU-25
- 74% coal-fired
- 20-40 year useful life





Don't give up on prices/taxes/fees: U.S. VMT and Gasoline Prices



Source: NY Times



How the State can Help

- Reduce Innovation Costs
 - Traditional R&D Finance
 - Leadership: Infrastructure investments (grid, etc.)
 - Loans, guarantees, and contracts
- Change Behavior
 - Standards, standards, standards
 - Incentives, disincentives
 - Information, education



How to Promote EE Adoption

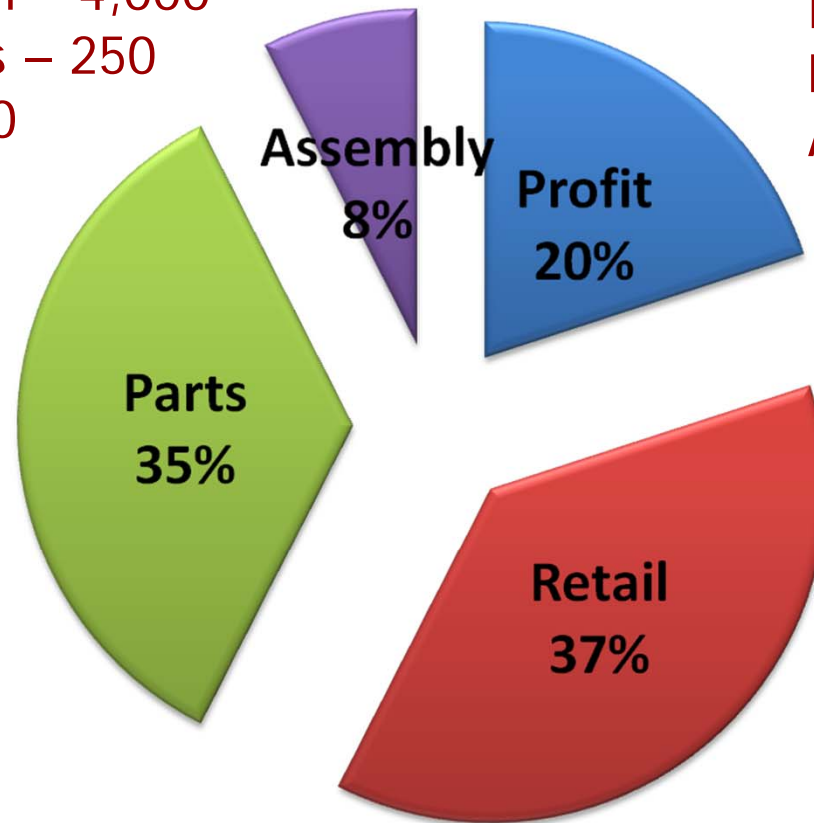
- US experience suggests that capital markets can fail here.
- California, the most successful US state in promoting EE, has relied completely on standards (i.e. command and control).
- Even if the technology has to be imported, energy savings have domestic multiplier effects and usually reduce other (fuel) import dependence.

Green Jobs vs. Greencollar Jobs

- Will climate action re-industrialize the West? I have to be skeptical.
- Technology Lifecycle:
 1. Design and development 
 2. Fabrication 
 3. Marketing and maintenance 
- Green technology can be designed, marketed, and maintained in the West, but most tech hardware isn't made here anymore.
- For the innovators, however, most value added can be retained at home, with substantial multiplier effects.

Who, Where, Why do we care? A Mouse Called Wanda

Employees:
Shenzen – 4,000
Millpitas – 250
Zug - 50



<u>Price</u>	\$40
Profit	\$8
Retail	\$15
Parts	\$14
Assembly	\$3



THANK YOU