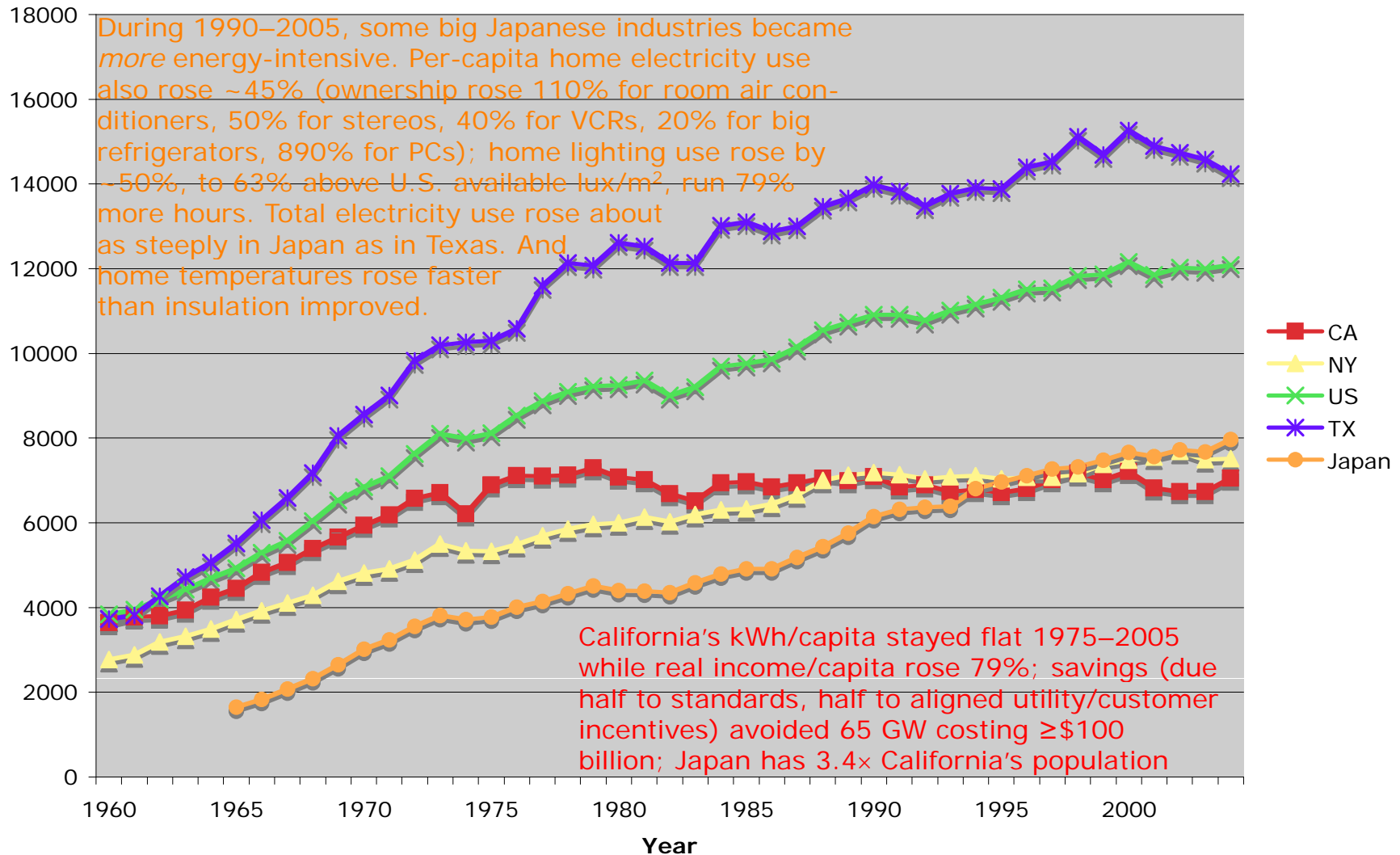




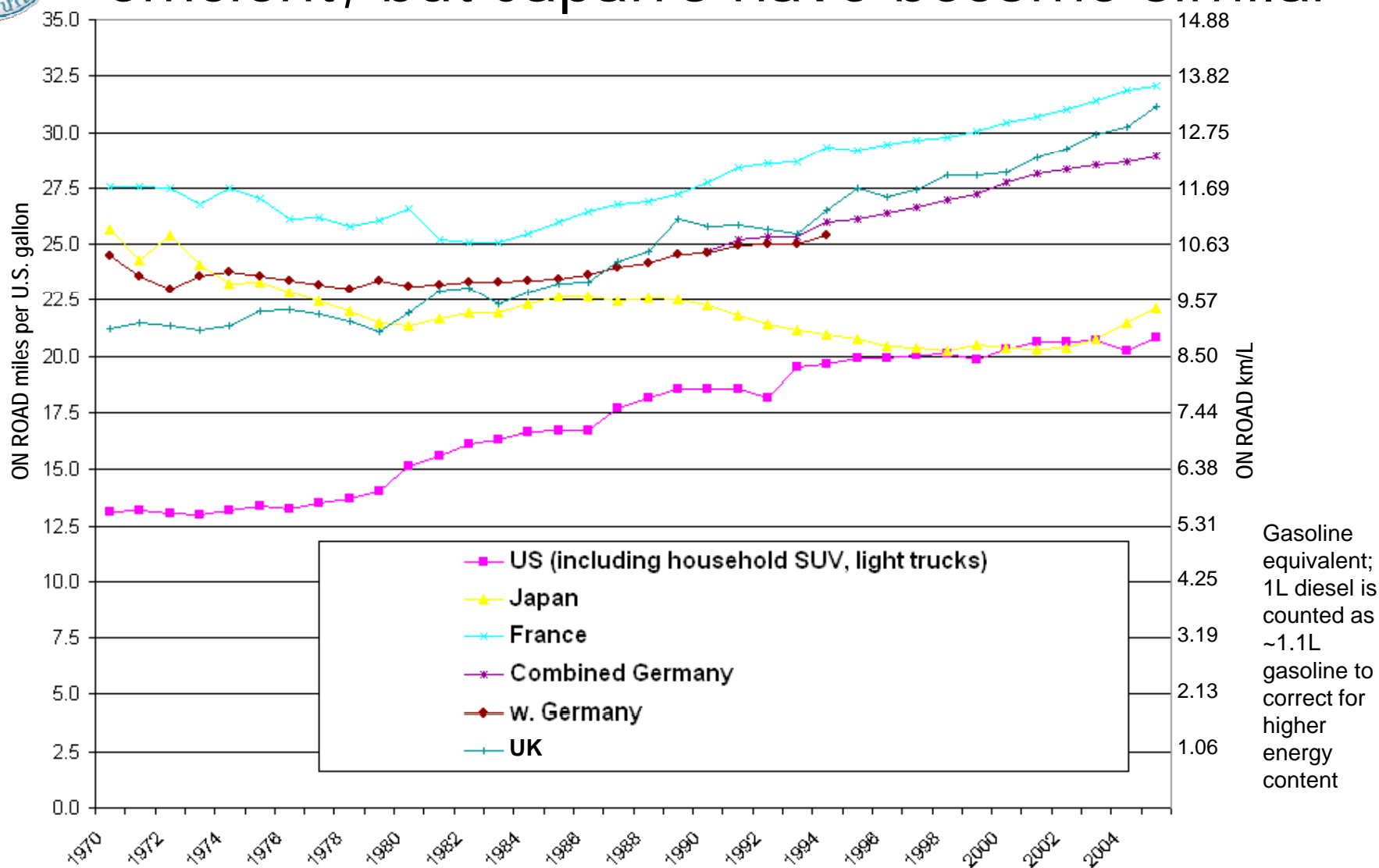
## Per capita electricity consumption



Source: EMBARQ, the World Resources Institute (WRI) Center for Sustainable Transport (Dr. Lee Schipper, Director of Research), from official data sources



# U.S. cars & light trucks were long the least efficient, but Japan's have become similar



Source: EMBARQ, the World Resources Institute (WRI) Center for Sustainable Transport (Dr. Lee Schipper, Director of Research), from official data sources



# -44 to + 46 °C with no heating/cooling equipment, *less construction cost*



2200 m, frost any day, 39 days' continuous midwinter cloud...yet 28 banana crops with no furnace



Key: integrative design—multiple benefits from single expenditures

## Lovins house / RMI HQ, Snowmass, Colorado, '84

- Saves 99% of space & water heating energy, 90% of home el. (372 m<sup>2</sup> use ~120 W<sub>av</sub> costing ~\$5/month @ \$0.07/kWh)
- 10-month payback in 1983

## PG&E ACT<sup>2</sup>, Davis CA, '94

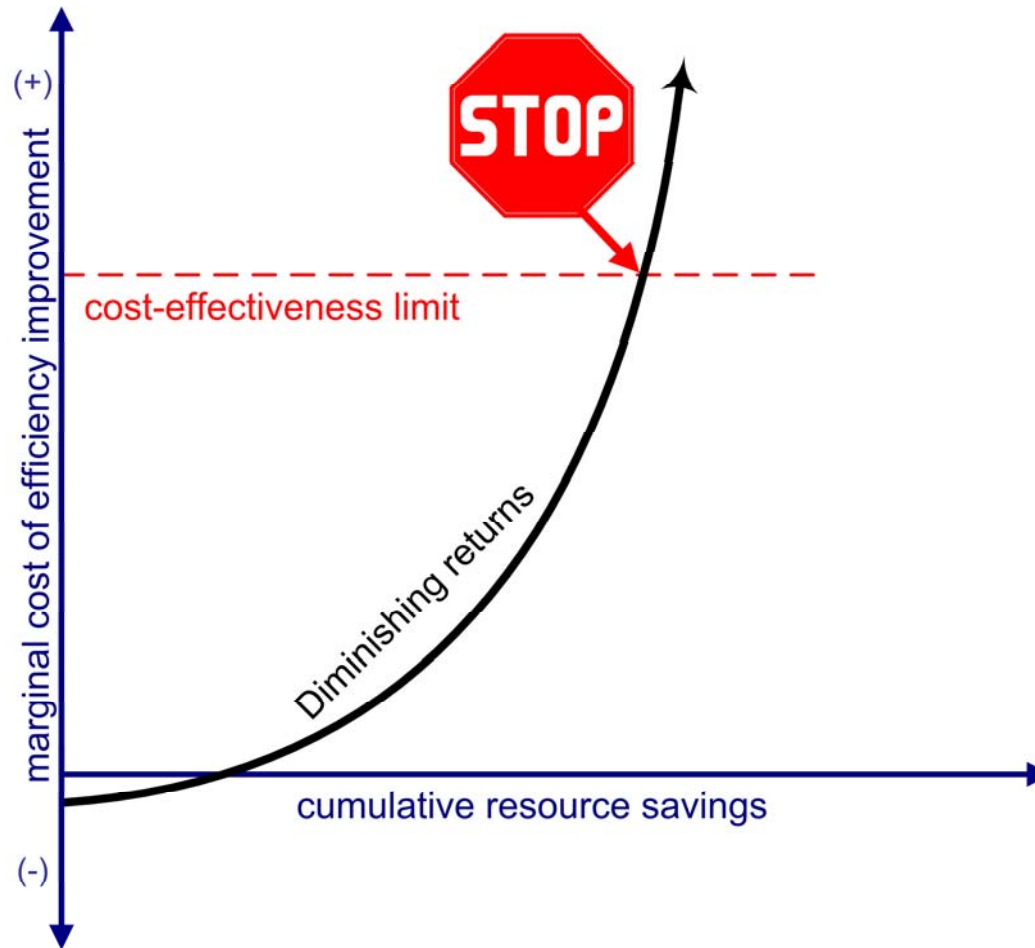
- Mature-market cost -\$1,800
- Present-valued maint. -\$1,600
- 82% design saving from best 1992 std., ~90% from US norm

## Prof. Soontorn Boonyatikarn house, Bangkok, Thailand, '96

- 84% less a/c capacity, ~90% less a/c energy, better comfort
- No extra construction cost



# Old design mentality: always diminishing returns...





# New design mentality: expanding returns, "tunneling through the cost barrier"

