



THE US RENEWABLE ENERGY TAX CREDITS: MORE INSTALLATIONS, OR MORE EXPENSIVE INSTALLATIONS?

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May 2014

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MOTIVATION

- State and utility incentives for renewable energy and energy conservation date back to the mid 90s.
- The Federal Residential Renewable Energy Tax Credit, launched in 2005, aimed to promote investment in renewable energy technologies at the residential scale.
- How did it do?



THE INCENTIVE

- Created in 2005 as part of the Energy Policy Act
 - Mainly motivated insulation and energy conservation
 - In addition, it supported investment in “renewables” with tax credits of (the lower of \$2000 or 30% of investments) in PV, solar thermal and fuel cells.
- Revised in 2008 with the Emergency Economic Stabilization Act
 - + 30% credit on investments 01/2009 – 12/2016.
 - + Small Wind
 - + Geo-exchange heat-pumps



THE TECHNOLOGIES

- The supported technologies differ in their economic characteristics:
 - Sizing criteria
 - Economies of scale
 - Technological maturity and price trends
- They also differ in which energy form they displace
 - PV and wind displace electricity generation
 - Solar thermal displaced gas/electricity
 - Geo-exchange displaces gas with electricity
 - Fuel cells displace electricity with gas



DESIGN OF SYSTEM

- If the technology has strong economies of scale, bigger systems would be more economical.
 - For electrical systems, FIT etc. allow sizing beyond need.
 - For thermal systems, there is little possibility of production beyond need.

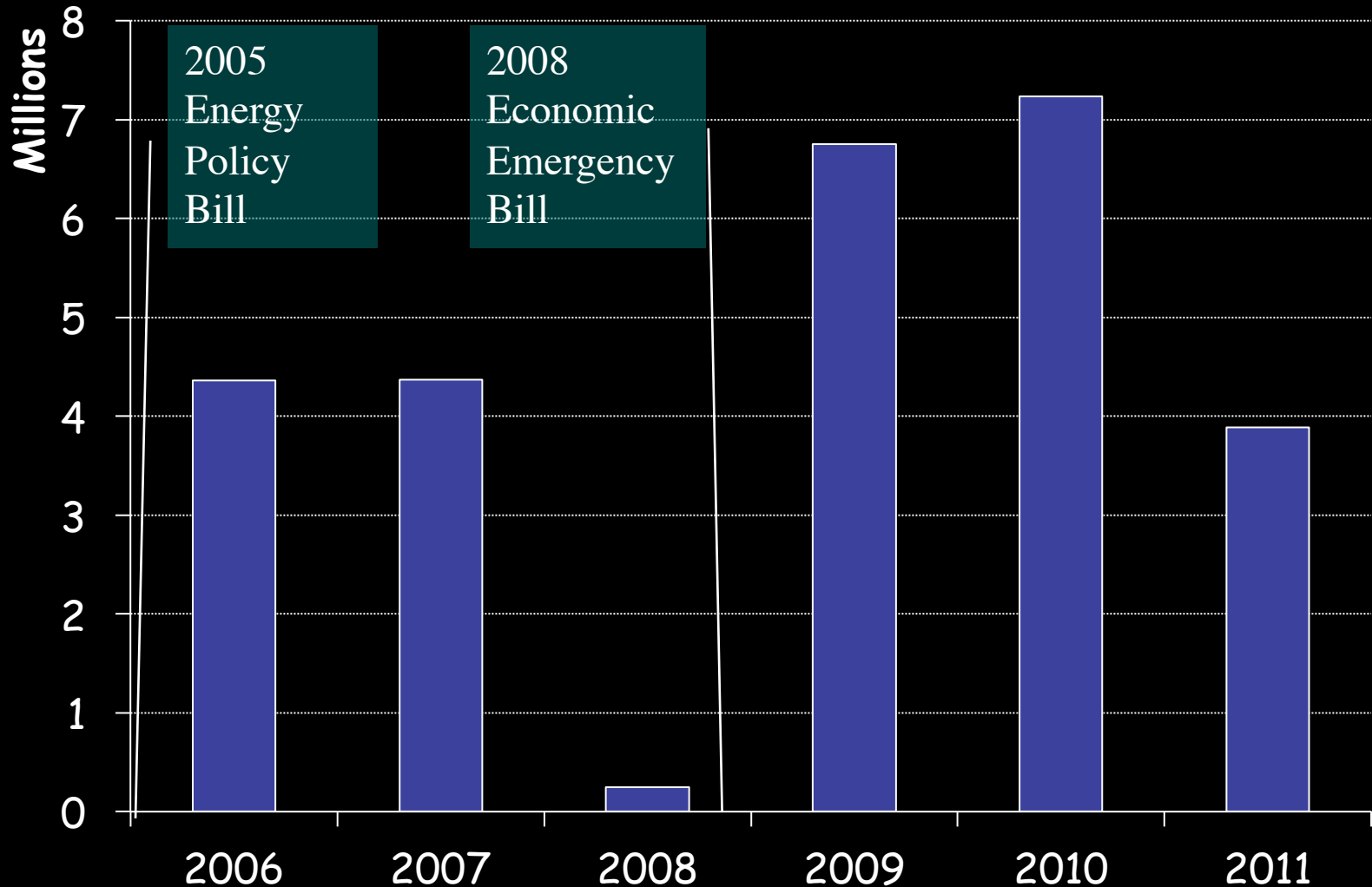


IMPACT OF TAX CREDIT

- Expected impact on number of installations?
 - More people investing in energy efficiency and renewables.
- Expected change in size of systems?
 - Investment in bigger electrical systems – where economies of scale and availability of FIT makes this a more rewarding investment.
 - Smaller thermal systems – as the bigger systems would have been sufficiently economical without the tax credits.
- Expected change in the price of systems?

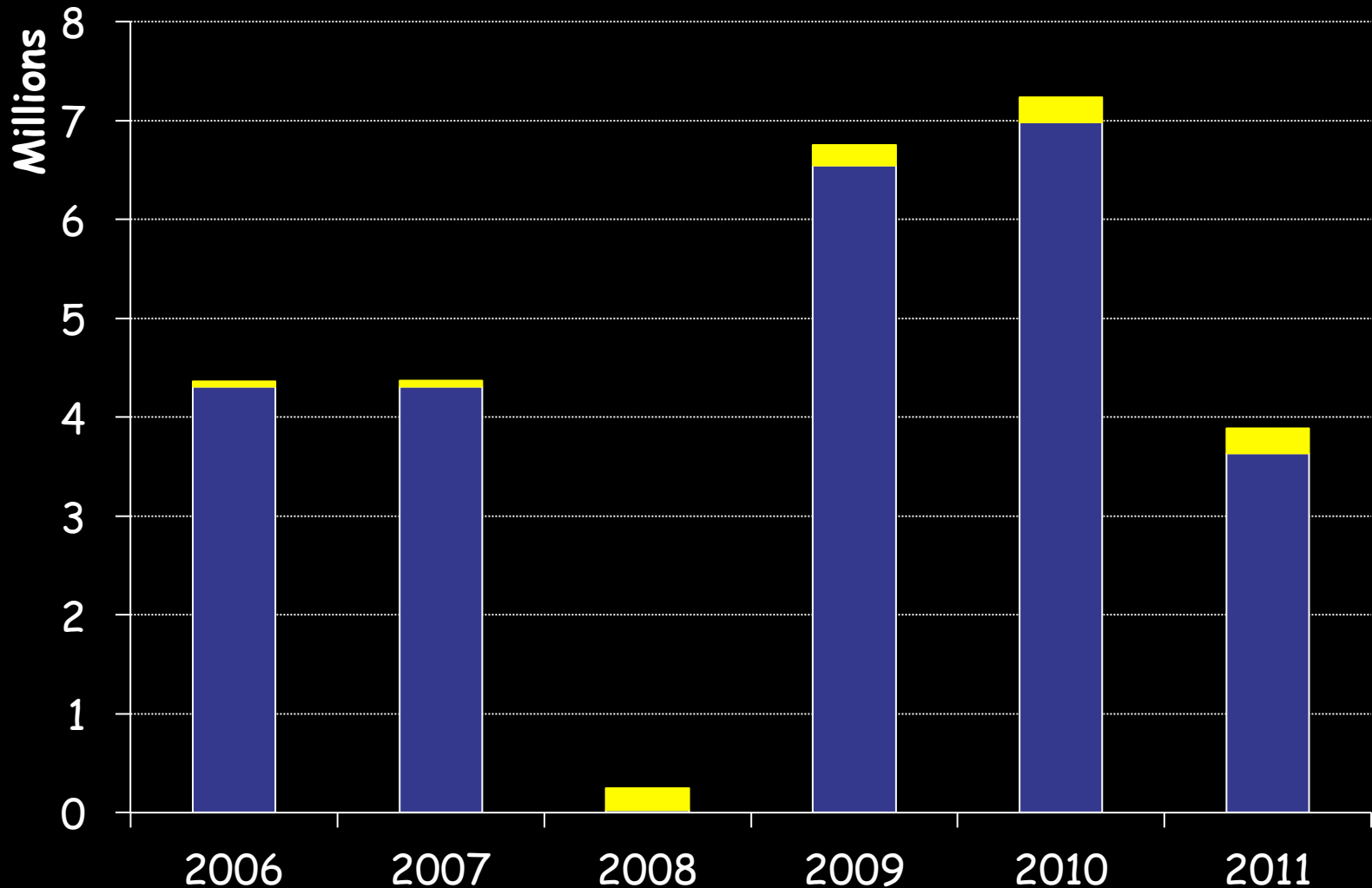


ENERGY TAX CREDIT FILINGS



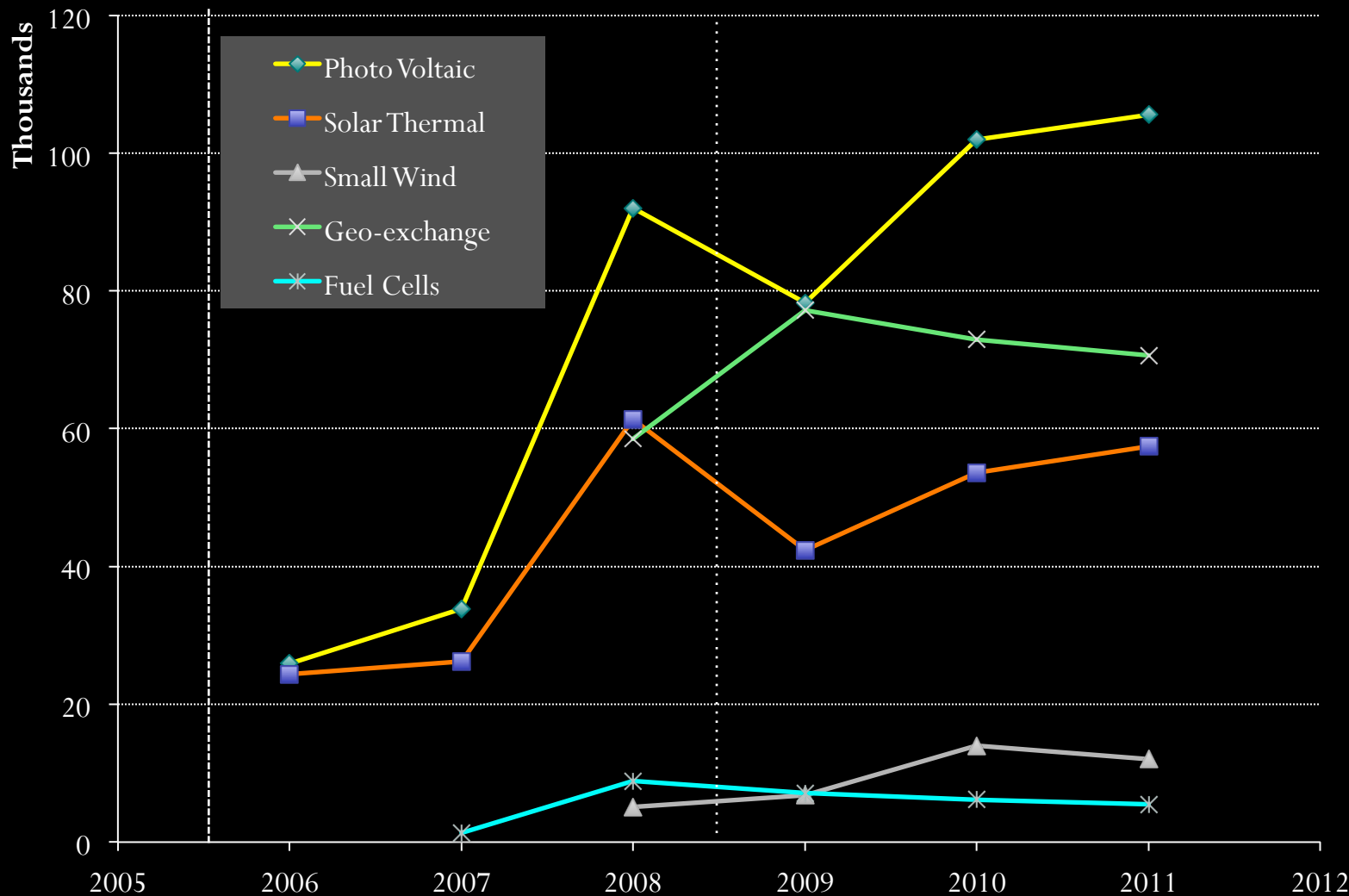


ENERGY TAX CREDIT FILINGS: EFFICIENCY CF. RENEWABLES



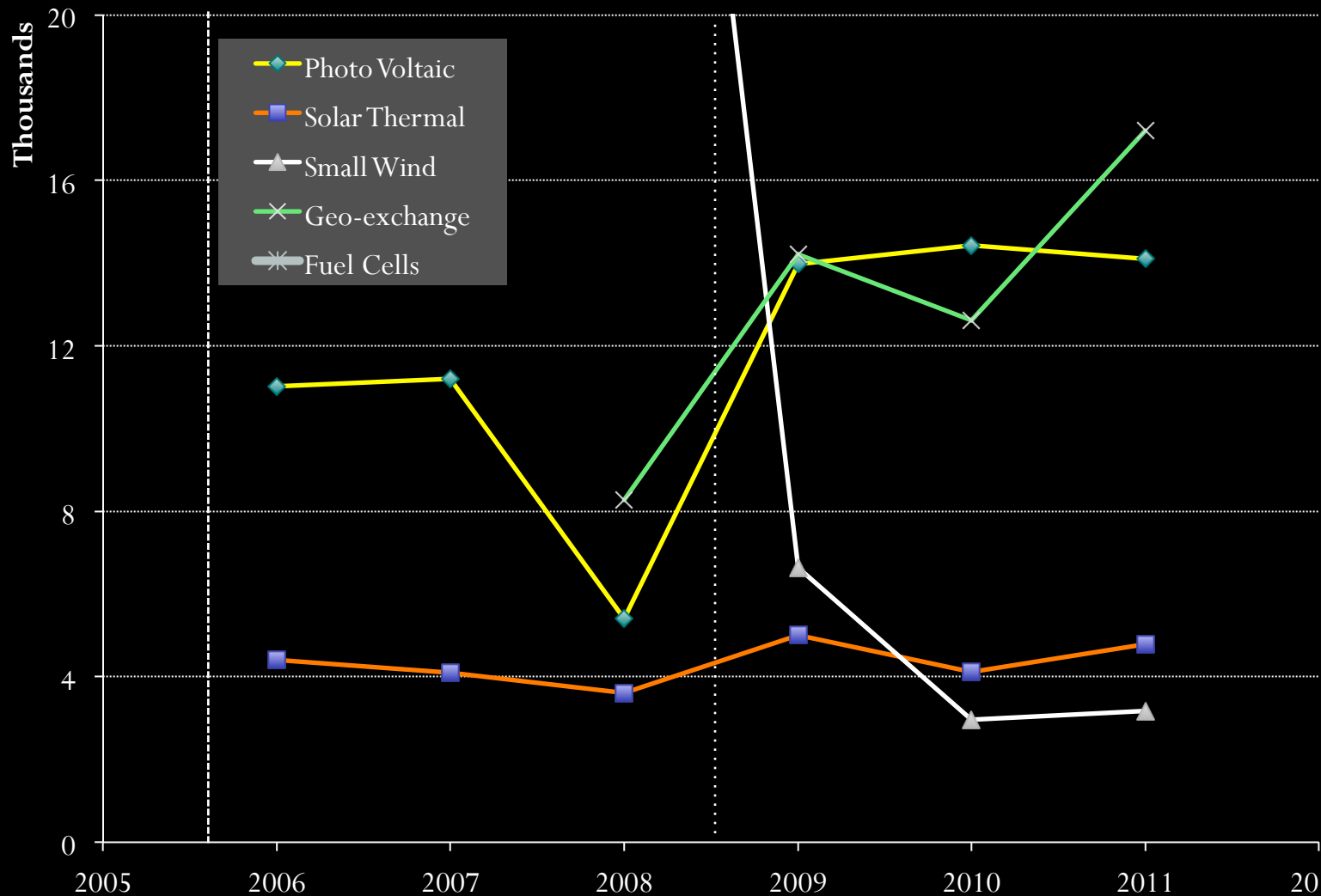


“RENEWABLE” INSTALLATIONS



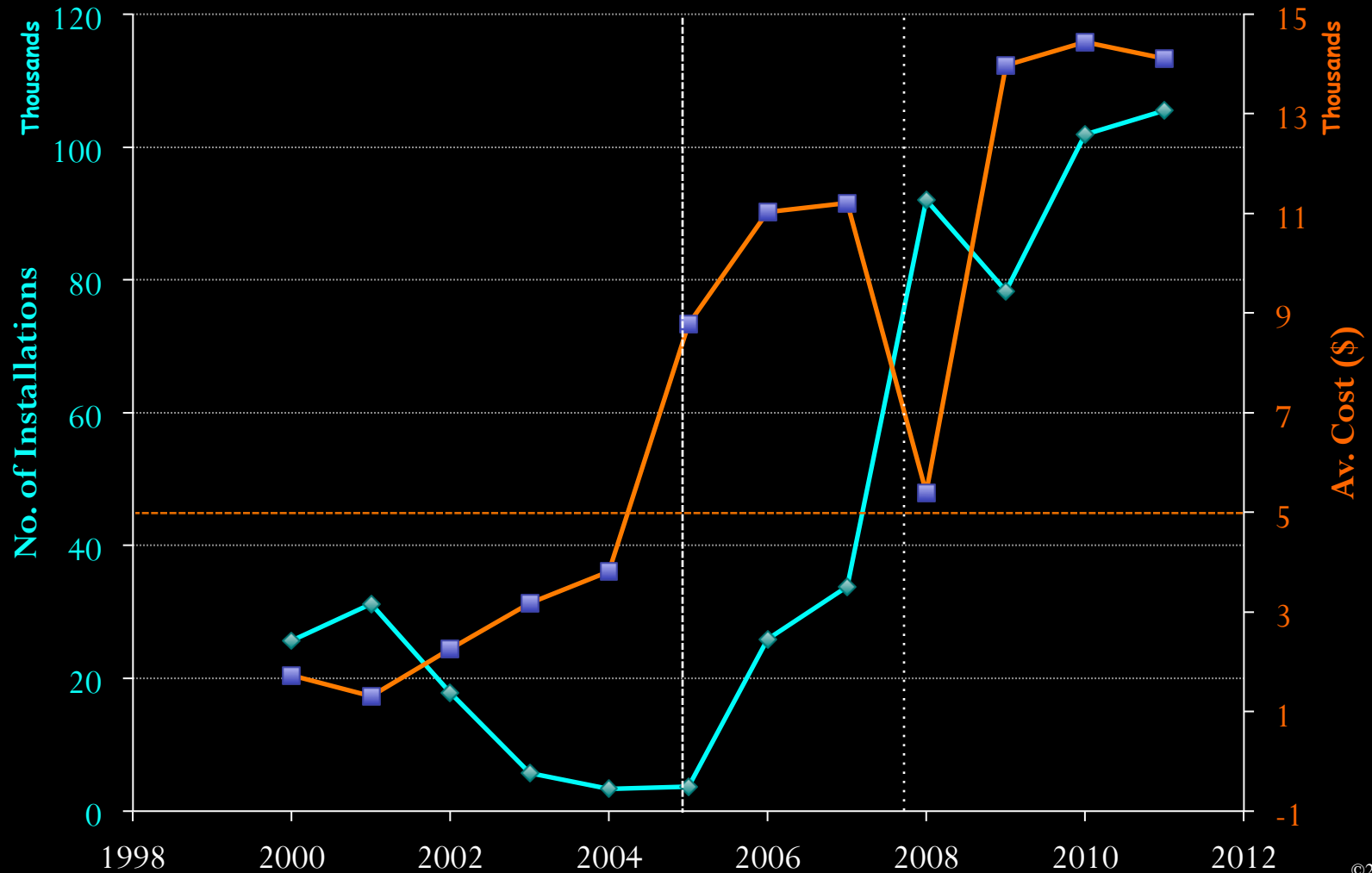


AV. COST OF INSTALLED SYSTEMS



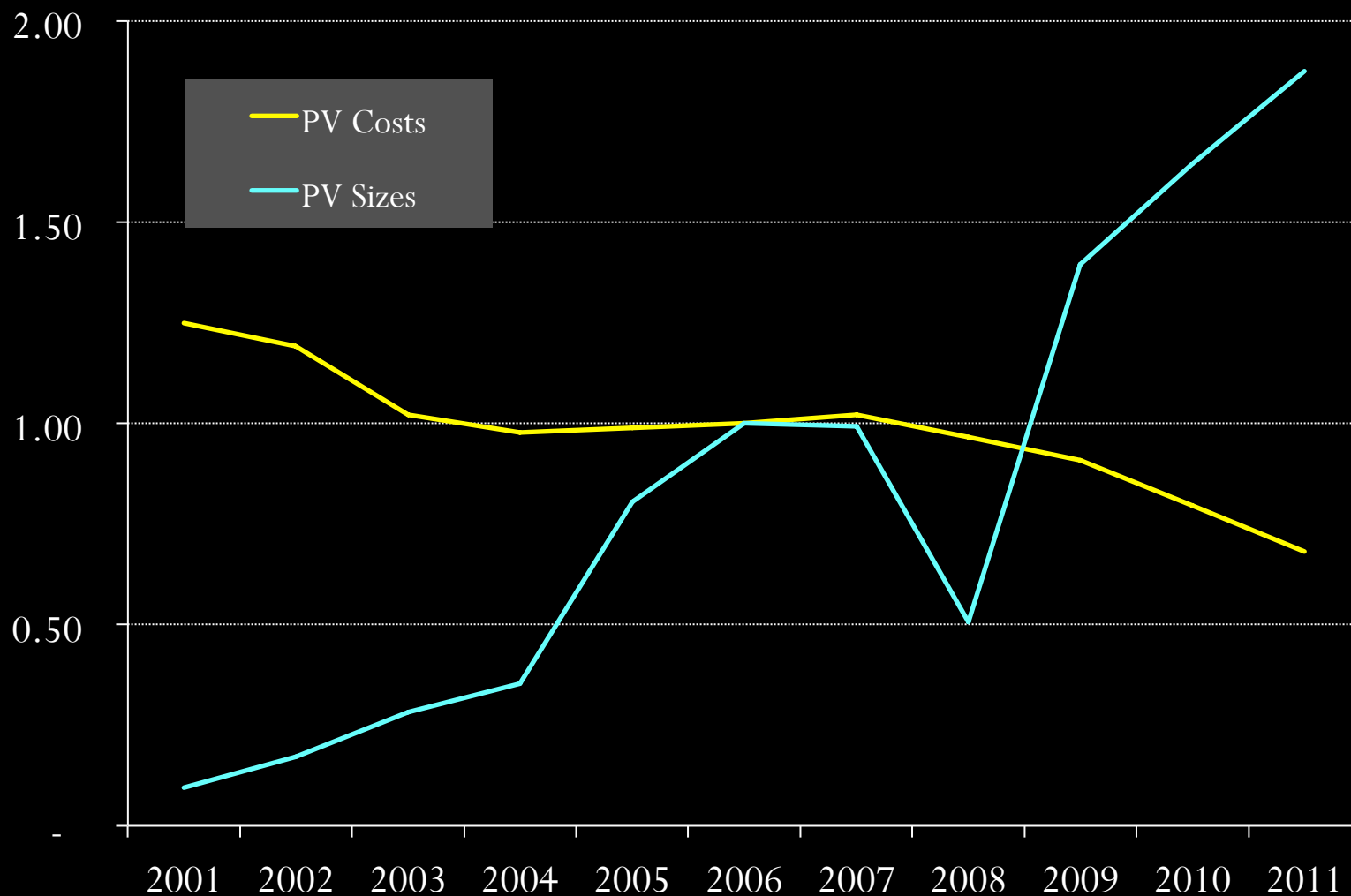


PV INSTALLATIONS & Av. COSTS



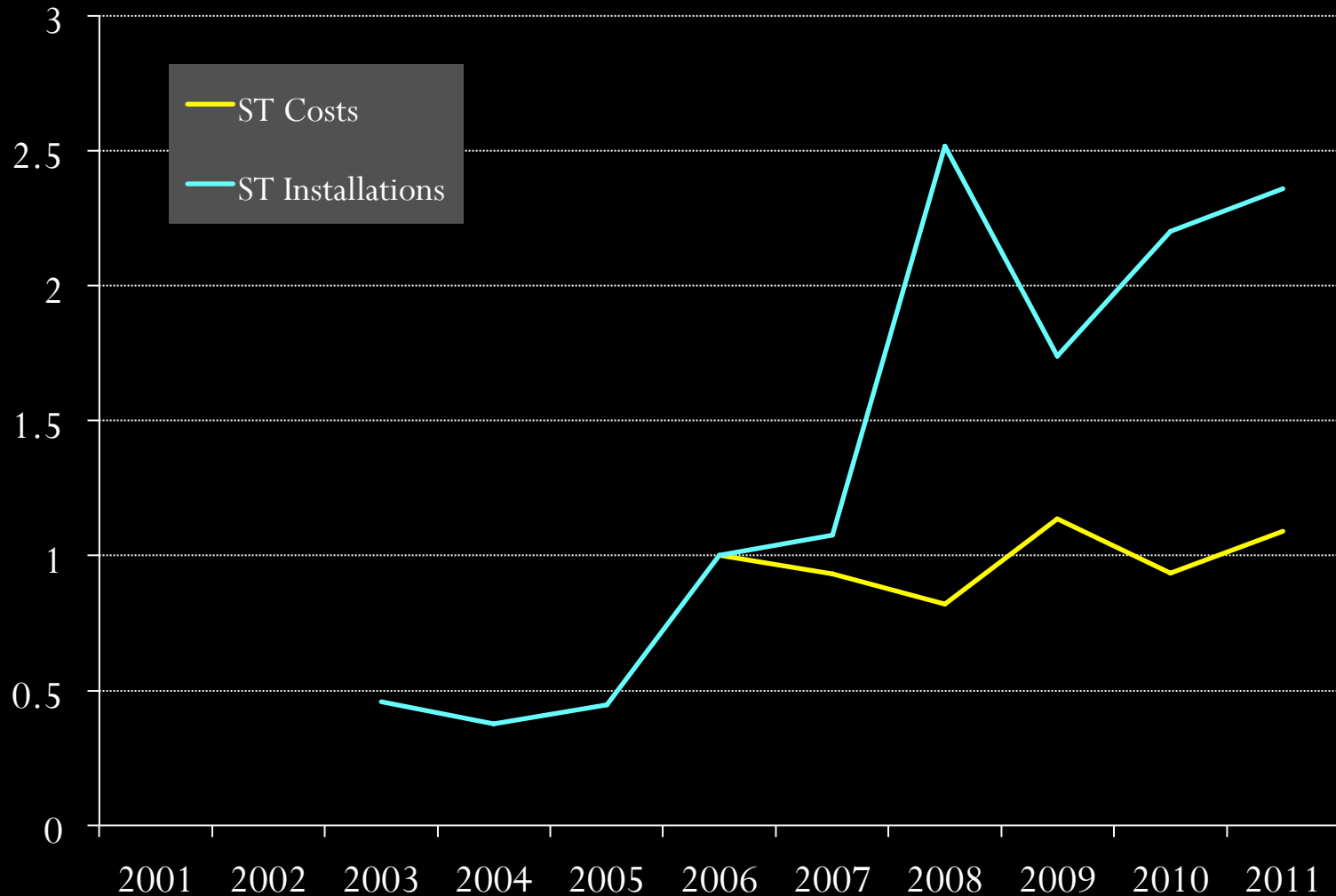


PV PRICE & SIZE INDEX (2006=1)



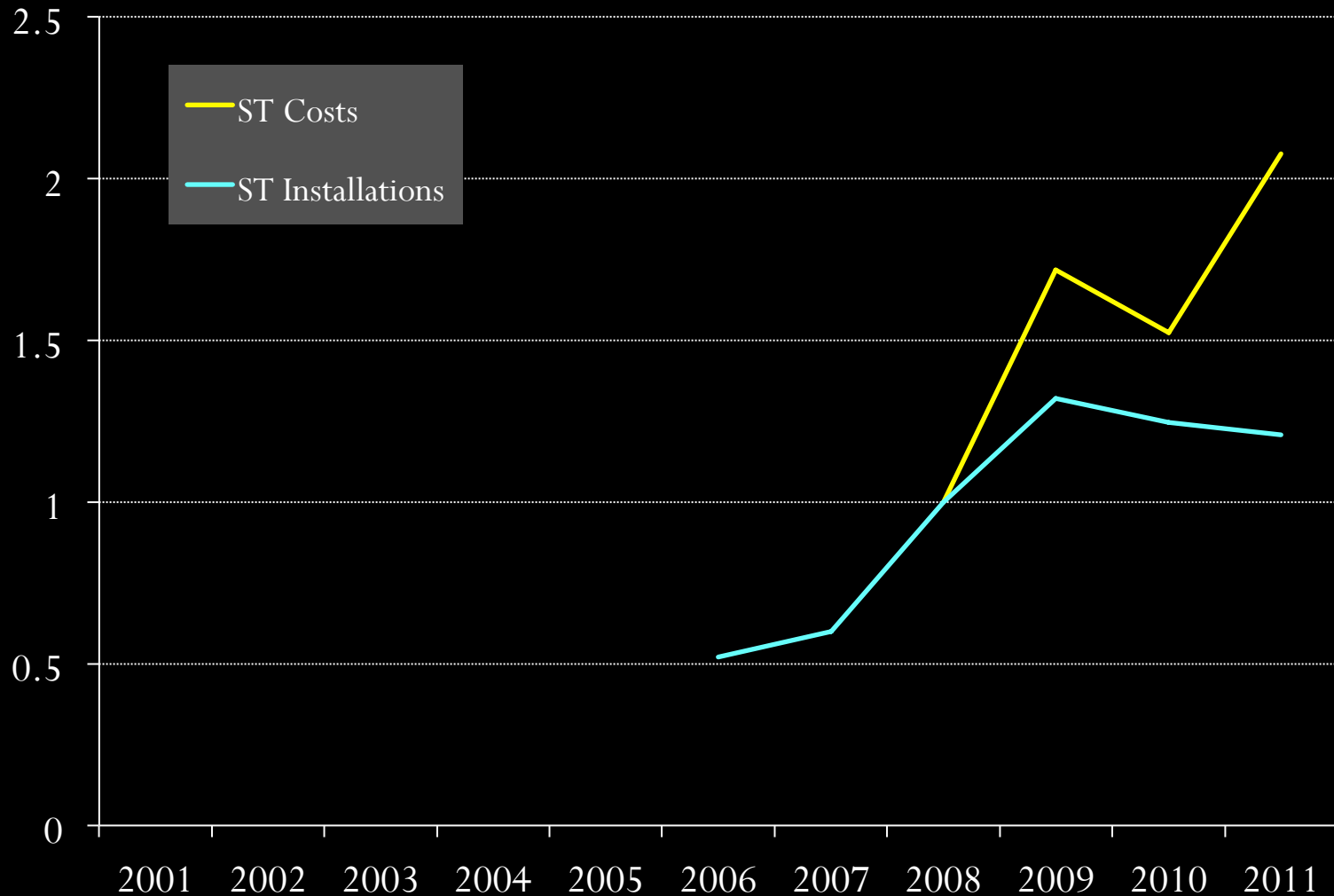


SOLAR THERMAL INSTALLATIONS & COST INDEX (2006=1)





GEO-EXCHANGE HEAT PUMPS INSTALLATIONS & COST INDEX (2008=1)





SUMMARY

- New installations, some free riders and some gougers:
 - PVs: falling prices along with the opportunity to sell power led to much larger installations. indicating a free-rider tax payer windfall of \$12B.
 - STs: higher uptake and flat prices and size of system suggest a policy impact as desired.
 - GeX: adoption was growing before the tax incentives, their prices shot up after the incentives. We estimate suppliers to have captured \$0.5B of the tax credits.



AVERAGE TAX CREDITS BY DECLARED INCOME GROUP

