

# THE FUTURE OF THE ELECTRIC INDUSTRY

Jerrold Oppenheim

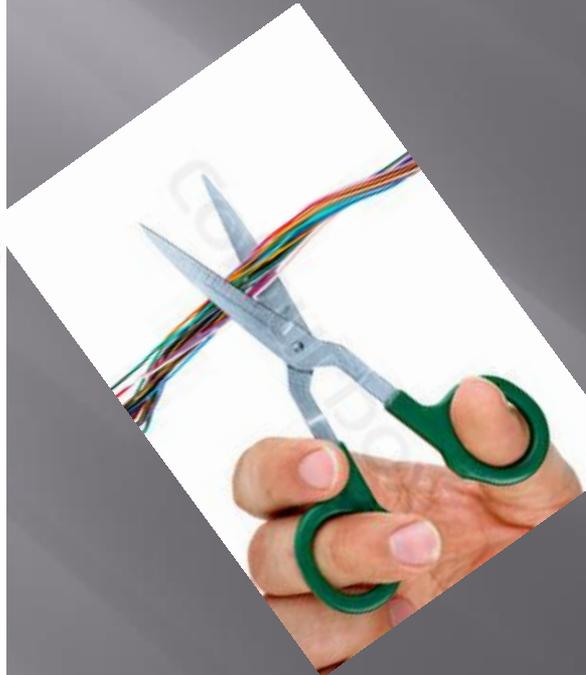
Nancy Brockway

National Association of State Utility  
Consumer Advocates

Mid-year meetings, June 10 2013

Seattle, Washington

# Telecom?



# Does this sound familiar?

- ▣ Large customers demand competition.
- ▣ Utilities ordered to interconnect.
- ▣ Utilities fight change...
- ▣ Then embrace it, merge and diversify.
- ▣ Regulators allow cost allocation and rate design to preserve legacy utility, so ...

# Then ...

- ▣ Prices for captive legacy folks go up.
- ▣ Regulation, competition, technology, etc. drive down prices of non-utility alternatives, so ...
- ▣ Usage moves away from legacy systems.
- ▣ Utilities skimp on reliability, sell least attractive territories.

# Finally:

- ▣ At the extreme, a death spiral for the legacy industry (and for those stuck using its capital).



# Telecom restructuring results

- ▣ Innovation.
- ▣ Ultimate merger of telecom, TV, internet (the original vision of cable TV!).
- ▣ Lower prices for large customers, telephone instruments, long distance, international calling.
- ▣ Universal Service Fund.

# But ...

- ❑ Low-price pay phones replaced by expensive cell phones with lower reliability.
- ❑ Innovative phone sets that are cheap but low quality.
- ❑ Sharp increases in landline local service price, with deteriorating reliability.
- ❑ Loss of Bell Labs basic research.
- ❑ Threat to common carriage (“net neutrality”).
- ❑ Monopoly break-up replaced by oligopoly in many sectors.

# How did we handle telecoms?

- ▣ Can we learn from that experience:
  - What to expect
  - What strategies work or don't
  - How to come out at the other end with the best deal for residential and low-income customers.
  - How to preserve social objectives such as low-income supports, environmental safety, innovation

# Going down the same road?



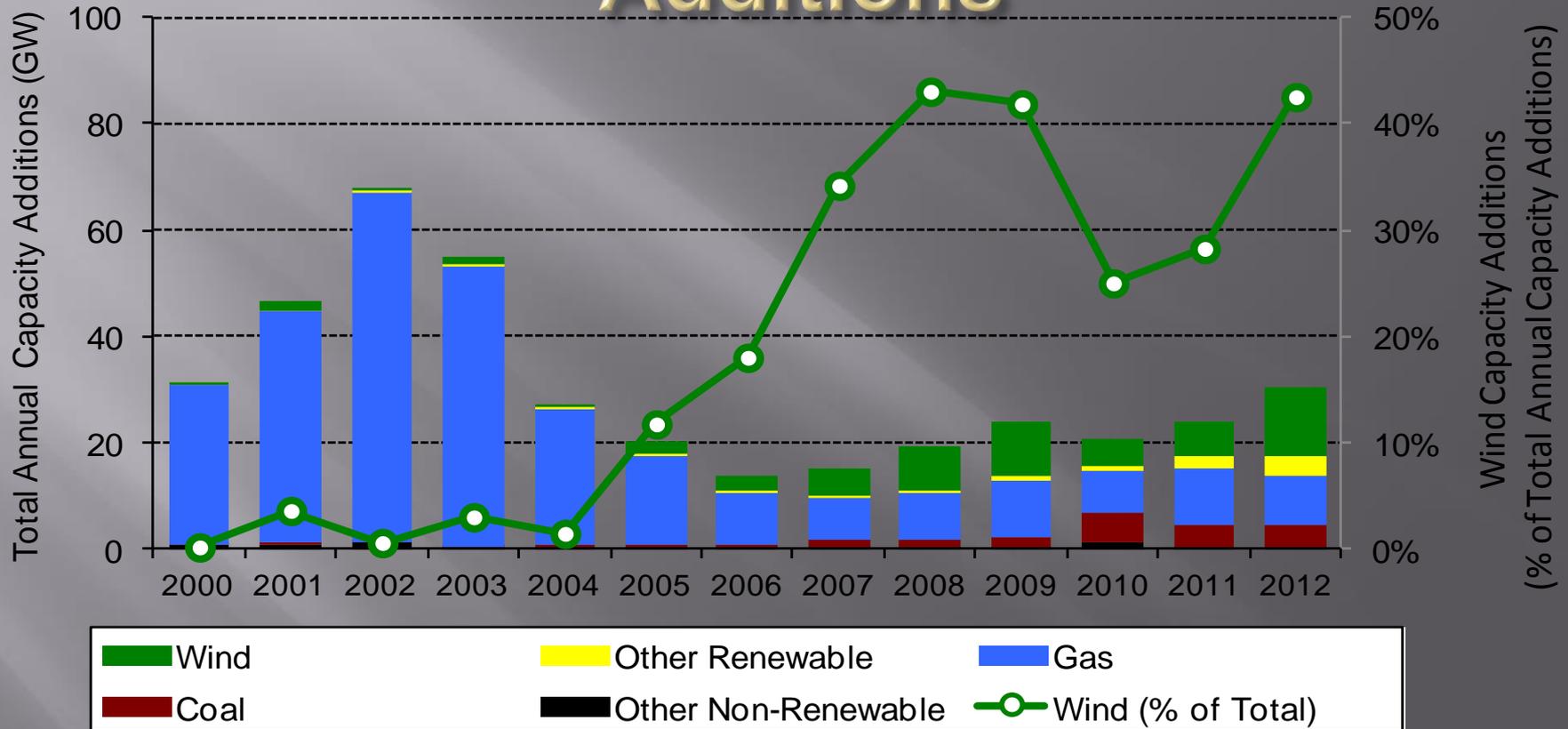
# What are the signs for electricity?

- ❑ Large customers demand generation competition, then T&D (e.g., microgrids).
- ❑ Utilities ordered to interconnect (e.g., retail access, DG).
- ❑ Mostly non-utility technology develops: EE, ESCOs, DR, PV, CHP, Self-gen, Storage, Other DG, EVs, Smart homes
- ❑ Utilities fight change ...
- ❑ Then embrace it, change role, merge and diversify.
- ❑ Regulators allow shifts in cost allocation (shift to res.) and rate design (e.g., decoupling) to preserve legacy utility.

# Then ...

- ▣ Regulation, competition, technology, etc. reduce total use and drive down prices of non-utility alternatives (EE, DR, PV, CHP, Self-gen, Storage, Other DG, microgrids), so ...
- ▣ Prices for captive legacy folks go up to cover reduced throughput and to pay for infrastructure competitors need, reliability only some need, so ...
- ▣ Usage declines and moves away from legacy systems.
- ▣ Utilities skimp on reliability, sell least attractive territories.

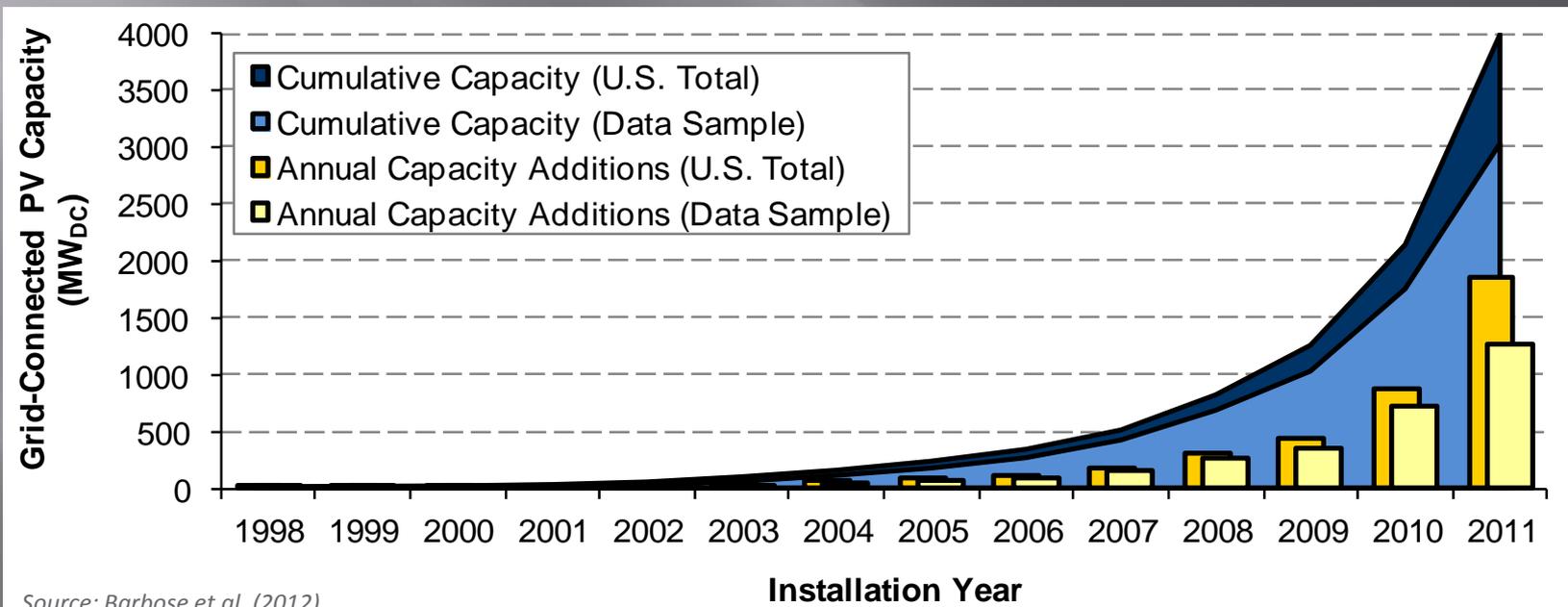
# Renewable Generation Accounts for Increasing Share of U.S. Capacity Additions



Source: *Wiser and Bolinger (forthcoming)*.

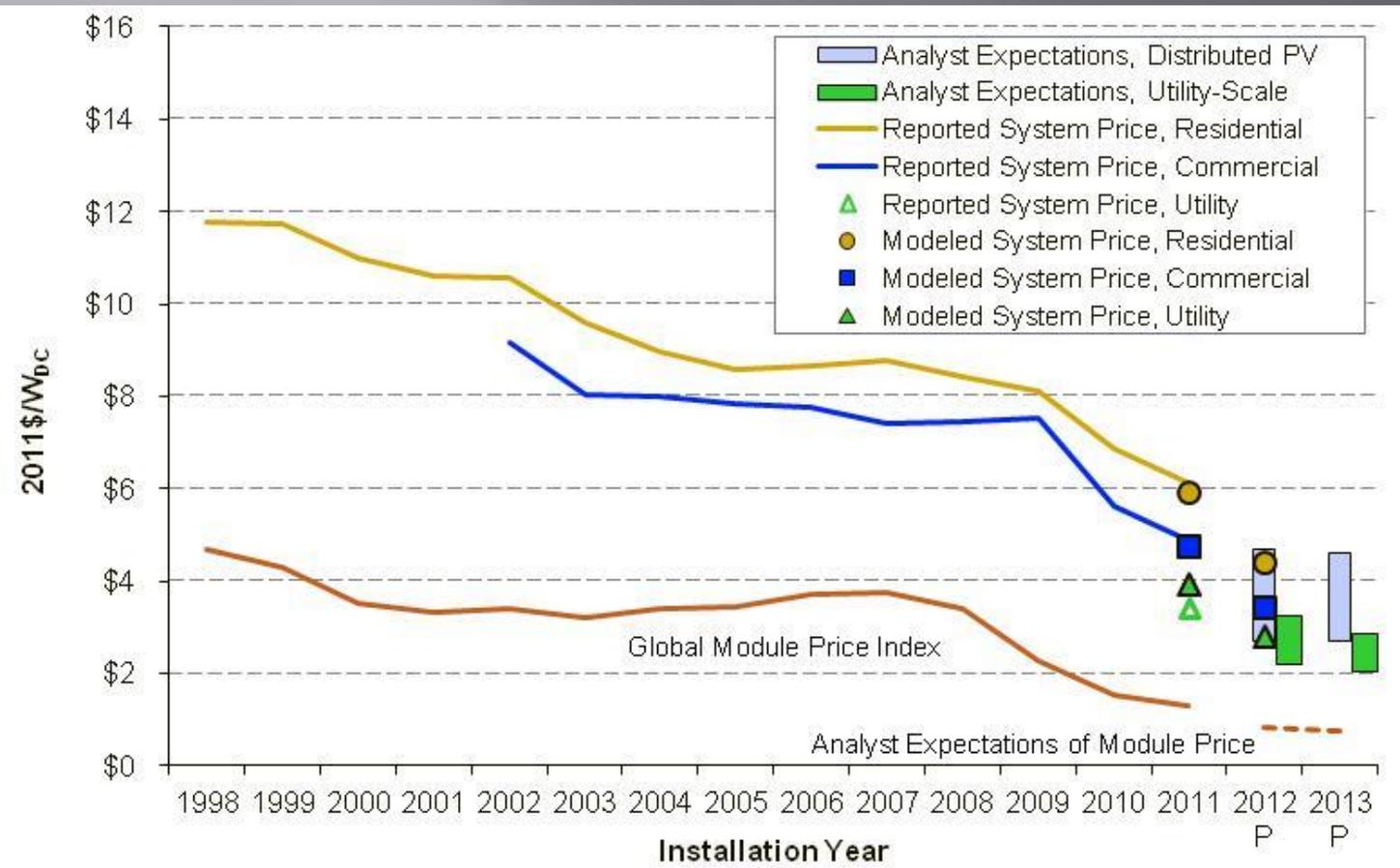
# U.S. PV Capacity Increased Substantially Over Past 5 Years

- Starting in 2007, US cumulative PV capacity was ~500 MW.
- Total installed capacity doubled by 2009, doubled again in 2010 and then doubled again in 2011
- Annual growth rate of PV in the U.S. has exceeded 30%/yr since 2001



Source: Barbose et al. (2012)

# Installed Solar PV Prices Continue to Decline

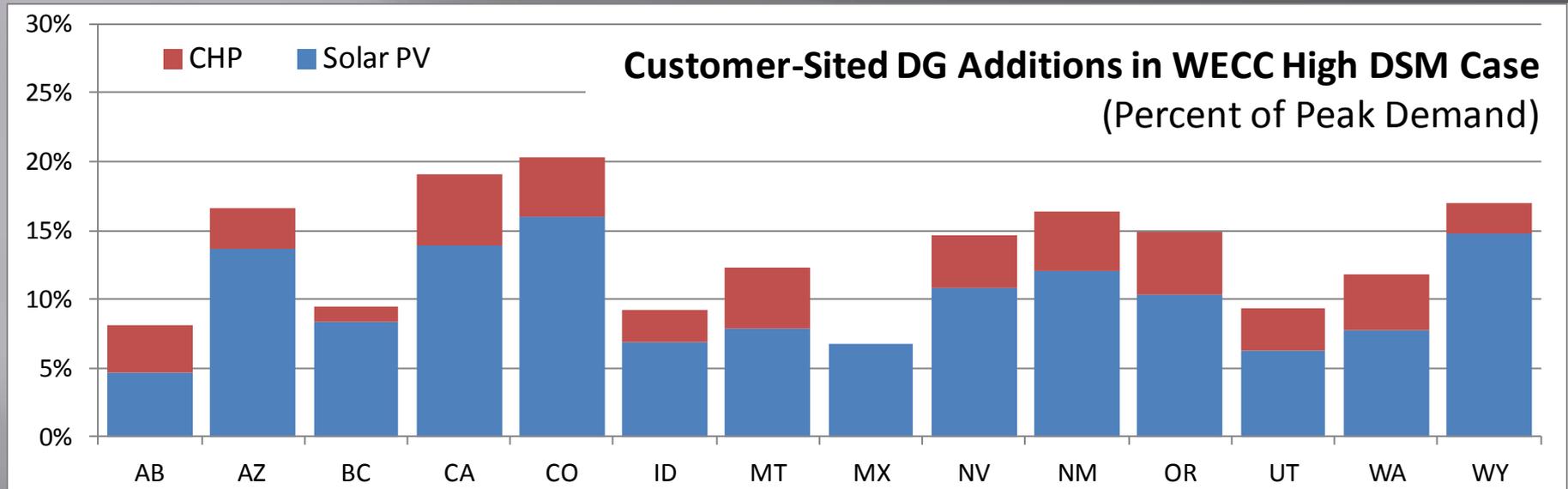


Source: Feldman et al. (2012)

No state incentives needed to compete at retail grid parity in some markets (third-party ownership flourishes)

Solar PPAs for 10 MW+ plants in Southwest now well below 10 cents/kWh

# Potential Bypass Threats from Distributed Generation are Large

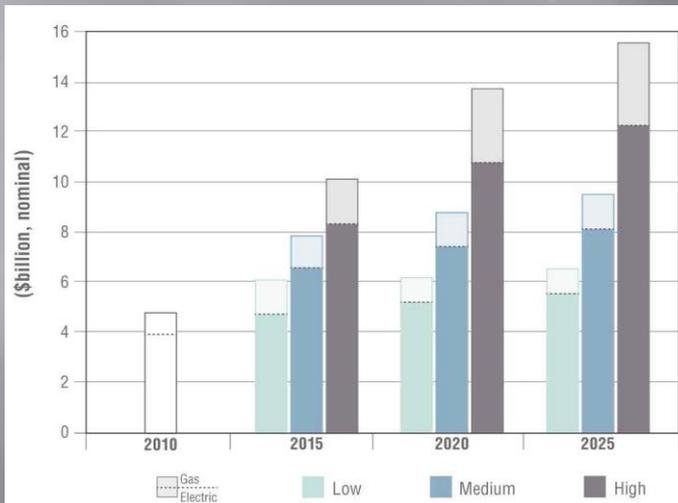


Source: E3 (2013).

- WECC-wide Behind-the-Meter DG: 19 GW of solar PV + 7 GW of CHP
- Distributed PV based on “interconnection potential” (no back-flow through feeders), with adjustments to reflect relative economics among states
- CHP additions represent a fixed percentage (~40%) of technical potential in each state

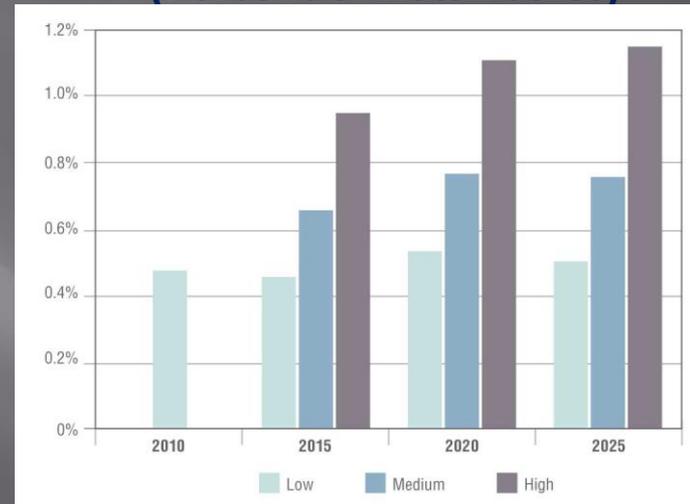
# Electric Savings Could Offset a Large Portion of Projected Load Growth

**Projected Utility Customer Funding for Electric and Gas EE Programs**



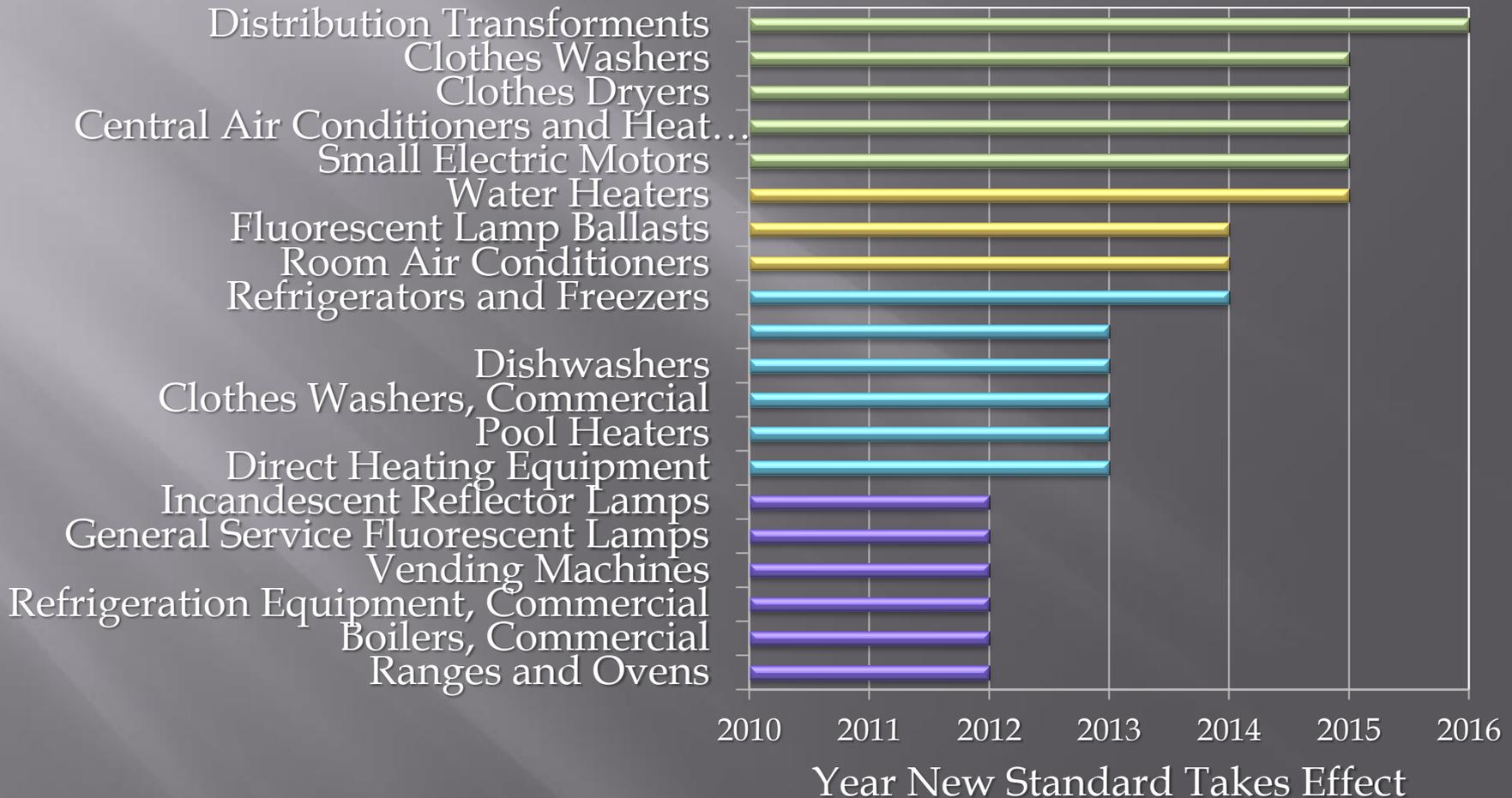
Source: Barbose et al. (2013)

**Projected Incremental Annual Electric EE Savings from Customer-Funded Programs (Percent of Retail Sales)**



- ❑ Total electric & gas spending doubles to \$9.5B in 2025 in the medium case (low: \$6.5B, high: \$15.6B)
- ❑ Projected annual incremental savings rise to 0.76% per year by 2025 in medium case
- ❑ Projected EE savings in the medium case would offset much of electric load growth forecasted by EIA

# 20 New Federal Efficiency Standards Take Effect by 2016

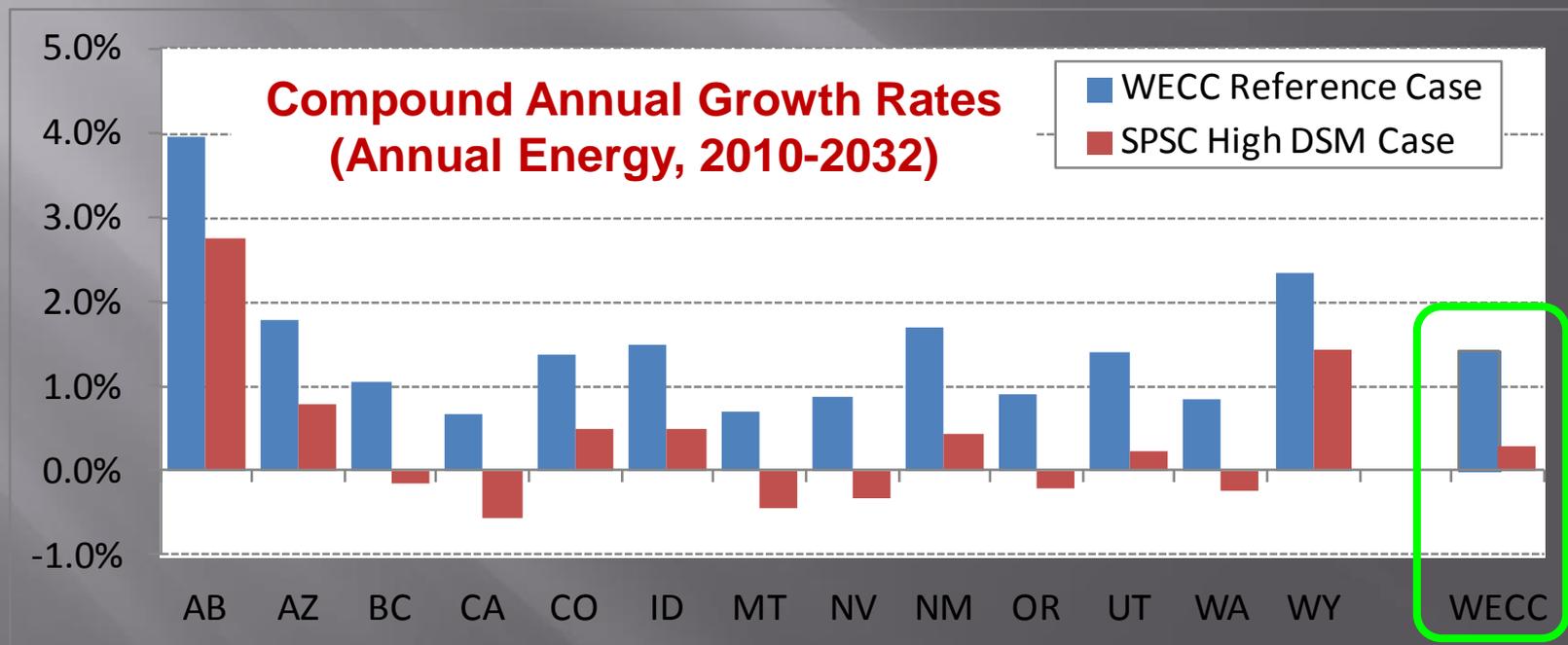


# 20 Federal Rulemakings Are Underway or Anticipated to Commence in 2013

- Automatic Ice Makers
- Battery Chargers and External Power Supplies
- Ceiling Fans and Ceiling Fan Light Kits
- Residential Boilers
- Set-Top Boxes
- Walk-In Coolers and Freezers
- Commercial Furnaces
- Commercial Water Heaters
- Fans, Blowers, and Fume Hoods
- Furnace Fans
- High-Intensity Discharge (HID) Lamps
- IRLs (Certain ER, BR, and Small Diameter)
- Commercial Refrigeration Equipment
- Electric Motors
- Commercial and Industrial Pumps
- Commercial Packaged A/C and Heat Pumps
- General Service Fluorescent Lamps and IRLs

# SPSC High DSM Case would result in nearly flat load growth through 2032

- Historical load growth in WECC: 1.6%/yr (1998-2010)
- WECC 20-yr reference case forecast with current EE policies = 1.4%/yr, with growth <1% in 5 states
- SPSC High EE case reduces load growth to 0.3%/yr (WECC-wide), with 6 states projected to have negative load growth



Source: LBNL and Itron (2013).

# Death spiral?

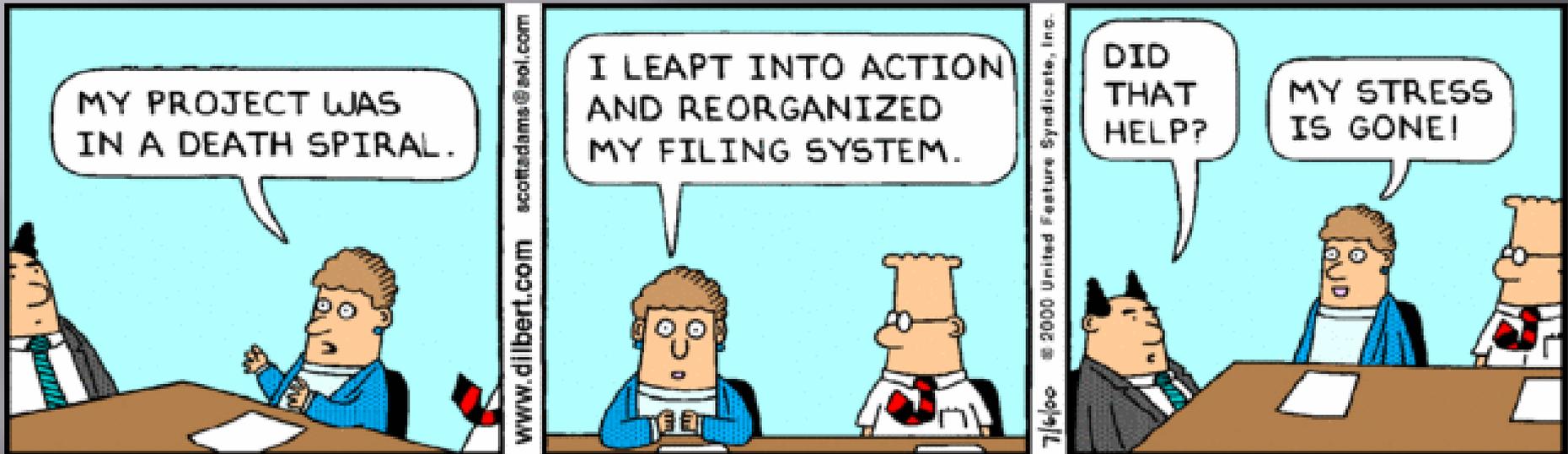
- ▣ At the extreme, a death spiral for the legacy industry (and for those stuck using its capital).



# Have we learned anything?



# If we ignore it, will it come out ok?



# So, what should be our strategy?

- ▣ In case of declining industries, trickiest question is how long it will take?
  - Do we push for continued investment and legacy programs and policies, on theory that it will be a long time before the threat of the industry unraveling is real?
  - Do we try to get ahead of the curve, and put in place necessary protections for residential and low-income customers, the environment, other social objectives?
  - Or both?

# Perpetual motion machine



Cat always lands on her feet.



Bread with butter always fall buttered side down



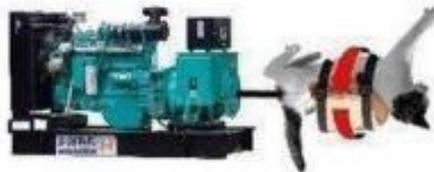
Fasten the bread with butter to cats back



Cat will keep rotating and never fall on the ground.



Attach the Cat-Bread to the generator



Infinite energy!

# How about both?

- ▣ Maintain principles of affordability, prudence, used-and-useful, least-cost, cost-effectiveness, cost allocations and rate designs that match costs to beneficiaries of non-mandatory new services.
- ▣ Recognize the very high low-income discount rate and so maintain supports as nonbypassable charges. [But how, in face of declining revenue?]
- ▣ Continue to meet environmental objectives with tax policy. And mandatory utility policy, such as EE and grid purchases. [But how, in face of declining revenue?]

# Are the industries the same?

- ▣ Though some possible contraindications, e.g., EV, load controls (smart homes), increased plug loads.

# Now what?

- ▣ Still a work in progress, especially to protect the most vulnerable...
  - Level the playing field with truly universal system benefit charges, i.e., on all technologies.
  - Promote technologies and rate designs that will fairly protect legacy utility ratepayers, e.g., EVs, DR, and DLCs to increase load factors, EVs and efficient plug loads to increase throughput, demand charges for technologies that require grid investment (such as RE, DG, EV, DLC).
  - Increase targeted EE to protect environment and low-income.
  - Apply least-cost principles to RE mandates.

## ▣ DISCUSSION

# Resources

▣ Jerrold Oppenheim

JerroldOpp@  
DemocracyAndRegulation.com

+1-978-283-0897

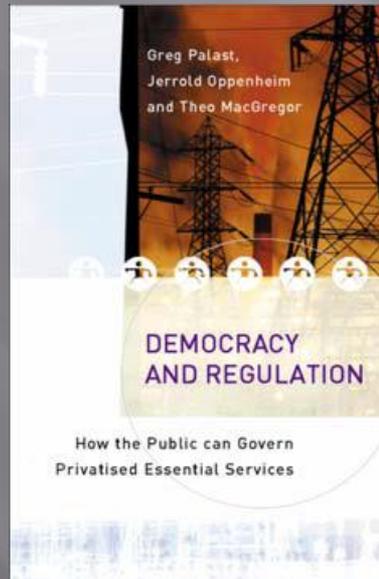


WWW.  
DemocracyAndRegulation.com

▣ Nancy Brockway

▣ nbrockway@aol.com

▣ 617-645-4018



# About the Speaker: Jerrold Oppenheim

Jerrold Oppenheim is an independent consultant and attorney who has advised and represented low-income and other utility consumer advocates, government agencies, labor, and utilities across the country for more than 40 years. A graduate of Harvard College and Boston College Law School, he led utility litigation and argued precedent-setting cases for four Attorneys General in New York State and Massachusetts; for Legal Services in Boston, Chicago and New York City; and for the National Consumer Law Center. He is a member of the Center for Public Utilities Advisory Council, New Mexico State University, and has spoken and published on five continents, including *Democracy And Regulation* with Theo MacGregor and Greg Palast, published by Pluto Press (London) and winner of the ACLU Upton Sinclair Award.

# About the Speaker: Nancy Brockway