American Council for an Energy-Efficient Economy

The Utility of the Future and the Role of Energy Efficiency

Steven Nadel

American Council for an Energy-Efficient Economy

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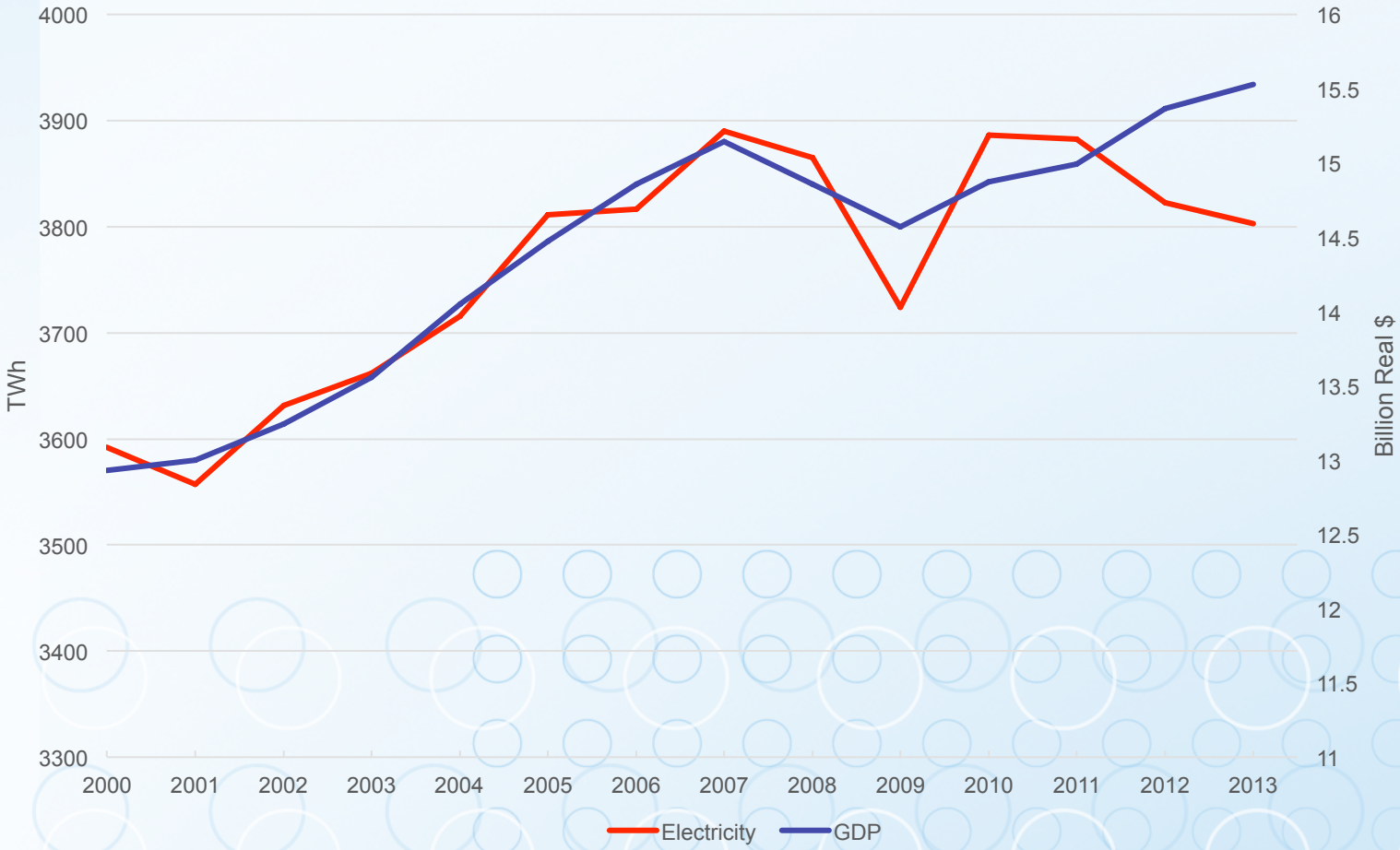
Electricity Use Declining Recently



Source: ACEEE, 2014, “Why is Electricity Use No Longer Growing”

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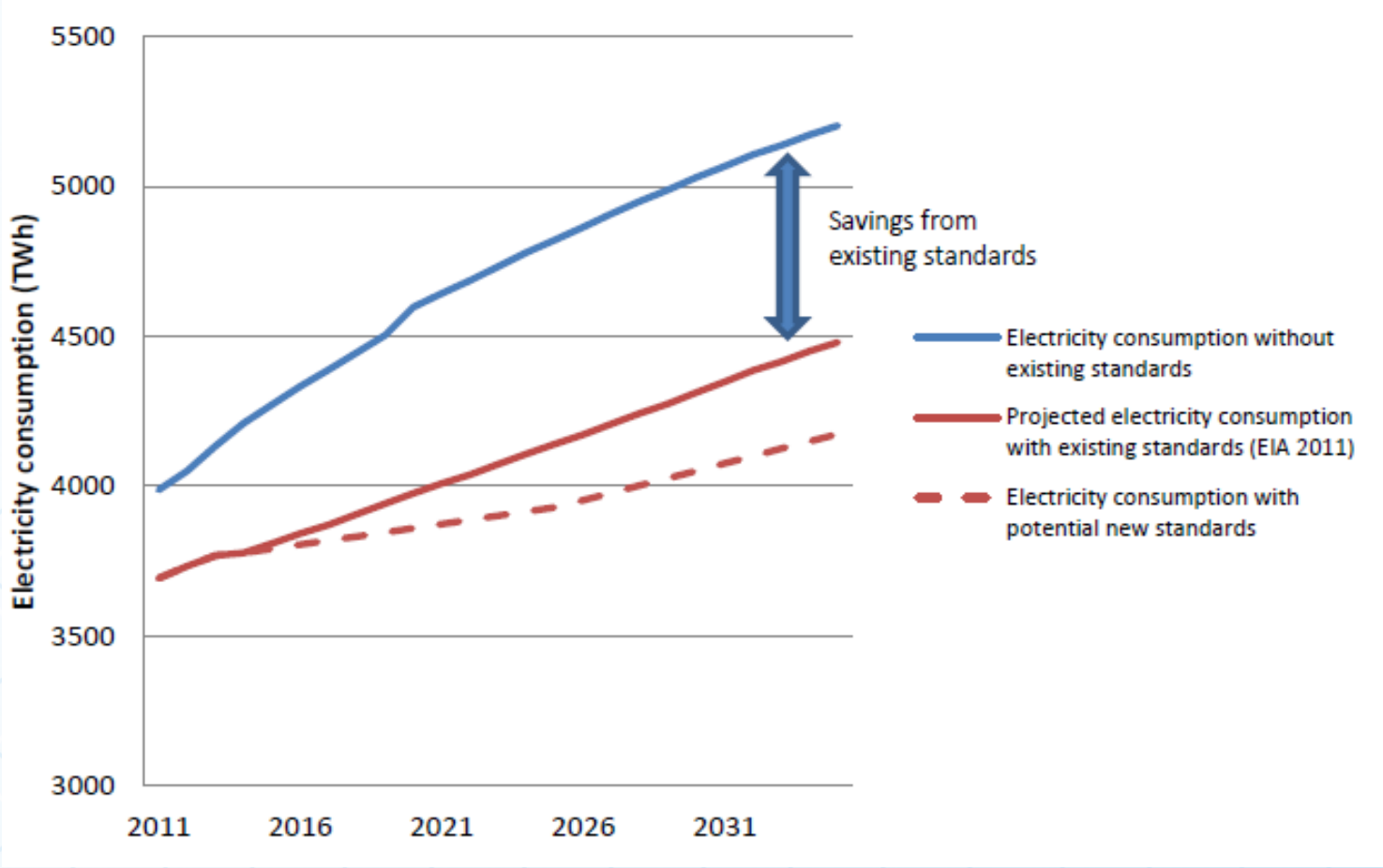
Electricity Savings from Potential Future Standards



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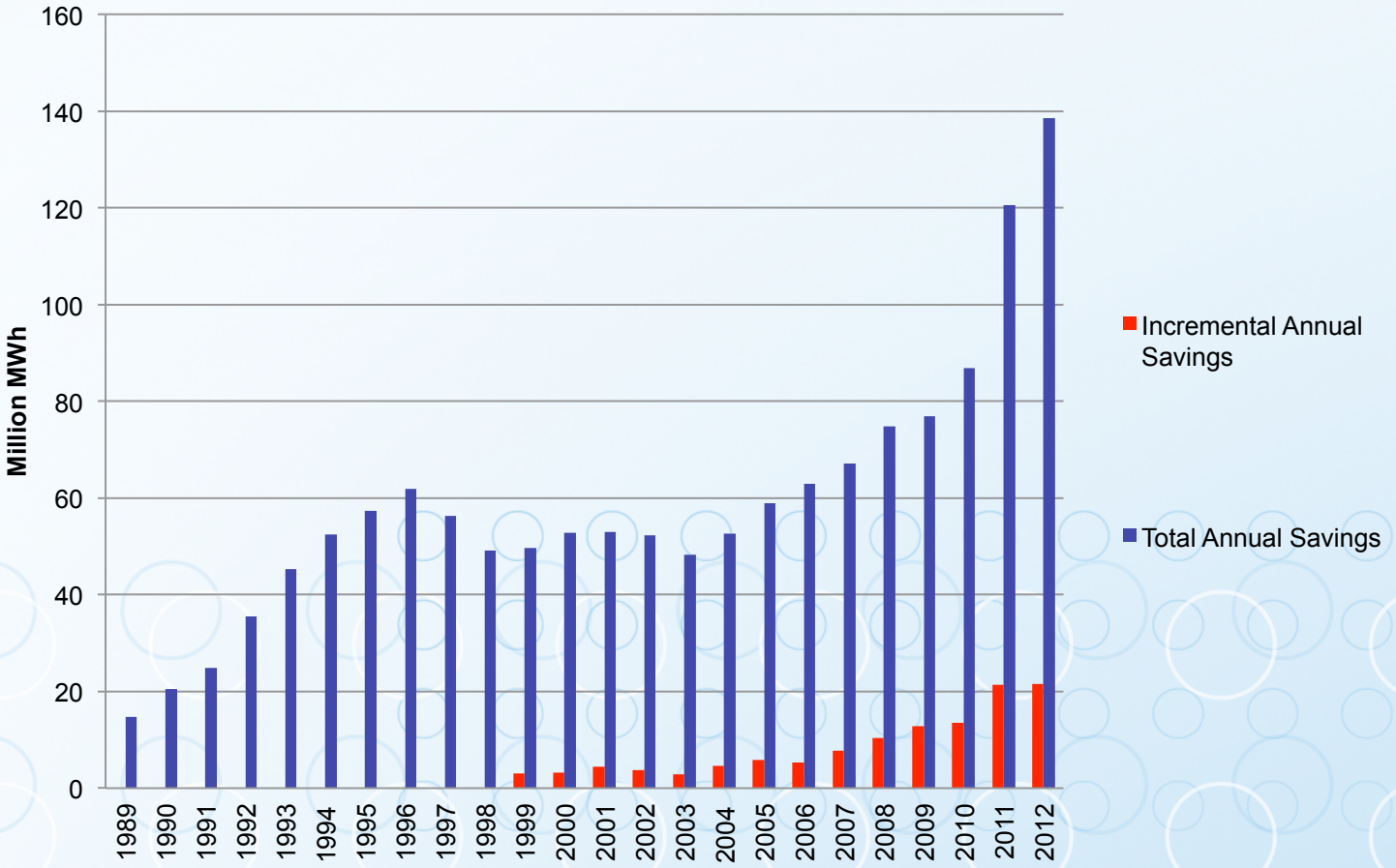
Source: ACEEE & ASAP, 2012, Efficiency Boom

Savings from Utility EE Programs



Source: ACEEE analysis of EIA data

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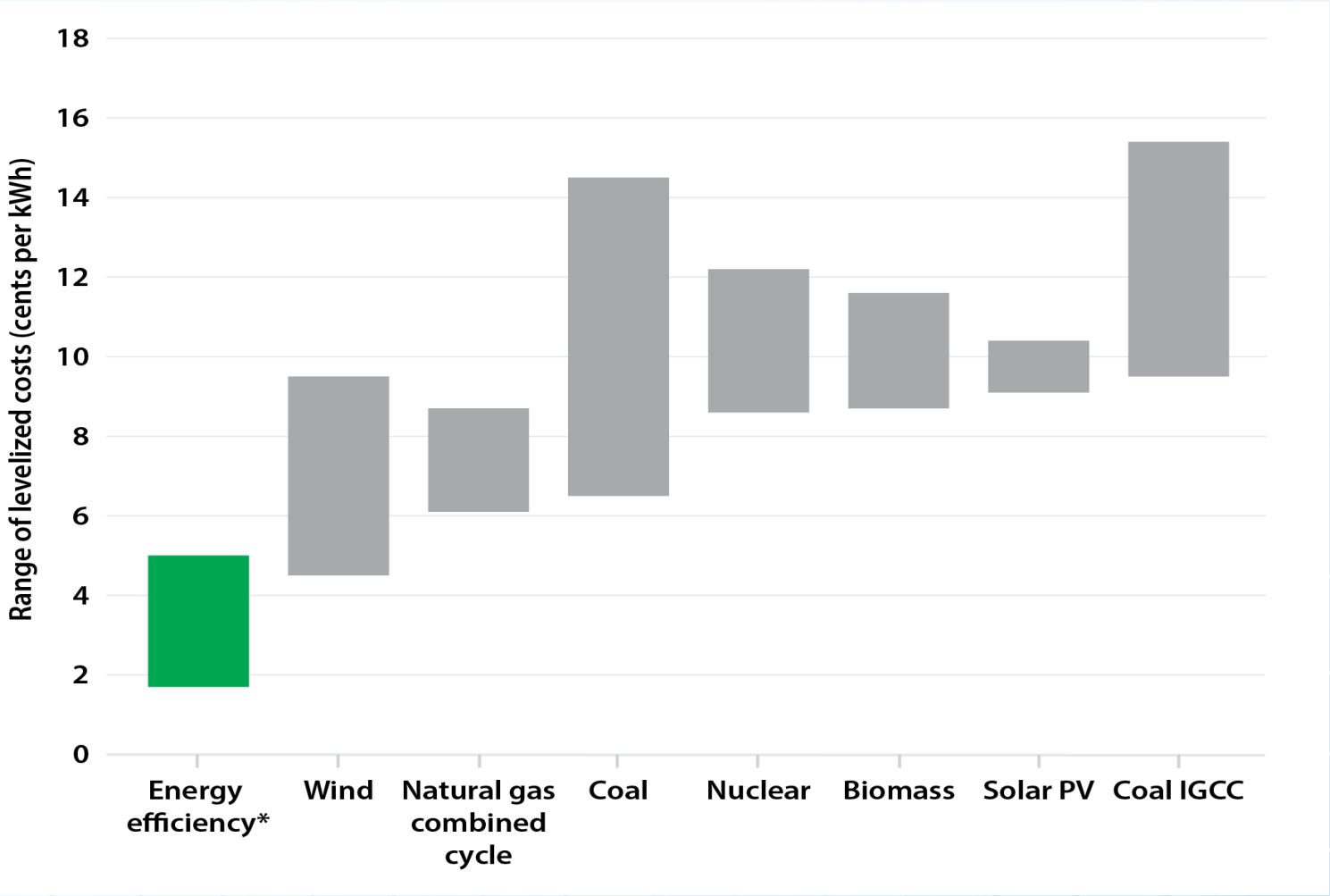
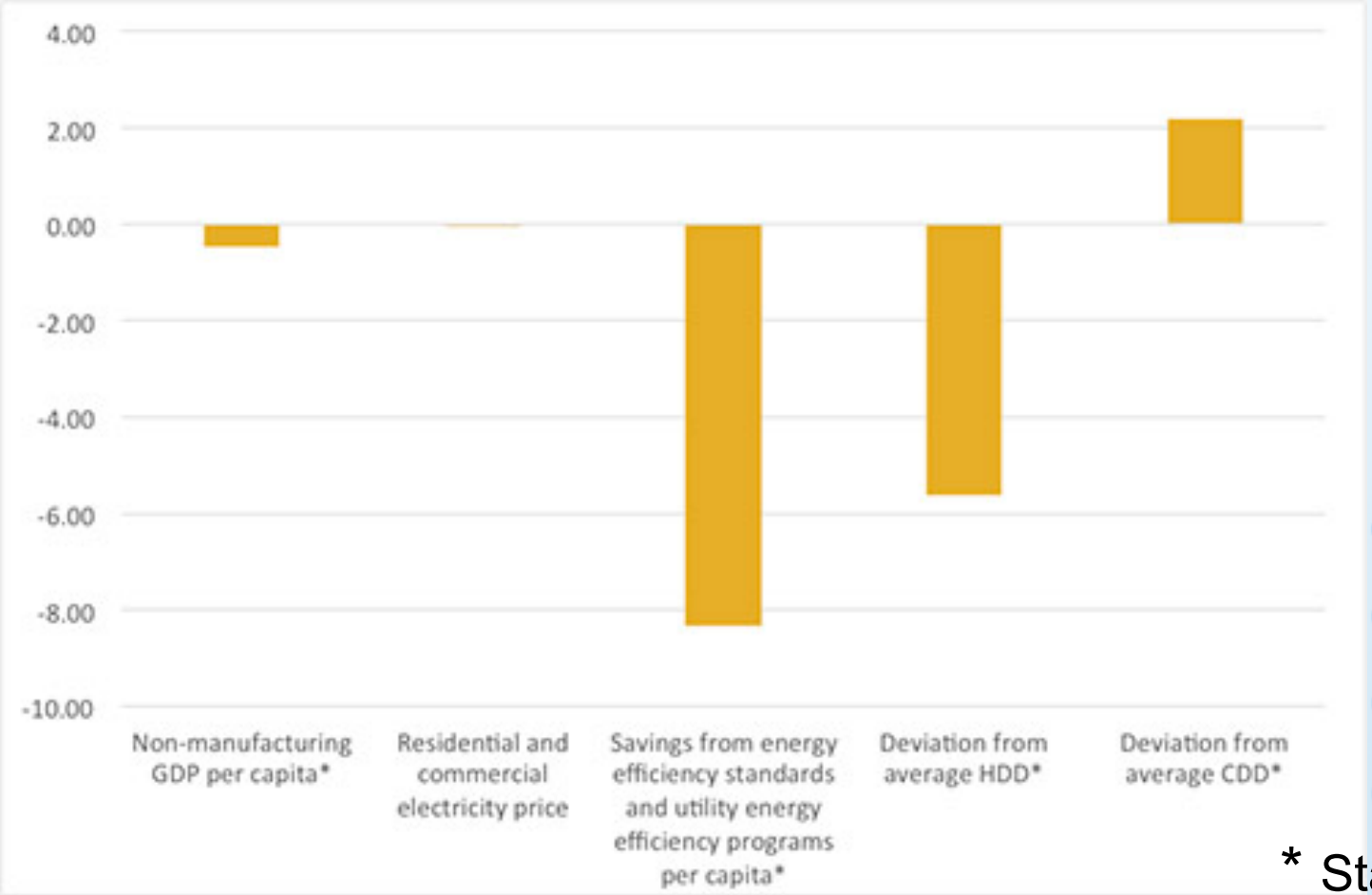
Levelized costs to the utility of new electricity resource options in 2012



Source: ACEEE and Lazard Associates

Efficiency a Significant Cause
Factors affecting R&C sales 2007-2012



* Statistically significant

Source: ACEEE, 2014, "Why is Electricity Use No Longer Growing"

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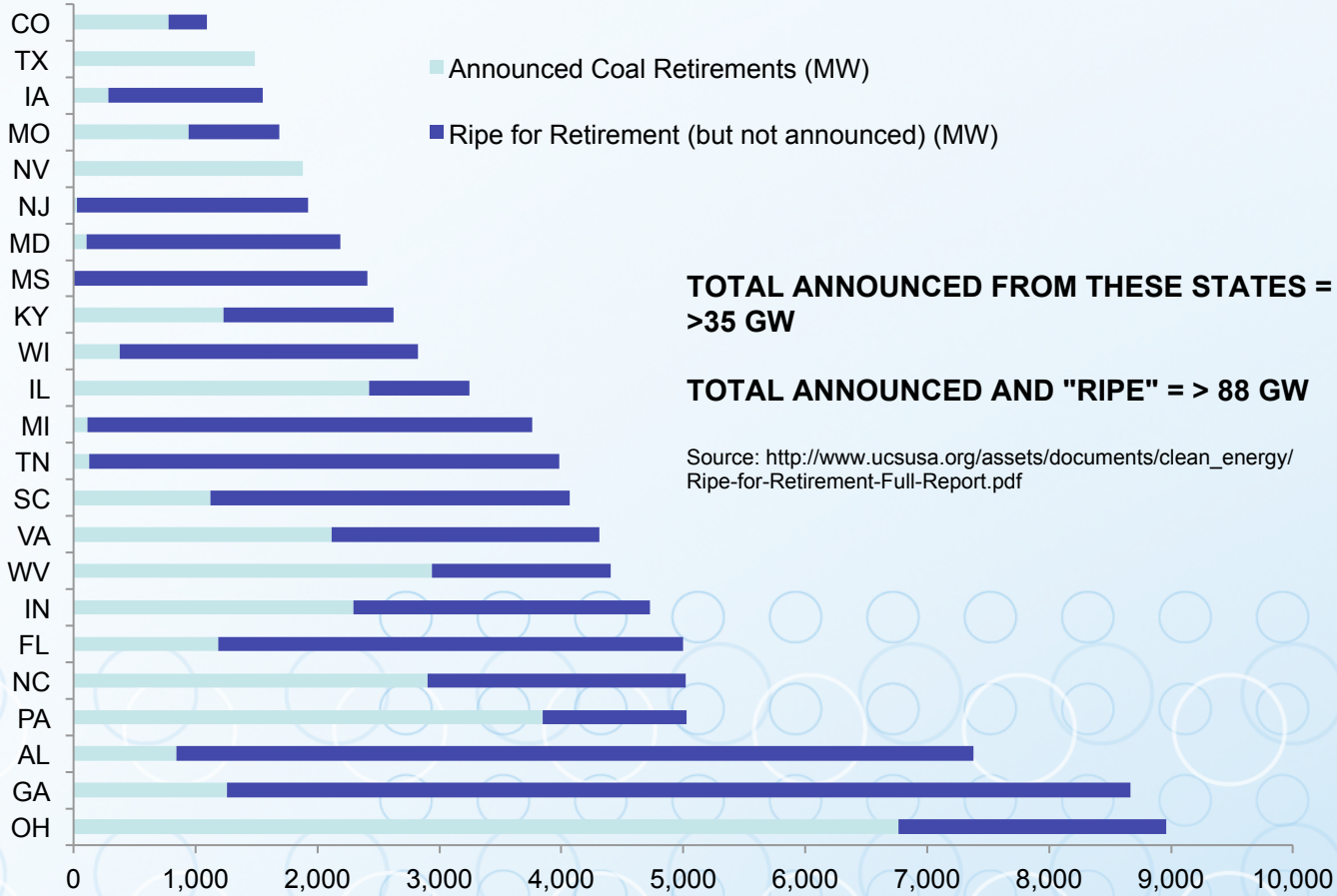
Possible Coal Plant Retirements



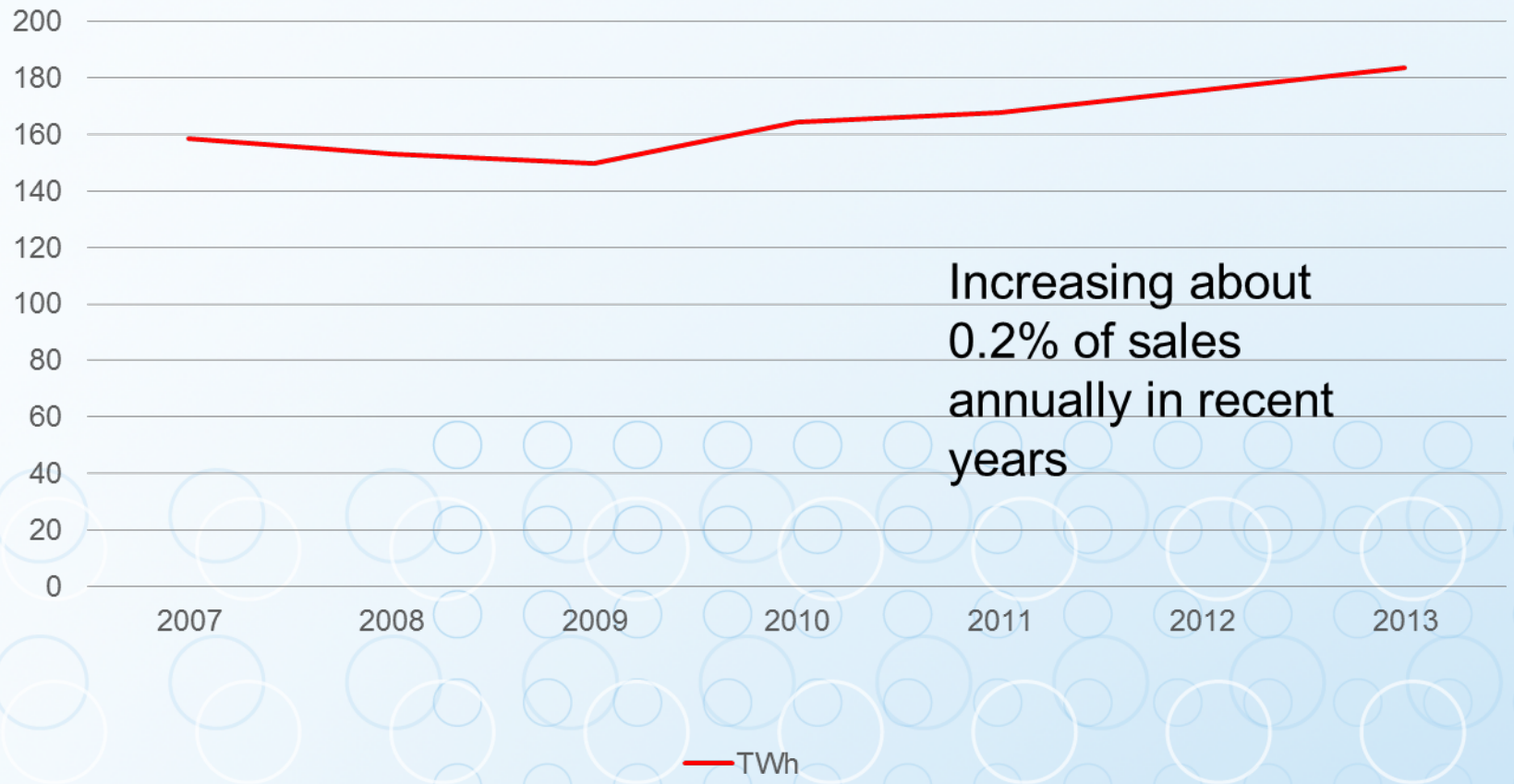
TOTAL ANNOUNCED FROM THESE STATES = >35 GW

TOTAL ANNOUNCED AND "RIPE" = > 88 GW

Source: http://www.ucsusa.org/assets/documents/clean_energy/Ripe-for-Retirement-Full-Report.pdf

Source: Union of Concerned Scientists

Production from Distributed Generation (R, C & I sectors)



Source: ACEEE analysis of data in EIA Monthly Energy Review

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ACEEE Utility of the Future Study

1. What might future electricity sales be?
2. What is the range of options proposed by others on the future role of utilities?
3. How will these options affect energy efficiency?
4. What are appropriate paths forward?

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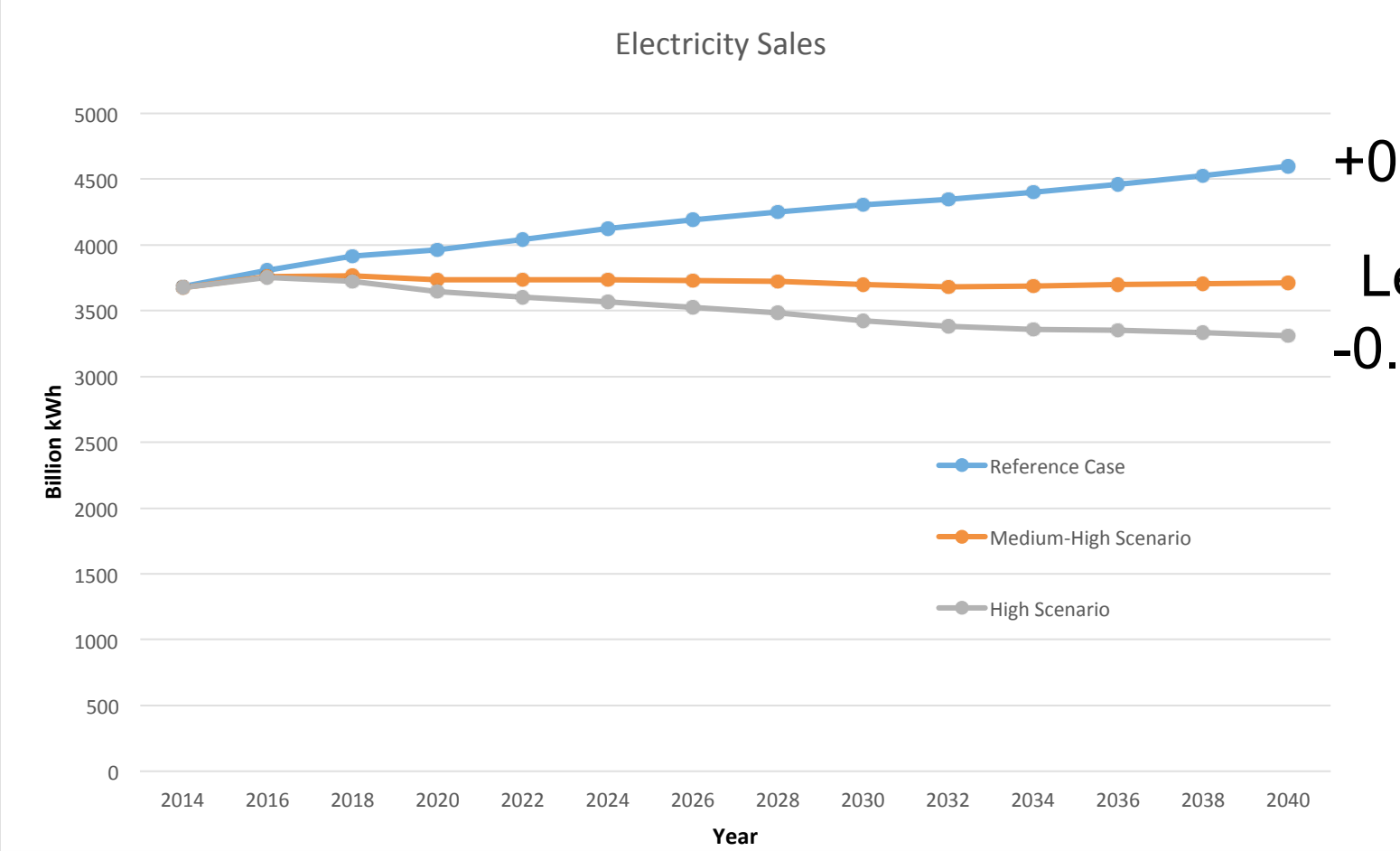
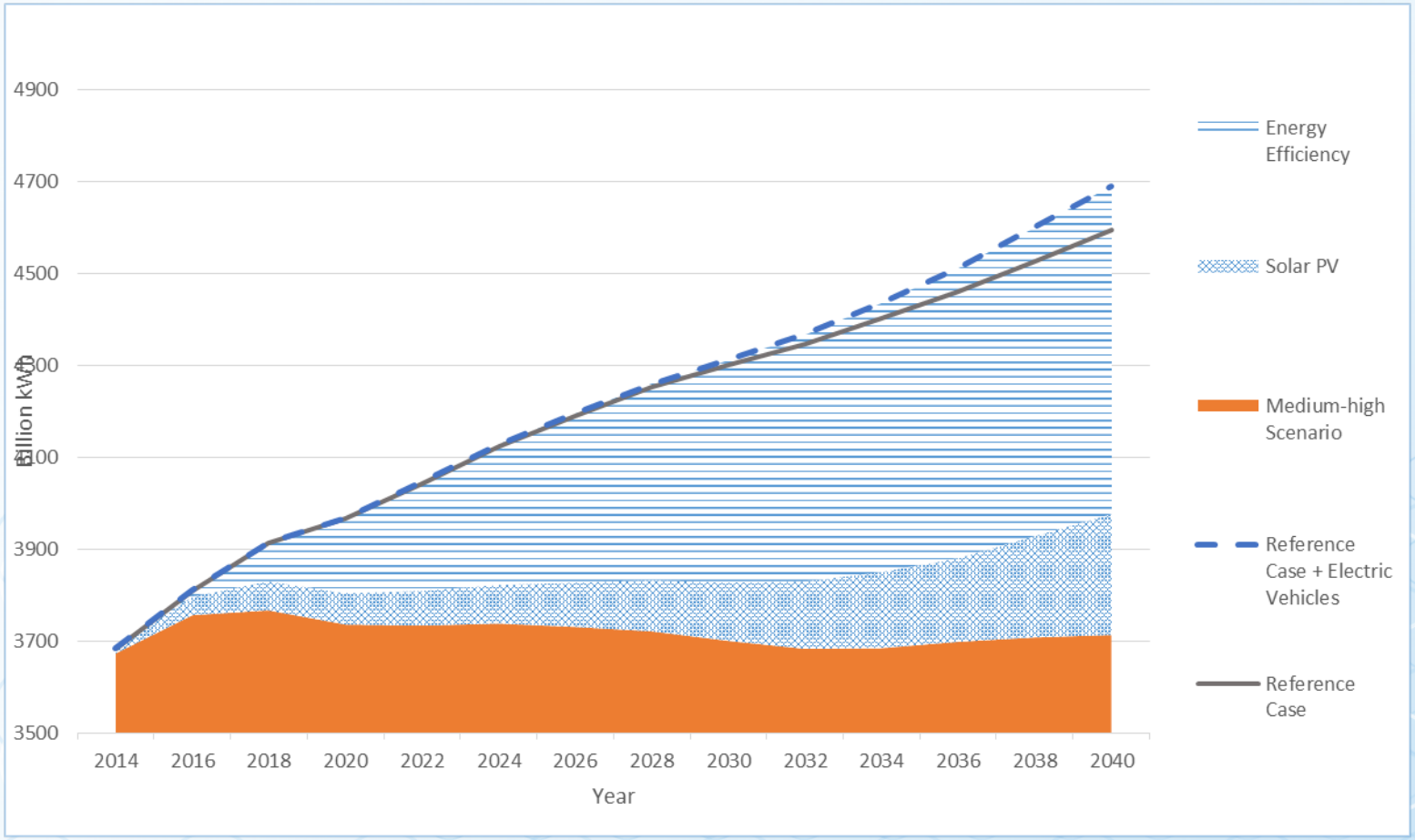
Sales Scenarios

- AEO 2014 our medium change scenario
- Augment EE, solar, EV
  - Medium-high change – clearly feasible
  - High change – plausible but unlikely
- For EE, ramp up to 1.5% & 2%/yr
- For PV, grow 10% & 15% per year, capped at 80% of tech potential
- For EV based on plausible and optimistic National Academy estimates

National Results



Contributions in Medium-High Change Case



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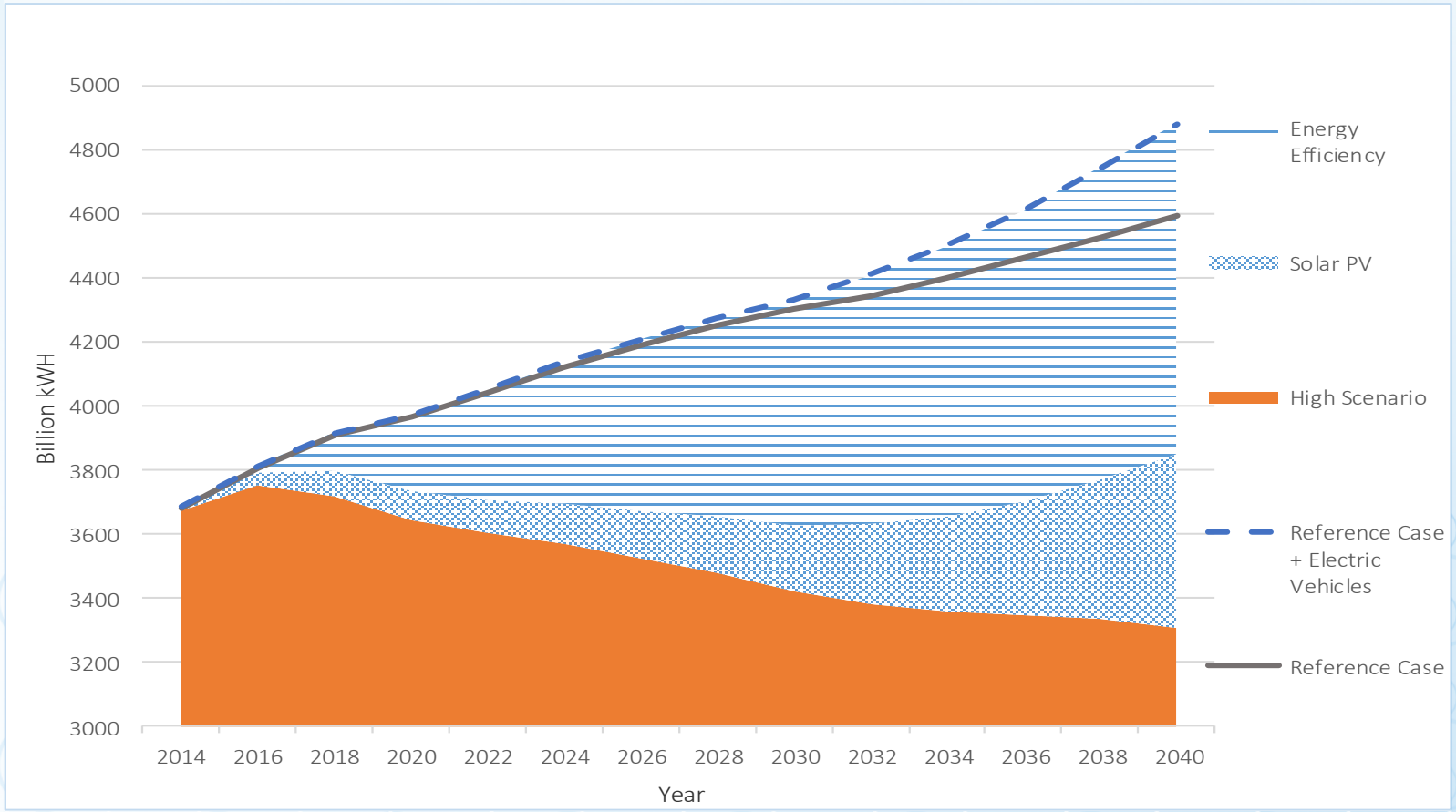
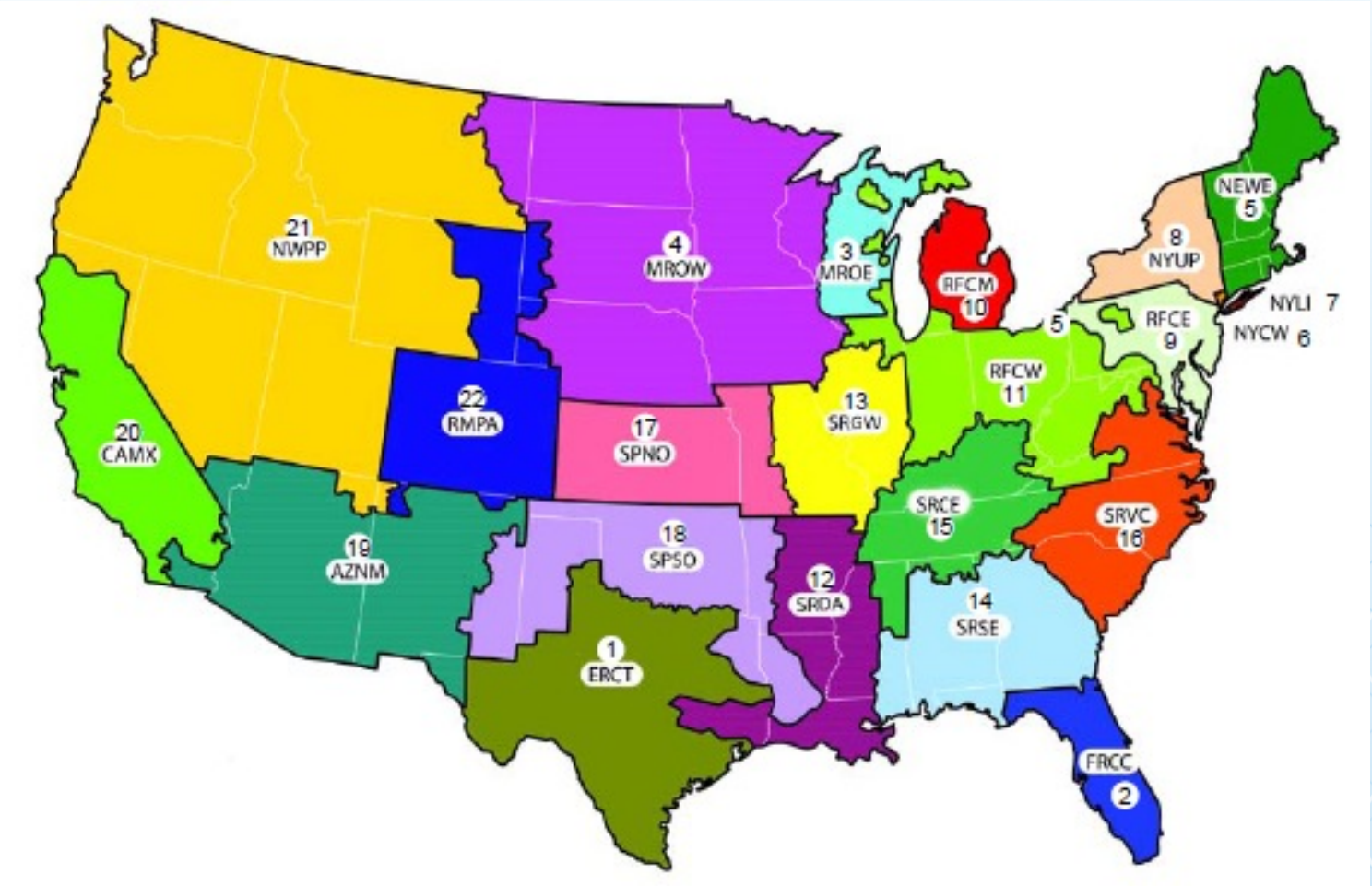
Contributions in High-Change Case



EIA Electricity Market Regions



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Results by Region

Compound Annual Growth Rates				
Region	Primary States Included	Reference Case	Medium-High-Change-Case	High-Change Case
New York State	NY	0.10%	-0.35%	-0.73%
TRE All	TX	0.89%	0.02%	-0.66%
FRCC All	FL	0.84%	0.10%	-0.74%
MRO East	WI	0.46%	-0.48%	-1.44%
MRO West	MN, IA, NE, ND, SD	0.58%	0.06%	-0.47%
NPCC New England	ME, NH, VT, MA, RI, CT	0.21%	-0.13%	-0.37%
RFC East	East PA, MD, DE, NJ	0.40%	-0.55%	-0.54%
RFC Michigan	MI	0.41%	-0.12%	-0.58%
RFC West	North IL, west PA, IN, OH, WV	0.48%	-0.10%	-0.46%
SERC Delta	AR, LA, west MS	0.85%	0.04%	-0.44%
SERC Gateway	East MO, south IL	0.49%	-0.42%	-0.92%
SERC Southeastern	AL, GA, southeast MS	0.86%	0.19%	-0.04%
SERC Central	KY, TN, northeast MS	0.86%	0.08%	-0.49%
SERC VACAR	VA, NC, SC	0.86%	0.12%	-0.53%
SPP North	KS, west MO	0.57%	-0.11%	-0.38%
SPP South	OK	0.88%	0.23%	0.03%
WECC Southwest	AZ, NM, south NV	1.15%	0.34%	0.01%
WECC California	CA	0.74%	0.23%	-0.21%
WECC Northwest	WA, OR, ID, MT, UT, west WY, north NV	0.87%	0.63%	0.32%
WECC Rockies	CO, east WY	1.15%	0.41%	-0.04%
United States	All states, excluding AK and HI	0.70%	0.04%	-0.39%

Options for the Future

Better management

Regulation

- Reassess the role of regulation
- Expand decoupling and shareholder incentives
- Reform electricity pricing
- Institute performance-based regulation
- Foster innovation, R&D, and more competition
- Establish long-term climate policy
- Improve utility ability to invest and recover costs
- Consider an energy efficiency utility model

Energy resources and infrastructure

- Expand energy efficiency and renewable energy
- Expand demand response and customer options
- Improve infrastructure
- Expand transmission system
- Limit generation expansion
- Engage in long-term planning

Services

- Expand utility services
- Consider the utility as “FinanceCo” model

Long-term models

- Consider the utility as smart integrator
- Consider the energy services utility

Evaluated Impact of Options on:

- Energy efficiency
- Cost of service (bills)
- Quality of service
- Utility profits
- The environment

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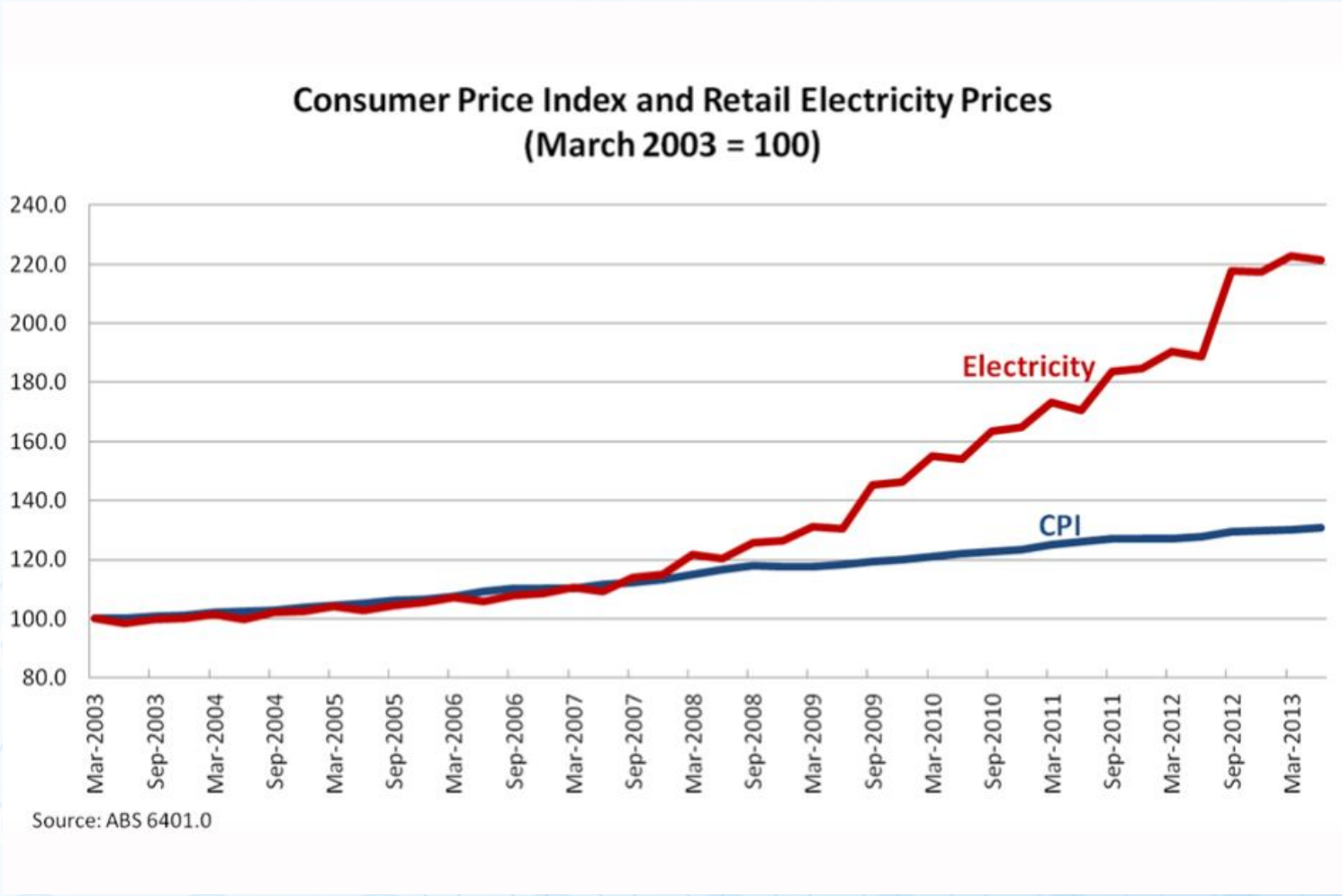
Options that *Can* be Useful *if* Done Well

- Better management
- Expansion of customer options and demand response
- Decoupling and shareholder incentives
- Fostering innovation
- Long-term planning
- Performance-based regulation
- Expand utility services
- Energy-efficiency utility
- Utility as "FinanceCo"

Options that Can Help or Hurt

Option	Cautions
Reform electricity pricing	Need to reflect long-term variable costs; high fixed charges discourage EE
Expand EE and RE	Need decoupling & incentives to make business case to utility
Improve infrastructure	Need some but be careful not to over-invest. Be careful about making it easier for utilities to invest & recover costs.
Expand transmission system	
Limit generation expansion	
Establish long-term climate policy	Need mechanisms for coal-heavy utilities to adjust
Utility as "smart integrator"	May not work for integrated utilities
Energy services utility	For integrated utilities but need greater regulatory oversight
Competition	Can benefit large customers but thus far not smaller customers

Electricity Prices in Australia



Stock Price of a German Utility

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Role of Energy Efficiency

- Generally low-cost resource
- Can use to replace some retiring generation
- Meet environmental requirements (e.g. 111(d))
- Provide a valued customer service
- Can be alternative to some transmission and distribution investments
- Lowers customer bills and therefore can help ameliorate rate increases
- Utilities have important role to play (including smart integrators) – due to market barriers can't just rely on market

Short-Term Actions

- Expand the use of energy efficiency.
- Institute decoupling and shareholder incentives for meeting EE goals
- Increase use of demand response and smart pricing; better integrate with EE
- Establish fair pricing to pay for fixed costs without unfairly discouraging investments in EE & DG
- Look at infrastructure needs and prioritize them so that key projects with significant net benefits can move forward
  - Where balancing areas are small, operating areas should be combined

Short-Term Actions (continued)

- Experiment with new utility services to see what works in particular situations
- Manage well
- Experiment with performance-based regulation
- Increase efforts to better manage a diverse grid
- Reduce uncertainty about future environmental regulations by completing a variety of pending rulemakings that affect the power sector
- Think very carefully before proceeding with decisions to build new generation

Utility Services

- Provides an opportunity to earn profits
- Should build on existing expertise, e.g. EE, EV, larger DG (CHP, community solar)
- Need level playing field with competitors
  - Clear rules so utility is neither advantaged nor disadvantaged

Medium-Term Actions

- Develop and offer optional services
- Develop and implement new systems and capital plans for managing increasingly complex grids
- Establish and implement best practices for performance-based regulation
- Continue efforts begun in the near term – EE, DR, prioritize potential infrastructure improvements
- Experiment with new long-term structures

Long-Term Actions

- Choose long-term model
  - Will utility continue to own significant generation?
    - No = smart integrator
    - Yes = energy services utility
- In either model utility should continue to offer EE services and help with DG, perhaps subject to caps and time limits

Conclusions

- Future of the utility industry is far from clear; next few decades will be challenging
- Substantially increasing sales driving increasing profits is unlikely, but “death spiral” is also unlikely
- Utilities will likely need to pursue new services and good management to increase profits
- Energy efficiency should play a strong role
- Regulators have an important role – get rules right so meet public goals and have strong utilities

Conclusions (continued)

- Important decisions will need to be made in the short term and built upon over the medium and long terms.
- But if we can get these rules and systems right:
  - Utilities can profit
  - Customers will get services they want without high bills
  - We can all enjoy a clean environment

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Contact Information

Steven Nadel

snadel@aceee.org

202-507-4000

www.aceee.org

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