

# LCOE and LACE

## Seeking Simplicity



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imagination at work

# A love-hate relationship

- We love Levelized Cost of Electricity (LCOE) because it is simple
- Everything is boiled down to one number
- Provides an easy point of comparison across technologies
- Serves as a shorthand for many dimensions

## ***BUT***

- LCOE masks many site-specific issues
- Ignores system interaction issues
- Is barely used in actual decisions about technology choice
- Shorthands lack nuance ... they are cartoons

# Some nuances ... site to site

- Site configurations affect the installed cost of technology
- IPPs, Co-ops, IOUs, NUGs, all face different costs of capital and in some cases different fuels contract prices
- Ambient temperatures affect the output of gas turbines
- Wind speed varies by site and height
- Wind energy captured can vary significantly by wind farm configuration (“wind park effect”)
- Solar PV output can be affected by the angle of the panels, the tree shade, the hours of sunlight vs cloud cover

*Should we report an LCOE for each permutation?*

# Some more nuances ... system to system

- The *value* of a particular technology will change depending on the existing grid topology, existing installed base and demand profile
- As the systems evolve, so too will the value

*Should we report an LCOE for each system topology?  
For each year of evolution?  
For each scenario?*

# Is LACE the answer?

- EIA should be applauded for putting forth “LACE” - Levelized Avoided Cost of Electricity (or LCOE – LACE) as an alternative ... a much needed discussion
- LACE, in principal, addresses some of the problems with the blunt LCOE formulation

## ***BUT***

- LACE mostly addresses the systemic-nuances, not the site nuances
- LACE is useful only within the context of a specific scenario/forecast
- LACE is useful only by comparison with LCOE, and then by comparing that comparison



*Do you need a model to provide a simple answer?*

# A call for simplicity

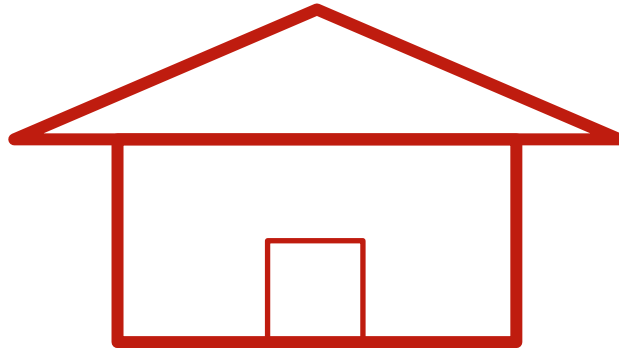
- LACE adds detail without adding clarity ... requires too much of the audience
  - Doesn't usefully add to "realism"
  - LCOE, like a batting average, condenses a lot of information
    - But who can really, quickly interpret "Equivalent Average"?
- "...stat used to measure hitters independent of ballpark and league effects. It's a complex formula that takes into account hits, total bases, walks, hit by pitch, stolen bases, sacrifice hits, sacrifice flies, at-bats and caught stealing. It's then normalized for league difficulty." (baseball.about.com)*
- Metrics are audience-specific ... LCOE isn't meant to tell the whole story to every audience member

*I come not to bury LCOE but to praise  
it ... or at least learn to tolerate it*

# Detail and clarity

The usefulness of one measure depends on:

- Audience
- Question
- Purpose



*Sometimes, cartoons are OK*