A Local Clean Energy Future for North Carolina

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Prepared for NC WARN

Challenge: customers want local clean energy, state policy is clean energy, yet much of what is built is gas-fired power and conventional transmission infrastructure

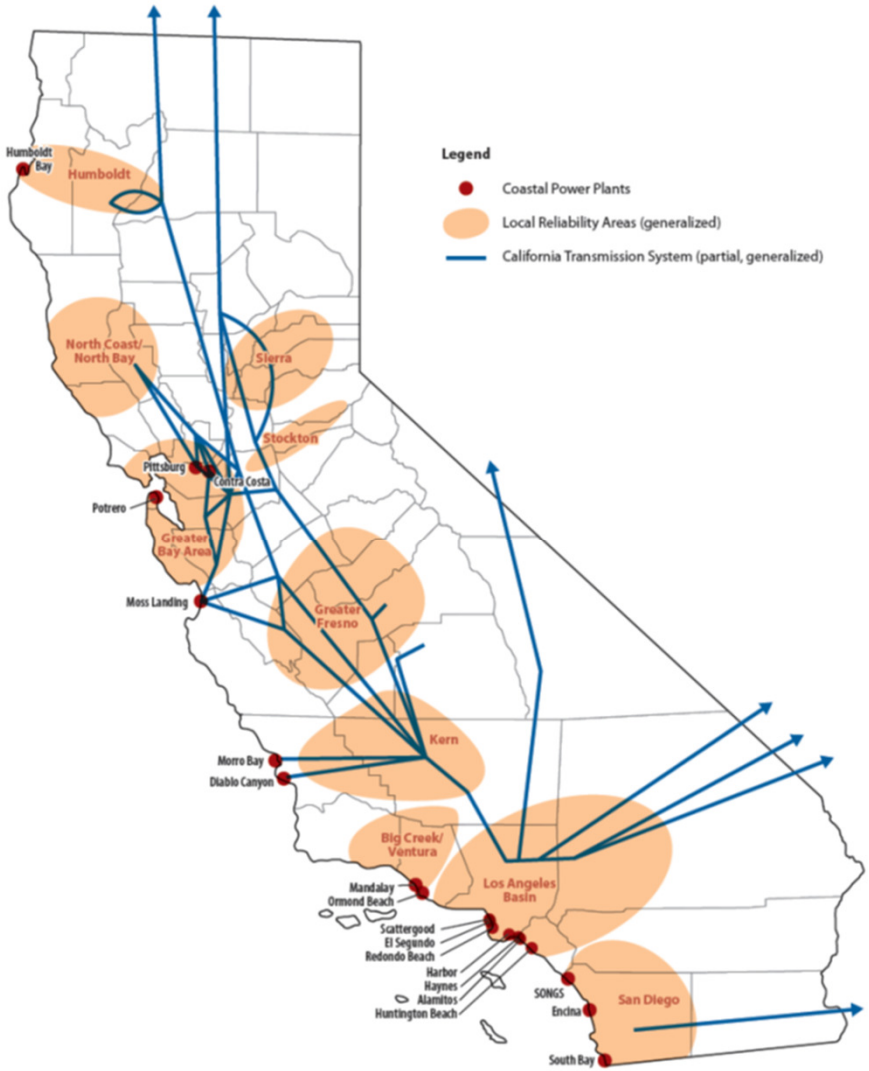
source: CEC, *Pio Pico Energy Center – Final Staff Assessment*, cover photo, May 2012.

[YOUR UTILITY HERE] is focused primarily on expanding conventional infrastructure – big rate increases, slower progress on local green power

- Investor-owned private utility focused on maximizing shareholder value.
- Maximum profit realized by building transmission lines.
- Example - Seventeen Midwest 345 kV transmission projects: many $billions, ostensibly to move wind power from Great Plains to urban centers east of Mississippi River (or could be gas-fired power, or mix).
- Locating renewables outside of local reliability area (LCA) increases need for more gas-fired generation inside LCA.

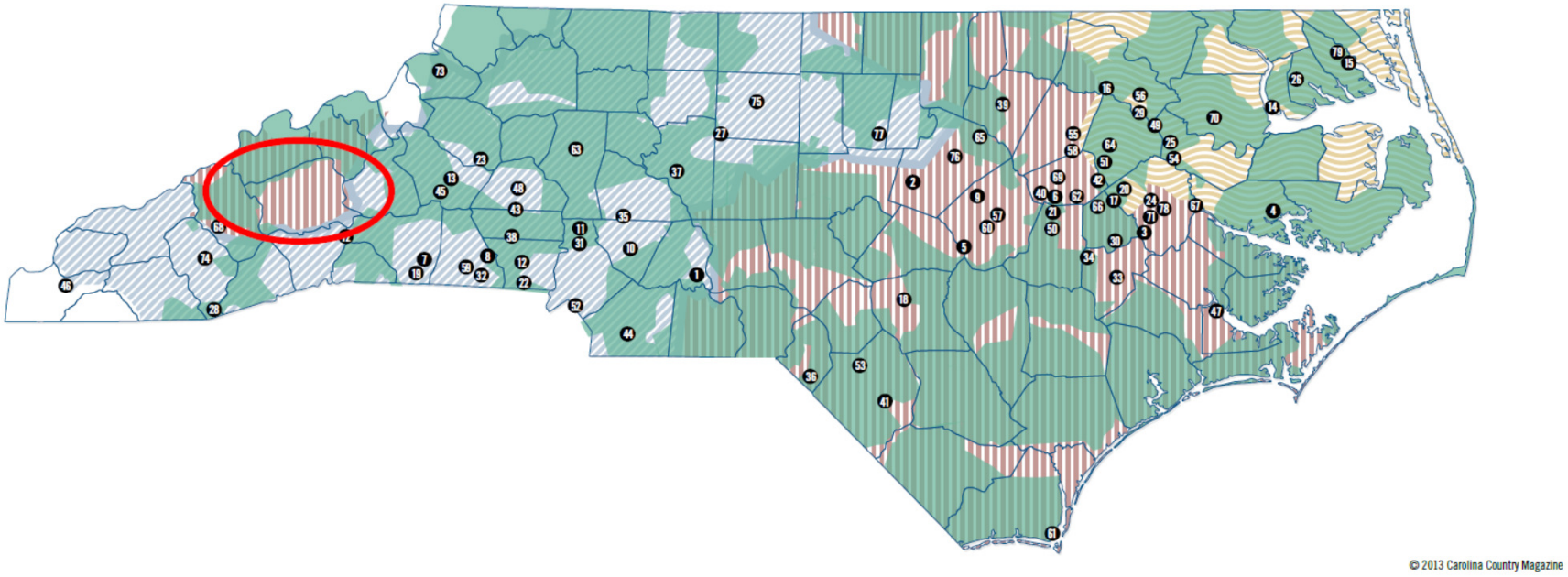
Local Capacity Areas (LCA) – California Example

source: ICF Jones & Stokes, *Electric Grid Reliability Impacts for Regulation of Once-Through Cooling in California,* April 2008, Figure 1.



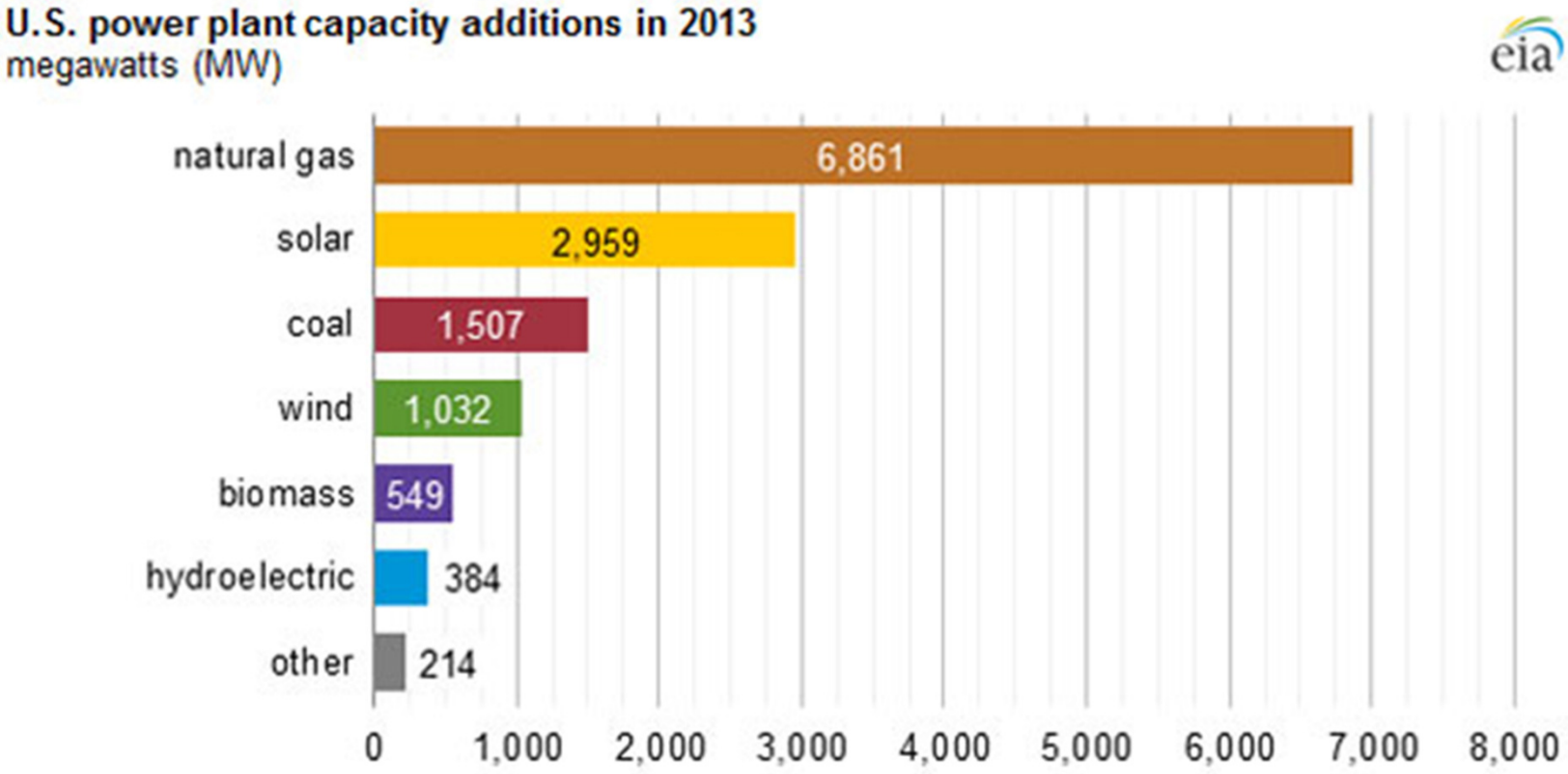
Sample Local Capacity Area (LCA) in North Carolina

source: Carolina Country Magazine, 2013; red circle around DEP West added by B. Powers.



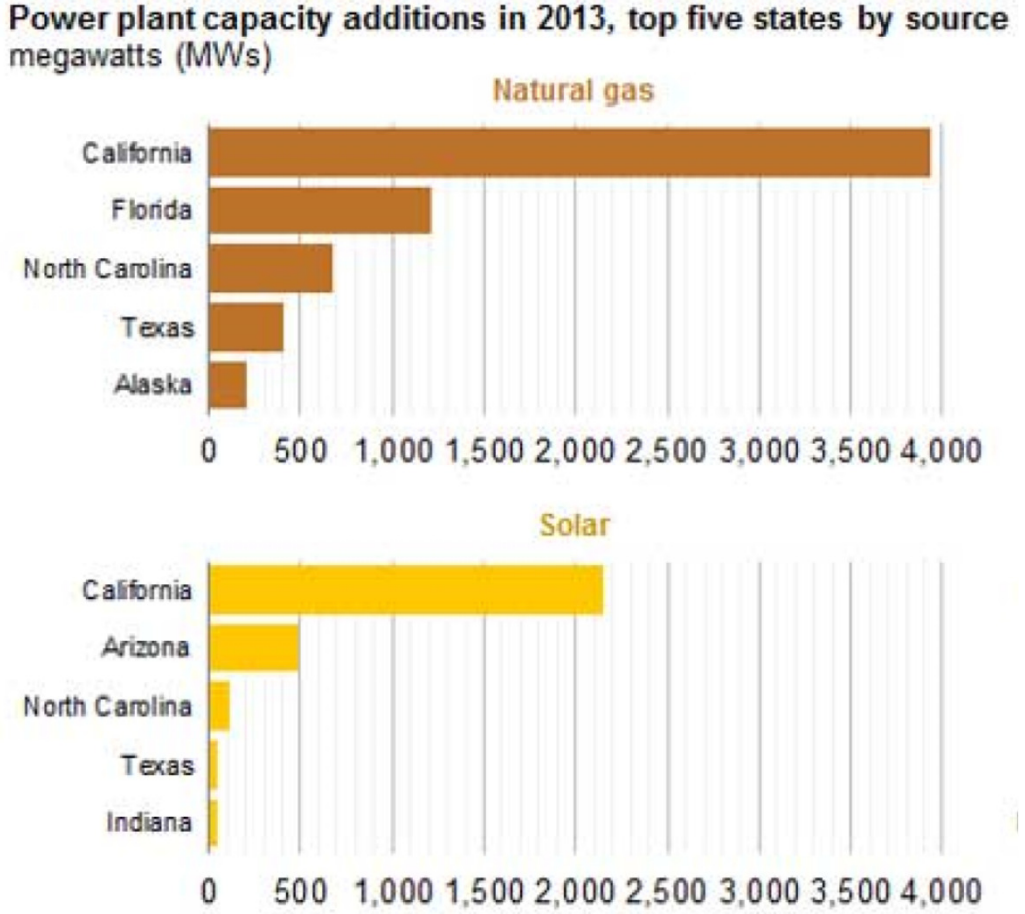
New natural gas-fired power plants are single most dominant source of new supply

source: Greentech Media, *Solar Jumps to 22% of New US Generation Capacity in 2013,* April 8, 2014.



California seen as clean energy leader, yet state built about 60 percent of all gas-fired capacity installed nationwide in 2013 – North Carolina followed same pattern that year

source: Greentech Media. *Solar Jumps to 22% of New US Generation Capacity in 2013,* April 8, 2014.



Reason given by [YOUR UTILITY HERE] for proposing XYZ gas-fired project – local reliability and addressing intermittent renewable energy

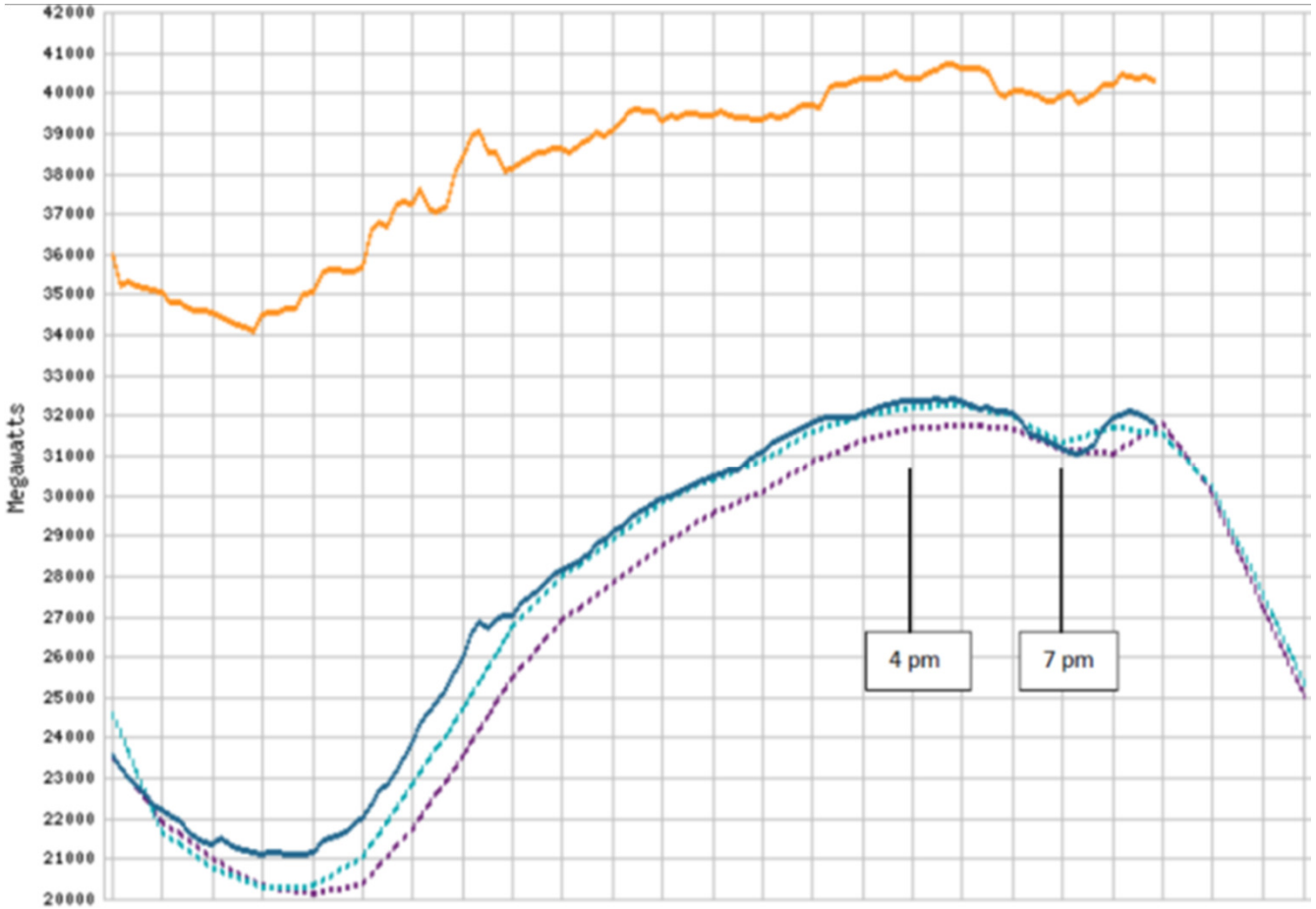
source: 1) AES, *Alamitos Energy Center Application for Certification – Section 1.0 Executive Summary* CEC Docket 13-AFC-01, February 3, 2014, p. 1-1, and 2) *Section 2.0 Project Description*, p. 2-1.

- *[YOUR UTILITY HERE] has identified a need for power generation facilities in the western sub-area of the ABC Local Reliability Area to replace the coal-fired plants that are expected to retire as a result of [YOUR STATE HERE] clean energy targets.*

- *As [YOUR STATE HERE]'s intermittent renewable energy portfolio continues to grow, operating in either load following or partial shutdown mode will become necessary to maintain electrical grid reliability, thus placing an increased importance upon the rapid startup, high turndown, steep ramp rate, and superior heat rate of the configuration employed at the XYZ gas-fired power plant.*

Solar and wind output is very predictable, do not need fast-start gas turbines to address variability

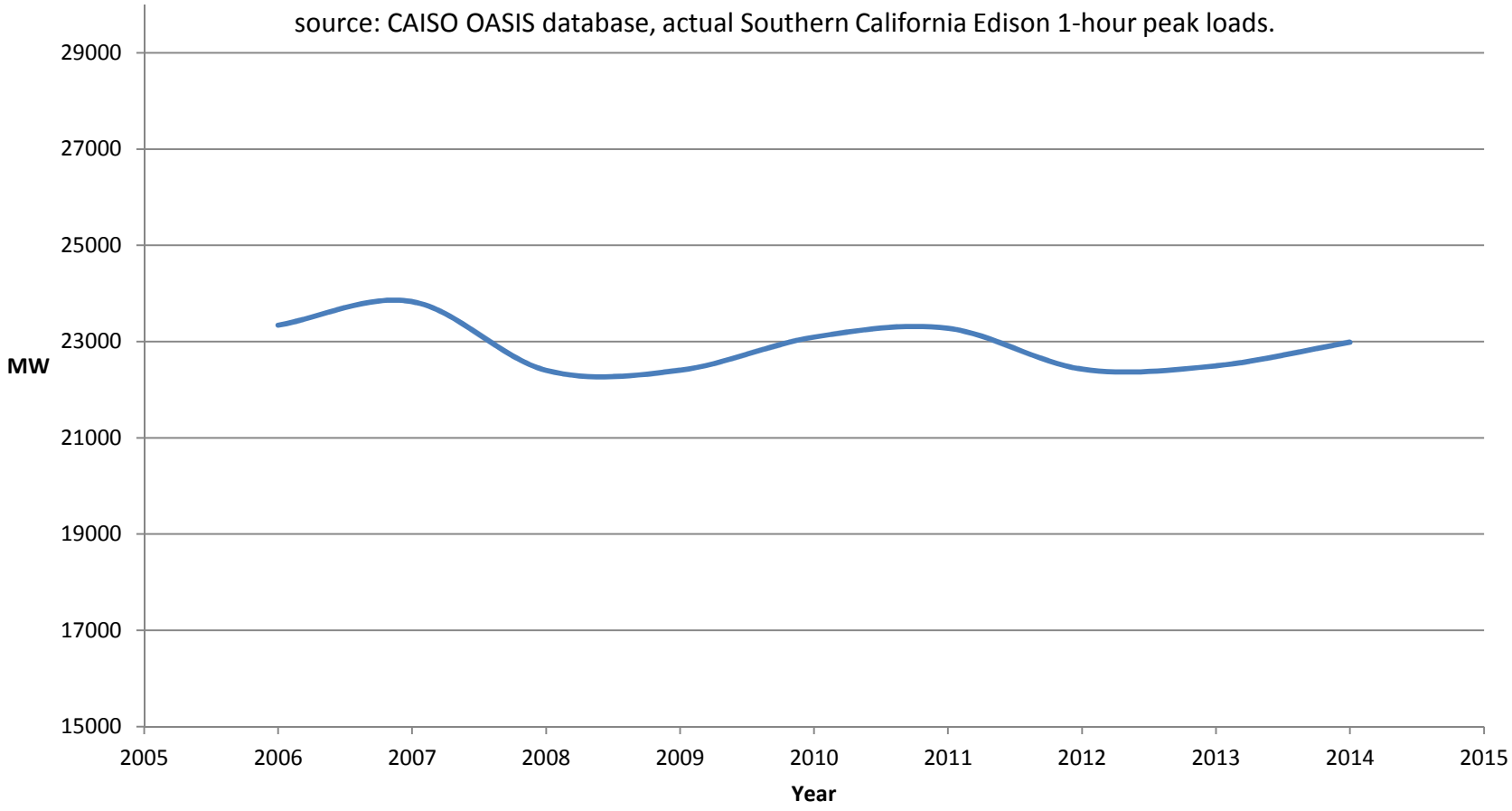
source: CAISO homepage graphic, April 29, 2013, 9 pm. yellow = available resources; solid blue = actual demand; light blue dashed = hour-ahead demand forecast; purple dashed = day-ahead demand forecast.



Local reliability – meeting demand under extreme conditions in “load pockets”

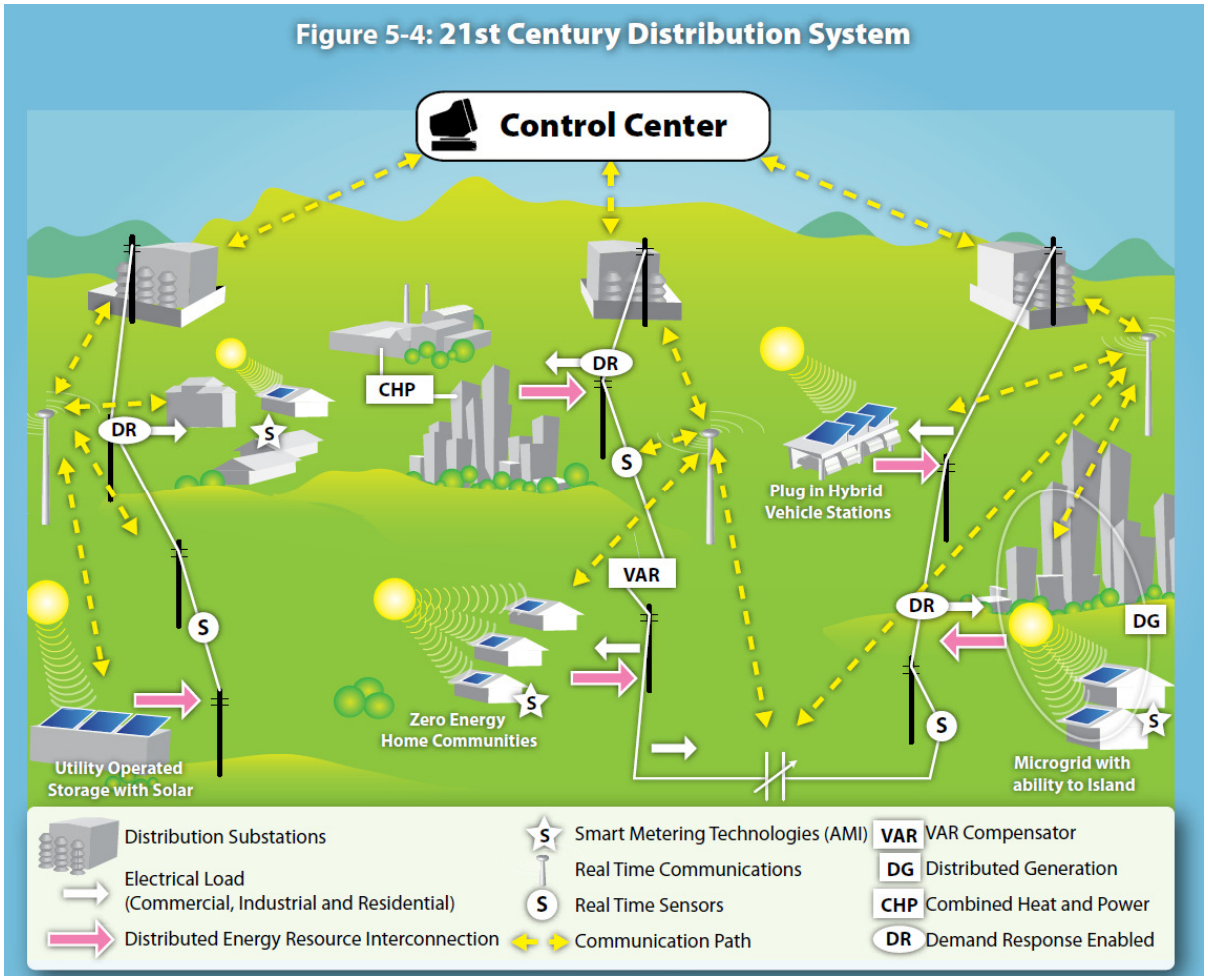
- 1-in-10 year extreme demand peak hour load.
- Loss of largest single transmission line or generator (federal standard).
- Must have sufficient local resources, in addition to remaining available transmission lines, to meet peak demand.

"*Steady peak demand growth means [YOUR UTILITY HERE] must build now*." Reality – no peak load growth on grid in a decade, and probably none in the future – driven by appliance standards



Excellent state energy strategy - local distributed (small scale) energy, predominantly green power

source: CEC 2007 Integrated Energy Policy Report, December 2007, p. 155.



Electricity supply loading order "preferred resources" – order in which state must meet new demand

source: CPUC, Decision 14-03-004, *Decision Authorizing Long-Term Procurement for Local Capacity Requirements Due to Permanent Retirement of the San Onofre Nuclear Generations Stations*, March 13, 2014, pp. 13-14..

- Energy efficiency & demand response
- Renewable energy
- Combined heat & power

  (local small-scale, high efficiency natural gas-fired)
- Conventional utility-scale natural gas-fired

Climate action and energy security the right way – cheaper, better, faster, no environmental impacts

source: California Energy Efficiency Strategic Plan (2008, 2011)

- Energy efficiency & demand response & rooftop solar
  (net zero energy buildings: energy efficiency + rooftop solar)
- All new residential homes net zero by 2020
- All new commercial buildings net zero by 2030
- 25% of existing residential ~ net zero by 2020
- 50% of existing commercial net zero by 2030
- 30 – 40% reduction in existing building electricity demand via energy efficiency measures
- Reduce air conditioning loads by 50% by 2020

The key is customer-owned rooftop solar

sources: B. Powers , *Powers Engineering Comment Letter on Draft DRECP NEPA/CEQA*, February 23, 2015.

- 1,940 MW to 5,256 MW by 2017.
- California 2013 law mandates big increase in customer-owned rooftop solar target for investor-owned utilities
- Result - accelerating rooftop solar installation rates in California: should reach target by mid-2016 at current installation rates:
  - 2013: ~1,000 MW installed
  - 2014: ~1,300 MW installed
- Should reach 5,256 MW target by mid-2016 at current rooftop installation rates.
- Utilities working hard to derail further rooftop solar expansion.

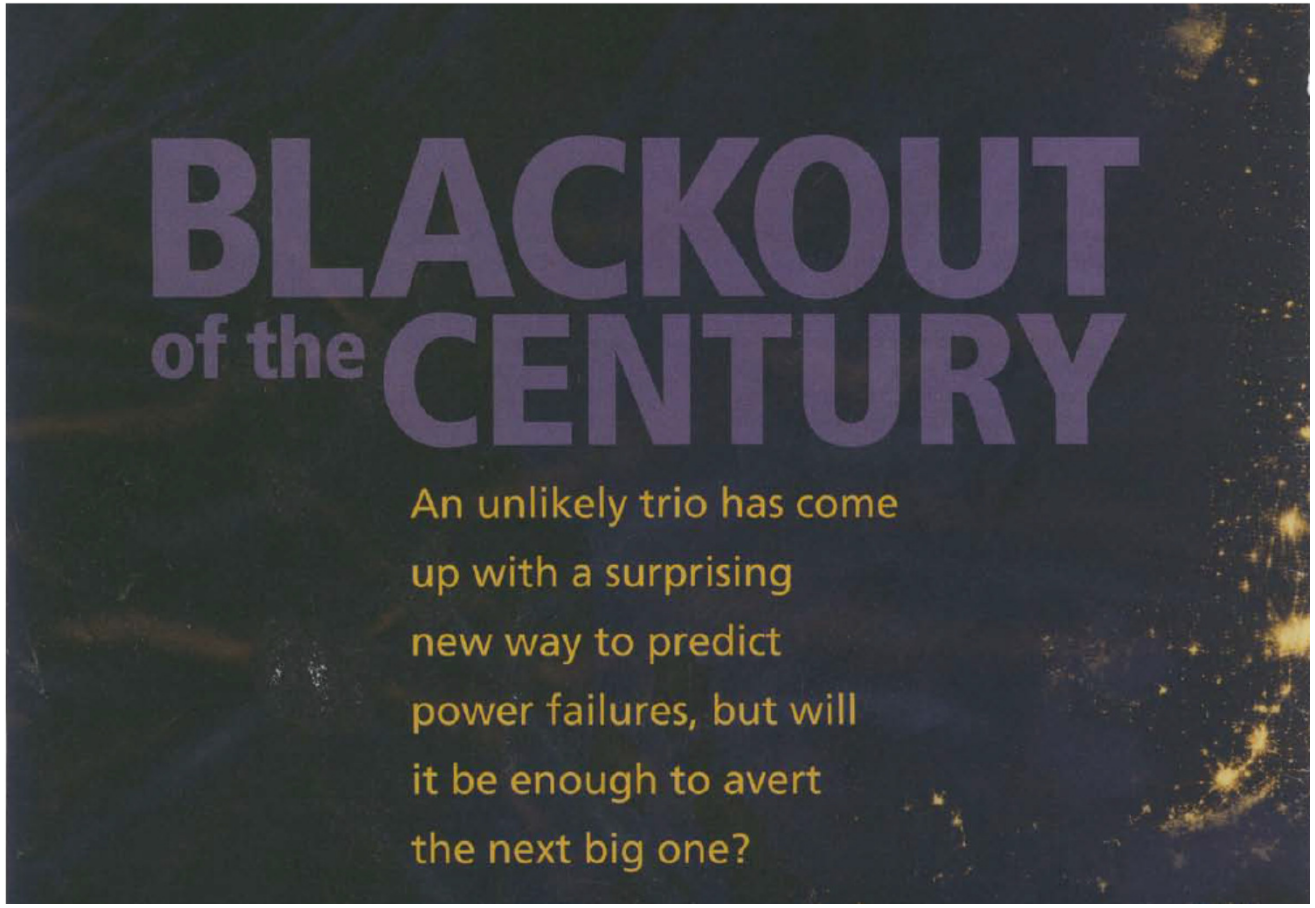
The right solution – rooftop solar and battery power

sources:: 1) CPUC D.13-10-040, *Decision Adopting Energy Storage Procurement Framework and Design Program*, October 17, 2013, Table 2, p. 15, 2) CPUC D. 13-02-015, *Decision Authorizing Long-Term Procurement for Local Capacity Requirements*, February 13, 2013, p. 131, and 3) Southern California Edison, Application A.14-11-012, before California Public Utilities Commission, November 24, 2014..

- California utilities required to install 1,325 MW of energy storage.
- Must be under contract by 2020.
- California utilities already identifying battery storage as more cost-effective than peaking gas-fired power plants.

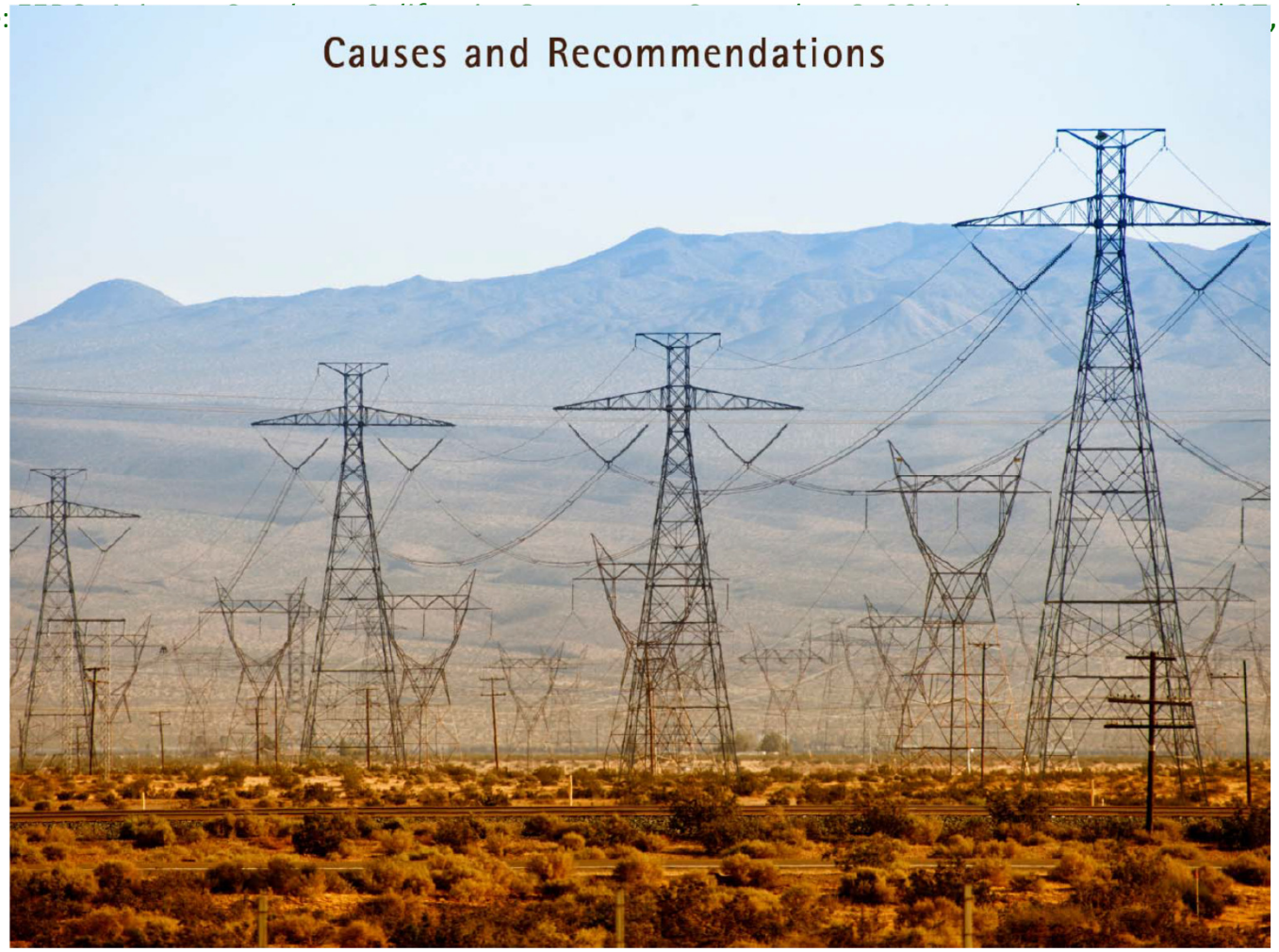
Energy security benefit of local power: riding-out the unexpected when the grid goes down

source: Discover Magazine, *Blackout of the Century*, February 2016.



Blackout, September 8, 2011- reliability of SoCal utilities in doubt , despite all the transmission lines & gas turbines

source: , 2012.



Taking control of local clean energy initiatives

source of photos: B. Powers

Residential battery systems can compete economically with new peaking gas turbines if paid the same for capacity

source: San Diego Gas & Electric July 2014 customer bill insert, impact on rates of 600 MW Carlsbad Energy Center; a) battery cost estimates by B. Powers (sealed lead-acid gas mat) and Mobile Solar (wet lead-acid forklift batteries converted for home energy application.

- Ratepayers pay $220 per kilowatt-year for new peaking gas turbine capacity – insurance policy for day when supplies are tight.
- Home battery system cost (retail): $4,000 - $6,000 for 30 kilowatt-hours or which 24 kilowatt-hours available if necessary.
- Residential system can send 8 kilowatts to grid for up to three hours.
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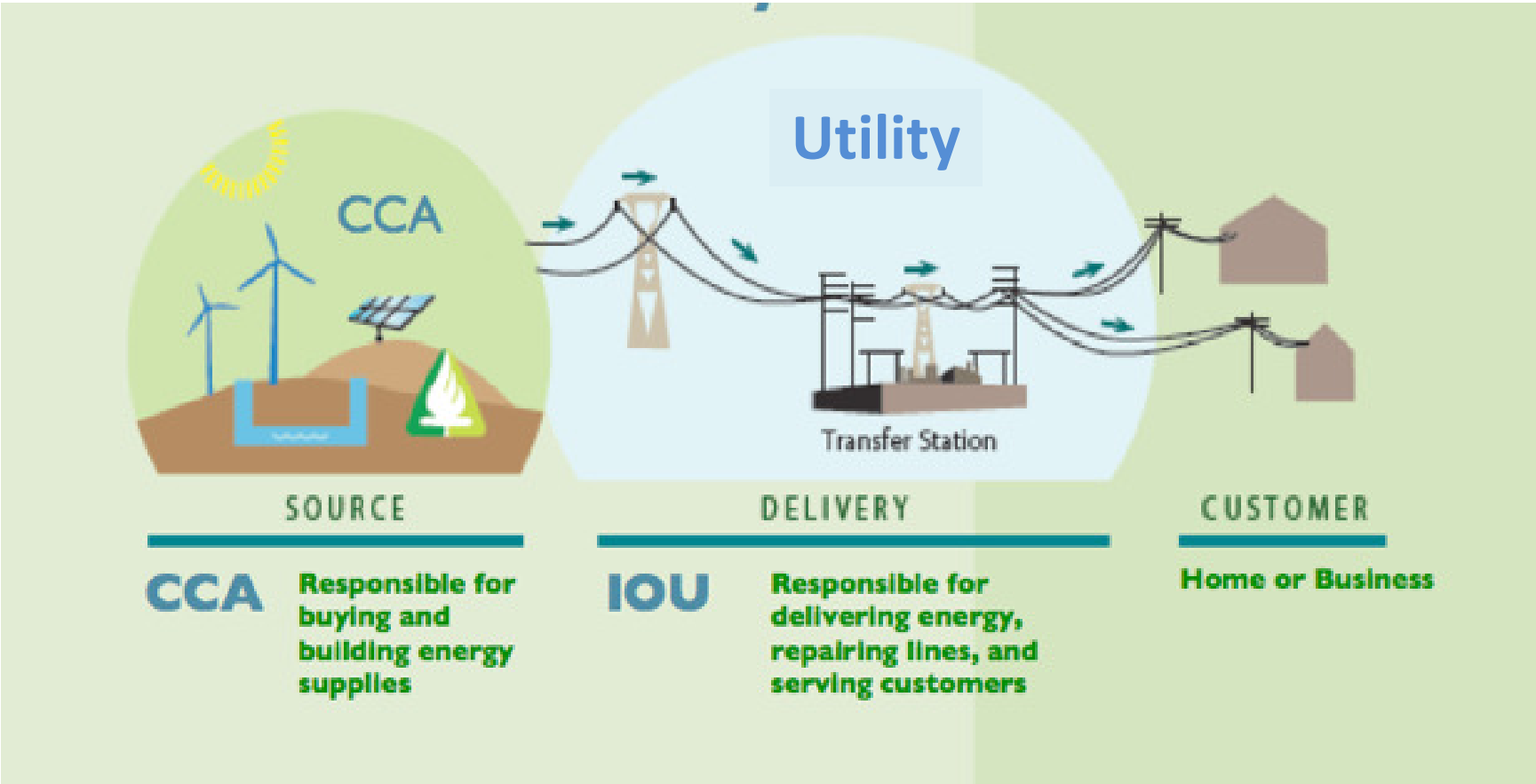
- If paid same utility pays for peaking power, residential system earns $1,800 per year.
- Simple payback of the batteries, for this purpose alone, is 2 to 3 years.
- Batteries guaranteed for 7-10 years.

Politics and Power

- Five (5) utility commissioners, appointed by Governor
- Approved by the state senate, lots of utility interest
- Commission decides what hardware gets built, constantly lobbied
- Union Project Labor Agreements – “PLAs” – make utility-scale gas-fired and renewable energy projects very formidable politically
- Community choice energy alternative – sometimes political ball bounces against status quo:
  - Option in numerous states: Illinois, Massachusetts, California, others
  - City or County takes control of electricity supply to residents
  - Lots of momentum behind this option in California due to frustration with utilities.

WHAT IS CCA?

Established by State law, CCA allows cities and counties to pool their residential, business and municipal electricity loads, and to purchase power (and/or generate it*) on their behalf. Energy transmission, distribution, repair and customer service functions remain with the incumbent utility. **Where allowed by state CCA law*



Reasons California counties and cities are transitioning to community choice energy

- Local control of electricity supply
- Ability to focus on local economic development
- Potential to reduce rates
- Authority to accelerate development of local clean power
- Provides competition to incumbent utility
- City of San Diego mandated target – 100% clean energy by 2035, vehicle of choice is community energy structure

Conclusions

- Utility claims that more gas-fired power plants and associated transmission infrastructure is needed ring hollow under scrutiny.
- More rigorous appliance standards primarily responsible for flat and declining peak loads and energy usage.
- Local solar power with batteries is the long-term clean power and energy security solution and it is ready for prime time.
- Local community control of energy supply is the best model for a rapid transition to local clean energy.