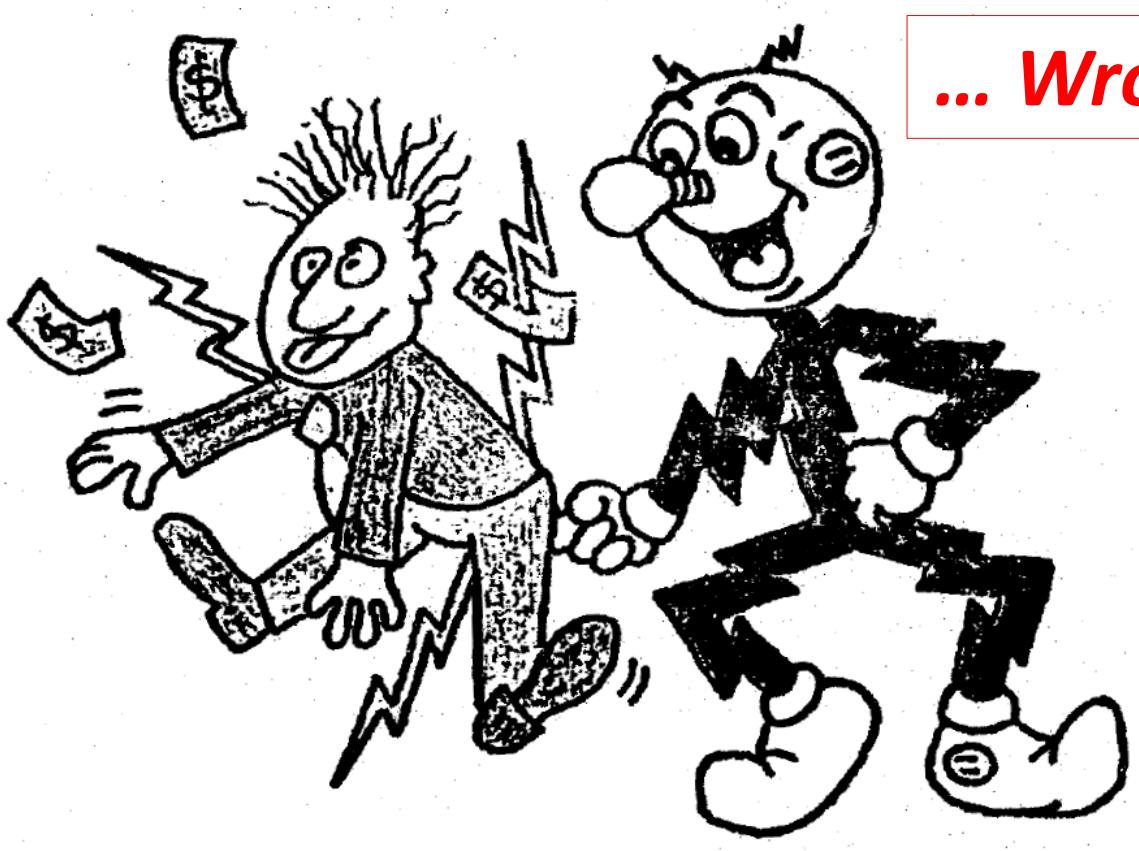
Rate Design:
New Times Warrant New Approaches

Presented by Kenneth Colburn
NHEC Board Member (*Speaking as an Individual*) and
Principal, Regulatory Assistance Project (RAP)

Electricity Use in Rural and Islanded Communities: A Workshop Supporting the Quadrennial Energy Review's Public Outreach

National Academy of Sciences, Washington DC
February 8-9, 2016

Facing Flat or Declining Demand, Utilities Nationwide Are Seeking Higher Fixed Charges…



… Wrong Answer!

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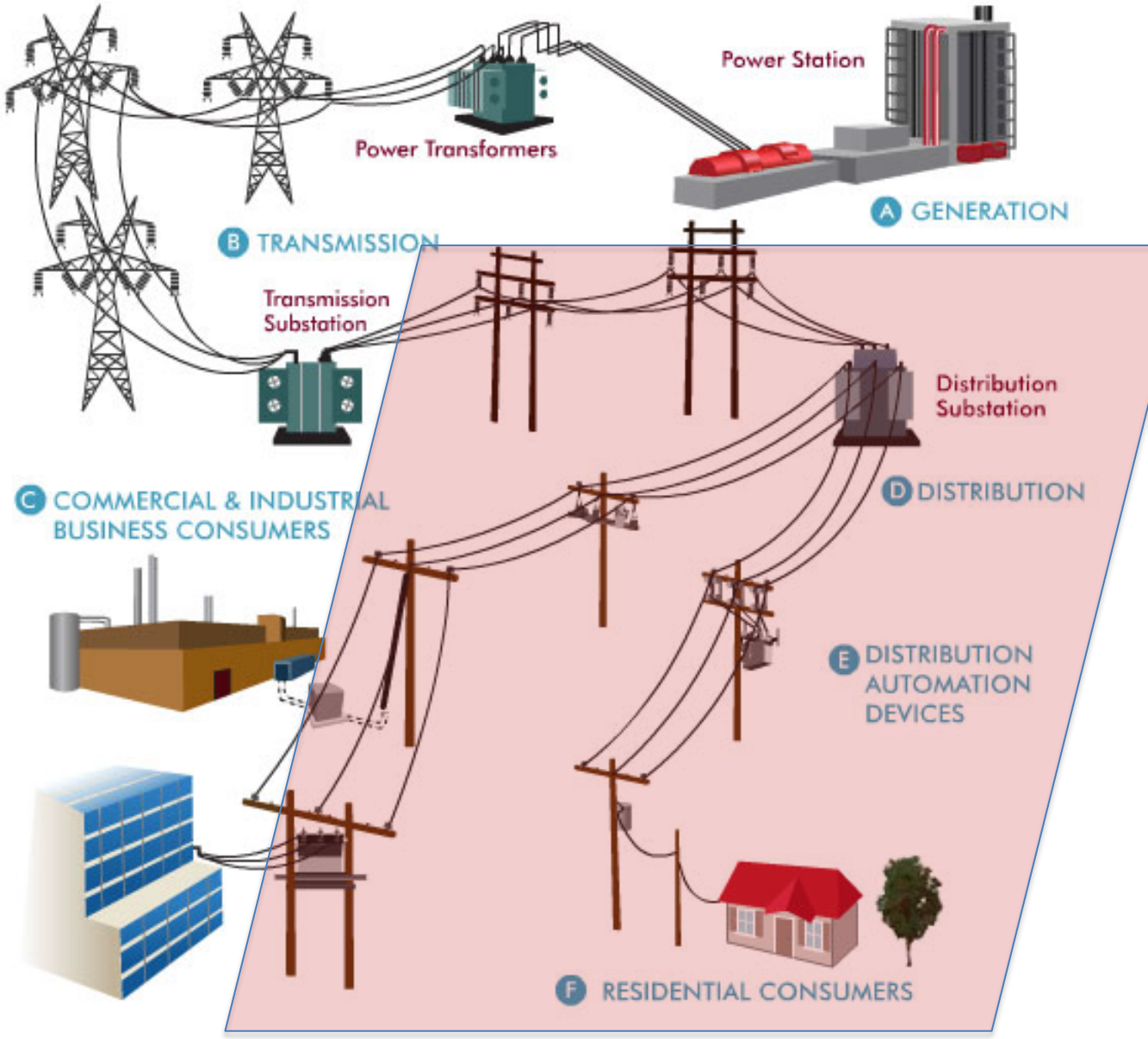
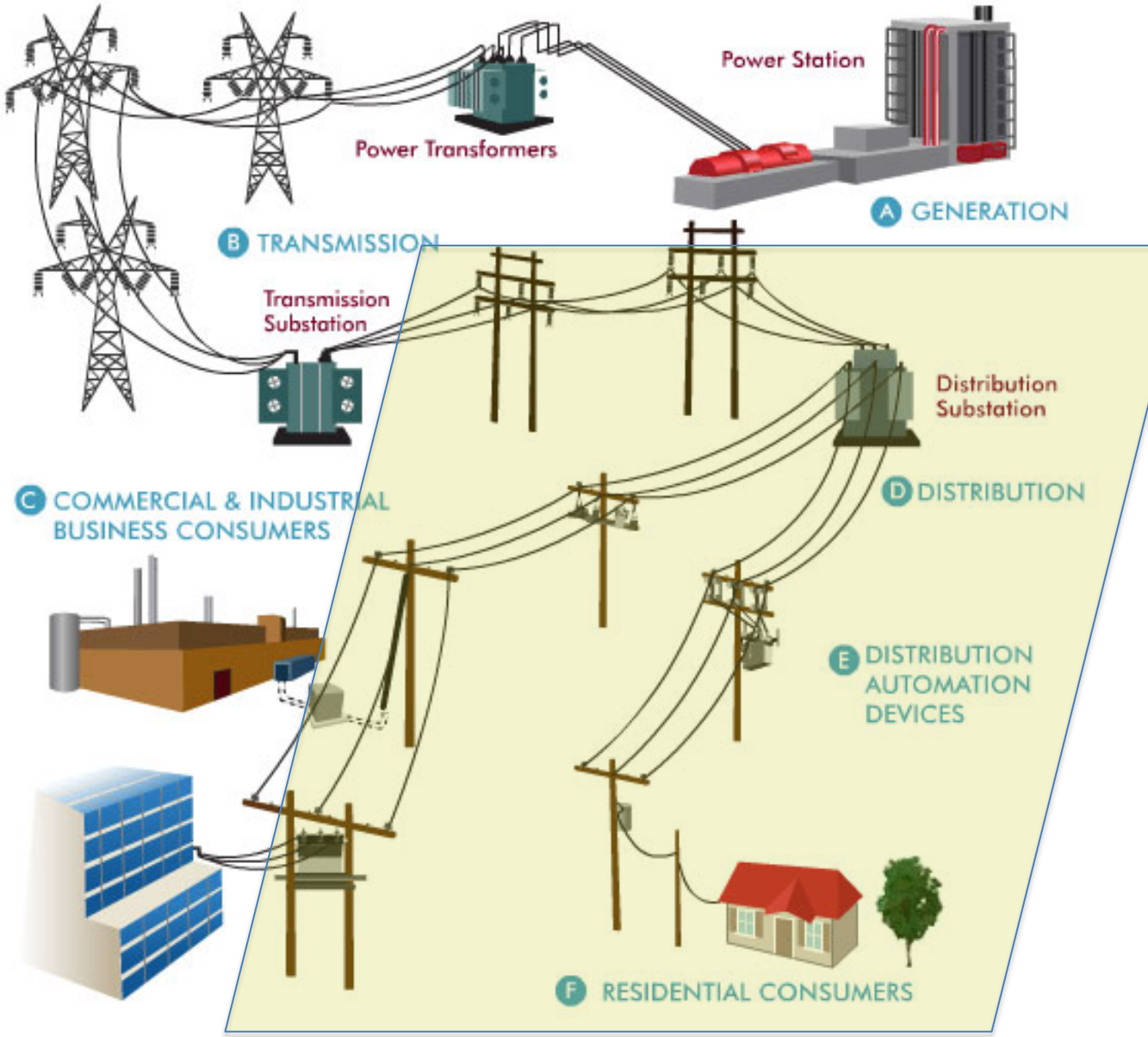
Straight Fixed / Variable:

100% of distribution system is classified as customer-related



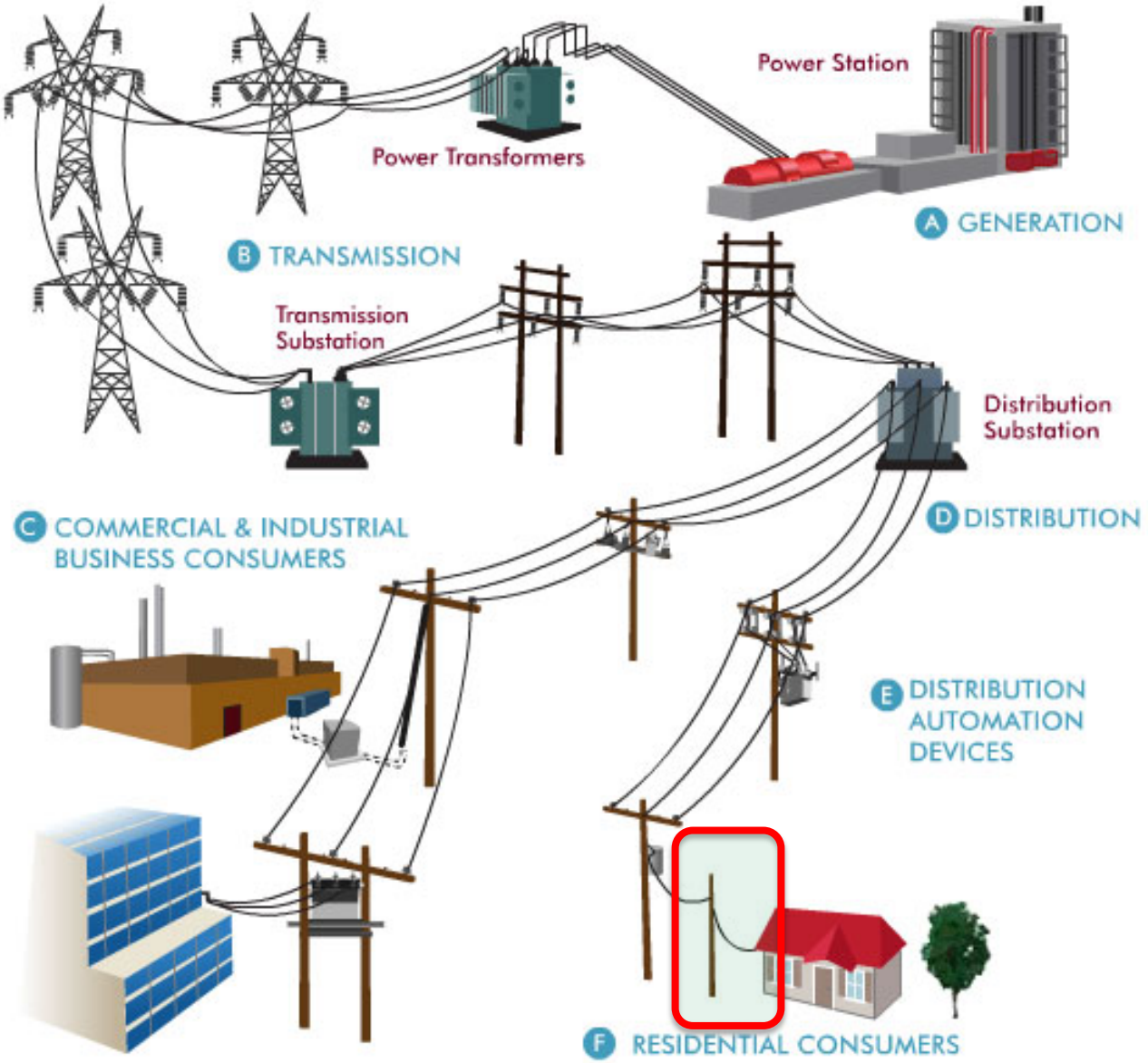
Minimum System (Zero-Intercept) Method:

~50% of distribution system classified as customer-related



Basic Customer Method:

ONLY customer-specific facilities are classified as customer-related

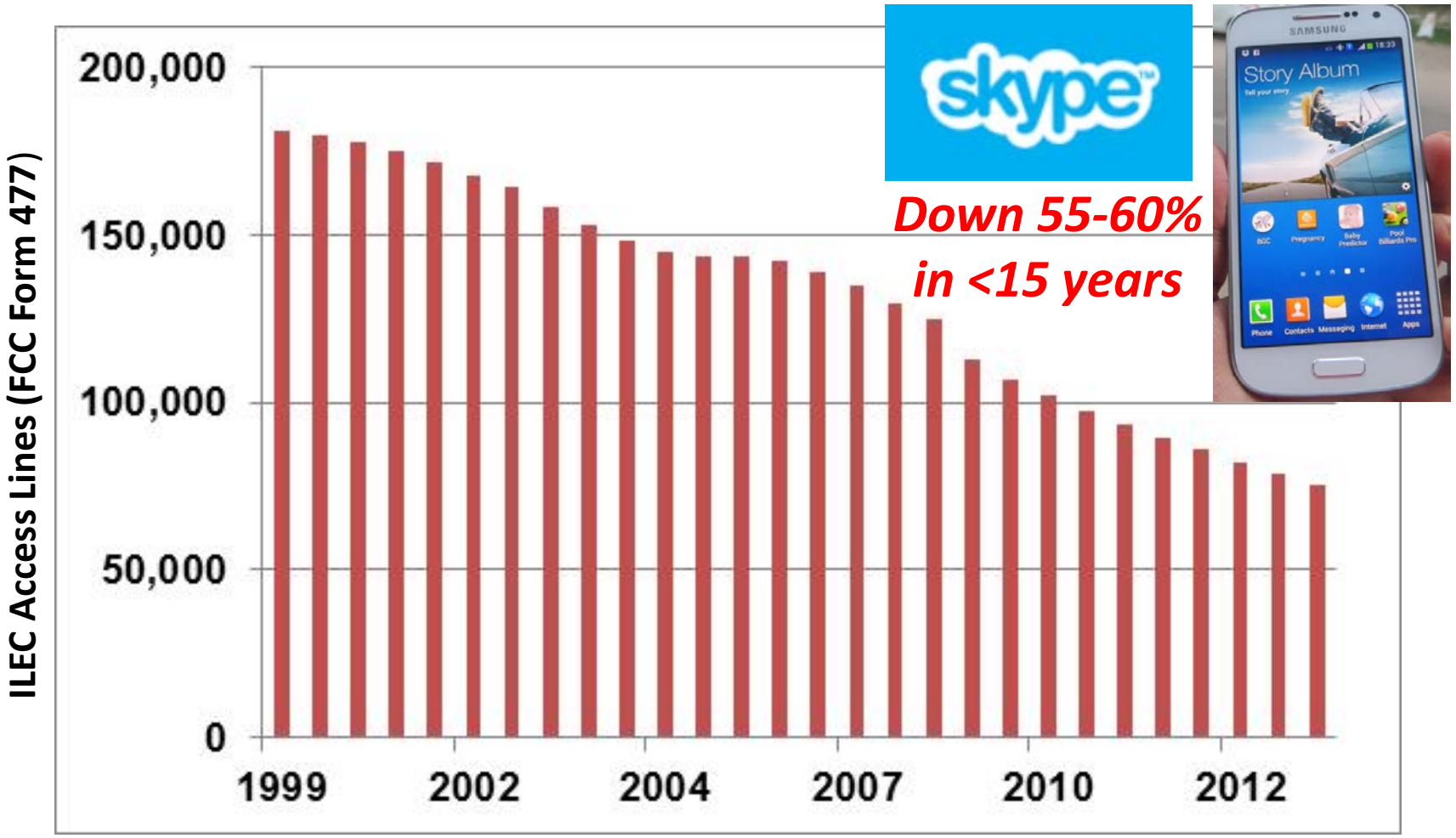


Comparing These Methods (Lazar, 2015)

Cost Category	Straight Fixed / Variable	Minimum System Method	Basic Customer Method
	$/month/customer		
Poles	$10	$5	$ -
Wires	$20	$10	$ -
Transformers	$14	$7	$ -
Services	$1	$1	$1
Meters	$1	$1	$1
Billing	$3	$3	$3
Customer Service	$3	$3	$3
Total	**$52**	**$30**	**$8**

What About Other Industries?

How Did High Fixed Charges Work Out for Landline Phone Companies?



Right Principles for Today
(Lazar/Gonzales, 2015)

1. A customer should be able to connect to the grid for no more than the cost of connecting to the grid.

2. Customers should pay for grid services and power supply in proportion to how much they use these services and how much power they consume.

3. Customers who supply power to the grid should be fairly compensated for the full value of the power they supply.

NATIONAL GEOGRAPHIC

News Video Photography The Magazine

As Solar Powe
Over U.S. Utili

Electric power companies challenge "n
costs.

By Ker Thar
PUBLISHED DEC

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HOME U.S. ▾ NEW

RENEWAE

ENERGY | OIL A

Solar fi
battle

Javier E. David |
Sunday, 12 Oct 2014 |

FOX 13 SALT LAKE CITY

NEWS ON-AIR GOOD DAY UTAH THE PLACE TRAFFIC CONTESTS CONTACT CARS

Kauai co-op integrates over 70% solar, 90% renewables four times in January

(PV averaged62% in January)

By Herman K. Trabish | February 4, 2016 print

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Dive Brief:

- The Kauai Island Utility Cooperative (KIUC) obtained 90% or more of its electricity from renewables on four occasions in January. In addition to its baseload capacities of 8% biomass, 7% hydroelectric and ramping diesel generation, KIUC achieved up to 77% solar in its power mix, the most solar ever integrated by a U.S. utility, according to Hawaii News Now.

gry after city
its credits for

rative Electric informed its 12 members
ed generation (DG) that their facilities
fee, the fixed charge all of the co-op member-customers' monthly bills, will triple from $27.50 per month to $85 per month beginning in 2020.

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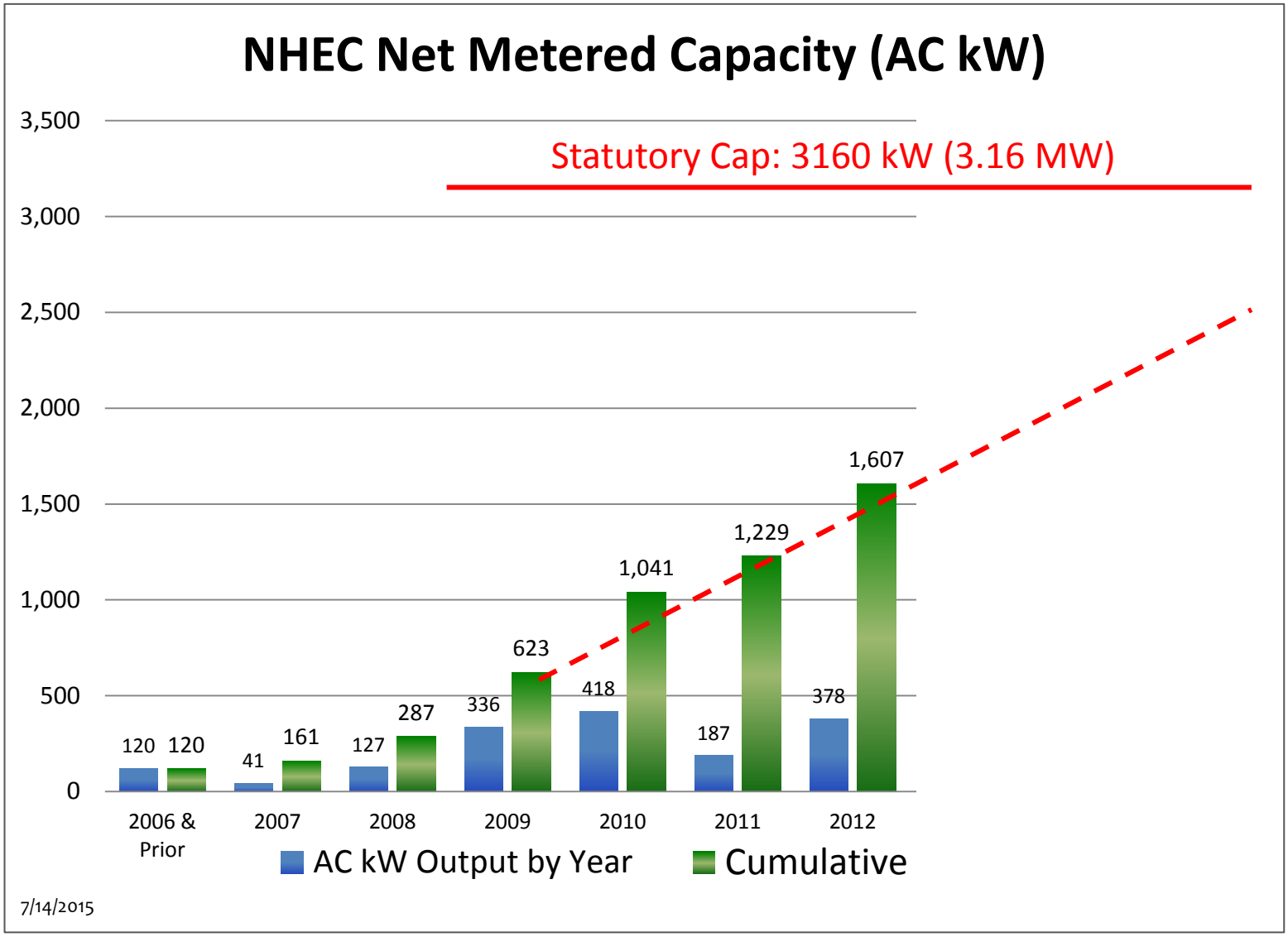
Net Energy Metering (NEM) in NH

- NH RSA 362-A:9 statute (1998+)
  - NHPUC 900 rules
- 50 MW net metering cap statewide
  - NHEC share = 3.16 MW
- NHEC Net Metering Payments:
  - <100kW: Full retail (~13¢/kWh summer)
  - >100kW: Avoided energy only (~7¢/kWh summer)
- *Problem: Who maintains the poles and wires if coops pay full-retail for NEM?*


NHEC Net Metered Capacity (AC kW)
Statutory Cap: 3160 kW (3.16 MW)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
120
120
41
161
127
287
336
623
418
1,041
187
1,229
378
1,607
2006 & Prior
2007
2008
2009
2010
2011
2012
AC kW Output by Year
Cumulative
7/14/2015

"Houston, We Have a Problem"

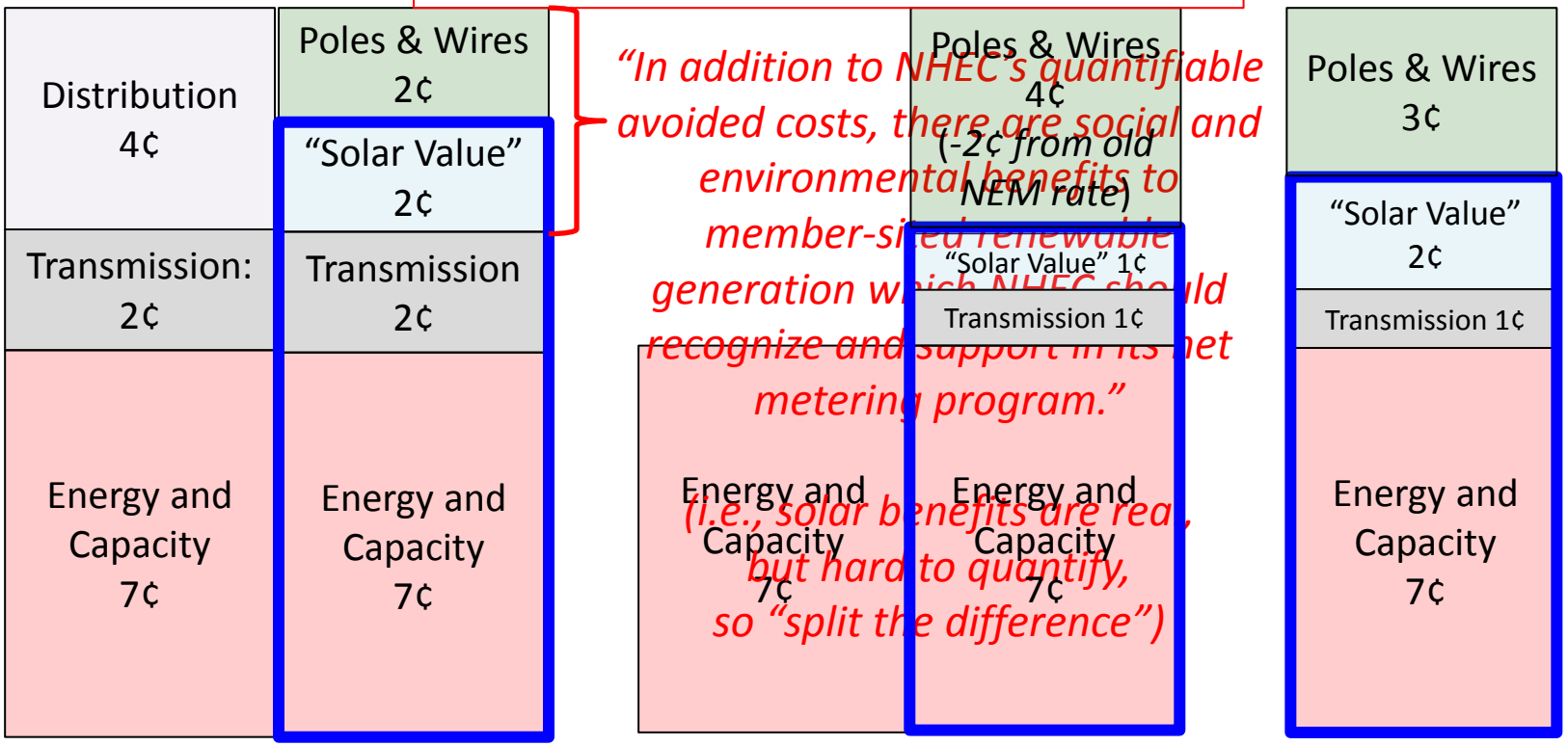
- Clean energy advocates aware NHEC near cap
  - Initiating legislative effort to raise NEM cap
- Very strong support for NEM and Renewable Energy among NHEC members
- State law completely silent about NEM once "above-the-cap"
- *What to do?*

"No, We Have an ***Opportunity***!"

- Without statutory direction or PUC regulation, NHEC "free to do what's in members' interest"
  - *What do members want?*
- Board, Management, and Legal Counsel…
  - Bought time by voluntarily raising cap 10% to 3.40 MW
  - Considered multiple options
    - Consultant: Fixed charges, feed-in tariffs, TOU rates, etc.
  - Met several times with interested members, advocates, and stakeholders
- *Focus of effort: How to both encourage RE **and** maintain the distribution system?*

Old (Below Cap) vs. New (Above Cap) NEM Rates

All ¢/kWh values are merely illustrative!



"Below-the-Cap" NEM Rate (Small <100 kW) ~13¢/kWh

"Above-the-Cap" NEM Rate (Small <20 kW) ~**11**¢/kWh

"Below-the-Cap" NEM Rate (Large >100 kW) ~7¢/kWh

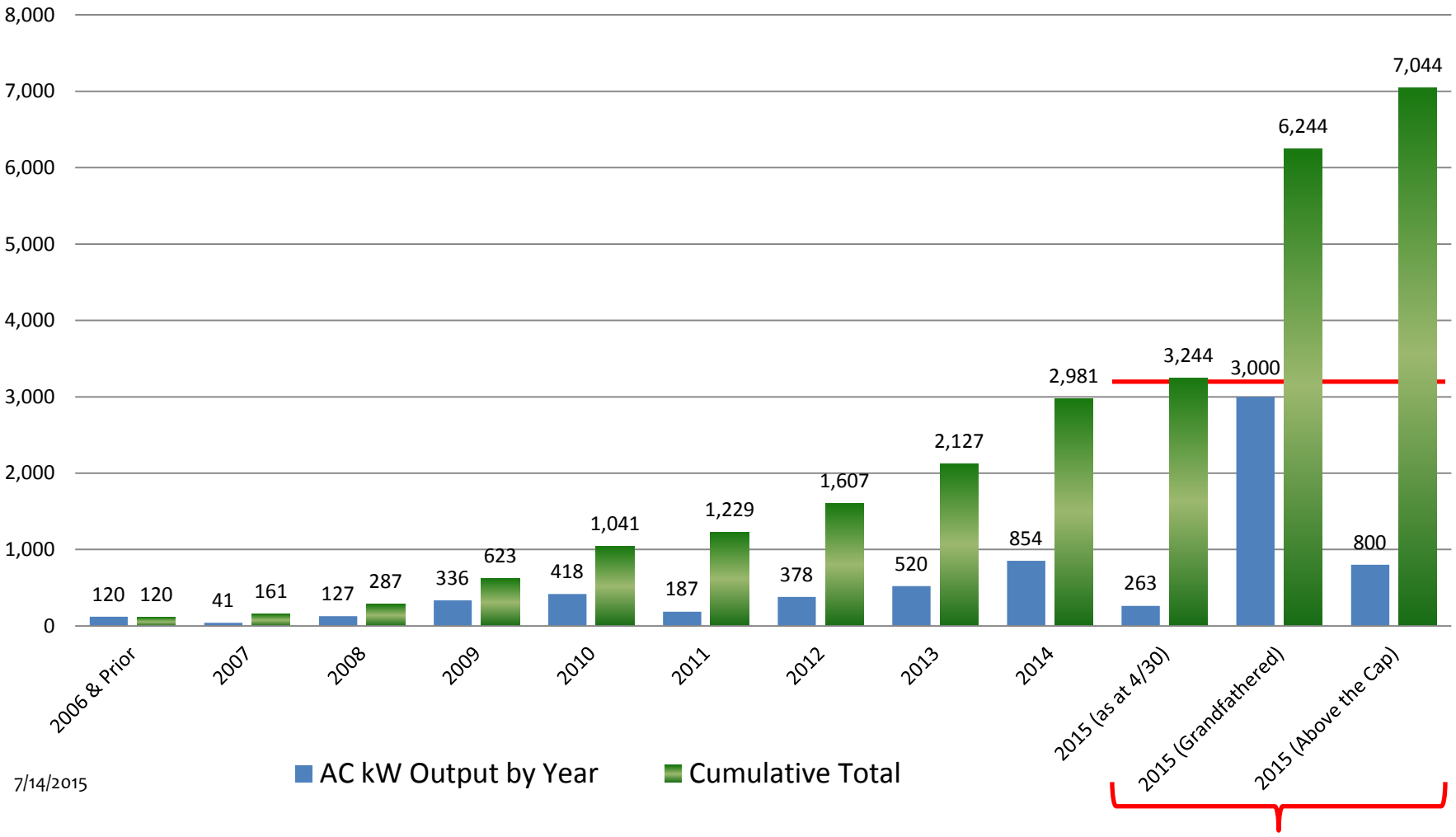
"Above-the-Cap" NEM Rate (Large >100 kW) ~**9**¢/kWh

"Above-the-Cap" NEM Rate (Medium 20-100 kW) ~**10**¢/kWh

But What Did Members/Advocates Get?

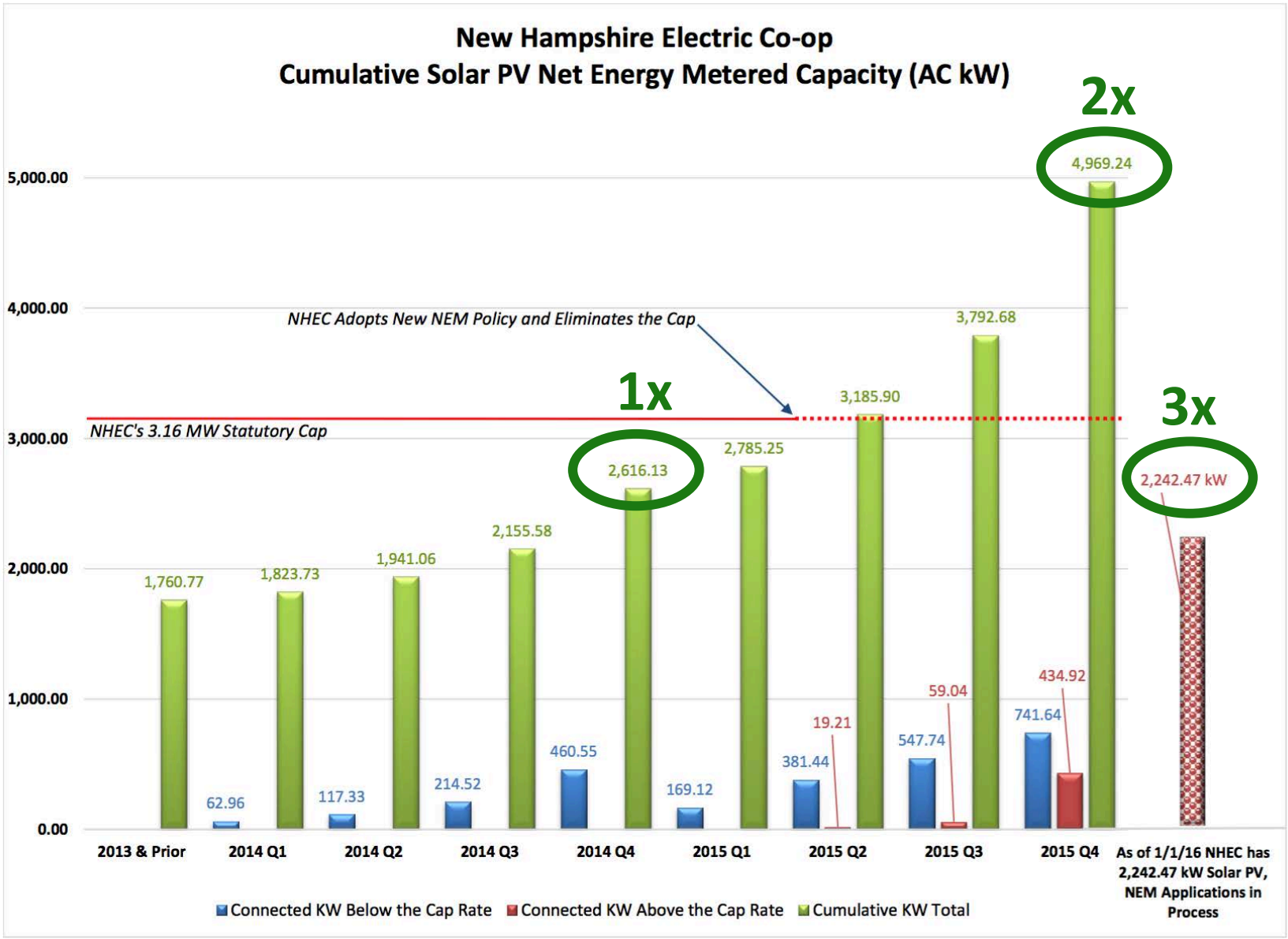
- NHEC Board NEM Policy Statement:
  "A net metering program which fairly balances NHEC's goal of encouraging member-sited renewable generation with NHEC's goal of minimizing cost shifting will be sustainable in the long run, and if periodically adjusted, can make predetermined 'caps' unnecessary."
- ***Net Metering Cap Eliminated*** **at NHEC.**

New Hampshire Electric Cooperative
Net Metered Capacity (AC kW)



7/14/2015

2015 = 4063 kW
(through July 14)



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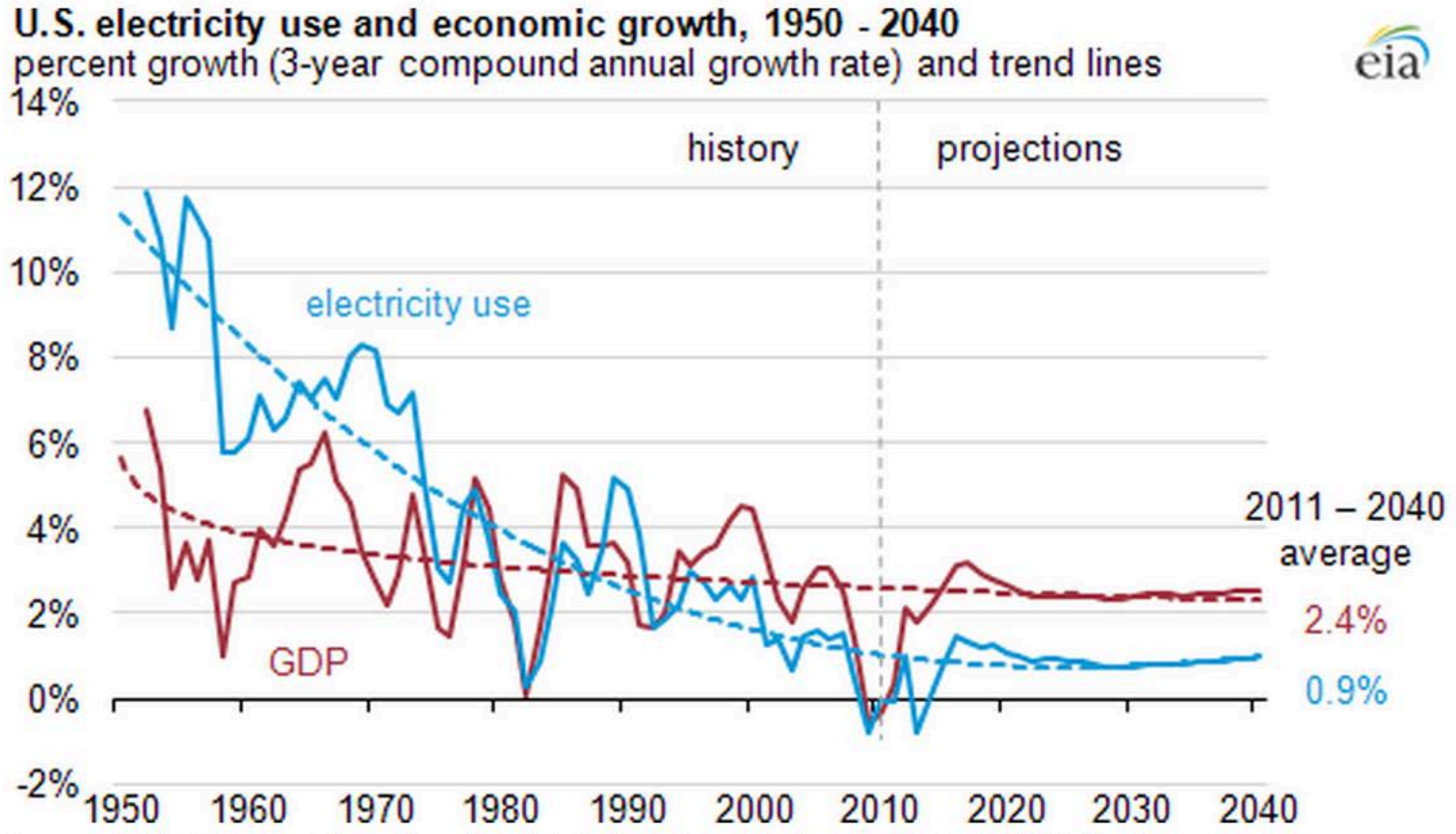
NHEC NEM End Result

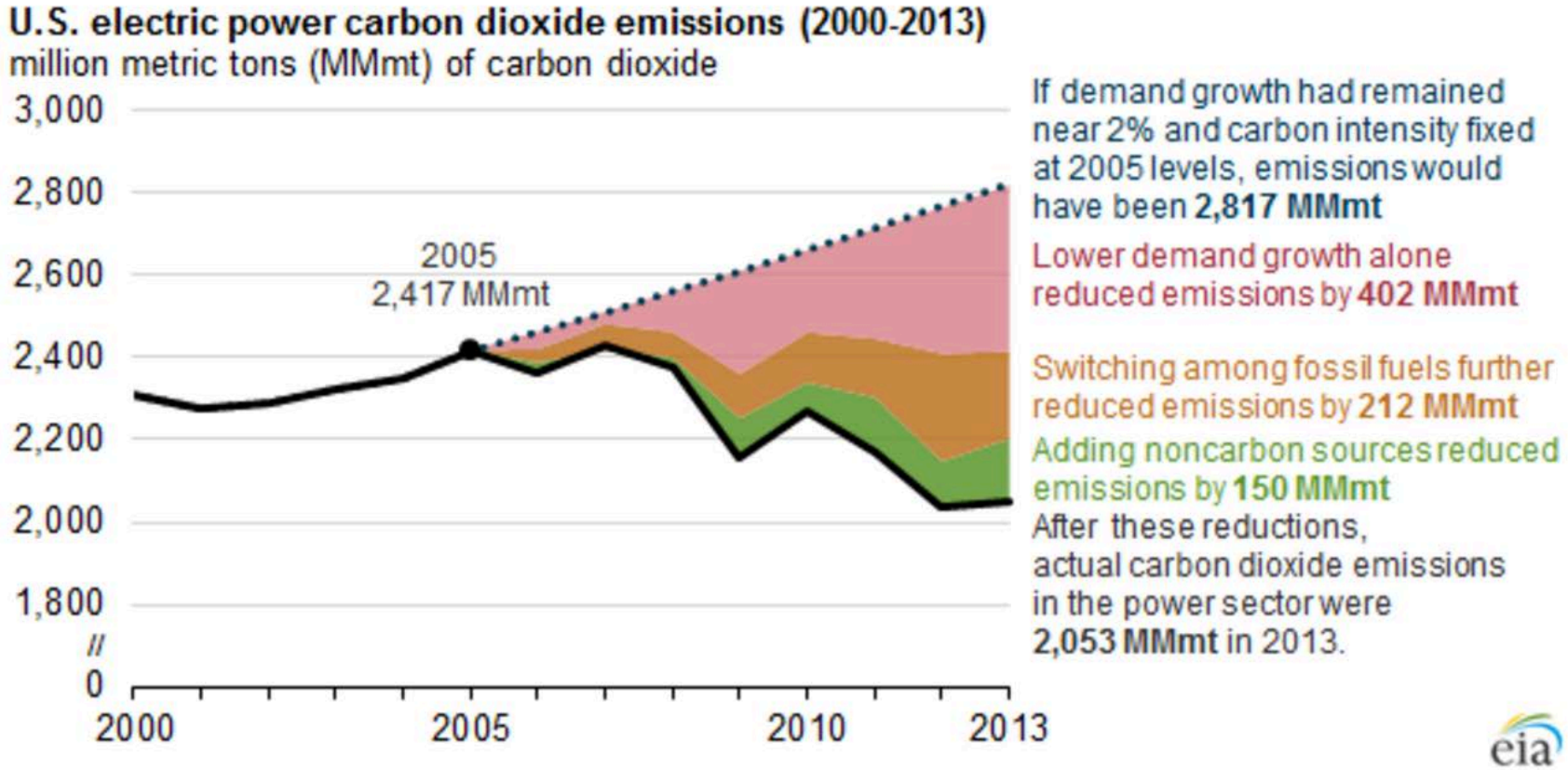
- Other NH utilities are now reaching their caps
  - Regulators/advocates/utilities looking at NHEC's approach for possible application statewide
  - So, this coop initiative may lead to state policy
  - "*The best way to predict the future is to create it.*"
- **Keys to this leadership opportunity:**
  - **Coop's ability, and willingness, to take initiative**
  - **The flexibility provided by cooperatives' member governance (i.e., the cooperative business model)**

U.S. economy and electricity demand growth are linked, but relationship is changing



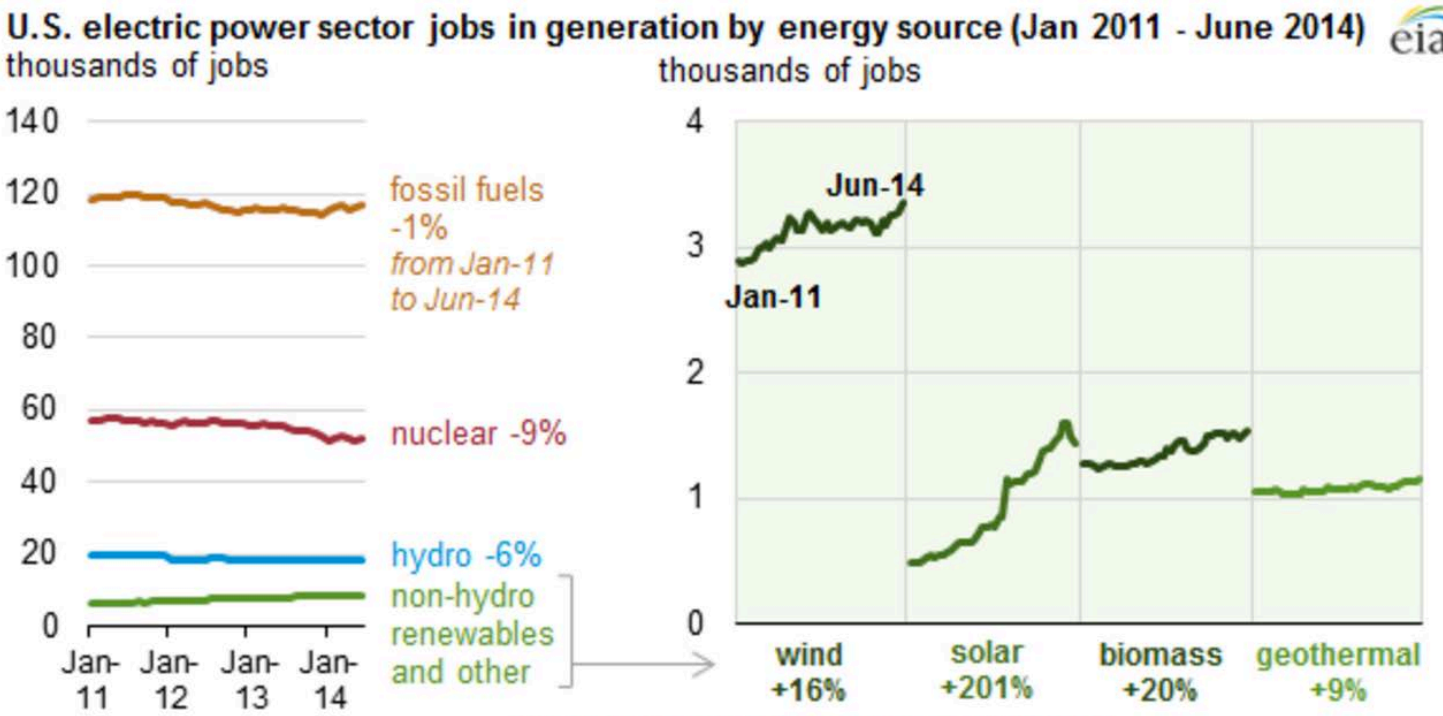
Source: U.S. Energy Information Administration, Annual Energy Outlook 2013 Early Release.

Lower electricity-related CO2 emissions reflect lower carbon intensity and electricity use



Source: U.S. Energy Information Administration, *Annual CO_2 Analysis*

Power sector employment declines, except for renewable electricity generators



Source: Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages
Note: 2014 data are preliminary.

The electric power generation sector lost more than 5,800 jobs from January 2011 through June 2014 despite a gain of nearly 1,800 non-hydro renewable electricity generation jobs, according to the latest data available from the Bureau of Labor Statistics (BLS).

Even More Sobering News…

- For 100+ years, we managed electricity supply to meet demand
- "Internet of Things" now allows demand to be managed too
- Supply + Demand = A Market
  - *The end of utility-life-as-we-have-known-it!*

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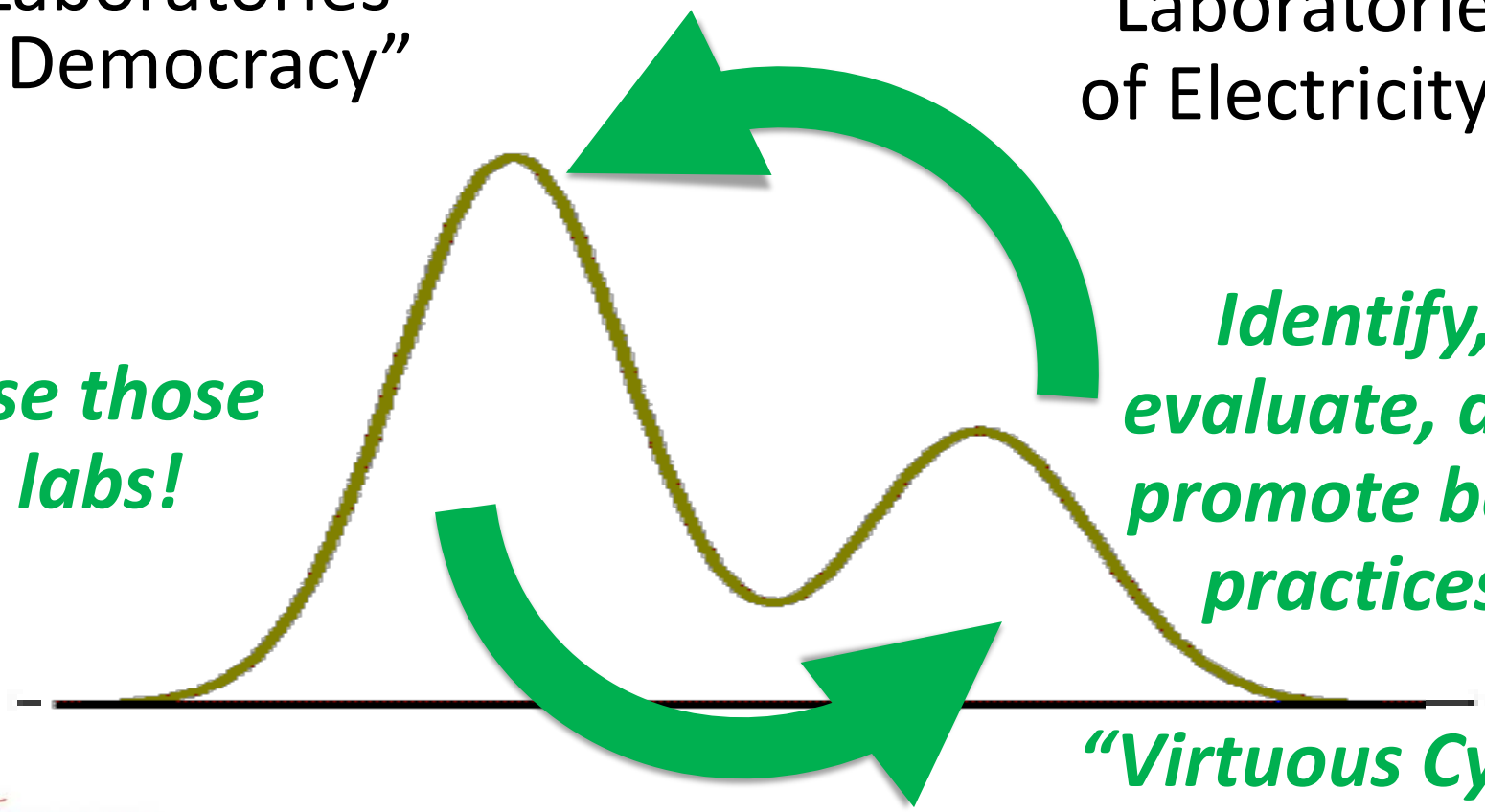
Recommendations (1)

States are "Laboratories of Democracy"

Cooperatives are "Laboratories of Electricity"



Use those labs!

Identify, evaluate, and promote best practices

"Virtuous Cycle"

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Recommendations (2)

- Coops, Munis, Islands are close-knit communities
  - *Significant opportunity to credential and leverage*
- Success stories are out there; use them!
- Integrate and educate
  - *Compile pieces into a "world view" of industry change (DER/DG, NEM, REV, IoT/Analytics, Cyber, Pecan Street…)*
- Outreach; host convenings
  - *Don't just be a "repository" or "archive"*

Recommendations (3)

- Conduct R&D/evaluations; bridge the "valley of death"
  - *"Pay As You Save"/on-bill financing; DHW as storage (GRE); decoupling options/experiences; ancillary services from demand; integrating EVs; …*
  - *Beta test sites (e.g., test C3's "Internet of Energy" on a distribution coop?)*
- Other technical
  - *Beneficial Electrification (Keith Dennis, Electricity Policy)*
  - *Fix "source cite" metrics; develop useful metrics*
  - *Clean Power Plan compliance help via EE/RE*
  - *Rigorize non-energy benefits; "Layer Cake" of EE benefits*
  - *Improve cost-effectiveness tests; and cost-of-service studies*
  - *Streamline EM&V practices and/or morph into analytics*

For More Information

www.raponline.org

www.nhec.coop

Additional information on rate design:

- ***Smart Rate Design for a Smart Future***
  www.raponline.org/document/download/id/7680
- ***Rate Design as a Compliance Strategy for the EPA's Clean Power Plan***
  www.raponline.org/document/download/id/7842

Thank You for Your Attention!

Contact Information*:*
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I'm indebted for many slides to Jim Lazar, RAP

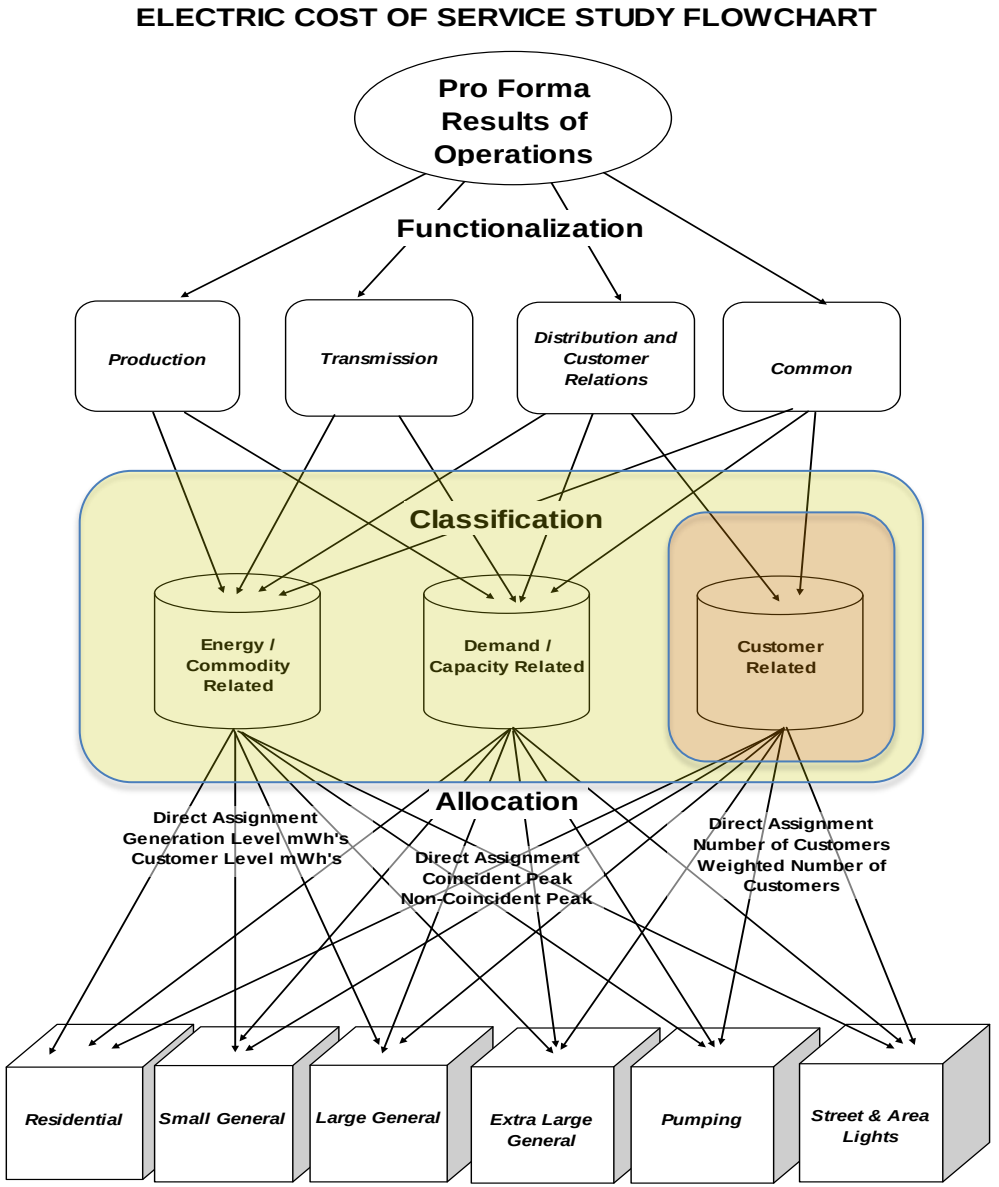
NH Electric Cooperative Overview

- 83,000 member-owners across 115 towns
  - 2nd largest utility in NH
- ~$150 million revenue
- ~180 MW peak; ~800 million kWh/year
- ~5,500 miles of lines; ~14 members/mile
- Distribution-only (no G&T)
- Mostly not subject to PUC regulatory oversight

Unexpected Serendipity

- "We found that, on average, we could attribute an **increase in usage** of about 52% to the PV accounts."
  - Nice surprise; not yet clear why
  - Best guess: Heat pumps replacing fossil-fuel HVAC
- What are the **actual dollars** we're talking about?
  - Nameplate x (Hours x Capacity Factor) x ¢/kWh
  - 6244 kW x (8760 x 25%) x **4¢ (@full-retail)** = ~$550K (not counting value of RECs) = <0.37% of revenues
  - Get 52% of that back => ~$263K (not counting value of RECs) = **<0.18% of revenues**

Where Did The Idea that High Fixed Charges are Appropriate Come From?



Pro Forma Results of Operations by Customer Group