

ACEEE Finance Forum Plenary

June 1, 2015 - San Francisco

The Policy Landscape: Impact on Energy Efficiency Finance and Role as Demand Driver

Dr. Holmes Hummel

Founder, Clean Energy Works

www.cleanenergyworks.org

International Energy Agency finding in 2012:

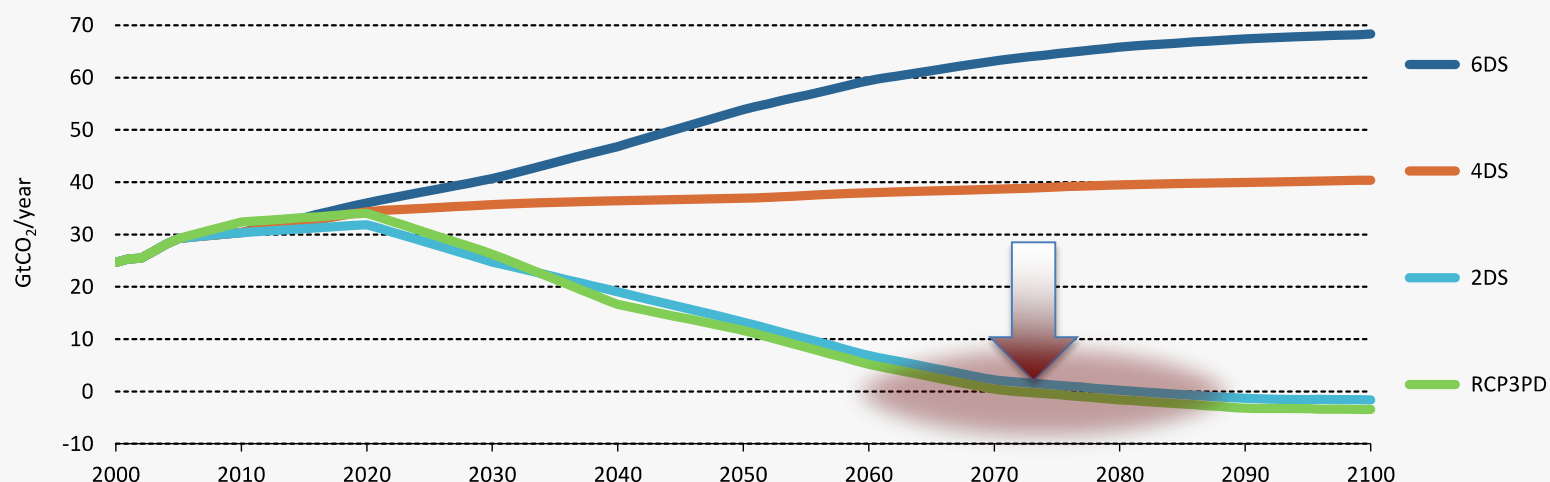
“Energy-related CO₂ emissions need to be

completely eliminated by 2075

in order to limit global temperature rise to 2 deg C.”

Figure 16.1

Long-term energy-related CO₂ emissions derived from ETP scenarios and compared with RCPs.



Source: Unless otherwise noted, all tables and figures in this chapter derive from IEA data and analysis.

Key point

Energy-related CO₂ emissions need to be completely eliminated by 2075 in order to limit global temperature rise to 2°C.

Vision: 100% Clean Energy for All



Policy Drivers for Clean Energy Finance

- Imperative for Speed and Scale
- Access to the Clean Energy Economy
- Tariff-based Financing
- Leadership Pivot: Policy and Private Sector

HARNESSING SCALE:

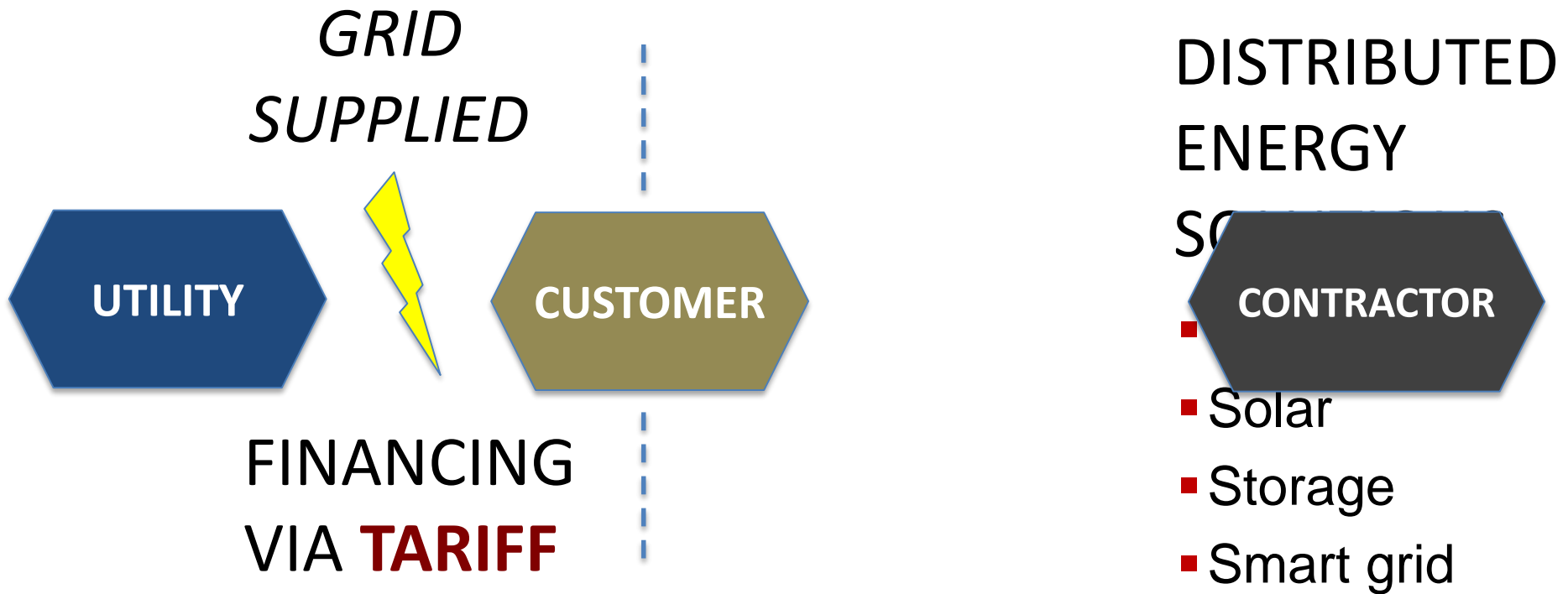
*GRID
SUPPLIED*



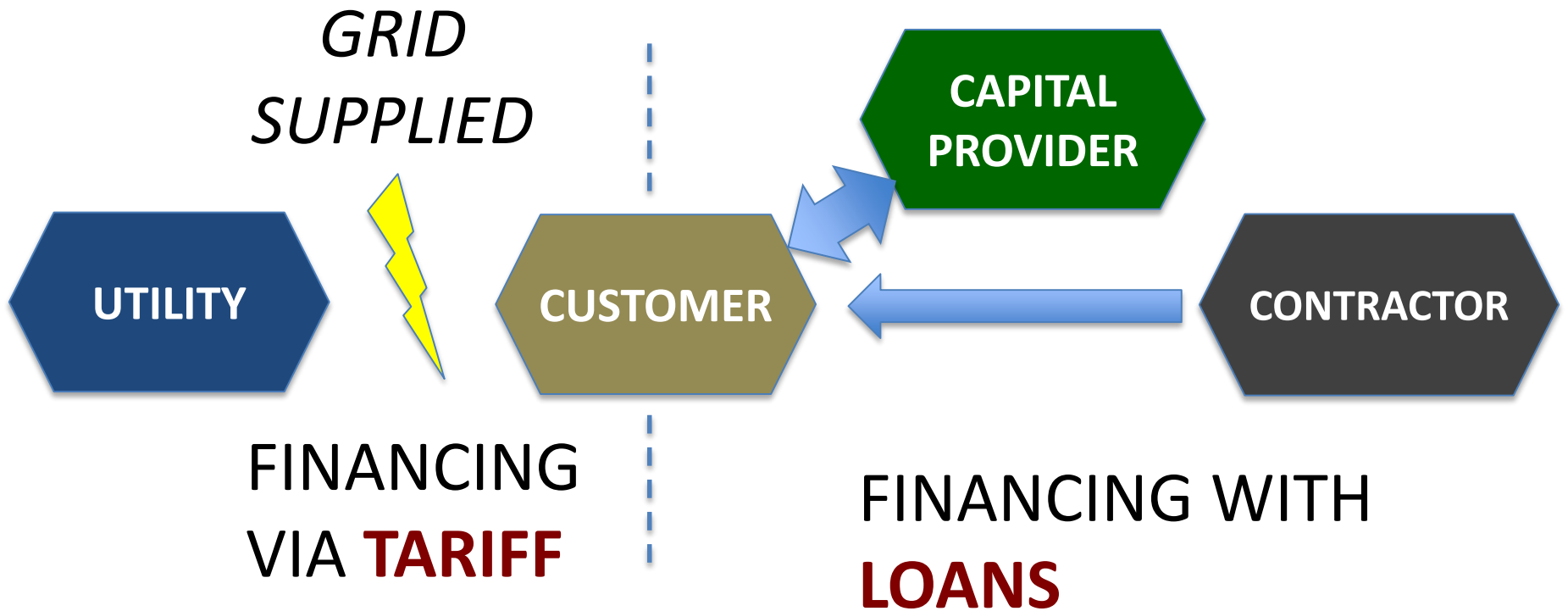
FINANCING
VIA **TARIFF**



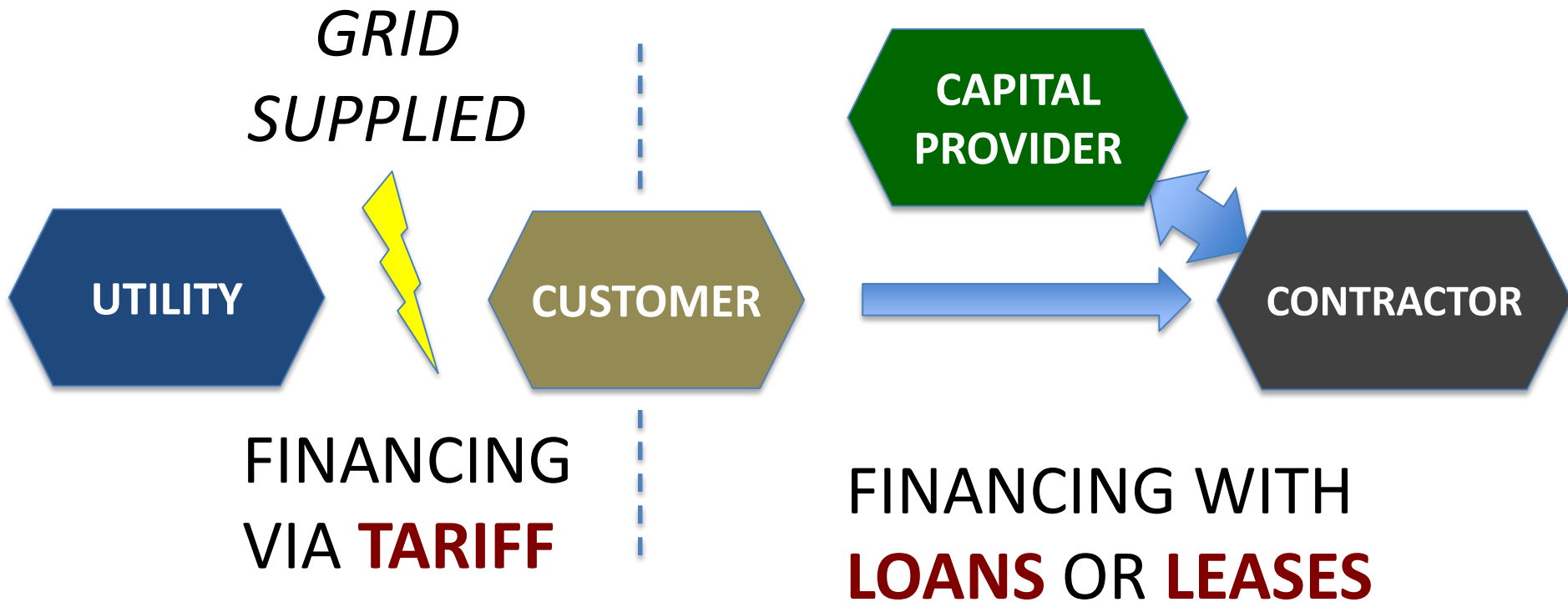
HARNESSING SCALE: FINANCING FOR DISTRIBUTED SERVICES



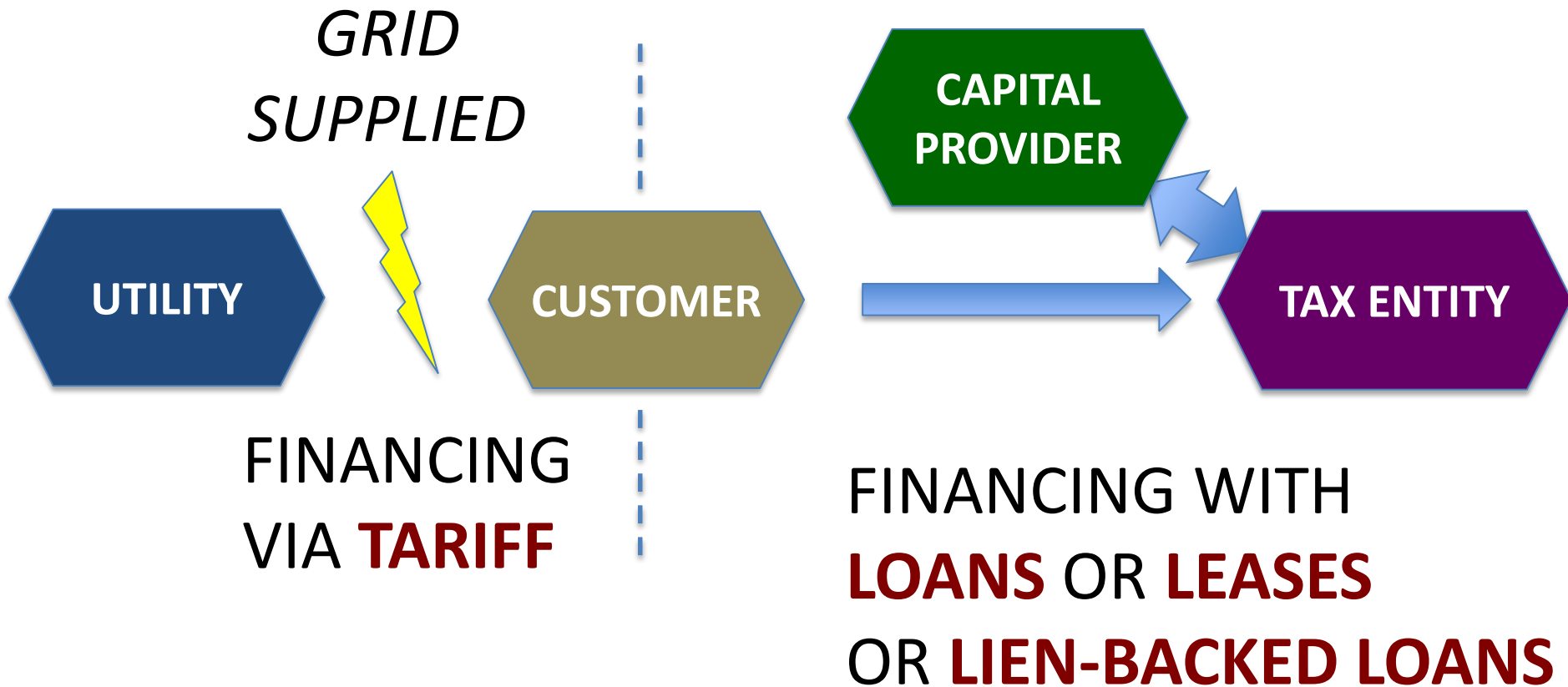
HARNESSING SCALE: FINANCING FOR DISTRIBUTED SERVICES



HARNESSING SCALE: FINANCING FOR DISTRIBUTED SERVICES



HARNESSING SCALE: FINANCING FOR DISTRIBUTED SERVICES



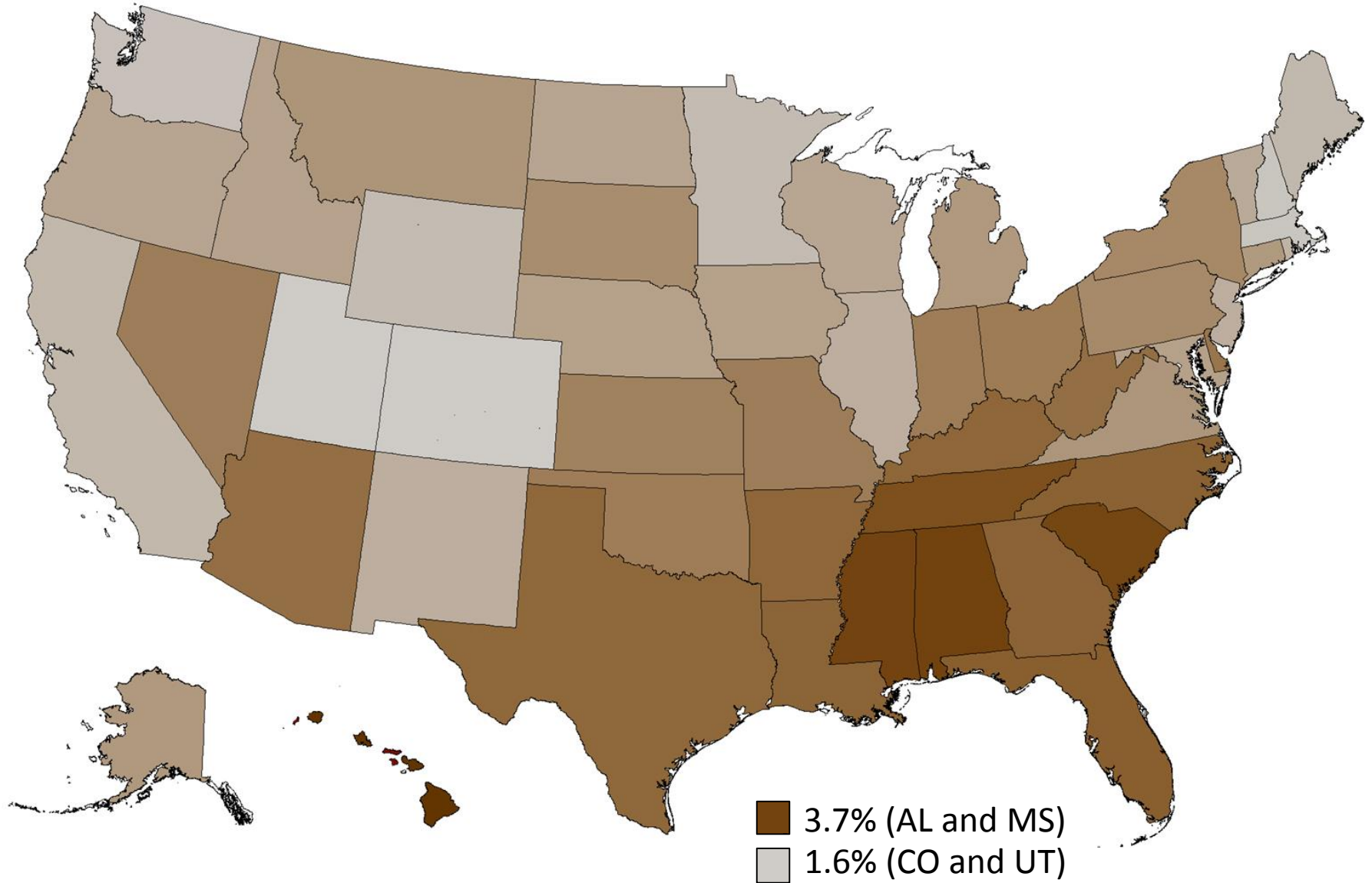
Vision: 100% Clean Energy for ~~All~~
Land Owners with FICO Scores above 620?



Policy Drivers for Clean Energy Finance

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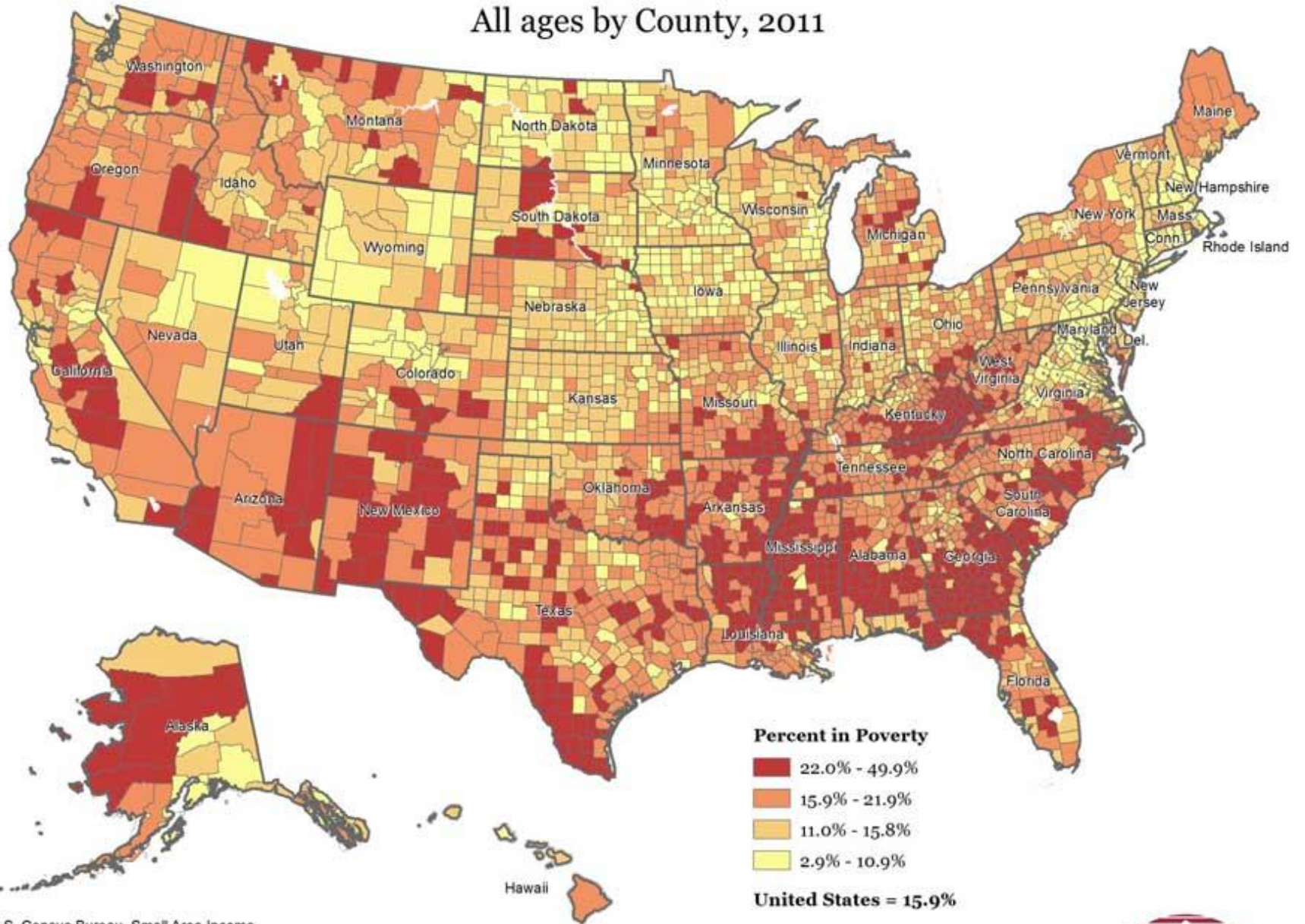
Electricity Costs as a Share of Household Income



Average electricity cost (EIA form 861) as a share of median household income (Census Table H-8B), indexed to highest state (HI, 4.1%) and shaded to show relative level among states.

Estimated Percent of Population in Poverty

All ages by County, 2011



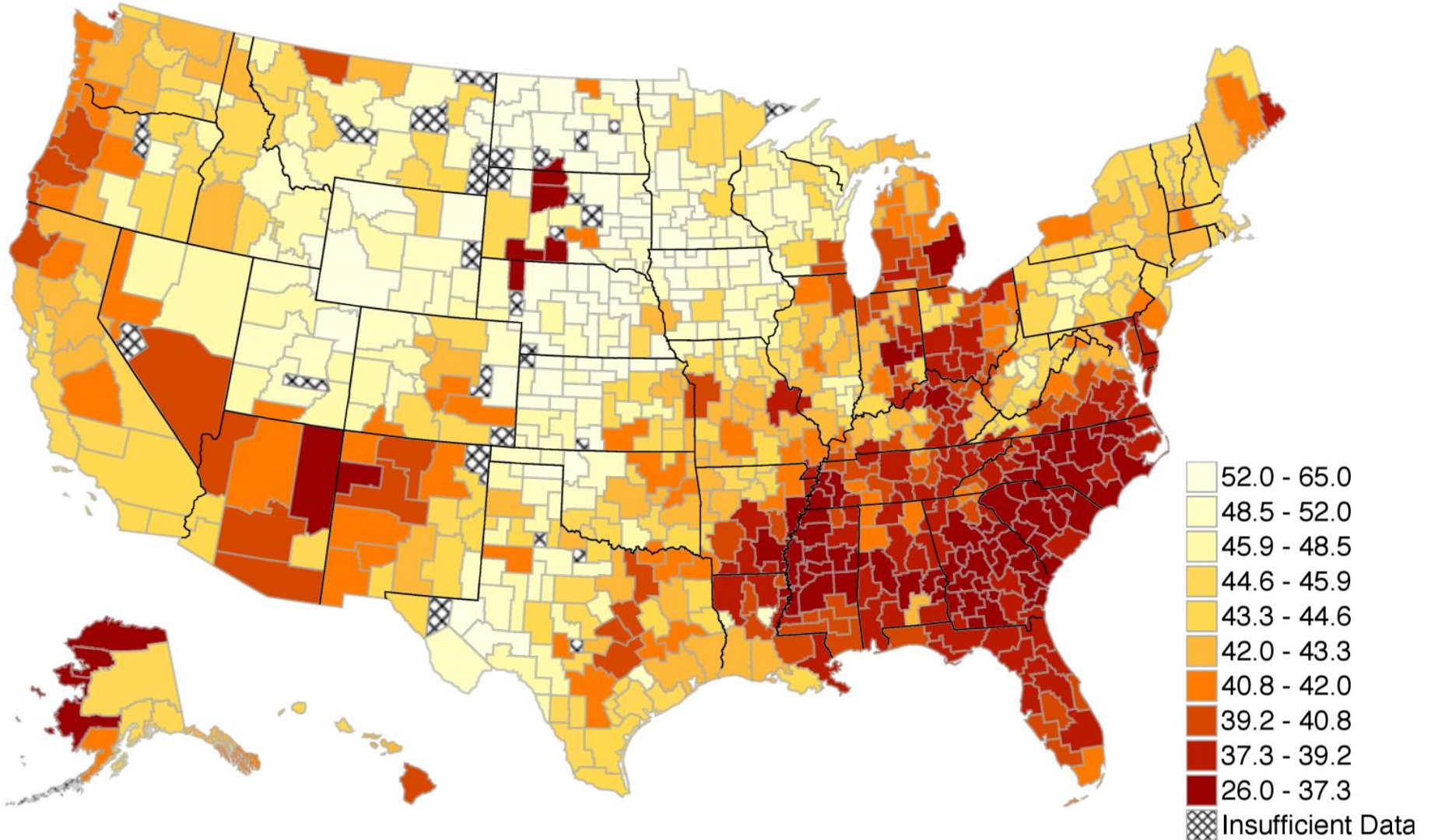
Source: U.S. Census Bureau, Small Area Income & Poverty Estimates (SAIPE), 2011.

Note: Alaska and Hawaii not shown to scale.

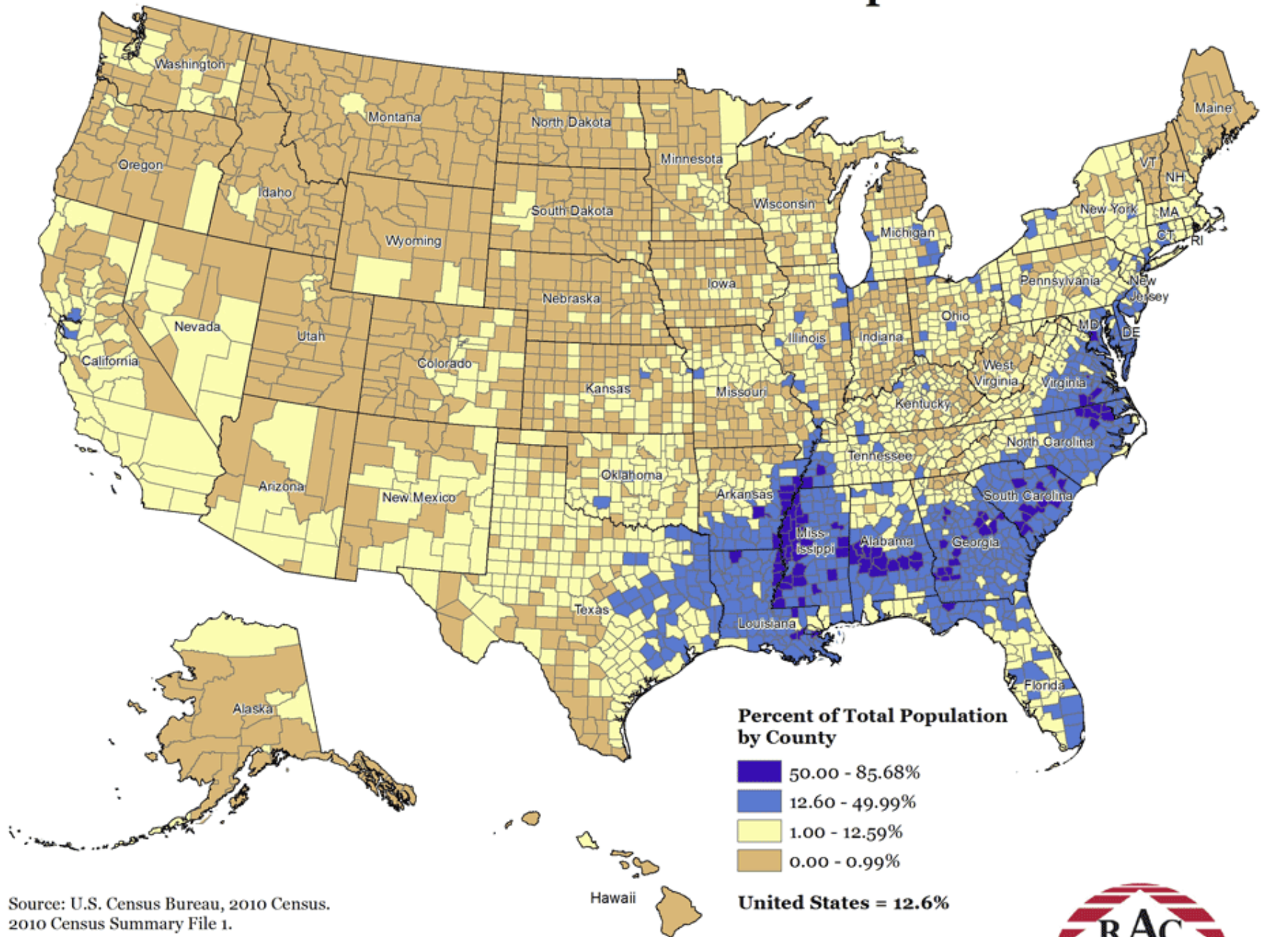
Intergenerational Upward Mobility in the U.S.

Darker Color = Less Absolute Upward Mobility

Average Percentile Rank of a Child of Parents at the 25th Percentile



Black or African American Population

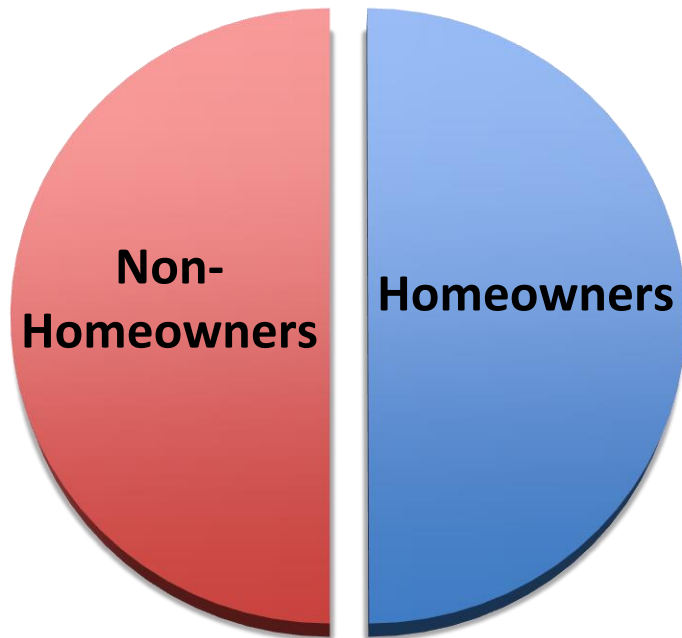


Source: U.S. Census Bureau, 2010 Census.
2010 Census Summary File 1.

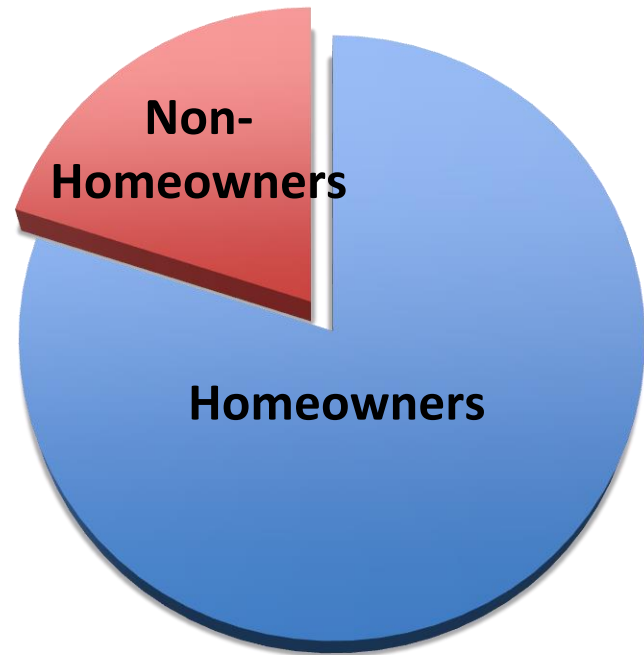
Note: Alaska and Hawaii not shown to scale

Structural Barriers: Example - Property Ownership

Below Median Income



Above Median Income

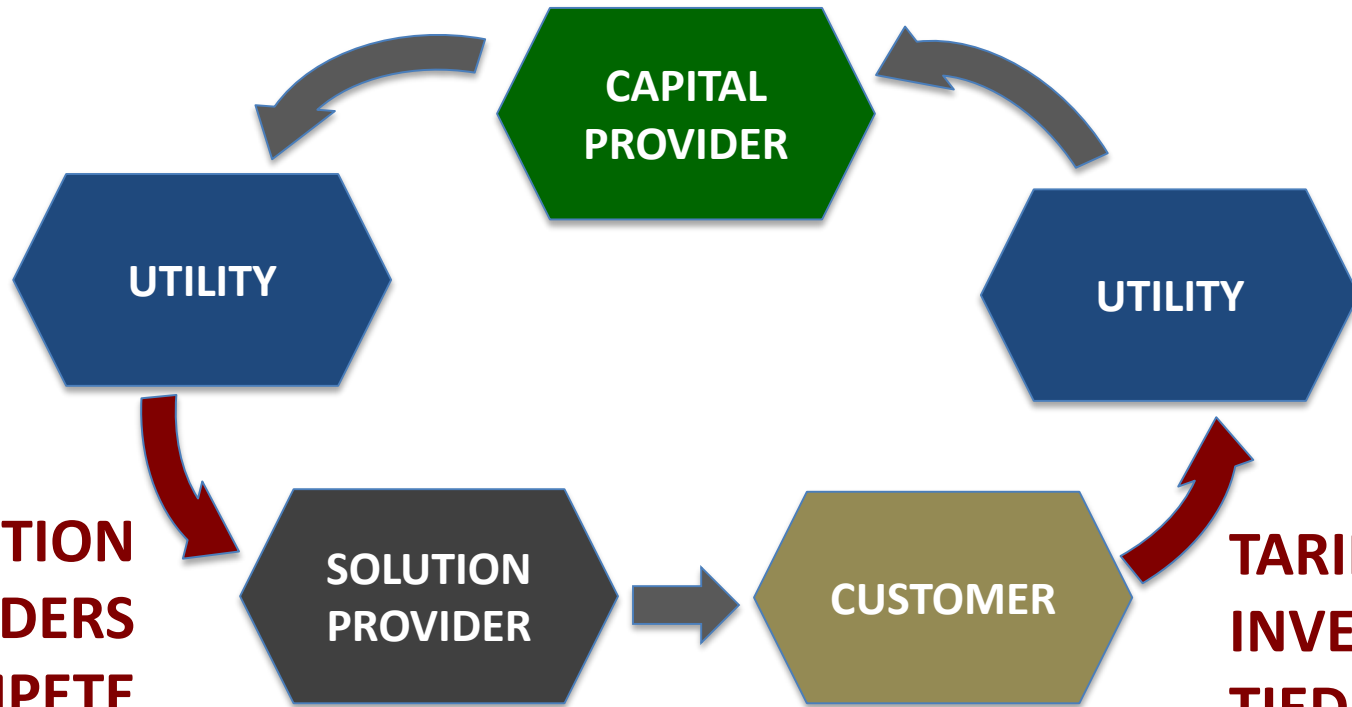


More than **1/3** of all U.S. households are not in a home they own.

Policy Drivers for Clean Energy Finance

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TARIFF-BASED FINANCING



ALL SOLUTION PROVIDERS CAN COMPETE

TARIFF: INVESTMENT TIED TO METER

PAY AS YOU SAVE[®] (PAYS[®]) OFFER TO CUSTOMERS

- Energy saving upgrades are installed in your home or building, and you pay nothing upfront.
- The utility pays for the cost-effective energy solution you choose.
- The utility recovers its costs through a stable charge on your electric bill that is significantly less than the estimated savings from the upgrades.
- You have no loan, no lien, and no debt associated with this transaction; just lower utility bills and a more comfortable building or home.
- When all costs are recovered, your obligation to pay ends.
- Also, if you leave this home before all costs are recovered – or if a measure fails for reasons beyond your responsibility and is not repaired, your obligation to pay ends.

PAY AS YOU SAVE[®] IMPACT

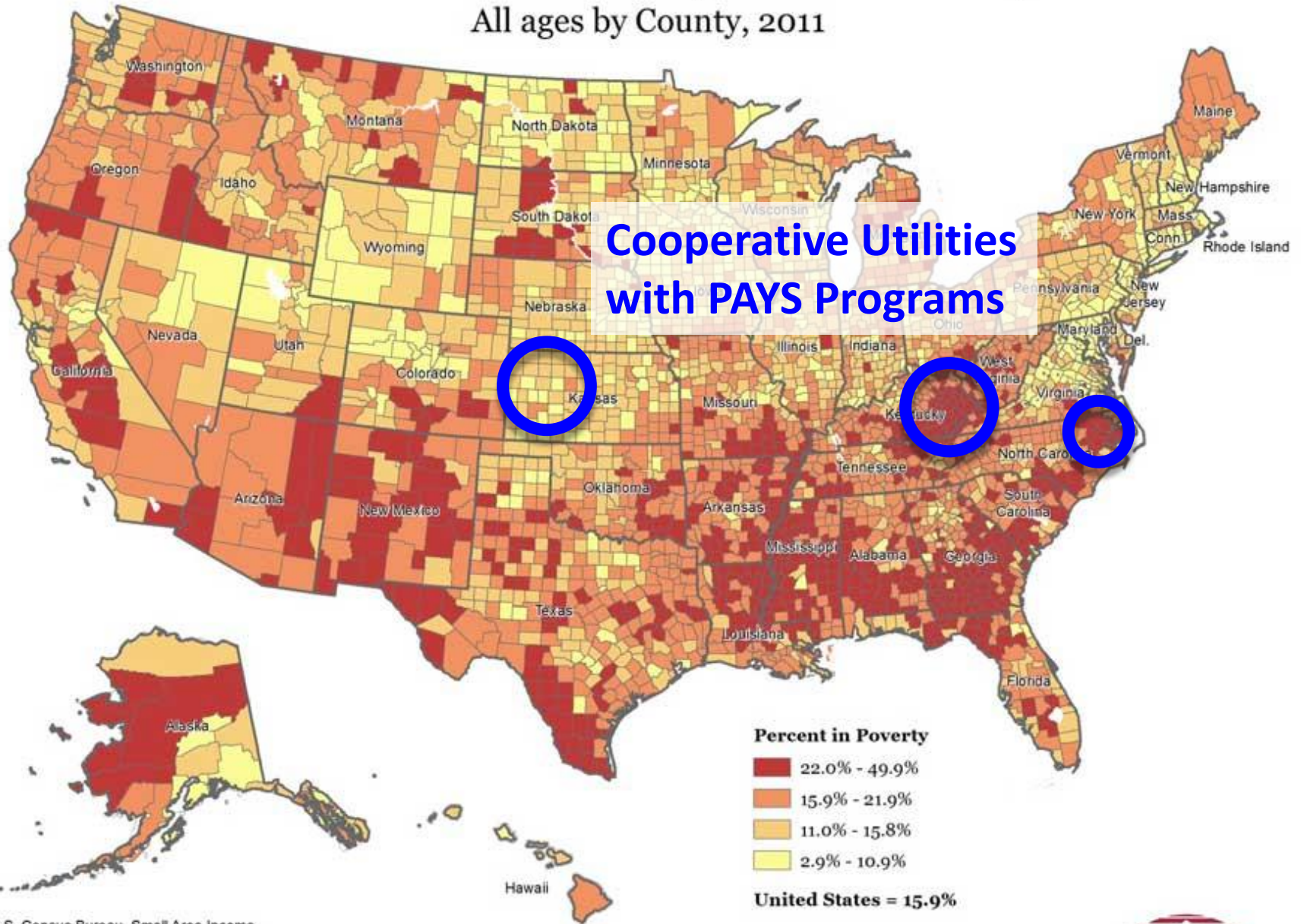
- ✓ **No consumer loan, lien, or debt.**
- ✓ **~25% energy savings with commensurate carbon savings**

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Estimated Percent of Population in Poverty

All ages by County, 2011

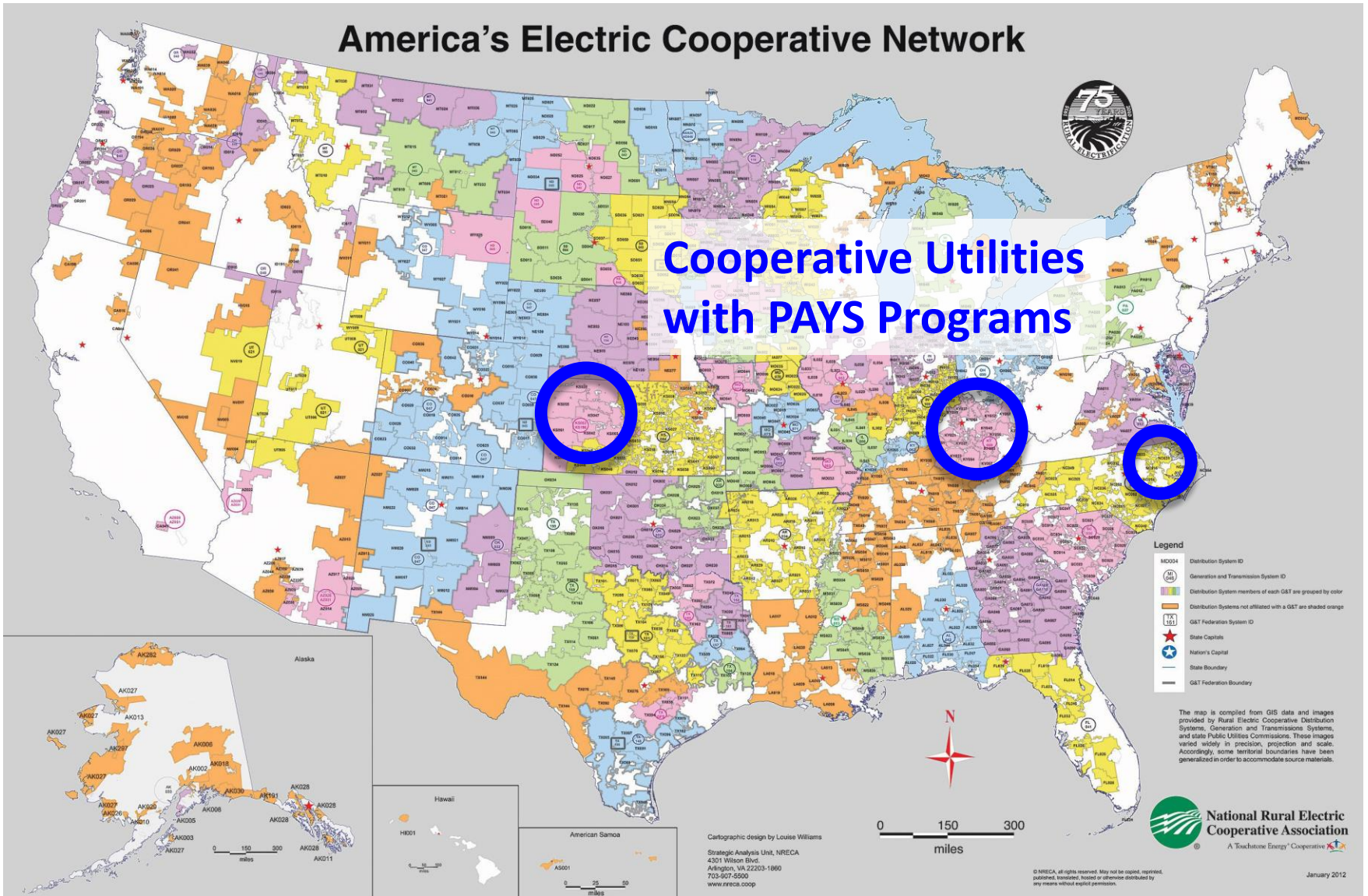


Source: U.S. Census Bureau, Small Area Income & Poverty Estimates (SAIPE), 2011.

Note: Alaska and Hawaii not shown to scale.

America's Electric Cooperative Network

Cooperative Utilities with PAYS Programs



Today 40+ million Americans buy more than \$40 billion of electricity from cooperatives each year

America's Electric Cooperative Network



**Roanoke
Electric
Cooperative**



- Legend**
- MC004 Distribution System ID
 - Generation and Transmission System ID
 - Distribution System members of each G&T are grouped by color
 - Distribution Systems not utilized with a G&T are shaded orange
 - G&T Federation System ID
 - State Capitals
 - Nation's Capital
 - State Boundary
 - G&T Federation Boundary

The map is compiled from GIS data and images provided by Rural Electric Cooperative Distribution Systems, Generation and Transmission Systems, and state Public Utilities Commissions. These images varied widely in precision, projection and scale. Accordingly, some territorial boundaries have been generalized in order to accommodate source materials.



Cartographic design by Louise Williams
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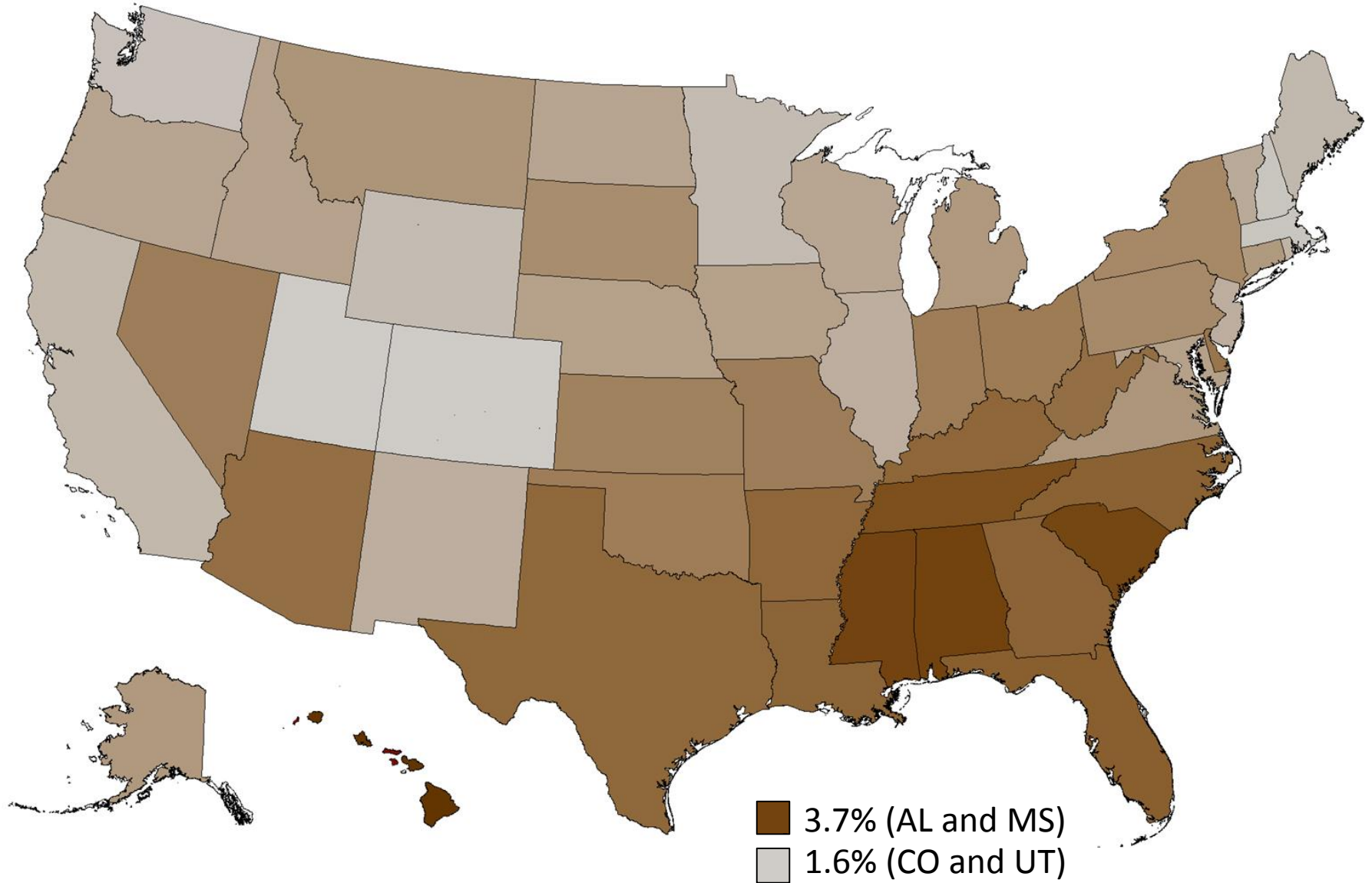


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January 2012

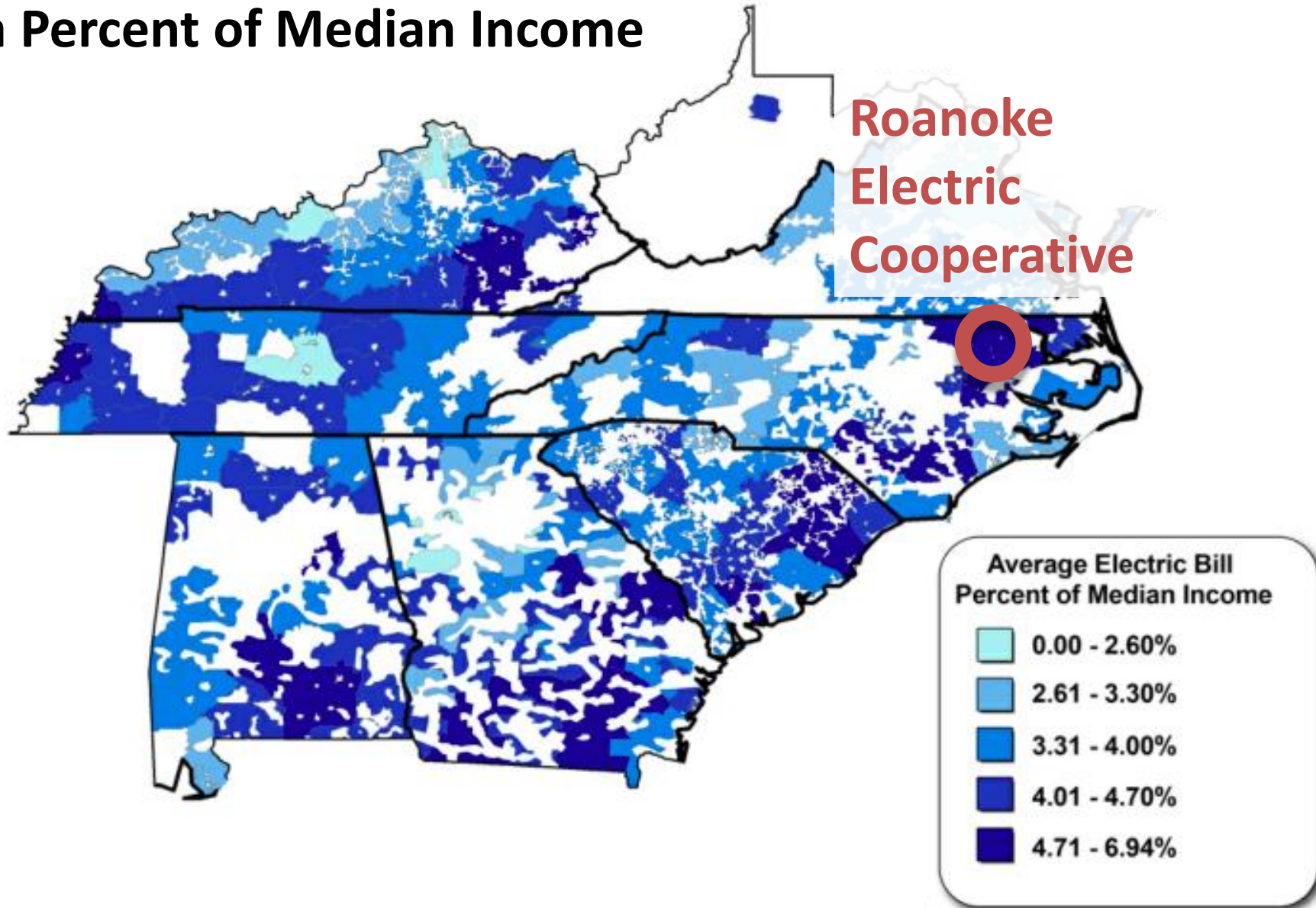
Today 40+ million Americans buy more than \$40 billion of electricity from cooperatives each year

Electricity Costs as a Share of Household Income



Average electricity cost (EIA form 861) as a share of median household income (Census Table H-8B), indexed to highest state (HI, 4.1%) and shaded to show relative level among states.

Average Electric Bill for Electric Cooperative Customers as a Percent of Median Income



Sources: GIS Layers from Platts 2012 average residential electricity price and consumption data for utilities from EIA-880 database; median income for counties from U.S. Census Bureau; analysis and mapping by Appalachian Voices, 2014.

RURAL UTILITIES SERVICE WILL BACK TARIFF FINANCING

Billions unleashed for distributed energy solutions starting in 2014



Roanoke Electric
Cooperative



Upgrade to \$ave
Using PAYS



Up to **\$5 Billion**
available annually
at Treasury rates

\$6 Million
Investment
program

~\$7,000
in upgrades
per participant



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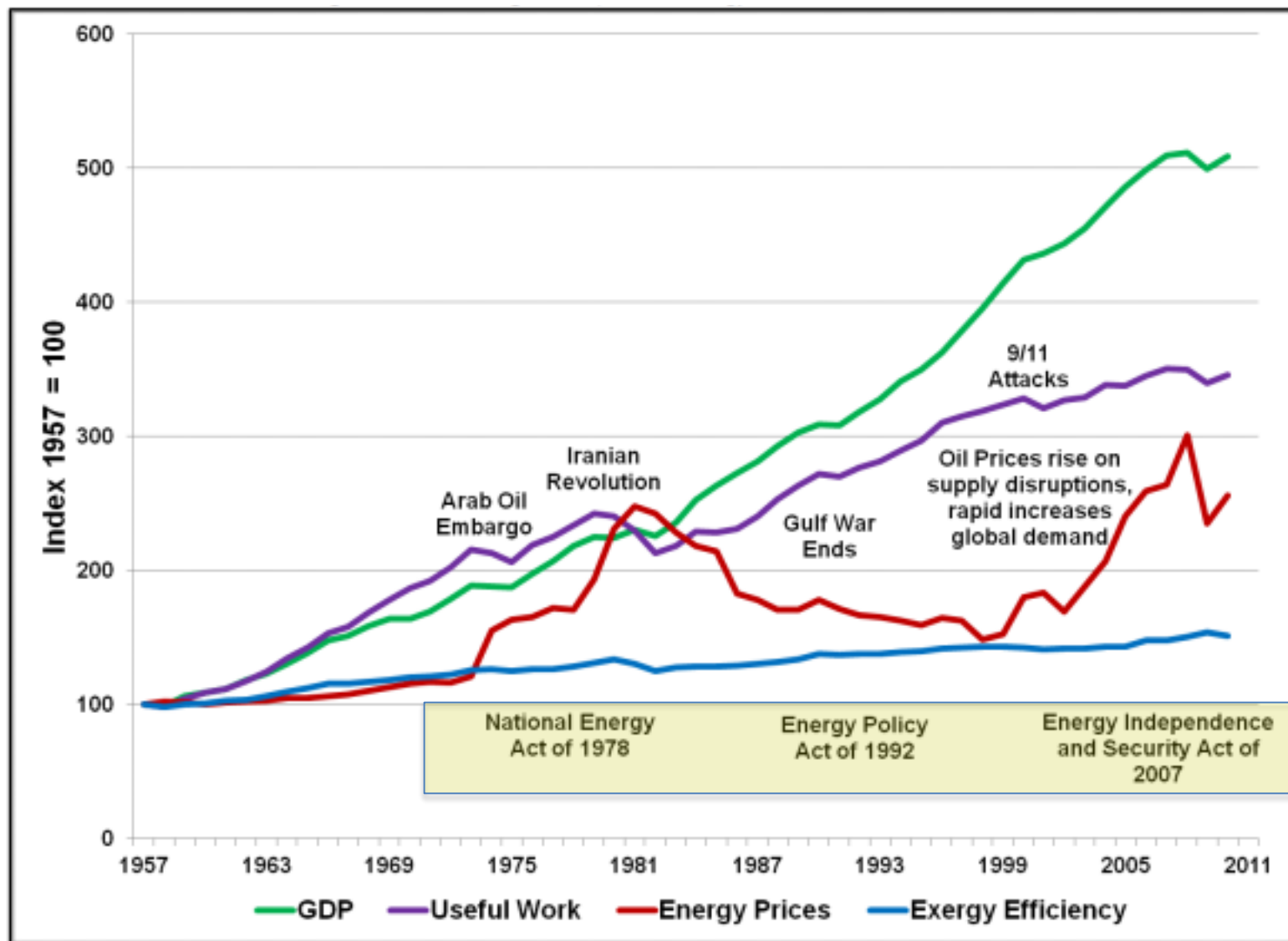
Founder, Clean Energy Works

www.cleanenergyworks.org

TARIFF OBLIGATION VS. DEBT OBLIGATION

- **Tariffs** are the tool that brought us near universal access to grid electricity.
- **Loans** require meeting underwriting standards that most people don't or won't meet.
- **Tariff** terms entitle utility to disconnect for non-payment.
- **Loan** terms require collateral arrangements and a lien to deal with non-payment.
- **Tariff** default rates are ~10X lower than the charge-off rate for consumer lending.
- **Tariff** terms are transferable automatically and binding on successive customers.
- **Loan** terms are transferable if the lien on the collateral asset can be transferred.
- **Tariff** terms are compatible with the prevailing utility business model.
- **Loans** are a bank product, subject to banking regulations.

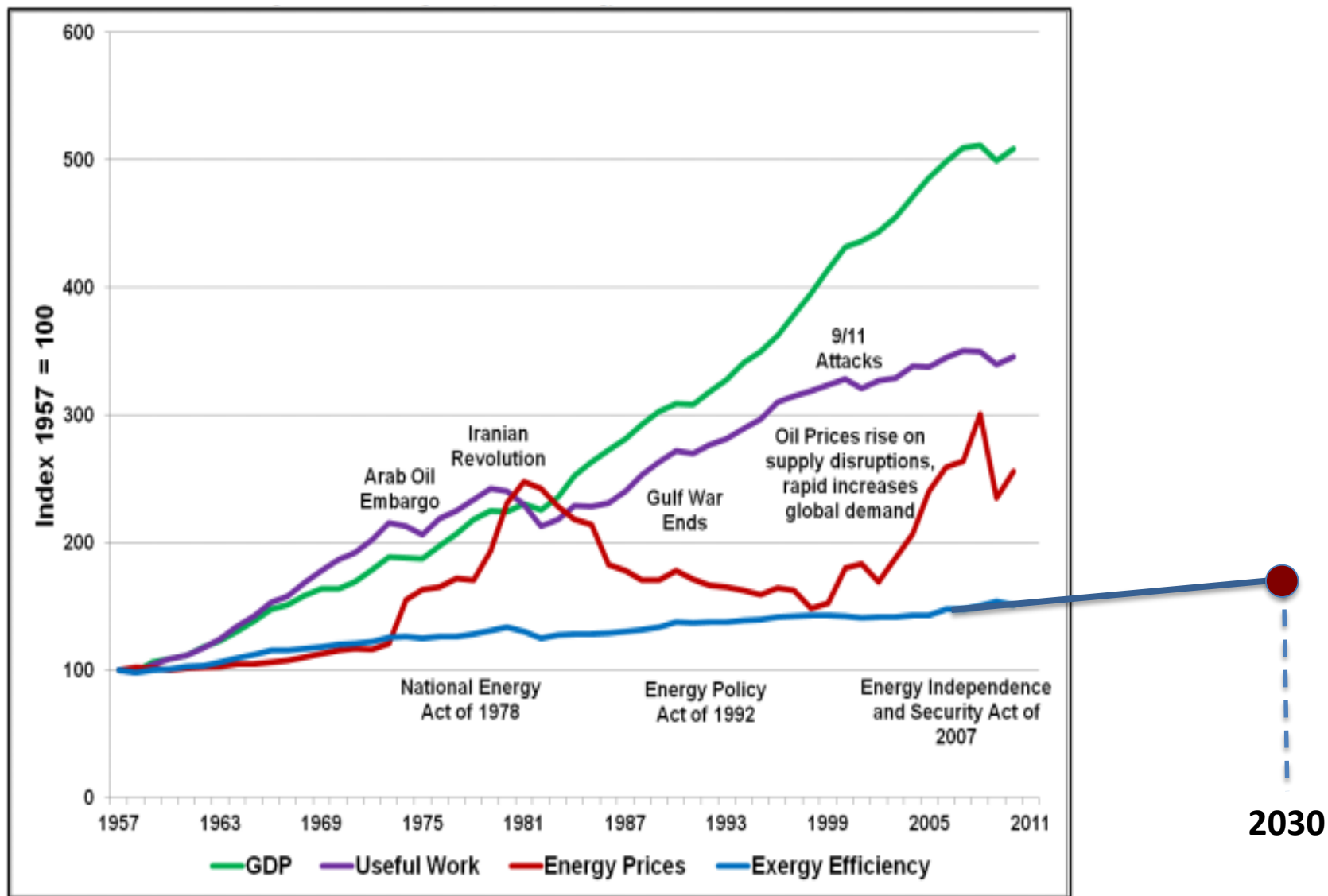
Examining the Impact of Energy Prices, Policies and Events



Sources: Author analysis based on data from BLS (2013), EIA (2012b), and Appendix A.

Note: Lines on the right-hand side of this graph run in the order listed in the legend.

Examining the Impact of Energy Prices, Policies and Events

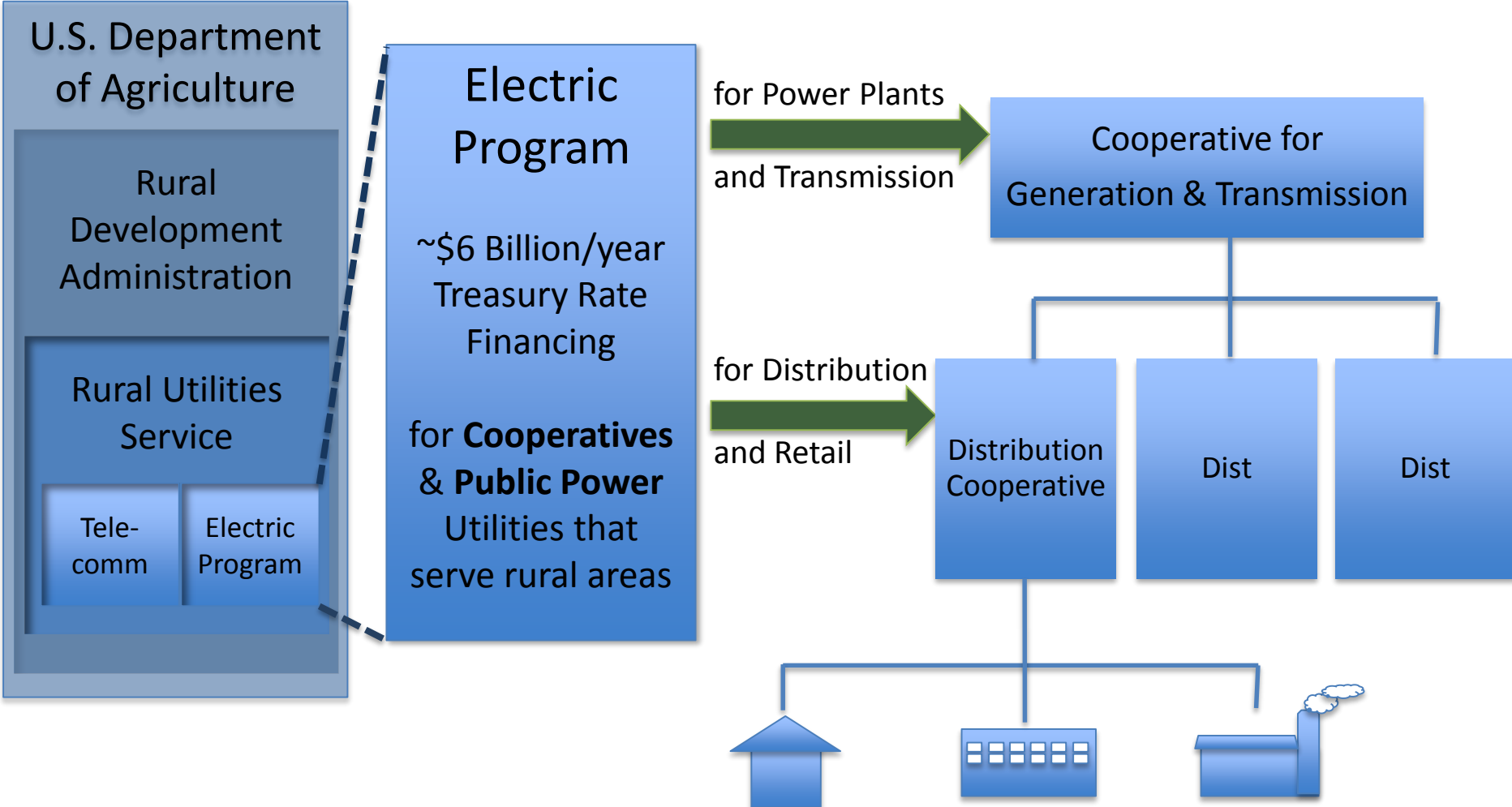


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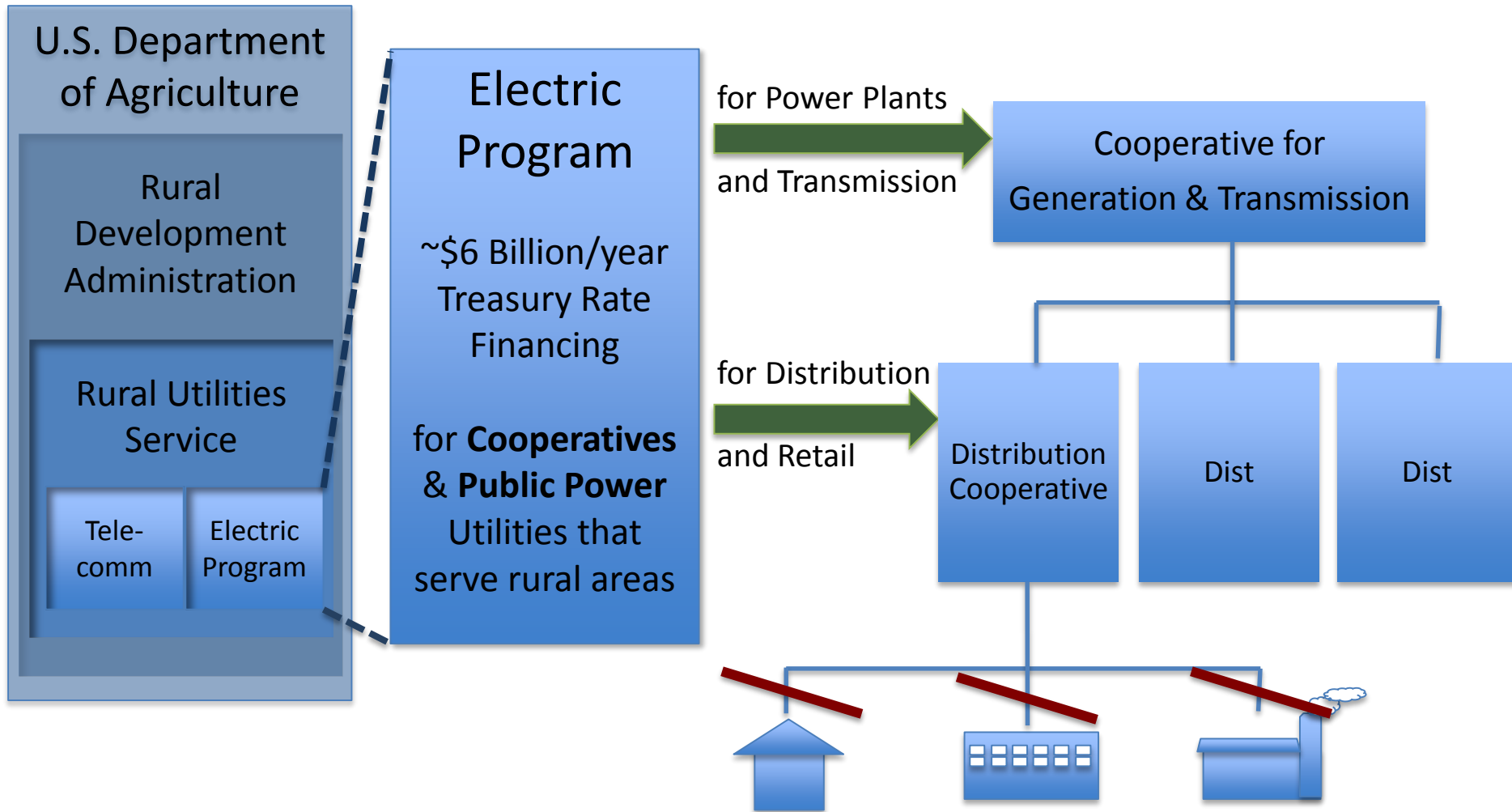
Source: Laitner, J.A.S. 2013. Linking Energy Efficiency to Economic Productivity. ACEEE.

In the 1930s, 9 out of 10 Rural Households Lacked Access to Electricity



Electric Cooperatives Brought Modern Energy to Millions

From 1930s to 2014, electric cooperatives could not use federal Treasury rate loans to finance investments in demand-side solutions.



The new Energy Efficiency & Conservation Loan Program levels the playing field and unlocks the market for distributed solutions.

