



Key Accounts Certificate Program

Electric Utility Industry Overview

Tim L. Blodgett

President and CEO

Hometown Connections

tblodgett@hometownconnections.com

303/526-4515

Hometown
Connections



About the Instructor

- Tim Blodgett, President and CEO, Hometown Connections
- On staff since 1998 and President and CEO since 2001
- Manage Hometown's day to day business and strategic direction as well as providing consulting, training and facilitation support to public power entities and their governing bodies.
- Prior to Hometown, worked at a subsidiary of KN Energy and PacifiCorp developing customer care products and services. Prior to that, worked for Phillips Petroleum in exploration and production.



Five Courses over Five Days

- **Monday: Electric Utility Industry Overview**
- **Tuesday: Implementing a Customer-Focused Key Accounts Program**
- **Wednesday: Developing Your Key Accounts Representative**
- **Thursday: The Effective Key Accounts Toolbox**
- **Friday: Developing Your Customer Action Plan**



Program Design

- The Key Accounts Certificate Program is designed to show you how to nurture strategic relationships and build trust and loyalty. Whether you plan to start a utility key accounts program or want to take your current program to the next level, this curriculum provides the skills, knowledge, and tools for success.

Certification Requirements



- Completion of five courses
- Within one year of attending last course in the certificate program curriculum, you must:
 - Pass an online exam of 100 multiple choice questions covering the five required courses. May log in to take exam at your convenience.
 - Score at least a 75% to pass the exam. Will have two opportunities to pass the test, thereafter there will be a \$50 fee assessed to retake the exam.
 - Submit a customer action plan that demonstrates how your utility plans to address the needs of a selected account.



Today's Course Agenda

- History of the Electric Industry
- Industry Participants
- Electric utility regulatory structure
- Electric generation
- Electric transmission
- Electric distribution system
- Issues and challenges

Today's Learning Outcomes



- **Upon completion of this course, participants will be able to:**
 - Correctly identify the types of industry participants and explain their similarities and differences
 - Correctly explain the elements of the electric utility regulatory structure and be able to identify the jurisdictions of the various federal, state and local agencies
 - List the types of electricity generation
 - Correctly identify the components of the electricity transmission and distribution systems
 - Define the wholesale power market and its role in public power
 - Correctly identify the regulatory, financial, and technology issues and challenges impacting the electric utility industry in general and the public power sector specifically
 - Correctly explain the advantages of living and working in a public power community

Public Power

An American Tradition That Works

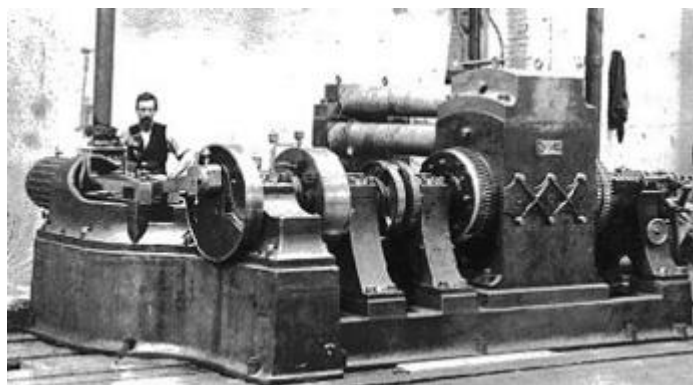
***DID YOU KNOW
YOU GET YOUR
ELECTRICITY
FROM A PUBLIC
POWER UTILITY?***



Birth of an Industry



Pearl Street Station was the first central Power plant in the United States. It was located in NYC on a site measuring 50 by 100 feet. It began with one Direct Current (DC) generator, and it started producing energy on September 4, 1882, serving an initial load of 400 lamps and 85 customers.





Power to the People

- Large cities the first beneficiaries
- Small towns not willing to wait: the birth of public power
- Rural America left behind for many years



Industry Participants

- Investor-Owned Utilities
- Public Power
- REAs, Co-ops, EMCs
- Others

Public Power: there from the start

- Over 30 public power systems began in the 1880s
- By 2016, 885 public power systems had celebrated their 100 year anniversary



A Lansing, Mich., Board of Water & Light line crew in the 1890s.

Long & Proud History



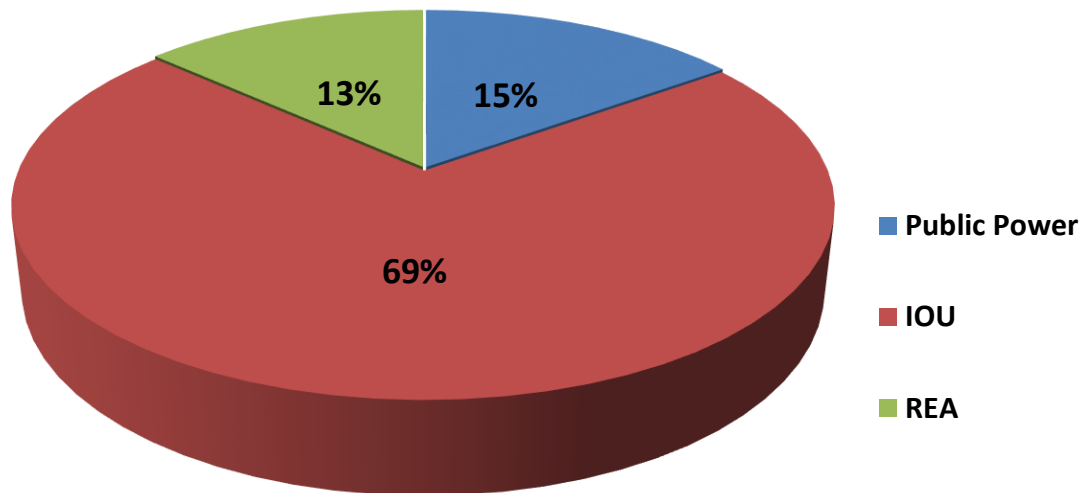
Early line worker tools



The Industry Players

- Investor-owned utilities (IOU)
- Public Power
- Co-ops, REAs, EMCs

% of U.S. Customers Served





Investor-Owned Utilities (IOUs)

- 185 IOUs (EEl: 2015)
- Going through a period of significant mergers and acquisitions



E.g., Duke Energy Corp

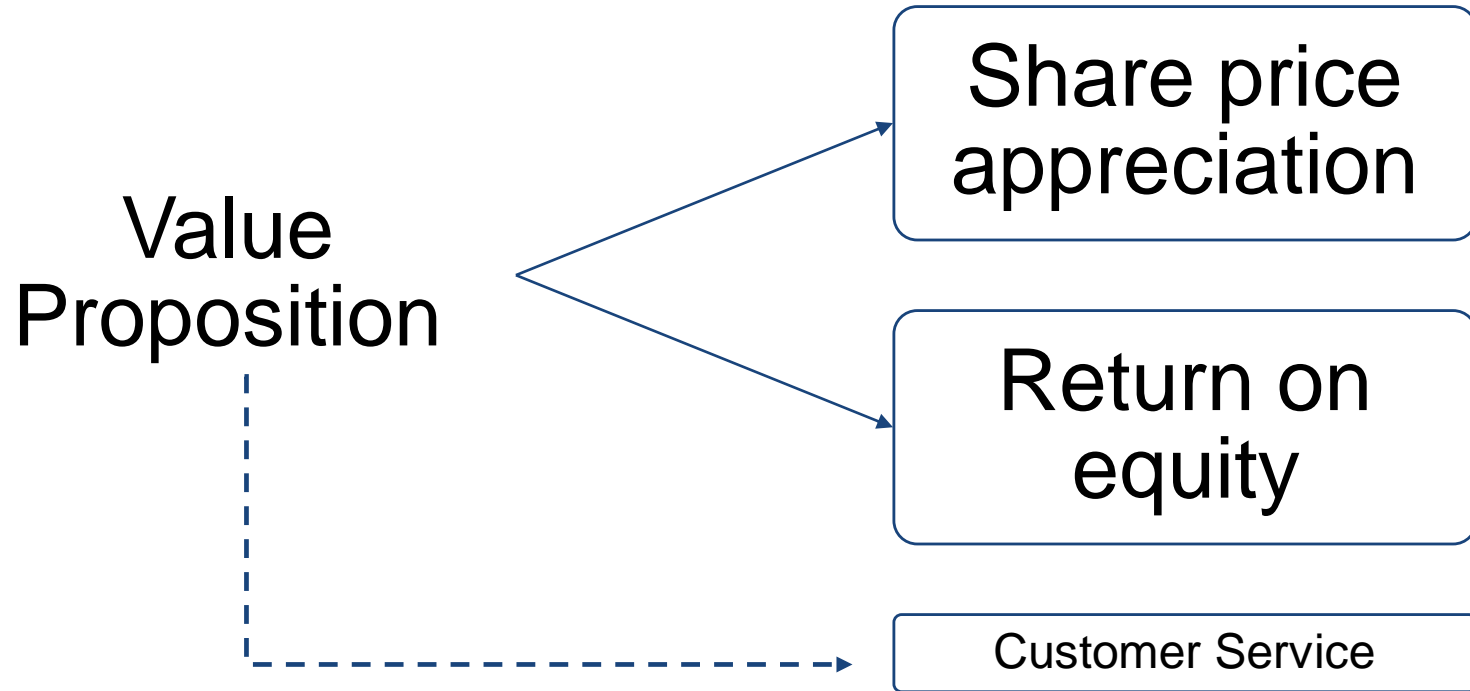
Serves distribution customers in Ohio, Kentucky, Indiana, North Carolina, South Carolina, and Florida. It serves customers under the name ***Duke Energy*** (***Duke Energy Indiana, Duke Energy Kentucky, Duke Energy Ohio, and Duke Energy Carolinas***). In 2012, the company acquired ***Progress Energy***, which was a holding company formed from the merger of ***Florida Progress Corp***, holding company for ***Florida Power Corp***, and ***CP&L Energy***, holding company for ***Carolina Power & Light***; in 2003, these utility companies became known as ***Progress Energy Carolinas*** and ***Progress Energy Florida***. Prior to its 2006 merger with ***Cinergy Corporation***, Duke served its Carolina customers under the name ***Duke Power***, including customers of its former subsidiary, ***Nantahala Power & Light***. Prior to the merger, Cinergy Corporation was a holding company formed from the 1994 merger of ***PSI Resources***, holding company for ***PSI Energy*** (formerly named ***Public Service Company of Indiana***) and ***Cincinnati Gas & Electric Co*** (including its subsidiary, ***Union Light, Heat & Power Company***, which served customers in Kentucky).



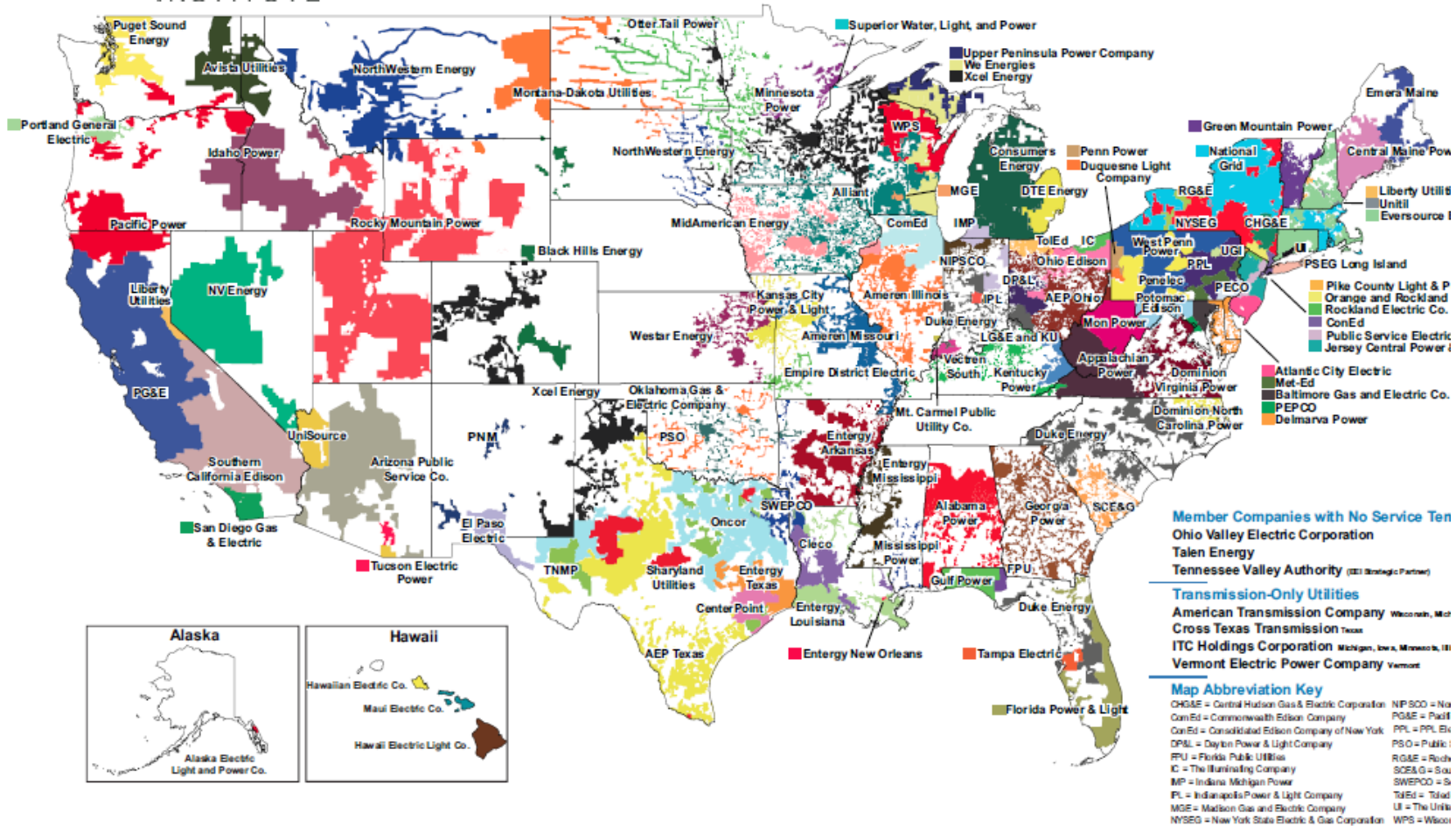
Investor-Owned Utilities

- Business Model:
 - For-profit, guaranteed rate-of-return
 - Focus on shareholder value and price appreciation
 - Regulated by state public utilities commissions
 - Mostly electric and gas (not much water)

IOUs = Owner Value



EEI U.S. Member Company Service Territories



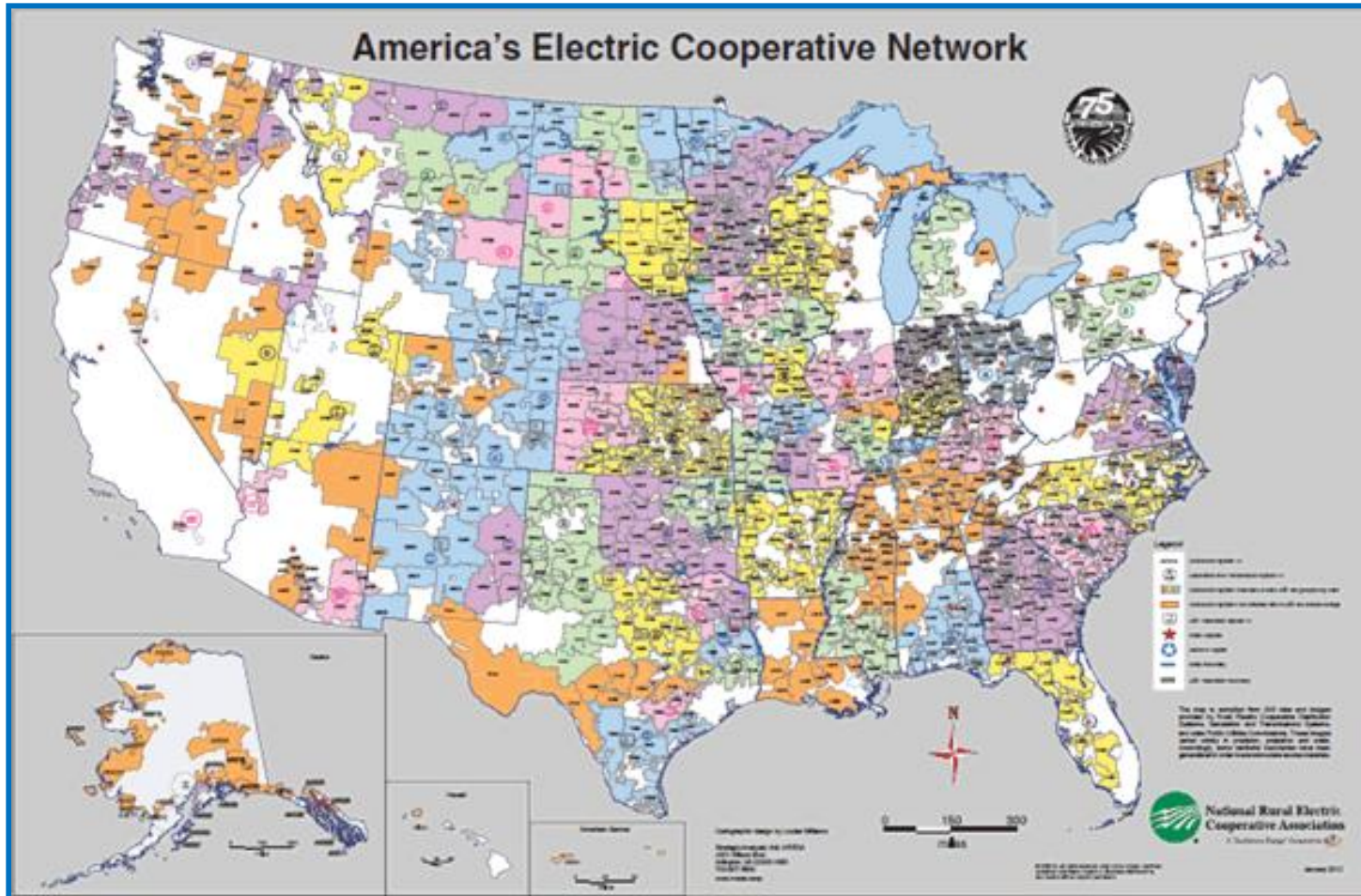
Produced by Edison Electric Institute's Energy Delivery Group. Data Source: ABB, Velocity Suite. Updated September 2016.



Cooperatives

- Rural Electrification Act of 1936
- Federal loans
- Bringing power to regions of the country others unwilling to serve
- Member-owned cooperatives

Cooperatives, REAs, EMCs



Public Power Values Proposition



- ✓ Brings **electricity** to homes and businesses
- ✓ May **generate** and/or **buy** power
- ✓ Is a **not-for-profit** entity
- ✓ Is owned by the **community**
- ✓ Is usually a division of **local government**
- ✓ Is **transparent** (subject to sunshine laws)
- ✓ Involves **citizens** in decision-making



Public Power Network

- Utilities
- Joint Action Agencies
- Federal Power Suppliers
- State Associations
- Regional Associations
- American Public Power Association
- Hometown Connections



Public Power

- 2010 Public Power Systems in 49 states
- Largest: Puerto Rico, 1.47 million customers
- Often formed in response to costly and unresponsive IOUs

Public Power Customers



1,360
PUBLIC POWER
UTILITIES HAVE
UNDER 4K
CUSTOMERS

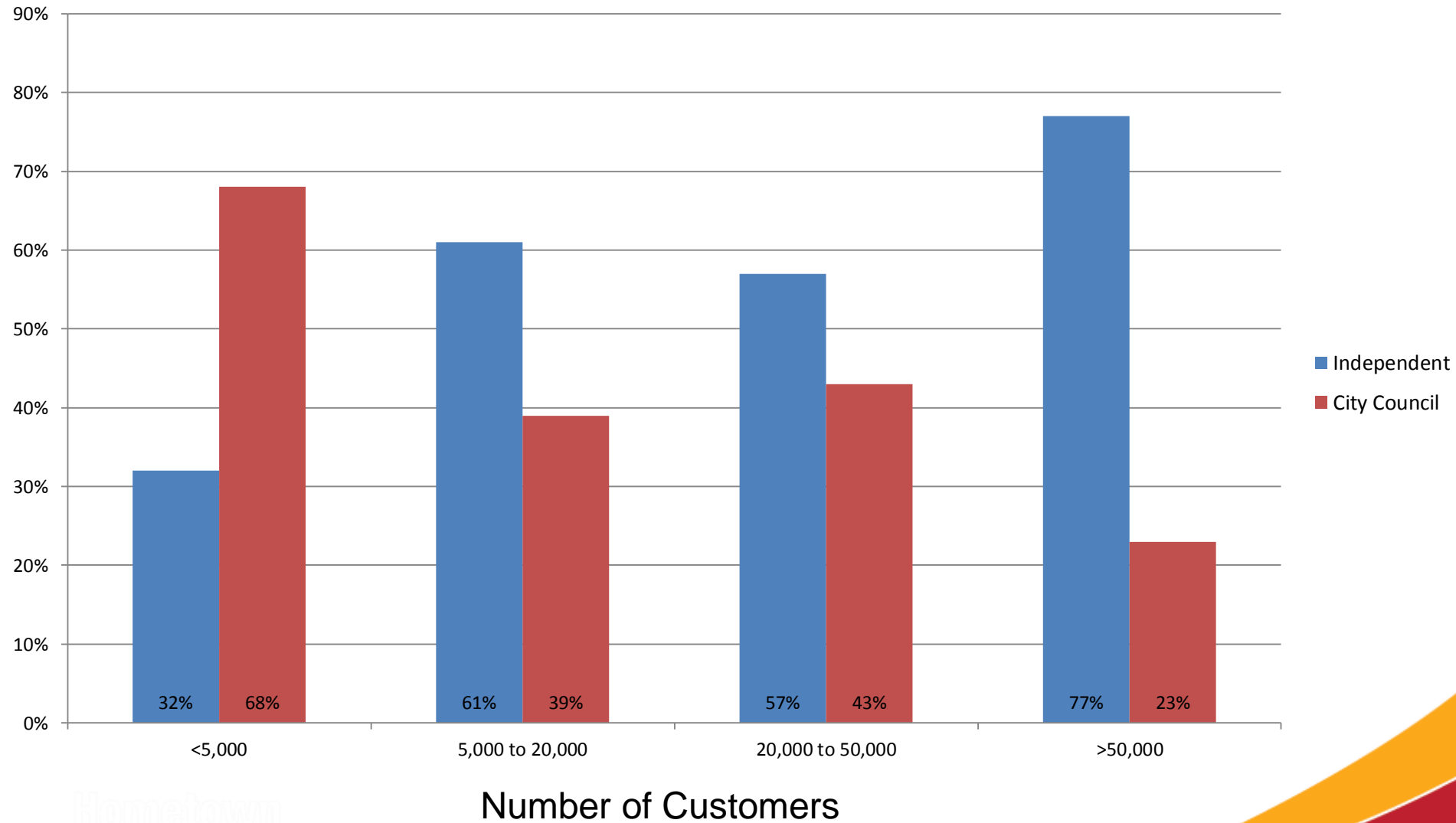
328
PUBLIC POWER
UTILITIES HAVE
4-10K
CUSTOMERS

44
PUBLIC POWER
UTILITIES HAVE
40-100K
CUSTOMERS

30
PUBLIC POWER
UTILITIES HAVE
100K+
CUSTOMERS

159
PUBLIC POWER
UTILITIES HAVE
10-40K
CUSTOMERS

Governance: Independent vs. City Council

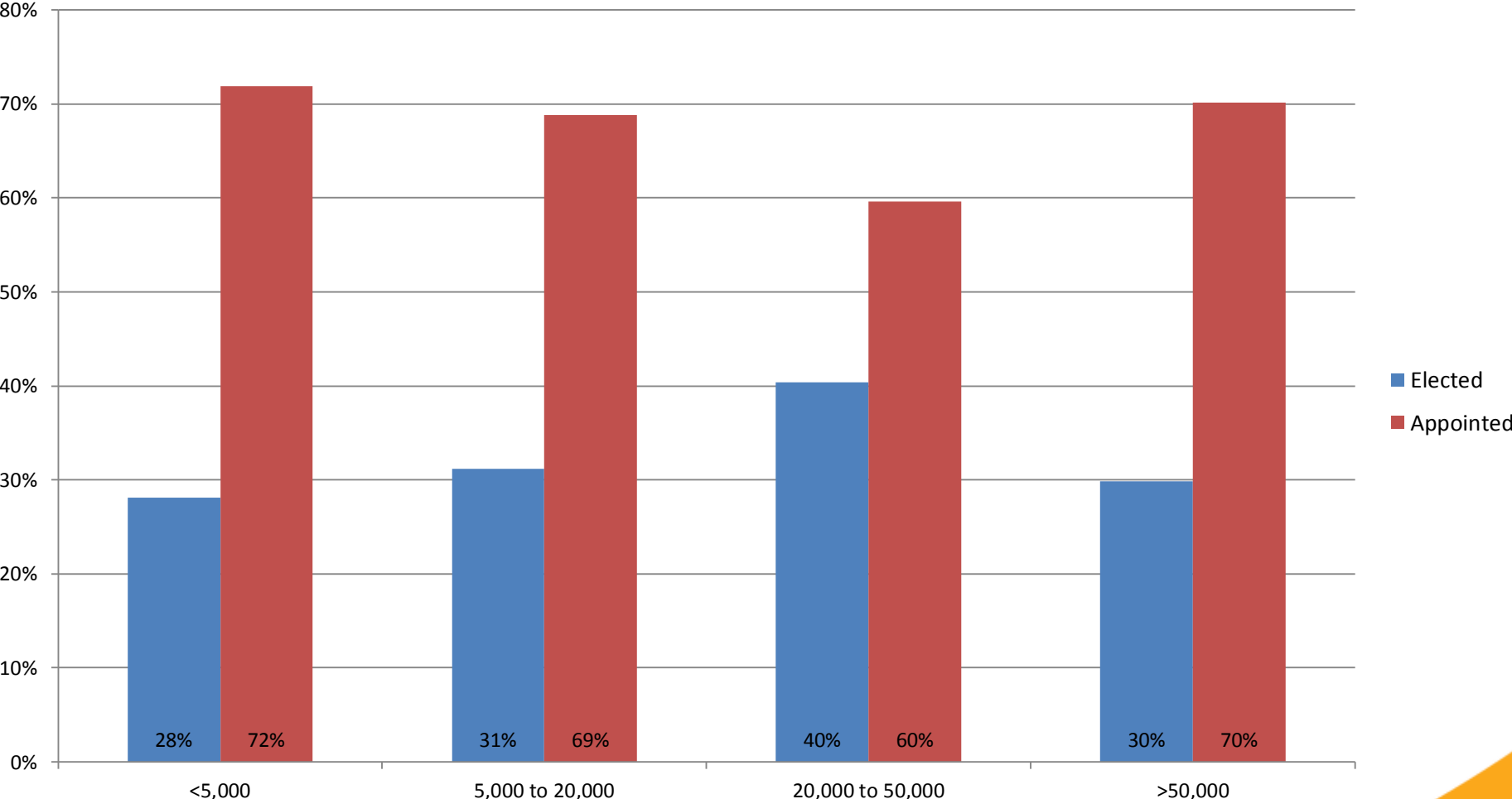


Number of Customers

Hometown
Connections

Source: 2015 APPA Governance Survey

Independent Governing Board: Appointed vs. Elected



Number of Customers



JOINT ACTION AGENCIES
BUY POWER & PROVIDE SERVICES
FOR A GROUP OF UTILITIES
ECONOMIES OF SCALE
STRENGTH IN NUMBERS

- First JAA: Grand River Dam Authority in Oklahoma (1935)
- 1970s (29) and 1980s (23) joint action took off

Federal Power Suppliers: Generation



Tennessee Valley Authority

- Federally-owned
- Generate and sell electricity
- Hydro, nuclear, and other sources
- Serving public power and rural electric cooperatives



Federal Power Suppliers: Transmission

Power Marketing Administrations

- Federally-owned
- Market and transmit electricity
- Hydro and other sources
- Prioritize supply to public power
- Examples:
 - Western Area Power Administration
 - Bonneville Power Administration
 - Southeastern Power Administration
 - Southwestern Power Administration

State and Regional Associations



- Address wide range of non-power supply issues:
 - Lobbying and legislative activity
 - Safety and training
 - Ongoing education/conferences/publications
 - Mutual aid



American Public Power Association

- Formed in 1940
- Trade association representing the interests of public power
- Education, outreach, lobbying, conferences, publications, research



American Public Power Association

- A nonprofit, non-partisan organization
- Created to advance the public policy interests of its members and their consumers
- Provides member services to ensure adequate, reliable electricity at a reasonable price with the proper protection of the environment



American Public Power Association

Trade association representing public power utilities across the U.S.

**MEMBER EDUCATION
AND INFORMATION**



**POLICY
ADVOCACY**



**BEST PRACTICES
AND RESOURCES**

Hometown Connections®

DELIVERING VALUE TO PUBLIC POWER

**Over 900
Public Power
Clients**

**Established
in 1998**

**Solutions Supporting
Technological, Financial
and Human Infrastructure**

**Savings to Public Power:
\$18.3 million**

Management Consulting Services

Subsidiary of American Public Power Association

**Products and Services
Designed for Public Power**

**Partnerships with
22 joint action agencies
and state associations**

Integrated Solutions for Public Power

Hometown Connections



- A trusted public power resource, Hometown Connections is the utility services subsidiary of APPA
- APPA members gain access to:
 - Discount pricing from the industry's leading vendors
 - Consulting support in the areas of organization assessment, strategic planning, market research, and workforce solutions

Hometown Connections



Integrated Solutions for Public Power

Public Power Regulatory Environment



- Federal
 - Federal Energy Regulatory Commission
 - Department of Energy
 - Environmental Protection Agency

What Is FERC?



- Independent regulatory agency (although technically part of the Department of Energy (DOE))
- Regulates wholesale electricity sales and transmission of electricity in interstate commerce under the Federal Power Act



Why Do APPA Members Need To Care About FERC?

- Most APPA members purchase at least part of their electric supply from wholesale markets, and *the price they pay for the wholesale power is regulated by FERC*
- Almost all APPA members must transmit at least some of their power over the lines of FERC-regulated utilities to their own systems, and *the price they pay for transmission use is regulated by FERC*
- The price paid for these services is passed through in the rates APPA members charge to their own retail customers



Does FERC Regulate APPA Members?

- FERC does not regulate the price at which APPA members sell wholesale or retail power (they are “non-jurisdictional” or “Federal Power Act (FPA) 201(f)” utilities)
- FERC can regulate the rate at which APPA members transmit power over their own transmission lines for others under FPA Section 211A, known as “FERC-Lite”



FERC and Reliability

- FERC does regulate around 330 of APPA's members to ensure they comply with electric reliability standards under FPA Section 215, added in 2005
- Standards are developed by the North American Electric Reliability Corporation (NERC) and approved by FERC; either can enforce compliance with standards

Environmental Protection Agency (EPA)



- Established in 1970
- EPA's mission is to protect human health and the environment
- EPA's purpose is to ensure that:
 - All Americans are protected from significant risks to human health and the environment where they live, learn and work
 - National efforts to reduce environmental risk are based on the best available scientific information



Environmental Protection Agency (EPA)

- Many new EPA regulations for the electric utility sector
- They are evolving
- The EPA is becoming a dominant force in the energy industry

Top EPA Regulatory Issues Impacting Electric Utilities



1. Electric Generating Utility (EGU) Mercury **Maximum Achievable Control Technology (MACT)** or **Mercury and Air Toxics Standards (MATS)**
2. Regulation of CO₂ at existing power plants
3. Regional haze regulations and deadlines for western utilities
4. **Coal Combustion Residual (CCR)** regulation and proposed effluent guidelines

The EPA Clean Power Plan



The Clean Power Plan

Overview

- Relies on a federal-state partnership to reduce air pollution from the biggest sources of air pollution: power plants
- Carrying out EPA's obligations under section 111 of the Clean Air Act, the CPP sets carbon dioxide emissions performance standards for affected power plants that reflect the "best system of emission reduction" (BSER)
- EPA identified three "Building Blocks" that will be used to calculate performance rates for fossil-fueled EGUs and natural gas combined cycle units
- Then, EPA translated that information into a state or tribal goal – measured in mass and rate – based on each state or tribe's unique mix of power plants in 2012
- The states and tribes have the flexibility to develop their own plans for EGUs to achieve either the performance goals directly or the state goals, with guidelines for the development, review, and implementation of those plans



APPA Concerns with CPP

- Uncertain impacts on:
 - Reliability
 - Wholesale Power Supply
 - Infrastructure Development
- Usurpation of local decision-making
- Stranded assets
- Creates a *de facto* fuel and renewable energy standard



Other Federal Level Issues

- Tax-exempt financing
- OSHA requirements

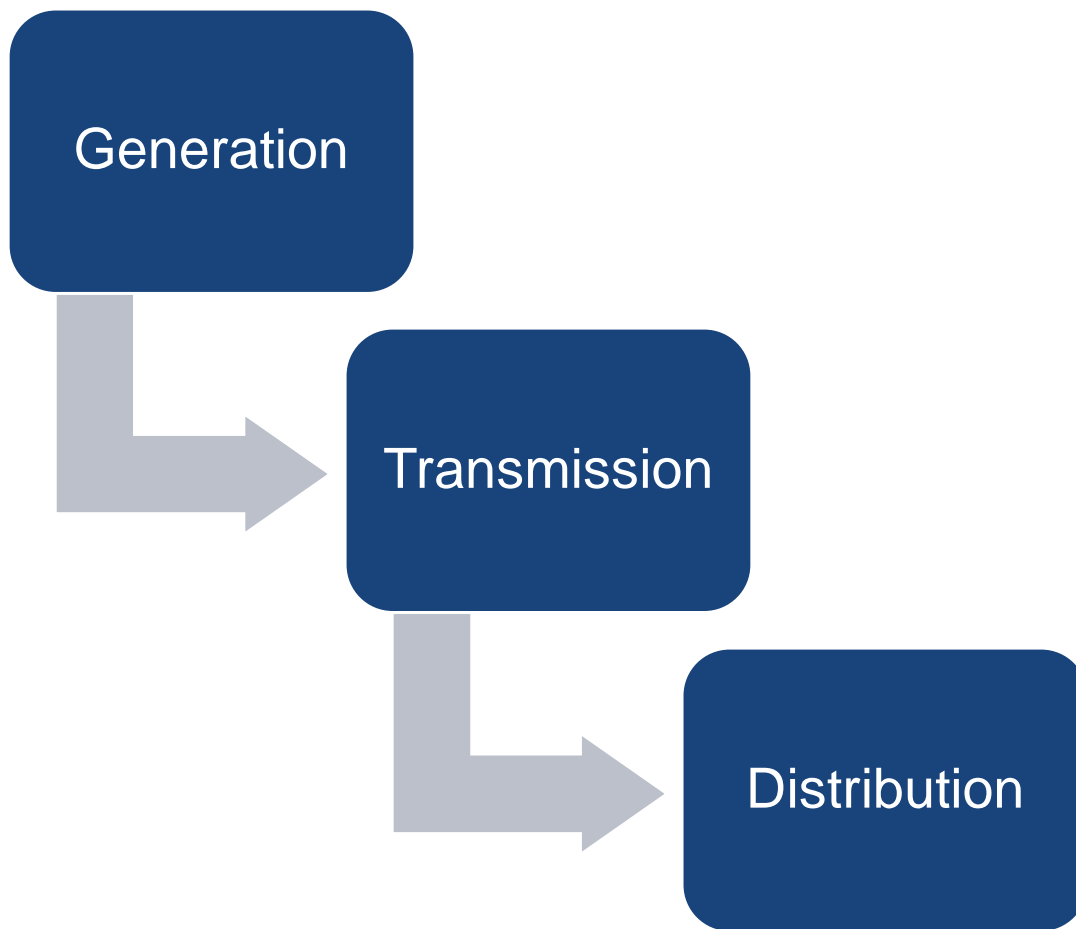


State Regulatory Issues

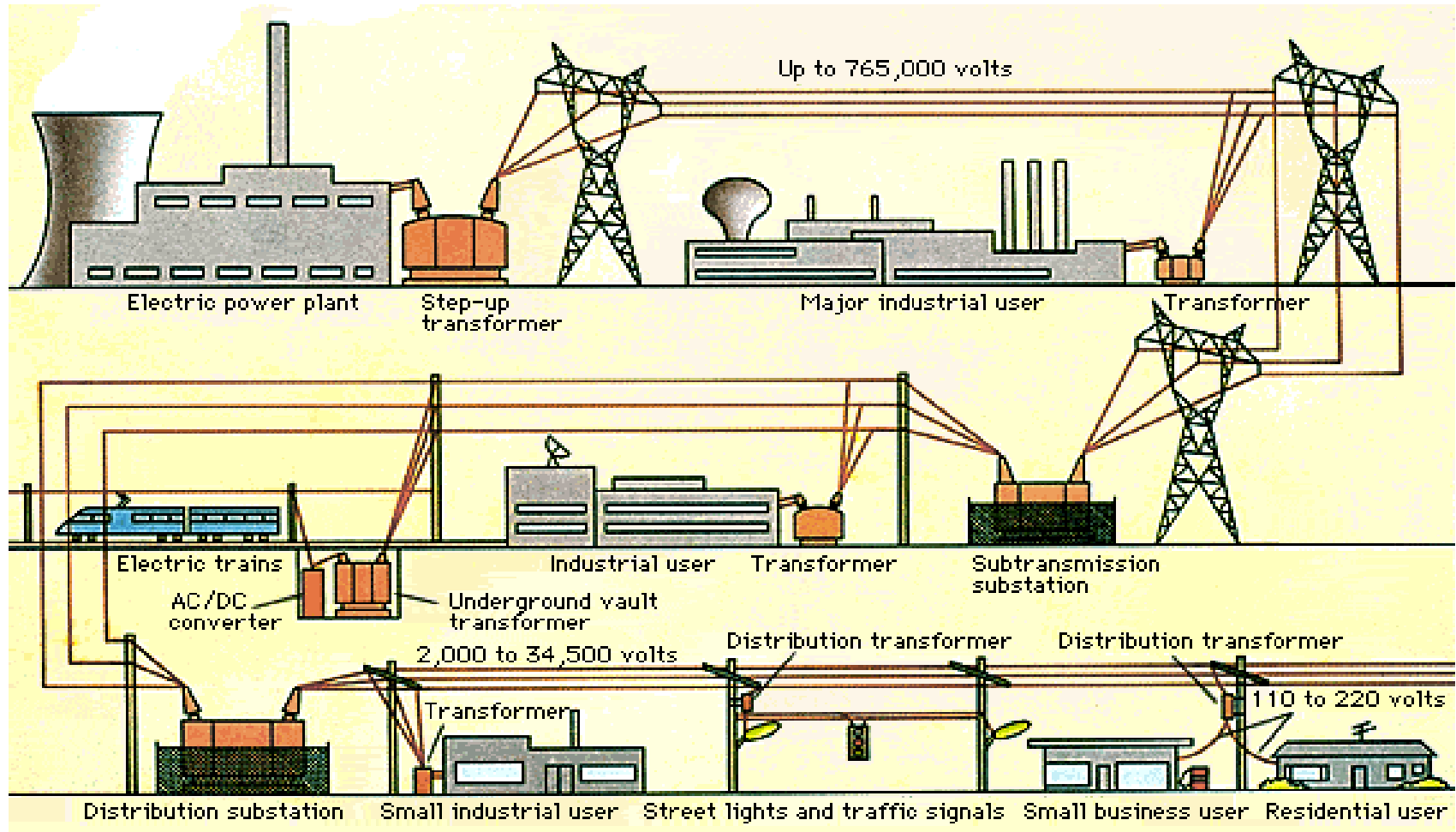
- Increased regulatory action that is impacting public power
 - RPS
 - Net Metering
 - Energy Optimization
- PUCs in five states directly regulate public power activities, rate-making, etc.



Electric Power 101

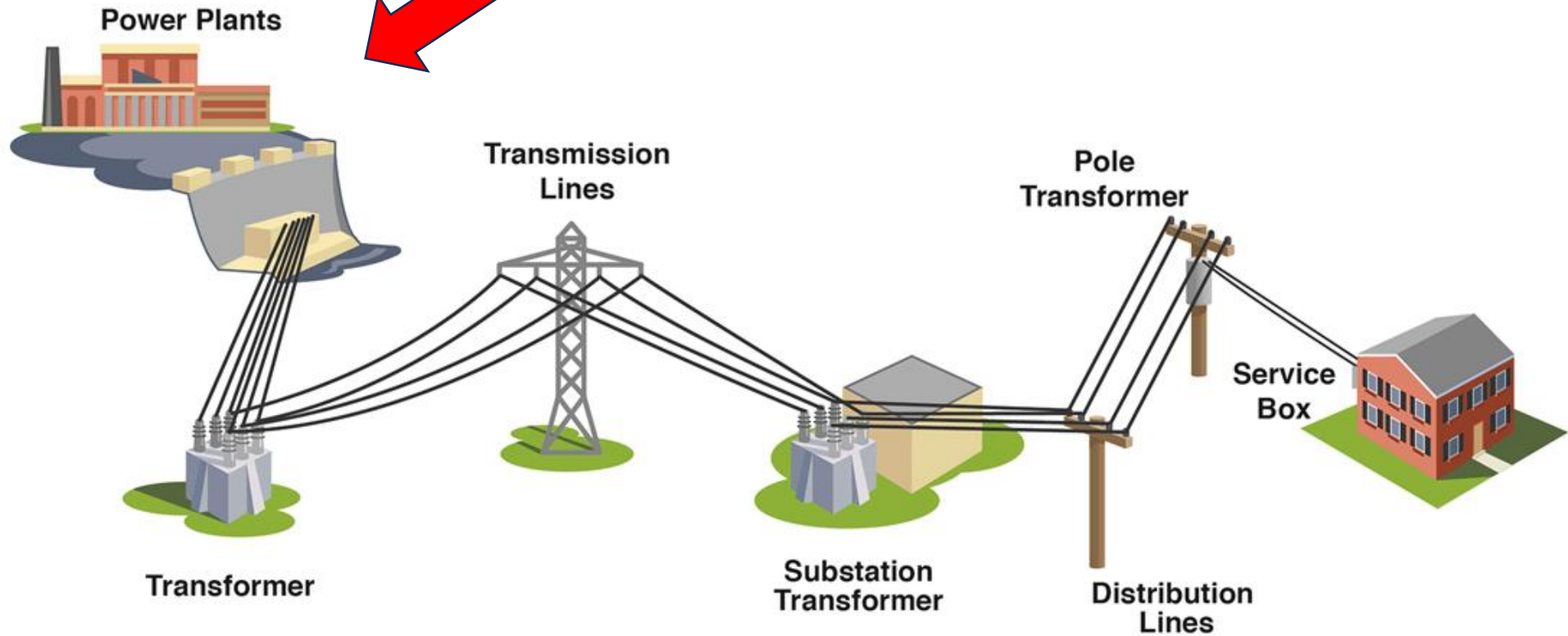
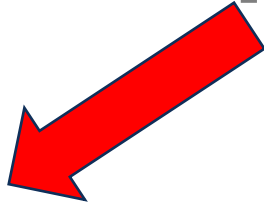


The Electric Power System



Miu, Karen N. "Electric power." *World Book Online Reference Center*. 2005. World Book, Inc.

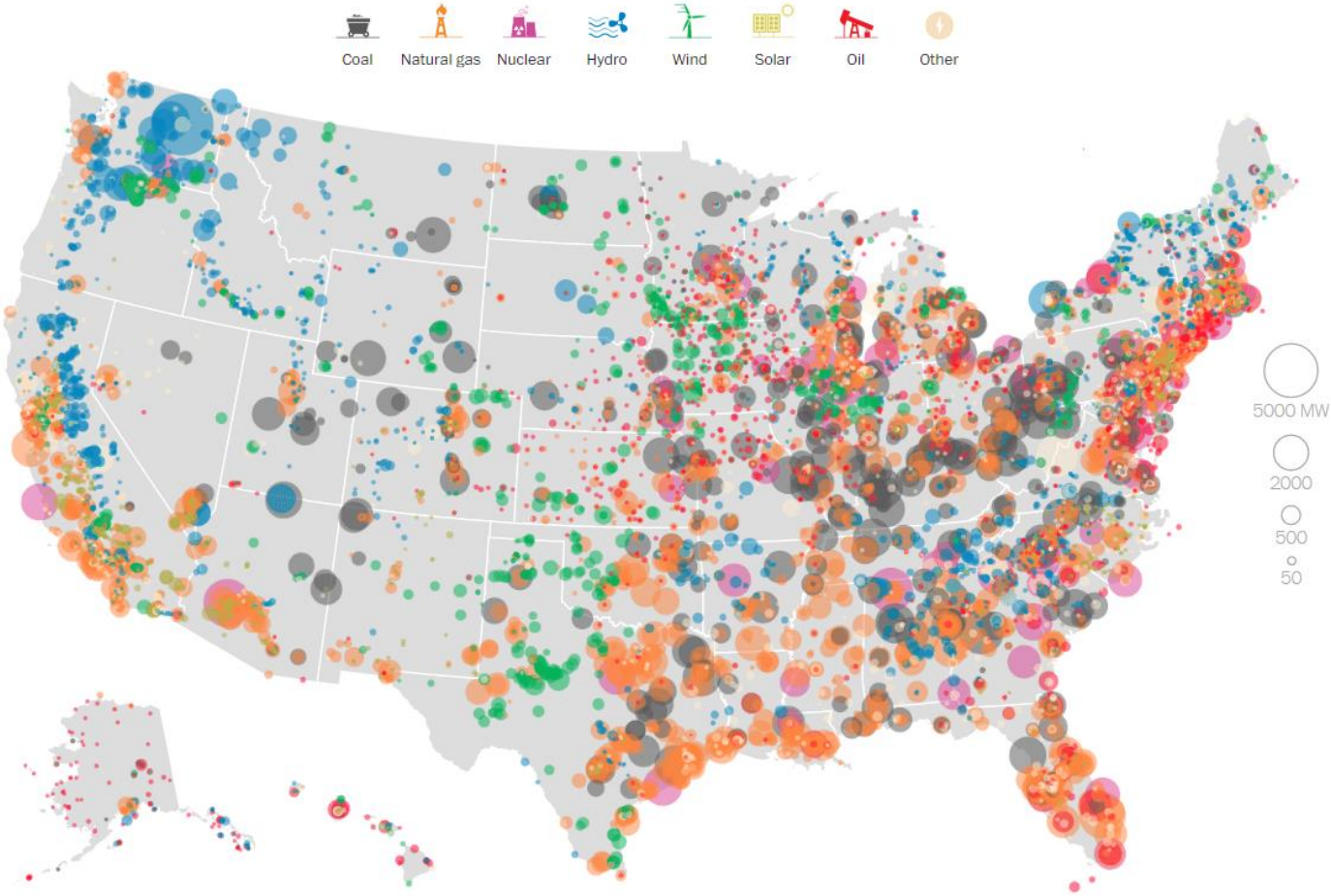
Let's Keep It Simple



Generation



Plant capacity by power source in megawatts



Electricity generation by power source, January to May 2015

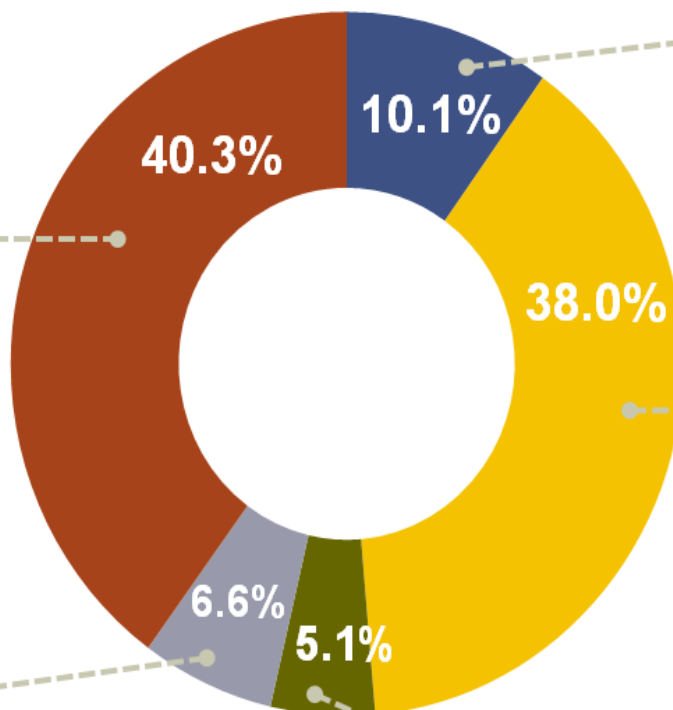
WHO GENERATES POWER IN AMERICA?



INDEPENDENT GENERATORS



FEDERAL POWER AGENCIES



PUBLIC POWER UTILITIES

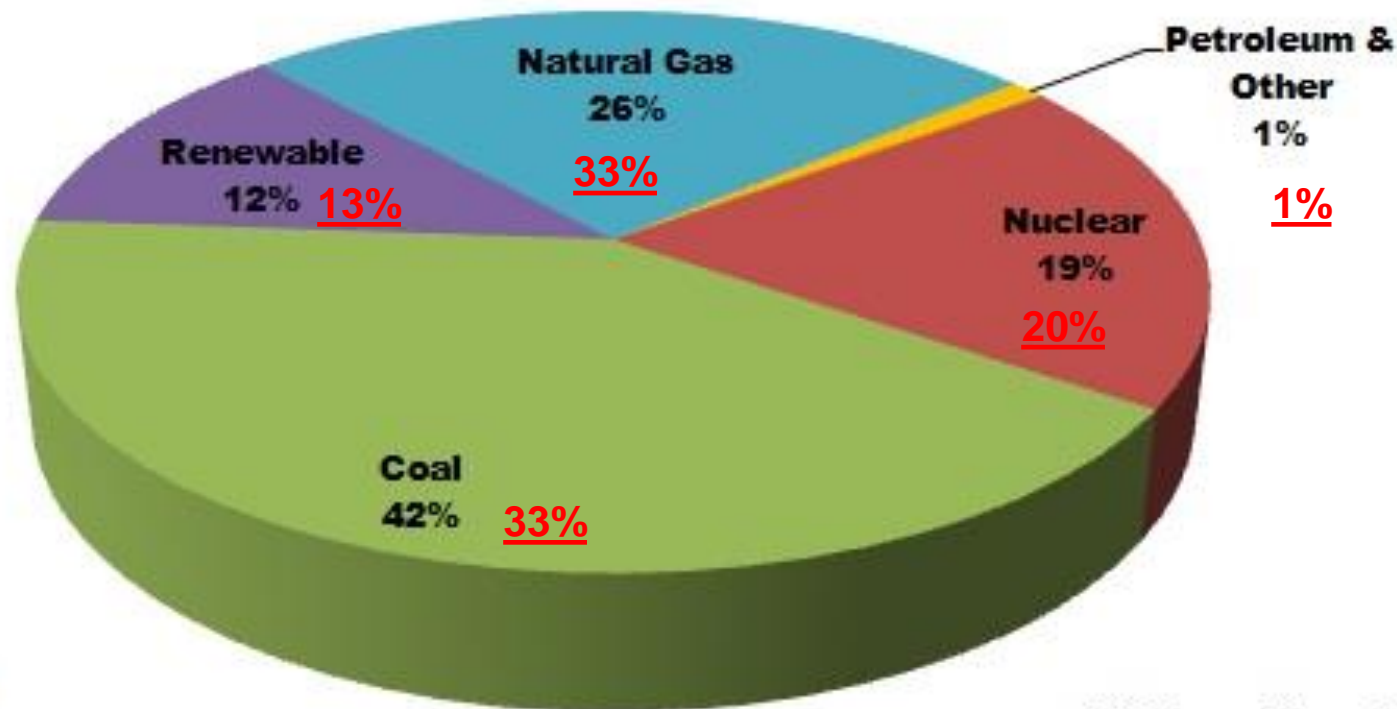


INVESTOR-OWNED UTILITIES



RURAL ELECTRIC COOPERATIVES

U.S. Electricity Net Generation By Fuel - 2012 - 2015

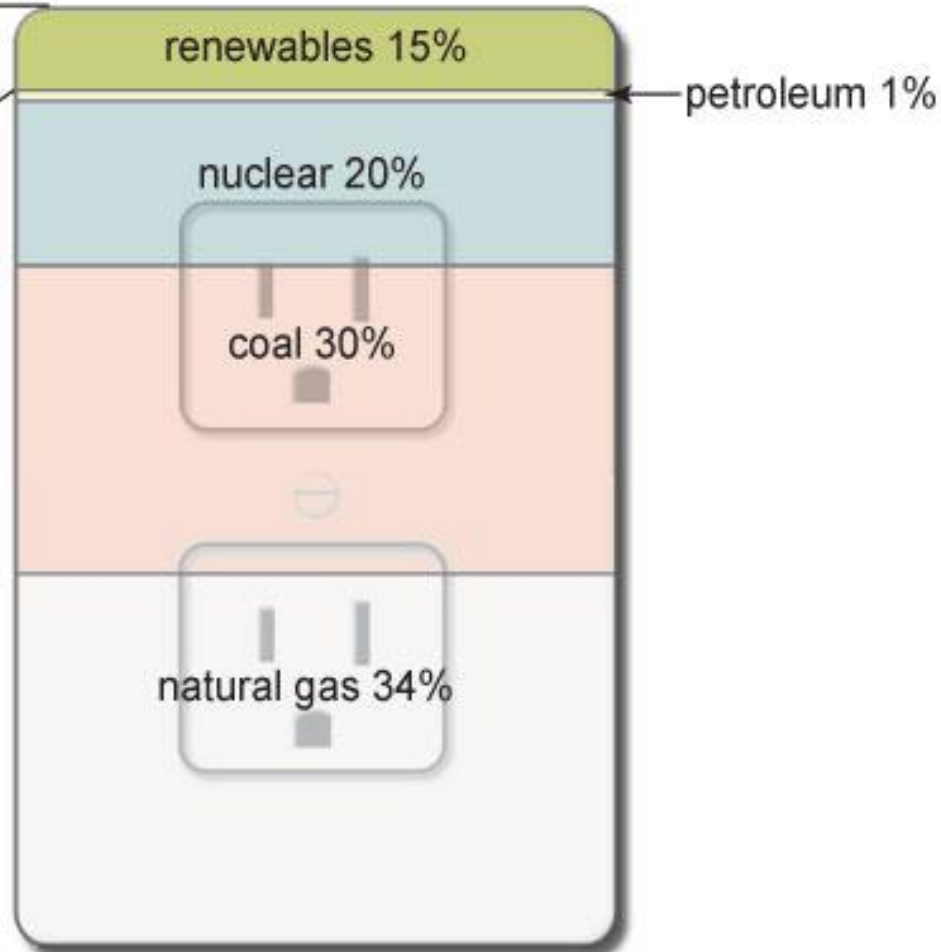


Sources of U.S. electricity generation, 2016



Total = 4.1 trillion kilowatthours

hydro	6.5%
wind	5.6%
biomsss	1.5%
solar	0.9%
geothermal	0.4%

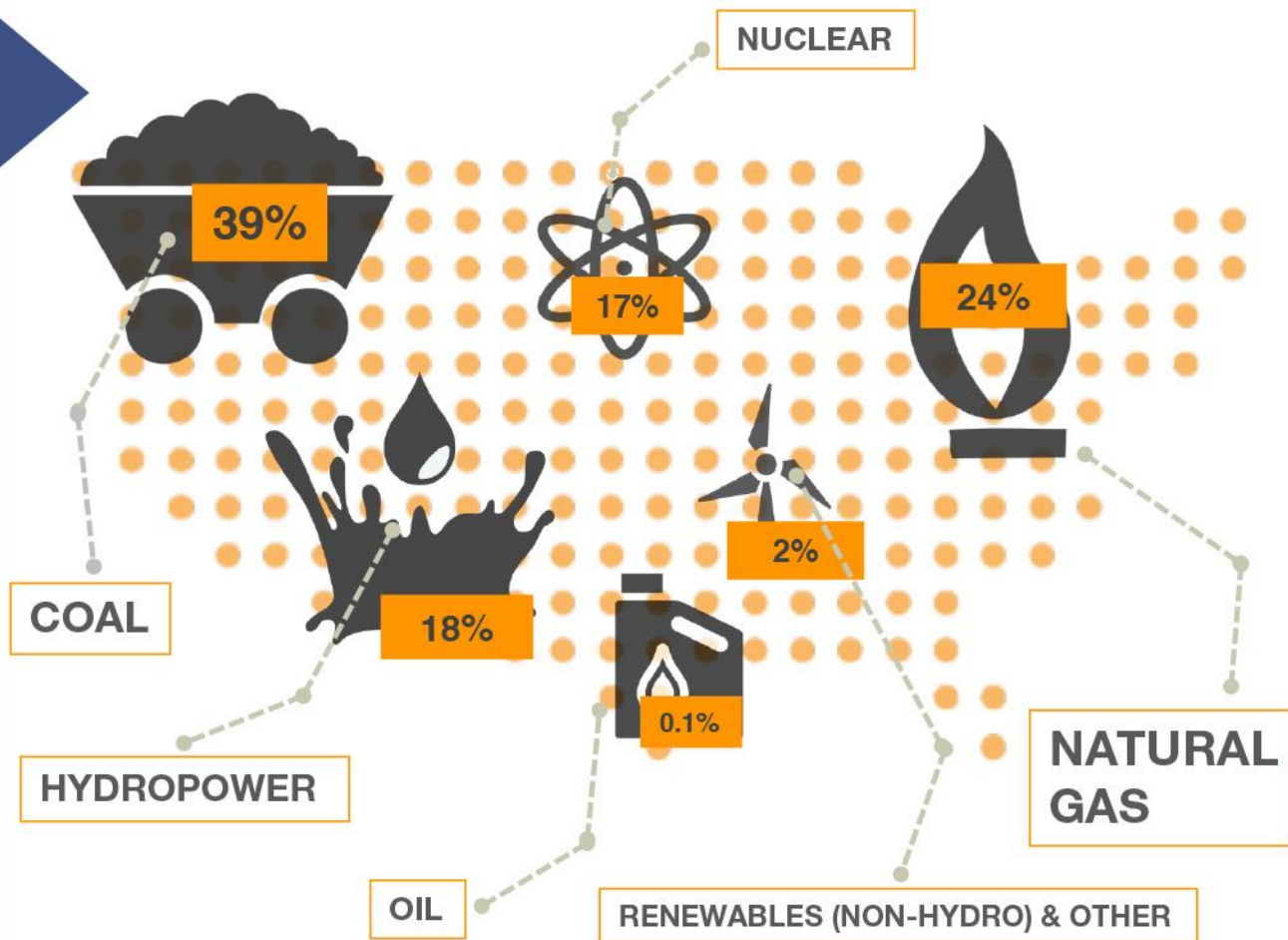


Note: Electricity generation from utility-scale facilities.

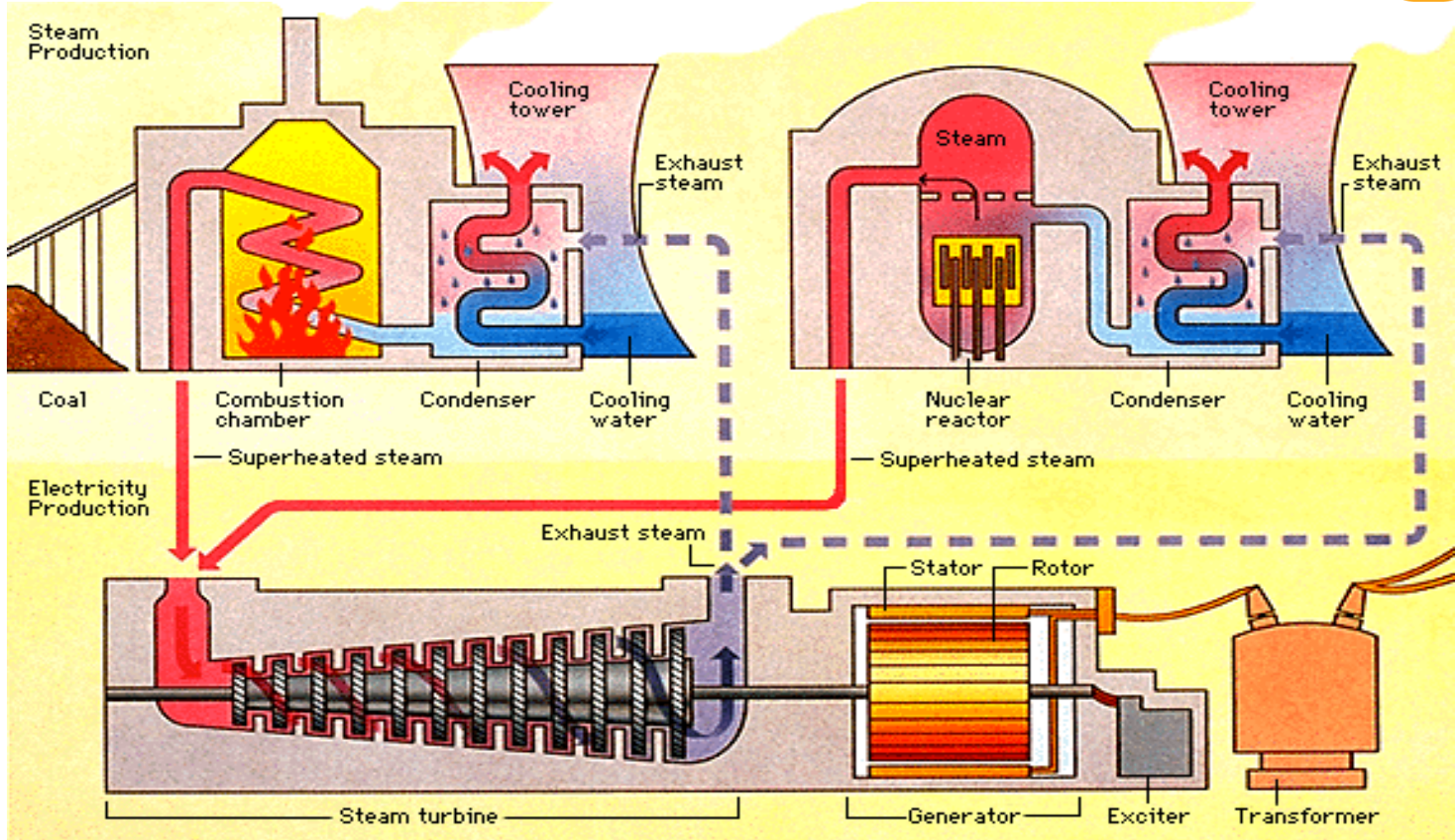
Source: U.S. Energy Information Administration, *Electric Power Monthly*, February 2017, preliminary data for 2016



ELECTRICITY USED BY PUBLIC POWER IS GENERATED FROM



Electric Power From Steam

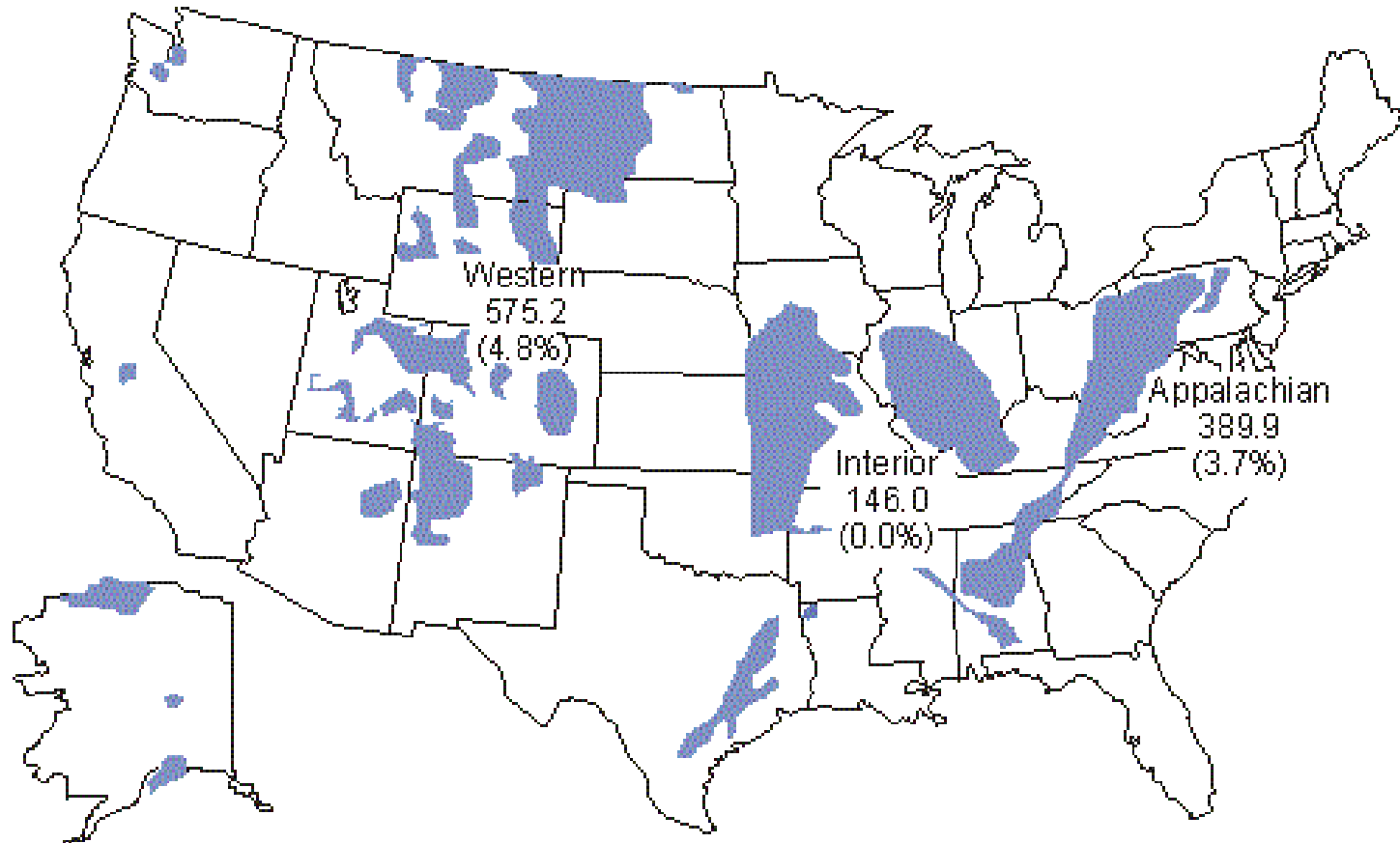


Miu, Karen N. "Electric power." *World Book Online Reference Center*. 2005. World Book, Inc.

Coal



Sources of Domestic Coal



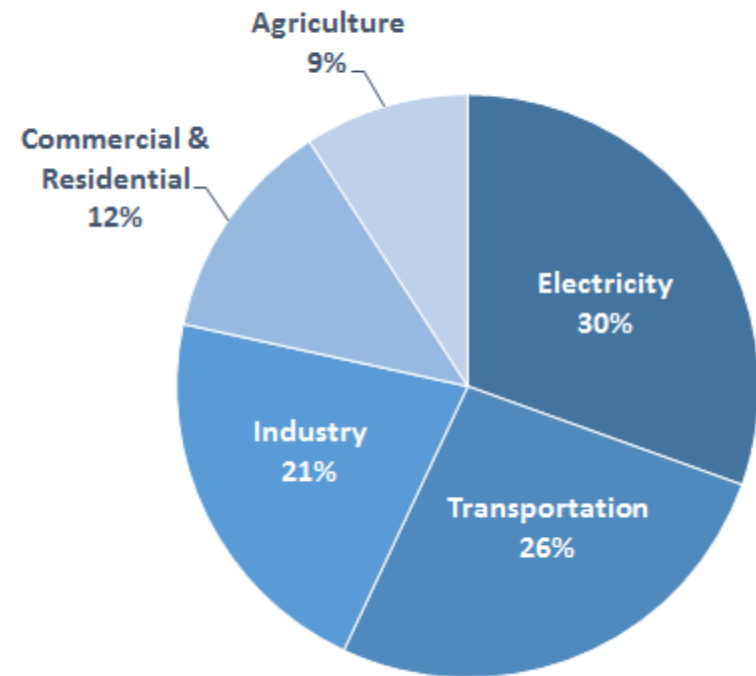
Source: EIA Coal Data

Coal Power is in Decline



- Coal plants are the nation's top source of carbon dioxide (CO₂) emissions, the primary cause of global climate change.
- In 2014, utility coal plants in the United States emitted a total of 2 billion tons of CO₂.

Total U.S. Greenhouse Gas Emissions
by Economic Sector in 2014



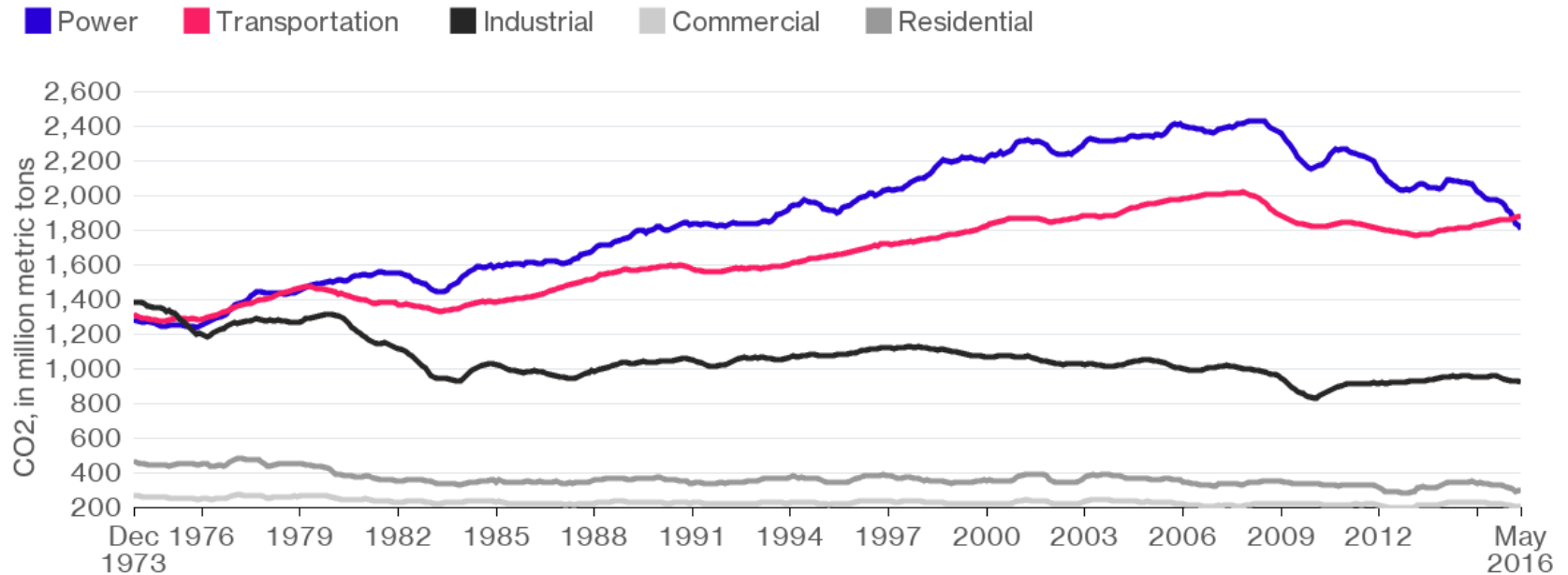
U.S. Environmental Protection Agency (2014).
U.S. Greenhouse Gas Inventory Report: 1990-2014.

Power Plant Emissions Are Dropping



Vehicles Speed Ahead

For the first time since 1978, carbon dioxide pollution from transportation has passed emissions from the power sector.



Department of Energy; Energy Information Administration

Bloomberg

Coal Power is in Decline



- Also a major contributor of
 - Sulfur dioxide (SO₂): acid rain
 - Nitrogen oxides (NO_x): ground-level ozone (smog) and respiratory illnesses
 - Particulate matter: chronic bronchitis, aggravated asthma, and premature death
 - Mercury: neurotoxin that can contaminate waterways, make fish unsafe to eat, and cause birth defects



Coal Plant Closures

- About 350 coal plants have either closed since 2000 or planed to be closed in the next 5 years.
- About 70 of the closed plants are already converted or planned to be converted to Natural Gas or other fuels

www.SourceWatch.org



Reprieve for Coal?

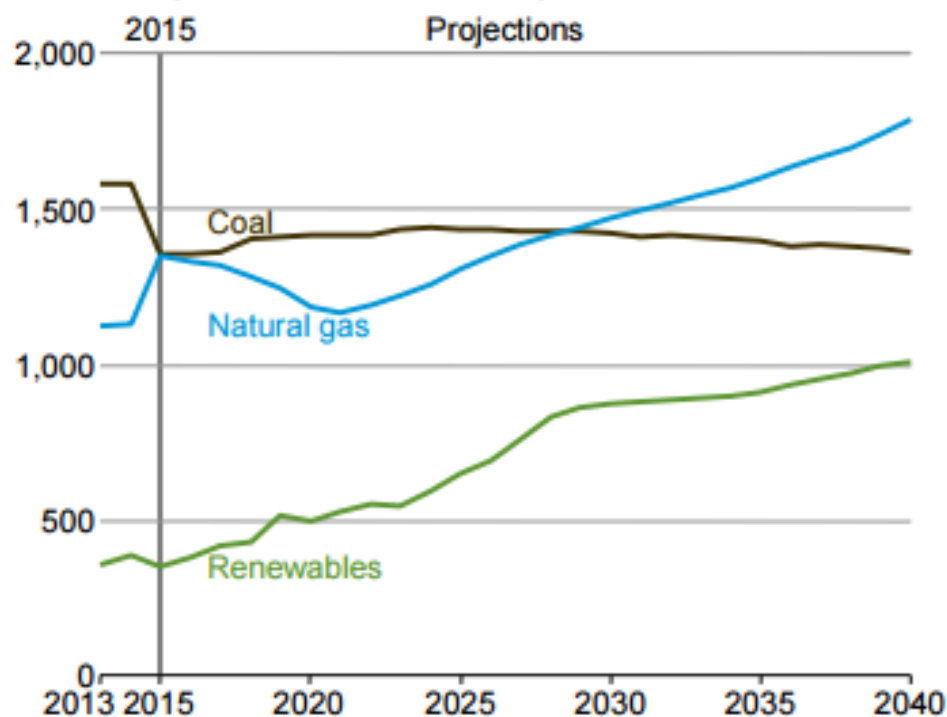
- Regardless of current administration, economics still favor natural gas
- Renewables will continue to decline in cost
- Storage will continue to decline in cost
- Unlikely to see new coal generation but,
- Existing plants may run more and longer

Natural Gas



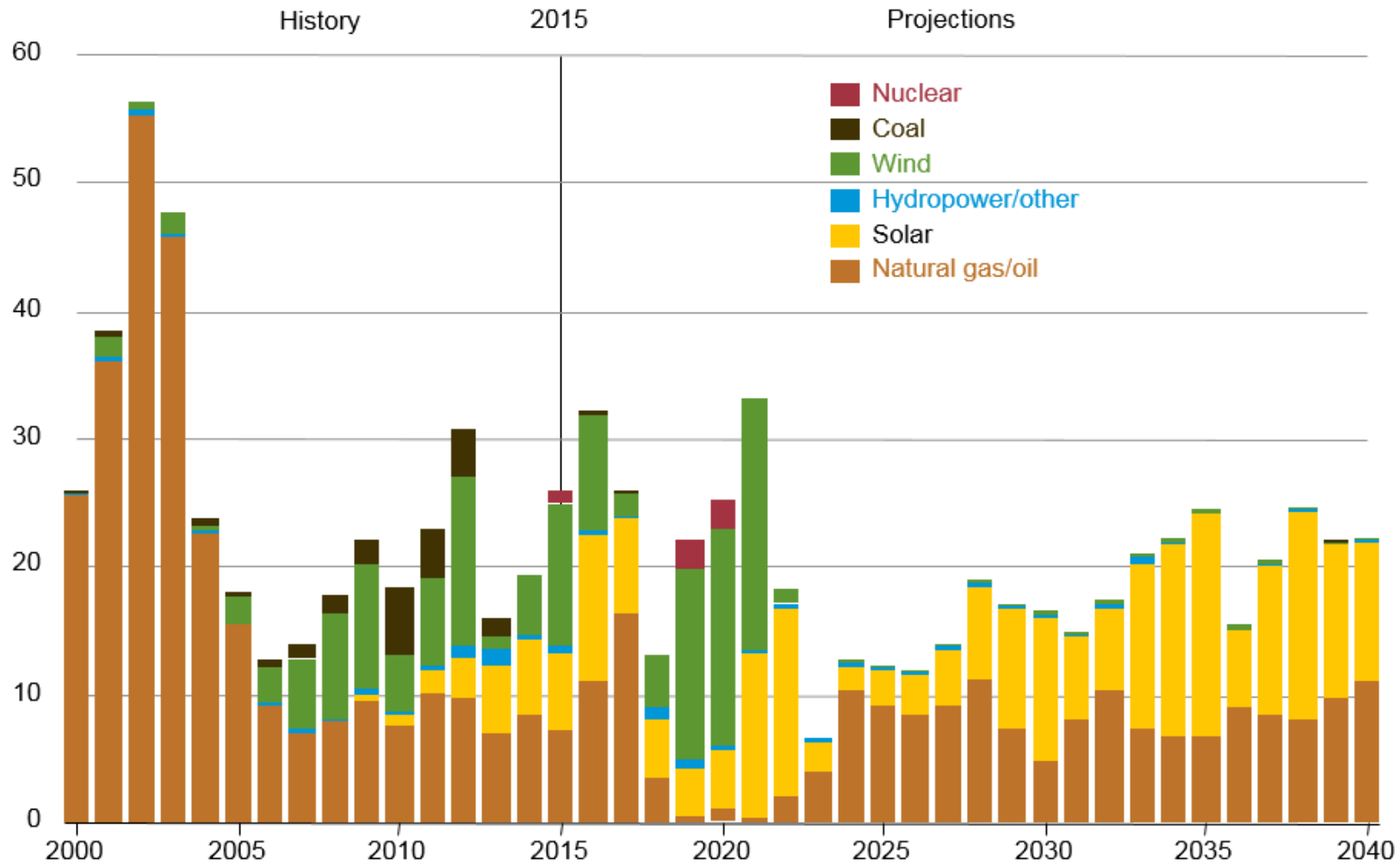
Natural Gas is on the Rise

- Net electricity generation from coal, natural gas and renewables



Source: U.S. Energy Information Administration | Annual Energy Outlook 2016

New Capacity by Fuel (gigawatts)

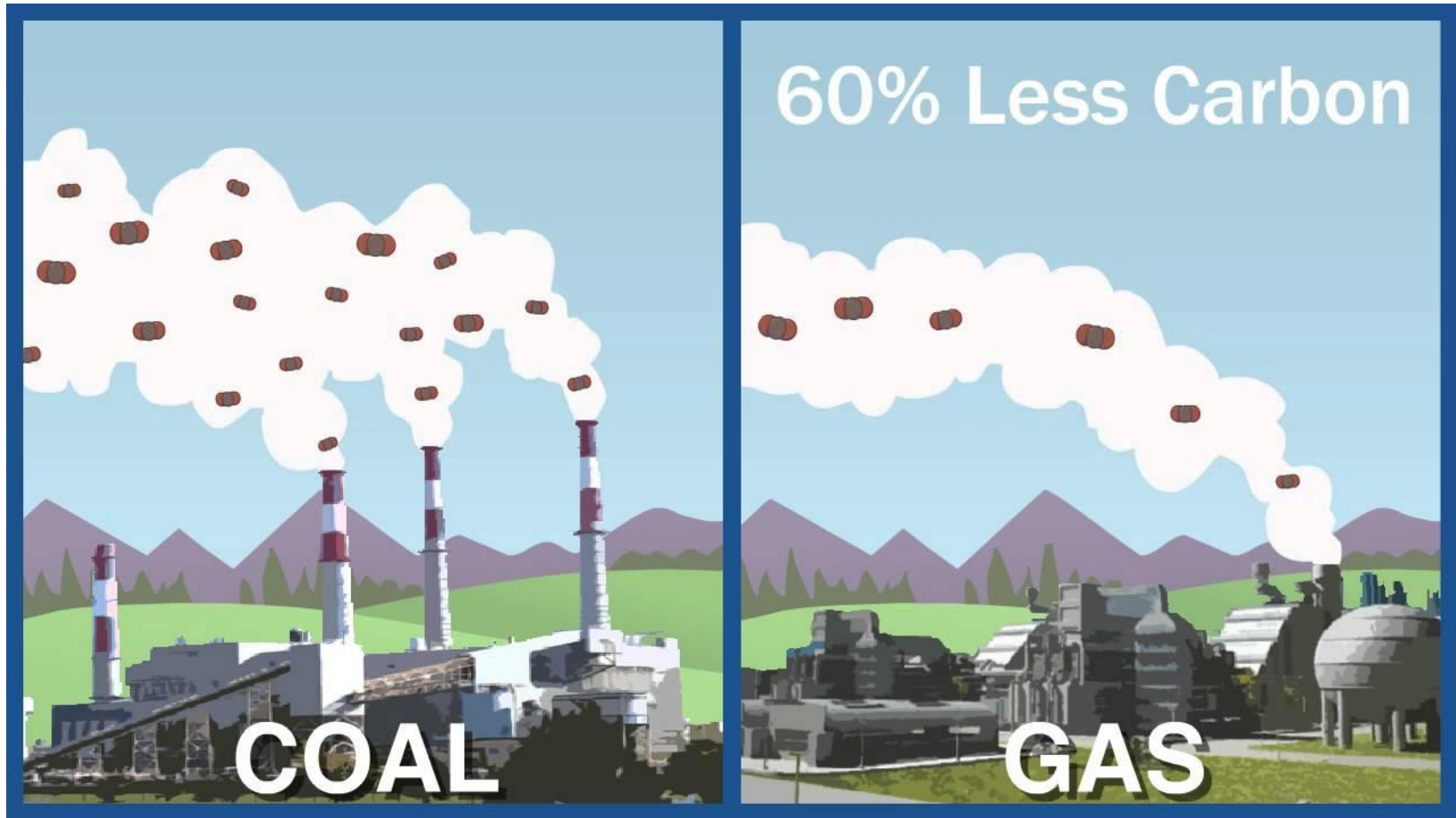




Natural Gas

- Advantages over coal:
 - Reduced air and water pollution
 - Fewer smokestack carbon emissions
 - Less power plant water use
 - Greater flexibility of the power grid
 - Renewed economic development in gas-rich regions of the country

Coal vs. Gas



Natural Gas Prices Low (but much more volatile)

NGV07 - Natural Gas (NYMEX)



Nasdaq 9/14/17 End of day Commodity Futures Price Quotes for Natural Gas (NYMEX)

Nuclear Power





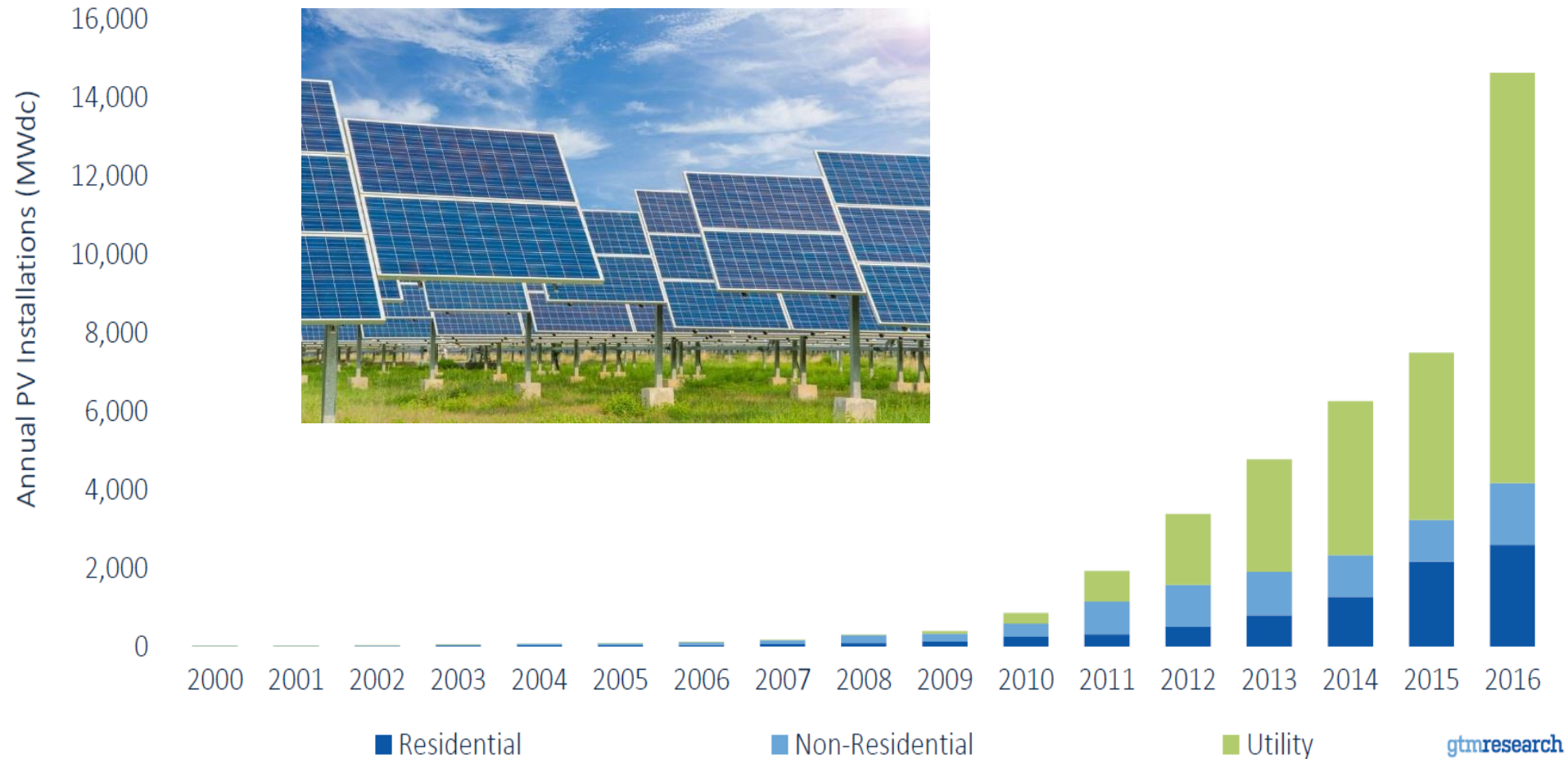
Nuclear Power

- No greenhouse gas emissions
- Large financial risks
 - Risks associated with fuel, reactor accidents, and disposal – on average a nuclear power plant annually generates 20 metric tons of used nuclear fuel, classified as high-level radioactive waste
- 2005 Energy Act and the current Administration supports Nuclear Energy
 - Two plants are/were under construction in GA & two in SC
 - Yet, nuclear units are down from 105 plants to 100

Renewables

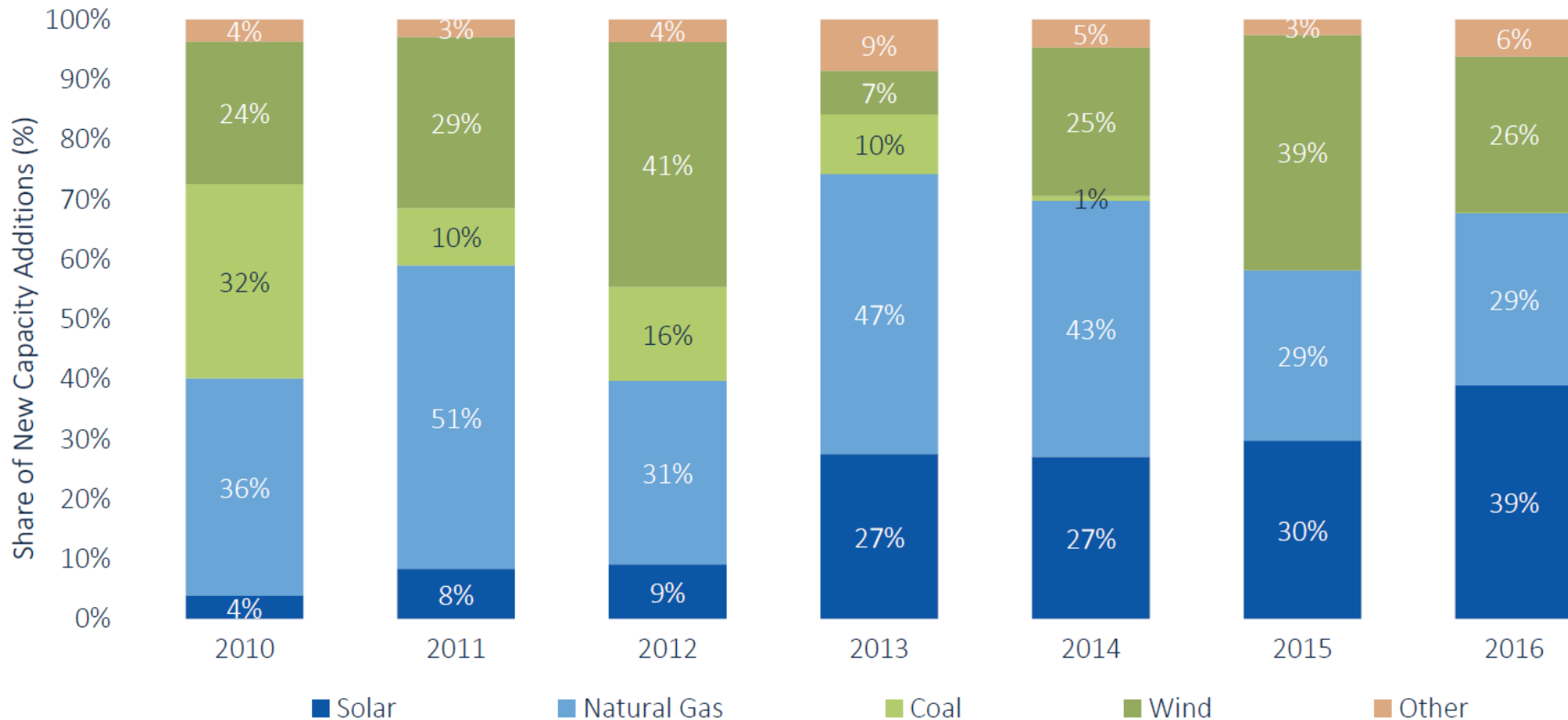


Annual U.S. Solar PV Installations, 2000 - 2016



GTM Research – “Electricity Transformation” March 2017

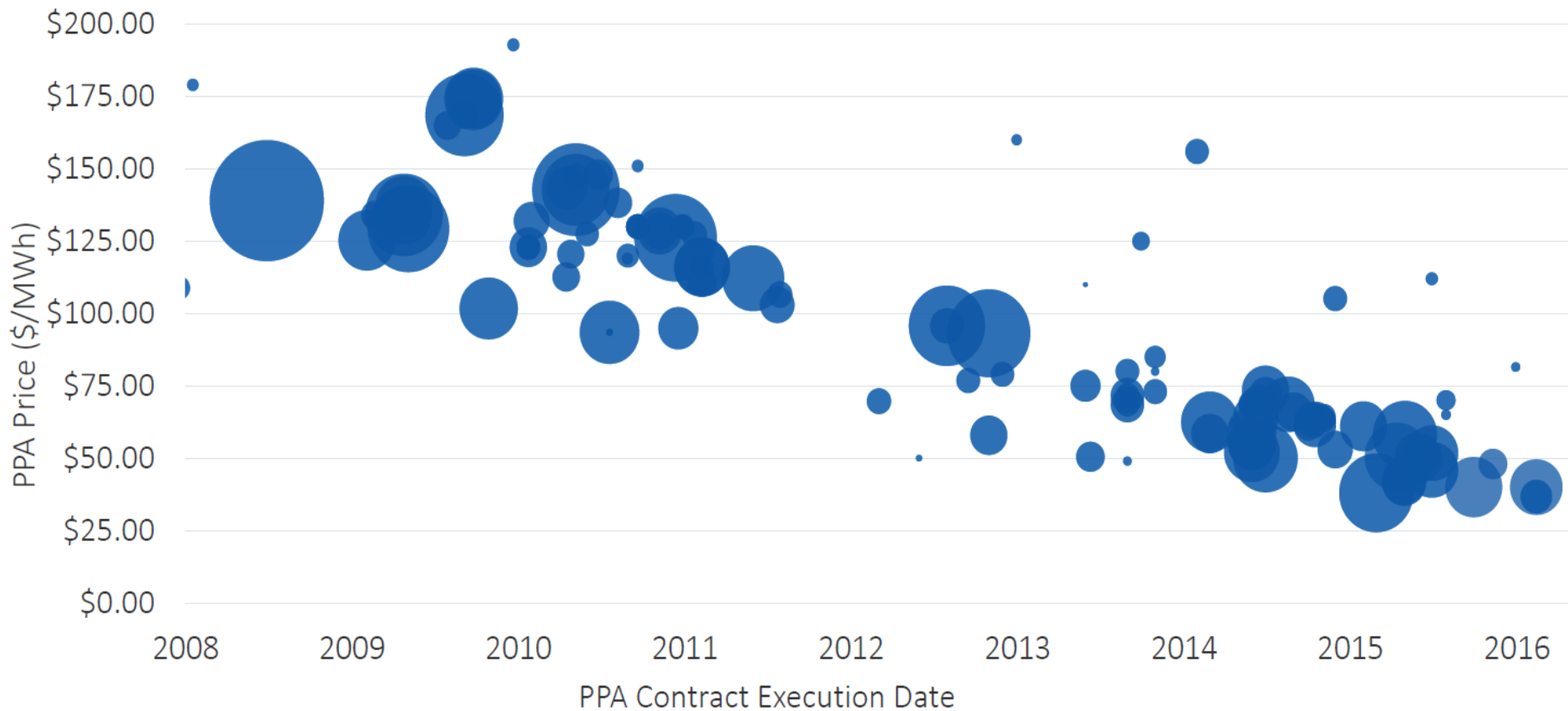
For the first time, Solar was the largest source of new capacity



GTM Research – “Electricity Transformation” March 2017

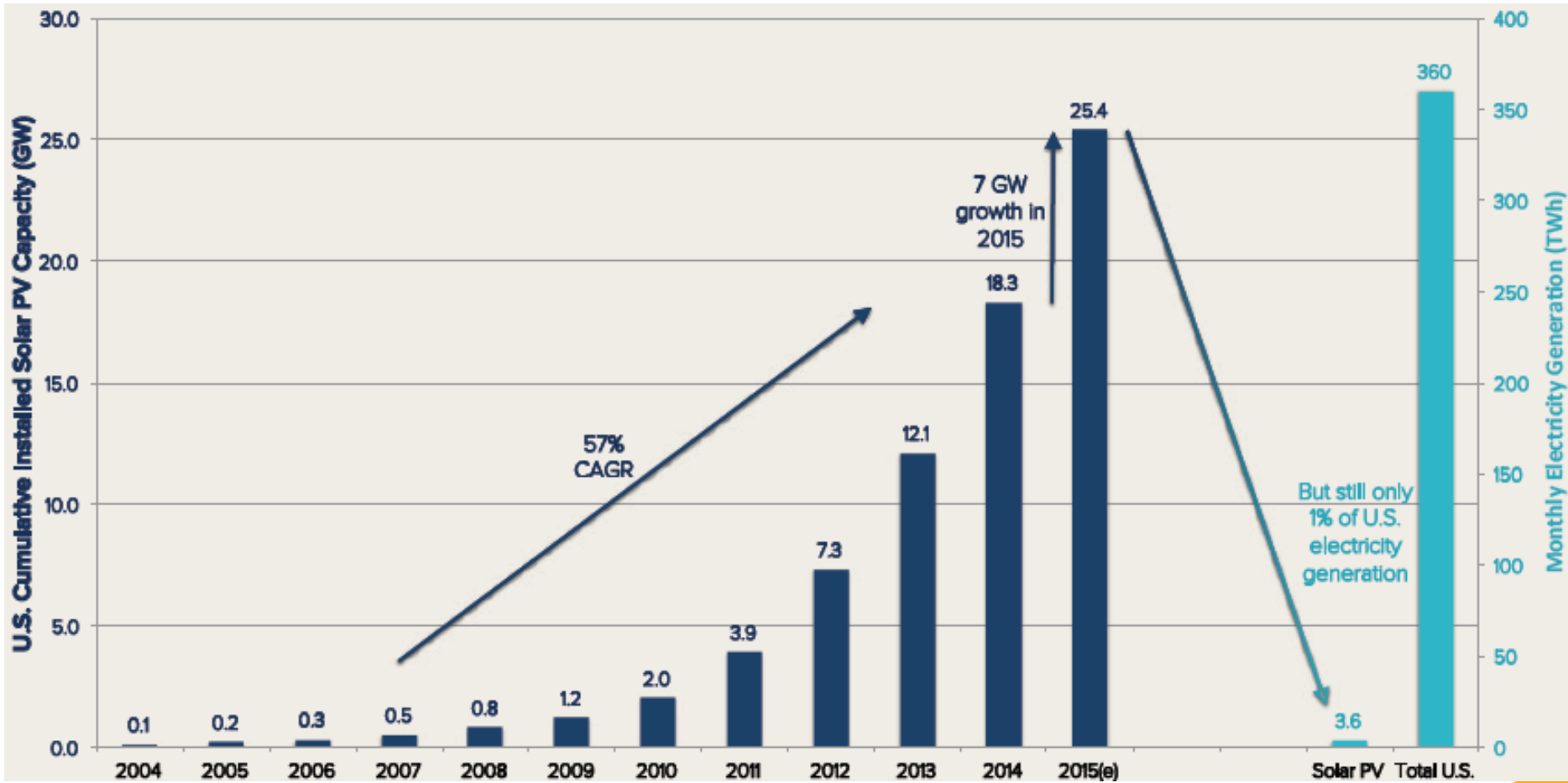


Solar PPA Price (\$/MWh)



GTM Research – “Electricity Transformation” March 2017

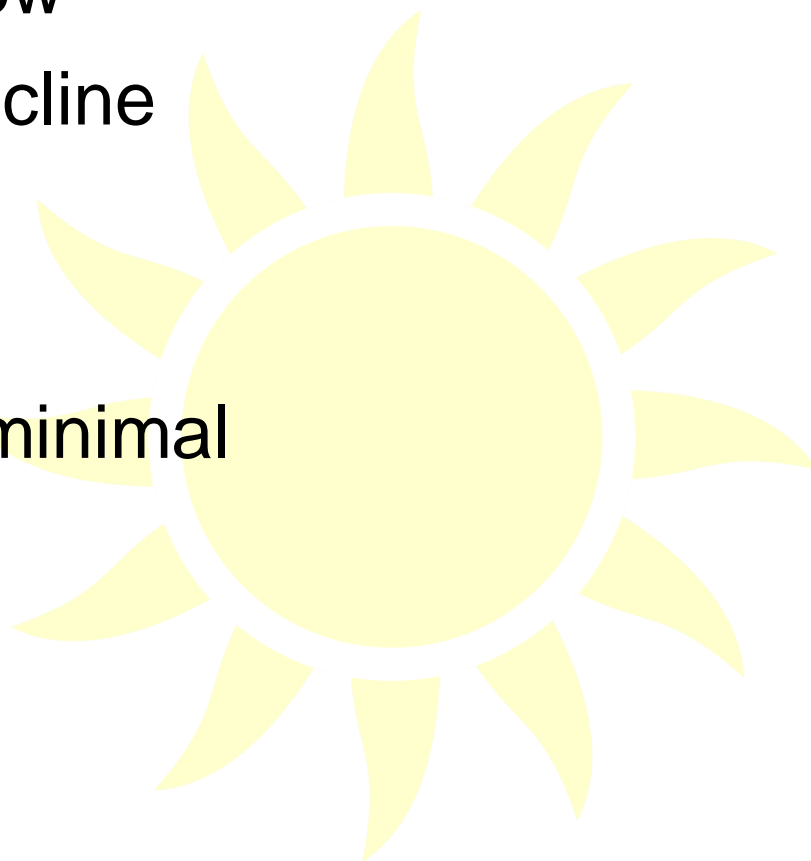
US Solar PV Cumulative Installed Capacity and Monthly Generation



Rocky Mountain Institute – “Community Scale Solar, Insight Brief”
 March 2016

Renewables – Solar

- Solar will continue to grow
- Costs will continue to decline
- Abundant
- Silent
- Environmental impacts minimal
 - Production process
 - Land use
- Intermittent Power



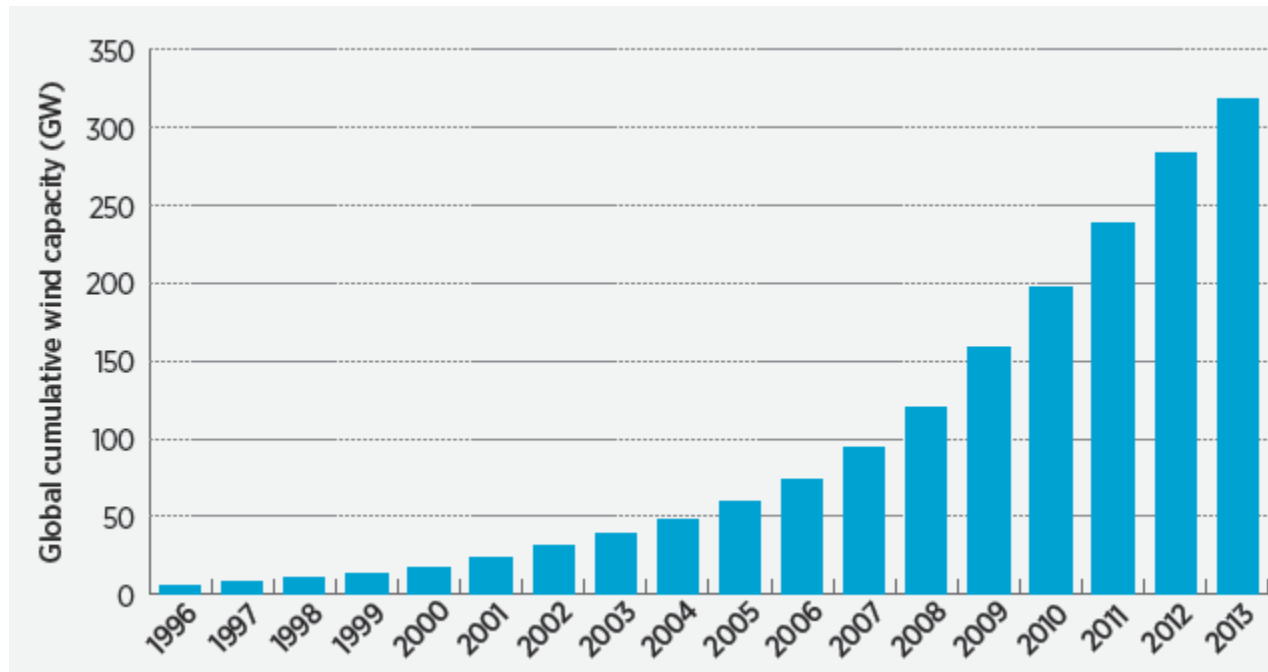
Renewables – Wind



Renewables – Wind

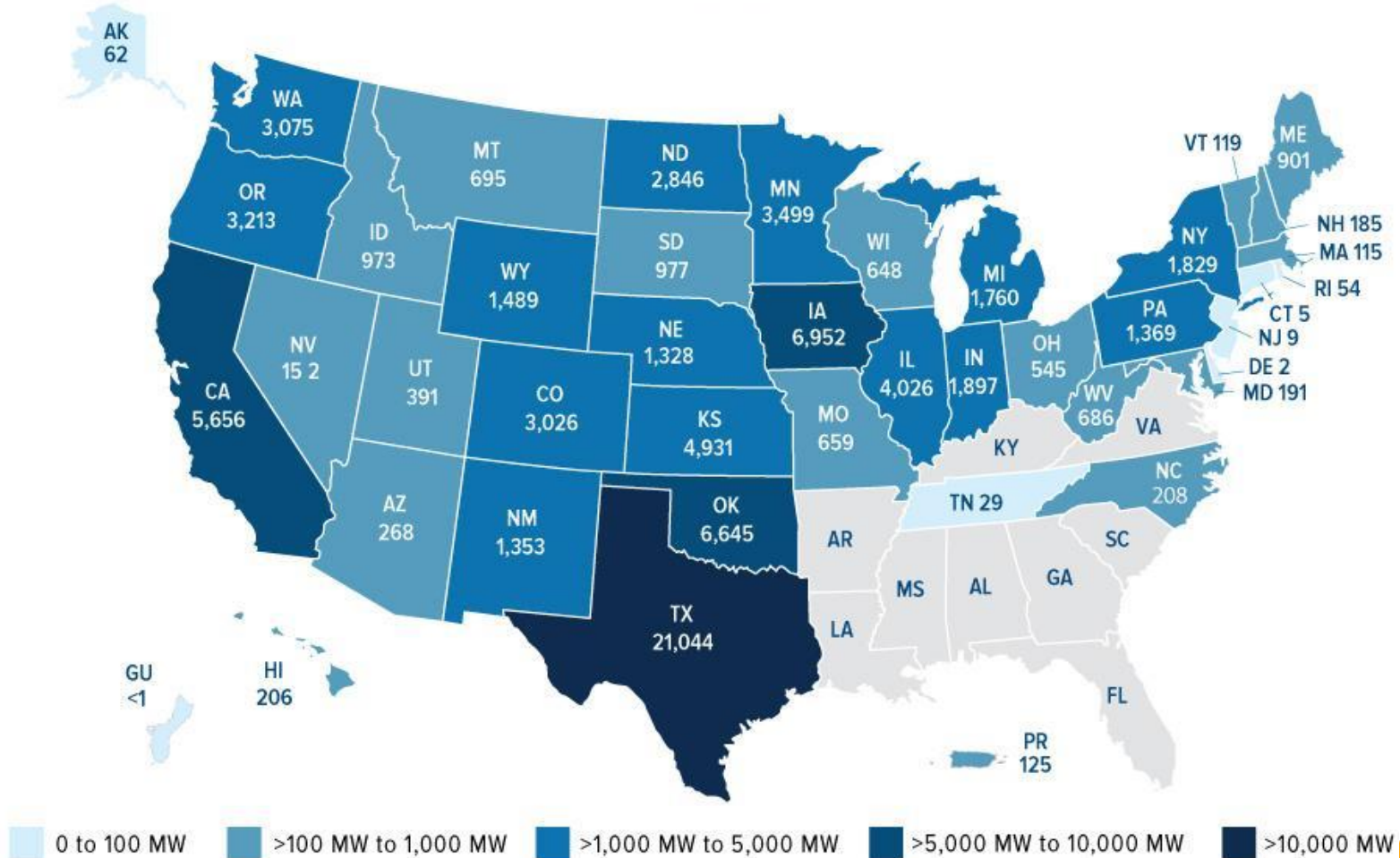


Global Cumulative Installed Capacity Growing



Renewables – Wind

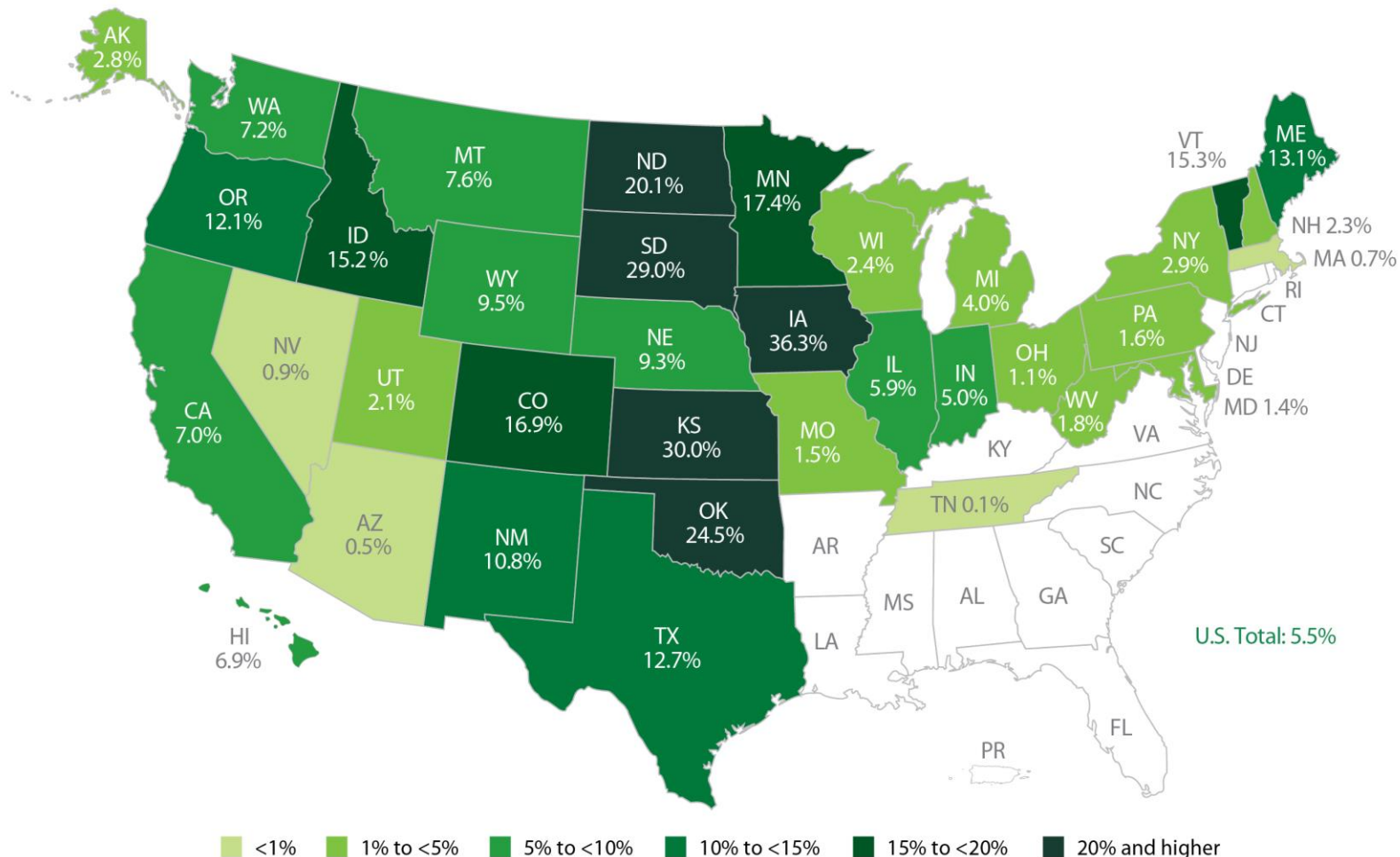
U.S. Installed Wind Power Capacity, by State
As of First Quarter 2017



Source: U.S. Wind Industry First Quarter 2017 Market Report, U.S. Global Investors

Renewables – Wind

U.S. Wind Energy Share of Electricity Generation*, by State



*Rolling 12 Month Average, November 2015 - October 2016

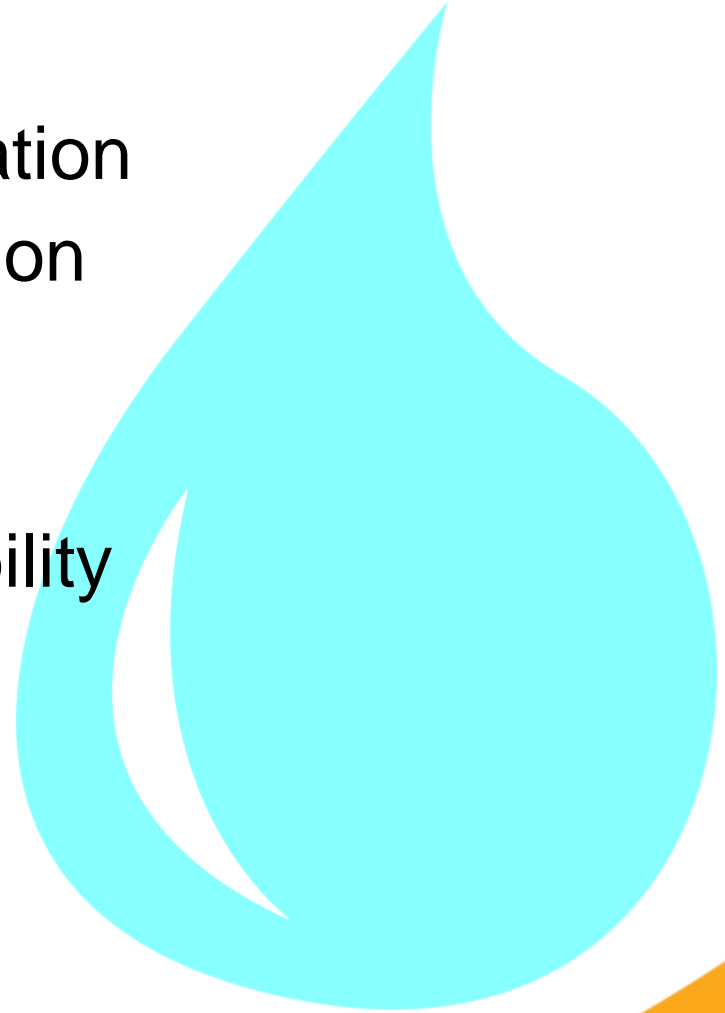
Hydroelectric Power





Hydroelectric Power

- Clean form of power generation
- Renewable form of generation
- Start quickly
- Can load follow well
- Strong electric supply reliability
- Safe





Other Types of Generation

- Fuel cells
- Geothermal
- Biomass
- Landfill gas (methane)

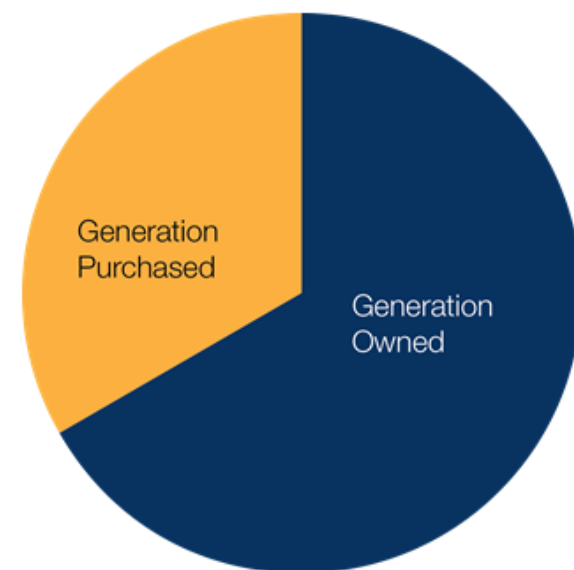
Public Power: Generate or Purchase?



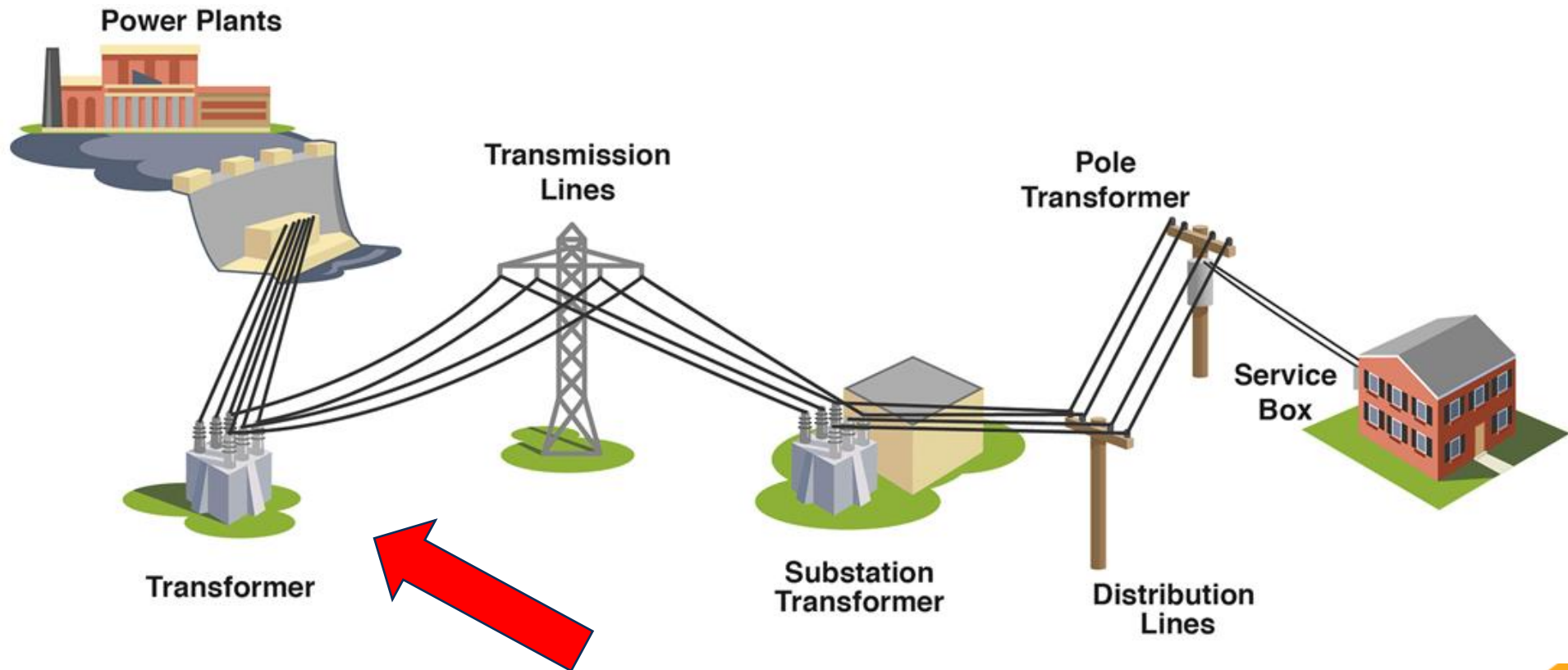
Where Public Power Utilities Get The Power They Distribute

2/3: Generation owned by public power utilities and joint action agencies

1/3: Generation bought from investor-owned and co-op utilities and federal power agencies



The Electric Power System

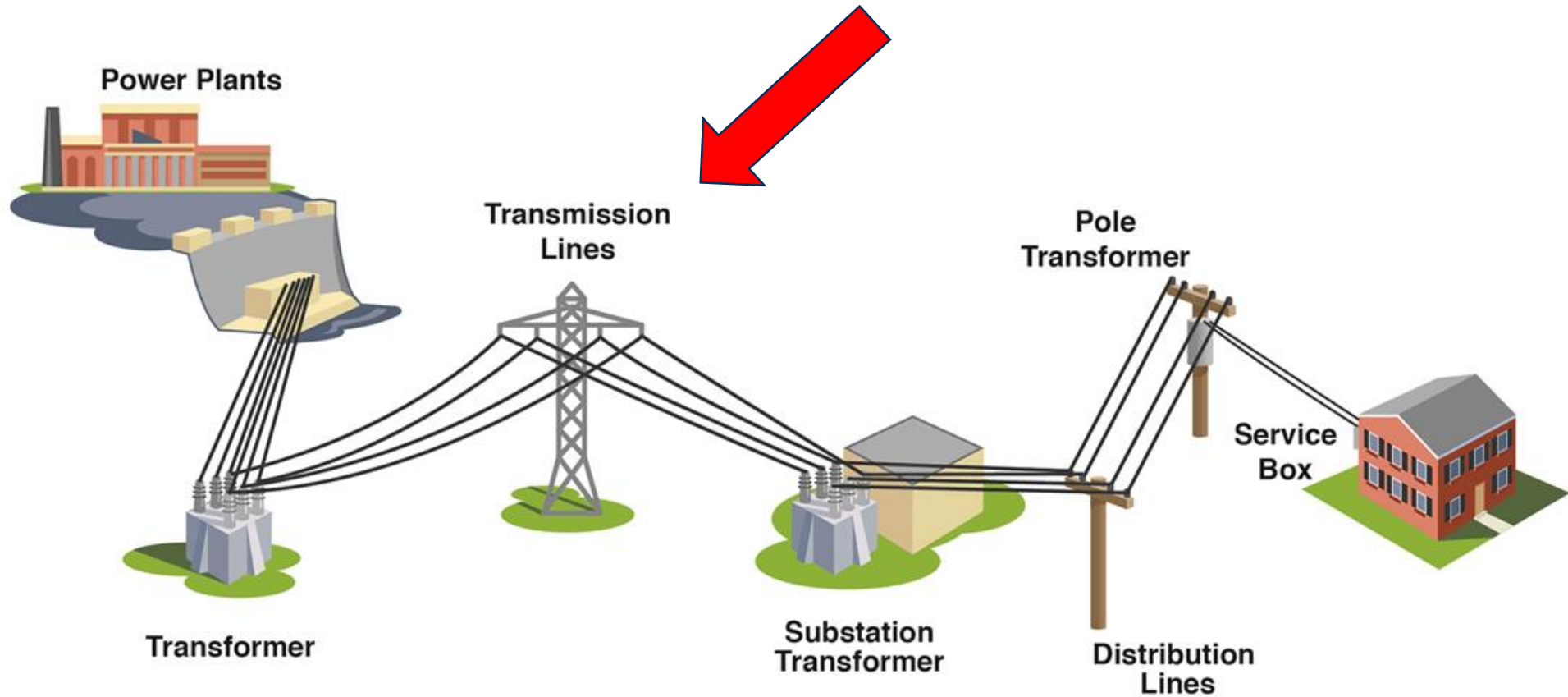




Step-Up Substations

- Always located near a power plant
- Convert the electric power (energy) coming out of the generating plant from Low Voltage/High Current to High Voltage/Low Current to reduce losses in the transmission lines

The Electric Power System





Transmission Lines

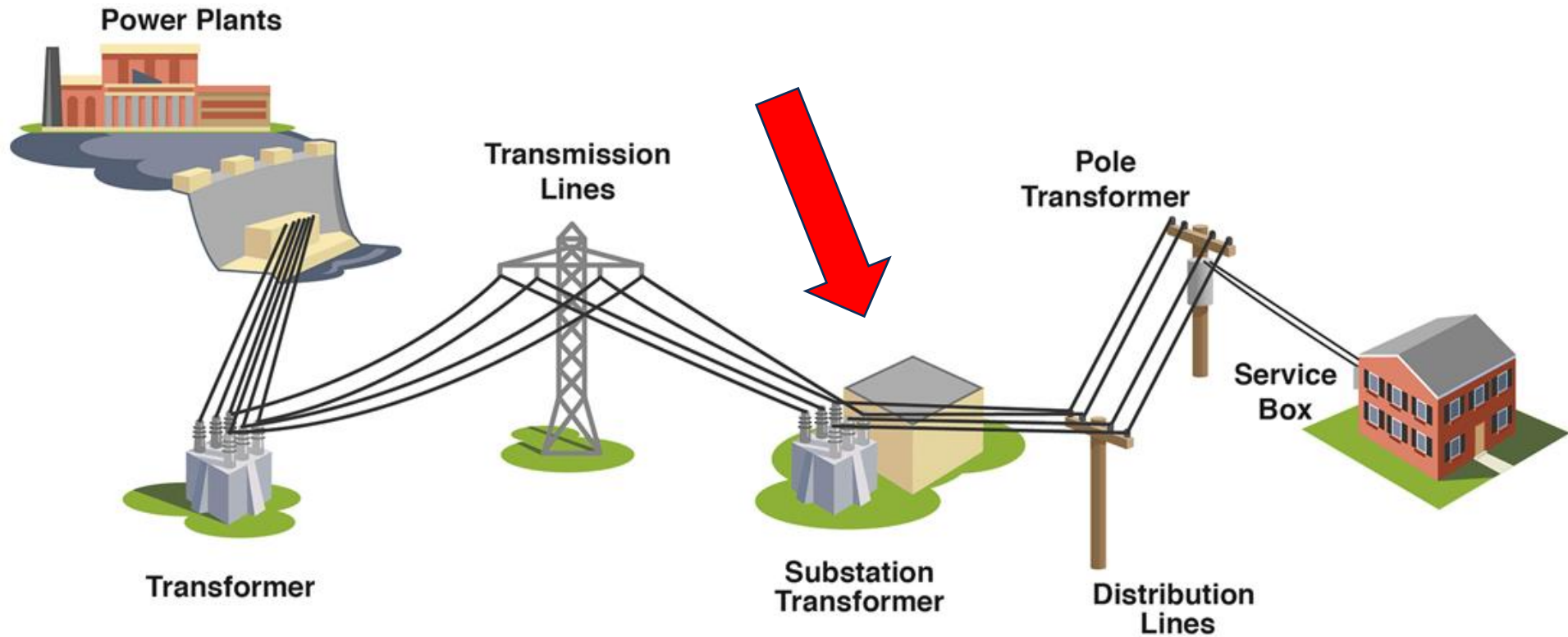
- Transmission lines operate at high voltages usually between 70Kv and one million volts
- Transmission lines are the large towers you see crossing the country side
- They can be thought of as the long haul tractor trailer trucks of our industry

Need for Transmission Lines



- To reduce losses over long distances
- To strengthen the energy supply network in a region
- To tie the regional grids strongly together to form a national grid
- To move the “bulk” quantities of energy from remote power plants to substations closer to the load centers

The Electric Power System



Voltage Step-Down Substations

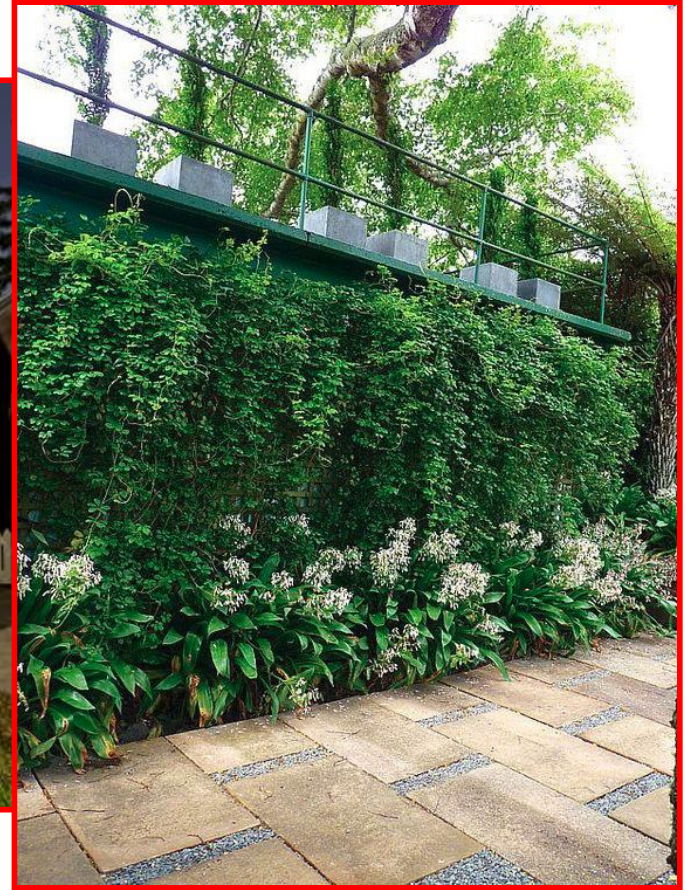


- Utilize Transformers
 - Utilized in the opposite direction as step-up
- Step-Down in Voltage
 - The secondary has fewer turns than the primary and reduces the voltage to a lower level
 - Converts transmission voltage levels to distribution voltage levels (typically between 12Kv to 14Kv)
- Types of Substations
 - Transmission to sub-transmission
 - Sub-transmission to distribution
 - Transmission directly to distribution

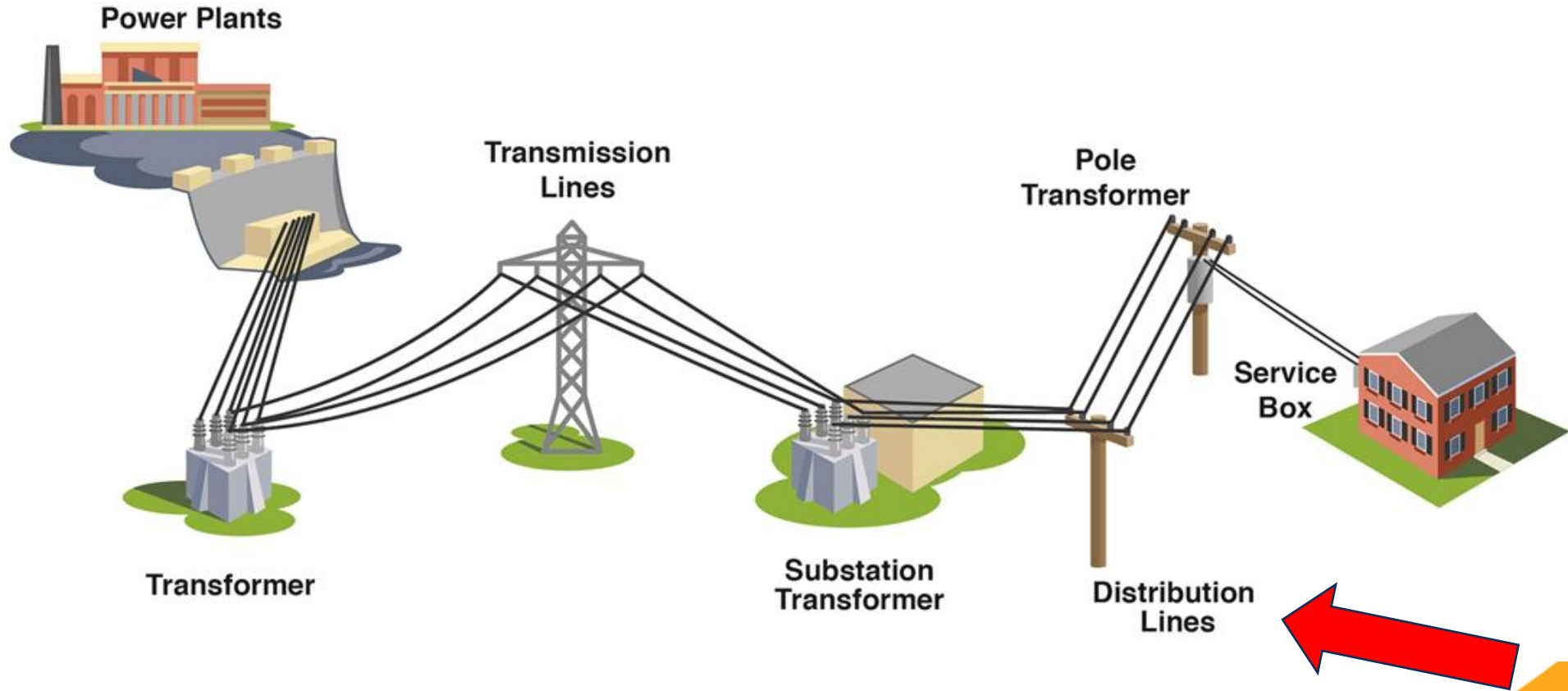
Distribution Substation



Substation Options



The Electric Power System

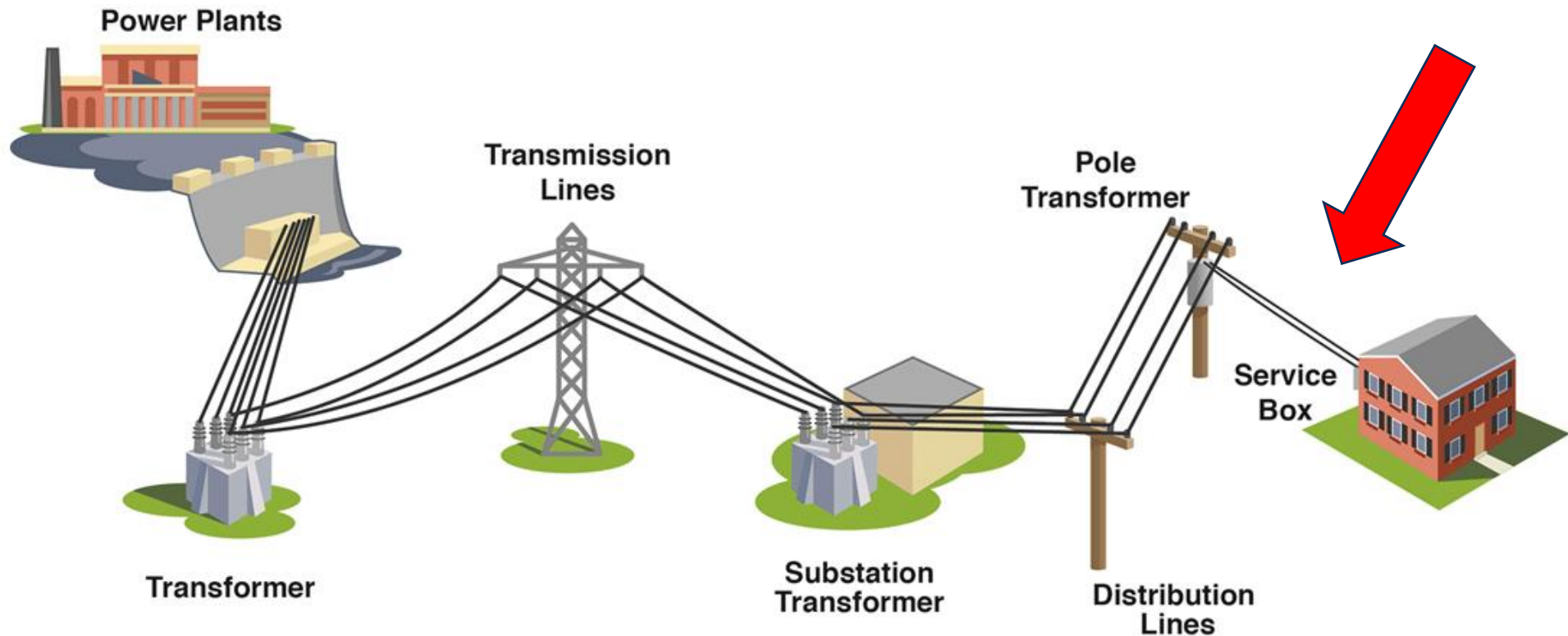




Distribution Systems

- They are the final link to the customer
- Typically operate at a primary voltage between 2Kv and 35Kv
 - Most operate at between 12Kv and 14Kv
 - Have a secondary voltage level typically between 120 volts and 440 volts

The Electric Power System



Transformers



Pad Mount and Underground



Metering



Electric Meters



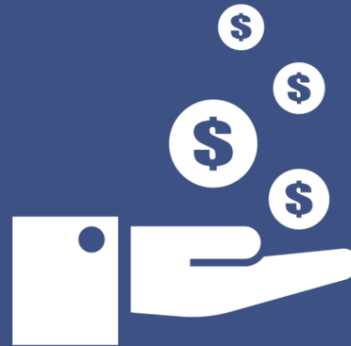
The Public Power Advantage



PUBLIC POWER =



+



+



LOCAL CONTROL

LOW RATES

HIGH RELIABILITY

The Public Power Advantage



**RESIDENTIAL
CUSTOMERS PAY
14% LESS**
than customers with
privately owned utilities



**Rates are
generally
lower**



**COMMERCIAL
CUSTOMERS PAY
10.7 CENTS
PER KWH**
vs 11.1 cents per kWh
with privately owned utilities

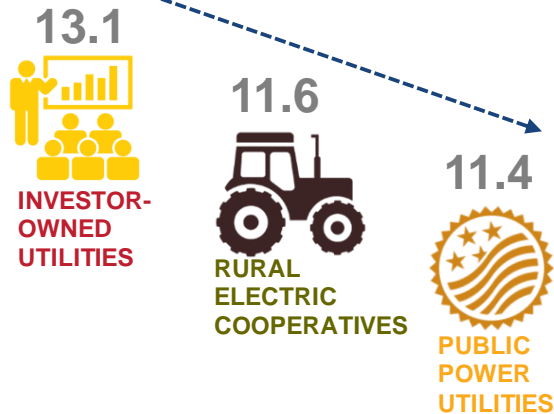
The Public Power Advantage



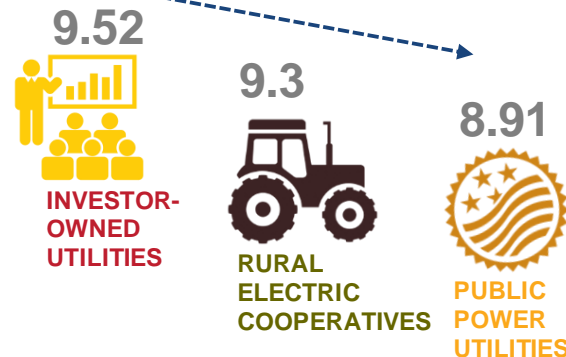
PUBLIC POWER COSTS LESS

National average retail rates: cents per kilowatt hour

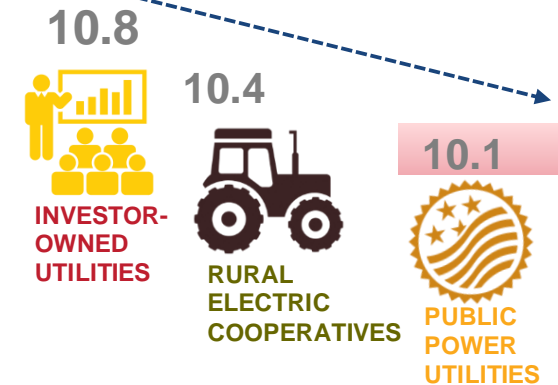
RESIDENTIAL



BUSINESS



OVERALL

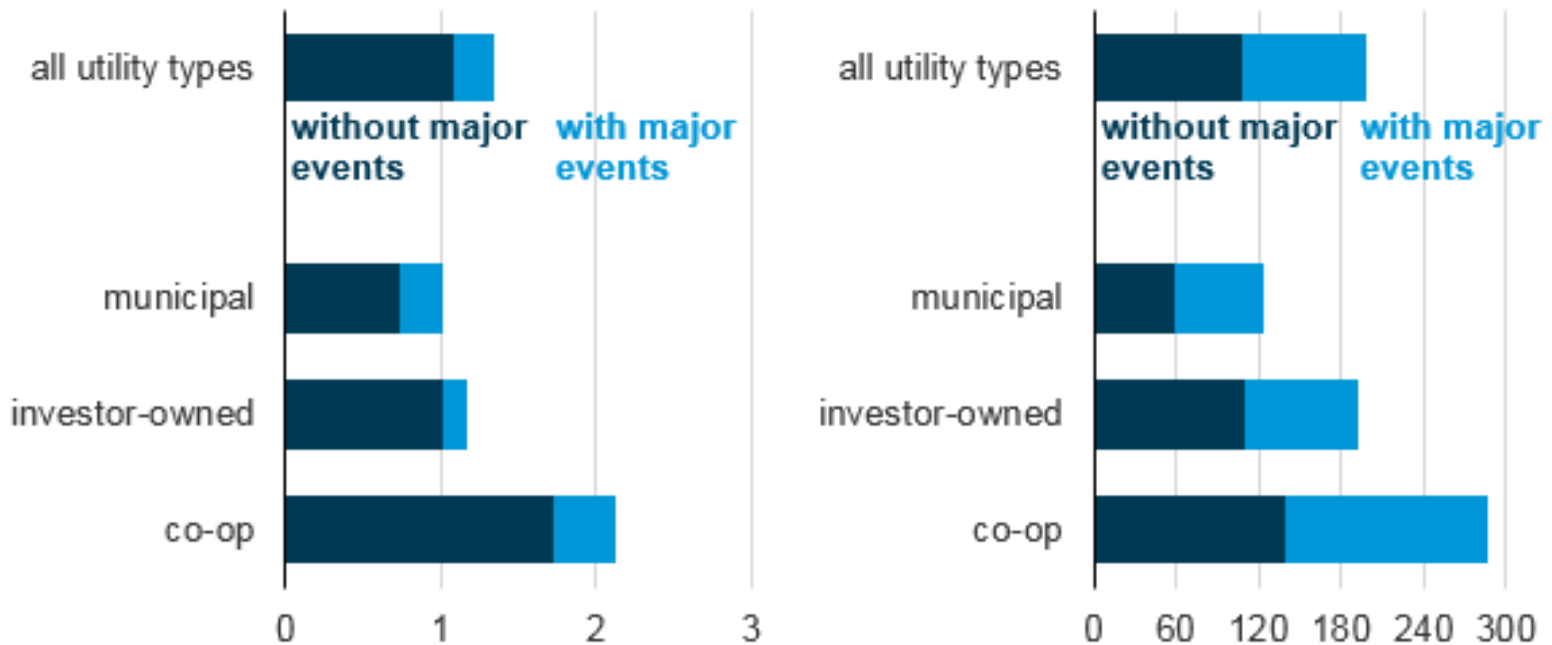


The Public Power Advantage: Reliability



EIA data show average frequency and duration of electric power outages

Average electric power service interruptions per customer by utility type, 2015
 frequency (number of instances) total duration (minutes)



Source: U.S. Energy Information Administration, *Annual Electric Power Industry Report* (EIA-861) 2015 early release

The Public Power Advantage



BEST IN CUSTOMER SERVICE

J.D. Power 2016 Business Customer Satisfaction Survey

4 out of top 8 utilities are public power

- Midwest midsize: Omaha Public Power District Nebraska
- South midsize: JEA, Jacksonville, Florida
- West large: Salt River Project, Arizona
- West midsize: Sacramento Municipal Utility District, California

The Public Power Advantage



POWERFUL ECONOMIC ENGINES

Public power utilities employ **93,000** people
and earn **\$58 BILLION** in revenue annually



**ECONOMIC
DEVELOPMENT**



**NEW BUSINESS TO
THE COMMUNITY**



BUY LOCAL

The Public Power Advantage



**PUBLIC POWER UTILITIES
COLLECTIVELY GIVE MORE THAN
\$1 BILLION BACK TO THE
COMMUNITIES THEY SERVE**

The Public Power Advantage



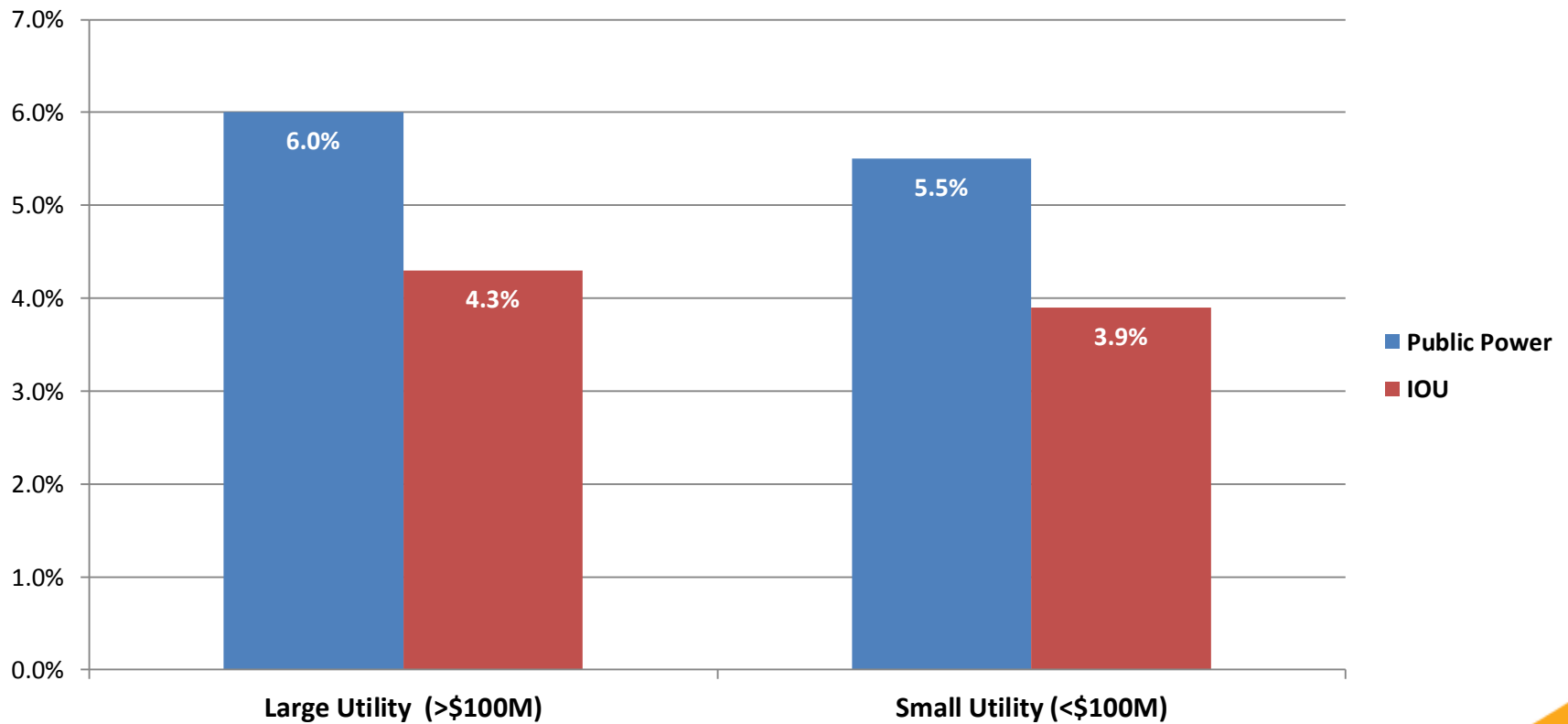
PUBLIC POWER GIVES BACK

- ✓ **5.5%** of electric operating revenues to state and local governments
- ✓ Property-like taxes, **payments in lieu of taxes**, general fund transfers, free and reduced cost electric services

More Money Stays in the Community



Payments to Local/State Governments
(% of electric operating revenue - 2014)



Jobs Stay in the Community



When you work for a publically-owned electric utility, you become:

- Part of a long tradition of public power cities and towns in the United States
- Delivering a vital service to the American economy for more than 130 years.

The Public Power Advantage



“Public Power” is an expression of the American ideal of local people working together to meet local needs.

When you are a member of the public power family, you join with friends and neighbors to deliver electricity to every home and business 24/7:

- In a safe and responsive manner
- On a not-for-profit basis
- While protecting the environment

The Public Power Advantage



- Local
- Been here yesterday, will be here tomorrow
- We live here too: we're your neighbors and friends
- Our governing body meets next door

Electric Utility Industry Overview



- Questions/Comments about today's material?
- Tomorrow:

Implementing a Customer-Focused Key Accounts Program



Contact Me

Tim Blodgett

President and CEO, Hometown Connections

Hometown Connections

303-526-4515

tblodgett@hometownconnections.com