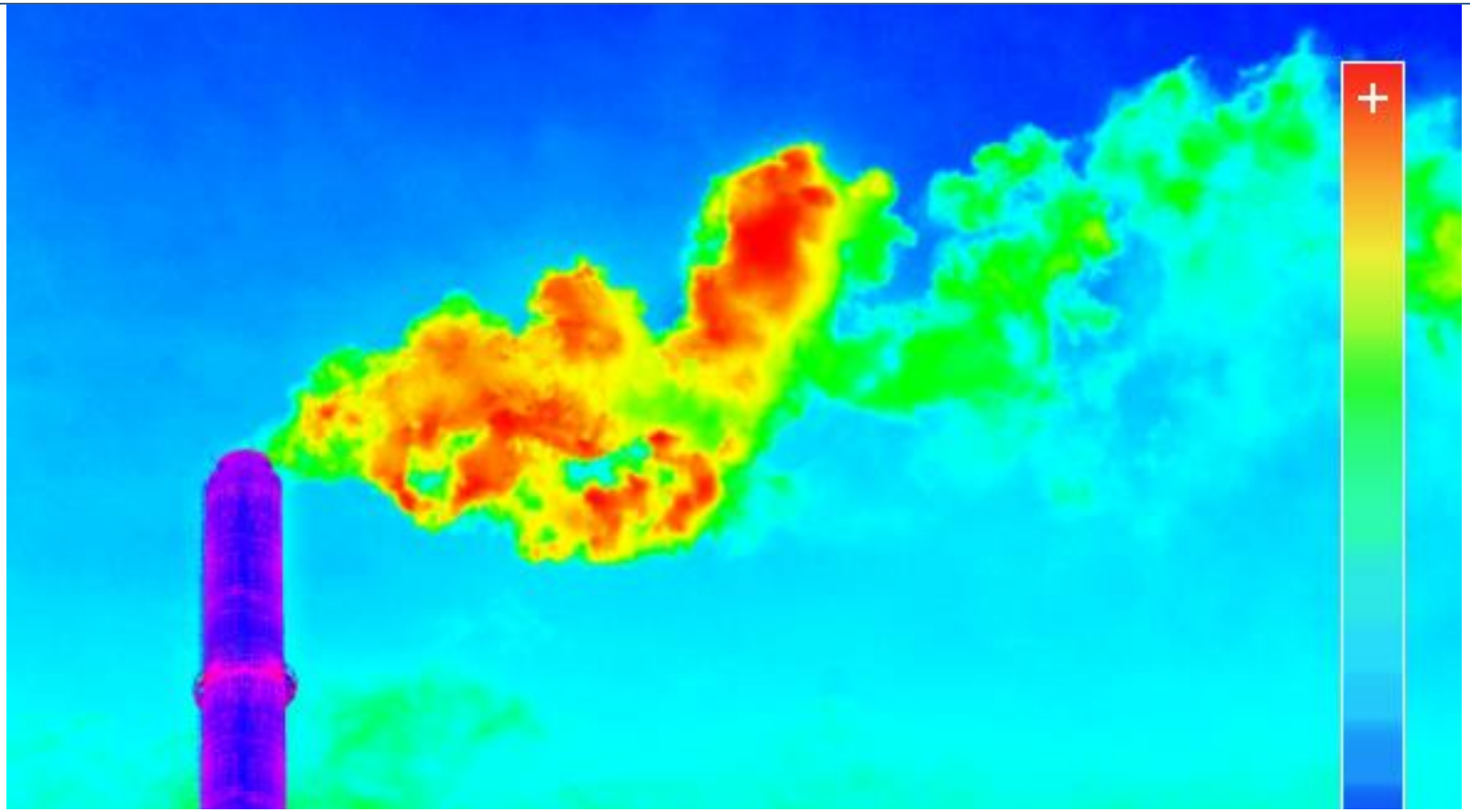

Distributed Generation:
Cleaner, Cheaper, Stronger

Industrial Efficiency in the Changing Utility Landscape

Jessica Lubetsky
Officer
Pew Charitable Trusts

Michael Fucci
Associate
ICF International

THE PEW CHARITABLE TRUSTS

Congressional voices

Congressman
Earl Blumenauer
(OR-3)

Congressman
Tom Reed
(NY-23)

Speaking on his behalf:
Phillips Hinch, Senior Economic Policy Advisor

Our research

Jessica Lubetsky

officer, clean energy initiative

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Pew clean energy initiative

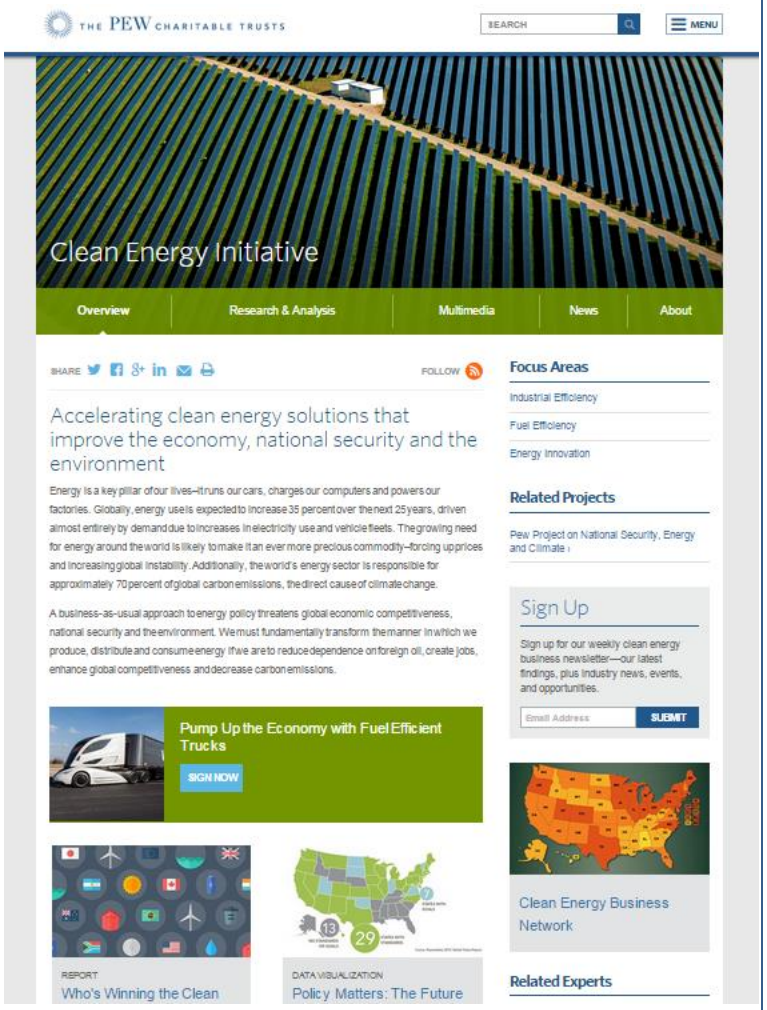
The goal is to accelerate the clean energy economy for its national security, economic, and environmental benefits.

The initiative promotes the adoption of key changes to U.S. energy policy in four sectors:

- Industry
- Utilities
- Transportation
- Research and Development

www.pewtrusts.org/cleanenergy

www.pewtrusts.org/businessnetwork



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Our research

Global Investment

Innovation and Competitiveness

National Security

A changing electrical system

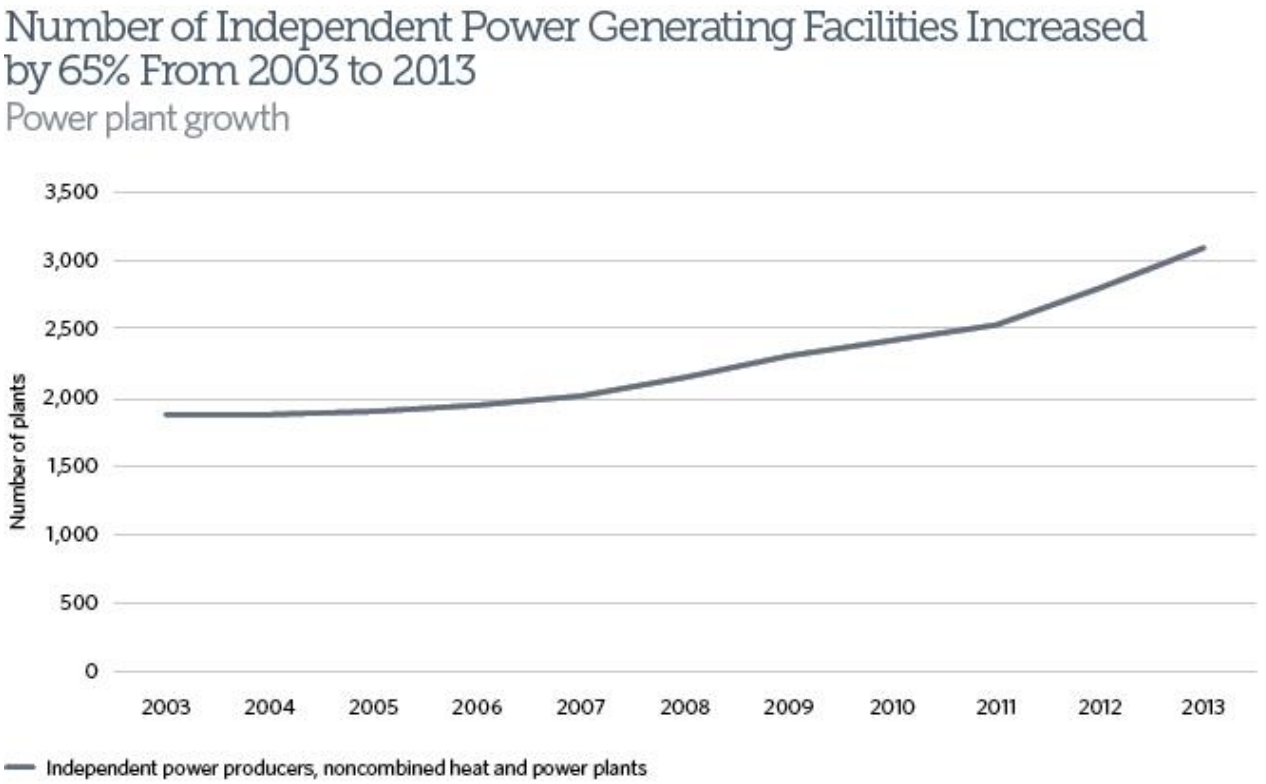
Causes

- Demand for electricity is flattening
- Cheaper, more efficient power sources are expanding
- Environmental standards and requirements for power plants are growing

Effects

- Power generation is tilting away from coal
- Power sector emissions are falling
- Competition in the sector is growing
- Pressure is mounting on businesses and policymakers to adapt to changes

Increase in independent power producers



Source: U.S. Energy Information Administration

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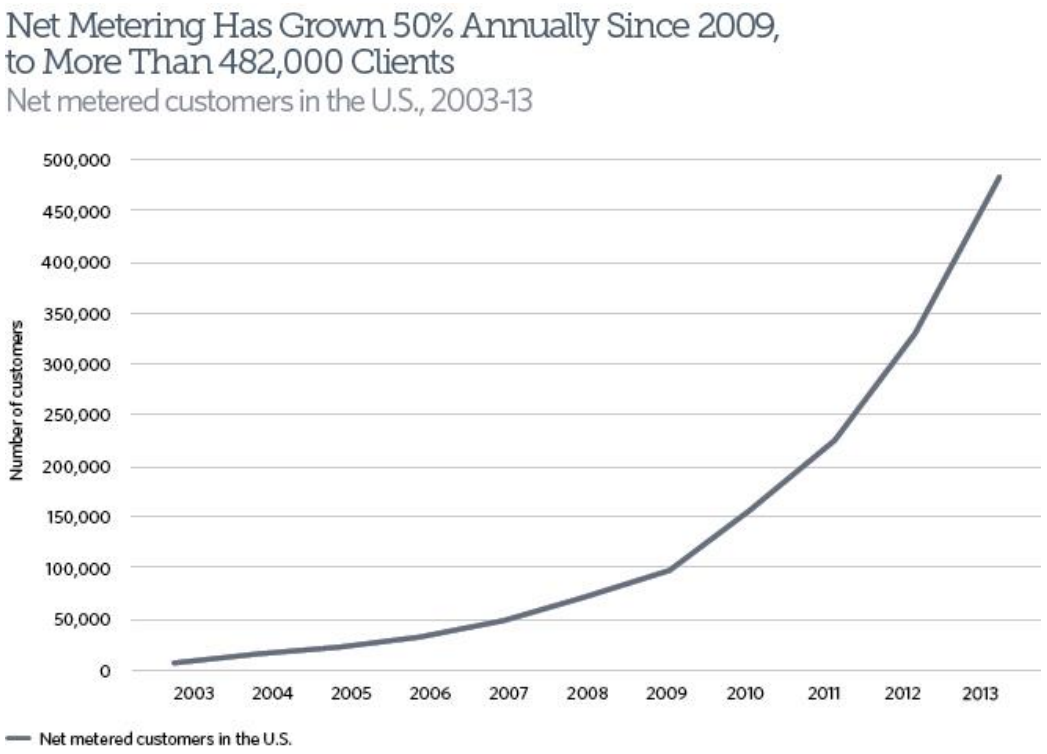
Net metering is helping to drive the spread of distributed generation



Source: U.S. Energy Information Administration

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Benefits of distributed generation

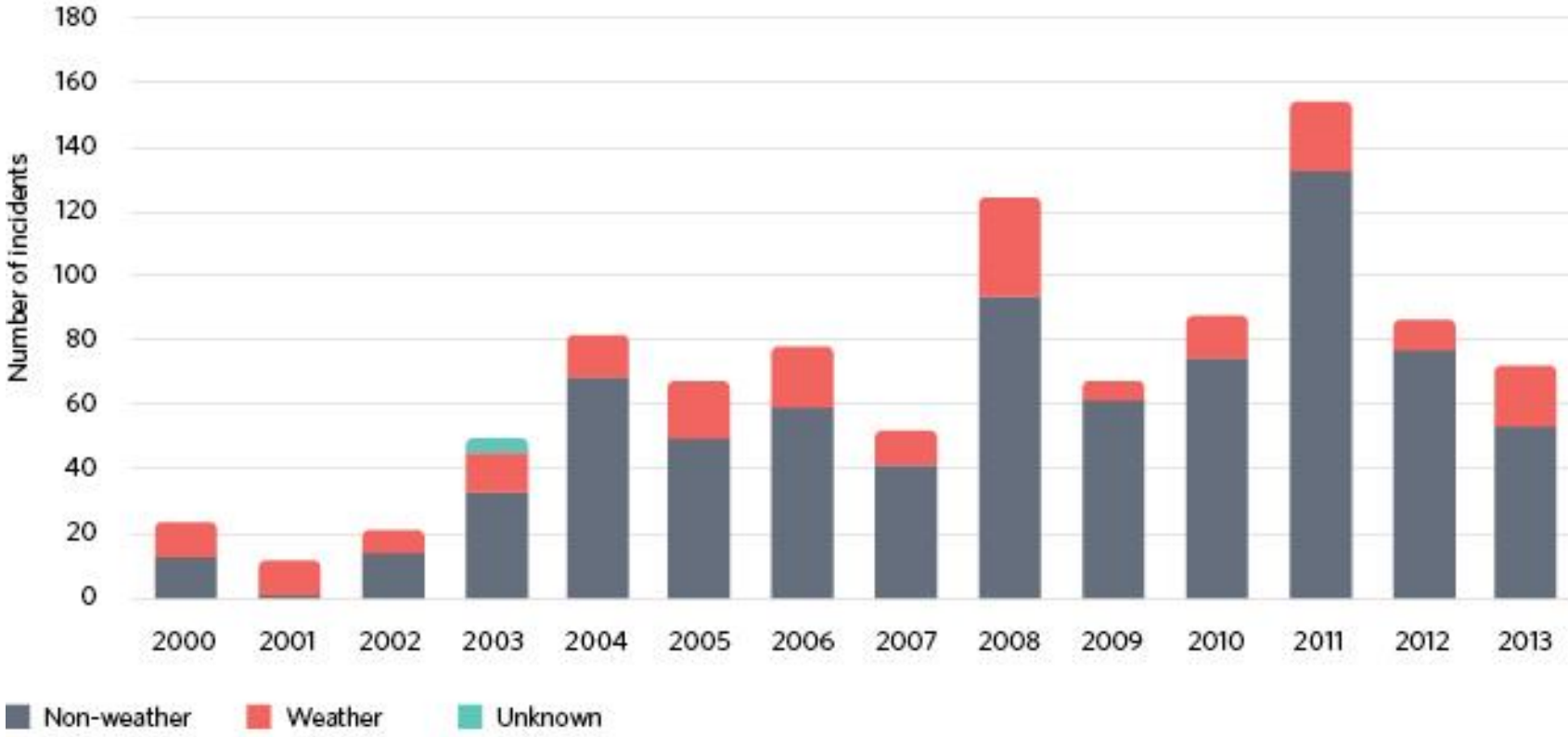
- Consumer choice
- Increased grid resilience and energy security
- Lower energy prices
- Reduced transmission losses
- Declining emissions

"Our reliance on installed, dispatchable power generation during extreme weather serves as a shining example of why diversity of baseload capacity is necessary to secure grid reliability."

>>Senator Lisa Murkowski (R-AK)

The U.S. Electric Grid Experienced 300 Disturbances From 2011 to 2013

Significant incidents, by type



Source: Pew Charitable Trusts and Inside Energy

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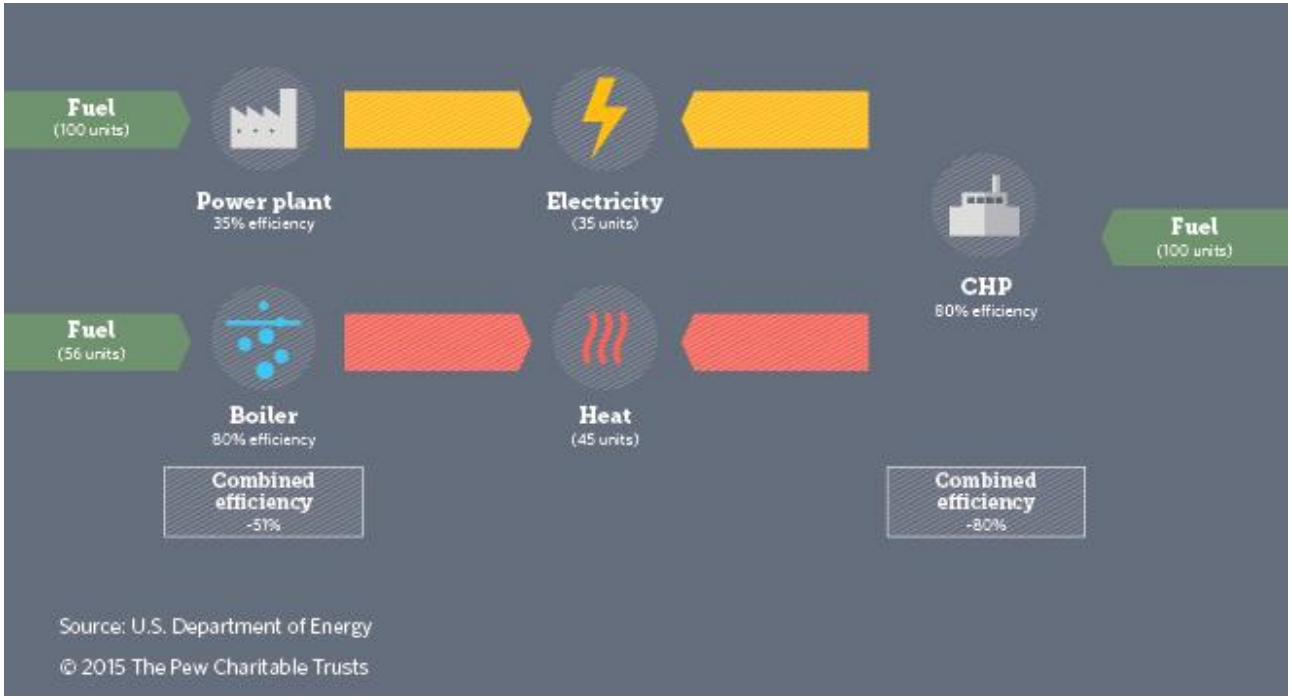
What is combined heat and power?

Known as CHP, this technology generates electricity and thermal power from a single fuel source.



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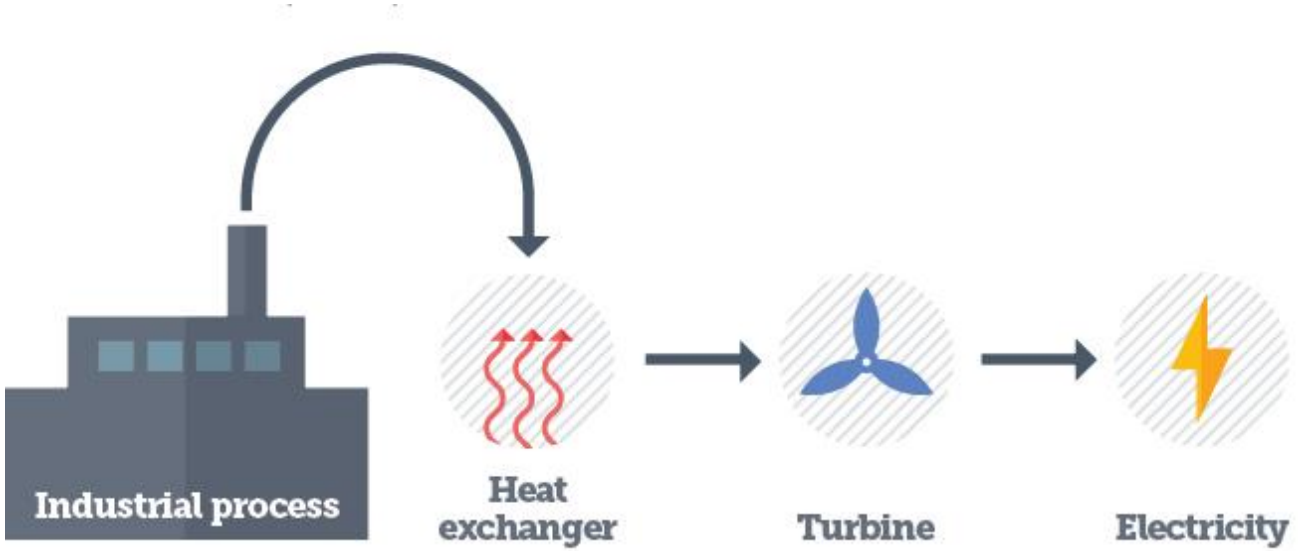
VIDEO: Turn Heat Into Power

www.pewtrusts.org/industrialefficiency

What is waste heat to power?

Known as WHP, this technology captures the waste heat from industrial processes and uses it to make electricity with no additional incremental emissions. No thermal heat is produced.



Source: Heat is Power Association

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VIDEO: Waste Heat To Power

www.heatispower.org/resources

CHP & WHP enhances economic, energy security, & environmental objectives

- Strengthens grid resilience/energy reliability
- Helps U.S. use natural gas efficiently
- Reduces need for large-scale investments in transmission and/or new generating capacity
- Improves the competitiveness of manufacturing and commercial enterprises

Federal policy is spurring development of CHP & WHP

- Financial incentives
- Critical facility resilience/disaster response
- Goal setting with executive orders
- Grid integration policies
- Demand driving policies
- Technical assistance
- Research
- Emissions reduction

POWER Act of 2015 (H.R. 2657/S.1516)

would improve the investment tax credit for CHP projects and apply to WHP

Current Policy	Proposed Policy
10% ITC for combined heat and power	Expands ITC to 30%
Does not include waste heat to power	Includes waste heat to power
Applies to the first 15MW of projects which are smaller than 50 MW	Applies to first 25MW, eliminates project size cap
Ends Dec. 2016	Ends Dec. 2018

About the POWER Act

- **H.R. 2657:** Congressmen Tom Reed(R-NY) and Earl Blumenauer(D-OR) introduced in June 2015
- 42 cosponsors

- **S. 1516:** Senators Susan Collins(R-ME) and Bob Casey(D-PA) introduced in June 2015
- Cosponsor: Sen. Harry Reid (D-NV)

Rep. Mark E. Amodei (R-NV)
Rep. Joyce Beatty (D-OH)
Rep. Dan Benishek (R-MI)
Rep. Mike Bishop (R-MI)
Rep. Earl Blumenauer (D-OR)
Rep. Kathy Castor (D-FL)
Rep. Chris Collins (R-NY)
Rep. Gerald Connolly (D-VA)
Rep. Joseph Crowley (D-NY)
Rep. Carlos Curbelo (R-FL)
Rep. Rodney Davis (R-IL)
Rep. Charlie Dent (R-PA)
Rep. Robert Dold (R-IL)
Rep. Dan Donovan (R-NY)

Rep. Christopher P. Gibson (R-NY)
Rep. Joseph J. Heck (R-NV)
Rep. Ron Kind (D-WI)
Rep. Ann Kirkpatrick (D-AZ)
Rep. Darrin LaHood (R-IL)
Rep. Ted Lieu (D-CA)
Rep. Daniel Lipinski (D-IL)
Rep. Frank LoBiondo (R-NJ)
Rep. Mia Love (R-UT)
Rep. Tom MacArthur (R-NJ)
Rep. Tom Marino (R-PA)
Rep. Betty McCollum (D-MN)
Rep. David McKinley (R-WV)
Rep. Candice Miller (R-MI)

Rep. Tim Murphy (R-PA)
Rep. Richard Neal (D-MA)
Rep. Bill Pascrell (D-NJ)
Rep. Thomas Reed (R-NY)
Rep. Tim Ryan (D-OH)
Rep. Mike Simpson (R-ID)
Rep. Elise Stefanik (R-NY)
Rep. Steve Stivers (R-OH)
Rep. Mike Thompson (D-CA)
Rep. Dina Titus (D-NV)
Rep. Paul Tonko (D-NY)
Rep. Dave Trott (R-MI)
Rep. Peter Welch (D-VT)
Rep. Kevin Yoder (R-KS)

Modeling results

Michael Fucci,

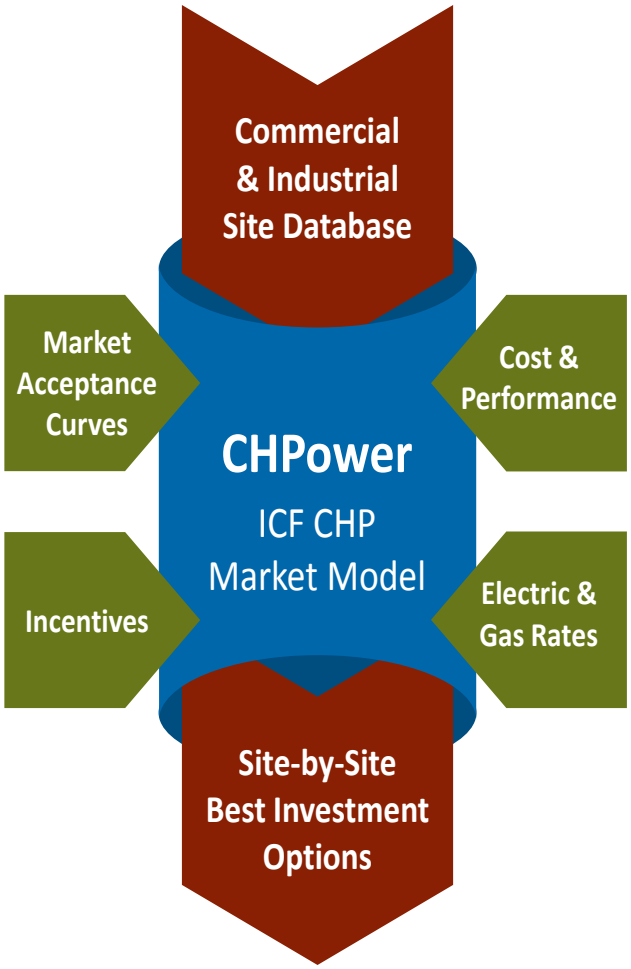
associate, ICF International

THE PEW CHARITABLE TRUSTS

Market potential inputs

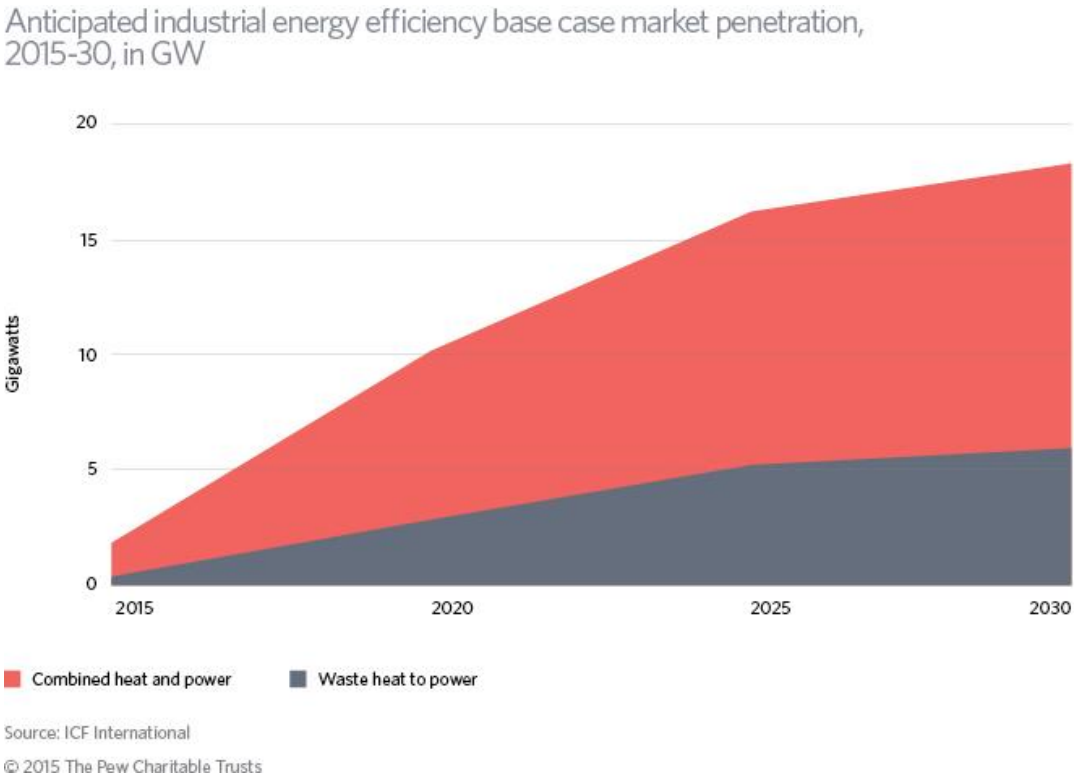
- Technical market potential
- Current electric and gas prices
- Electric and gas rate escalation
- CHP technology cost and performance
- CHP market acceptance – ACEEE assumptions
- Applicable CHP incentives
  - Base Case: 10% Federal ITC through 2016, applied to first 15 MW of CHP systems up to 50 MW
  - Alternative policy or incentive scenarios:

    1. **POWER Act of 2015** - 30% Federal ITC through 2018, applied to first 25 MW of CHP and WHP systems of any size
    2. **Final CPP Rule** – EPA modeled CO_2 shadow prices and state emissions rate targets to calculate CHP credit



Base Case

- 18 GW of CHP and WHP penetration by 2030
  - 12 GW from CHP, 6 GW from WHP
- Texas, New Jersey, and California see some of the greatest gains in CHP/WHP development.



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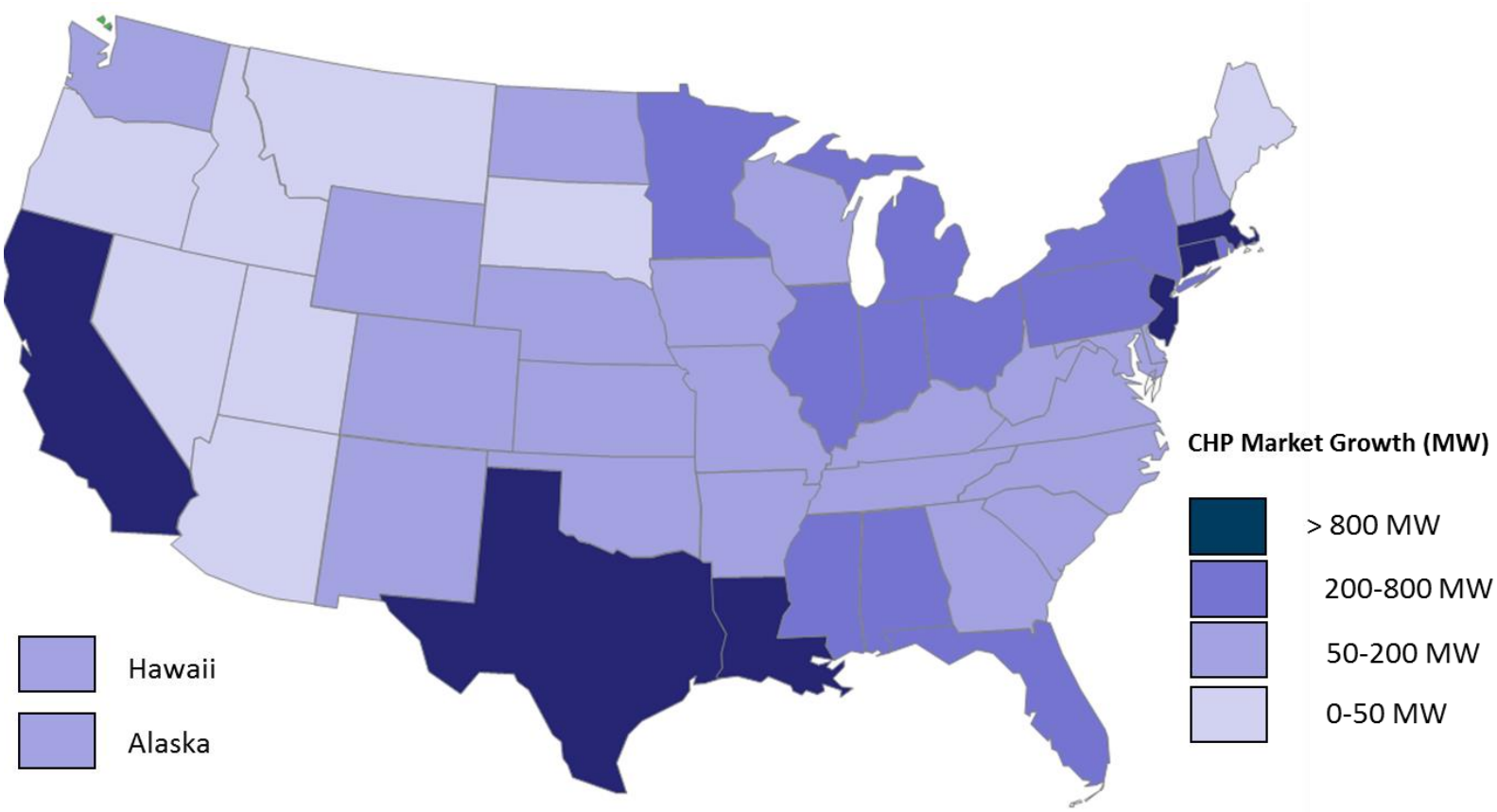
Base Case Results:

Growth in CHP & WHP Capacity by State (2015-30)



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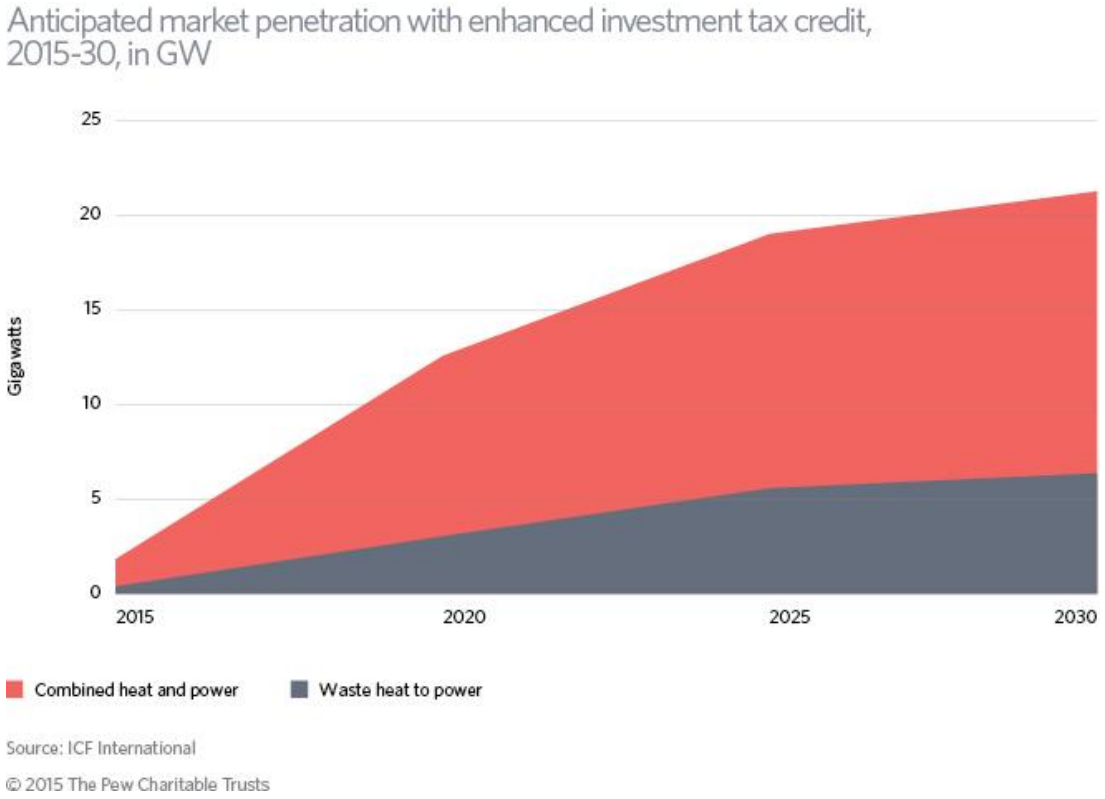
POWER Act could add 21.5 GW of new CHP & WHP by 2030

- 15 GW of CHP
- 6.4 GW of WHP
- Increase from base case:
  - 2,700 MW of CHP
  - 480 MW of WHP



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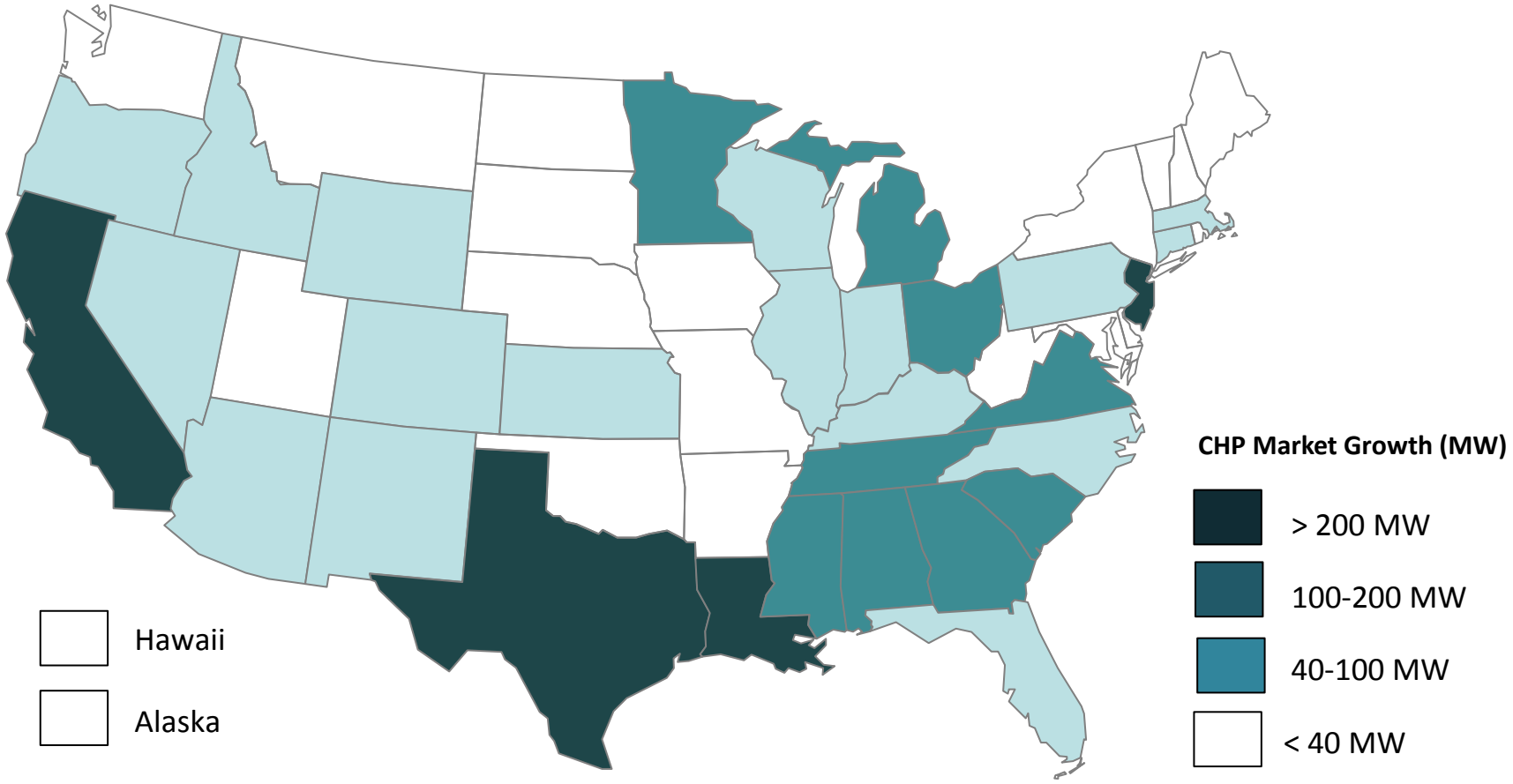
POWER Act Results:

Growth in CHP & WHP Capacity by State (2015-30)



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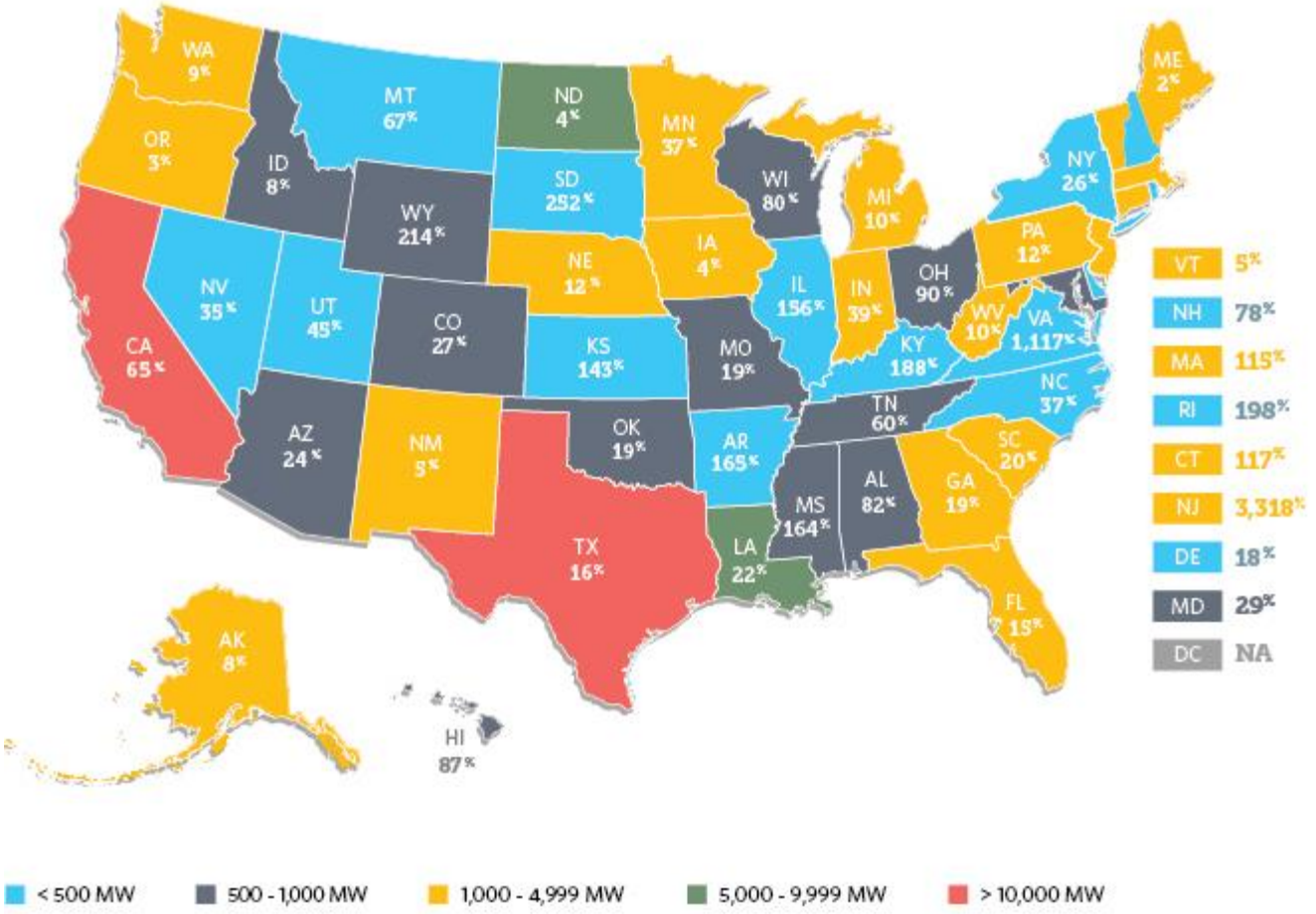
California and Texas Could See Largest Capacity Gains, New Jersey Greatest Percentage Change

Industrial energy efficiency market penetration and percentage growth in an improved policy landscape, 2030



Source: ICF International

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