



WHAT'S FUELING THE CLEAN ENERGY ECONOMY? NATIONAL TRENDS AND LOCAL OPPORTUNITY

CLEAN ENERGY BUSINESS NETWORK



POLICY

Inform and engage clean energy business leaders in policy issues impacting the industry



BUSINESS DEVELOPMENT

Promote networking/industry collaboration and provide resources to help small businesses reach target markets and grow



EDUCATION

Communicate the benefits of the clean energy economy to the public and policymakers

OUR MISSION

GROWING THE CLEAN ENERGY ECONOMY—ONE SMALL BUSINESS AT A TIME

3,000+ clean energy business leaders across 50 states and nearly 350 Congressional districts



Technology breakdown for members who have been categorized:



Visit www.cebn.org or text
CEBN to 66866 to join!

CEBN IS PROUD TO
BE A PARTNER!



The Power Network is EPIcenter's membership group for those interested in new energy innovation. The network engages a broad collective of supporters advancing our mission while enjoying opportunities for networking, continuing education, support, and access to EPIcenter leadership and innovators.

By becoming a member you will:

- Gain first-hand knowledge of start-up companies and breakthroughs in energy innovation
- Support the growth of a new asset for South Texas that will have global impact
- Enjoy the historic preservation of a part of San Antonio's history and EPIcenter's unique location on the San Antonio River

CEBN'S PARENT ORGANIZATION

The CEBN was founded by The Pew Charitable Trusts in 2009 to inform and engage clean energy business leaders in policy.



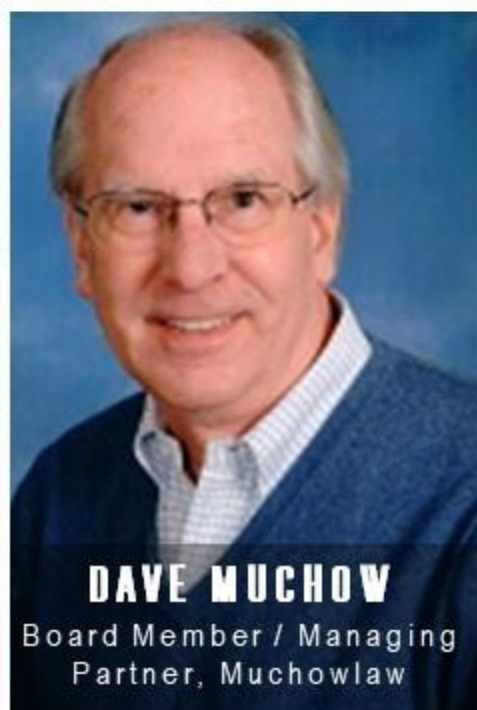
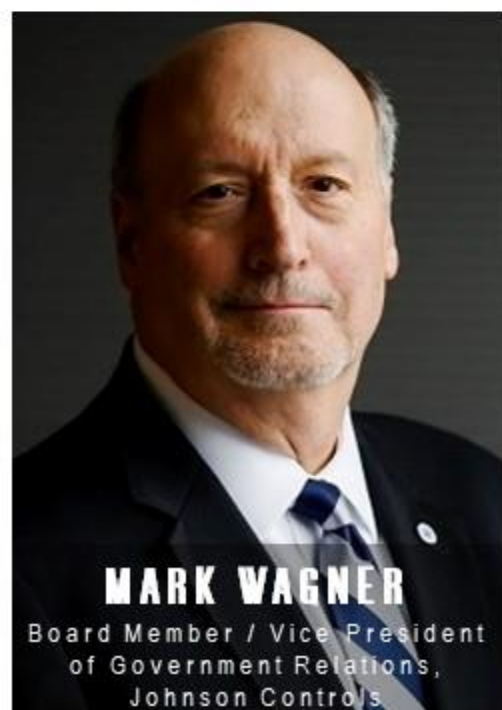
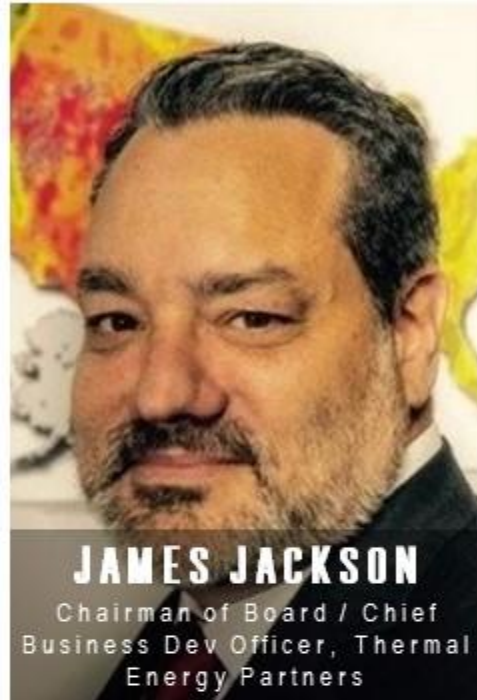
It transitioned in May 2017 to become an independent initiative of the Business Council for Sustainable Energy—a 26-year-old coalition of leading trade associations, corporations, and utilities working to advance market opportunities for energy efficiency, renewable energy, and natural gas. In its new home, the CEBN has reinvented itself to become a one-stop-shop of resources for small- and medium-size clean energy providers.

The CEBN serves as a bridge to promote policy and industry collaboration between small businesses and the highly-connected group of clean energy influencers represented by the BCSE.



CEBN STAFF & BOARD

The CEBN is governed by leaders representing the very core of our small- and medium-size business focus, along with representatives of major corporations that support our mission.



A photograph of a wind farm at sunset. Several wind turbines are visible, silhouetted against a bright orange and yellow sky. The sun is low on the horizon, creating a strong lens flare effect that radiates across the field. The foreground is a field of tall grass or crops, also bathed in the warm light of the setting sun.

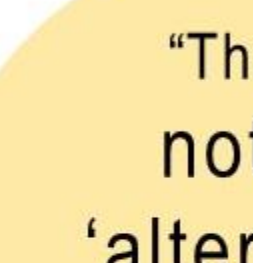
READY TO NAVIGATE THE CLEAN ENERGY LANDSCAPE?

73% of the
\$11.5 trillion
global investment
in new power
generation capacity
through 2050 is
projected to go to
wind and solar

These two technologies
will surge to almost
50% of global
electricity
generation by 2050

GLOBAL LANDSCAPE

A satellite map of North America, showing the United States, Canada, and Mexico. The map is overlaid with the text "NATIONAL LANDSCAPE" in a large, white, sans-serif font. The text is centered horizontally and vertically over the United States. The map shows various geographical features, including the Gulf of Alaska, Hudson Bay, the Great Lakes, the Gulf of Mexico, and the Pacific Ocean. State and provincial boundaries are visible, and some major cities are labeled. The map is presented as a curved, hemispherical view of the Earth's surface.



“There is nothing ‘alternative’ about clean energy.”

- Ethan Zindler, Head of Americas,
Bloomberg New Energy Finance

2018 Sustainable Energy in America Factbook

GROWTH SECTORS OF THE U.S. ENERGY ECONOMY



Energy Efficiency



Natural Gas



Renewable Energy

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New Energy Finance

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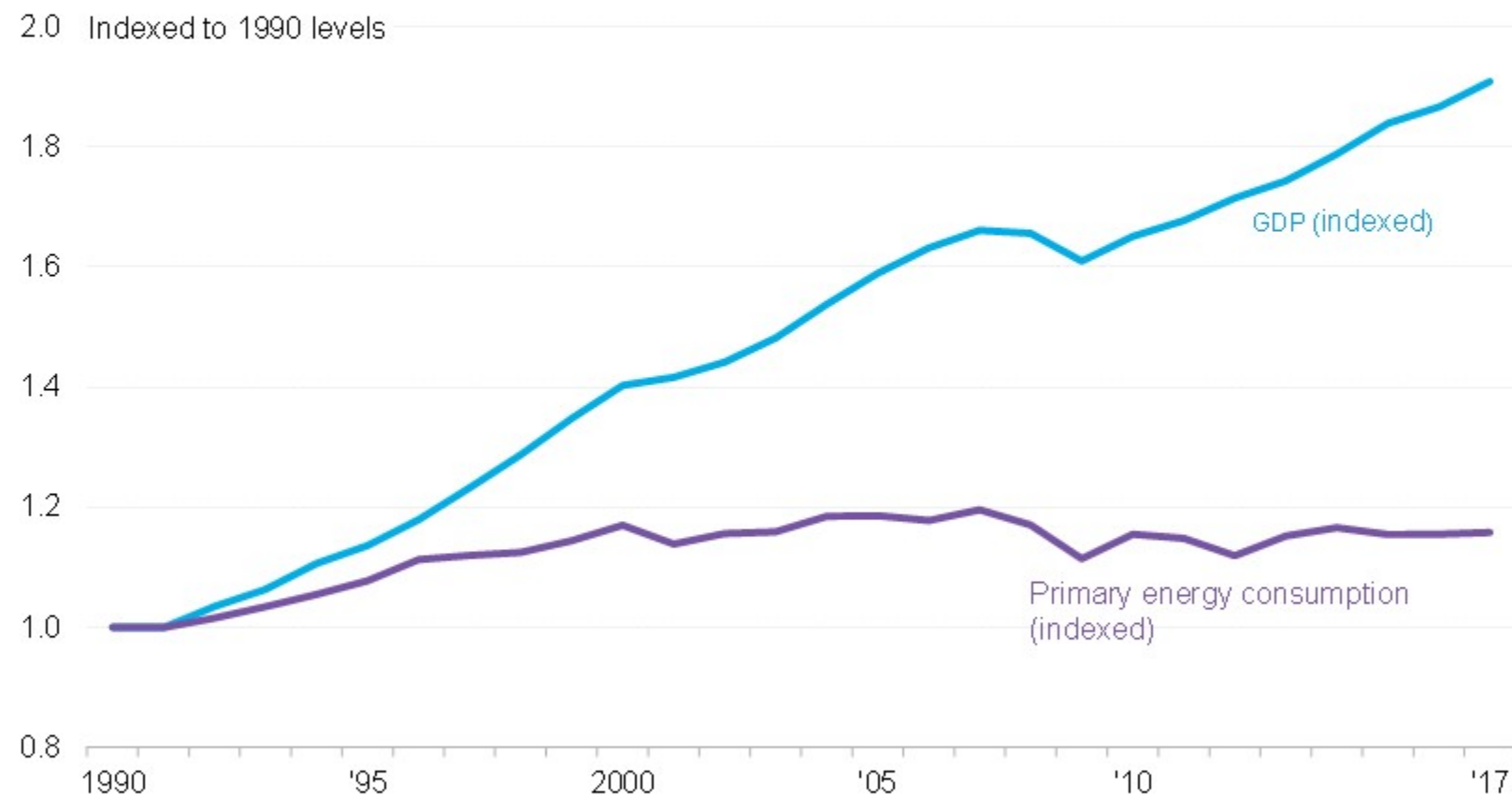


JPMORGAN CHASE & Co.



U.S. economic growth no longer relies on expanding energy consumption

U.S. GDP and primary energy consumption



In the past 10 years:

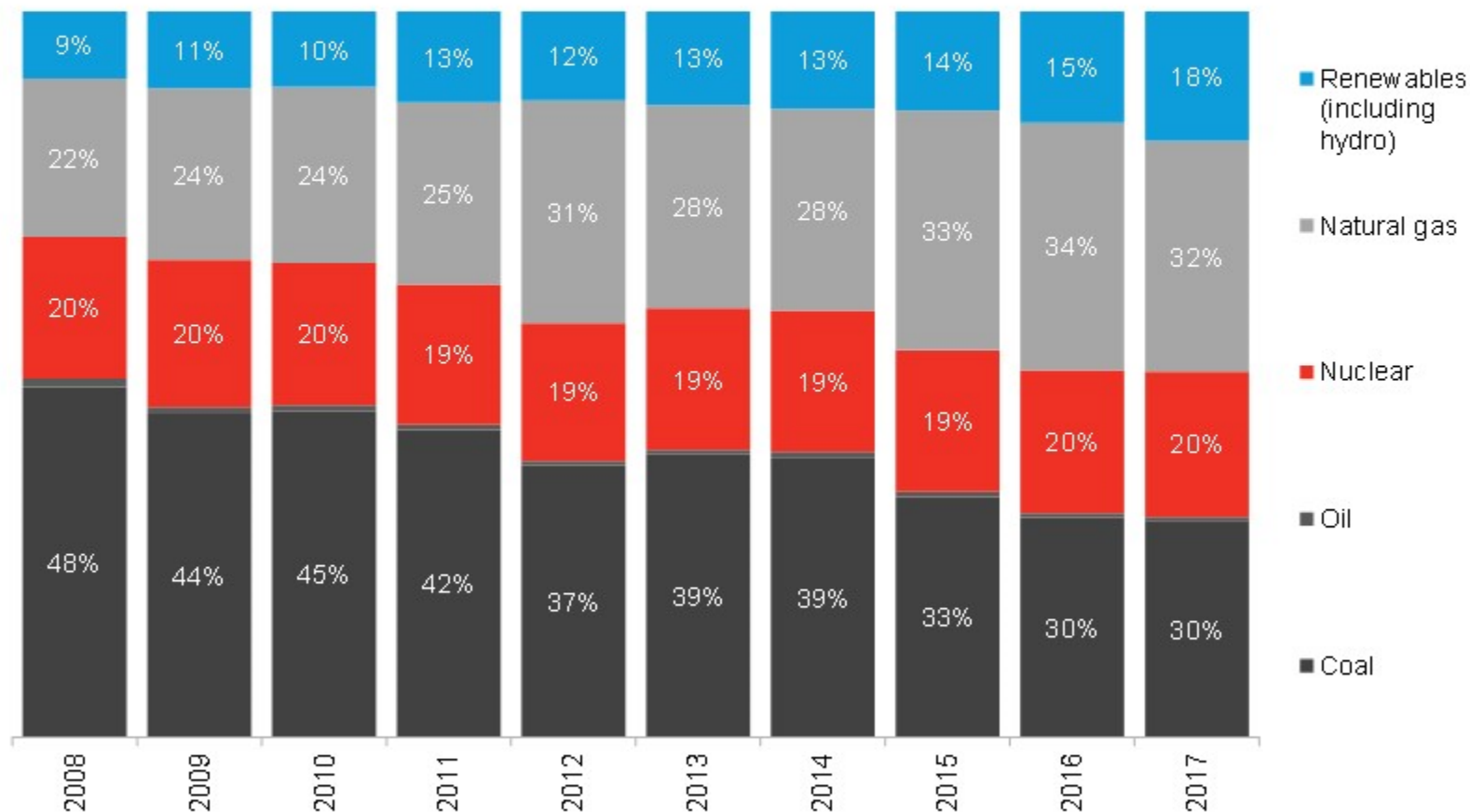
↑ +15%

↓ -1%

Source: Bureau of Economic Analysis, Lawrence Berkeley National Laboratory, BNEF. Notes: Values for 2017 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through October 2017). 2017 GDP estimate is a projection from economists compiled at ECFC <GO> on the Bloomberg Terminal.

Sustainable energy resources have become an established part of U.S. power

U.S. electricity generation by fuel type (% of total generation)



In the past 10 years*:



+90%



+47%



2%

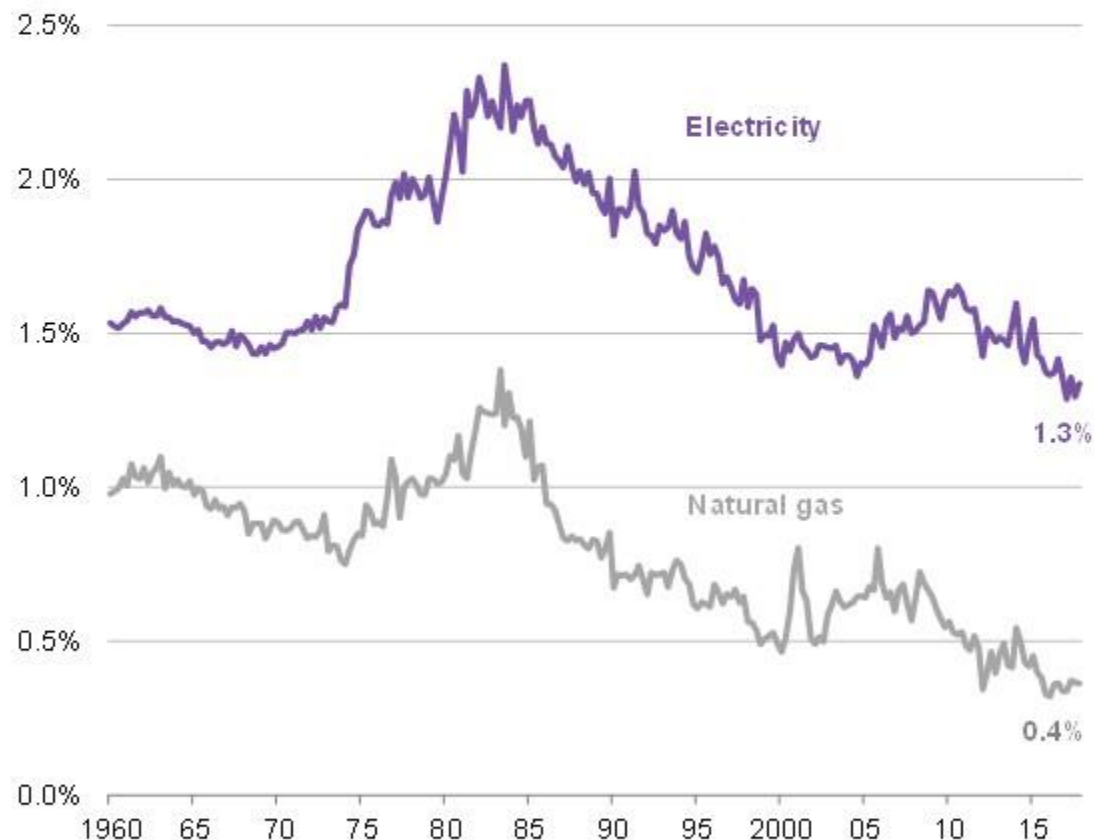


-38%

Source: EIA, BNEF. Note: Values for 2017 are projected, accounting for seasonality, based on latest monthly values from EIA (data available through November 2017). *Percentage changes over the past 10 years are for share of total generation, not for the absolute number of MWh generated.

Electricity is making up a smaller share of household bills than ever before

Electricity and natural gas as share of total consumption expenditure



Source: Bureau of Economic Analysis, BNEF

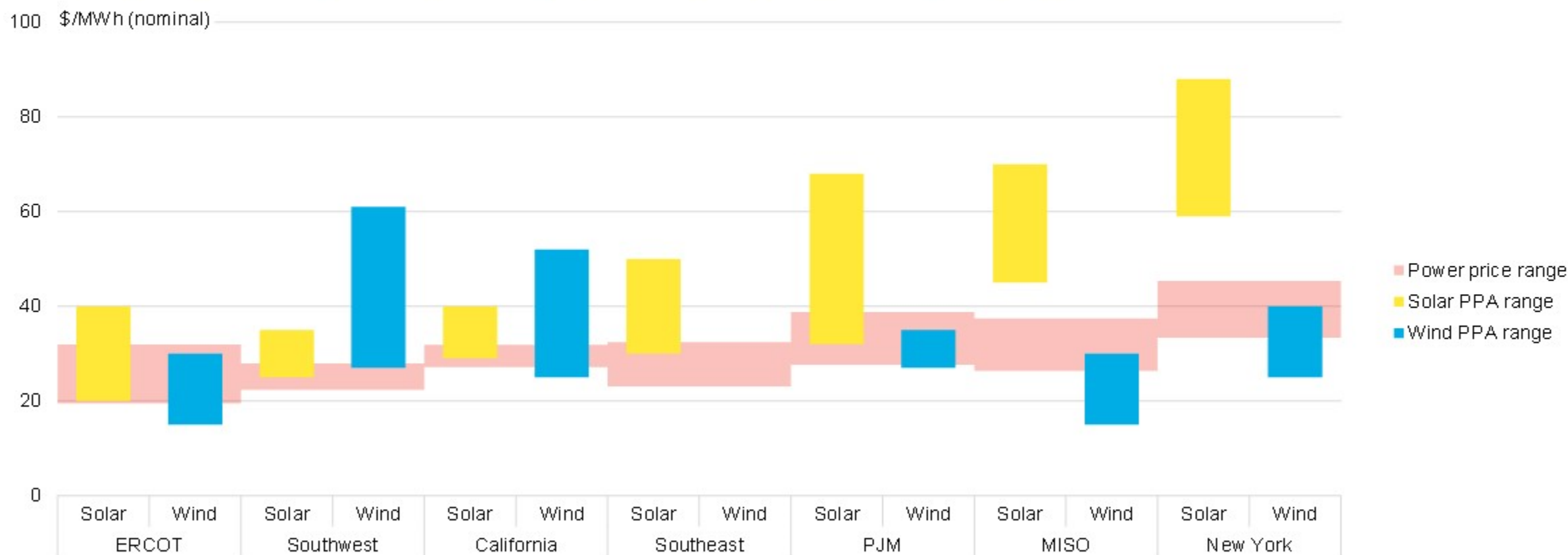
Total energy goods and services as share of total consumption expenditure



Source: Bureau of Economic Analysis, BNEF

Clean energy is no longer expensive: Wind, solar contracts are economic in parts of the U.S.

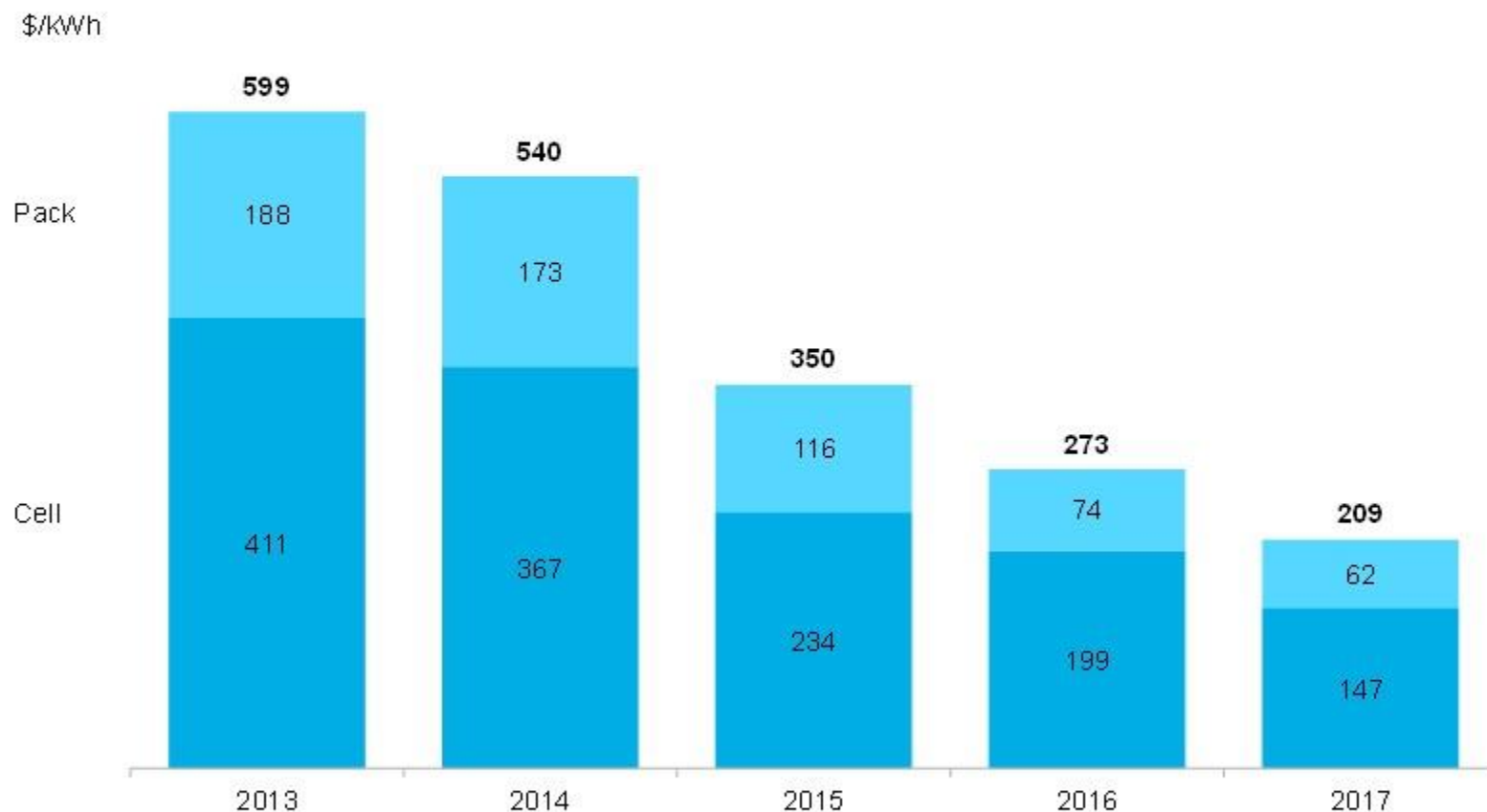
Wind, solar power purchase agreement price ranges (estimated) and power price ranges – by region



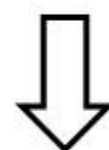
Source: Bloomberg New Energy Finance, SEC filings, interviews, analyst estimates Notes: MISO is the Midwest region; PJM is the Mid-Atlantic region; SPP is the Southwest Power Pool which covers the central southern U.S.; NEPOOL is the New England region; ERCOT covers most of Texas. Wholesale power prices are based on market-traded futures for calendar year 2018 for select nodes within each region.

Cheaper batteries are driving the falling cost of electric vehicles

Lithium-ion battery pack prices

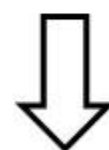


In the past 5 years:



-\$390/kWh
-65%

In 2017:

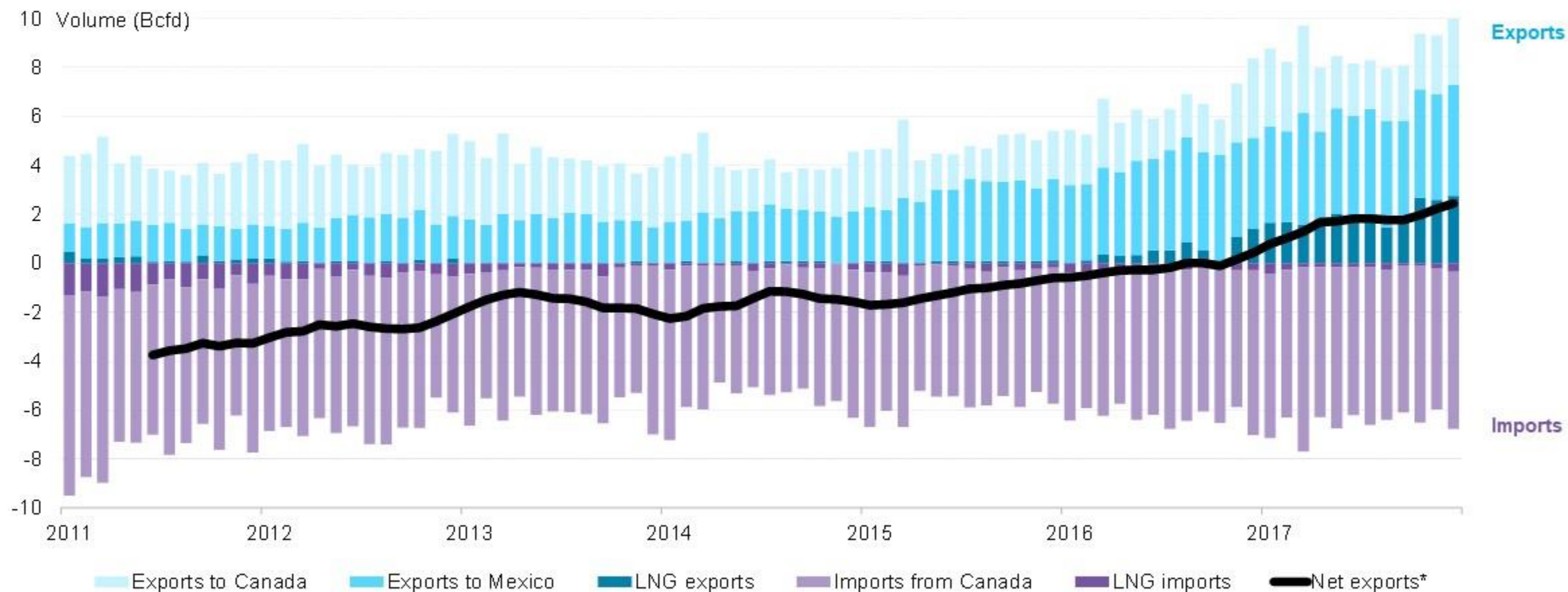


-\$64/kWh
-23%

Source: Bloomberg New Energy Finance Notes: BNEF has tracked lithium-ion battery prices since 2010 through an annual market survey process. It collects, anonymizes and aggregates price data for battery cells and packs. The numbers presented in the chart above include cell and pack prices for electric vehicles, and are in nominal terms. Prices are given as volume-weighted averages.

For the first time, the U.S. was a net natural gas exporter every month of the year

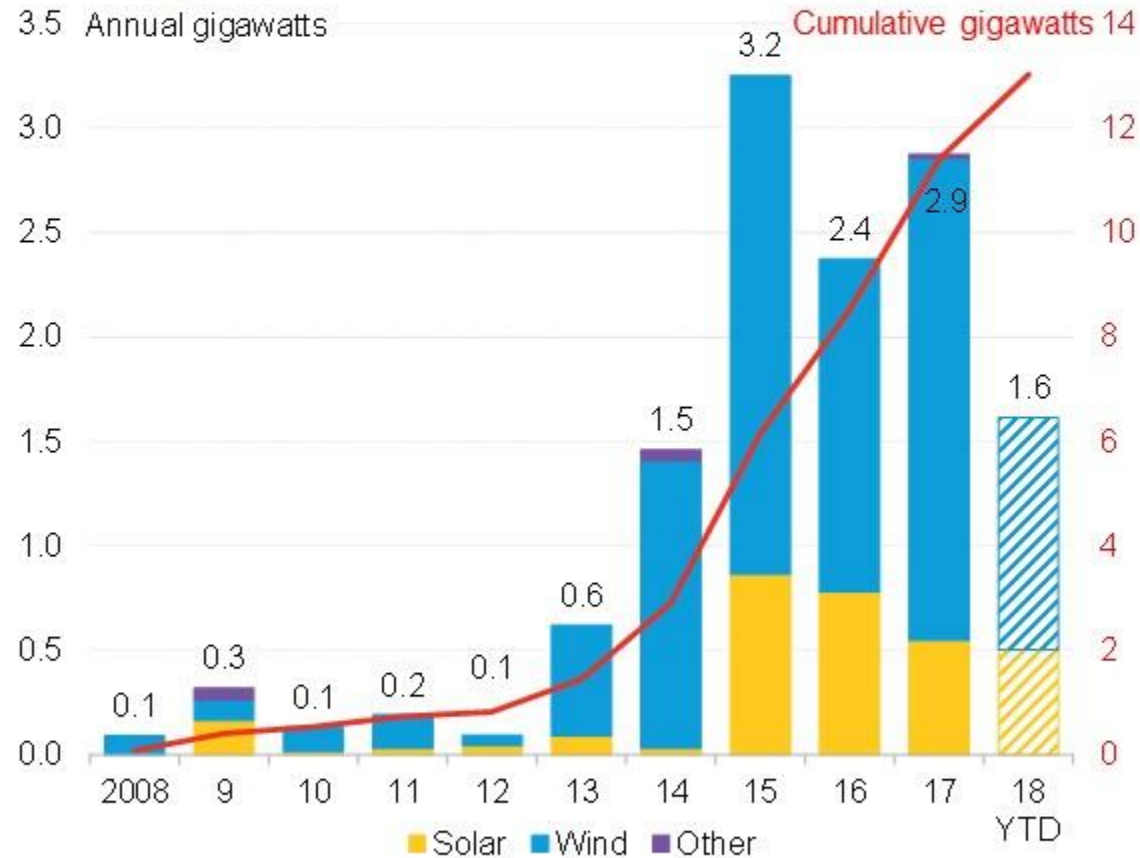
U.S. natural gas exports and imports



Source: Bloomberg Terminal, EIA Note: *Net export line shows the six-month rolling average.

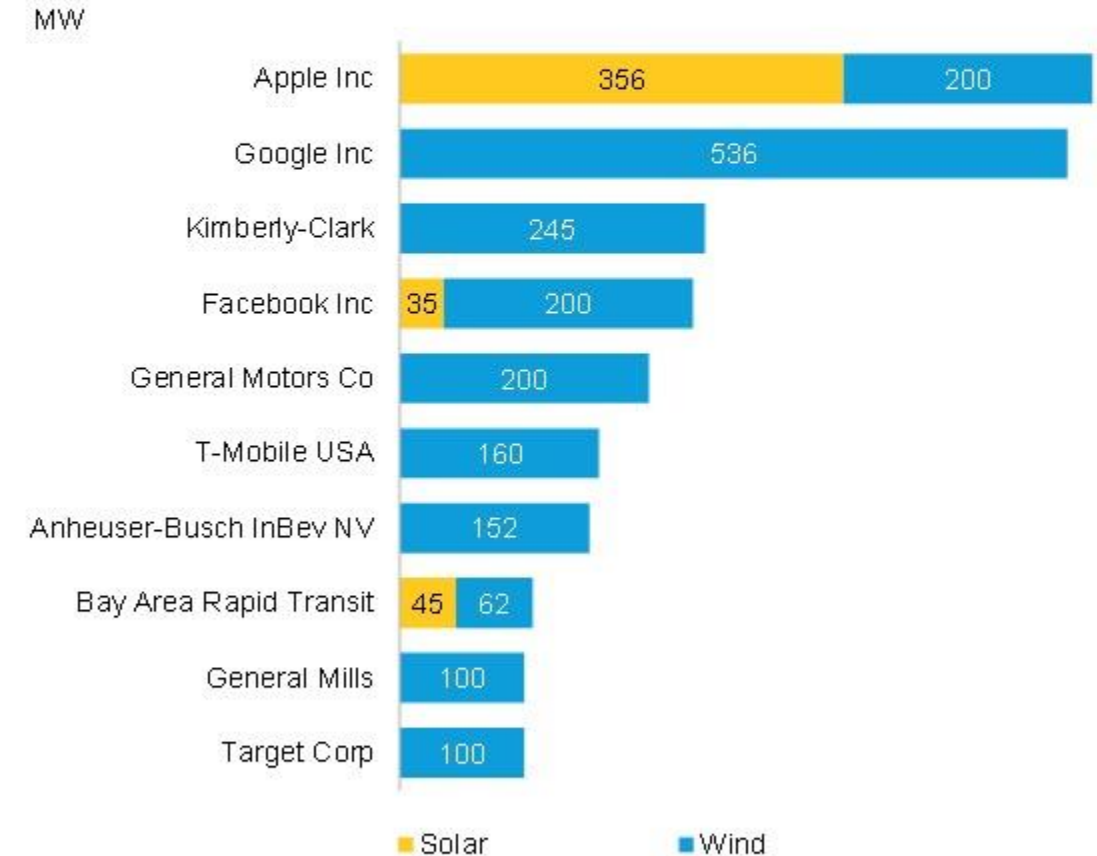
Corporations “Are Still In” (Part I)

Renewable capacity contracted by corporations, by technology



Source: Bloomberg New Energy Finance Note: Charts show offsite PPAs only

Largest corporate offtakers, 2017



Source: Bloomberg New Energy Finance Note: Charts show offsite PPAs only














Corporations “Are Still In” (Part II)

Key players: Corporate clean energy procurement

Retail	GROUPE L'OCCITANE	BURBERRY	
Financial & Insurance	JPMorganChase	Morgan Stanley	citigroup
Tech	PHILIPS	ebay	Schneider Electric
Food & Beverage	Kellogg's	Carlsberg Group	ABInBev

Source: Bloomberg New Energy Finance, The Climate Group, company announcements, DOE Note: Corporate clean energy procurement key players are companies that signed onto the RE100 in 2017.

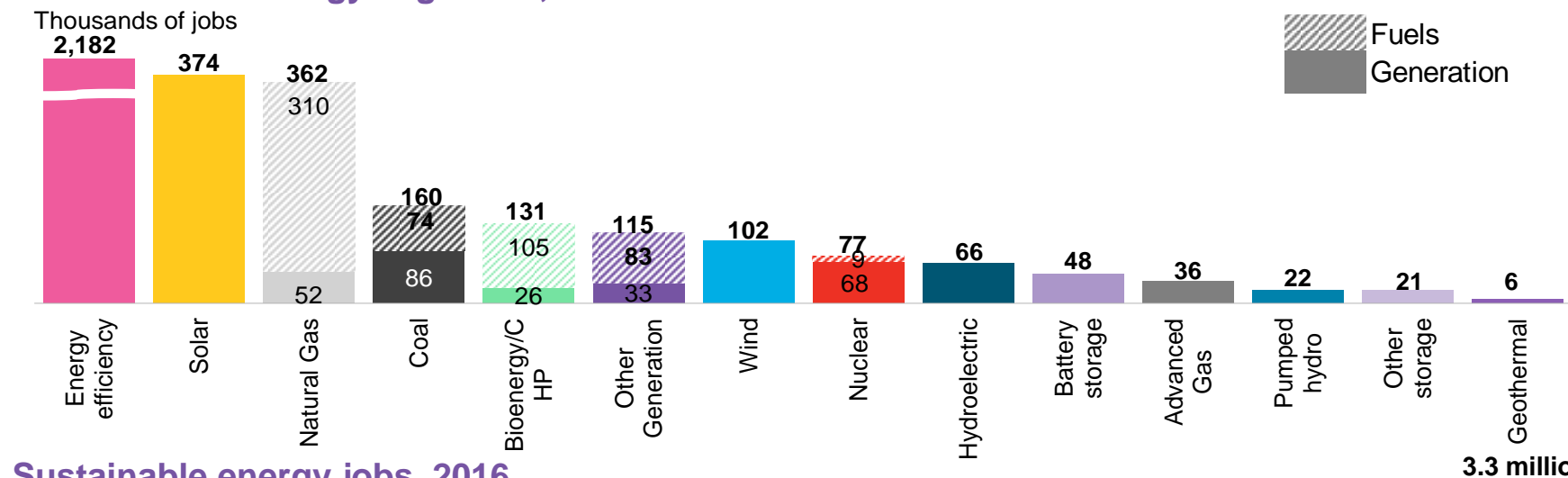
Key players: Corporate energy efficiency

Manufacturing				
Automotive				
Retail				
Financials				

Source: Bloomberg New Energy Finance, The Climate Group, company announcements, DOE Note: The key corporate energy efficiency players displayed here are drawn from EP100 members and the list of ISO 50001 certified facilities. ISO 50001 certification means that a company has met established efficiency standards at one or more of its facilities.

U.S. energy overview: Jobs in select segments of the energy sector

Jobs in select energy segments, 2016



Sustainable energy jobs, 2016



- The renewable, energy efficiency, and natural gas sectors employed an estimated 3.3 million Americans in 2016, according to the Department of Energy. Energy efficiency alone supported 2.2 million jobs, while solar supported roughly 374,000 and natural gas 362,000.
- While renewable sectors like solar, wind, hydropower and geothermal do not require upstream processing or extraction of a fuel, fossil-fired generation does. Adding in these fuel-related jobs notably boosts the total employment by fossil fuel-fired generation and bioenergy. In 2016, 86% of the 362,000 jobs associated with the natural gas sector came from fuel supply. Coal employed 160,000, with about half in coal production and supply.
- Energy efficiency jobs related to construction often hire people who also work on other types of construction tasks (26% of the 1.4 million employees in this category spend only the minority of their time on efficiency).

Source: Department of Energy (DOE) Notes: Transmission, distribution, and oil/petroleum jobs not included as available data does not break out the portion of those jobs relevant to the electricity sector. See footnote on next slide for details on the definition for "Advanced Gas."



Faces Behind the Facts

Success Stories of the 2018 Sustainable Energy in America Factbook

cebn.org/faces-behind-the-facts/



CPS Energy's 'New Energy Economy' initiative has led to more than **\$1.4 billion** in annual economic impact, over **900 jobs**, and over \$200 million in educational and capital investment."

- [San Antonio Economic Development Foundation](#)

"By focusing entirely on new energy, EPIcenter will help grow this segment of our economy, **creating jobs and new economic opportunities** in the region."

- [Kimberly Britton, CEO, EPIcenter](#)





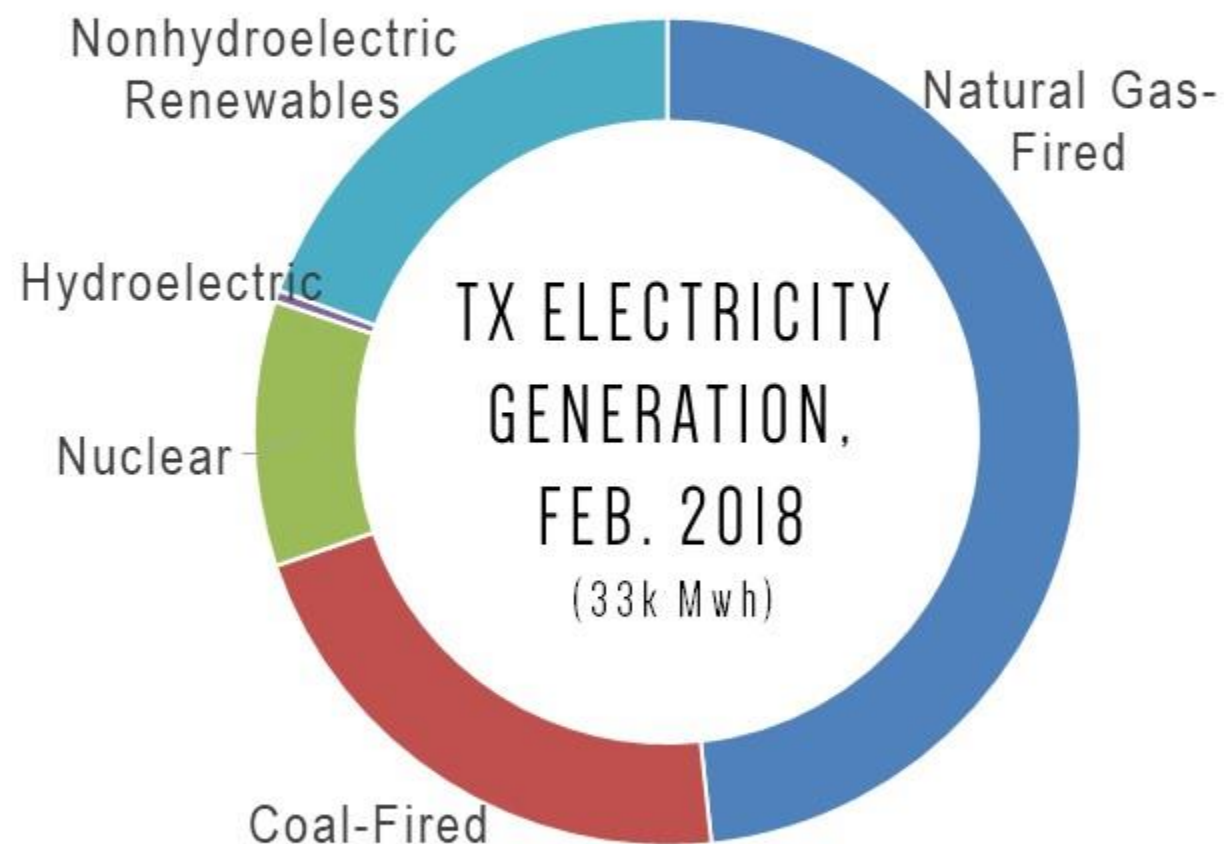
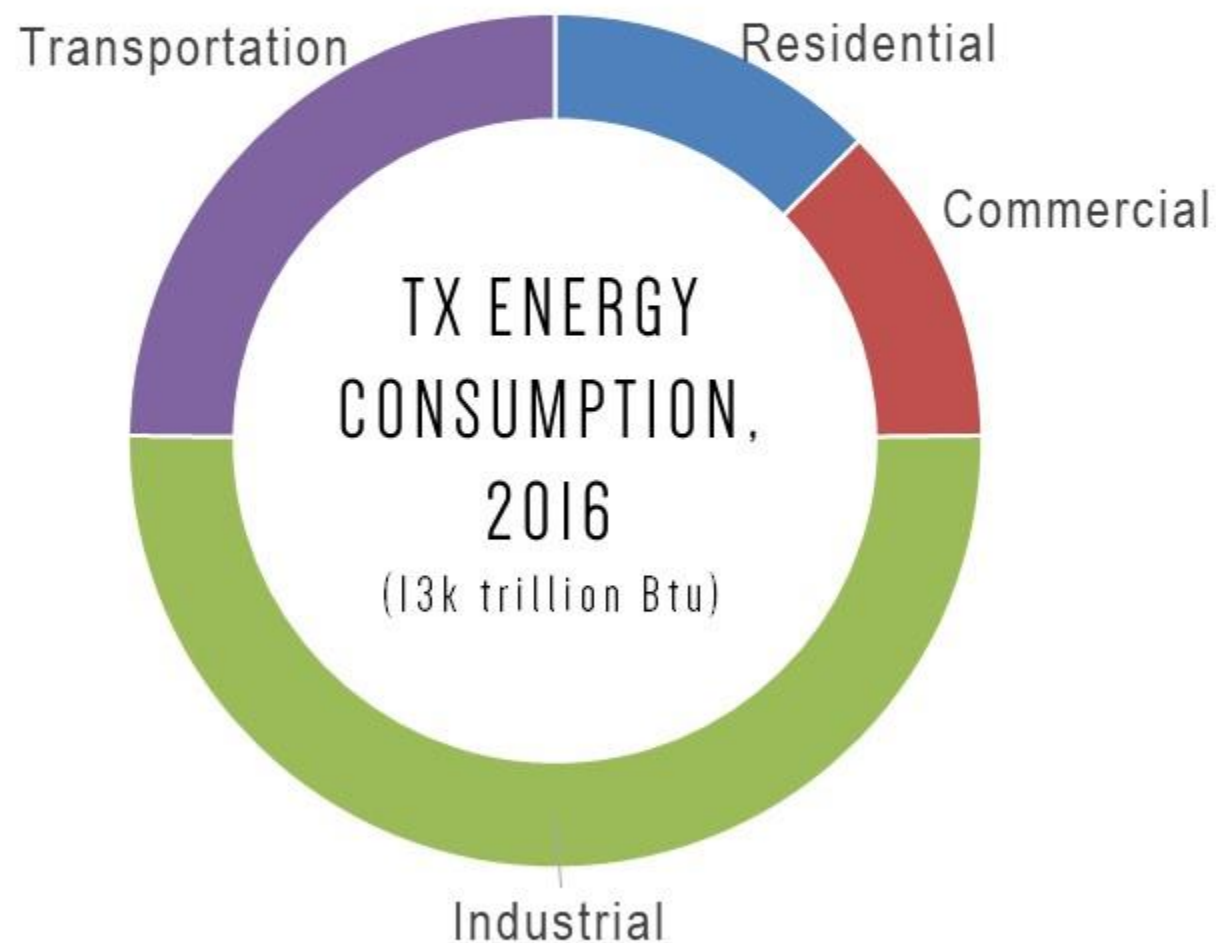
THE CPS PERSPECTIVE

Paula Gold-Williams
President & CEO, CPS Energy






The image shows two construction workers in silhouette against a vibrant sunset sky. The worker on the left is seen from the back, wearing a white hard hat and a high-visibility vest. The worker on the right is in profile, pointing towards the horizon. In the background, several tall power line towers and their associated cables are visible, stretching across the sky. The overall color palette is dominated by the warm oranges and yellows of the setting sun, contrasting with the dark silhouettes of the workers and infrastructure.

WHERE DO YOU SEE THE POSSIBILITIES?

HOW WILL TEXAS' ENERGY PORTFOLIO EVOLVE?

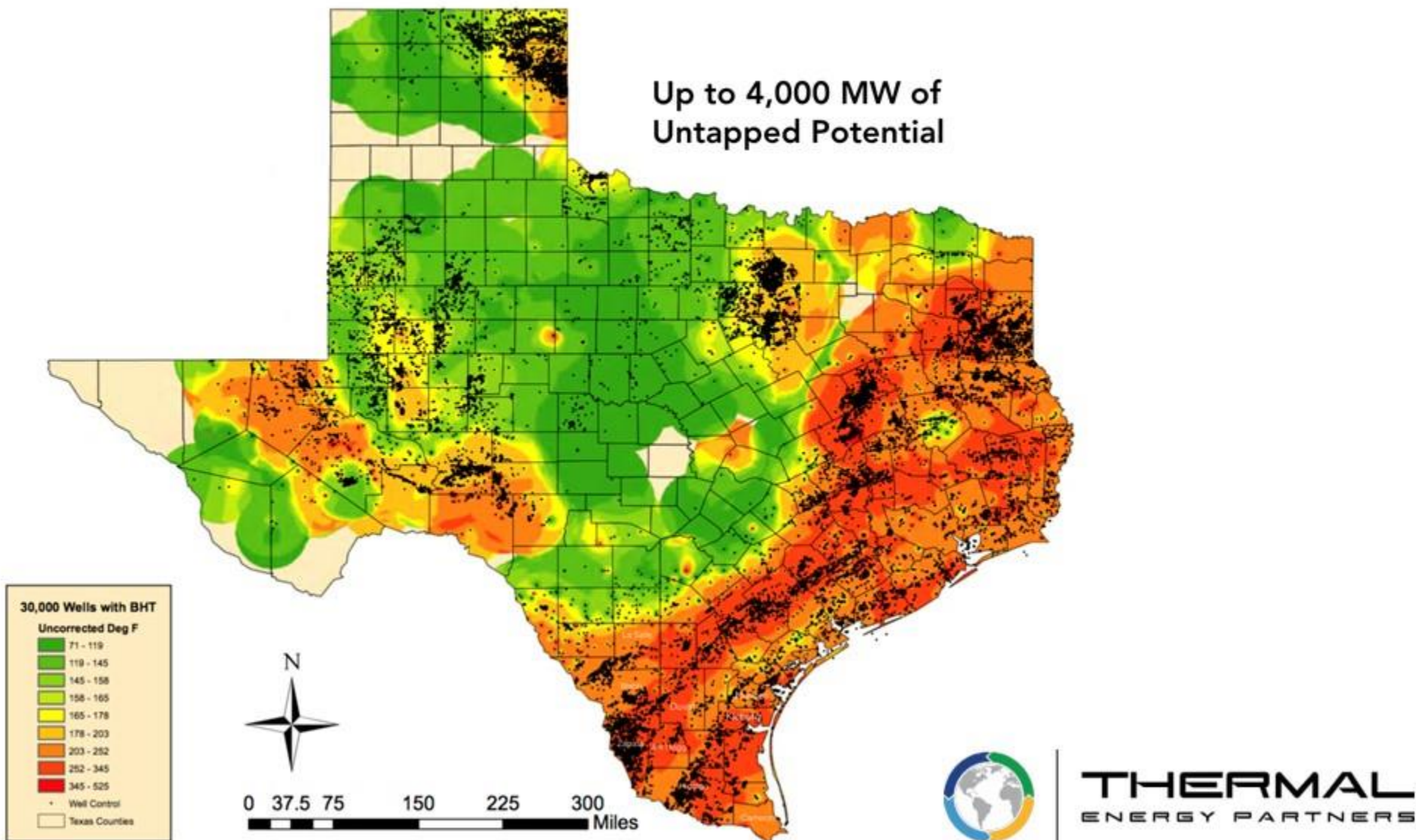


HOW DO TEXAS—AND SAN ANTONIO—STACK UP?

Current Benchmarks		Potential Growth Areas	
	1 st in cumulative installed wind capacity (22 GW as of 2017)	Harnessing this resource: Only 10 th in electricity generation from wind (14.8% in 2017) and technical potential is 62X greater	AWEA
	7 th in cumulative installed solar capacity (1.9 GW as of 2018)	Nearly half (46%) distributed solar installations concentrated in San Antonio & Austin	SEIA , TXSES
	11 th in electricity generation from natural gas (46% in 2017)	LNG exports	EIA
	1 st in cumulative installed CHP/WHP capacity (17 GW as of 2018); various efficiency financing programs and incentives	Only 26 th in ACEEE state scorecard (16.5/50)	DOE/ICF , ACEEE
	10 th lowest avg. retail electricity prices (8.47¢/kwh across sectors in Mar. 2018)	Residential sector: 19 th lowest prices (11.58¢/kwh in Mar. 2018)	EIA

HOW DO TEXAS—AND SAN ANTONIO—STACK UP?

Using O&G best practices Texas is poised to be the next Geothermal Giant



WHAT ARE SOME OTHER OPPORTUNITIES FOR/BARRIERS TO CLEAN ENERGY GROWTH?

Emerging Industries?

Renewables, NG, Efficiency
Storage
Microgrids
CCUS
Load Regulation/Demand Response
Alternative Fuel Vehicles

End Users/Economic Sectors?

Health Care
IT/Cybersecurity
Financial Services
Higher Education
Defense & Aerospace
O&G, Ports, Manufacturing
Commercial Buildings & Hotels

Drivers/Motivations?

Economic Competitiveness
Affordability
Resilience & Reliability
Investor Climate Risk
International/Corporate C Pricing
Corporate Sustainability
Customer Preference/Demand



CONCLUSIONS



1. The clean energy economy **has arrived**
2. To compete in the **global economy**, cities, states, and nations need to compete in **clean energy**
3. Texas is **making progress** in diversifying its energy economy, and **San Antonio is a leader**
4. There remains **enormous untapped potential** to increase efficiency and low-carbon energy across all economic sectors—and enjoy a cleaner, more affordable, more reliable energy future!

CONNECT TODAY!

CEBN: www.cebn.org (or text "CEBN" to 66866)

EPIcenter Power Network:

<http://epicenterus.org/connect/powernetwork>



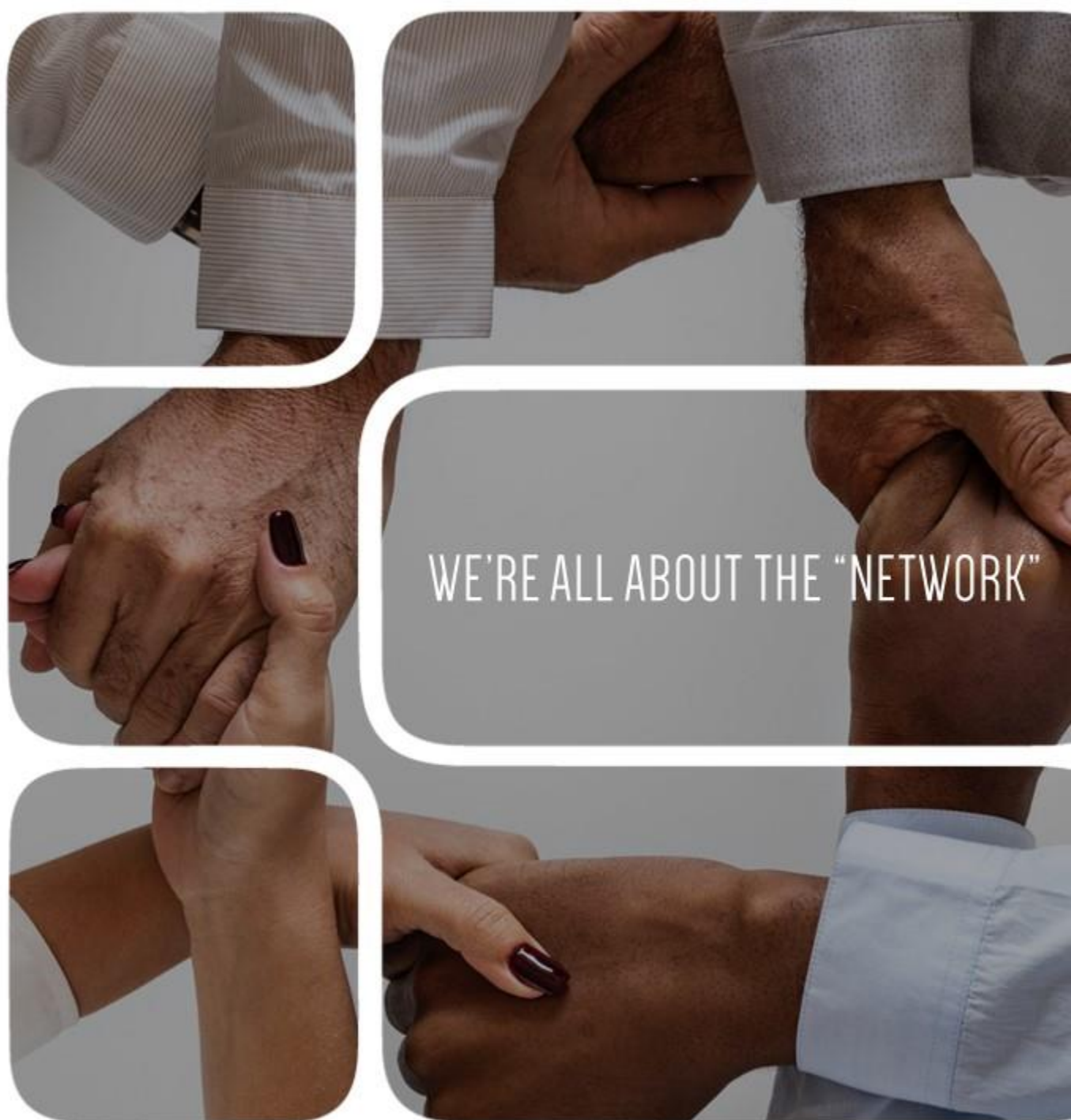
Small or Medium Size Business



Corporation or Investor



Clean Energy Changemaker



WE'RE ALL ABOUT THE "NETWORK"