Better Buildings Webinar Series

We'll be starting in just a few minutes….

Tell us…please send your response to the webinar organizers via the question box:

What topics are you interested in for future webinars?

Better Buildings
U.S. DEPARTMENT OF ENERGY

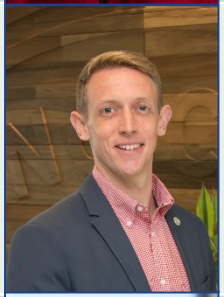
Buildings that Rebound:

Resiliency Strategies for Commercial Buildings & Communities

February 6, 2018
3:00-4:00 PM ET

U.S. DEPARTMENT OF ENERGY

Today's Presenters

Name		Organization
Una Song		Moderator
Jeremy Sigmon		U.S. Green Building Council
Charlene Heydinger		Texas PACE Authority
Rachel Davis		Petros PACE Finance

Jeremy Sigmon

U.S. Green Building Council

U.S. DEPARTMENT OF ENERGY

Buildings that Rebound: Resiliency Strategies for Commercial Buildings and Communities

A Better Buildings Challenge webinar by the U.S. Department of Energy

February 06, 2018

The Sustainability *and* Resilience Imperative

Risks are rising

Every year since 1997 has been warmer than average and 5 of top 10 hottest years are within last decade. Climate change, population growth and urbanization are contributing.

Climate-induced disasters are expensive

Cost of U.S. disasters has quadrupled since 1970 to $100 billion per year. Our risks are interconnected beyond climate alone.

Everywhere is risky

One third of U.S. counties declared disaster in 2017. Some of the riskiest places are low-income communities.

Invest now or pay later

New NIBS report finds that mitigation funding can save the nation $6 in future disaster costs, for every $1 spent on hazard mitigation.

New Orleans, LA

Prioritizing sustainability in the recovery

Highlights:

- Principles for disaster-resilient and sustainable gulf coast restoration
- Green Schools as center of recovery
- NOLA resilience strategy released in 2015

For more info:

http://resilientnola.org/

https://www.usgbc.org/resources/building-back-better-new-orleans-public-schools

Source: Jocelyn Augustino/FEMA care of 2005 USGBC report "The New Orleans Principles."

Source: Flickr Creative Commons – original image (modified)

Charleston, SC

Historic buildings, climate modeling, & proactive land use planning

Highlights:

- Applying lessons learned from historic structures
- Social cohesion boosts resilience
- Modeling understand most impacted areas
- Transit system redesign
- Property buy-back

For more info

http://www.charlestonresilience.net/

Los Angeles, CA

Buildings and business as resilience catalysts

Highlights:

- Buildings are central nexus for human activity
- Resilient businesses and communities are more prosperous and profitable
- Community resilience hubs could be replicated

For more info:

http://www.resilience.la

Source: Flickr Creative Commons – original image (modified)

Hoboken, NJ

Bouncing Forward from Hurricane Sandy

Highlights:

- Resilient building codes
- Downtown microgrid
- Green infrastructure park

For more info:

http://hobokennj.gov/resiliency/

Source: Flickr Creative Commons – original image (modified)

Guiding, Measuring & Ensuring Resilience Performance

- **LEED – www.USGBC.org/LEED**

  The LEED rating system helps project teams make informed decisions about sustainability and resilience, including many resilience mitigation and adaptation measures.

- **PEER – PEER.gbci.org**

  PEER outlines a comprehensive approach to reliability and resiliency for power systems that includes risk and threat identification and prevention, then mitigation and recovery.

- **SITES – www.sustainablesites.org**

  The SITES rating system rewards leadership in sustainable and resilient landscapes, open spaces, parks, and natural spaces with a core goal to create regenerative systems that foster resiliency.

- **RELi – www.GBCI.org/RELi**

  The RELi resilience standard guides the planning, design and management of buildings that offer greater adaptability and resilience to weather and natural disasters.

- **GRESB – GRESB.com**

  In March, 2018, a new module will be released to help real estate and infrastructure companies and funds recognize leadership and provide transparency in more resilient business practice.

- **STAR– www.STARcommunities.org**

  With a particular focus on city climate adaptation planning, STAR's core content will enhance the LEED for Cities and LEED for Communities programs.

Additional Resources

The Road to Resilience (USGBC Education Compilation & Resource Center):

https://www.usgbc.org/education/sessions/learning-pathway-road-resilience-11313345

Returns on Resilience (Urban Land Institute):

http://returnsonresilience.uli.org/

Natural Hazard Mitigation Saves: 2017 Interim Report (National Institute of Building Sciences)

http://www.nibs.org/page/mitigationsaves

Sustainability Guidelines for Gulf Coast Reconstruction (USGBC): https://www.usgbc.org/resources/sustainability-guidelines-gulf-coast-reconstruction-creating-disaster-resilient-and-sustai

Voluntary Resilience Standards: An Assessment of the Emerging Market for Resilience in the Built Environment (Energy, Kresge, Barr Foundations):

http://www.mc-group.com/voluntary-resilience-standards-an-assessment-of-the-emerging-market-for-resilience-in-the-built-environment/

2016 Resilient Cities Summit Report (National League of Cities, ULI, USGBC):

https://www.usgbc.org/resources/2016-resilient-cities-summit-report

Focus of resilience within Building Rating Systems – LEED 4.0 Review (UT San Antonio):

https://portal.nibs.org/files/wl/?id=672qjV0PmTXTtR8SqPwPP2DYyh97RcXK

Thank you!

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www.USGBC.org

Charlene Heydinger

Texas Pace Authority

U.S. DEPARTMENT OF ENERGY

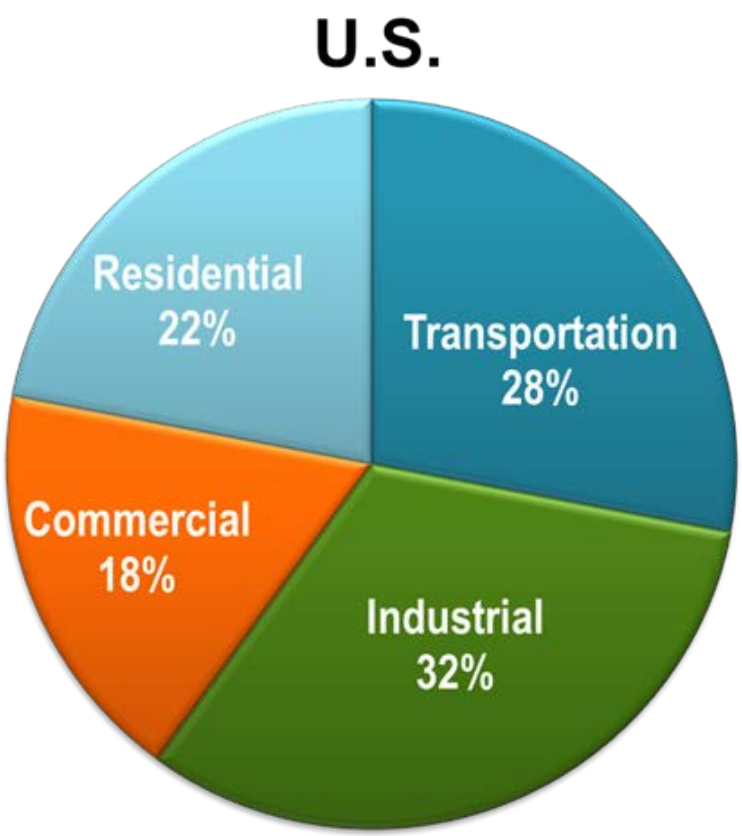
TX-PACE

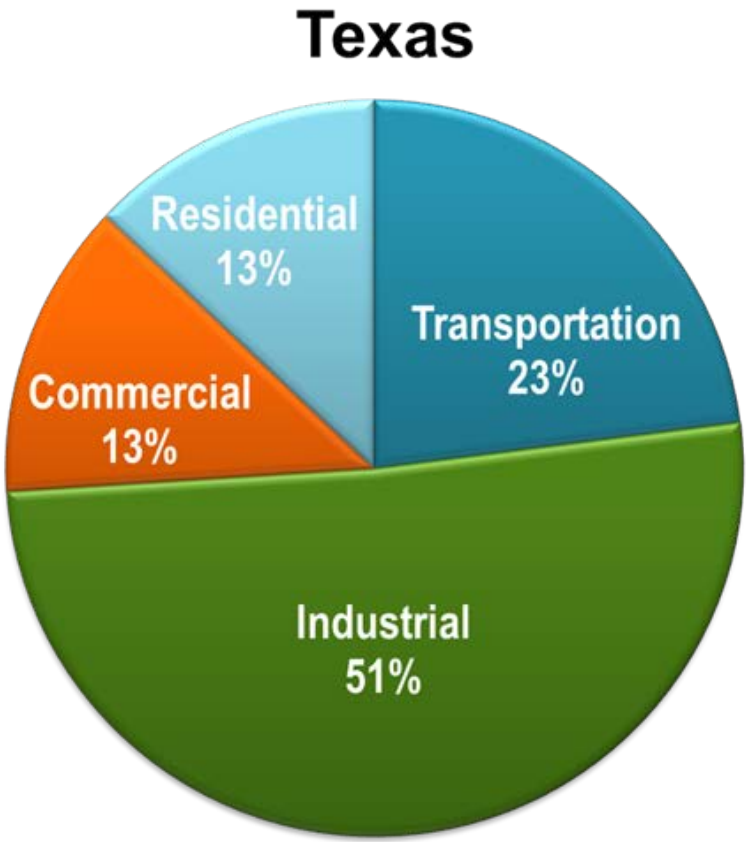
A resiliency tool for

Texas

www.TexasPACEAuthority.org

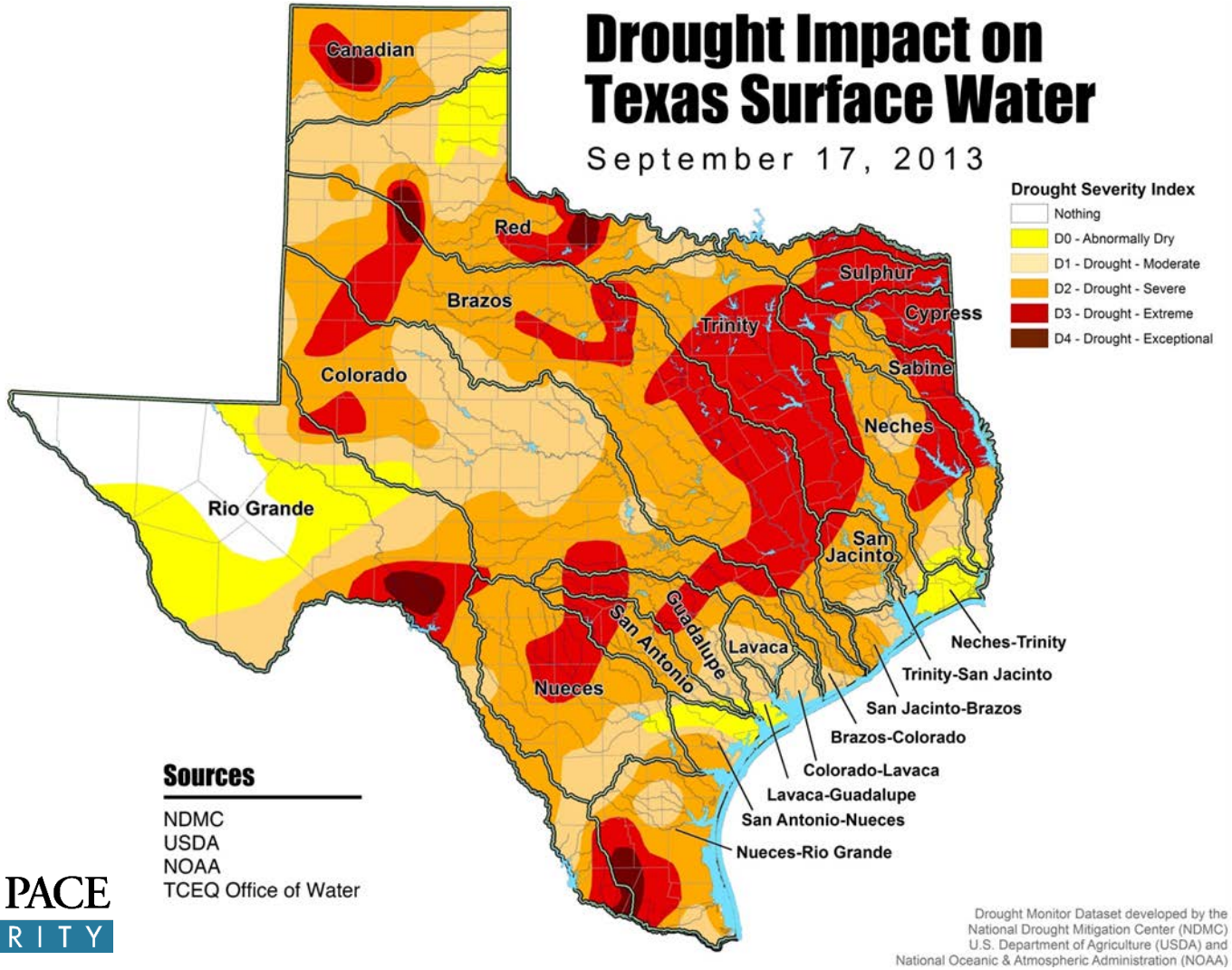
Energy Sector Consumption





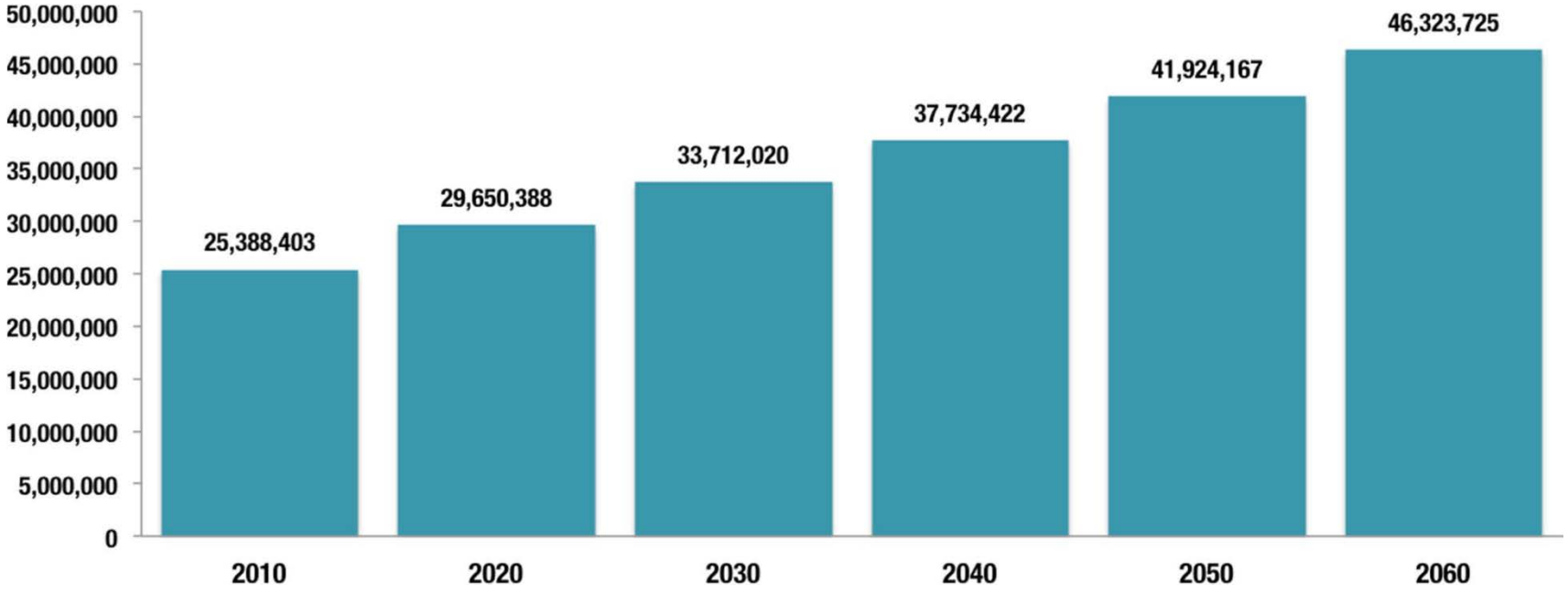
TEXAS PACE AUTHORITY

Texas Drought Impact



TEXAS PACE AUTHORITY

Projected Texas Population



"More than 1,000 people…move to Texas every day."
Gov. Rick Perry, 12/2012.

TEXAS PACE AUTHORITY

WHAT IS TX-PACE?

TEXAS PROPERTY ASSESSED CLEAN ENERGY

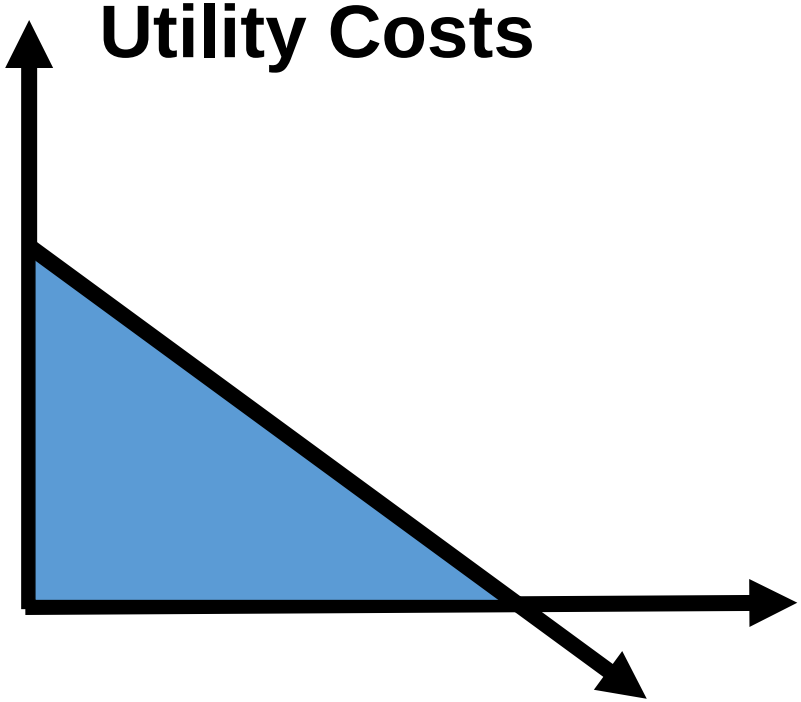
A simple way of paying for capital projects with no money out of pocket
100% long term, upfront, low-cost financing

- What: Energy efficiency, water conservation, and distributed generation/resiliency projects
- Where: On commercial (incld. non-profit, hospitality, healthcare); industrial (incld. manufacturing and agricultural) and multi-family (5+units) existing properties
- How: Repaid via special property assessment over the useful life of the improvements

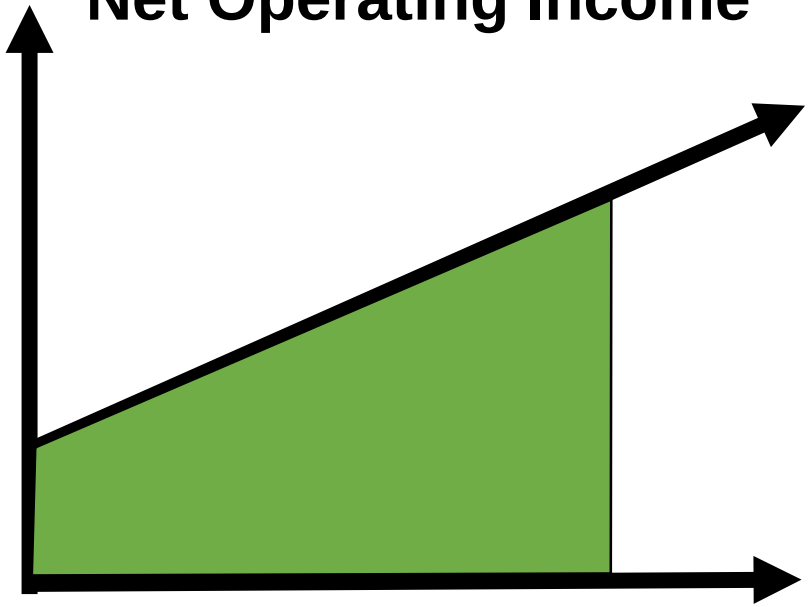
TEXAS PACE AUTHORITY

WHAT TX-PACE DOES

LOWER
Utility Costs



INCREASE
Net Operating Income

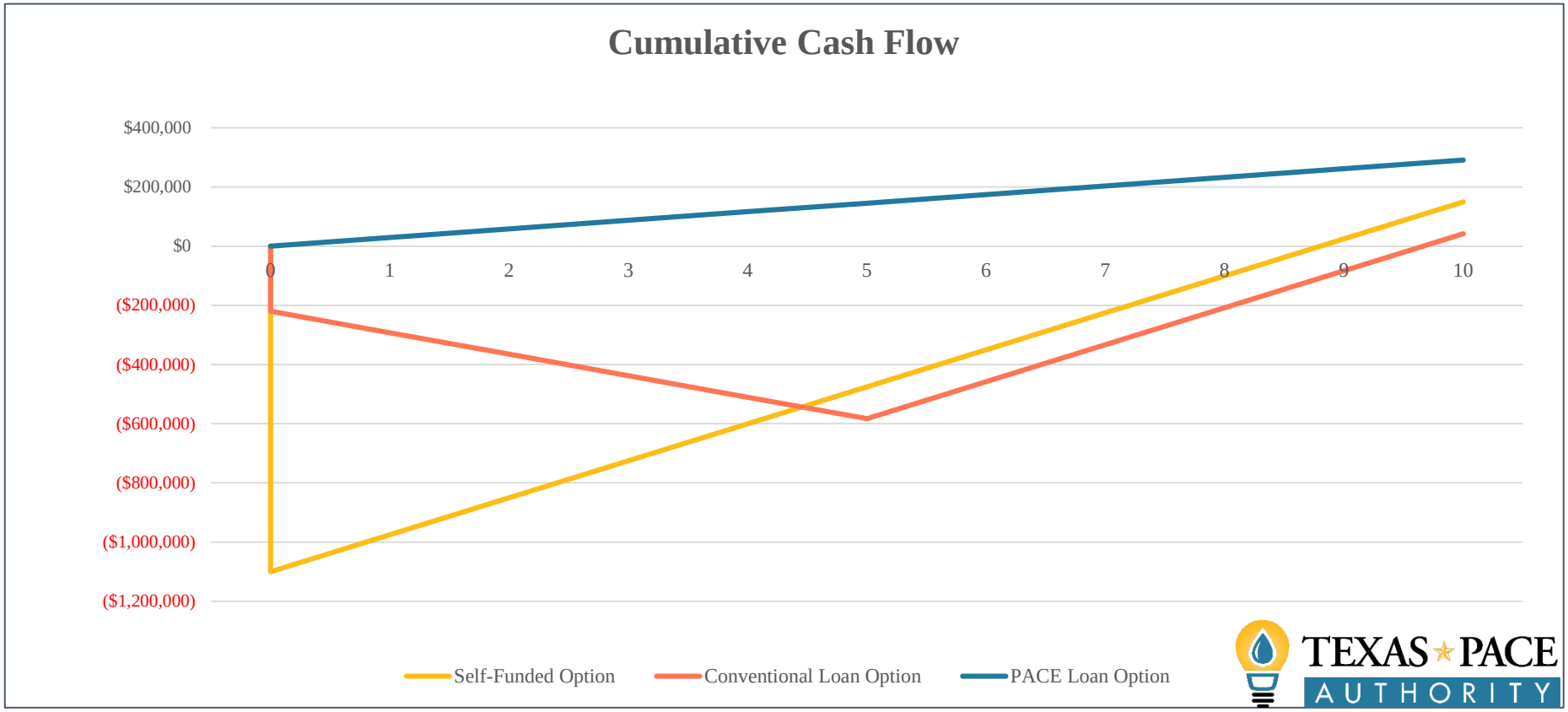


Bottom Line: Increased Building Value

TEXAS PACE AUTHORITY

FINANCIAL IMPACT OF TX-PACE

- Increase property value with no capital investment by building owner
- Generate positive cash flows immediately



TEXAS PACE AUTHORITY

PACE IN A BOX

"PACE in a Box" is a toolkit of recommendations and templates for counties and municipalities to:

- **Create uniform, user friendly, scalable, and sustainable PACE programs**
- **Administered by a nonprofit in a transparent manner, focused on gov't tasks; free market with decision/power in hands of property owner**

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Local Gov't Risk Avoidance

- Financial
  - No tax dollars (user fee)
  - No risk to treasury
  - No risk to public servants
  - Limited impact on public servant work load
- Fiduciary
  - Build strong local stakeholder support
  - Best practices/consumer protection
  - Gov't doesn't compete w/private sector
- Gov't costs covered if foreclosure

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Free Market Flexibility

- No mandates, market distortions, or financial incentives that siphon funds away from local government
- Risk stays with property (not transferred to the Gov't or lender)
- Property owner selects lender, contractor and project, negotiates interest rates and other terms
- Private capital (gov't does not need to fund projects through bonds)
- No picking winners and losers
- Thorough Underwriting and Technical Standards requirements

TEXAS PACE AUTHORITY

TEXAS ★ PACE AUTHORITY

How It Works

A Building Owner:

finds a contractor → selects a project → identifies a lender → applies to PACE program

If the owner, building, and project all meet PACE requirements:

the owner signs a contract with the PACE program, which places a senior lien on the property → lender signs a contract with the county in exchange for the assessment payments → the lender provides funding → contractors complete the project → the PACE program bills assessments to the owner and forwards the payments to the lender

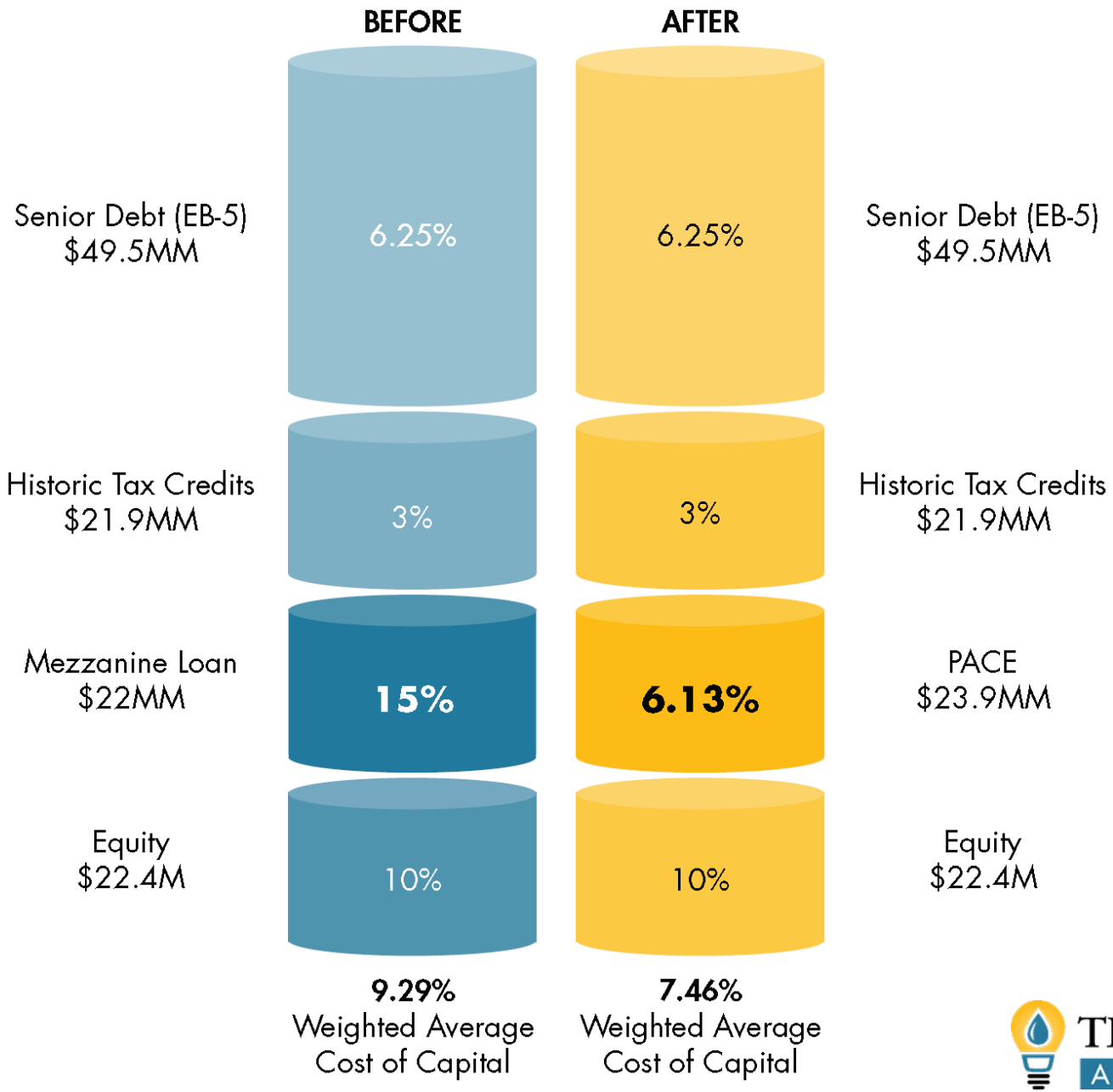
Butler Brothers Building
Dallas

Measures:

- HVAC
- Lighting
- Insulation
- Roofing
- Glazing
- Plumbing
- Irrigation
- Exterior Waterproofing/Plaster

Assessment Total: **$24 Million**
Annual Savings: **40% energy reduction**
700,000 gallons of water; 3,500 metric tons CO_{2e}

TEXAS PACE AUTHORITY



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RJ LIEBE COMPANY
NAVARRO COUNTY

- Empty 1979 Hagar Sewing plant recently purchased by Missouri Company moving to Texas.
- Site selection depended on the availability of the PACE program.
- The PACE project investment of $344,000 resulting in 30% utility savings.
- Creation of 60 – 80 permanent manufacturing jobs when the plant opens in late 2017.

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Congregation Beth Israel
Austin

Measures:

- Boilers
- Chillers
- Window Film
- BAS Controls

Assessment Total: $450K
Annual Savings: $40,000

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PACE as a Resiliency Tool

Creating Power Onsite with Distributed Generation

- CoGen/CHP/Waste heat to Power, Microgrids, geothermal, etc.
- Creating Power onsite, provides control after unforeseen separation from the grid
- Market options – enough capacity to control shutdown & avoid damage to maintaining production

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Capacity to Avoid:

- Property damage and cost of cleanup
- Disruption in production
- Loss of business
- Safety risks to employees and community
- Loss of work for employees
- Loss of community good will
- Regulatory permitting violations
- Liability for damage to others

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Resiliency needed for more than Hurricanes & Flooding:

- Drought
- Ice and snow
- Fires
- Wind
- Brownouts
- Any disconnect from the electric grid, or community **water** source

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PACE is a WIN-WIN-WIN

- **Property Owners – lower utility bills, energy independence, energy efficiency, resiliency, property value increase**
- **Contractors – source of increase in business, more local hiring, best practices, keeping up with technology advancements**
- **Lenders – new loans, steady & stable process, fully collateralized, Tax Assessment lien position, improved asset value**
- **State of Texas – reduced peak demand, improved grid loading, distributed generation as resilient power source, improved air quality, better water conservation**
- **Communities – increased economic development and jobs, improved building infrastructure, more appealing building stock**

TEXAS PACE AUTHORITY

TEXAS PACE AUTHORITY

www.TexasPACEAuthority.org

Charlene Heydinger, president
Charlene.Heydinger@KeepPACE.org

POWERED BY:

PACE in TEXAS
PACE in a BOX

Rachel Davis

Petros PACE Finance

U.S. DEPARTMENT OF ENERGY

PETROS PACE FINANCE

Department of Energy Webinar

Buildings that Rebound: Resiliency Strategies for Commercial Buildings and Communities from a C-PACE Lender's Perspective

February 6, 2018

About Petros PACE Finance

Petros PACE Finance is an Austin-based specialty lender focused solely on C-PACE lending

Committed Capital

As a direct lender with strategic capital partners in place, we have the flexibility to fund projects from $500K to $50M+

Program Design

Involved in early stage development in numerous state programs, Petros is on the front lines helping program administrators structure documents and processes for optimum efficiency

Experience

Petros is the only C-PACE lender in the country with executive level expertise in commercial lending, debt fund management, structured finance and long-term, direct relationships with institutional investors

Execution

Recognized as the industry leader in C-PACE financing, Petros has funded over $50M in projects since 2016, including the largest ever C-PACE loan

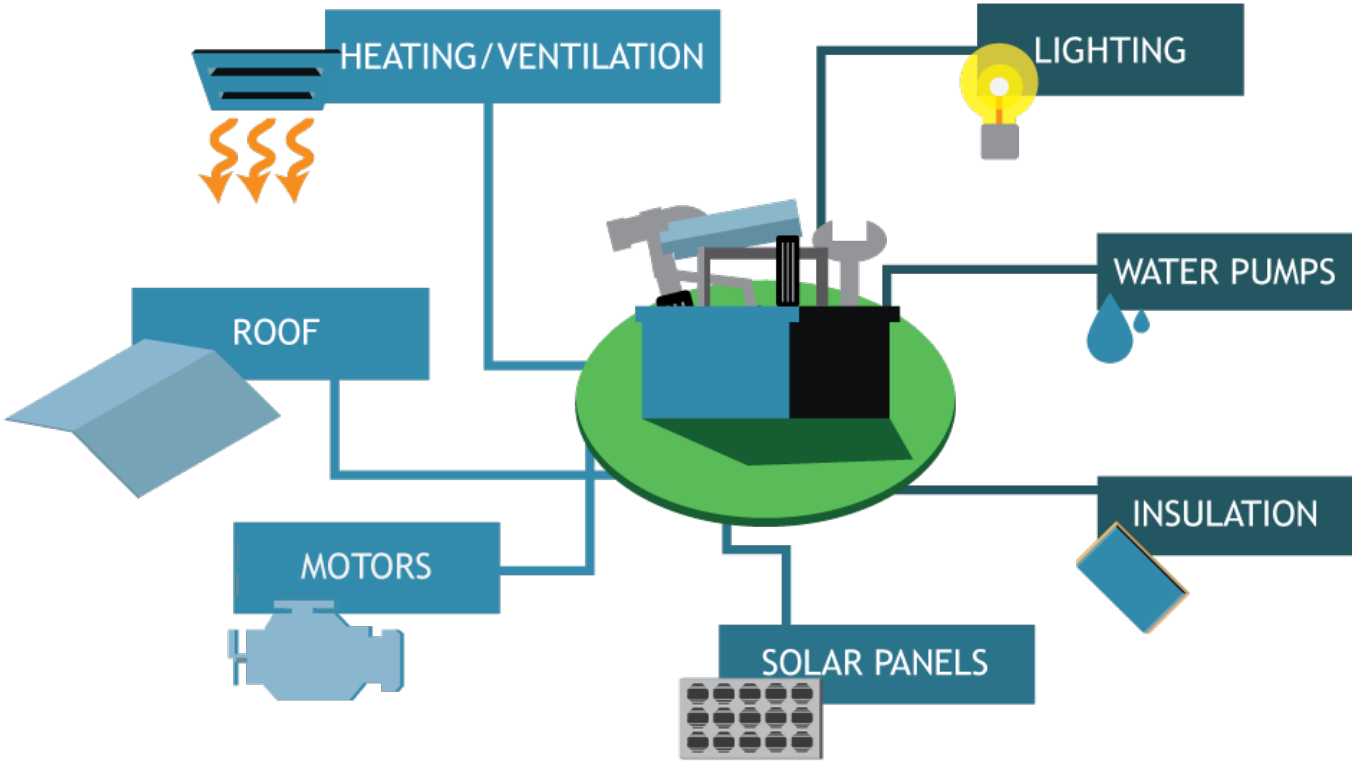
National Coverage

Petros is an approved lender in the majority of approved PACE markets and has closed transactions in six states plus Washington, D.C.

PETROS PACE FINANCE

Typical Measures Funded by C-PACE

Projects that Reduce Water or Energy Usage or Generate Energy Onsite



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On-Site Generation Measures

Solar

- Solar Thermal
- Ground-Mount Solar PV
- Roof-Mount Solar PV

Wind

- Behind the Meter Wind System

Cogeneration

- Combined Heat and Power (CHP) Plants (with or without an absorption chiller)
- Fuel Cells

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Additional Resiliency Measures

Seismic

- Seismic strengthening improvements may qualify depending upon PACE program jurisdiction
- Available in CA & OR

Windstorm

- Structural windstorm resistance improvements may qualify depending upon PACE program jurisdiction
- Only available in FL

Others

- Battery Storage
- Generators for Backup and Demand Response Programs
- Geothermal Energy Systems
- Biomass
- Anaerobic Digesters
- Qualification varies by state

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Value of C-PACE to Building Owners

No Upfront Cost	✓**100% financed => no out-of-pocket expenses (including soft costs)** ✓**Frees** up operating and capital budgets
Favorable Loan Terms	✓**Non-recourse to owner and does not accelerate** ✓Competitive, fixed interest rates ✓Up to 30 year term (max term = average useful life of equipment financed)
Transferrable Payment Obligation	✓**PACE loan stays with property upon sale, foreclosure, etc.** ✓Underwriting based primarily on the property
Cash Flow Positive	✓**Energy savings from retrofits typically outpace project costs (PACE loan) from day one** ✓Owner keeps any tax credits and/or rebates as a result of the project
Reduced Operating Expenses	✓**Increased net operating income on most projects** ✓Lower utility bills ✓Reduced maintenance expenses
Improved Property Value	✓**Potentially off balance sheet** ✓PACE improvements extend the life of the building ✓Building becomes more desirable, which creates additional tenant demand
Aligned Owner & Tenant Interests	✓**PACE loan costs and energy savings can be transferred to tenants** (if applicable) ✓Potentially addresses split incentive issues associated with NNN leases

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Why Use C-PACE for Resiliency Measures?

C-PACE enables sustainable improvements that provide additional comfort and/or resiliency to tenants.

At the end of the day, C-PACE provides inexpensive capital that can reduce the size of equity or cash reserve requirements and enhance project-level returns.

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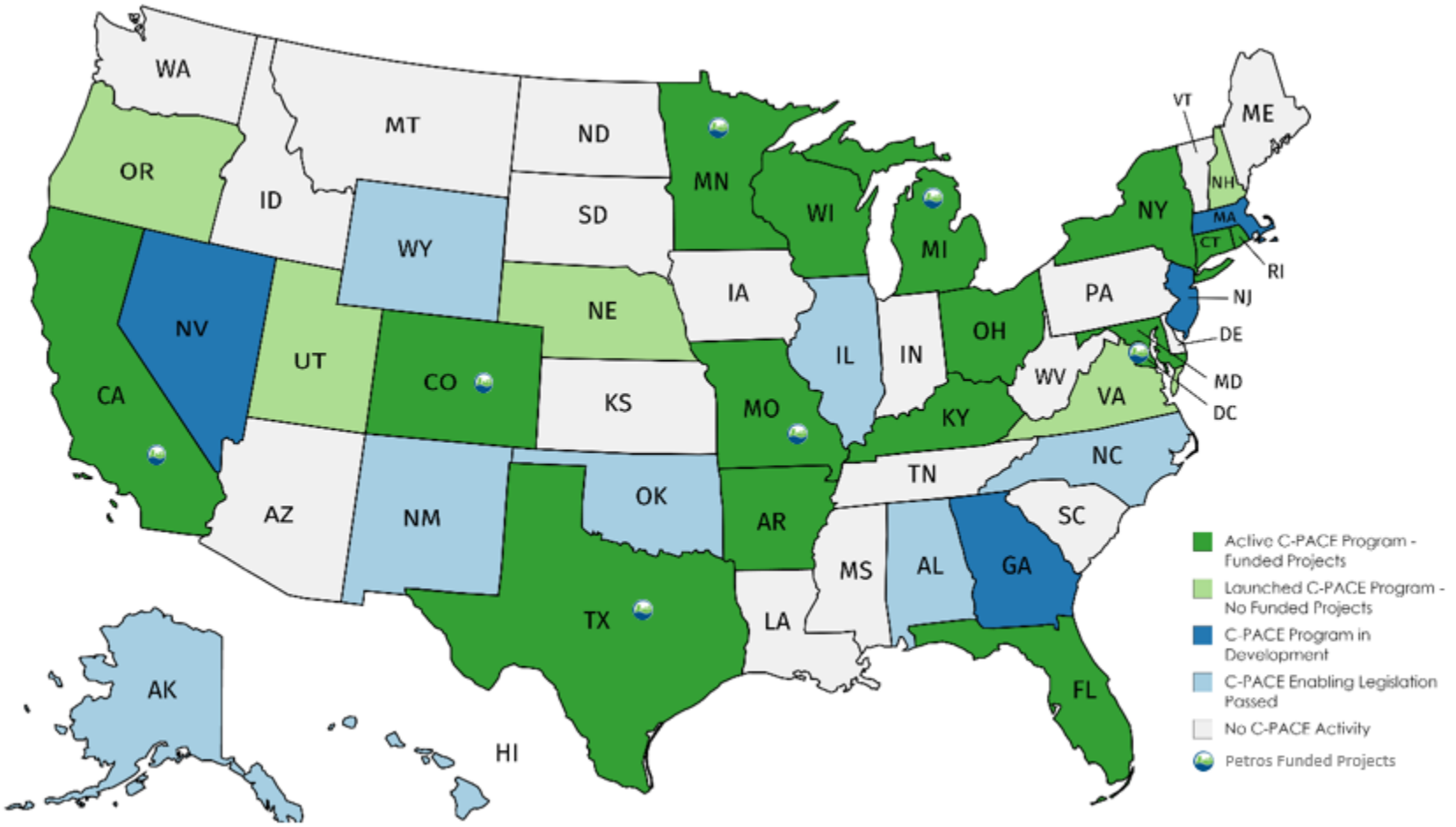
C-PACE Programs Nationally



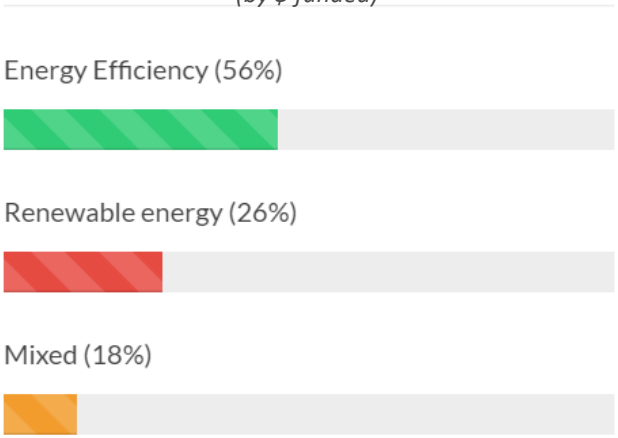
Petros has funded C-PACE loans in 6 states plus Washington, D.C.

PETROS PACE FINANCE

State of the C-PACE Market

C-PACE funding by improvement type

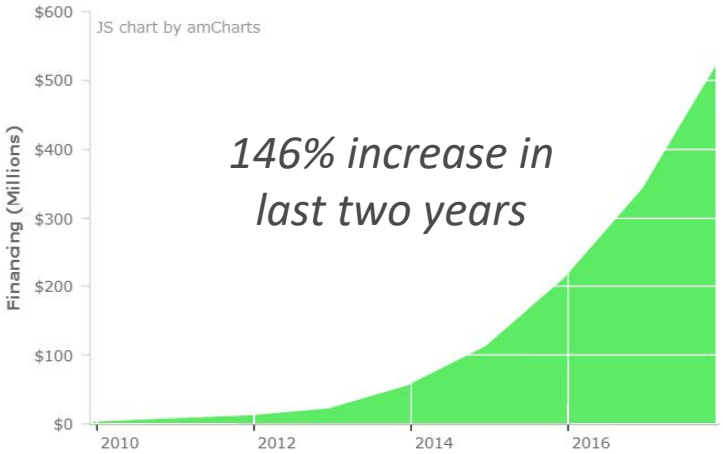
(by $ funded)



PACENation
Building the clean energy economy

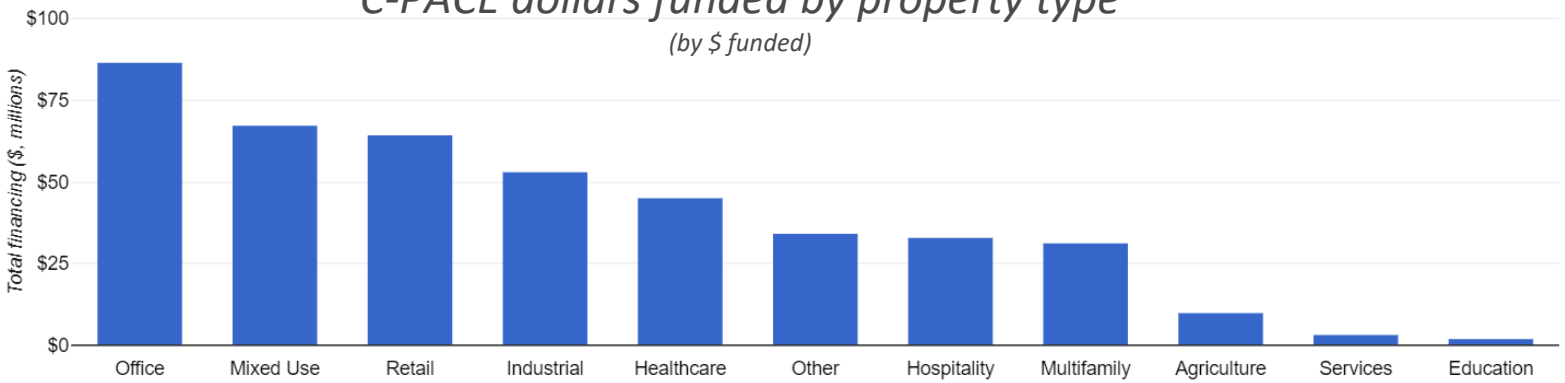
Cumulative C-PACE financing

(2010-2017)



C-PACE dollars funded by property type

(by $ funded)



Source: http://pacenation.us/pace-market-data/

Petros PACE Resiliency Success Story

PETROS PACE FINANCE CLOSES ON LARGEST DEAL IN COMMERCIAL PACE HISTORY WITH CLEANFUND

In May 2017, Petros PACE Finance, LLC, the premier national PACE lender, completed a $20 million PACE financing with Seton Medical Center in San Mateo County, California for mandatory seismic upgrades required by California state law.

Seton Medical Center
A Part of Verity Health

Funding: Petros $20 Million of $40 Million Total

Property Type: 11-story, 377,000 SF, 357-bed hospital in San Mateo County, CA

Scope of Work:

- Widening of the core foundation to reduce rocking potential, including grade beams, steel gravity framing, spread footing foundations, fiber wrap around concrete columns, steel plate and threaded rod collectors, and concrete collectors.
- Upgrades to hospital's key systems, such as communications, fire alarm, emergency power and lighting, and fire sprinklers.

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Other C-PACE Industry Resiliency Projects

Seismic Projects

- ~$1M for three multi-family buildings in CA

Cogen & Generators

- $8.65M for pharmaceutical company in CA to fund cogen, generating power on-site using natural gas and providing emergency backup during grid outages (includes other EE measures)
- Currently evaluating project in Texas with natural gas generator for use as emergency back up and demand response programs along with other EE measures

Across the country, there is a growing interest in utilizing C-PACE to fund resiliency measures.

PETROS PACE FINANCE

Contact Information

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PETROS PACE FINANCE

PACE Promotes Local Economies, Creates Jobs, Lowers the Cost of Business, and Improves the Environment

PETROS PACE FINANCE

Q & A

U.S. DEPARTMENT OF ENERGY

Additional Resources

- Combined Heat and Power (CHP) for Resiliency Accelerator - supports consideration of CHP and other distributed generation solutions for critical infrastructure resiliency planning at the state, local, and utility levels
- Energy Resources for Hurricane Season – helpful resources for incorporating energy into disaster planning, response, and rebuilding.
- Focus of resilience within Building Rating Systems – LEED 4.0 Review (UT San Antonio): https://portal.nibs.org/files/wl/?id=672qjV0PmTXTtR8SqPwPP2DYyh97RcXK
- PACENation – Provides information on commercial PACE and status of programs in your state
- NREL Resilience Roadmap –offers comprehensive guidance for federal, state, and local entities to effectively convene at the regional level for adaptable and holistic planning.
- Returns on Resilience (Urban Land Institute): http://returnsonresilience.uli.org/
- Sustainability Guidelines for Gulf Coast Reconstruction (USGBC):
- https://www.usgbc.org/resources/sustainability-guidelines-gulf-coast-reconstruction-creating-disaster-resilient-and-sustai
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- 2016 Resilient Cities Summit Report (National League of Cities, ULI, USGBC): https://www.usgbc.org/resources/2016-resilient-cities-summit-report
- Natural Hazard Mitigation Saves: 2017 Interim Report (National Institute of Building Sciences)
- http://www.nibs.org/page/mitigationsaves
- Forthcoming report from LBNL and DOE – Lessons in Commercial PACE Leadership: The Path from Legislation to Launch. Due for release in February 2018 and will be posted on DOE's State and Local Solution Center

Additional Resources, Cont.

- Clean Energy Smart Manufacturing Innovation Institute (CESMII), //www.cesmii.org/
- DOE Southwest Combined Heat and Power Technical Assistance Program (TAP), http://www.harcresearch.org/work/DOE_SW_CHP_TAP
- Industrial Assessment Centers, https://energy.gov/eere/amo/industrial-assessment-centers-iacs
- South-central Partnership for Energy Efficiency as a Resource (SPEER), https://eepartnership.org/
- Texas Industries of the Future, https://texasiof.ceer.utexas.edu/
- TMAC, http://tmacdfw.org/
- Texas PACE Authority, www.TexasPACEAuthority.org

Better Buildings Webinar Series

Cutting Water Waste:

DOE and EPA Resources to Advance Water Efficiency

Tuesday, March 6, 2018 | 3:00 - 4:00 PM ET

Learn about tools and resources from the Energy Department and U.S. Environmental Protection Agency that can help you meter and track water consumption, identify savings opportunities, and implement best practices to accelerate your water saving strategies.

REGISTER TODAY

Additional Questions? Please Contact Us

betterbuildingswebinars@ee.doe.gov

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