



DOE Packaged CHP Accelerator

CHP Financing Strategies, Solutions, and
Case Studies

June 24, 2020

Housekeeping

- Webinar will start at 2:03 to make sure everyone is signed in
- Please mute phones/microphones
- Short question period after each speaker
 - ✓ You can submit questions through Chat
- Longer question/discussion period at end
- Session will be recorded, and slides will be forwarded to all attendees

Agenda

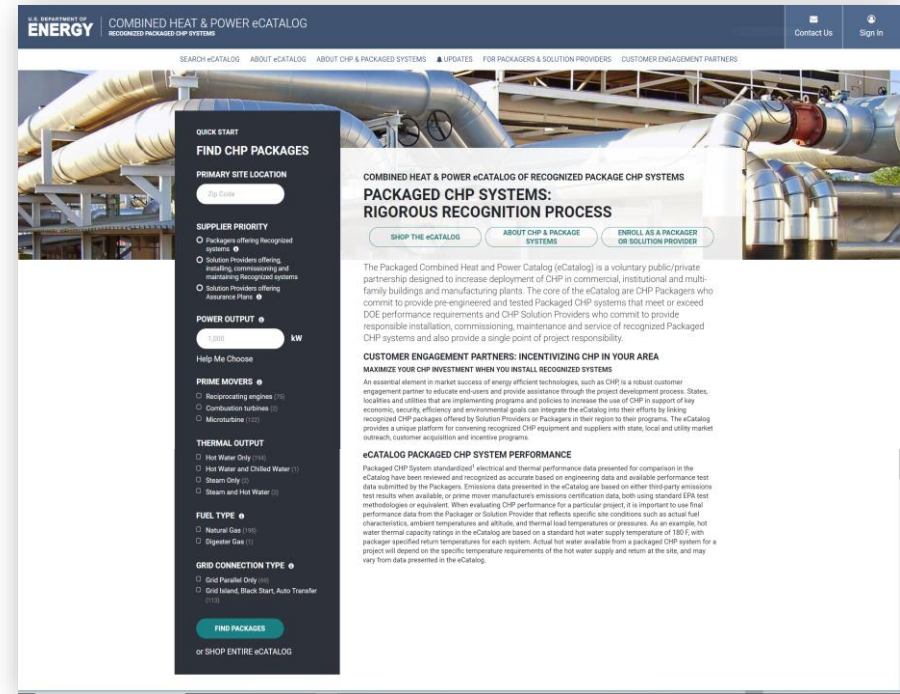
- Accelerator / eCatalog Update
 - Bruce Hedman & Rich Sweetser
- DOE Better Buildings Financing Navigator and Financial Ally Network
 - Joe Indvik, US DOE Better Buildings Initiative
 - jindvik@retechadvisors.com
- C-PACE Overview and Financing for CHP
 - Mackey Dykes, Vice President, Financing Programs, Connecticut Green Bank
 - Mackey.Dykes@ctgreenbank.com
- Third Party Ownership for CHP Projects
 - Jack Sins, Vice President, Business Development, Unison Energy
 - jack.sins@unisonenergy.com
- Wrap-Up & Questions

This Webinar Is Being Recorded

eCatalog Update

Packaged CHP eCatalog Status (June 24, 2020)

- 31 Recognized Packagers
- 19 Recognized Solution Providers
- 212 Package Offerings
 - ✓ 129 recip engine
 - ✓ 82 microturbine
 - ✓ 1 gas turbine
 - ✓ 205 natural gas
 - ✓ 7 digester gas
 - ✓ 57 grid parallel only
 - ✓ 143 grid islandable/auto transfer
 - ✓ 24 kW to 7.5 MW
 - ✓ Multiple suppliers and packages in every zip code
- 10 Customer Engagement Partners enrolled



<https://chp.ecatalog.lbl.gov/>

Live Demo

**DOE Better Buildings Financing
Navigator and Financial Ally Network**
Joe Indvik, US DOE Better Buildings Initiative



Financing Options for CHP Systems

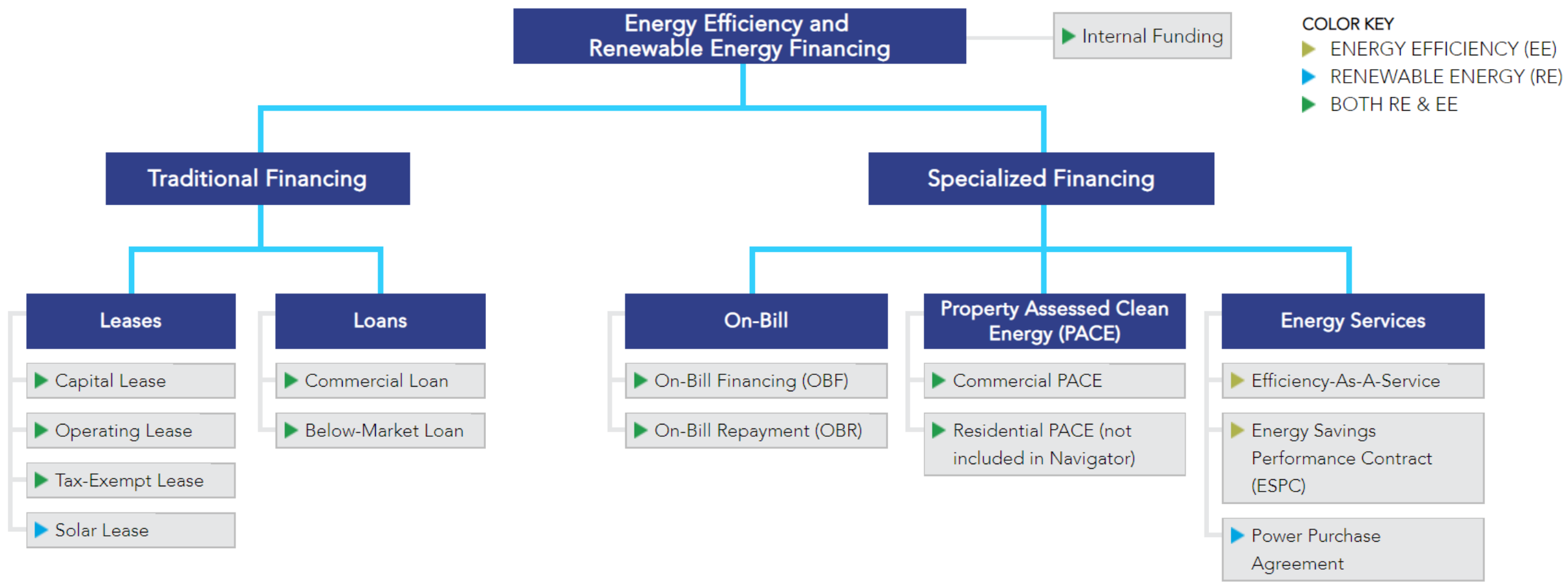
June 24th, 2020

2:00 – 3:30 pm EST

Agenda

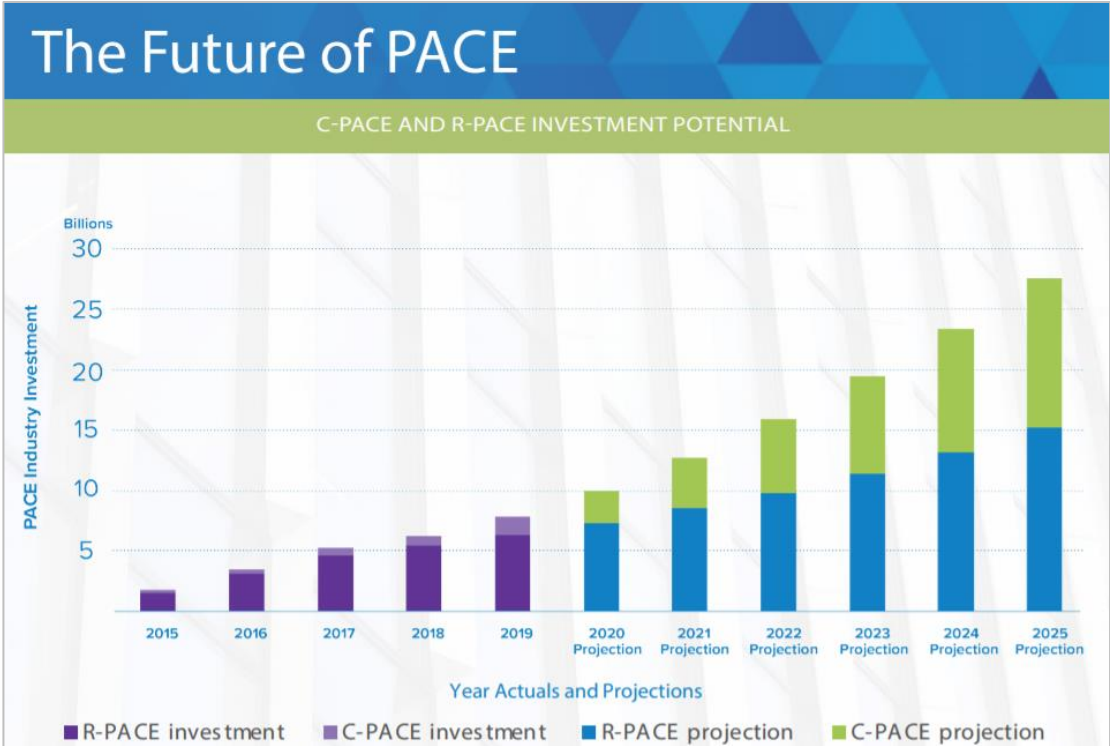
- 1 Overview of Financing Options and Resources
- 2 Demo of Better Buildings Financing Navigator
- 3 Q&A

The Energy Financing Landscape



Source: Better Buildings Financing Navigator

Up and to the right



(1) PACENation: <https://pacenation.org/wp-content/uploads/2020/04/PACE-Facts-4-24-20.pdf>

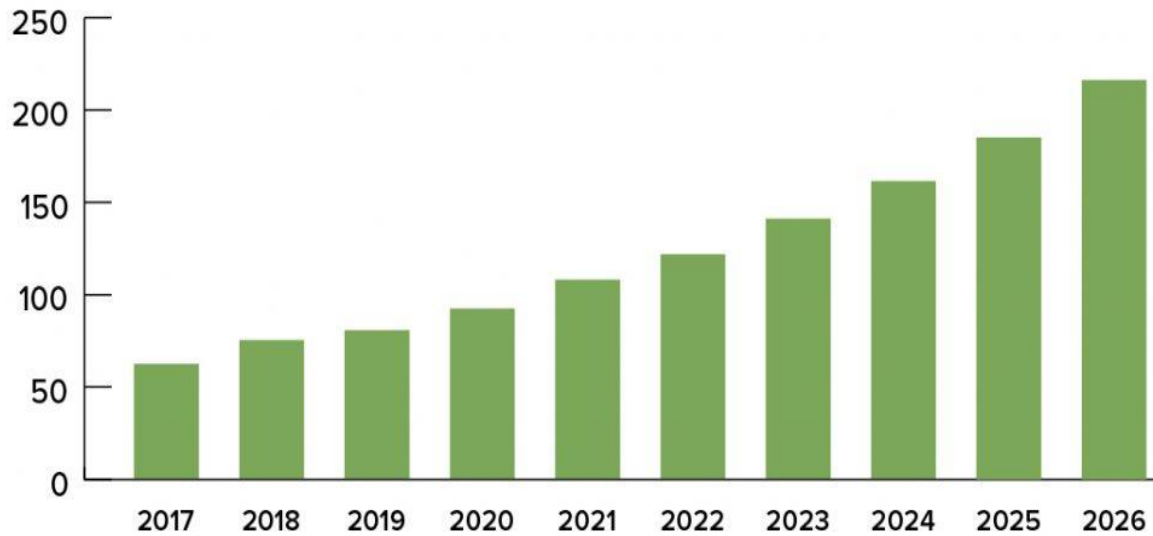
Up and to the right

The Future of PACE

C-PACE AND R-PACE INVESTMENT POTENTIAL



Global Annual EaaS Revenue Forecast



Source: Navigant Research's Energy as a Service, 2017.

- (1) PACENation: <https://pacenation.org/wp-content/uploads/2020/04/PACE-Facts-4-24-20.pdf>
- (2) Greentech Capital Advisors/Navigant Research: <https://www.greentechcapital.com/reports/articles/energy-service-customers-suppliers/>

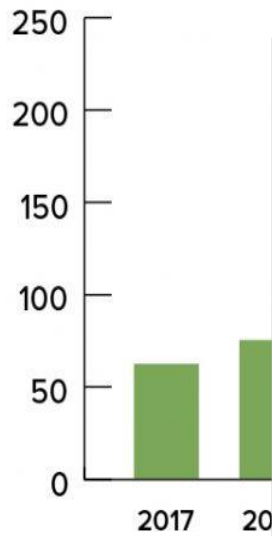
Up and to the right

The Future of PACE

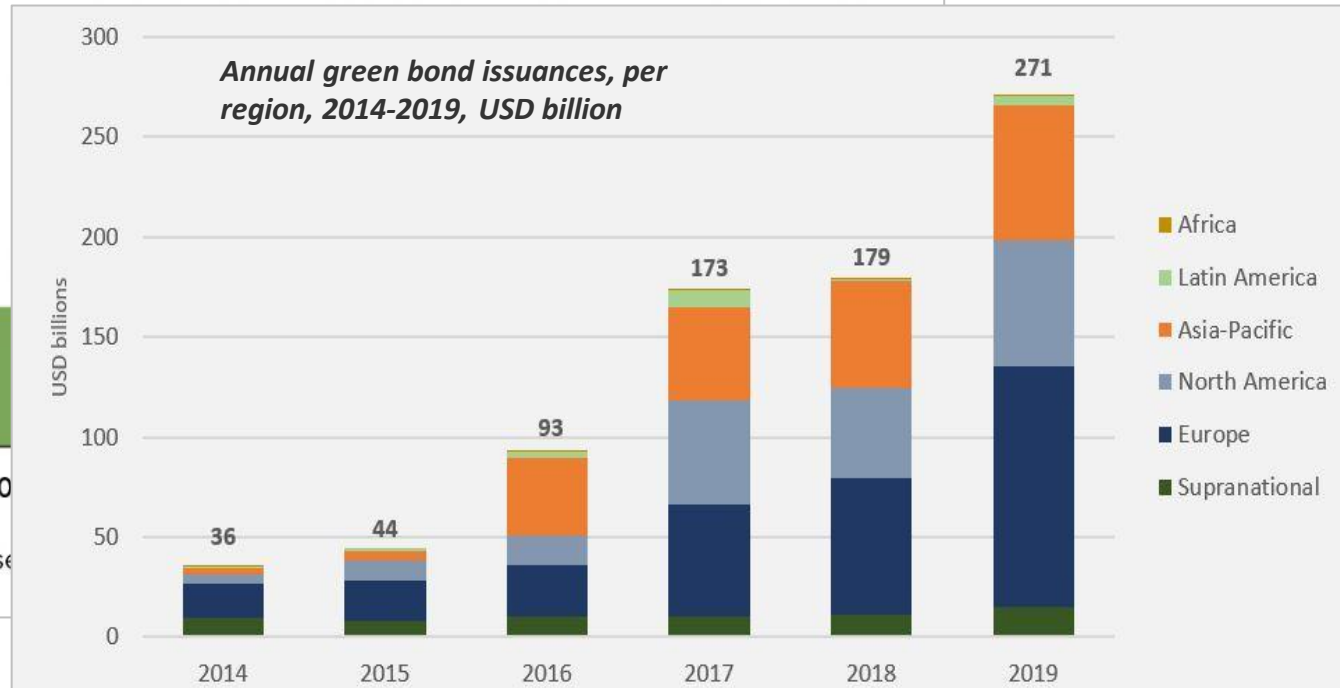
C-PACE AND R-PACE INVESTMENT POTENTIAL



Global Annual EaaS Revenue Forecast



Source: Navigant Research



IRENA analysis, based on data from Environmental Finance Bond database

(1) PACENation: <https://pacenation.org/wp-content/uploads/2020/04/PACE-Facts-4-24-20.pdf>

(2) Greentech Capital Advisors/Navigant Research: <https://www.greentechcapital.com/reports-articles/energy-service-customers-suppliers/>

(3) IRENA: <https://www.irena.org/newsroom/articles/2020/Feb/Financing-the-Global-Energy-Transformation-Green-Bonds>

The Better Buildings Financial Allies



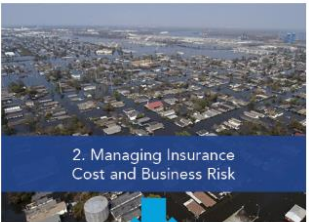
Resilience Roadmap is Live on the Solution Center

Steps to Resilience



1. BUILDING THE FINANCIAL BUSINESS CASE FOR RESILIENCE

This fact sheet introduces the Resilience Roadmap and reviews key concepts including the challenges of resilience, understanding and measuring risk, and how to quantify and articulate the financial business case for resilience improvements.



2. MANAGING INSURANCE COST AND BUSINESS RISK

This fact sheet discusses the role that the insurance industry plays in mitigating resilience risk and offers best practices for building owners to work effectively with insurers.



3. FINANCING AND IMPLEMENTING RESILIENCE PROJECTS

This fact sheet discusses implementing resilience improvements across a commercial building portfolio and evaluating financing options that can help overcome upfront costs and other common barriers to resilience.

Resources & Case Studies

Figure 1: Physical and Transition Risks from Climate Change



Available at: <https://betterbuildingsolutioncenter.energy.gov/finance-resilience>

Better Buildings Financing Navigator

The Better Buildings Financing Navigator is an online tool that helps public and private organizations find financing solutions for energy efficiency and renewable energy projects.



With the Navigator, you can...

- 1 Explore:** Learn the basics of the clean energy financing market
- 2 Find:** Answer a few simple questions to see which financing options might be a fit for your project
- 3 Connect:** Speak to Better Buildings Financial Allies who may be able to finance your project

Available at: <https://betterbuildingssolutioncenter.energy.gov/financing-navigator>

C-PACE Overview and Financing for CHP

*Mackey Dykes, Vice President, Financing
Programs, Connecticut Green Bank*

C-PACE



Connecticut Green Bank



Connecticut Green Bank, a national leader in the green bank movement and trusted partner across the commercial and industrial sector, is accelerating the adoption of green energy by making it more accessible and affordable to commercial, industrial and institutional buildings.

- Quasi-state bank with a \$130 million balance sheet
- Supported through surcharge on electric bills and investment returns

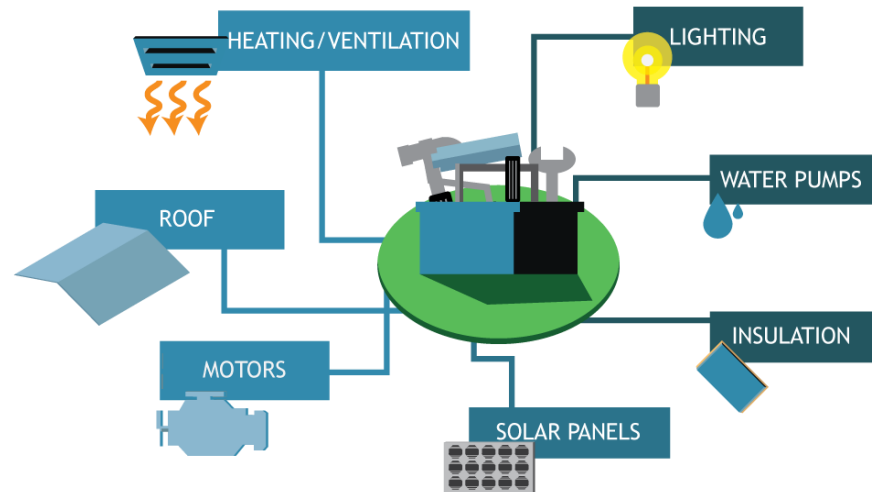
- Mobilized \$1.2 billion of investment
- Over 26,600 projects



C-PACE (Commercial Property Assessed Clean Energy) is an innovative financing solution from Connecticut Green Bank that makes upgrades that save energy accessible and affordable.

Enabled by State-level legislation, PACE is a public-private partnership, creating the first voluntary property tax assessment for optimizing building infrastructure.

With C-PACE, building owners can access 100% upfront, long-term financing to fund eligible improvements



C-PACE Basics



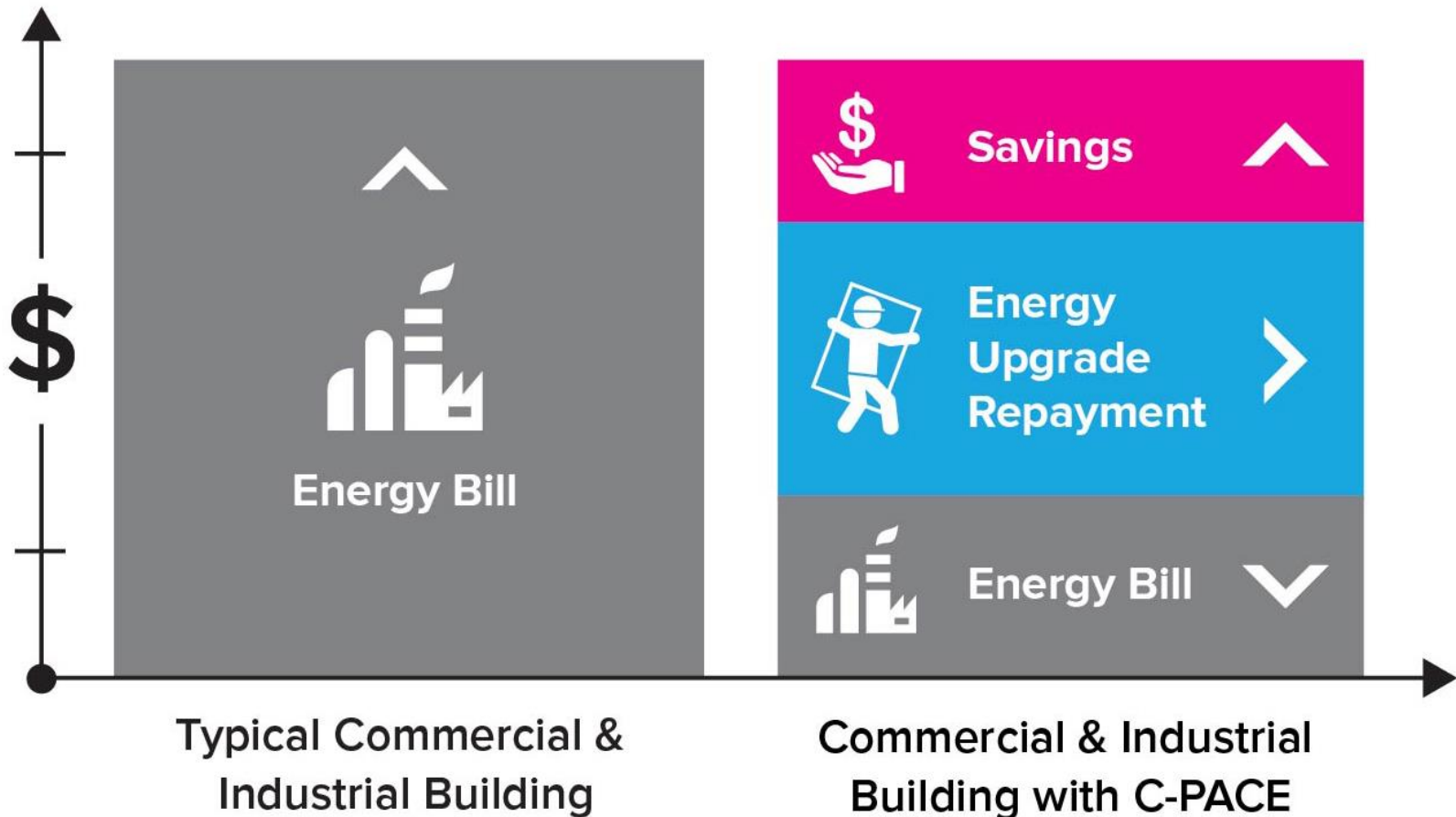
- Assessment-based financing
- PACE assessment collected with and like any other property tax and assessment
- PACE assessment survives sales, including foreclosures
- PACE assessment in arrears is senior to mortgages - but only the past due assessment
- Future PACE assessments are paid by future building owners

How C-PACE Works



- Energy project construction proceeds exactly as it typically would.
- Rather than using equity and/or debt for project financing, property owner uses CT Green Bank CPACE financing
- CT Green Bank directs the town to place an assessment on the property and bill alongside the property's regular tax bill, in biannual repayment amounts for duration of the financing.
- PACE repayment is collected with the property tax payment, with no additional paperwork for the property owner.
- Municipality remits the PACE assessment payment to the CT Green Bank.

C-PACE increases your bottom line



Why CPACE Financing?



- ❑ The secure nature of PACE enables up to 25-yr funding: projects with long simple payback period can be implemented on a positive cash flow basis
 - ✓ Increases NOI.
 - ✓ Increases Property Value
- ❑ Funds 100% of hard and soft development costs
 - ✓ Recovery of overhead expenses and development fees.
 - ✓ No money down
 - ✓ Ensures modernizing infrastructure will not compete with other investment opportunities
- ❑ The benefits AND the cost of projects can be shared with tenants
 - ✓ Financed through property taxes allowing costs to be passed to tenants under many lease types
 - ✓ Tenants see energy savings

Why CPACE Financing?



- ❑ No payoff on sale – CPACE automatically transfers to the new owner, like any other real estate tax
 - ✓ No residual encumbrance and easy exit.
 - ✓ Takes the risk away from investing in needed CAPEX.
- ❑ Improved Building Performance
 - ✓ Improves building attractiveness and tenant quality of life
 - ✓ Address preventive and deferred maintenance

MERIDEN YMCA

ENERGY UPGRADES:

Cogeneration system, energy
efficient lighting

PROJECTED ENERGY SAVINGS:

\$688,991 over the life of
the upgrades

pacesetter >>

John Benigni, CEO



MERIDEN YMCA

LOCATION:

110 West Main Street
Meriden, CT

BUILDING SIZE:

40,000 square feet

YEAR BUILT: 1997

TOTAL PROJECT COST:

\$331,142

INCENTIVE:

\$2,952

C-PACE FINANCING: \$331,884

ENERGY UPGRADE: Cogeneration
system, energy efficient lighting

TERM: 19 years

ANNUAL C-PACE ASSESSMENT:

\$27,321

ANNUAL ENERGY COST SAVINGS:*

\$34,450

LIFETIME ENERGY COST SAVINGS:

\$688,991

ANNUAL ENERGY SAVINGS:

438 MMBtu

*over the financing term



"I definitely feel the responsibility of how we spend our money here at the Meriden YMCA. When I came across C-PACE, it was a no-brainer."

– JOHN BENIGNI

Thank You!

Mackey Dykes, Vice President, Financing Programs

www.cpace.com | (860)257-2175

mackey.dykes@ctgreenbank.com



Third Party Ownership for CHP Projects

*Jack Sins, Vice President, Business
Development, Unison Energy*

CHP Financing Strategies, Solutions, and Case Studies

June 2020

SMARTER ENERGY – INSIDE THE BOX

+ Reliable Power + Lower Costs + No Capital Investment

A decorative graphic in the bottom right corner consisting of several overlapping orange ovals of varying sizes, arranged in a cluster.

THE BIG PICTURE

- **The Benefits of CHP**
 - Energy cost savings
 - Resiliency
 - Carbon Reduction
- **The Challenges of CHP**
 - Complexity
 - Cost
- **CHP Market Developments**
 - Containerized solutions
 - Energy as a Service (3rd parties, ESAs/PPAs)

CHP or cogeneration has been around since Edison's first plant in NY. The traditional CHP model was for the end-user to “buy, own and operate” the CHP system.

Similar to developments in the solar PV market, CHP end users now have the ability to “outsource” their CHP system, while still reaping its benefits of financial savings, resiliency and carbon reduction.

CHP 1.0 – Traditional Model

- High capital cost
- All on customer's balance sheet
- Not developer's core competency
- Risk
- **3rd party O&M**
 - Getting paid for problems (service calls)
 - Multiple vendors - “finger pointing” in event of problems
- Many systems under this structure are poorly maintained, run inefficiently, and are even de-commissioned early

CHP 2.0 – “As-a-Service” Model

- No capital cost
- \$0 on customer's balance sheet
- Outsourced risk
- Customer can focus on core business
 - leave utility plant to experts
- **In-House O&M**
 - getting paid to *not* have issues
 - Alignment of interests between end-user and CHP owner & operator
- Better CHP system results, operational efficiency, and client experience

Energy Services Agreement (ESA)

Similar to a power purchase agreement (PPA), the ESA is a long-term agreement (typically 15-20 years) under which electricity (kWh) and thermal (therms a/o chilling) are sold to the end-user by the owner/developer. As a result, the end-user gets a CHP system without having to expend any capital

While ESAs can vary in terms, end-users should look for flexibility and beneficial terms such as:

- Only billed for what is used (kWh, therms, chilling)
- All CHP-related costs are included in ESA kWh and therm rates (capex, equipment, engineering, permitting, interconnection, construction, owner's return, ongoing O&M, etc...everything)
- ESA is assignable
- Heat rate guarantee
- What happens at end of term (renew, remove, purchase at "fair market value")

Other Items

- ESA is off-balance sheet for end-user
- Cancellability?
- Minimum energy purchase?
- Gas purchasing outside ESA?
- Who takes commodity risk?
- Do they have own capital? Have to raise it?
- Dedicated source?
- In-house O&M?

Red Flags

- Guarantees for \$ savings, uptime, performance
- Back-out clauses
- High exit costs
- Billing for service calls or consumables

Union Hospital

Elkton, MD

Client goals: Install backup power within the limited space available to ensure patients have electric and AC during outages

Unison Energy installed a 1.2 MW CHP microgrid system:

- One 1,200 kW MWM engine operating at 76% efficiency
- Heat recovery 105 psi steam and domestic hot water
- Load following and island mode capabilities
- Covers over 87% of the building's energy needs
- Carbon footprint reduced by 60% or 7,300 tons of CO₂ per year*
- 4,160 V operating voltage

Unison Energy met several design challenges to ensure patient comfort:

- Installed VFDs on chillers to ensure AC would function during an island mode event
- Placed the quiet, 65 dB system behind a custom-built wall at the hospital's entrance

"Unison was without a doubt the best company that we could have partnered with."

— Mark Mears, Facilities Management Director

*EPA non-baseload emissions data (eGRID 2016)



Gaylord National Harbor Resort and Convention Center

National Harbor, MD

Client goals: Gain resilient power for 2.4 million square feet of space, three utility feeds, five 700 HP boilers, and four 2000-ton chillers

Unison Energy installed a 6.0 MW CHP microgrid system, the largest of its kind in Maryland:

- Three 2.0 MW generators operating at 70% efficiency
- 25 kV operating voltage with three 2500 kVA step-up transformers
- Load following and island mode capabilities
- Variable frequency drives for chillers included at no upfront cost
- Carbon footprint reduced by 59% or 32,800 tons per year*
- Covers over 85% of the building's energy needs
- Offsets 60% of hot water system's natural gas usage

"Unison Energy has been a reliable and dependable partner. Their team is responsive, proactive, and very professional. When the CHP system has issues they fix them quickly and take ownership of the situation. For Ryman, this has resulted in greater power resilience, bottom-line savings, and environmental sustainability."

— Patrick Chaffin, COO, Ryman Hospitality

*EPA non-baseload emissions data (eGRID 2016)

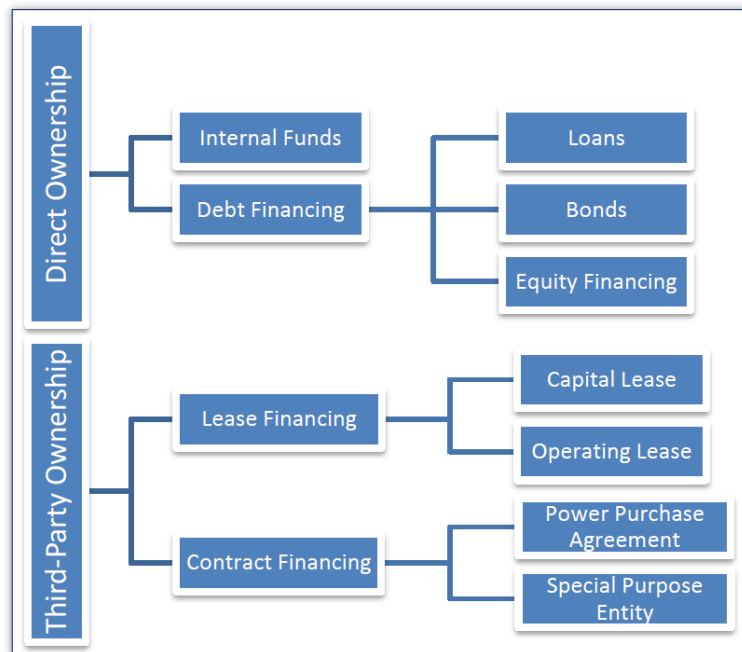


Wrap-Up, Questions & Discussion

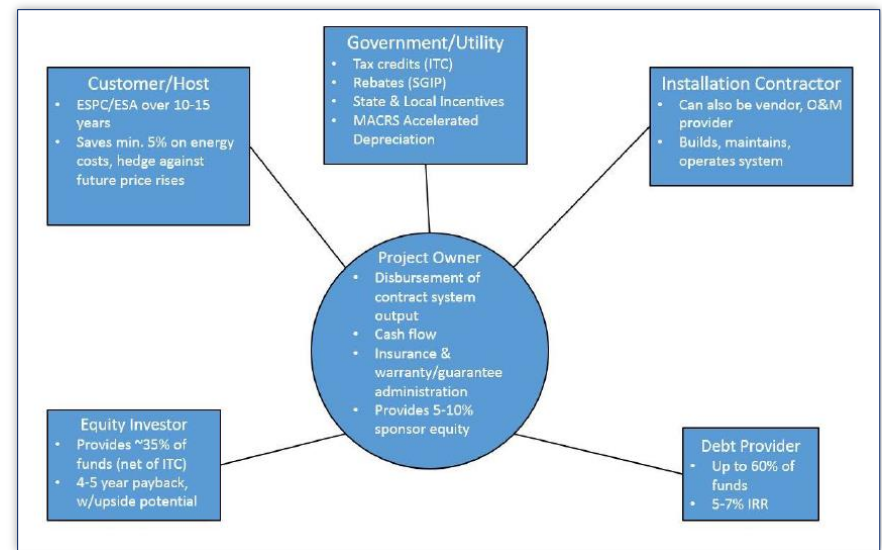
CHP Financing Primer

- DOE (2017) report detailing financing options available for CHP
 - Financial metrics & considerations used to assess CHP
 - CHP project due diligence checklist, permitting and the project financing timeline
 - Project profiles and the business case for CHP
- Download the Primer [here](#)

CHP Financing Options



Key CHP Financing Stakeholders



DOE Team

Bob Gemmer, Technology Manager, US DOE Advanced
Manufacturing Office

Bob.Gemmer@ee.doe.gov

Packaged CHP Accelerator Coordinator

Bruce Hedman

Entropy Research

202-251-0017

bhedman.entropyresearch@gmail.com

eCatalog Coordinator

Rich Sweetser

Exergy Partners

703-707-0293

rsweetser@exergypartners.com

Packaged CHP Accelerator Support

Nick Posawatz

ICF

703-272-6613

nick.posawatz@icf.com

<https://chp.ecatalog.lbl.gov/>