

# Ownership and Financing Strategies for CHP

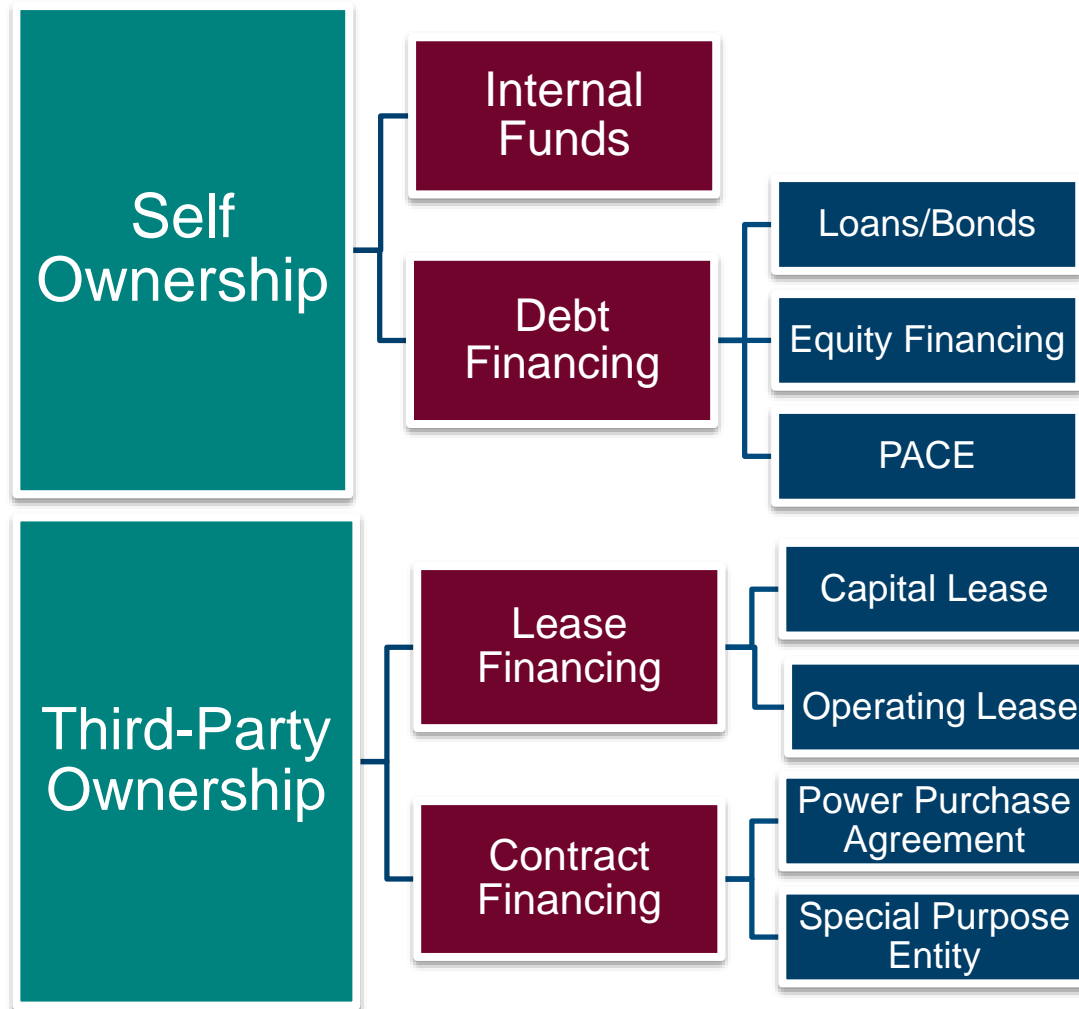
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2017



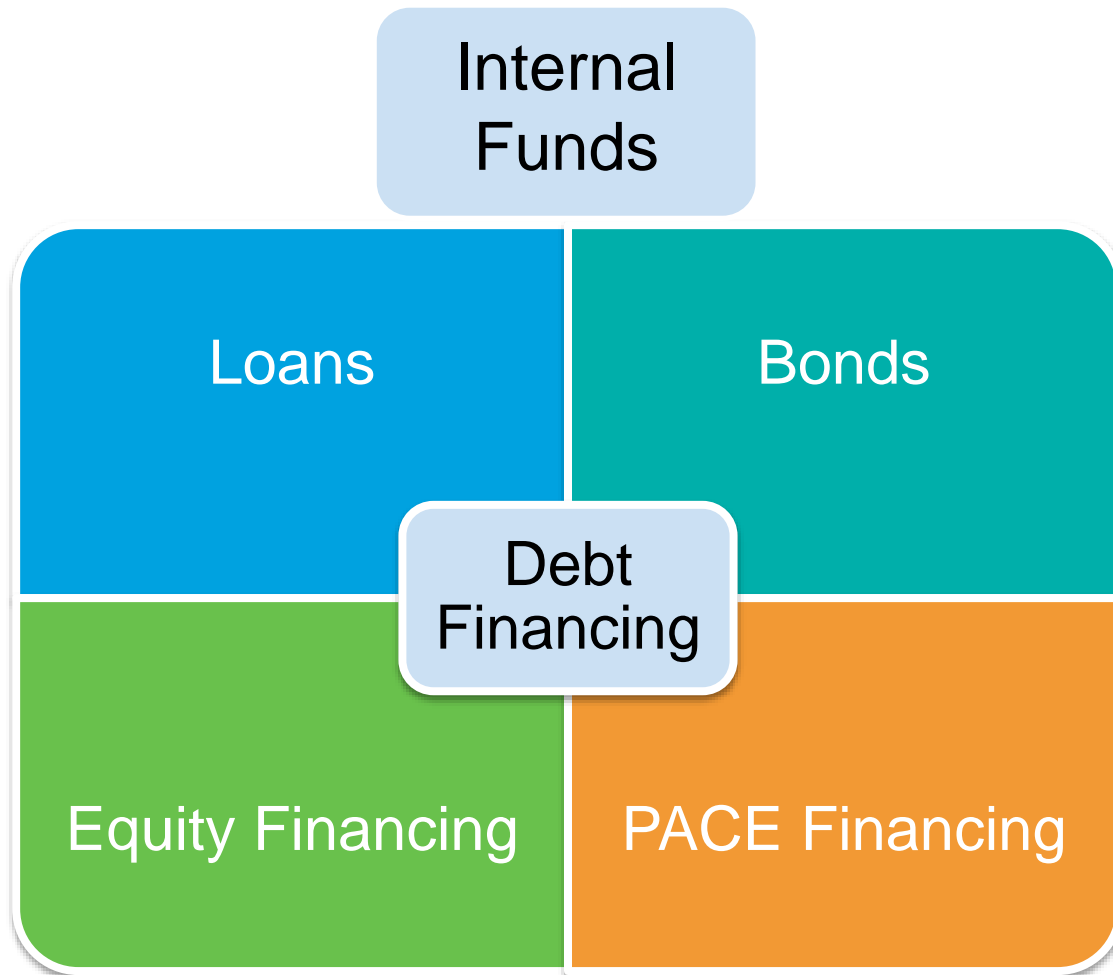
*IDEA Campus Energy  
2017*

Anne Hampson  
ICF

# CHP Financing Options



# Direct Ownership Options



# Internal Funds (Self-Financing)

## ■ Advantages

- Lowest cost of money (avoid interest or fees)
- Take advantage of financial incentives and tax benefits
- Income improvement through energy savings and improved return on corporate cash

## ■ Disadvantages

- Competition with core business and other internal projects
- Potential drag of depreciation on income statement

### University of New Hampshire's (UNH) Self-Financed CHP System

- Estimated Cost of \$28 million
- System online in 2006 – began using landfill gas to power CHP system in 2009 (EcoLine project partnership with Waste Management)
- UNH sells Renewable Energy Credits (RECs) from EcoLine project



**UNH Cogeneration Plant,**  
<https://www.unh.edu/facilities/unh-cogeneration-facility>

# Loans and Bonds

## ■ Loan Agreement

- Lender provides funds, borrower pay interest to repay principal

## ■ Bond Agreement

- Borrower uses funds for defined period of time at a specific interest rate

## ■ Advantages

- Interest rates low – debt is currently cheap compared to historic levels
- Full ownership retained

## ■ Disadvantages

- Banks have little to no experience w/CHP – difficult to receive bank loans
- Have to pay interest on borrowed capital
- Borrowers retain technical and financial risks

## University of Alaska Fairbanks CHP System

- Scheduled for Completion in 2018 – will provide heat and power for over 3 million ft<sup>2</sup> of UAF's facilities
- Alaska State Legislature approved \$157.5 million of revenue bond insurance for the project from 2014-2018 – UAF will contribute \$50 million in project capital



**UAF Campus,**

<http://www.districtenergy.org/blog/2014/11/25/univ-of-alaska-fairbanks-picks-power-plant-designer/>

# PACE Financing

- **Commercial Property Assessed Clean Energy (PACE) bond financing method**

- Offered by some local governments
- Financing tied to property, not borrower

- **Advantages**

- Provide all upfront capital costs
- Increases property values and provides long-term financing for large projects

- **Disadvantages**

- Financing comes in at commissioning – gap financing may be required
- Higher complexity and transaction costs on property sale
- Stakeholder misalignment if owner hasn't properly maintained equipment

## Meriden, Connecticut YMCA CHP

- 60 kW CHP engine operational in 2014
- Received \$372,466 in funding for CHP and lighting project
- Annual interest rate of 4.94% over a term of 19 years
- Estimated annual energy cost savings of \$34,450

*Meriden, CT YMCA,  
[http://www.ct.gov/deep/lib/deep/p2/institution/CT\\_GreenBank\\_C-Pace.pdf](http://www.ct.gov/deep/lib/deep/p2/institution/CT_GreenBank_C-Pace.pdf)*



# Equity Financing

- **Investors (typically large institutions or accredited investors) who commit large sums of money to an investment over a long period of time**
  - Stock or other security representing an ownership interest in a project
- **Advantages**
  - Applicable to most CHP projects
  - CHP developers, equipment vendors, fuel suppliers, and investment banks can all be equity investors in a CHP project
- **Disadvantages**
  - Higher cost – more expensive than debt
  - Reduced returns to host/owner – cover off-loading of risk to investor

## The Filer City Project CHP System

- 60 MW coal/wood waste cogeneration facility
- Electricity sold to Consumers Energy, and steam sold to adjacent paper mill
- Prudential Insurance Company of America provided \$78 million of the project's \$87 million total cost as debt
  - 10% equity requirement by affiliate of Consumers
  - 19-1/2 year term and a fixed interest rate



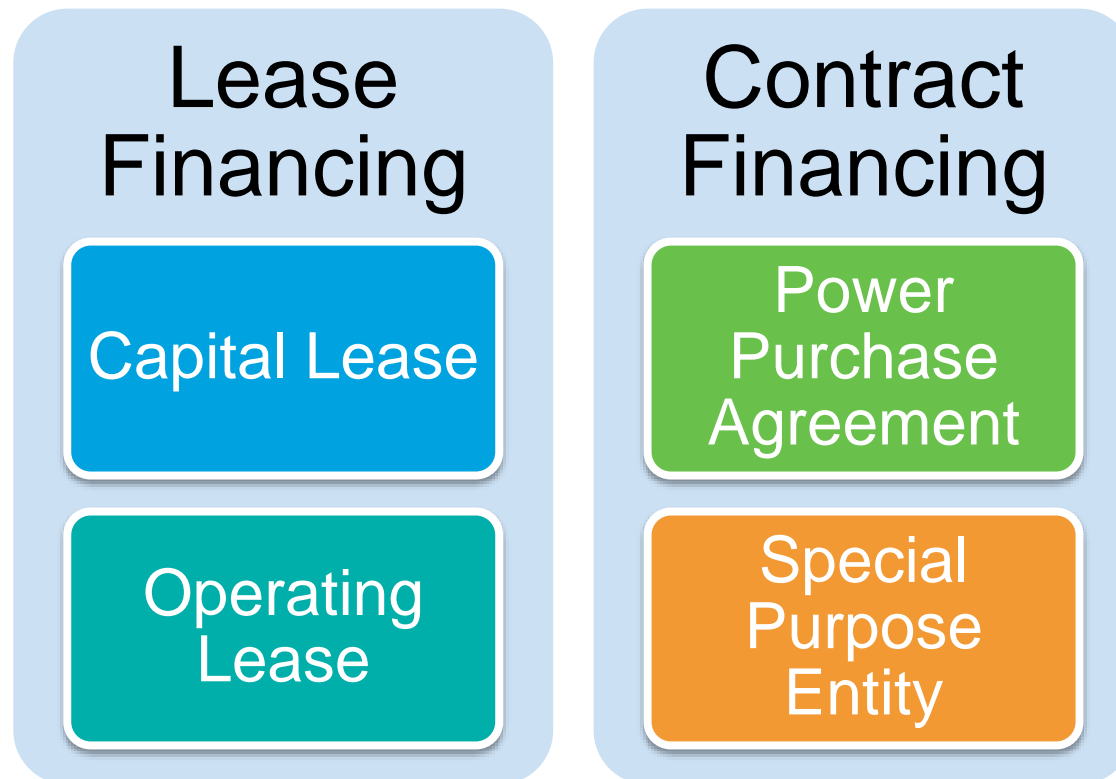
**Filer City Power Plant**

[http://www.tonducorp.com/projects\\_investments\\_details.php?id=1](http://www.tonducorp.com/projects_investments_details.php?id=1)

# Third-Party Ownership Options

- **Third-Party Ownership (TPO) allows end-users to utilize the capital, expertise, and incentives of an outside organization**

## TPO Options





# Leases

- **Contractual agreement for the use of one party's property by another party**

- Capital and Operating Leases

- **Advantages**

- Long-term financing and energy cost savings used to offset monthly lease payments
  - Generally does not require significant lessee capital
  - Not responsible for O&M and insurance costs

- **Disadvantages**

- Payments can be higher due to the deal length (10+ years)
  - Risk of savings estimates and O&M efficiency
  - Subject to lender or internal budget constraints

## Dublin, Ohio CHP System

- 248 kW CHP system providing 60% of the power to the city's recreation center
- 15-year lease agreement with IGS Energy
  - City pays fixed price for electricity (\$/kWh) for first 5 years, with 3% annual rate increase of 3%
- Estimated annual savings of \$19,000 and avoided boiler cost replacement savings of \$69,000



**Dublin, OH Rec Center CHP System**  
<http://dublinohiousa.gov/dev/wp-content/uploads/2014/06/Res-55-14.pdf>

# Power Purchase Agreement (PPA)

- **Contract between a power producer and a power consumer for the sale of electricity and thermal energy**
  - Off-balance sheet financing method
- **Advantages**
  - No upfront capital or O&M costs/responsibility
  - Reduction of energy costs, and certainty of costs over lifetime of contract
  - Can be structured to reduce commodity risks
- **Disadvantages**
  - Loss of development incentives and tax benefits
  - Long-term commitment to purchase power
  - Expensive compared to other options due to investor risk

## Upper Chesapeake Medical Center PPA

- UCMC installed 2 MW CHP system in 2014
- Partnered with Clark Financial Services Group (CFS) on PPA for 20 years
- PPA valued at \$9 million for entire contract period based on average price of electricity
- Also received \$1.5 million incentive under the EmPower Maryland program

### UCMC Facility Entrance

<http://www.distribugen.org/docs/presentation/Doug-Davis-Clark-Broad-Upper-Chesapeake-Presentation-WADE.pdf>



# Utility Ownership of CHP: Eight Flags Energy-Rayonier CHP Plant

- **Florida Public Utilities (FPU)/Chesapeake Utilities Corporation**

- Built and owns a \$40 million, 21 MW CHP plant at Rayonier Advanced Materials in Amelia Island, FL
- Increased regional electric reliability by forming microgrid on Amelia Island
- Increased local tax base and employment

- **Rayonier Advanced Materials**

- CHP provides up to 200,000 lb/hr steam, and 500 gal/min of hot water from waste heat
- Steam sold to Rayonier, and electricity sold to FPU for retail customers
- Projected 5-7 more days of revenue/production per year



***Eight Flags Energy CHP Plant,***  
***<http://www.chpk.com/eight-flags-energy/>***

# Special Purpose Entity

- **Provide power to a customer under build-own-operate (BOO) model**
  - Third-party organization builds, owns, and operates (and finances) the CHP system at a host facility
  - Combination of operating lease, PPA, and other financing pieces
- **BOOs are often implemented by Energy Service Companies (ESCOs)**
  - A prospective CHP customer will partner with an ESCO through an Energy Services Performance Contract (ESPC), which outlines all aspects of the CHP project
- **Advantages**
  - No upfront capital or O&M costs/responsibility with ESPC
  - Can take advantages of tax considerations not applicable to nonprofits or governments
  - Limits scopes of liability and losses
- **Disadvantages**
  - Entity creation and funding costs of the SPE
  - Lack of entity history can make it difficult to sign counterparties
  - Additional compliance costs (annual tax filings, audits, governance, etc.)

# Typical Financing Timeframe

***Start-to-finish: 3 – 6 months***

½ – 1 ½ months

½ – 1 ½ months

1 – 2 months

1 – 2 months

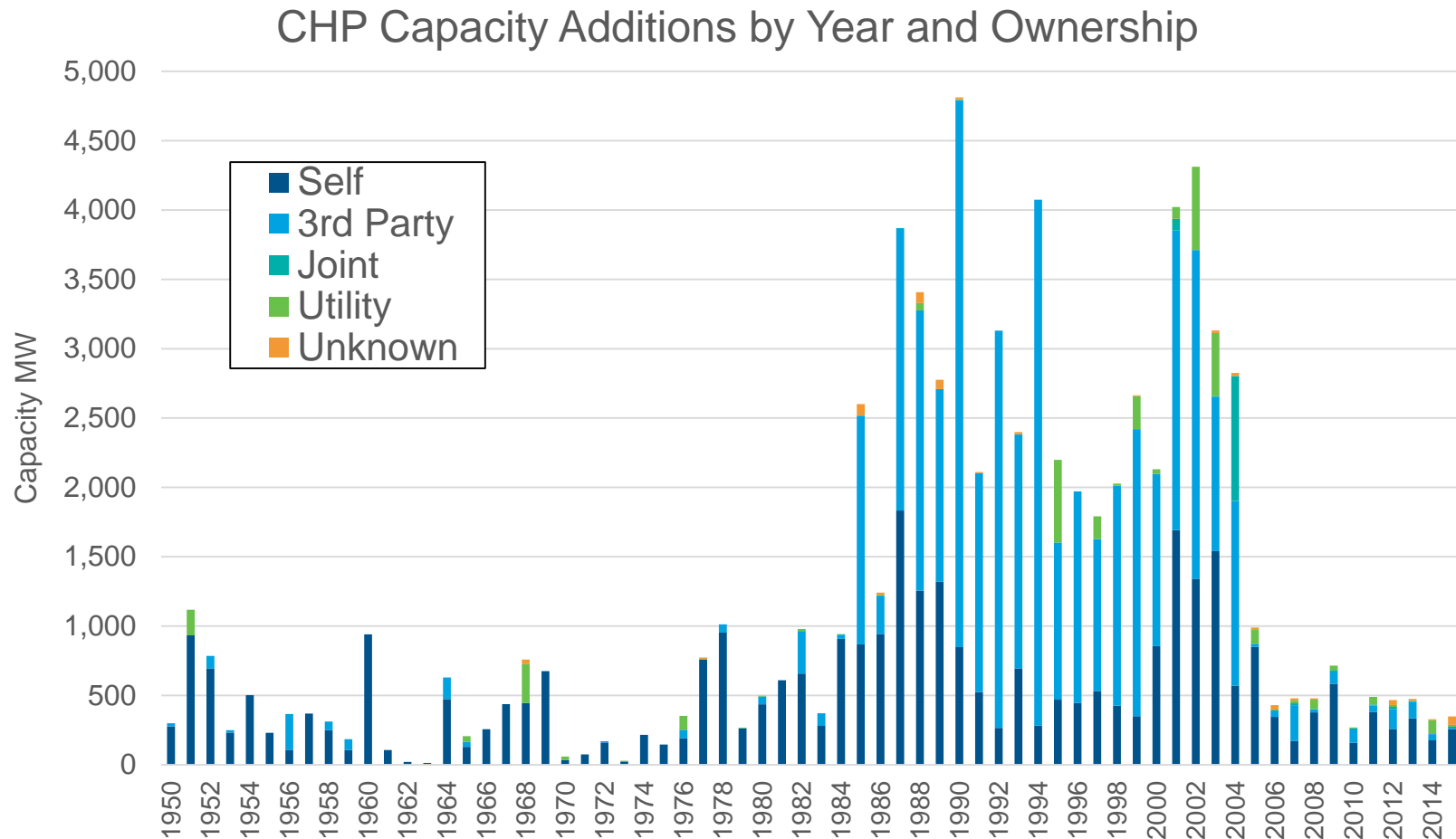
Identify lender  
to provide  
financing

Draft term  
sheet

Negotiate  
contract terms  
and conditions

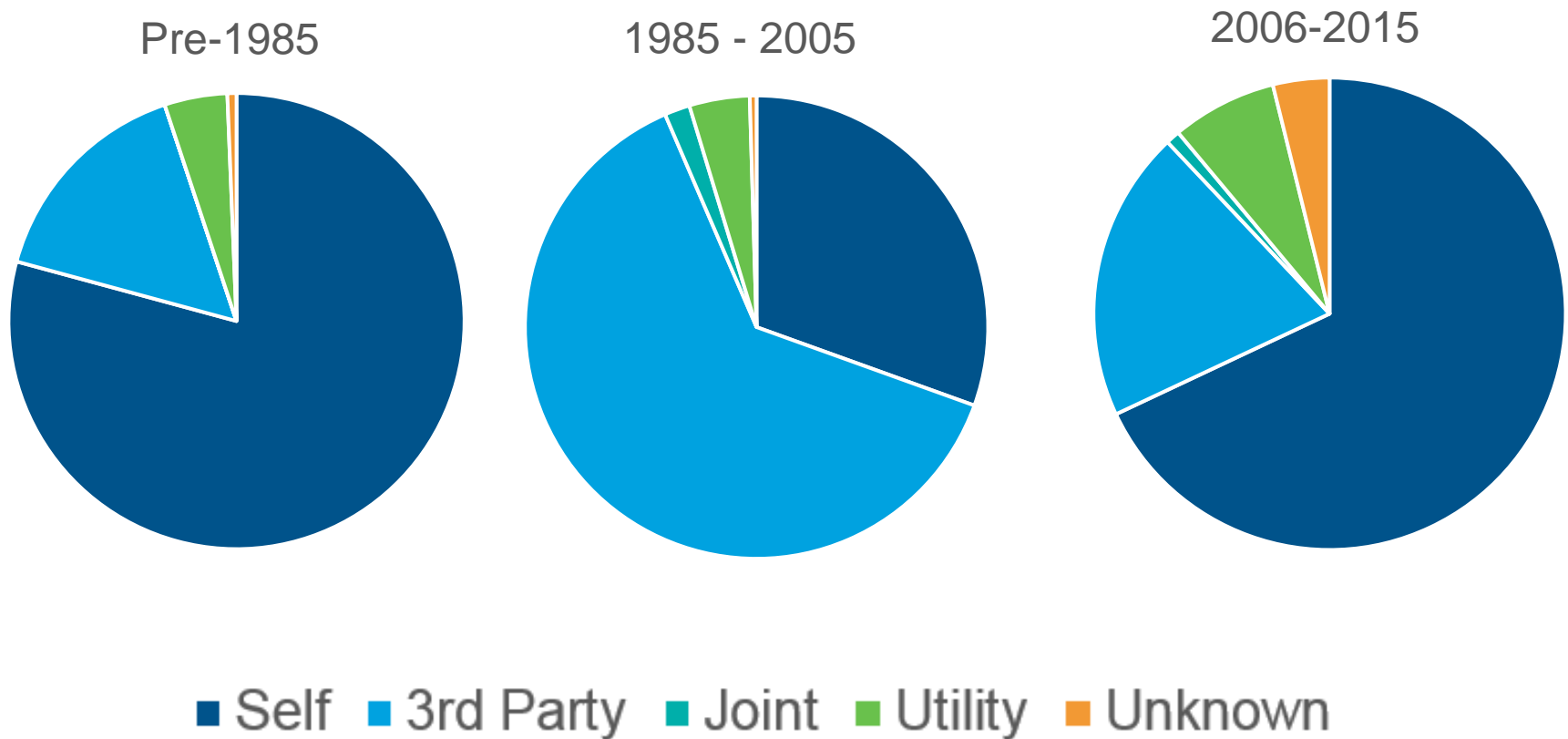
Finalize contract  
language and  
obtain financing

# Changes in CHP Ownership Over Time



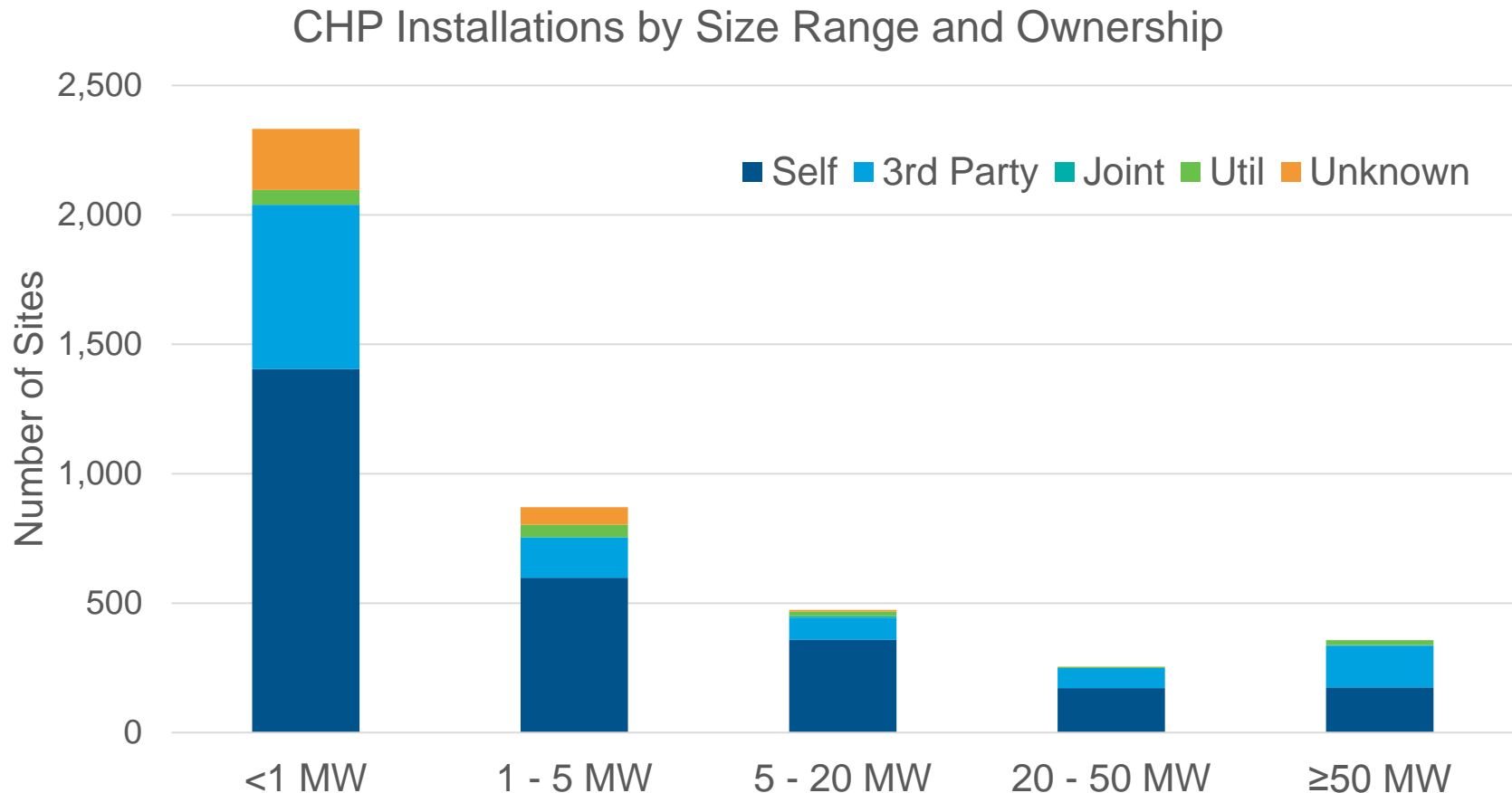
Source: DOE/ICF CHP Installation Database (U.S. installations as of Dec. 31, 2015)

# CHP Capacity by Ownership



Source: DOE/ICF CHP Installation Database (U.S. installations as of Dec. 31, 2015)

# CHP System Size Impact on Ownership



Source: DOE/ICF CHP Installation Database (U.S. installations as of Dec. 31, 2015)



# Parting Thoughts

- CHP ownership and financing strategy is all about allocating project risks and responsibilities
- Ownership strategies have changed over time and will continue to evolve
- A thorough understanding of the goals of your project and the risks you are willing to take on will determine your best financing option

# Questions?

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