

Ownership and Financing Strategies for CHP

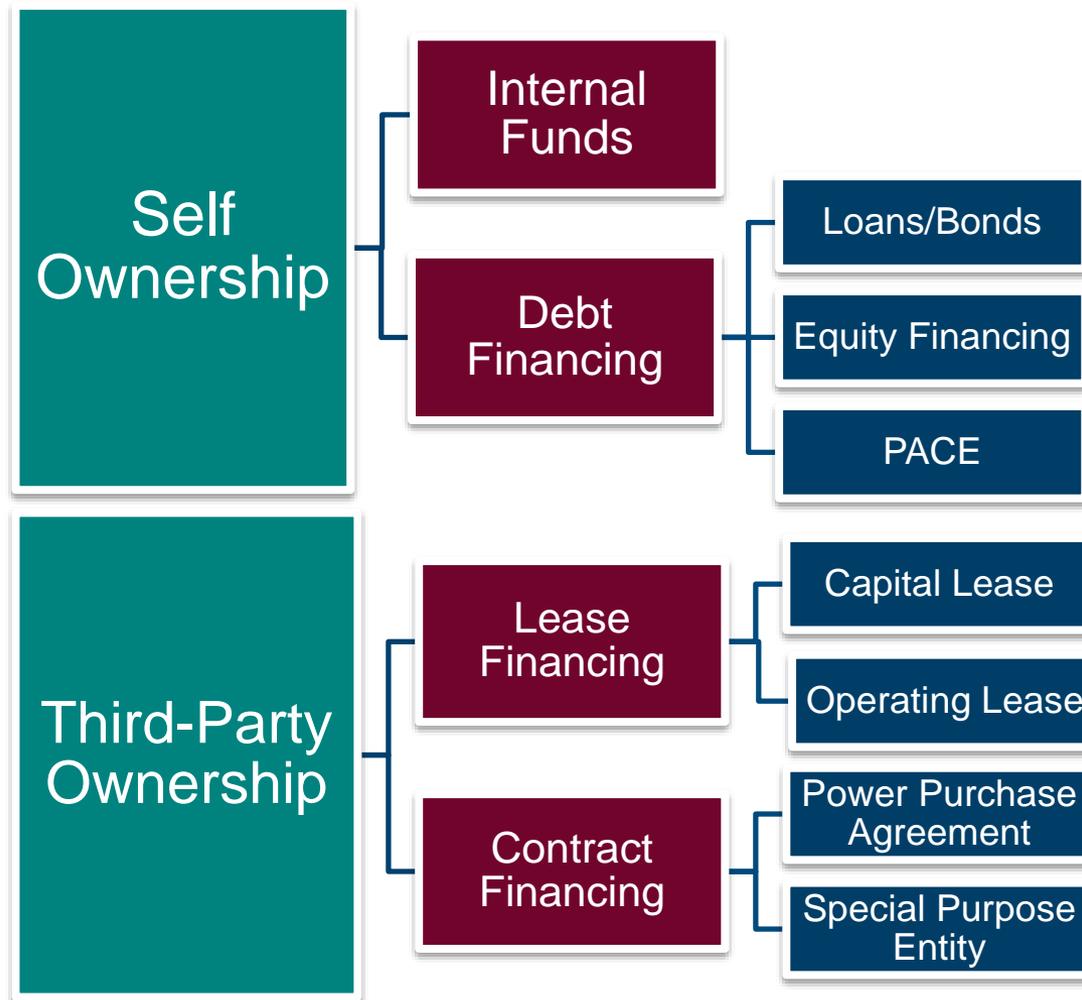
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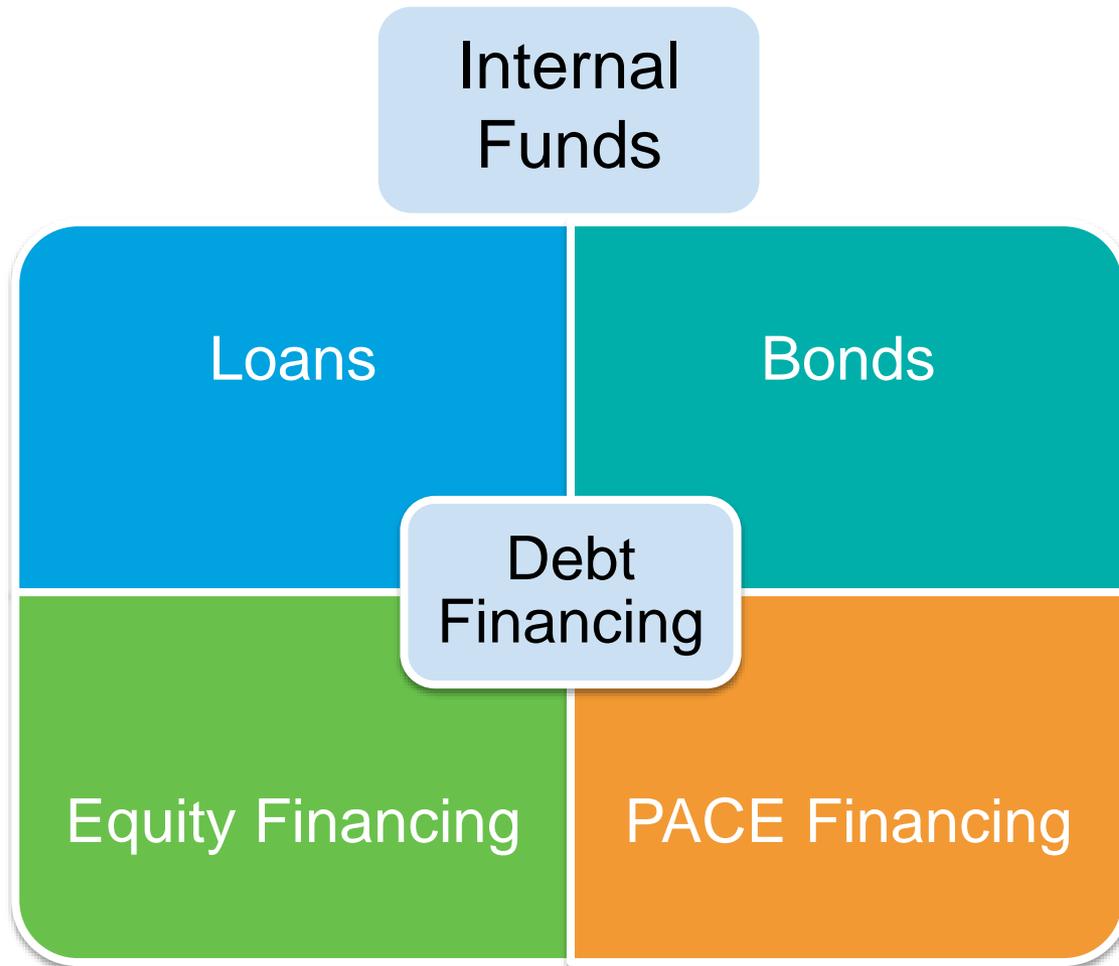
*IDEA Campus Energy
2017*

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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 ft² 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*

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



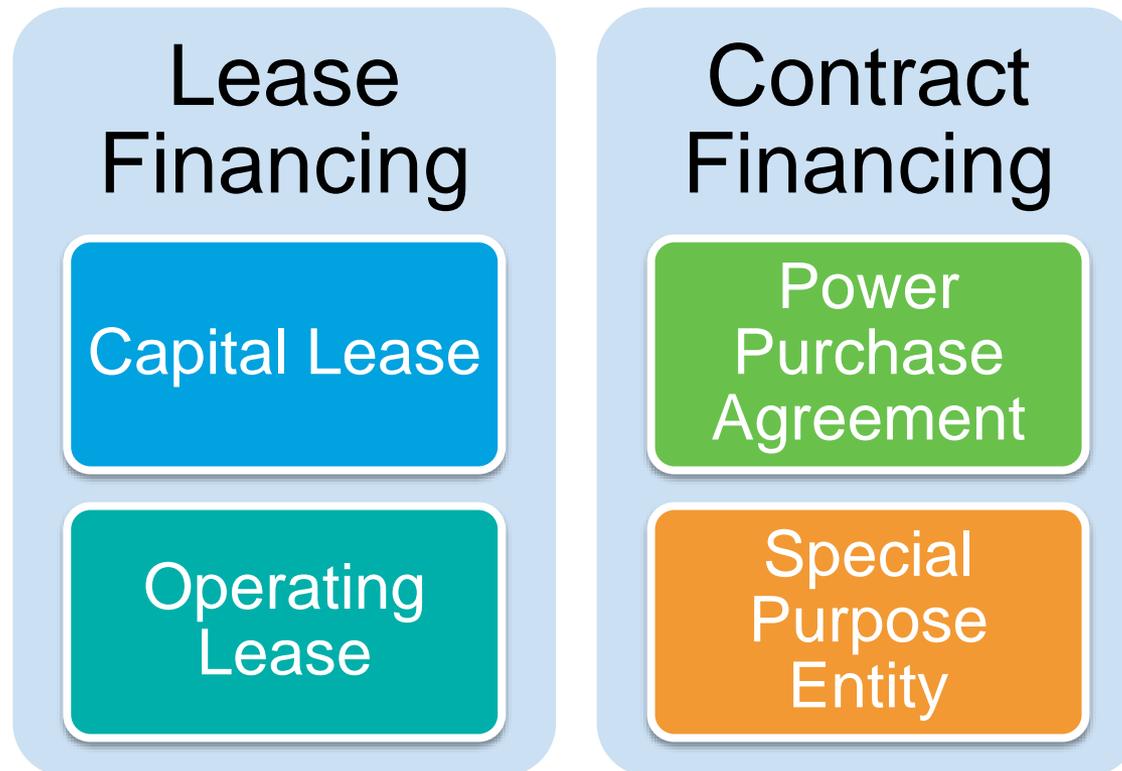
Filer City Power Plant

http://www.tonducorp.com/projects_investments_details.php?id=1

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

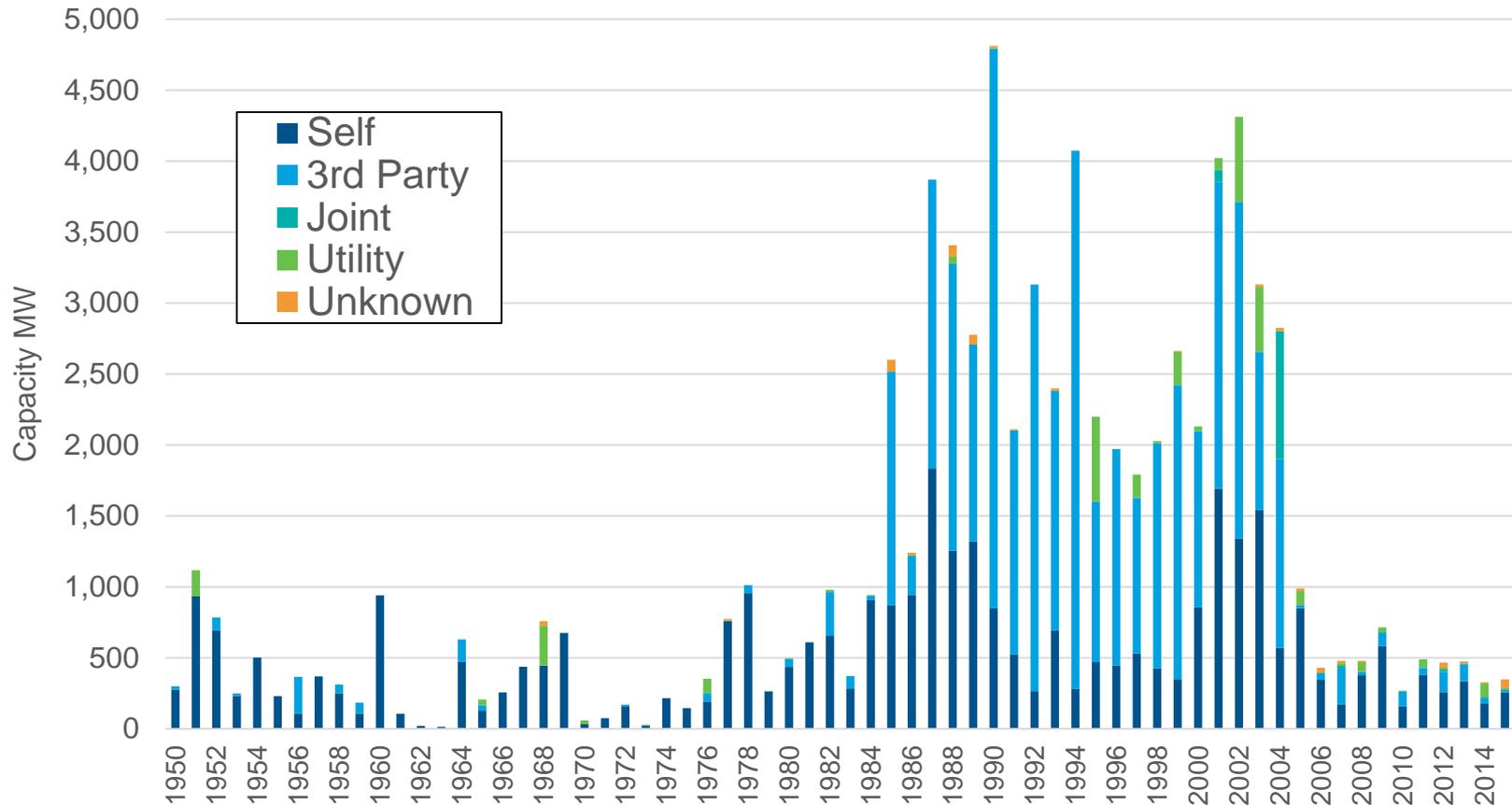
Draft term
sheet

Negotiate
contract terms
and conditions

Finalize contract
language and
obtain financing

Changes in CHP Ownership Over Time

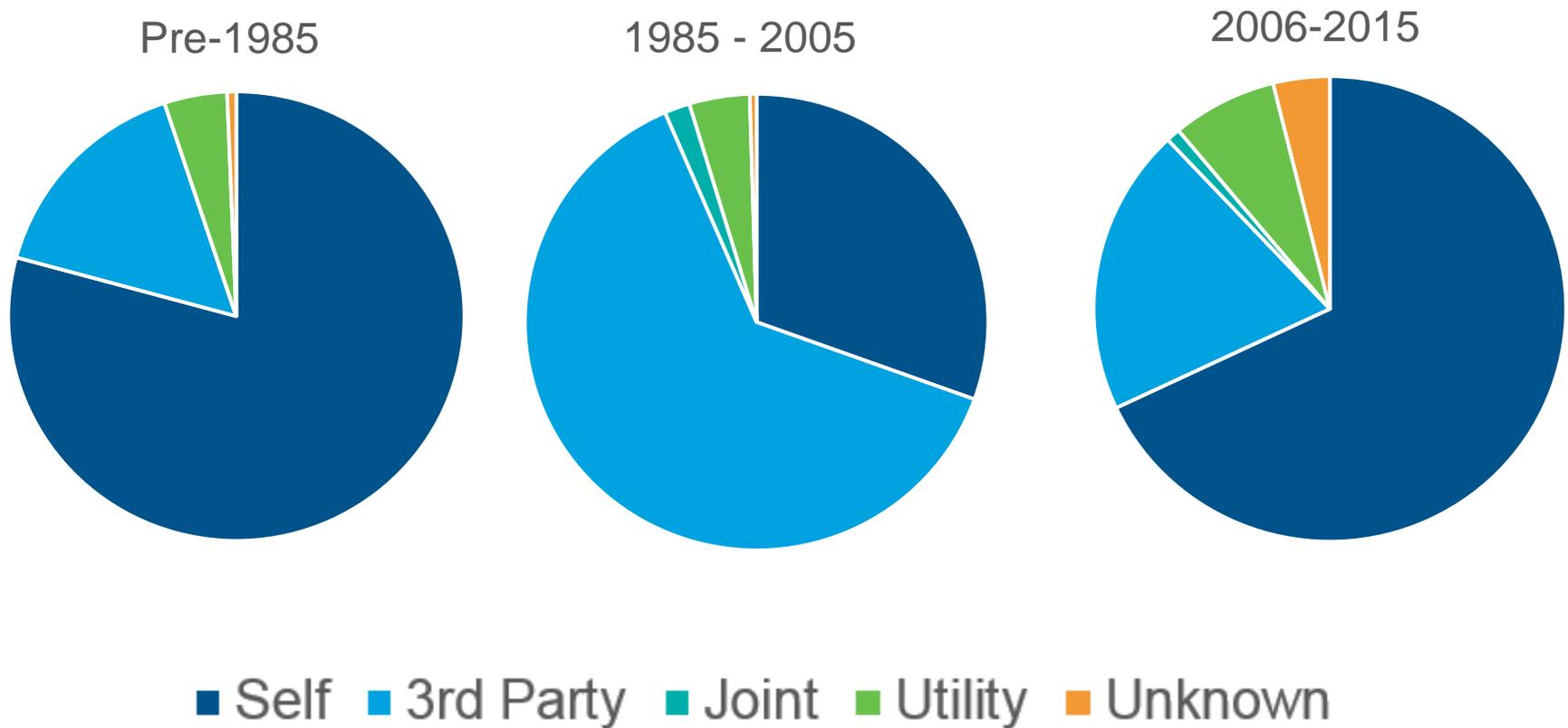
CHP Capacity Additions by Year and Ownership



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

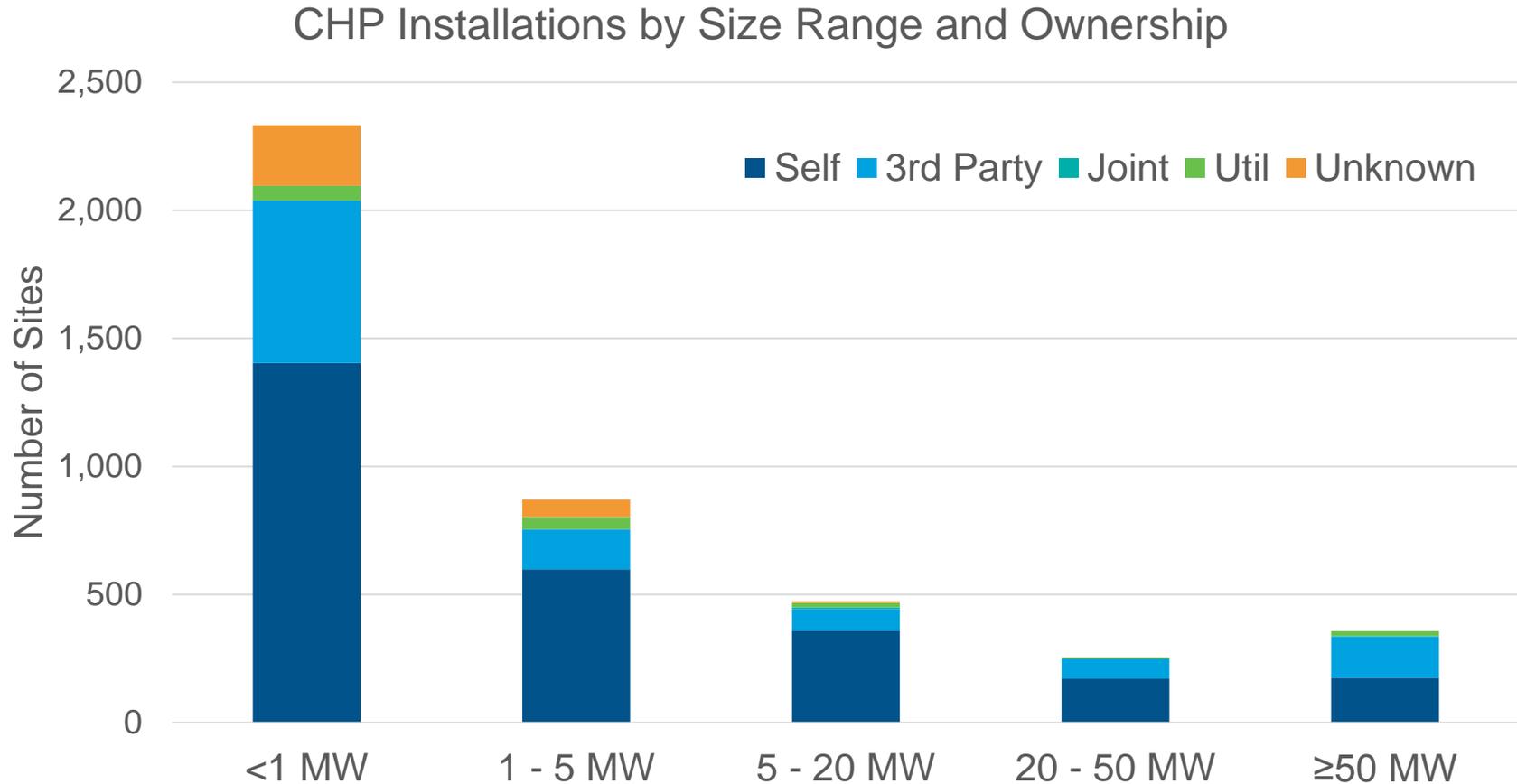


CHP Capacity by Ownership



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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