



Transforming the Market for CHP: How Maryland Created the Market



**Presented at the 2015 ACEEE National Conference on Energy
Efficiency as a Resource**

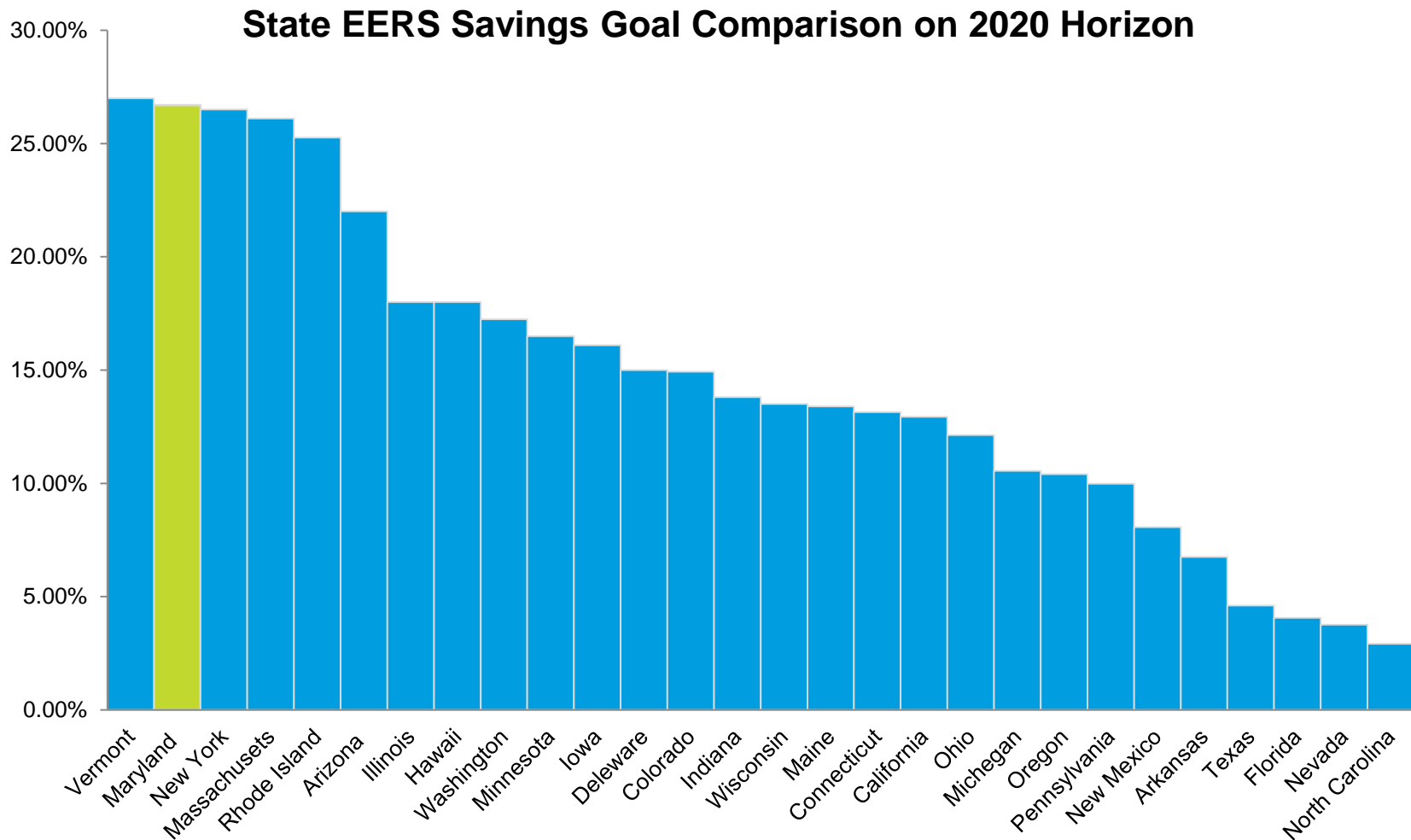
Presented by: Tim Witting
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Energy Efficiency in Maryland

- EmPOWER Maryland Act of 2008
 - Ratepayer funded
 - Commercial & Industrial programs
 - Residential programs
- Goal of 15% savings by 2015
 - 2007 baseline per capita consumption and demand



Ambitious Goals in Maryland



Source: ACEEE, 2011

EmPOWER Maryland Programs

Commercial & Industrial Energy Savings Programs

Program Cycle 2009-2011

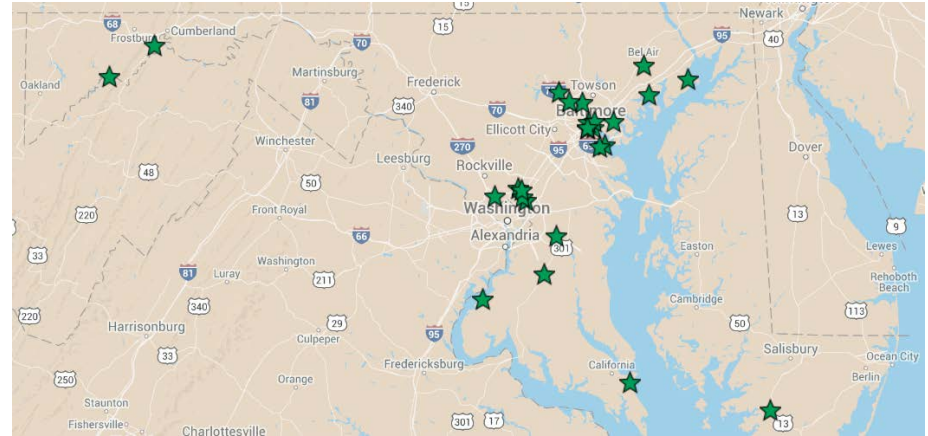
- Lighting
- VFD
- HVAC
- Chillers
- Custom

Program Cycle 2012-2015

- Small Business
- New Construction
- O & M Training
- Retrocommissioning
- ***Combined Heat and Power (CHP)***

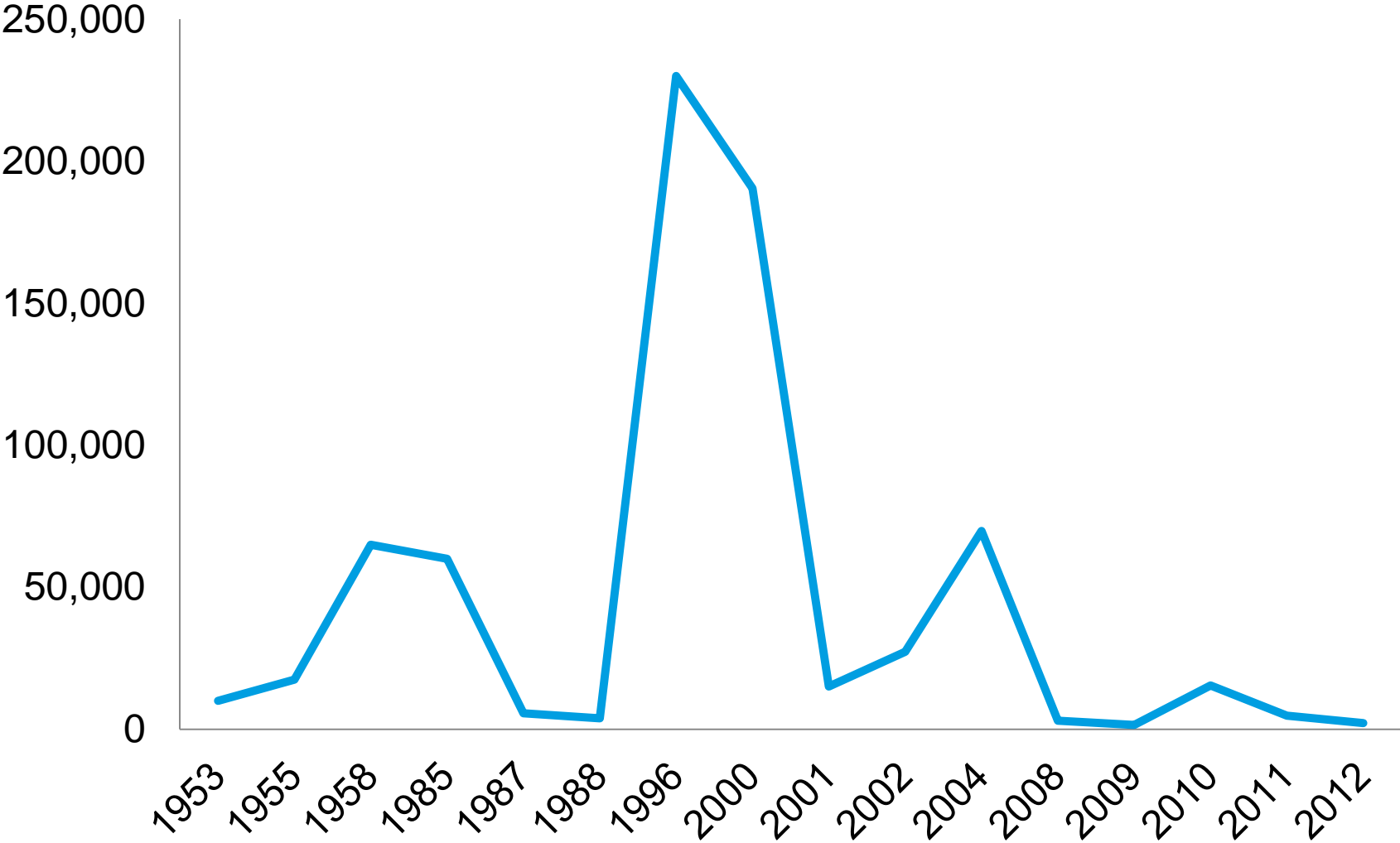
Existing Combined Heat and Power in Maryland

- More than 25 facilities
- Generating 722 MW of electricity
- Notable host facilities
 - University of Maryland (2002)
 - National Archives (2011)
 - Food and Drug Administration (2004)
 - National Institutes of Health (2010)



Source: DOE.gov

CHP Installations in Maryland by kW



Source: DOE.gov

EmPOWER Maryland CHP Incentives

- Incentives up to \$2.5 million per project
- Estimated 30-40% of total project cost
- Approximately \$1,100 per Gross kW
- Program available until 12/31/2017
- Eligible facilities
 - Commercial
 - Industrial
 - Governmental
 - Multifamily

EmPOWER Maryland CHP Criteria

- All prime movers are eligible
 - Reciprocating Engine
 - Turbine
 - Micro turbine
 - Fuel cell
- No minimum generator capacity
- Any fuel type permissible
- Capital or financed projects allowed

How Maryland Created a Market

- Build Customer Awareness
 - Active Direct Business Development
 - Marketing
 - CHP Conferences
 - Web
 - Print
 - Radio

PEPCO COMBINED HEAT AND POWER (CHP) PROGRAM

William Ellis, Pepco Program Manager, explaining the different types of CHP technology.

LOWER YOUR OPERATING COSTS WITH CHP


Combined Heat and Power (CHP) is being used by commercial, industrial and institutional facilities with large heat and power load demands to supplement their existing systems. Benefits include:

- More efficient production of electricity and heat
- Reduced emissions
- Decreased facility operating costs

CHP is also known as cogeneration. With the simultaneous generation of heat and electricity, it is beneficial to a wide range of commercial facilities, especially those needing large quantities of hot water or are looking to improve their power reliability. The recovered waste heat in CHP can be used for space heating or cooling, water heating, refrigeration and dehumidification.

Now, through the Pepco Combined Heat and Power Program, we are offering up to \$2.5 million in incentives for each CHP project.

If you're a Pepco business customer in Maryland, find out if a CHP system is right for your facility. Visit pepco.com/business, call us at 866-353-5798 or email PepcoEnergyEfficiency@LMBPS.com.

 **pepco**
Energy for a changing world.™

This program supports the EnPOWER Maryland Energy Efficiency Act

How Maryland Created a Market

- Challenges
 - Re-emerging technology
 - Project costs
 - Long project lead times
 - Inferior spark spread compared to Northeast markets
 - Improvements in resiliency of electric supply

How Maryland Created a Market

- Attracting Service Providers
 - Active outreach to non-local service providers
 - Recruiting existing trade allies to offer CHP
 - Partnering with the local gas utilities
 - Marketing
 - CHP conferences
 - Professional associations



Where Are We Today?

- Project pipeline is diverse and robust

9 Total Project Under Contract for Install

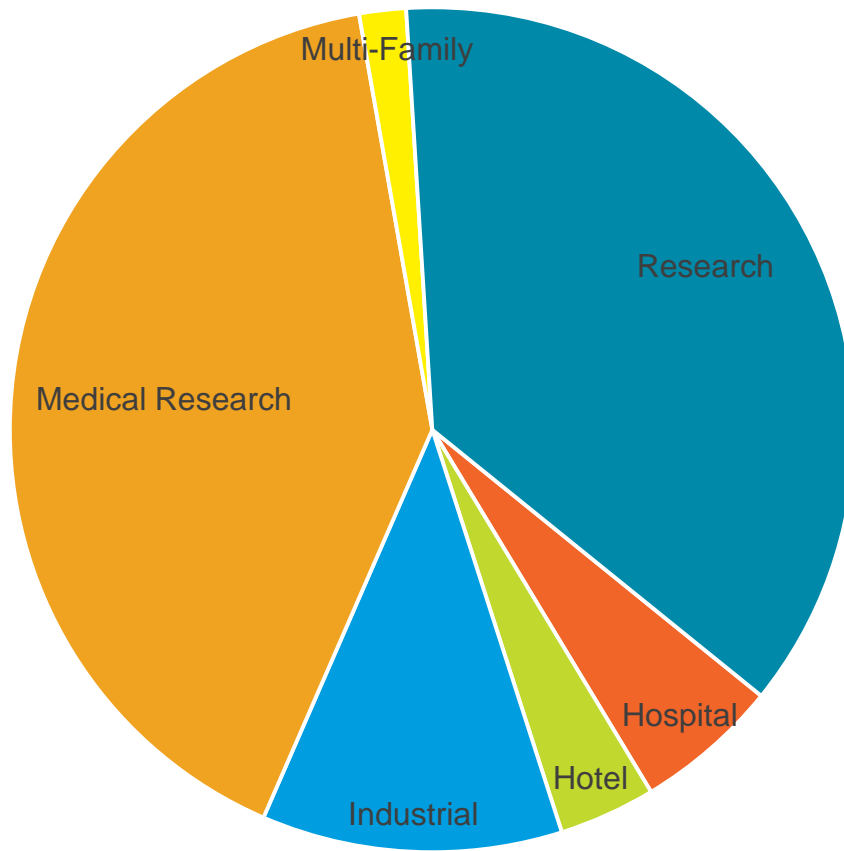
- 21,218 kW of gross generation
- 171,853,000 annual kWh savings

15 Pipeline Projects

- 32,468 kW of generation
- 275,978,000 annual kWh savings

Pepco & Delmarva Power CHP Pipeline

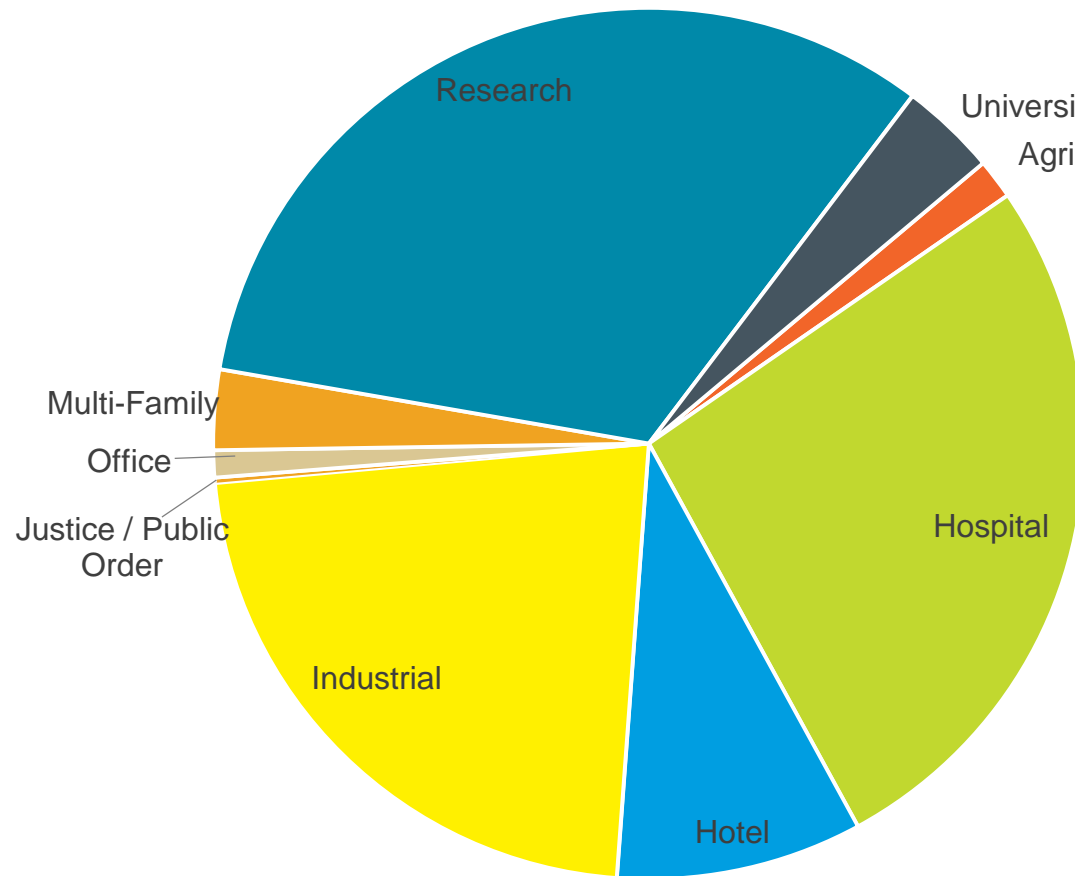
Gross kW Generation Under Contract



Hospital	1,200
Hotel	800
Industrial	2,500
Medical Research	8,839
Multi-Family	390
Research	8,000
Total	21,729

Pepco & Delmarva Power CHP Pipeline

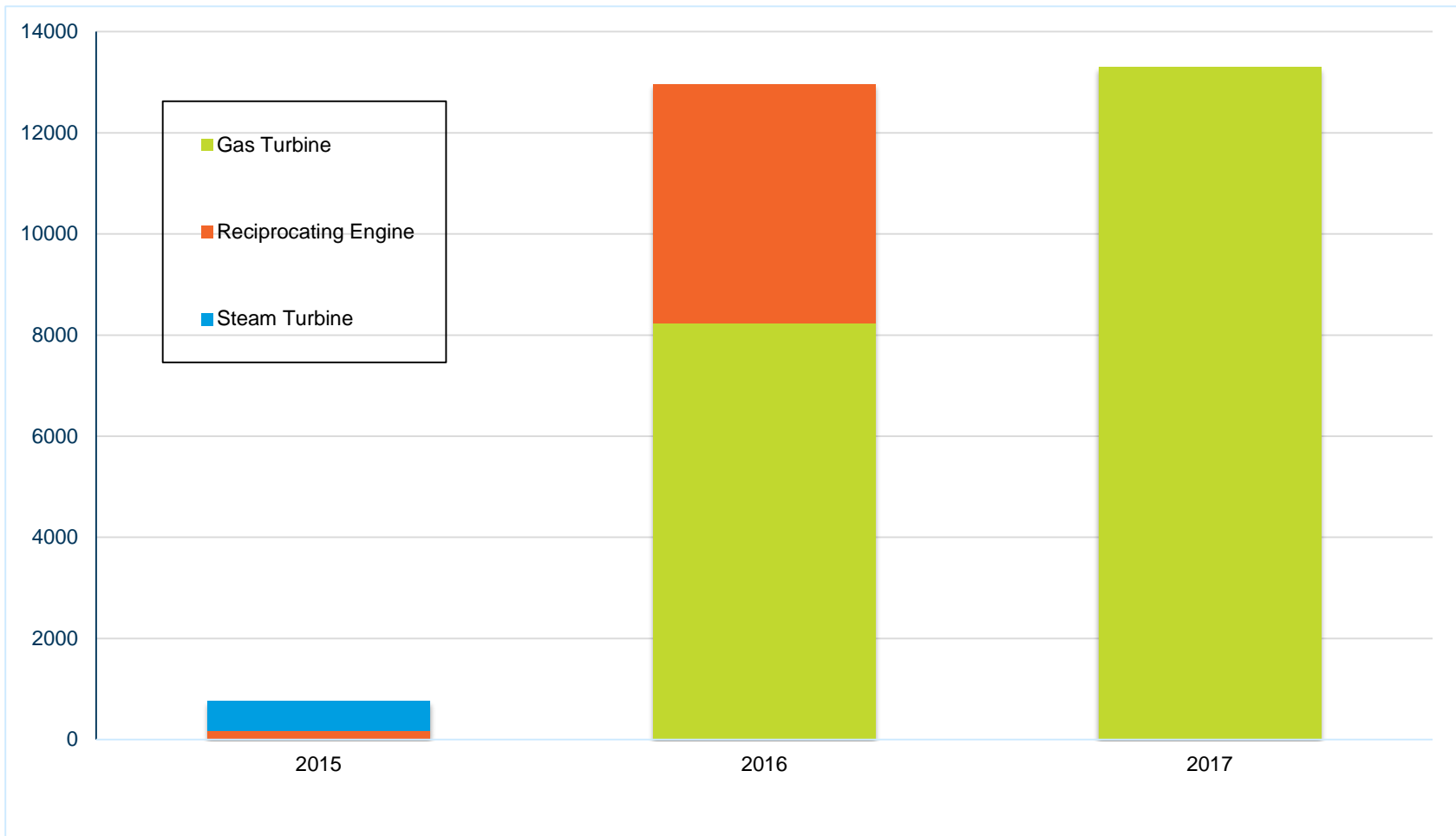
Gross kW Generation in the Pipeline



Agriculture	500
Hospital	9,000
Hotel	3,080
Industrial	7,550
Justice / Public Order	65
Multi-Family	340
Office	1,000
Research	11,000
University	1,200
Total	33,735

Pepco & Delmarva Power CHP Pipeline

ANTICIPATED COMMISSIONING DATES BY PRIME MOVER



Key Takeaways

- Direct outreach is necessary
- Simplifying the message
- Focusing on core customer segments
- Leading with Efficiency vs. Resiliency

PEPCO AND DELMARVA POWER COMBINED HEAT & POWER (CHP) PROGRAMS

REDUCE ENERGY COSTS WITH CHP.

Combined Heat and Power (CHP) can reduce your energy costs, increase the efficiency of your facility's electricity and heating systems, and reduce emissions.

CHP is beneficial to a wide range of commercial facilities especially those needing large quantities of hot water. The increased water heat in CHP can be used for space heating or cooling, water heating, absorption and desiccant dehumidification.

Cash Incentives

Through the Pepco and Delmarva Power Combined Heat and Power Program, we offer cash incentives to Maryland business customers:

- **CAPACITY INCENTIVE OF \$250 PER KW** of net nameplate capacity, capped at \$1,000,000.
 - Design and equipment ordering: \$175 per kW
 - Installation and commissioning: \$175 per kW

These payments will be made in two steps:

- 75% when the Customer signs contract (disregarding corresponding to at least 75% of the total estimated cost of the CHP installation.

• 25% when the CHP system has been commissioned, becomes fully operational, and a final statement of actual costs (with supporting records) has been submitted. The second step must be completed by December 31, 2016.

- **PRODUCTION INCENTIVE OF \$0.07 PER kWh** for net electricity (kWh) actually produced during a period of 18 months. Production Incentive payment checks will be issued in 3 month intervals.

Two incentive payments are capped at: at \$2,000,000 per project, and to 10% of total cost. Projects selected to participate in the CHP Program shall provide best monthly labor type program reports during the construction and Production Incentive periods.

EXAMPLE: 100-kW system having 1,000-kWh heat (from gas) per project, and to 10% of total cost. Projects selected to participate in the CHP Program shall provide best monthly labor type program reports during the construction and Production Incentive periods.

- Design and equipment ordering: \$175 x 100 = \$17,500
- Installation and commissioning: \$175 x 100 = \$17,500
- Production Incentive: \$0.07 x 1.5 x 1,000 x 100 = \$105,000

Total Incentives: \$230,000

- **ADDITIONAL CASH INCENTIVES** are available for energy efficient equipment upgrades. To qualify, detail these incentives, see "Program Overview & Benefits" at pepco.com/business or delmarva@chp.com.

How to Participate

This program is available to all Pepco and Delmarva Power commercial, industrial, governmental, institutional, non-profit and multi-family electric customers. For the purchase and installation of one or more qualifying CHP systems in Pepco's and Delmarva Power's Maryland service territories:

1. Please visit pepco.com/CHP or delmarva.com/CHP to download a copy of the Request for Application (RFA) and other forms needed to apply for incentives. Complete the application workbook and submit all required documentation to the Program Office.
2. Complete a CHP Fuel Selection Cost (FSC) Calculator and submit with the application workbook.
3. If you prefer, call the Program Office at 866-363-6796 or Delmarva Program Office at 866-363-6799 to learn if you qualify and to ask for assistance. You can also email us at RequestApplication@CHP.MDPE.com or DelmarvaRequest@Power@DMPE.com.

AND POWER (CHP) PROGRAMS

Can I submit an application for an Energy Study that examines the feasibility of a CHP installation?

Yes, but the study must be comprehensive, identifying and analyzing all electricity saving measures, and not be limited to only CHP.

What are the characteristics of the most economic CHP projects?

- A nearly constant electric and thermal load at a moderate temperature, facilities that would benefit are:
 - Hospitals
 - Nursing homes
 - Multi-family with centralized space heating and Delmarva Hot Water (DHW) systems
 - Police stations, especially those with swimming pools
 - Hotels
 - Universities
 - Three-Shift industrial plants

What are some examples of "Useful Thermal Energy"?

The best examples of useful thermal energy are units and facilities that require moderate temperature air year-round. Some examples are:

- Delmarva Hot Water (DHW) and heated swimming pools
- Space heat that is needed for 8 to 12 months of the year
- Moderate temperature process heat at a manufacturing plant
- Chilled water that is produced in a heat powered chiller if the chilled water is needed for at least 6 months of the year

CHP Service Providers

A number of qualified project developers, contractors and engineering firms support these CHP projects. A service provider list can be found at pepco.com/CHP or delmarva.com/CHP.

If you are a Maryland customer, find out if a CHP system is right for your facility. Learn more at pepco.com/CHP or delmarva.com/CHP.

• The CHP system must be at least 40kW efficiency.
• All CHP generated electricity must be used for the host facility.
• A 5-year warranty required, as a plan for performing all needed system maintenance activities.
• The facility must satisfy all utility, regulatory and environmental requirements.

pepco **delmarva power**

Questions & Answers

Presentation by Tim Witting, Lockheed Martin