



**Combined Heat and Power (CHP)  
En Banc Hearing  
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University of Pittsburgh**

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# CHP in the Northeast States

- CT, MA, NY recognize the public benefits of CHP
- These States have made investments in CHP programs, addressed regulatory impediments, and worked to streamline permitting
- As a consequence, these 3 states rank at the top nationally installations per capita

New CHP Installations 2007 - 2013		
State	Installations	Capacity (MW)
California	274	463.0
New York	184	207.4
Connecticut	106	274.3
Massachusetts	87	94.2

Source: ICF CHP Installation Database, 2014

# NY Statement on Benefits of CHP

In NYS the order enabling CHP funding states;

*“adoption of CHP and district energy options can reduce costs to ratepayers and minimize costly investment in new electric central generation and distribution capacity needed for load growth.”*

Further benefits cited include:

- *System-wide benefits: including reduced peak loads and price volatility.*
- *Economic development benefits: including jobs and lower energy costs to ratepayers through lower LBMPs.*
- *Environmental benefits: program emissions requirements more stringent than federal standard.*



# CT Recognizes Benefits

Commenting on the CHP/DG Capital Incentives, The CT DPUC Stated the objectives included:

- 1) assist individual business customers that participate by reducing and managing their energy costs,
- 2) reduce electric costs (federally mandated congestion costs) for all Connecticut electric consumers,
- 3) encourages investment in and deployment of important new technologies, and
- 4) enhance electric system reliability by further diversifying the range of resources we rely upon to meet our electric needs.



# MA Acts Enabling CHP Incentives

MA DOER (Dept. of Energy Resources) cites that from 2009-11, CHP Alternate Energy Certificates represented 2,014,670 MMBTU of source fuel savings.

MA DOER states that on ISO-NE grid, a typical natural gas fueled CHP system will achieve an 18% net GHG reduction.



# Benefits Identified in New York State 2014 Microgrid Report

- *Energy benefits*, including energy cost savings and reductions in the cost of expanding or maintaining energy generation or distribution capacity.
- *Reliability benefits*, which stem from reductions in exposure to power outages that are considered to be within the control of the local utility.
- *Power quality benefits*, including reductions in the frequency of voltage sags and swells or reductions in the frequency of momentary power interruptions.
- *Environmental benefits*, such as reductions in the emissions of air pollutants.
- *Public health and safety benefits*, which include reductions in fatalities, injuries, property losses, or other damages and costs that may be incurred during prolonged power outages. Such outages are generally attributable to major storms or other events beyond the control of the local utility.

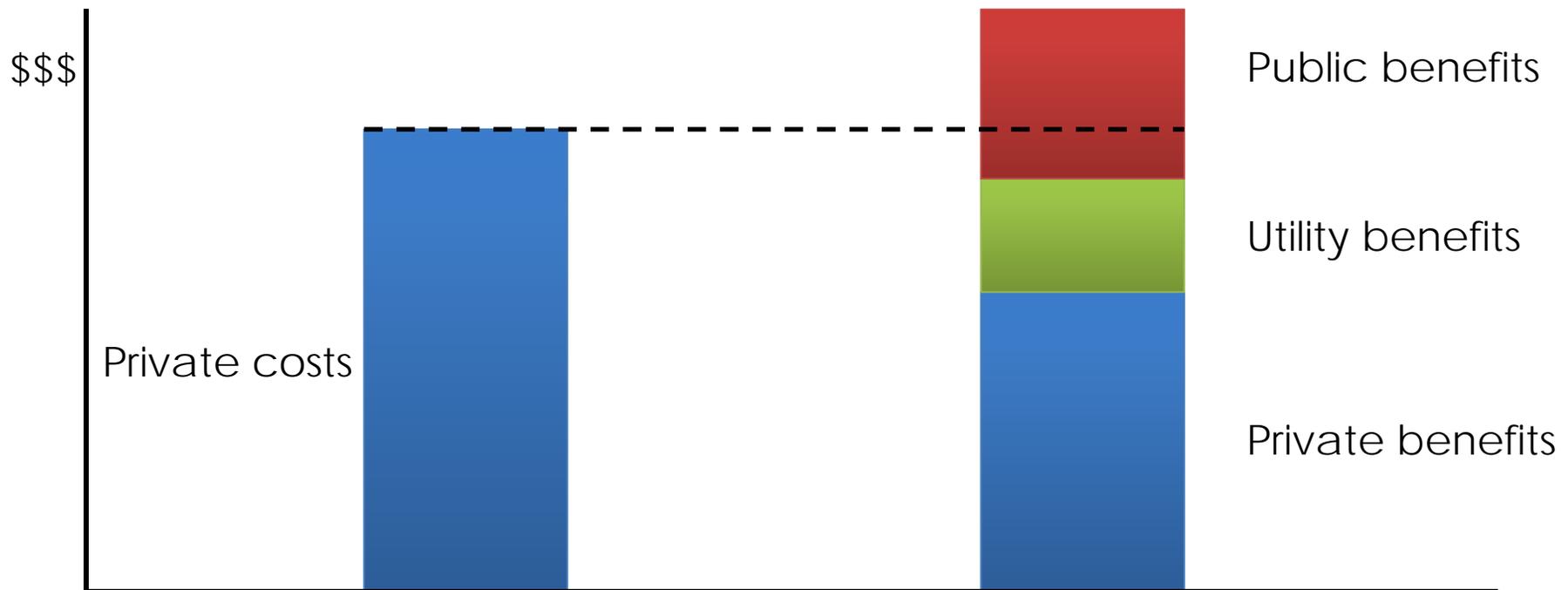
# CHP: What problems does it solve?

- Saves money, reduces operating costs
- More predictable, hedge against rising costs
- Greater efficiency
- Reduces energy/capacity and T&D costs for all ratepayers
- Reduce GHG emissions (environmental performance)
- ..and following Superstorm Sandy, Hurricane Irene and October 2011 snowstorm – Resiliency, Business Continuity, Emergency Preparedness!

# Cost-Benefit Considerations

Value Streams	Compensated or Not
Energy Savings at the Site	Yes
Demand Savings at the Site	Yes
Reliability Savings at the Site	Sometimes
Payments in RTO markets	Sometimes in PJM, No in NYISO
Wholesale Market Energy Price Suppression Effects	No
Wholesale Market Capacity Price Suppression Effects	No
Payments for Distribution System Value	No
Payments for Societal Resiliency	No
Other Non-Energy Benefits	No

# Illustrative CHP Costs/Benefits



# Why Invest in CHP Incentives?

- A private investment in CHP provides services to all ratepayers, and creates economic development, resiliency and societal benefits.
- The private investor is not compensated for the utility system, economic, or societal benefits.
- As a result too little private investment in CHP will be made in the State.

# NYSERDA CHP Incentives

- NYSERDA is offering incentives for pre-qualified CHP installations ranging from 50 kW to 1.3 MW through PON 2568
  - Program delivery mechanism is a catalogue of previously evaluated CHP systems
  - All systems in the catalogue are capable of both running every day and running during grid outages to power the site's priority loads
  - Incentive program is expressly designed to foster CHP as a mechanism to provide greater resiliency and reliability at host sites
- This program is unique in that NYSERDA only accepts applications from approved CHP system vendors
  - All incentive payments through this program are made to the CHP system vendors



# NYSERDA CHP Incentives

- For systems greater than 1.3 MW
- NYSERDA is offering \$36 million in incentives for CHP installations larger than 1.3 MW through PON 2701
  - System must have black start capability
  - If the site is located in a flood zone, all necessary CHP components must be located above the expected flood level (lesson learned from Sandy)
  - \$0.10/kWh + \$600/kW (Upstate) or \$750/kW (Downstate)
- Bonus Incentives Available for the following features:
  - “Facilities of Refuge” and projects serving critical infrastructure
  - Projects located in utility-identified load service areas of particular interest
  - Demonstrate superior performance, measured by fuel conversion efficiency



# Procurement Incentives

- **Massachusetts' Alternative Energy Portfolio Standard** requires Suppliers to acquire Alternative Energy Certificates (AECs) representing a certain percentage of the state's electric load met by eligible technologies, which include Combined Heat and Power (CHP). In 2009, the Suppliers obligation was 1%, and is set to increase 0.5% each following year until 2014, when the growth rate will be reduced to 0.25% per year, terminating at 5%.
- **Connecticut** requires utilities to obtain 4% of electricity from **Class III RECs**, which include CHP systems and Energy Efficiency

# Capital Expenditure Incentives

- **Massachusetts:** Green Communities Act provides that CHP projects passing a cost-effectiveness screen are eligible for support (up to \$750/kW) from the electric utility energy efficiency programs.
- **New York:** NYSERDA is offering \$60M in incentives for pre-qualified CHP installations ranging from 50 kW to 1.3 MW through PON 2568, and another \$36 million in incentives for CHP installations larger than 1.3 MW through PON 2701.
- **Connecticut:** CHP Capital Grant Program awards qualifying CHP projects under 1 MW a capital grant of \$200/kW. CEFIA's CHP Pilot offers projects under 5 MW up \$450 per kilowatt in grants or loans, or whatever is necessary to “achieve a fair and reasonable payback and return on investment during the life of the project.”

# Interconnection Standards: MA

Docket 11-11, initiated in Feb 2011 Established Standard Interconnection procedures. The Model Interconnection Tariff was last amended in 2013.

- Applies Expedited review path (40-60 days) to:
  - Single phase customers with listed single-phase inverter based systems >15 kW on a radial feed
  - Three phase customers with listed three-phase inverter based systems >25kW on a radial feed.
  - Maximum size is based on review of screens
- Typically little or no (utility) system modifications required. If meter only – usually no charges passed to customer.
- Note: CHP up to 60 kW is eligible for net metering.



# Interconnection in MA

MA DG Interconnection Working Group made 3 key observations on what proper standards must do:

- 1) Allow sufficient time and sufficient resources for the utilities to process all interconnection applications;
- 2) Enforce the timelines in the tariff on both the utility and customer side, which cannot be done without tracking performance against the timelines in the tariff; and
- 3) Include a more transparent set of interconnection technical standards into which non-utility parties have a process for input.



# Interconnection: NY and MA

**Connecticut:** systems up to 20 MW are eligible under standard interconnection rules derived from FERC's Small Generation Interconnection Procedure.

**New York:** New York State Standardized Interconnection Requirements and Application Process for New Distributed Generators 2 MW or Less Connected in Parallel with Utility Distribution Systems was first authorized in 1999 and went through the 5<sup>th</sup> Authority in February 2014



# Air Permitting

**Connecticut's Permit-by-Rule for CHP:** systems (including all other fossil-fueled on-site power) less than 10 MW may operate without a permit if they do not have potential emissions of 15 tons per year of any individual air pollutant.

# CT's DG Rule

Effective Jan 1, 2005, a new Sec. 22a-174-42 of the Regulations of Connecticut State Agencies, regarding Distributed generators was established .

For qualifying sites, it provided a standard exemption from the duty to obtain an individual permit.

It established output based (lbs/MWh) standards

It allowed for an emissions credit on a per pollutant basis for CHP systems



# We Agree with the NRRI Report

**NRRI:** Because CHP has positive features compared with some other generation technologies that have received greater attention, state utility commissions may want to revisit their policies in a wide range of areas, including standby rates, general ratemaking, interconnection rules and the status of CHP as clean energy and energy efficiency.

**NRRI:** State regulatory and legislative policies ostensibly favor renewable energy over gas-fired CHP technologies: Does net energy metering, for example, give rooftop solar systems an unfair economic advantage over CHP? The incentives commissions give to electric utilities through ratemaking and other practices might cause them to resist self-generation, such as from CHP technologies.



# We Disagree with the NRRI Report

**NRRI:** Only when CHP has substantial public benefits, which this paper calls into question, should policymakers go beyond removing legitimate barriers to actively promoting CHP growth.

**Pace:** New York and most New England states agree that CHP has substantial public benefits that are being captured, and therefore, these states actively promote and incentivize CHP.



# We Agree with the NRRI Report

**NRRI:** To the extent that state utility commissions are able to cost-effectively reduce the uncertainty for CHP investors, they can help bolster CHP investments. For example, by approving well-defined interconnections rules and standby rates based on cost-causation principles, commissions can create a more supportive environment for CHP investments.



# We Disagree with the NRRI Report

**NRRI:** Commissions should exercise caution in supporting subsidies or taking other actions funded by general ratepayers; it is questionable whether CHP should enjoy subsidies or special incentives.  
After all CHP is a mature technology...

**Pace:** CHP is a proven technology approach, but as currently being applied in New York and New England, CHP requires market support similar to renewables to develop.



# The NRRI Report on Renewables

**NRRI:** CHP may have greater benefits and fewer costs to an electric utility than renewable DG has. The reasons are that most CHP technologies are dispatchable and normally depend less on ancillary and balancing services. CHP may also be able to achieve public benefits designated by policymakers as relevant (e.g., job creation, cleaner environment) more cheaply than renewable energy can).





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