

# *AGA Joint IMC-CMC Meeting*

## **Gas Utility DG Potential: Extent to Which DG Market will be Served by LDC's**

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Paul Bautista

# Project Background and Objectives

- DG projected to be large opportunity for natural gas
- What is the impact on regulated gas utilities?
- One of three tasks to help determine impact on LDC's
  - How much of new DG load will be served by LDC's as opposed to direct connection to interstate pipelines?
- CHP experience may provide insights
- Are there typical profiles of loads likely to be served by LDC's?
  - Size of project
  - Prime mover technology
  - Location
  - Customer segment

# Approach

- Review existing CHP provides insight into these issues
  - 50+ GW total CHP capacity
  - 62% of CHP capacity fueled by natural gas
  - Determine size, prime mover, location, SIC breakdown
  - Identified 1300+ gas fueled CHP sites
  - Determine relevant LDC service territory for each (101 utilities)
- Survey to LDC's
  - Validate list of plants in service territory
  - Determine gas delivery service
- Interview LDC's, Pipelines, and Affiliates
- Develop conclusions on extent to which DG will likely be served by LDC's

# Database Review: Fuel Breakdown

<b>Natural Gas</b>	<b>Coal</b>	<b>Oil</b>	<b>Waste</b>	<b>Wood</b>	<b>Other</b>
<i>31,486 MW</i>	<i>8,072 MW</i>	<i>1,354 MW</i>	<i>3,905 MW</i>	<i>2,379 MW</i>	<i>3,195 MW</i>
<i>1,350 sites</i>	<i>165 sites</i>	<i>93 sites</i>	<i>109 sites</i>	<i>141 sites</i>	<i>138 sites</i>

# Database Review: Commercial/Insitutional Breakdown for Gas fueled CHP

- Largest markets
  - Colleges & Universities - 1,104 MW, 93 sites
  - District Energy/Utilities - 728 MW, 16 site
  - Government Facilities - 502 MW, 26 sites
  - Hospitals - 413 MW, 119 sites
  - Health & Country Clubs - 163 MW, 81 sites
  - Airports - 151 MW, 7 sites
  - Commercial Buildings - 110 MW, 45 sites
- Other Notables
  - Hotels - 26 MW, 78 sites
  - Laundries - 3.3 MW, 76 sites
  - Apartments - 95 MW, 97 sites
  - Elementary/Primary Schools - 14 MW, 101 sites
- Relatively untapped markets
  - Food stores, restaurants, national accounts & car washes

# Database Review: Industrial Breakdown for Gas fueled CHP

- Heavily concentrated in a few industries - 88% of capacity and 75% of sites
  - Food & Kindred Products - 3,363 MW, 105 sites
  - Paper and Allied Products - 2,792 MW, 69 sites
  - Chemicals and Allied Products - 13,918 MW, 127 sites
  - Petroleum Refining - 3,398 MW, 40 sites
  - Primary Metals - 1,246 MW, 15 sites
- Large systems account for most of existing capacity

# Database Review: Size Breakdown for Gas fueled CHP

- ***Total Gas Fueled CHP - 31,486 MW, 1,350 sites***

0-999 kW - 134 MW, 751 sites

1-4.9 MW - 588 MW, 224 sites

5-9.9 MW - 542 MW, 80 sites

10-14.9 MW - 445 MW, 37 sites

15-19.9 MW - 262 MW, 16 sites

20-29.9 MW - 955 MW, 39 sites

30-49.9 MW - 2,545 MW, 63 sites

50-74.9 MW - 1,844 MW, 31 sites

75-99.9 MW - 2,004 MW, 24 sites

100-199.9 MW - 8,280 MW, 55 sites

200-499.9 MW - 7,848 MW, 23 sites

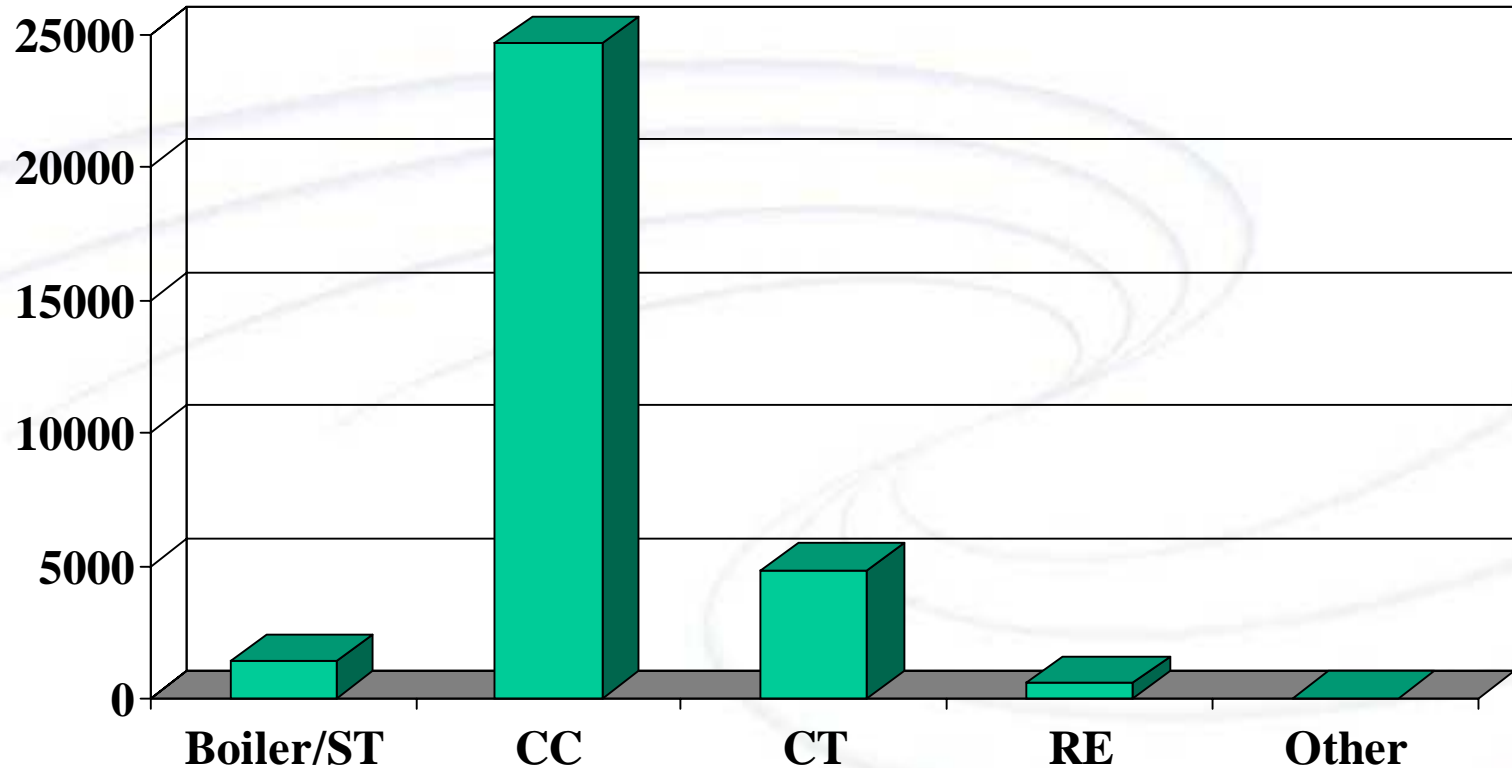
500-999.9 MW - 2,314 MW, 4 sites

1000+ MW - 3,724 MW, 3 sites

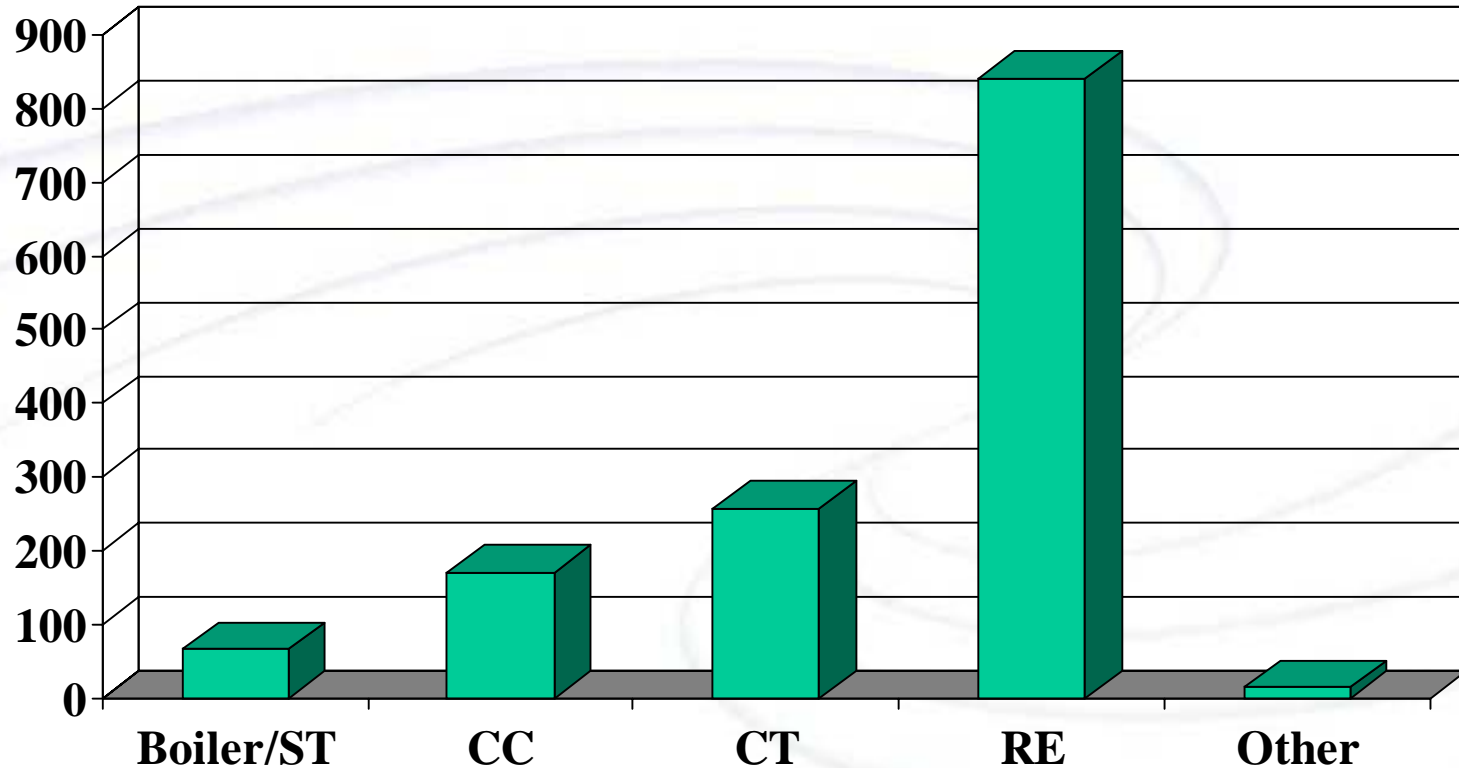
- ***Mean Plant size - 23 MW***

- ***Median Plant size - ~850 kW***

# Database Review: Prime Mover Breakdown for Gas Fueled CHP (MW Capacity)



# Database Review: Prime Mover Breakdown for Gas Fueled CHP (# sites)



# Database Review: State Breakdown for Gas Fueled CHP

- Concentrated in several states - 69% of Capacity and 73% of sites
  - California - 3,340 MW, 545 sites
  - Louisiana - 2,264 MW, 26 sites
  - Massachusetts - 1,014 MW, 43 sites
  - New Jersey - 2,521 MW, 146 sites
  - New York - 4,056 MW, 146 sites
  - Texas - 8,595 MW, 82 sites

# Results to Date

FNAME	FCITY	FCOUNTY	FSTATE	FZIP	SIC2	CAPACITY	PRM MV	Utility
FRITO-LAY'S PERRY SNACK FOOD PLANT	ROBBINS	HOUSTON	GA		20	300000	CC	AGL RESOURCES
LINDALE MANUFACTURING COMPANY	LINDALE	FLOYD	GA		22	6000	B/ST	AGL RESOURCES
RICEBORO PLANT	RICEBORO	LIBERTY	GA	31323	26	12500	B/ST	AGL RESOURCES
GENSTAR BUILDING MATERIALS COMPANY	SAVANNAH	CHATHAM	GA	31498	24	1600	CT	AGL RESOURCES
DERST BAKING COMPANY	SAVANNAH	CHATHAM	GA	31405	20	1100	RENG	AGL RESOURCES
COURTLAND MILL	COURTLAND	LAWRENCE	AL		26	100000	CC	ALABAMA GAS CORP.
UTILITY DISTRIBUTION CENTER PROJECT	MONTEVALLO	SHELBY	AL	35115	82	3000	CT	ALABAMA GAS CORP.
MEAD COATED BOARD PROJECT	PHENIX CITY	RUSSELL	AL		26	24620	CC	ALABAMA GAS CORP.
SPARKS REGIONAL MEDICAL CENTER	FORT SMITH	SEBASTIAN	AR	72917	80	8500	RENG	ARKANSAS OKLAHOMA
HARDING UNIVERSITY, INC.	-0-	SEARCY	AR		82	4100	RENG	ARKANSAS WESTERN
IGNACIO GASOLINE PLANT	DURANGO	LA PLATA	CO	81301	49	6200	CC	ATMOS ENERGY CORP
UNIVERSITY OF NORTHERN COLORADO	GREELEY	WELD	CO		82	76000	CT	ATMOS ENERGY CORP
THERMO GREELEY, LLC FACILITY	GREELEY	WELD	CO		39	32000	CT	ATMOS ENERGY CORP
TOTAL ENERGY PLANT	OWENSBORO	DAVIES	KY	42301	65	400	RENG	ATMOS ENERGY CORP
FINA OIL & CHEMICAL/AMERICAN PETROFINA	BIG SPRINGS	HOWARD	TX		29	200000	CC	ATMOS ENERGY CORP

# Survey to LDC's - Excerpts

- Still in progress
- Information on existing natural gas-fired CHP projects believed to be in your service territory
  - » Operating – Is the CHP system at the site currently operational?
  - » LDC/Bypass – What is the gas delivery structure?
  - » Contact – Is there a site contact?
- Describe and rank the key forces in the decision process
  - » Proximity to pipeline
  - » Size of project
  - » Relationship between LDC and customer
  - » Cost of service
  - » Lack of alternatives
  - » Pressure requirements
  - » other

# Interviews

- Insights to determine extent to which DG will likely be served by gas LDC's
  - 20 interviewees (LDC's, pipelines, affiliates)
  - All US geographical areas represented
- General topics of discussion
  - Relationship between LDC and interstate pipelines in their territory
  - Decision process that DG customer would go through in deciding gas delivery service
- Definition of DG still unclear in industry

# Summary of Interview Results

- Bypass is typically customer driven
  - Not pursued by pipelines
- DG <10 MW very unlikely to be at risk of bypass
- Bypass in 10-25 MW range is marginally economic
  - Only in cases of very close proximity to pipeline is bypass viable
- Low percentage of customers even have the option to bypass
  - Not in proximity to interstate pipeline
  - Pipelines owned by LDC
  - Pipelines defer to LDC
- Gas load is driver to investigate bypass not specific DG technologies
- LDC's have become skilled at averting bypass
  - Combination of price concessions, favorable terms and conditions, and most importantly good relations

# Some LDC Perspectives

- Relationships are overriding factor when economics are less than overwhelming
  - Physical proximity and size of project are secondary factors
- Typically good relations between LDC and pipelines
  - Neither party wants to damage relationship
  - Primarily a customer decision to consider bypass
  - In many cases same company owns both LDC and transmission line so competition and bypass is not a consideration
- Key parameters in decision are gas usage, proximity to pipeline, and cost savings
- Capital cost of bypass is high, and usually not justified for DG projects
  - Time period used by customer for payback important

# Some LDC Perspectives cont.

- New merchant power plants (100-300 MW) are likely to warrant bypass
- Load not technology is driver
- Bypass does not happen quickly - allowing LDC time to respond
- Capital costs and gas prices are not the only factors
  - LDC's have supply backup advantage (multiple suppliers and storage capacity)
  - Ability to get short-term transport gas at discount favors LDC
  - LDC balancing services
- Unregulated subsidiaries can be used to compete against bypass as needed
- Some states do not allow third party ownership of bypass connection
- Bypass may require customer to become a pipeline company and take on the associated risk and liability
- Bypass isn't likely to be any more of an issue with DG than it has in the past

# Some Pipeline Perspectives

- Bypass is a sensitive issue
- LDC customers are very large and it doesn't benefit them to strain the relationships
- Customers drive review of bypass possibilities
  - Used to obtain better gas rate from LDC
  - Less than 5% of bypass studies conducted result in a pipeline project
- Capital costs to customer are high
- Economics depend on daily and annual gas consumption, differential gas costs, and LDC transportation rate
- Other factors include storage and balancing, pipeline prior commitments, customer sophistication, and unique pressure requirements
- Some have a longstanding policy of supporting their LDC customers and would work with LDC rather than promote bypass

# Some Pipeline Perspectives cont.

- Promoting bypass could do more damage than good in the long run
  - An LDC that is at odds can make life miserable and oppose them in FERC rate cases
- Smaller pipelines may be more aggressive in pursuing bypass opportunities

# Illustrative Capital Cost of Bypass

- Project results indicates a tap cost of ~\$250,000 and running non-urban pipeline costs of \$500,000/mile

	<b>0 miles</b>	<b>1 mile</b>	<b>2 miles</b>	<b>5 miles</b>
<b>100 kW</b>	\$2,500/kW	\$7,500/kW	\$12,500/kW	\$27,500/kW
<b>1000 kW</b>	\$250/kW	\$750/kW	\$1,250/kW	\$2,750/kW
<b>10 MW</b>	\$25/kW	\$75/kW	\$125/kW	\$275/kW
<b>100 MW</b>	\$2.5/kW	\$7.5/kW	\$12.5/kW	\$27.5/kW

- Relative to capital cost of generation equipment, bypass capital costs are quite high at small sizes and extended distances from pipeline. Urban area costs and right-of-way will be considerably higher

# Conclusions

- Bypass is likely to impact only a small part of the DG marketplace
  - High end of DG size range (10-25 MW) is still only marginally susceptible
- Bypass isn't likely to be any more of an issue with DG than it has in the past
  - Validate with mail survey results
- DG technologies are not an issue with regard to bypass
- There are four major considerations for a potential DG project contemplating bypass
  - Relationship with the LDC
  - Physical proximity to interstate pipeline
  - Gas consumption
  - Capital cost of connection
- Good relations were cited as being the major reason for not bypassing; conversely, poor relations could result in “irrational bypass”

# Conclusions con't

- Secondary influences include
  - Ownership of pipeline by LDC company (no incentive to compete)
  - Deference of pipelines to the LDC
  - Existing LDC gas delivery infrastructure
  - Customer sophistication
  - Customer interest in long term gas supply
  - Consequences of pipeline ownership and operation