#### Distributed Generation-Combined Heat and Power: What, Why Now, Importance

A presentation by

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## The Need For More Power in New York is Real

- NYISO Report: By 2005 <u>new, additional</u> generating capacity needs
  - New York State: 7,100 mw
  - New York City: 2,000-3,000 mw
- Load Pockets = imported transmission constraints
  - Prime examples: New York City and Long Island
- Effects of demand outpacing supply
  - Higher prices

2002

- Decreased reliability
- Challenge to environmental quality and economic growth
- In New York City, these results would have far-reaching implications



## August 6-10, 2001

- Tested the limits of KeySpan's generating facilities & LIPA's T&D system
- "… To keep every piece of equipment working under the most difficult of circumstances is practically unheard of…"
  Phineas Fiske, Newsday, May 26, 2002
- To prevent replay, we've got to increase our megawatt margin







## New, High-Efficiency, Base Load Plants Are a Big Part of the Solution

- Combined-cycle technology fueled by natural gas
- Air quality issues
- KeySpan plants
  - 250 mw Ravenswood, New York City, 2003
  - 250 mw Melville, Long Island, 2004
- Larger plants: years to site, permit and construct Artist's rendering, KeySpan's
- Meanwhile…
  - Energy consumption grows
  - Pressure on rates to rise
  - Aging T&D system gets older
  - Demand increases for more reliable and high quality power



Artist's rendering, KeySpan's 250 mw Melville, Long Island plant



## Distributed Generation: An Idea Whose Time Has Come...Again

- Definition: The generation of power, usually electric, at or near the site where it will be used.
- Not a new concept KeySpan (via Brooklyn Union) has been involved for than 50 years
  - Rochedale Village, 1962
- KeySpan and Fuel Cells
  - 200-kw at St. Vincent's Medical Center, Staten Island
  - Two 200-kw at Sun Chemical
  - Conde Nast Building, Times Square
- KeySpan and Microturbines
  - Atlantis Marine World Aquarium
  - Brookhaven National Laboratory
- KeySpan current distributed generation portfolio: almost 850 mw at more than 100 locations



Conde Nast Building





# The Window of Opportunity is Open

- Timing is right
  - National energy policy
  - Utility deregulation
  - Aging T&D system
  - Transition to automated age
  - Focus on environment
- Technology has improved cost and performance
- Can site and use in a matter of months, not years
- Can be an integral part of U.S.'s energy strategy





## **The Potential of Distributed Generation**

- Works best for businesses with 24/7 operations and opportunities to use the waste heat
- Payback estimates can be 3-5 years; even less when combined with government and energy company incentives and programs
- Lower energy costs
- Combined heat and power opportunities
- Quantity and quality of power
- Environmentally sensitive power production



#### A Distributed Generation Model: Sea Crest Health Care Center, Coney Island, New York

- Natural gas-fired reciprocating engine
  - 40 months of operation
  - 98% online rate
- Saved \$81,000 in 2001
- Approaching payback period
- Can be the solution for smaller businesses
- Efficiencies in 80% 90% range vs. 30% of traditional power plant





## Energy & Environment Linked Together More Than Ever Before

- Focus will increase for energy industry, businesses, regulatory and elected officials
- Governor Pataki's Executive Order 111
  - State agencies must reduce energy consumption by 35% by 2010 (based on 1990 levels)
- This will give distributed generation a chance to mushroom and grow into private sector
  - Establishes Governor and New York State as true market leaders
- Distributed generation can also help transform abandoned "Brownfield" sites





## Today's Need For Reliable, High Quality Power

- Today's economy fundamentally tied to information via sensitive computer systems
  - Needs continuous, high-quality power that our aging electric grid was not designed to handle
- EPRI: Cost U.S. businesses \$50 billion a year in losses from power outages, fluctuations
- Can we quantify societal damage to disruptions in public health and scientific research?
- Downtime costs must be part of business's contingency and risk mitigation plans





#### **Challenges Do Exist**



# The Role of Natural Gas

- Cleanest burning fossil fuel
- Abundant in North America
- Can address air quality concerns
- Will need new pipelines and infrastructure to meet growing demand





## **Islander East Pipeline**

- Canadian Nova Scotia Gas to Connecticut to Long Island
- Downward pressure on gas prices
- Greater supply diversity
- Natural Gas: Can be the ideal bridge between a growing economy and cleaner environment





#### Future ...

- National targets are in place
- Federal and state programs must create more of a market for distributed generation and combined heat and power
- New York State out in front of the curve
  - Recognizes potential for economic success
  - Reduces dependence on foreign oil
  - Environmental benefits
- USEA: Advances in distributed generation could account for 20% of all new generation in coming decades
- Private sector leadership
- Market pace will accelerate as technologies advance and more consumers discover them



