Fixing Energy in New York City - A Call to Action

TGE and the Syntel Solution

Proposing Real Alternatives to Mitigate Risks

Infrastructure in New York City

The Vulnerability of Energy and Transportation

What's Being Covered
18.7 million in the NY metro area
LARGEST CITY - 8.2 million people in NYC and
Metros worth...?

CULTURAL CAPITAL - 14 museums alone, with
companies, TV stations, radio, etc.
consumer magazines have offices plus record
MEDIA CAPITAL - 200 newspapers and 350
companies worth $1.8 trillion
FINANCIAL CAPITAL - 44 Fortune 500

New York City is America’s:
Understanding Risks
Worst case scenario: Lights out

- Computers or air conditioners
- Telephones
- The subways
- The steam system

A 1946 Blackout scenario would not affect:

- World’s finest self-sufficient subway system
- Electric system built (since 1888)
- No failures in its first 50 year existence

In 1946, NYC’s energy infrastructure was unequalled:

Historical Context
Energy and NYC Today

- Grid failure due to an additional "steam freeze"
- Winter conditions would have caused a four-day steam system failure
- Blackout of August 2003:

2000MW need
Initiative
- Fused cables requiring a major repair
- Millions in loss and damages
- Power for 16 days
- Estimated 100,000 people without
- Load pockets with no voltage support

Queens Meltdown 2006:

Power and NYC Today
Growth of on-site generation
Electric demand continues to outpace
Subway system: fully reliant on the grid
No "hardened" plants
Surge (out of service in 2009)
Only one plant can withstand a 20 foot storm
generation
1 gas line supplies 65% of "in city" electric

Major power vulnerabilities:

Energy and Transportation
Susceptible
- Fire suppression and sanitary water supplies
- Insulated steam traps
- Over 130 miles of steam mains and 3,000 un-

INFRASTRUCTURE

- 750,000 people depend on the steam system
- Includes all hospitals south of 96th Street
- A 100-year-old district heating system
- Virtually every large building heated exclusively by

BUILDINGS

Steam? Who cares?
BACK UP AND RUNNING?
HOW LONG TO GET EVERYTHING

"Water Hammer" if re-pressurized too rapidly.

pounds per square inch and is susceptible to

The NYC steam system operates at up to 400

NO STEAM = NO HEAT = CATASTROPHIC DAMAGE

The Steam Equation
A mass evacuation of millions from Manhattan within 48 hours.
The financial district could not operate - national/global implications.
The United Nations could not operate - global implications.
Merchandise, food and other products would be damaged or ruined.
Most commercial and retail operations would close and evacuate.
Hospital's seniors and the most vulnerable would have to be

Within 24 hours:
Municipal and building water pipes freeze and potentially crack.
Outside and inside temperatures match to within a few degrees.

Within 12 hours:

A steam system failure in winter months would spell disaster:

Critical Steam Loss
Approximately 2.5 million people were killed in Kiev, a city of the Soviet Union, in 1920 days to solve a steam engine problem. Prior to the collapse of the Soviet Union, it took two steam engines to run New York City's public transportation system. How long do you think it took to get steam up and running again after a steam engine problem?
Grid Exposure

Power consumption grows exponentially each year.

- Out of control: Ontario and Quebec are the difference between enough power and a blackout.
- Subject to human error ("learning on the system").
- Susceptible to natural disaster: again in the next nanosecond.
- Unprotected - and still not fixed - could occur.
- Transmitted power: New York City relies on substantial amounts of

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Grid Exposure
Mitigating Risks

- Stability and "melt downs"
- Reactive power VARS (volt-amperes)
- Reactive power "ancillary services"
- NYISO - selling "ancillary services"
- Transmission is a "liability", not reliability
- Power generation - must be nearer to
- Reactive power VARS (volt-amperes)
Transmission Lines serving New York City Failed

Just prior to the meltdown: 2 of 4 major 345kV

Ordered to turn on generators
Getting off the grid - Manhattan buildings were
Far away as Ohio
Time and manpower - 13 days and crews from as
A cable merger - 22 melted into one copper ingot

Meltdowns

Queens Blackout 2006 - a textbook example of
power transmission lines.

fragile and vulnerable

York City rely on your

social activities in New

government, cultural and

All economic,

Hanging in the Balance
airport
• In the flight path of La Guardia
• No extended fuel oil storage pipeline
• One major gas transmission based in Northern Queens with:
  65% of in-city generation is

Concentration
Generation Capacity
(GIS) can withstand such a surge

- Only Gas Insulated Switchyards
  - withstand it

- No major East River substation can withstand it

- No current power plant can withstand it

Foote Storm Surge:

- Category 2 hurricane produces 25

Environmental Liabilities
Plants need to be buried in a “slurry wall” and employ GIS

- No switchyard is hardened
- City is hardened against terrorist attack
- No power plant in New York

Hardenings
DESTROYING Switchyards takes the grid offline for months

No interconnection with the Politi plant, which provides power to

W ithout the 13th Street Switchyard

No imported power from the PJM grid

Without the Faragut Switchyard

Not one is hardened in New York City - they are highly vulnerable

Susceptible to man-made and environmental disasters

Waterfront

Custom-built, open-air, multi-deck facilities located on the

Switchyard Vulnerability
- Repairs originally estimated to take five years
- A recent trash fire took out 20 percent of service
- Built originally by Vesta factories - no longer built or stockpiled
- 100 year old mechanical relays
- Over 3,000 entry/exit points
- Many have multiple exits as well as emergency exits
- Over 700 stations
- Over 450 miles of tunnels

Subway Vulnerability
Terrorist teams live below ground — striking at will:

- New York City subway out-of-service for several years
- Couple of dozen main mechanical relay stations
- Terrorist teams enter subway system, destroying the
  in-tunnel communication ability
- All platform battery lighting exhausted in five hours
- City-wide blackout halts the subway system

Potential Terrorist Scenario
Relays

- Hundreds of millions worth of spare mechanical
- Fully operational in a blackout
- A comprehensive backup communication system
- A backup lighting system
- A hardened power plant and command and control

Upgrades and Improvements:

Trans Gas offered to fund $700 Million in

The Solution
New York has moved well beyond N.I.M.B.Y. to B.A.N.A.N.A. Build Absolutely Nothing Anywhere Near Anything

THIS IS NOT A DEMOCRATIC OR REPUBLICAN ISSUE
THIS IS AN ISSUE OF NATIONAL IMPORTANCE AND SECURITY
The New York State Supreme Court stopped the condemnation – one of the few times eminent domain has been stopped by the courts.

Decision - under "eminent domain" for use as a park.

City sought to condemn TCE's proposed site - after the Kelo decision - intense local political pressure undermined it.

NYS Article X was established to maintain objective site decision.

- In direct competition with land developers
- Typically waterfront land
- Power plants have no local political support

The Politics of the Matter