Energy-Related Environmental Policy Initiatives Affecting New York State and the Region: Local/Regional Initiatives and Emerging Opportunities

Albany, NY – October 7-8, 2003

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Multiple initiatives under each category:
- Climate Change
- Electricity
- Diesels
- Fuels
- Light Duty Motor Vehicles
- Monitoring & Evaluation
- Low Income / Environmental Justice
- Multi-Pollutant Legislation
CLIMATE CHANGE

• RGGI (Gov. Pataki’s Cap & Trade Initiative)
• NEG-ECP Climate Commitment & Process
• Northeast GHG Registry – Infrastructure essential for cap-and-trade
• Region-Specific Climate & Economic Modeling “Umbrella” for policy makers
  - PRECIS, NE-MARKAL + NY + CA, REMI
• Impacts of climate change on air quality
  - Georgia Tech / MIT / NESCAUM
ELECTRICITY

• DG (NESCAUM study in Metro-NYC area)
• CHP (NECHPI; new Northeast CHP Center; NY Rule; NYSERDA leadership & support)
• Mercury MACT
  - “Floor = average of top 12% performing utilities
  - EPA to propose by 12/15/03, finalize by 12/15/04, compliance by 12/15/07 (unless multi-p legislation changes MACT)
DIESEL ENGINES

• Retrofits; Sanitation Fleets, Buses, and Ferries
  – NESCAUM/EPA Retrofit Workshop, October 21-22 in NYC
• Truck Stop Electrification (Hunts Point, Syracuse, soon NJ)
• NESCAUM Nonroad Occupational Exposure Studies
Mack Truck SEP:
NYC DOS SCR & DPF Combination
Refuse Collection Truck
Test Results: Particulate Matter

AVG REDUCTION: 88%

- 25CF-044 DPX
- 25CF-044
- 25CF-043 CRT
- 25CF-043
- 25CF-042 CRT
- 25CF-042
- 25CF-045 DPX
- 25CF-045

Retrofit (DPX/CRT) run

Uncontrolled diesel run

Grams Per Mile
Refuse Collection Truck
Test Results: Fuel Economy

AVERAGE PENALTY: 0.15%

- Retrofit (DPX/CRT) run
- Uncontrolled diesel run

Miles Per Gallon
Sustainable South Bronx and NYPAPA have installed a 30-bay truck electrification system at the Hunt’s Point Market in the South Bronx.

Adopting a system from IdleAire Technologies will create a zero-idling zone, eliminate diesel exhaust, and provide needed health benefits to this community.
### New York City #7 Construction Activity PM$_{2.5}$ Integrated Sampling Results

#### Estimated Diesel Particulate Matter Exposure

<table>
<thead>
<tr>
<th>Sampling Location</th>
<th>Workday Average Concentration ($\mu$g/m$^3$)</th>
<th>Low Estimated DPM Concentration ($\mu$g/m$^3$)</th>
<th>High Estimated DPM Concentration ($\mu$g/m$^3$)</th>
<th>24-hour Average* Concentration ($\mu$g/m$^3$)</th>
<th>Low Estimated DPM Concentration ($\mu$g/m$^3$)</th>
<th>High Estimated DPM Concentration range ($\mu$g/m$^3$)</th>
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</thead>
<tbody>
<tr>
<td>Perimeter Site #1</td>
<td>49.272</td>
<td>1.97</td>
<td>26.11</td>
<td>31.09</td>
<td>1.24</td>
<td>16.48</td>
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<tr>
<td>Perimeter Site #2</td>
<td>76.574</td>
<td>3.06</td>
<td>40.58</td>
<td>40.19</td>
<td>1.61</td>
<td>21.30</td>
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<tr>
<td>Excavator A</td>
<td>66.250</td>
<td>2.65</td>
<td>35.11</td>
<td>36.75</td>
<td>1.47</td>
<td>19.48</td>
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<tr>
<td>PC-100</td>
<td>-0.86</td>
<td>-0.03</td>
<td>-0.45</td>
<td>14.38</td>
<td>0.58</td>
<td>7.62</td>
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<tr>
<td>Drill</td>
<td>60.26</td>
<td>2.41</td>
<td>31.94</td>
<td>34.75</td>
<td>1.39</td>
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<td></td>
<td>44.37</td>
<td>1.77</td>
<td>23.52</td>
<td>29.46</td>
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<tr>
<td>PC-100</td>
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<td>21.40</td>
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<tr>
<td>Drill</td>
<td>49.469</td>
<td>1.98</td>
<td>26.22</td>
<td>31.16</td>
<td>1.25</td>
<td>16.51</td>
</tr>
</tbody>
</table>

*Assumes ambient average concentration is 22 µg/m$^3$
Target Gas Concentrations, NYC

<table>
<thead>
<tr>
<th>Monitoring Location</th>
<th>Acetaldehyde</th>
<th>Formaldehyde</th>
<th>Benzene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upwind</td>
<td>6.0</td>
<td>4.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Downwind</td>
<td>9.0</td>
<td>7.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Drill</td>
<td>6.0</td>
<td>4.0</td>
<td>0.5</td>
</tr>
<tr>
<td>PC-100</td>
<td>11.0</td>
<td>9.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Big Excav</td>
<td>8.0</td>
<td>6.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Nonroad Diesel Study Preliminary Results

• Diesel equipment activity substantially increased PM$_{2.5}$ exposures for workers and nearby residents, by as much as 16 times.
• Individual workers’ estimated 24-hour exposures exceed current air quality standards by nearly 2 to 3.5 times – substantially increasing workers’ health risk.
• The most potent portion of PM$_{2.5}$ – diesel particulate matter – was estimated to exist at levels that pose risk of chronic inflammation and lung damage in exposed individuals.
• As many as 200,000 workers may be exposed to these harmful concentration levels of nonroad equipment emissions in the Northeast.
• Concentrations of acetaldehyde, benzene and formaldehyde around nonroad equipment operations were as much as 140 times the federally established screening threshold for cancer risk.
• Concentrations of metals known to cause inflammatory responses and damage in pulmonary cells, such as iron, nickel and vanadium, were elevated in samples collected around nonroad equipment.
FUELS

• Low-Sulfur Diesel Fuels
• MTBE:
  – NY moving ahead in 60+ days
  – Renewable Fuel Standard (Ethanol) Compromise is in 2003 Energy Bill
• Home Heating Oil – Opportunity!
LIGHT DUTY MOTOR VEHICLES

• California LEV II (AB 1492 – Pavley)
  – Gov. Pataki’s Inaugural Speech

• Regional LEV II
  – Four states now (NY, MA, VT, ME)
  – CT, NJ, RI all considering joining
MONITORING & EVALUATION

• NESCAUM Black Carbon Characterization Study (Spatial Distribution)
• Rural “Transport Supersites”
• Diesel Occupational Exposure Studies
• Source apportionment work underway in NJ
Spatial BC Distribution Study
Spatial BC Distribution Study Results

11 Jan thru 26 Feb 2003 1-Hour Spatial BC Distributions

N = 1117 Hours
Micro-Scale Follow-Up BC Study
Preliminary Results of Follow-Up BC Study

Summer 2003 1-hour Boston BC percentiles
Limited to days with data from all sites

N = 840 hours
PM/Haze Rural “Transport Supersites”

- Multiple sites (3 or more) with detailed PM and visibility-related measurements
  - high-elevation (1000 - 3000 ft), rural, transport characterization
  - contrast “Fresh” vs. Aged secondary aerosols
  - highly time-resolved (1-h) aerosol composition measurements

- Hourly aerosol composition data provide enhanced insight into:
  - regional aerosol generation and source characterization
  - factors that drive short-term visibility
  - aerosol model performance and evaluation
Planned “Transport Supersites”

Planned MANE-VU and potential other non-Mane-VU site locations:

[Athens and Shenandoah are only concepts at this time]
OC Peaks with Ozone =>
Secondary Regional Component
OC Unrelated to EC

Sunset Labs Hourly OC vs. EC
Philadelphia PA, July 15-29 2001

Mean OC/EC = 20.9
R² = 0.04
Motor Vehicle Impact Shows in Hourly Data

Diurnal BC Jan 04 - Mar 06, 2003

Workday (N = 42)

Non-Workday (N = 19)
Possible Future “Transport Supersites”

- Other Possible “far-source” sites in MANE-VU domain:
  - Pinnacle St. Park, Addison NY (ASRC/NY-DEC)
  - Brigantine NJ - coastal, Class I
  - Underhill VT (Mt. Mansfield), northern VT
  - Whiteface MT (northeast NY)
  - Northern NH: Mt. Washington or Cannon Mt.
  - Pack Monadnock, southern NH (AIRMAP leverage?)
  - AIRMAP site in central NH – Castle Springs
  - Quabbin Reservoir (central MA)

- Other potential non-MANE-VU upwind sites:
  - Athens OH (Ohio University) [Quaker City?]
  - Shenandoah NP (existing Big Meadows IMPROVE site)

Nova Scotia: Env. Can. site in Kejimkujik National Park in southern NS
• Clean Air Communities
  - Teams disadvantaged community partners with technology partners, funding, and assistance
• Consolidated Ed
  - Hunts Point TSE, GMDC, Seward Park, etc.
• NYPA Queens Clean Air Project
CAC Projects Co-Funded by NYSERDA

• **GMDC**: 115kW solar installation on 2 commercial buildings in Greenpoint, Brooklyn.

• **Cherry Tree Association**: 15kW solar installation on community building in Mott Haven, Bronx.

• **Seward Park Housing Corp**: FlexTech grant to identify return on investment based energy efficiency control measures at 1700 unit housing cooperative in lower East Side, Manhattan.

• **Clinton Hill**: Combined heat and power (CHP) project utilizing micro-turbine technology at large, multi-building residential housing complex in Clinton Hill, Brooklyn.
MULTI-POLLUTANT LEGISLATION

- S.843 - Carper / Chafee / Gregg
  - Alexander now too
- S. 485 - Administration’s Clear Skies Act
  - Attach to Energy Bill?
• Whew!

• “All scientific work is incomplete – whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at any given time.”