Clean Power Plan Implementation
Considerations for Environmental Justice & Vulnerable Communities

May 26, 2016
Low-Income Forum on Energy
Welcome
Agenda

• Welcome, Overview
• Climate Change
• Air Quality
• Clean Energy
• Clean Power Plan Program Design
Climate Change
The greenhouse effect

1. Sunlight passes through the atmosphere and warms the earth.

2. Infrared radiation (IR) is given off by the Earth...

3. ... most escapes to outer space, allowing the Earth to cool...

4. ... but some infrared radiation is trapped by gases in the air (including CO₂), keeping the earth warm enough to sustain life.

5. ENHANCED GREENHOUSE EFFECT
   Increasing levels of CO₂ increase the amount of heat retained, causing the atmosphere and Earth's surface to heat up.

© CO₂CRC
For 650,000 years, atmospheric carbon dioxide had never been above this line.
Change in Global Temperature

- Rises 1° over 1,800 years
- Plateau for 4,000 years
- Drops 1.3° over 5,400 years

Rises 1.3° in the past 100 years

Source: Marcott et al. 2013
The Earth is warming NOW

• In February 2016 - CO₂ is 404 ppm
• This is a 30% increase in atmospheric CO₂ since 1880
• 1°C (1.8°F) global temperature rise since 1880
• It’s been warming ~0.15 - 0.20°C per decade since 1975
• With no decrease in CO₂ emissions, at least +2°C, possibly +5°C (3.6 - 9°F) by 2100 (relative to 1986-2005)
New York is warming, too

- Average warming across New York State (1900-2012) = 0.25°F per decade
- Since 1970, +2.4° F warmer annually, +4.4° F warmer in winter
- Increases in annual precipitation in most regions
- More precipitation in winter, less precipitation in summer
Annual average temperatures, baseline 1971-2000

- 2 - 3°F warmer within a decade
- ~10°F warmer by late century
- Most warming in northern NYS
- Summers get intense, winters get mild
- Growing season gets longer

New York State Projections
Annual regional precipitation, 
baseline 1971-2000

• 1 - 8% more precipitation within a decade
• ~15% more precipitation by late century
• Biggest precipitation increases happen in northern NYS
• Precipitation will happen mostly in winter

New York State Projections
Downstate

• Extreme Heat (days >90°F)
  • Up to 33 days per year (+83%) within a decade
  • Up to 87 days per year (+300%) by late century
  • By mid-century, days >100°F are up 1600%; 7 heatwaves per year, averaging 6 days each

• Sea-level Rise (NYC & LI)
  • Up to +10 inches within a decade
  • By 2100 –
    ▪ 6.0 ft (LI)
    ▪ 6.3 ft (NYC)
Estimated increases in ozone-related emergency room visits for children in the 2020s (compared to the mid-1990s) resulting from climate change-related increases in ozone concentrations.
Capital District

- Sea-level Rise (SLR) in the Mid-Hudson
  - 2020s – up to 9 inches
  - 2100 – up to 5.9 feet
- Albany w/ 6.0 ft SLR = 1000+ households, 1900+ people with increased flooding
- Troy w/ 6.0 ft SLR = 4000+ households, 7100+ people with increased flooding
Upstate

- Less snow cover, more precipitation
- Extreme heat (>90° F)
- Watertown - up to 57 days per year (up from 3) by late century
- Indian Lake - up to 27 days per year (up from 0.3) by late century
PREDICTED CHANGES IN WINTER SNOW COVER

1960-1990

2070-2100, SCENARIO I
LOW EMISSIONS

2070-2100, SCENARIO III,
HIGH EMISSIONS

Winter days (DJF) with snow cover:
- 81–90
- 72–81
- 63–72
- 54–63
- 45–54
- <45
Western New York

- Effects on agriculture –
  - Heat stress on animals
  - Delayed planting and harvest
  - Reduced yields
  - Early springs = vulnerable plants exposed to frost

- Spread of disease-carrying insects with warmer temperatures
- Lake effect snow is increasing
Asian tiger mosquito – a potential vector of encephalitis, dengue (all four serotypes), yellow fever, dog heartworm, and West Nile virus

Credit: Rochlin, PLOS One, 2013
Air Quality
A Suite of Programs

- Clean Power Plan focuses on carbon dioxide (CO$_2$) from power plants
  - RGGI is one in a suite of programs in New York
  - CO$_2$ has been reduced 45% since 2005 in New York
- Other air programs are reducing “criteria” pollutants
- Opportunities to discuss other air issues.
Air Quality Perspective

- Reducing CO$_2$ is helping people worldwide
  - EJ communities are the most vulnerable to heat and storm impacts, so the CO$_2$ reductions we are achieving are helping these communities
- Reducing criteria pollutants such as nitrogen oxides, sulfur dioxide and particulate matter can have local and regional benefits
New York State Powerplants Carbon Dioxide Emissions (2014)

This map shows the location of power plants and the amount of CO₂ emitted during 2014, the last year for which NYSDEC has data.

New York State has been regulating CO₂ pollution from power plants through a program called the Regional Greenhouse Gas Initiative (RGGI). RGGI is an effort by nine states to work together to promote clean energy, lower greenhouse gas emissions from electric power plants and create savings for electricity customers. Under RGGI and complementary clean energy programs, New York has reduced power plant CO₂ emissions more than 45 percent since 2005.

Legend
Power Plants
2014_CO₂
- < 5,000 tons
- 5,000 - 20,000 tons
- 20,000 - 75,000 tons
- 75,000 - 1,500,000 tons
- > 1,500,000

DEC Regional Boundary
State Boundary
Statewide NOx Emissions (Tons)

- **Tons/Year**
- **Linear Trend**

Data from 2005 to 2014 shows a significant decrease in statewide NOx emissions, with a linear trend indicating ongoing reduction.
Statewide SO\textsubscript{2} Emissions (Tons)

Year: 2005 to 2014

Tons/Year: 0 to 250,000
Design Value (ppm)

Ozone Trend 1997-2016: Bronx- Pfizer Laboratory

Year


1997 NAAQS
2008 NAAQS
2015 NAAQS
Clean Energy
New York Energy Policy and EJ

The NYS Energy Plan

• Recognizes the potential disproportionate impact on EJ communities from fossil fuel energy generation and transportation infrastructure
• Recognizes LMI consumers potentially pay a disproportionate share of income for energy
• Will increase the State’s emphasis on improving energy affordability, and increased deployment of DG in LMI communities

NYS Energy Policies and Programs serving EJ and LMI

• SBC, EEPS, RPS, Weatherization Assistance Program, transportation programs
• Clean Energy Standard (CES), Reforming the Energy Vision (REV)
• Clean Energy Fund (CEF)
• RGGI
Energy Policies in NYS

Clean Energy Standard (CES)
- 50% renewable energy by 2030
- Together with nuclear ensuring NYS gets cleaner power

Reforming the Energy Vision
- Transforming NY’s Energy Market
- Encouraging growth of RE and EE
- Increasing customer choice and participation
- Increasing customer bill savings
REV programs benefit EJ communities

- Community Choice Aggregation
- Community Net Metering
- Large-Scale Renewables
- Low Income Affordability
Clean Energy Fund – other statewide programs benefit EJ communities

- $234.5 million in funding commitment to Low- to- Moderate Income initiatives over the first 3 years
- Includes current incentive programs
  - Single family existing homes (EmPower NY, Assisted HPwES)- $107.4 million
  - Multifamily existing buildings (Multifamily Performance Program)- $33.9 million
  - New construction (NY ENERGY STAR Certified Homes and MPP)- $15.1 million
- Additional activities will include incentives for rooftop and shared solar, the provision of technical assistance, pilots and demonstrations, awareness and education, and a focus on increasing coordination with other state agencies
Use of RGGI Proceeds
RGGI Proceeds Support Other Programs

RGGI funds a diverse set of programs, and invests in 5 key approaches to deliver benefits to NYS:

1) Reduce GHG’s through RE and EE
2) Build capacity for long term CO2 reduction
3) Empower communities to reduce CO2 and transition to cleaner energy
4) Simulate entrepreneurial growth of companies focused on clean energy and CO2 reduction
5) Create new financing solutions to encourage CO2 reduction and clean energy adoption
RGGI Benefits EJ Communities

Reaching LMI and EJ communities:

- **GJGNY**: engaging LMI and EJ through Constituency Based Outreach Organizations (CBOs) – acting as the point of entry across the suite of RGGl funded Residential Efficiency Services Programs
- **Empower**: Participant referrals come from a variety of sources close to LMI and EJ communities
- **Community Solar under NY-Sun**: developing LMI solar program that will impact EJ communities, Solarize is leveraging GJGNY CBOs to engage EJ communities
RGGI Benefits EJ Communities, cont.

Reaching LMI and EJ communities:

- **Climate Smart Communities/Cleaner Greener Communities**: provide technical assistance, and preferential scoring resulting in 25+ projects in EJ communities to date.
- **Climate Research**: review of heat wave cooling center locations & flood zone mapping relative to vulnerable populations; studies in progress for 2016 incorporate vulnerable communities concerns.
- **Transportation Research**: results in measurable air quality improvements in EJ communities.
Estimated Benefits

- Funded more than 7,200 deployment projects in EJ areas
- EJ area projects account for:
  - More than 20% (54,000 MWh) of installed electricity savings,
  - More than 25% (661,000 MMBtu) MWh of fuel savings, and
  - Approx. 10,000 MWh of renewable energy.
- Significant additional benefits are realized through non-deployment programs
NEW YORK STATE
ESTIMATED RGGI SPENDING
IN ENVIRONMENTAL JUSTICE AREAS
BY COUNTY

Environmental Justice Totals
More than $37.0 million spent
More than 7,200 projects funded

Figure under county name represents number of contracts deployed in zip codes that fall within an EJ area

FUNDS SPENT IN EJ AREAS
<$50k
$50k - $250k
$250k - $1M
$1M - $2.5M
>$2.5M

Environmental Justice Areas
Clean Power Plan
Program Design
Implementing the CPP in New York

- Carbon dioxide (CO₂) from large power plants – same as RGGI
- EPA sets goals for each state – New York’s goals are similar to RGGI goals
- Different options for plan design – RGGI would be allowed
- Benefits will depend on program design, the energy mix, and other state policies
Elements of Program Design

- Mass-based, emission standards plan approach
- Other compliance plan approaches
- EPA’s goal compared to RGGI
- Expanding emissions trading
- Simple cycle turbines and biomass units
- Existing flexibility mechanisms
- Allocation methodologies
- Including the CEIP
Clean Energy Incentive Program (CEIP)

• Awards allowances to Renewable Energy projects and Energy Efficiency projects in Low or Moderate Income Communities.
• Allowances can be sold to offset the costs of projects.
• Allowances are intended to equal the amount of CO₂ emissions displaced by the project so there is no net change in CO₂.
Key Design Questions

• How stringent the program should be; should the cap be lowered?
  • A lower cap means less CO2 is emitted, and generally would result in burning less fossil fuels overall.

• Should we continue to include a cost containment reserve (CCR) and/or offsets?
  • These are flexibility mechanisms that are believed to decrease the volatility of the allowance price. When they are used they allow additional fossil fuels to be burned region-wide.

• What might be the advantages of broadening the trading market through linking with other programs or expanding to cover additional sources such as transportation?
  • Trading may increase the stability of allowance prices throughout the trading system. It may allow a more stringent cap to be accepted across the trading region which would result in less fossil fuel burning across the region.
Thank You

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