Using Energy Conservation, Green Energy, Green Infrastructure and EPA’s CREAT Program, to Reduce Carbon Footprint & Vulnerability to Climate Change

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American Society of Civil Engineers
Gives the Nation’s Water Infrastructure a
“D+” Grade
Climate History – Hurricane Sandy
October 2012

Flooding in NJ shore towns- Hurricane Sandy
Flooding in NJ shore towns - Hurricane Sandy (cont’d)
Floodwaters from Hurricane Sandy not only buried cars, but overwhelmed sewage treatment plants, which released billions of gallons of untreated waste into the environment.
Conclusion-

The Nation’s water infrastructure is inadequate to meet the requirements of how the climate is now; climate change will only widen that gap.
Camden County Municipal Utilities Authority (CCMUA)

- Services 500,000 customers in Southern New Jersey
- Design Flow: 80 MGD
- Average Flow: 58 MGD
- Secondary, pure oxygen activated sludge treatment
- Discharges to Delaware River
CCMUA Climate Change Vulnerabilities

• Loss of Power

• Rise in Delaware River elevation
  - wastewater treatment plant more prone to flooding and corresponding equipment damage
  - combined sewer system will see higher tides and corresponding increase of flooding of homes, streets & parks
CCMUA Climate Change Vulnerabilities (con’t)

• Increased rainfall volumes
  - increased pressure on finite capacity of wastewater treatment plant and combined sewer system
  - increased probability of combined sewage flooding and overflows
Resiliency Measures Already Implemented-
Energy Conservation & Green Energy

- Energy Audit
- Energy conservation measures
- Solar panels
- Digestion/Combined heat and power
- Sewage heat recovery
Resiliency Measures Already Implemented -
Green & Grey Infrastructure

- Water Conservation Ordinance adopted
- Optimization of operations & maintenance of sewer system
- Grey Infrastructure upgrades
  - pipe replacements
  - pipes lined
  - infiltration/inflow removal
  - combined sewer separation
- Green Infrastructure
  - rain gardens
  - rain barrels
  - stream daylighting
  - depaving projects
Waterfront South Rain Gardens
Green Infrastructure on Brownfield Sites - Before & After...
Baldwin’s Run Stream Daylighting Project - Before....
Baldwin’s Run Stream Daylighting Project -  After...
Phoenix Park Project - Before...
Phoenix Park Project- After...
CCMUA’s Continuing Climate Change Vulnerability

- Despite green energy & green infrastructure initiatives, CCMUA still vulnerable to storms like Superstorm Sandy (climate history!), and to future climate change
- USEPA Climate Change Task Force- CREAT
CCMUA’s CREAT Assessment Goals

• Understand system’s vulnerabilities to climate change impacts, particularly river elevation rises and increased rainfall

• Harness existing wherewithal and resources to develop a systematic approach to climate change vulnerabilities

• Identify shortfalls in existing wherewithal, in the face of climate change, and plan accordingly
Results of CREAT Analysis for Camden

- CCMUA very vulnerable to severe rain events
- Delaware River expected to rise by 18 inches by 2050
Planning & Design Consequences

- Accelerating green energy program, with a goal to be off the grid entirely as soon as possible
- Accelerating green & grey infrastructure program to shed stormwater burden
- All designs must factor in 18-inch river level rise predicted by CREAT
- Planning for “seawall” to protect plant
CCMUA’s Energy Resiliency Goal—Implement Sustainability Loop

- Receive 4MW of green energy from nearby trash to steam incinerator
- Send 1MGD of plant effluent to incinerator for cooling water

**Planned Outcome**
CCMUA will be entirely independent of the grid, with reduced vulnerability to power outages, reduced carbon footprint…and lower electricity costs as well by 2020
CCMUA’s Flooding Reduction Goal-Accelerate Long Term CSO Control Plan

- Ensure that Camden City’s CSO system is cleaned out and functioning at full volumetric capacity
- Upgrade Camden City’s CSO system to increase conveyance capacity
- Expand CCMUA’s wastewater treatment plant to receive 20-40% more flow during rain events

Planned outcome
Eliminate flooding in Camden City for at least the one-year storm by 2020
Benefits of CREAT

- Detailed analysis of vulnerabilities to climate change
- Catalog of possible improvements and upgrades
- Links to resources to assist in planning & implementation
- Links to best practices by fellow utilities that can be duplicated
- Reporting function
Learn More About USEPA’s CREAT Program

https://www.epa.gov/crwu/build-resilience-your-utility
Conclusions

• Few cleanwater utilities are adequately prepared for the climate as it is now, as shown by storms like Hurricane Sandy in 2012

• Such storms can lead to catastrophic failures that have significant adverse public health, environmental and economic impact

• Climate change is projected to make the challenge even more difficult to meet

• USEPA’s CREAT model is an extremely useful tool for utilities to plan for the challenges posed by climate change
Thanks for Listening!

If you would like more information, please contact:

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