

Hunts Point **RESILIENCY**

Public Meeting

March 8, 2017



Resilient Efforts in Hunts Point

A multilayered approach to resiliency

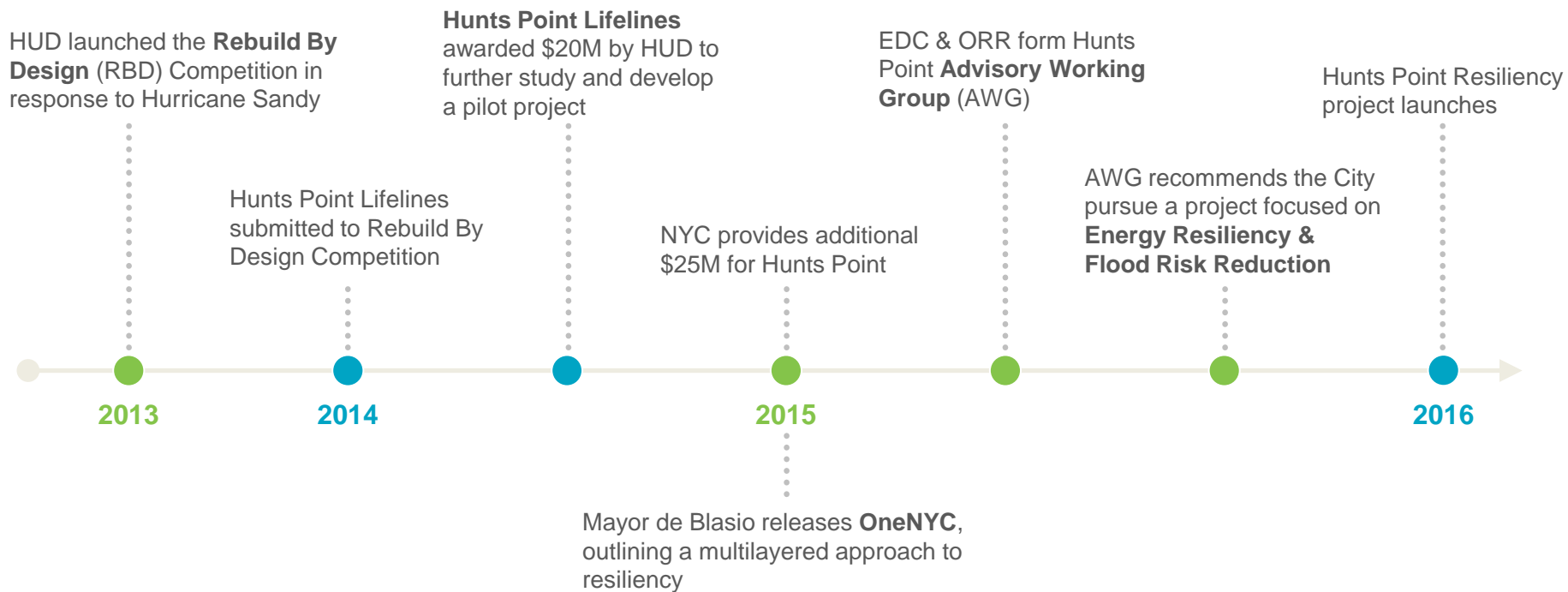
Neighborhoods **Buildings** **Infrastructure** **& Coastal Defense**

- Hunts Point Resiliency Project
- Resilient Mesh Wireless Network
- South Bronx Community Resiliency Agenda
- NYC Food Distribution & Resiliency Study
- Hunts Point Clean Truck Program
- Alternative Fuels Facility
- DEP Green Infrastructure Program
- Hunts Point Workforce1 Career Center

How We Got Here

Project Beginnings

- Awarded RBD funding → Aligned with the community’s vision → Commenced Project



Project Overview

The Project will result in the selection and design of a **Resilient Energy pilot project** and the identification of **feasible Flood Risk Reduction projects** for which to seek additional funding.

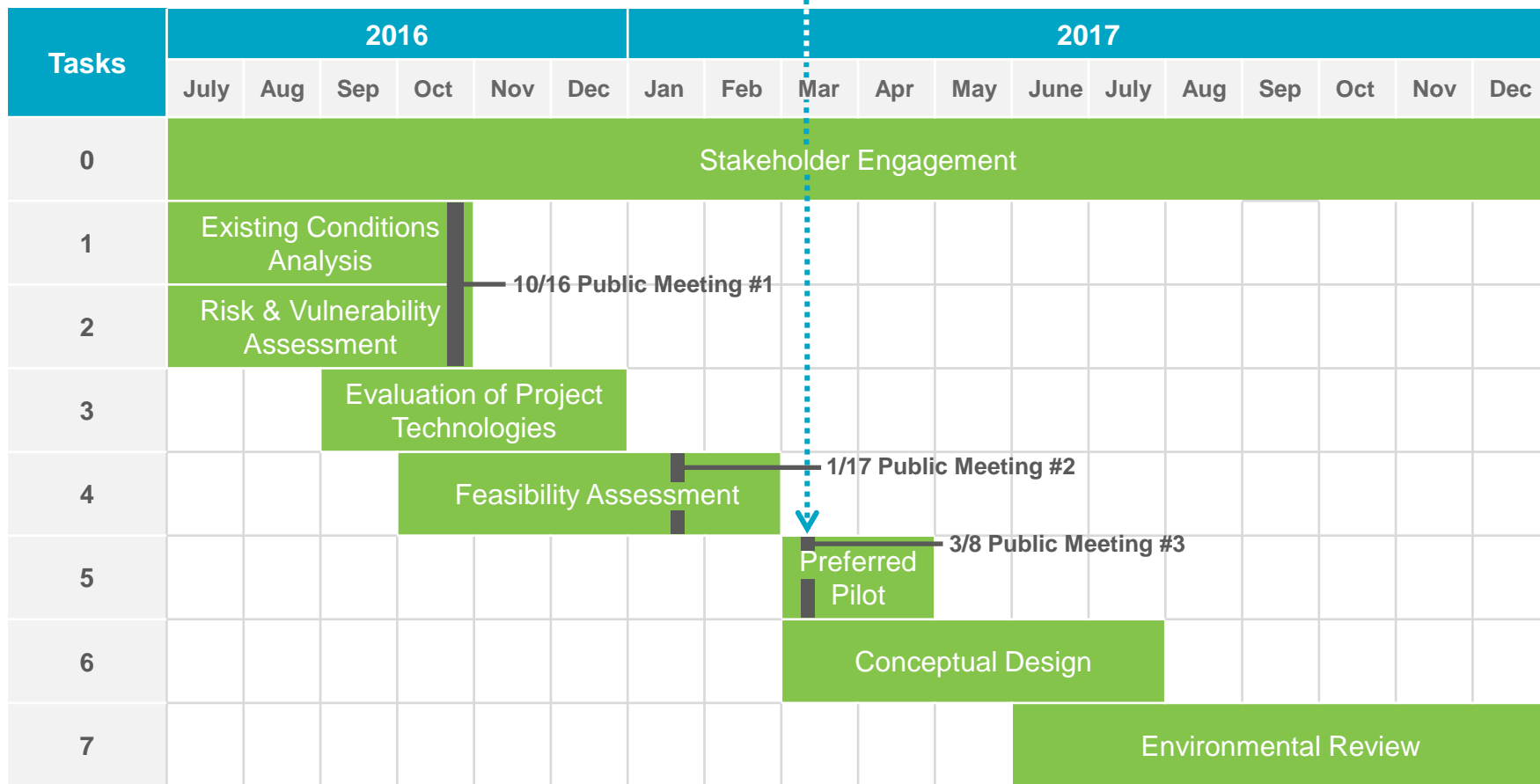
The project seeks to advance solutions that:

- Address critical vulnerabilities for both community and industry
- Protect important citywide infrastructure
- Protect existing and future industrial businesses and jobs
- Support the community's social, economic, and environmental assets
- Use sustainable, ecologically sensitive infrastructure when feasible

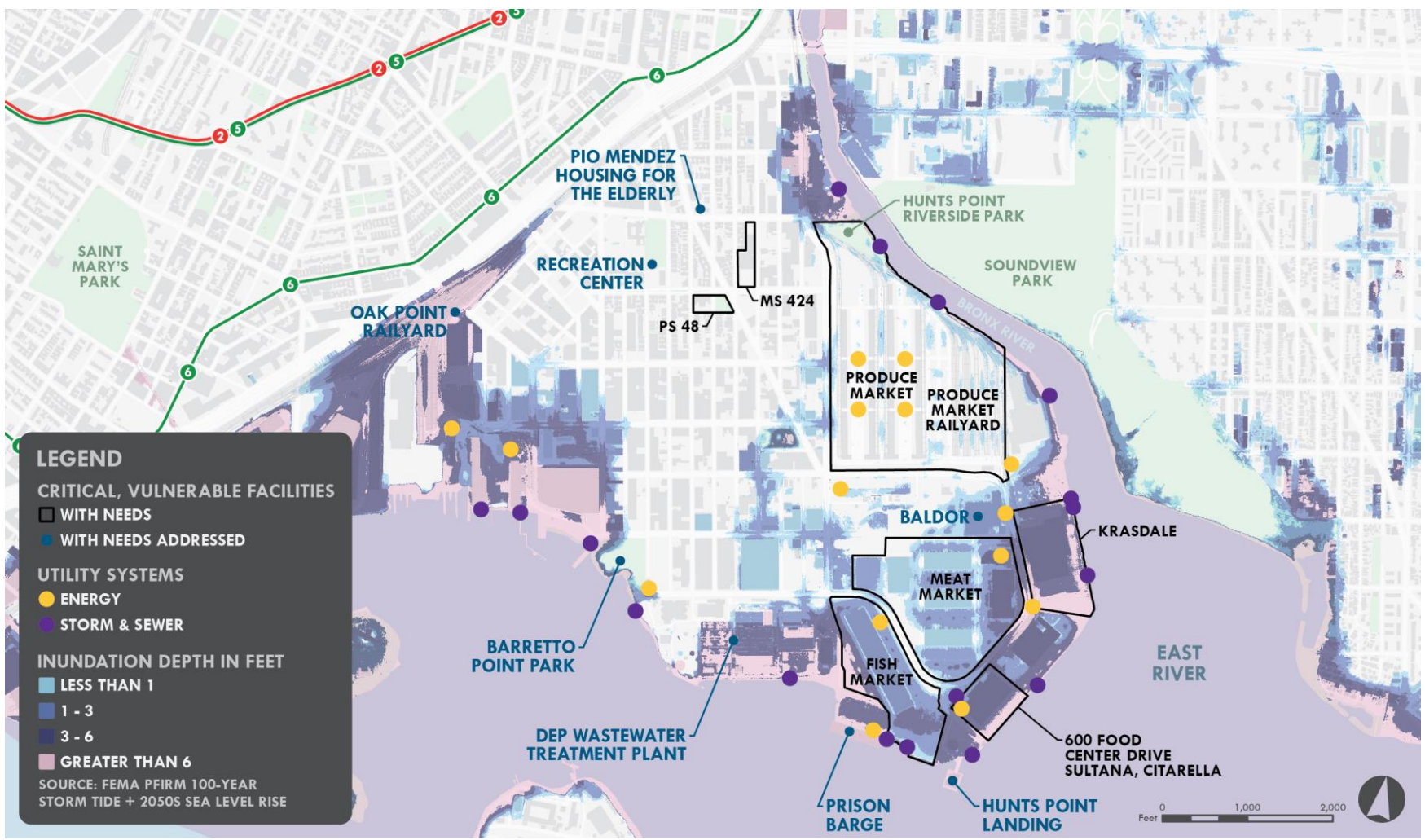


Project Timeline

We Are Here



Vulnerability Findings



Critical Facilities & Future Threats

Facility

Threat

Hunts Point Recreation Center

Outage, Heat

Pio Mendez Housing for the Elderly

Outage

Primary School (PS) 48

Outage, Heat

Middle School (MS) 424

Outage, Heat

Produce Market

Outage, Heat

Meat Market

Outage, Surge, Heat

Fish Market

Outage, Heat

600 Food Center Dr (Citarella/Sultana)

Surge

Krasdale

Surge

Hunts Point Wastewater Treatment Plant

Surge

Oak Point Railyard

Surge

Vernon C. Bain Correctional Facility

Surge, Heat

Certain Road Intersections

Surge, Outage

Certain Electrical Transformers

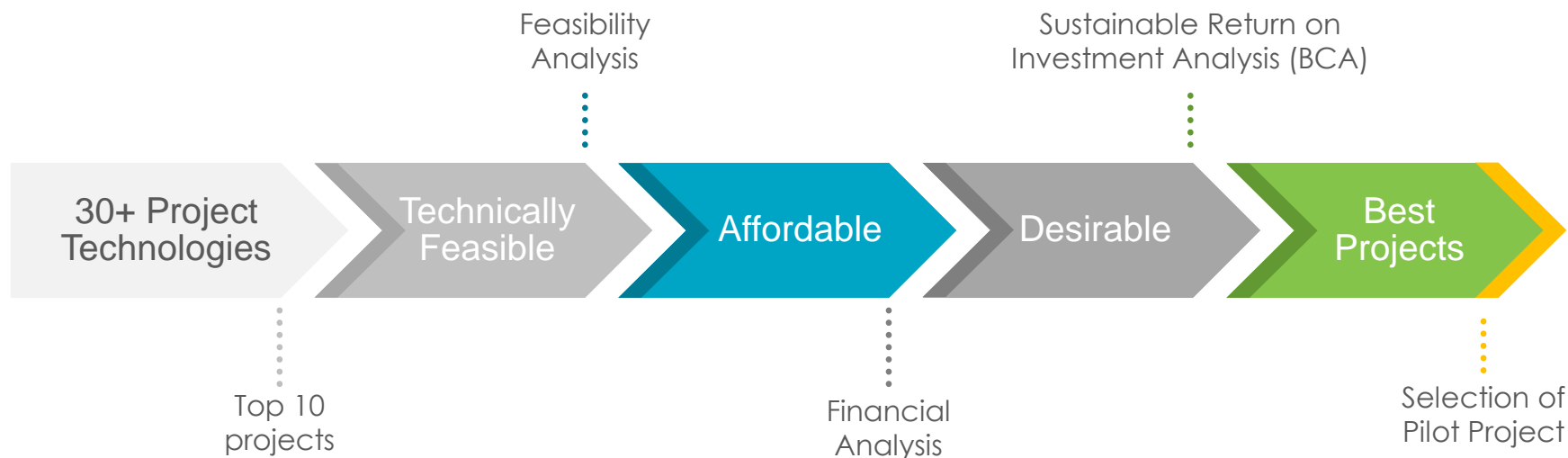
Surge, Outage

Community

**Food
Distribution
Center**

**Infrastructure &
Other Facilities**

Assessment & Analysis



Screening Criteria

Resiliency: applicability to critical facilities, dispatchable, reliable for minimum of 3 days, independent utility

Sustainability: emissions, efficiency, fuel source

Community benefits: workforce opportunity, scalability

Constructability: suitable space, required infrastructure, permitting

Implementability: Schedule, cost to construct, cost/MWh, potential to leverage other funds

Project Options

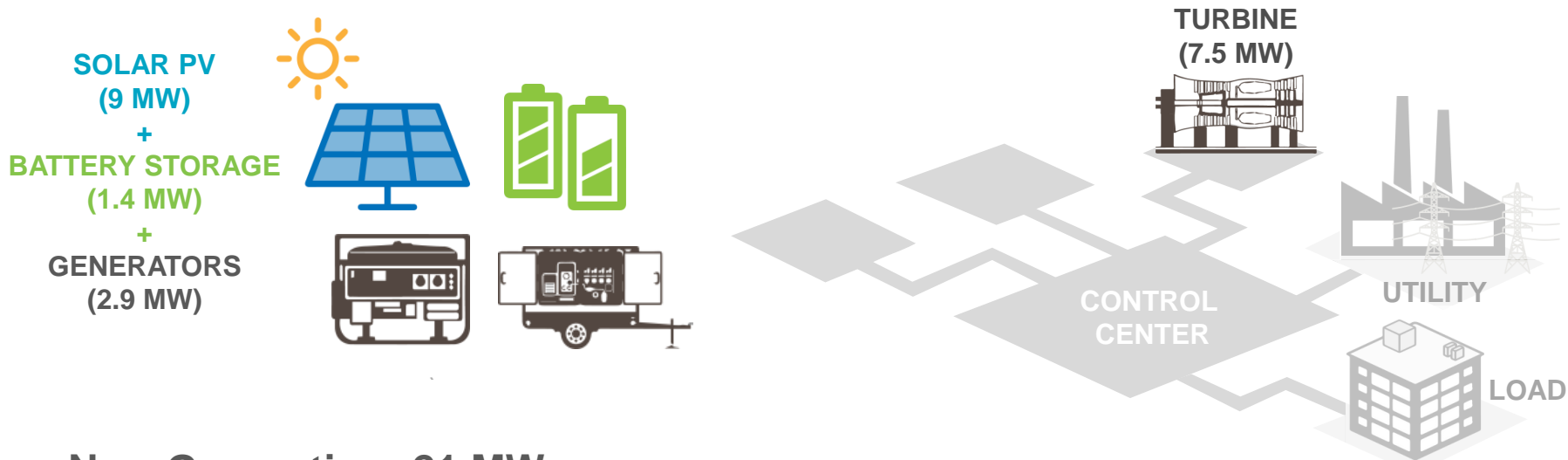
Packages

- **Package 1:** Pilot microgrid and solar + storage
- **Package 2:** Large microgrid and solar + storage
- **Package 3:** Individual generator solution

Considerations

- While individual facility-level solutions can technically achieve “full resiliency,” a district-wide solution is most efficient, sustainable, and reliable
- All energy projects incorporate flood protection measures into costs and designs
- Need to balance goals of sustainability and resiliency

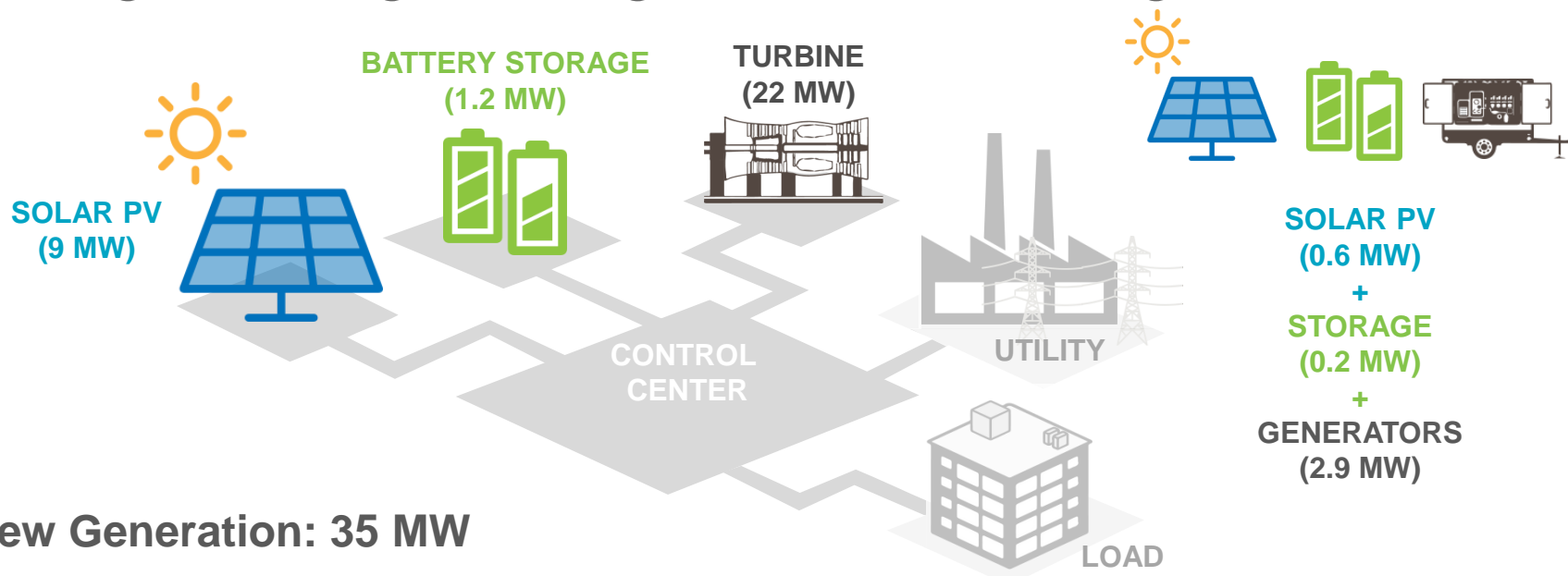
Package 1 – Pilot Microgrid & Solar + Storage



New Generation: 21 MW

Energy Solution	Building
Rooftop Solar PV w/ Energy Storage	PS 48, MS 424
Rooftop Solar PV (Community Solar Program when applicable)	600 FCD, Dairyland, Krasdale
Rooftop Solar PV w/ Battery Storage and Natural Gas Fired Reciprocating Generator	Fish Market
7.5 MW Simple Cycle Combustion Turbine	Produce Market
Solar PV w/ Energy Storage	6 key road intersections
Mobile Diesel Generators	Markets and businesses

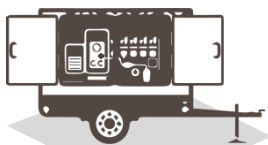
Package 2 – Large Microgrid & Solar + Storage



New Generation: 35 MW

Energy Solution	Building
Rooftop Solar PV w/ Energy Storage	PS 48, MS 424
Rooftop Solar PV (Community Solar Program when applicable)	Fish Market, 600 FCD, Dairyland, Krasdale
Rooftop Solar PV w/ Battery Storage	Fish Market
20-24 MW Combined Cycle Combustion Turbine	All FDC Facilities east of Halleck St
Solar PV w/ Energy Storage	6 key road intersections
Mobile Diesel Generators	Markets and businesses

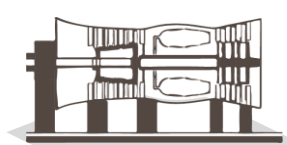
Package 3 – Individual Generators



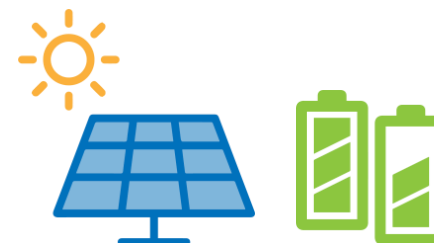
MOBILE GENERATOR
(1.7 MW)



NATURAL GAS GENERATOR(S)
(1.2 MW)



TURBINE
(7.5 MW)

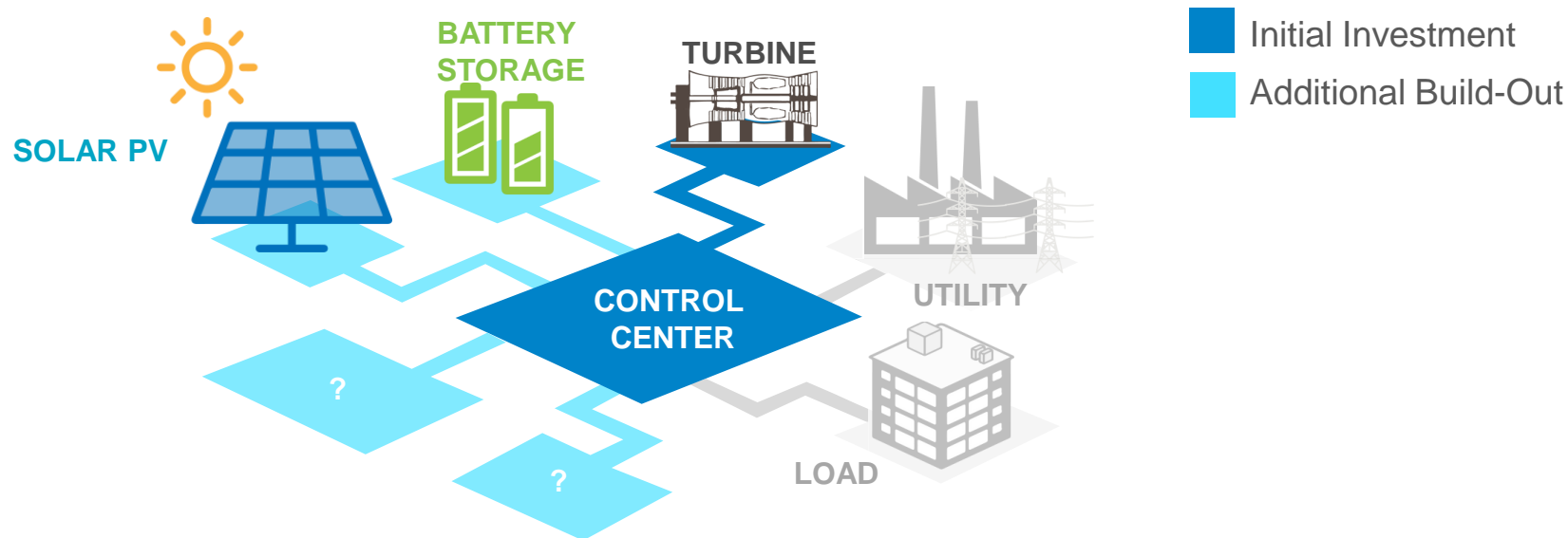


SOLAR PV
(**<0.2 MW**)
+
STORAGE
(**<0.2 MW**)

New Generation: 11 MW

Energy Solution	Building
6 Mobile Engine Generators that can be mobilized for emergency conditions	PS 48, MS 424, The Point, 600 FCD & others
Permanent 1.2 MW Natural Gas Fired Reciprocating Generator(s)	Fish Market
7.5 MW Simple Cycle Combustion Turbine	Produce Market
Solar PV w/ Energy Storage	6 key road intersections

Making the Most of an Initial Investment



- Opportunity to leverage outside funding sources to increase **resiliency, sustainability, and community benefits**
- Additional build-outs can be funded or built by anyone, enabling **future flexibility**
- Future build-outs can incorporate new and more **sustainable technologies** as they become more widely available

Community Benefits

- Direct provision of resilient energy for community facilities
- Potential to establish a community-owned solar program
- Workforce development and training opportunities
- Coordination with RISE : NYC mesh network for small businesses in the community

Sustainable Return on Investment

Quantifying benefits and costs

- Produce comprehensive and site-specific cost and benefit analysis
- Incorporate stakeholder input in priorities
- Inform identification of the preferred pilot project



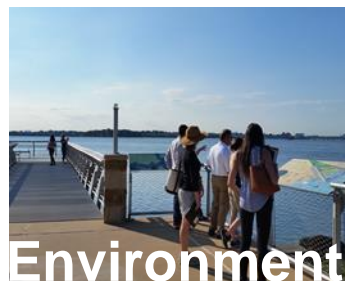
Costs

- Capital, Operations, & Maintenance
- Generation and Distribution Capacity
- Fuel



Resiliency

- Power Outage Reduction
- Property Damage Reduction
- Displacement Reduction



Environment

- Greenhouse Gas Emissions
- Chemical Discharges
- Noise



Social

- Respiratory Health
- Health and Safety
- Injury & Casualty Reduction



Economic

- Employment
- Training & Development Opportunity
- Competitive Advantage

Key Findings

Benefits	Package 1	Package 2	Package 3
Energy cost savings (\$M 2016)	\$13.8	\$63.0	\$0
Generation capacity cost savings (\$M 2016)	\$1.0	\$1.0	\$0
Power Outage Reduction: FDC (\$M 2016)	\$66.7	\$159.7	\$33.8
Power Outage Reduction: Community facilities (\$M 2016)	\$0.46	\$0.46	\$0.46
Jobs created (#)	Construction: 168; permanent: 13; on-call 6	Construction: 235; permanent: 22; on-call 6	Construction: 48; permanent: 7; on-call 6
Change in GHG Emissions (CO _{2e} tons/yr)	-5,755	-11,491	59
Change in CAC Emissions (tons/yr)			
NOx Emissions	-2.92	-19.02	0.11
SO ₂ Emissions	-3.03	-21.21	0.00
PM Emissions	-0.32	-0.44	0.00
VOC Emissions	-0.20	-0.29	0.03

Key Findings

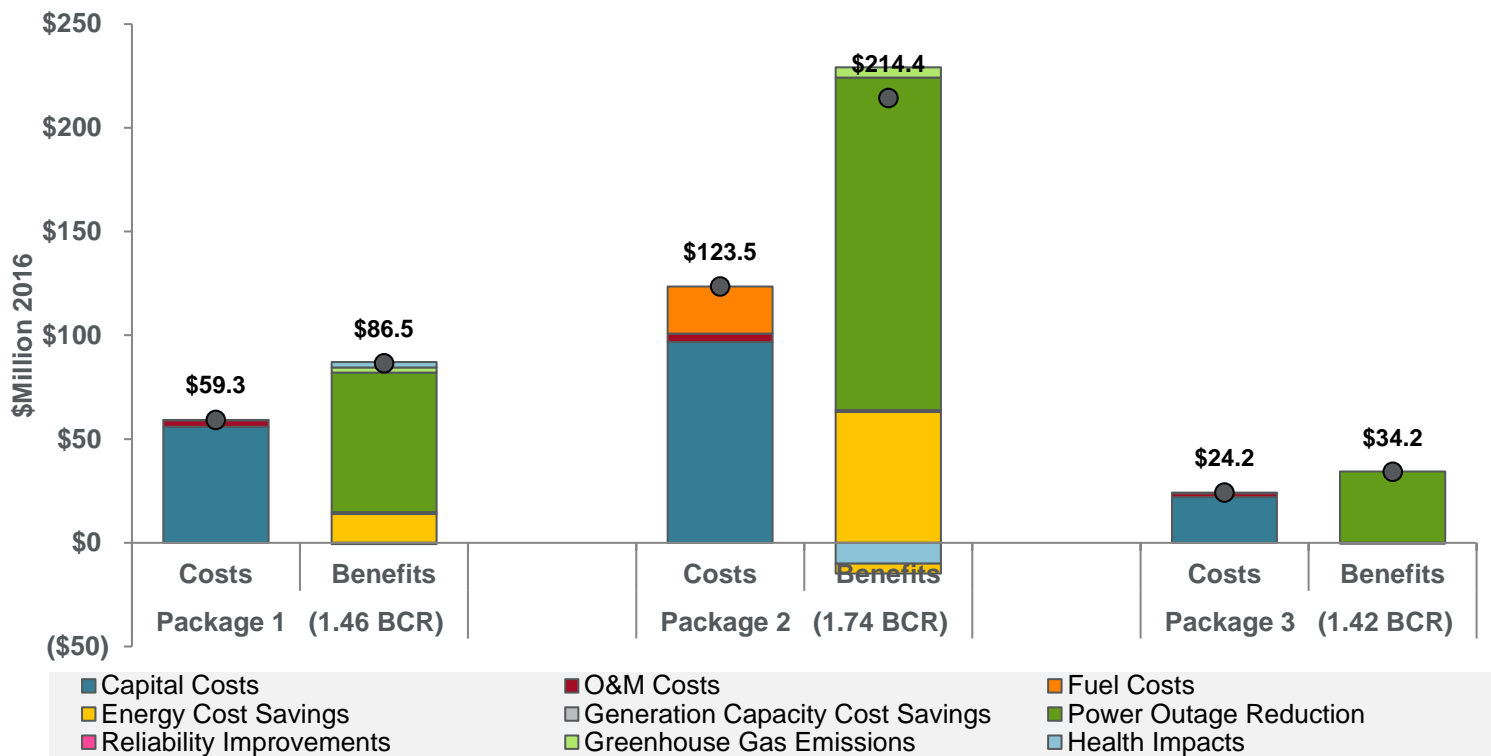
Costs (Net Present Value, 2016 \$M)	Package 1	Package 2	Package 3
Capital Costs	(\$55.99)	(\$96.76)	(\$22.03)
O&M Costs	(\$3.0)	(\$4.1)	(\$1.8)
Fuel Costs	(\$0.28)	(\$22.67)	(\$0.28)

- Includes all monetized costs for the lifespan of the project
- Includes additional funding strategies to supplement HUD funding

BCA Results

All Monetized Impacts (over the lifespan of the project)

Present Value of Total Costs & Benefits



Next Steps

Select Pilot Project

- Action Plan Amendment for submission to HUD (June 1)
- Public comment period and

Advance and Implement Pilot Project

- Conceptual design
- Environmental review and permitting (early 2018)
- Complete implementation (2022)

Community Engagement

- Public hearing for Action Plan Amendment (April 27)
- Next round of Advisory Working Group and Public Meetings

Stay in Touch

Website: [Huntspointresiliency.nyc](https://huntspointresiliency.nyc)

Email: huntspointresiliency.edc.nyc

Twitter/Instagram: [@nyclimate](https://twitter.com/nyclimate) and [@nycedc](https://twitter.com/nycedc)

Appendix

Technologies

Energy

- **Combined Cycle Microgrid**
- **Emergency Reciprocating Engines**
- **Solar PV and Battery Storage**
- **Anaerobic Digestion**
- **Power Hub**

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- Power Generation
 - Reciprocating Engine Microgrid
 - Simple Cycle Combustion Turbine
 - Reciprocating Engine CHP
 - Fuel Cell Applications
 - Tidal Power
 - Wind
 - Solar Generation & Storage
 - Rooftop Solar PV
 - Ground Mounted Solar PV

Flooding

- **Hardening**
- **Area-wide Flood Walls**
- **Facility-level Flood Walls**
- **Elevate Building**
- **Elevate Critical Equipment**

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- Area-wide Levees
 - Deployable Flood Barriers
 - Deployable Pumps

BCA Results

All Monetized Impacts

All Impacts (Net Present Value, 2016 \$M)	Package 1	Package 2	Package 3
Capital Costs	(\$55.99)	(\$96.76)	(\$22.03)
O&M Costs	(\$3.0)	(\$4.1)	(\$1.8)
Fuel Costs	(\$0.28)	(\$22.67)	(\$0.28)
Energy Cost Savings	\$13.8	\$63.0	\$0.0
Generation Capacity Cost Savings	\$0.96	\$0.96	\$0.00
Power Outage Reduction – Markets & Businesses	\$66.7	\$159.7	\$33.8
Power Outage Reduction - Community Facilities	\$0.46	\$0.46	\$0.46
Resiliency Impact on Intersections	\$0.011	\$0.011	\$0.011
Reliability Improvements	\$0.07	\$0.09	\$0.06
Greenhouse Gas Emissions	\$2.50	\$4.97	(\$0.03)
Health Impacts	\$2.6	(\$10.1)	(\$0.1)
Adjustment for Grid Emission Compliance Costs	(\$0.68)	(\$4.75)	(\$0.00)
Total Impacts	\$27.2	\$90.9	\$10.1

Emissions

Environmental: Greenhouse Gas Emissions

Net GHG Impacts (\$M)	Package 1	Package 2	Package 3
Present Value	\$2.50	\$4.97	(\$0.03)
Annual Average	\$0.34	\$0.68	(\$0.00)
Change in GHG Emissions (CO _{2e} tons/yr)	(5,755)	(11,491)	59

Social & Community Development: Health Impacts

Net Health Impacts (\$M)	Package 1	Package 2	Package 3
Present Value	\$2.57	(\$10.07)	(\$0.10)
Annual Average	\$0.34	(\$1.34)	(\$0.01)
Change in CAC Emissions (tons/yr)			
NOx Emissions	(2.92)	(19.02)	0.11
SO ₂ Emissions	(3.03)	(21.21)	0.00
PM Emissions	(0.32)	(0.44)	0.00
VOC Emissions	(0.20)	(0.29)	0.03

Localized criteria air contaminant emissions are valued approximately 4.8x higher than NY state averages for generation displaced from the power grid resulting in net negative value of health impacts despite a reduction in overall emissions in packages 1 and 2.

Economic Impacts

Employment

Construction Jobs	Package 1	Package 2	Package 3
Average Construction Workforce	168	235	48
Permanent Employment	13 permanent, 6 on-call	22 permanent, 6 on-call	7 permanent, 6 on-call

- Estimates assume staff required for individual installations; there may be efficiencies between markets where the same employees could service different equipment
- Construction duration varies: 6-18 months for solar, 20 months for the Produce Market turbine, 24 months for the microgrid, etc.

Economic Impacts

BCA Results

Economic Impacts (Present Value, 2016 \$M)	Package 1	Package 2	Package 3
Capital Costs	(\$56.0)	(\$96.8)	(\$22.0)
O&M Costs	(\$3.0)	(\$4.1)	(\$1.8)
Fuel Costs	(\$0.3)	(\$22.7)	(\$0.3)
Energy Cost Savings	\$13.8	\$63.0	\$0.0
Generation Capacity Cost Savings	\$1.0	\$1.0	\$0.0
Total Economic Impacts	(\$44.5)	(\$59.5)	(\$24.2)
Avoided Revenue and Inventory Loss to FDC	\$66.7	\$159.7	\$33.8
Avoided Wage Loss	\$1.2	\$3.1	\$1.2