

BGE Microgrid Pilot Proposal

April 2016



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

200 YEARS

reliability

innovation

diversity

safety

efficiency

Maryland Microgrid Background

- Gov. Martin O'Malley directed the MD Energy Administration (MEA) to lead a "Microgrids for Resiliency" Task Force
 - MEA charged with studying the statutory, regulatory, financial, and technical barriers to deployment of microgrids across Maryland, and developing a "Roadmap for Action."
- Final report issued June 2014
 - Cites data showing the number of named Atlantic storms is up 67% since '95, and large outages up ten-fold since mid-'80's. Annual costs running \$20B to \$50B.
 - Ability to island critical portions of the grid following weather events or terrorist attacks.
 - May provide improvements in power quality, system balancing and voltage regulation.
 - Potential to reduced peak demand during times of grid constraints.
- Report included recommendations for utility involvement in microgrids in short-term, for overcoming initial barriers
 - *On a short term basis, recommend moving forward with a deployed pilot project to serve as a model for future deployment. Utility owned microgrid applications are the likely path forward for near term. The Task Force feels the PSC has the authority to allow/require the utilities to implement these projects.*



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816



BGE Microgrid Pilot Proposal

- On December 18, 2015, BGE filed with the Maryland Public Service Commission (PSC) a pilot proposal to construct, own and operate two public-purpose microgrids within BGE's electric distribution service territory.
- Proposal is in part a response to 2014 MEA Microgrid Task Force Report.
- Proposed initial microgrid locations are in Baltimore City and Howard County.
- Proposed cost recovery through a monthly charge for most BGE electric customers.
 - For average residential customer, charges would be \$0.04 per month or \$0.48 during the first year of cost recovery.



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816



BGE Microgrid Pilot Proposal

- BGE proposes to design, build and operate microgrids in the service territory to provide power to buildings which provide public services and adjacent accounts during periods of extended outages.
- BGE proposes to work with local officials and identify sites for public purpose microgrids in each jurisdiction and build at least one microgrid in each county served by BGE.
- Potential sites evaluated through a criteria matrix to allow comparison and prioritization.
- Each site design will incorporate switching and controls needed to island the microgrid from the distribution system, and utilize either installed or deployed mobile generation to provide the capability for continuous service to the islanded group of services. The preferred fuel for generation is natural gas and where gas is not reasonably available, other options, such as diesel, are considered.
- It is expected the microgrids will enable local renewable generation (such as solar) on premises within the island to operate while in the islanded mode, complementing the installed generation source.
- Energy storage is being considered but requires further study to better determine cost effective deployment strategies. It is expected storage could be incorporated into the microgrids once a strategy is adopted.
- Estimated average cost per MW is ~\$3.5 million. Typical microgrid sizes may range from 3-5 MW, with each site varying by customer size, mix and configurations.



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816



Public Purpose Microgrids

A Public purpose microgrid is described as:

A Microgrid serving critical community assets across multiple customers and multiple properties. Critical community assets include resources that provide important community functions, such as community centers, commercial hubs, and emergency service complexes. Grocery stores, gas stations, pharmacies and similar facilities could be deemed to be eligible participants of a public purpose microgrid, in addition to hospitals, community centers, fire and police stations, etc.

Sample Site



Concentration of key services along major highway

- Adjacent to regional medical center and includes grocery, pharmacy, banking major retail, gas and auto service and other critical services
- Supports large suburban population in the surrounding area
- Near major interstate (I95) to support through travelers as well



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

200 YEARS

Proposed Initial Location

■ Kings Contrivance

- Grocery, pharmacy and other key services located in close proximity
- Significant community and meeting spaces including Hammond HS and 2 Churches
- Convenient to access via major thoroughfares
- Mix of established and newer communities
- Current existing infrastructure and space reduces challenge for switching and equipment requirements



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

200 YEARS

Kings Contrivance Proposed Initial Location



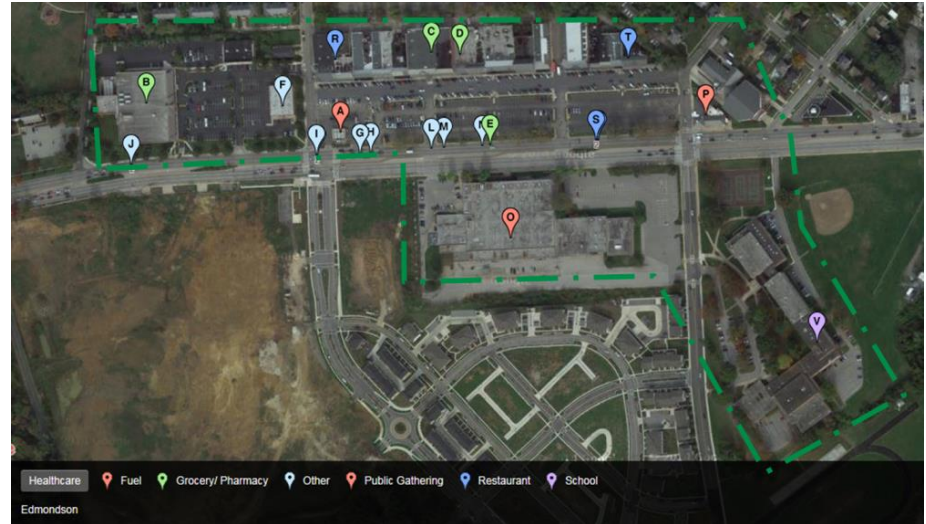
An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

200 YEARS

Proposed Initial Location

- Edmondson Village
 - Grocery, pharmacy and other key services located in close proximity
 - Significant community and meeting spaces including Edmondson-Westside HS and Enoch Pratt Free Library
 - Nearby area has experienced longer duration outages during significant weather events
 - Convenient to access via public and personal transportation
 - Mix of established and newer communities

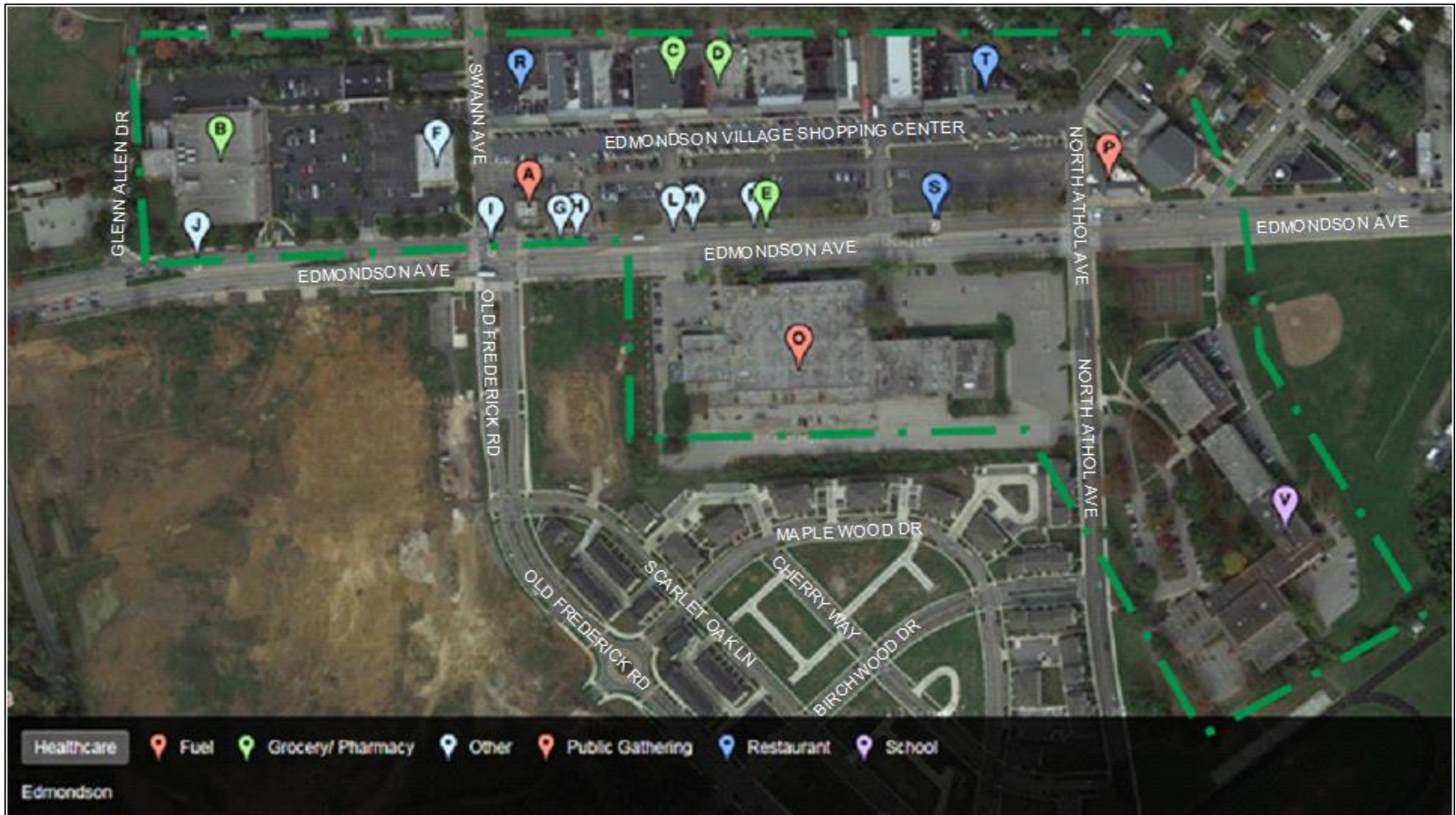


An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

200 YEARS

Edmondson Village Proposed Initial Location



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816



Milestones and Timeline

- December 18, 2015 PSC Filing
- January 15, 2016 PSC issues requests for comments; defers rate implementation
- February 11, 2016 Brief Baltimore City Mayor's Office
- February 16, 2016 Met with Maryland Department of the Environment
- February 23, 2016 Meet with Baltimore City, Sustainability & Resiliency Programs
- February 23, 2016 Met with Howard County
- February 26, 2016 Comments due to PSC
- April 13, 2016 PSC hearings
- 18-24 months (from approval) Secure site(s), design, build systems



An Exelon Company

MOVING SMART ENERGY FORWARD SINCE 1816

