



Microgrids in the District of Columbia  **pepco**

MEDSIS, Formal Case No. 1130 Workshop – April 28, 2016

Microgrids Are Emerging Distributed Energy Resources

Public-Sited Microgrids are the most complex form of DERs and present unique challenges and opportunities:

- Microgrids may be composed of multiple types of DERs, all with unique operating characteristics and legal and regulatory implications¹
- Microgrid assets may exist both in-front-of and behind-the-meter
- Microgrids require complex financial transactions to be facilitated among numerous stakeholders including developers, PJM, Pepco, and customers
- Microgrids must be designed and integrated into the distribution grid so that grid reliability can be enhanced and customer and public safety will not be impacted
- Microgrids should incorporate important customer service and consumer protection features (e.g., RAD, LIHEAP, Customer Bill of Rights)

¹In Pepco's April 18, 2016 comments to the Commission, Pepco broadly defines DERs among the following six categories:

1) Backup generators, 2) NEM facilities, 3) Community Renewable Energy Facilities, 4) Qualifying Facilities, 5) Generators selling into the PJM wholesale market, 6) Behind-the-meter generators that partially offset the customer's load but are precluded from exporting electricity to the grid.

² D.C. Code § 34-207

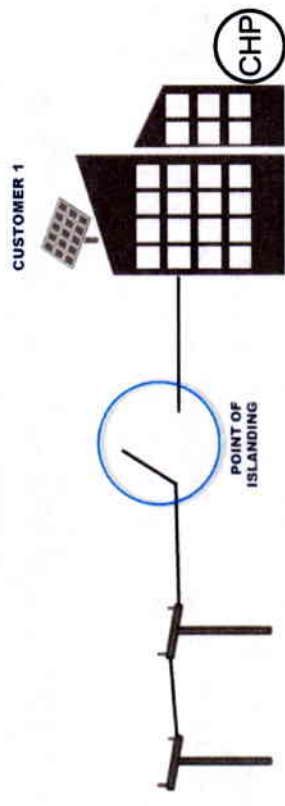
Pepco Sees Two Potential Microgrid Models Emerging in the District

Fundamentally, a microgrid is a combination of distributed energy resources (generation, storage & controllable load) that can be operated in parallel with the distribution system or in an islanded mode. Microgrids may take two forms:

Campus Microgrids

are owned and operated by a single customer. The owner has complete responsibility for the operation, maintenance and performance of the system. Existing examples include:

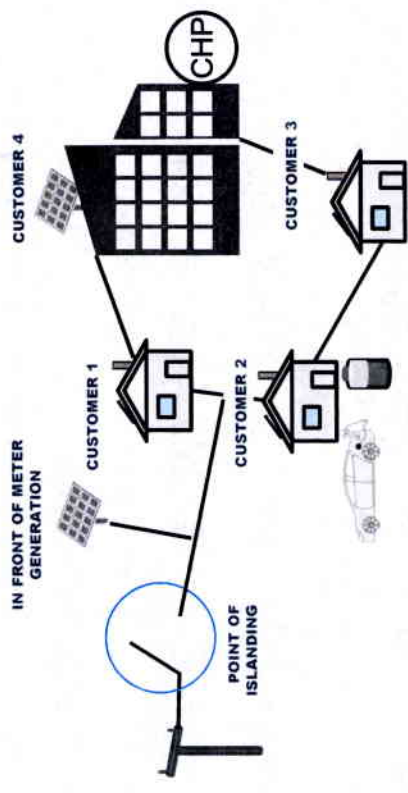
- [White Oak Federal Campus \(MD\)](#)
- [University of Maryland \(MD\)](#)



Public-Sited Microgrids

serve multiple customers. The owner of the generation will likely be different than the customers served by the microgrid. Examples currently under evaluation include:

- [ComEd's Bronzeville Microgrid Cluster \(IL\)](#)
- [Central Hudson Gas & Electric \(NY\)](#)



Guiding Principles for Public-Sited Microgrid Development

Microgrid development in the District should adhere to the following principles:

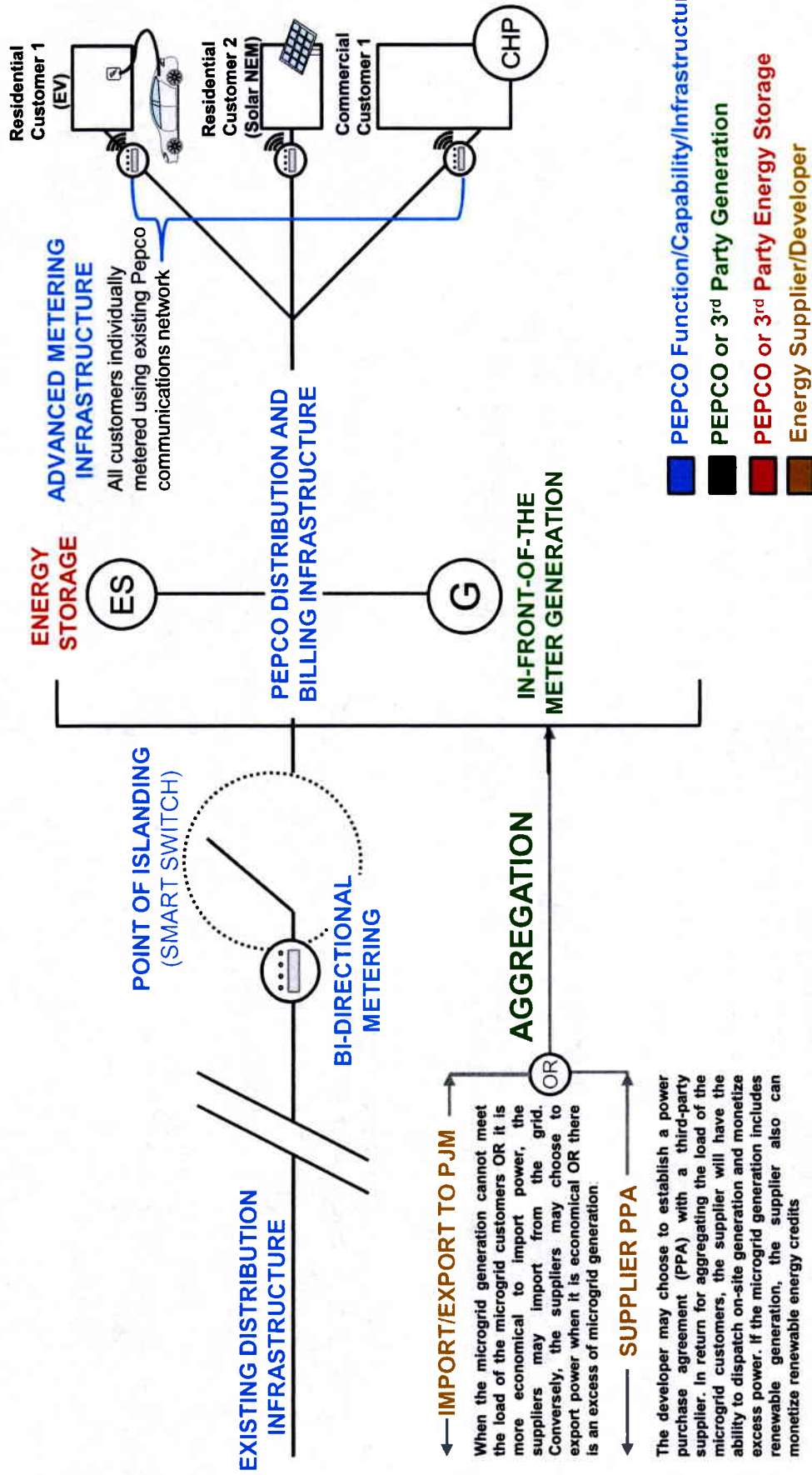
1. Public-sited microgrid development should further District policy goals, such as increasing the use and awareness of renewable energy generation technologies among District residents and businesses, assisting low-income residents with their energy needs, and promoting customer choice in supply
2. The costs of public-sited microgrids should follow the benefits such that only customers who receive the microgrid benefits pay the associated costs
3. Public-sited microgrids should be encouraged to act as a resource to enhance the reliable operation of the electric distribution system, and the associated costs should be socialized accordingly
4. The regulatory framework for public-sited microgrids must include the applicable retail customer protections, including anti-discrimination and other rate and terms of service protections and customer service and reliability protections

Integration of Public-Sited Microgrids Allows Improved Planning, Design and Operation

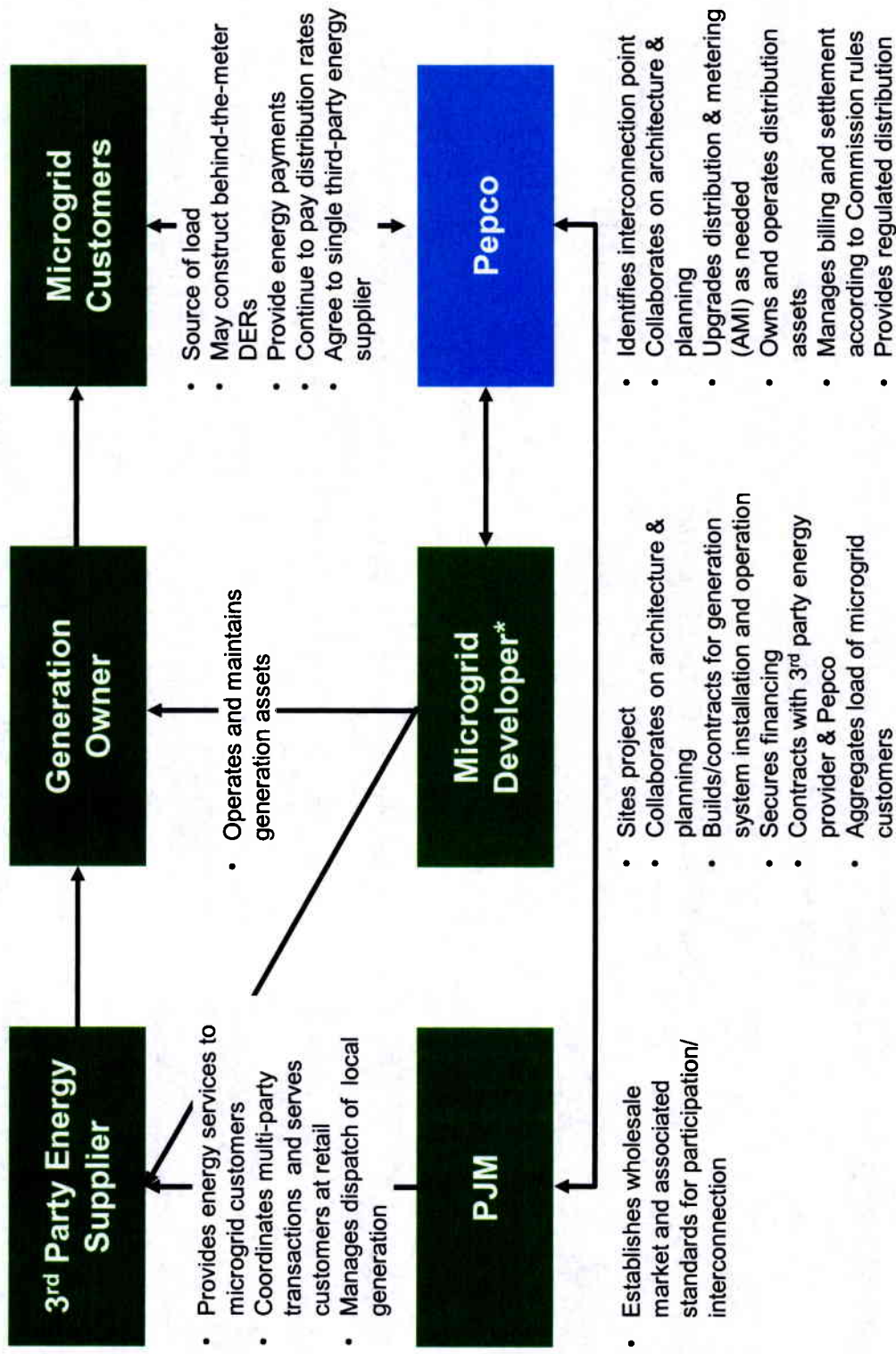
- Integrated operation between public-sited microgrids and electric distribution can unlock benefits that improve distribution system reliability and avoid the need for future investment
- Pepco can facilitate successful integration of public-sited microgrids
- Campus microgrids provide benefits to the facilities served but not to customers served from the grid

Potential Benefits	Benefits Realization	
	Campus Microgrid	Public-Sited Microgrid
On-site power source	✓	✓
Improved customer control and management of electricity consumption and production	✓	✓
Improved distribution system reliability	✗	✓
Potential distribution system investment deferral or avoidance	✗	✓
Transmission congestion relief or deferral	✗	✓
Improved bulk power system operation	✗	✓

Illustrative one-line diagram of community microgrid architecture and asset/services coordination



Illustrative public-sited microgrid energy supply contract structure



*In some instances, the Microgrid Developer may retain a role as a 3rd Party Energy Supplier or Generation Owner