

DISTRICT OF COLUMBIA
Formal Case 1130
Energy System Modernization

OCTOBER 1, 2015

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DEPT. OF ENERGY AND ENVIRONMENT

District of Columbia Goals

Sustainable DC Plan (2032)

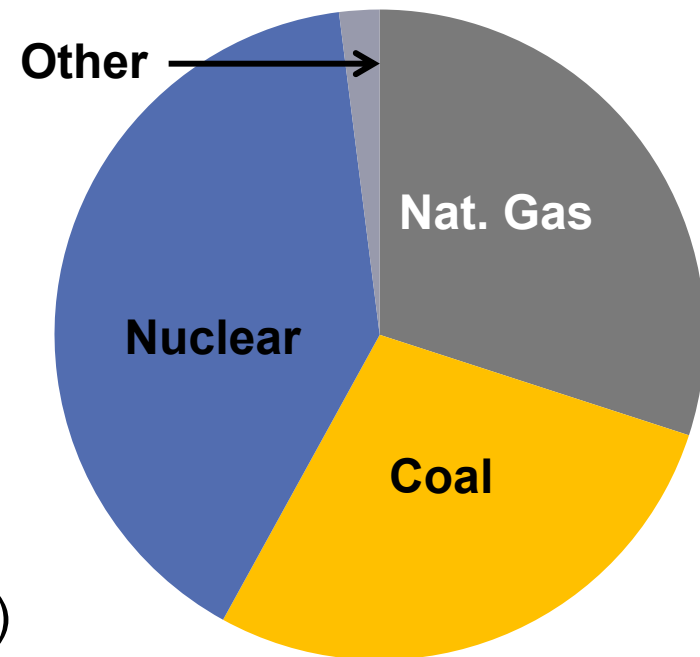
- 50% of supply from renewables
- 50% total energy use reduction

[50% reduction of GHG emissions]
2005 Baseline: 11,816,000 MWh

Renewables Target

- $\approx 5,500,000$ MWh (2013 consumption)
- DGS wind contract ($\approx 2\%$ of this number)

RFC East Region—Fuel Mix



District of Columbia Goals

Clean and Affordable Energy Act

Renewable Portfolio Standard

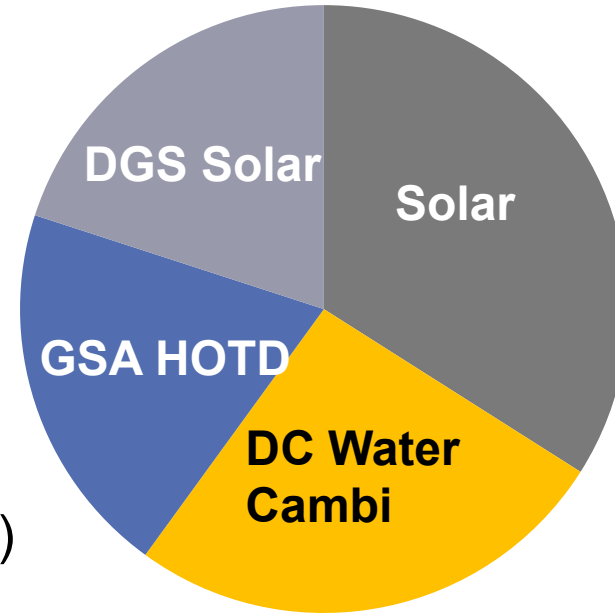
2017: 1% Solar: 103 MW

2023: 2.5% Solar: 288 MW

20% renewable purchase
by 2020 \approx 2,200,000 MWh

ACP \$ = Community Solar
Low-Income Solar (260 homes)

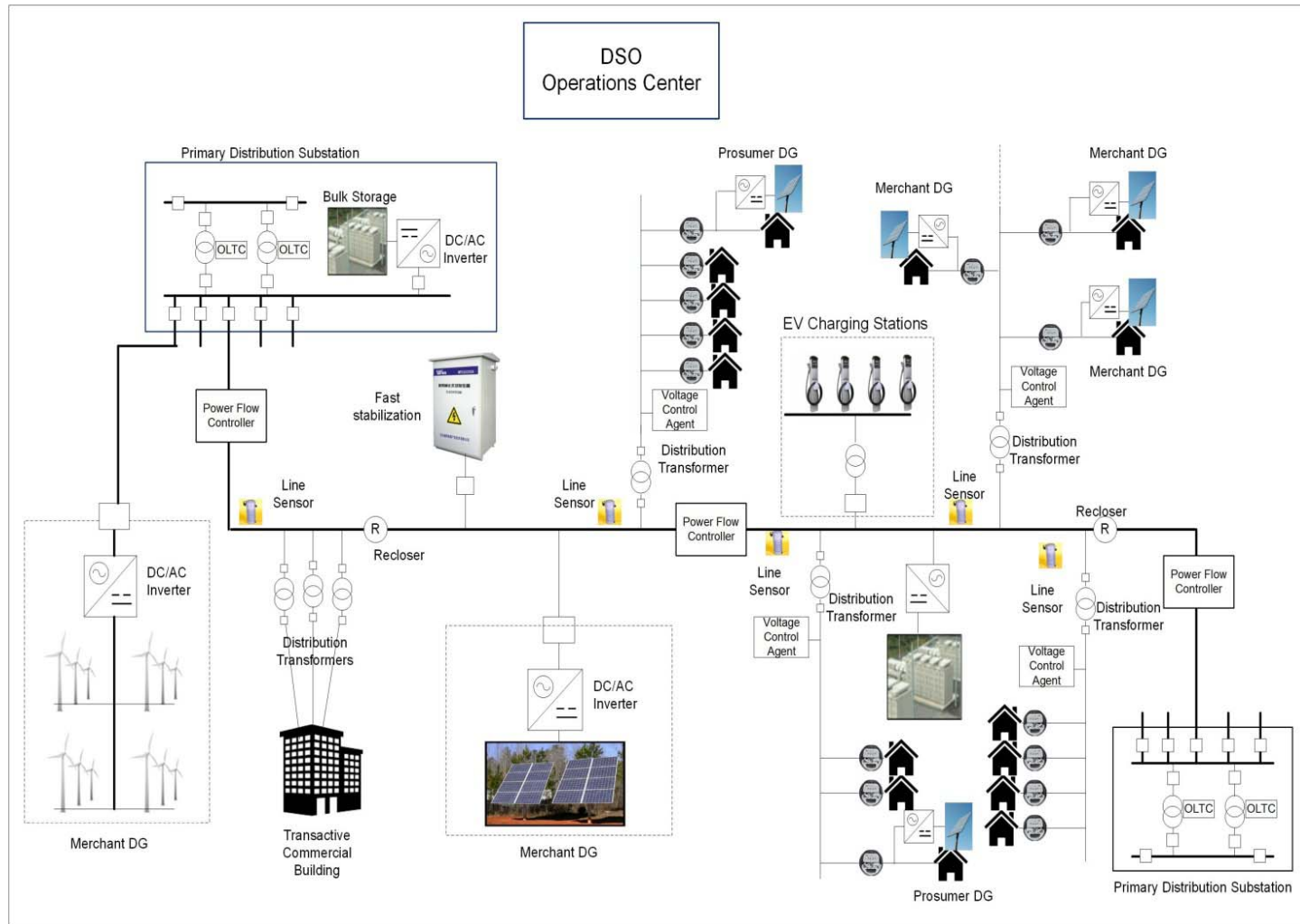
Electricity: \approx 50 MW



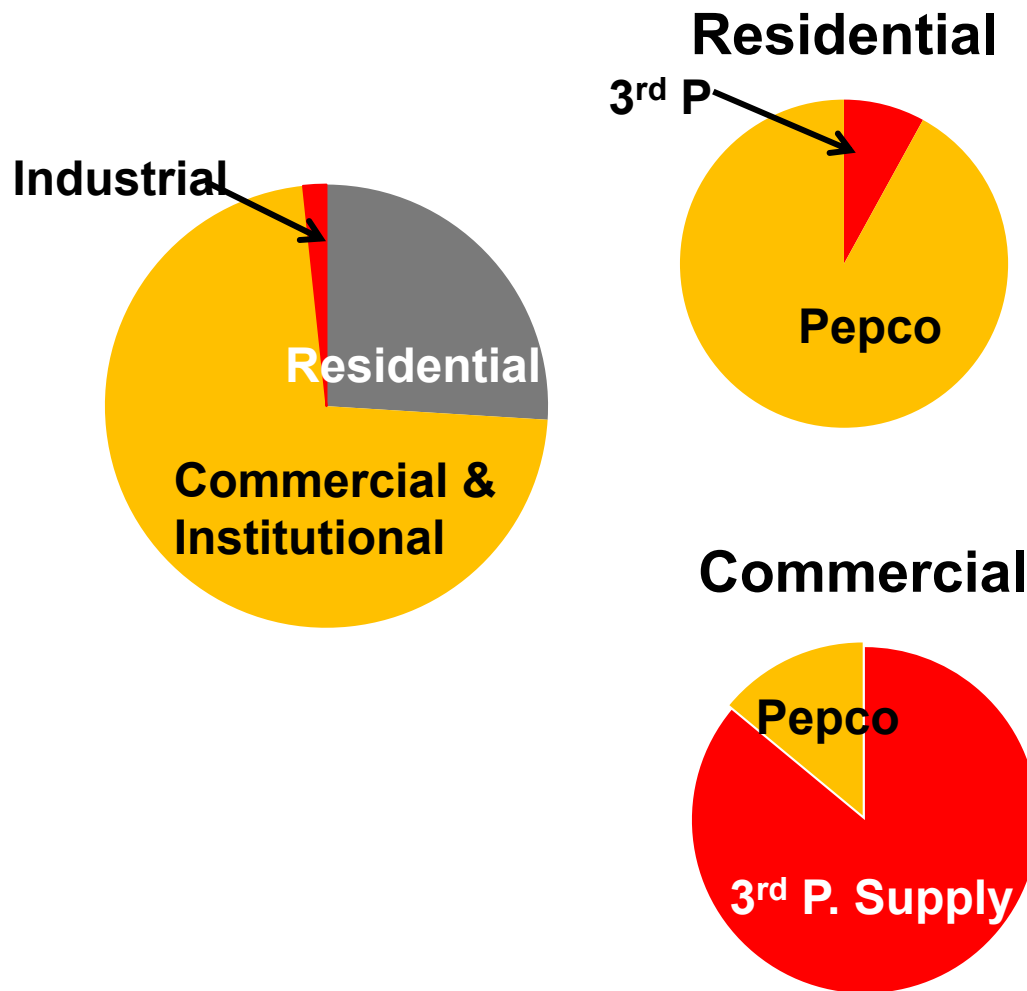
DOEE Energy Priorities:

- **Clean Distributed Energy**
- **Reliable Distribution Grid**
- **Resilient Energy Systems**
- **Affordable and Efficient**

ENERGY SYSTEM MODERNIZATION: GRID + DER + RULES (+ MARKET)

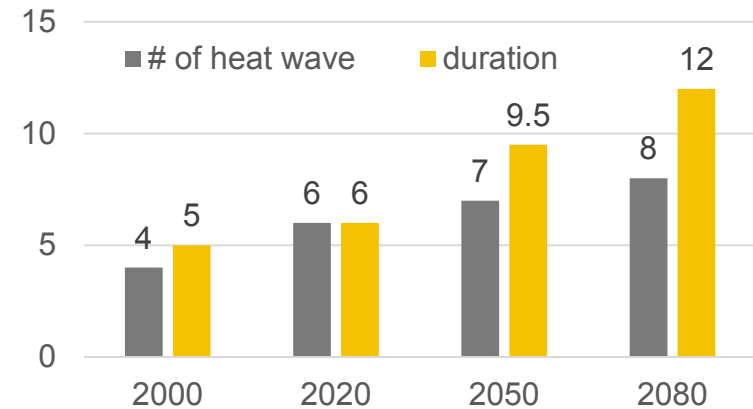
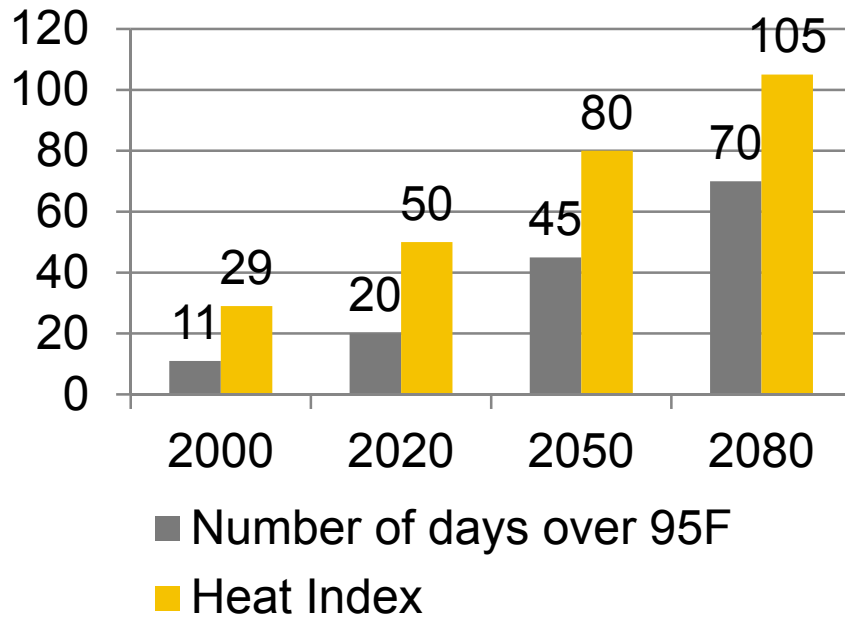


D.C. CONSUMERS



- **DC Pepco customers:**
≈ \$150 M
in congestion costs
for the past 3 yrs
- **Grid Utilization Rate: 53%**
Ample opportunity
for demand
response
- **Shopping: 64%**

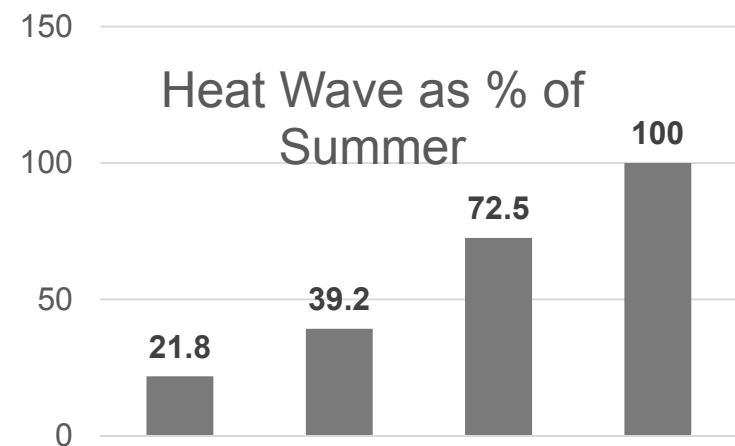
D.C. CLIMATE



**Heat wave % of summer:
62% - 74%**

**# of 95° days/ heat index:
70 to 80 days**

- PJM: Rising Peak Demand:
Pepco Region 5 yr. Forecast (2015 – 30)
- **Summer: 2 - 4% Winter: 3.6 – 4.8%**
 - **Should be reconsidered**



DOEE Energy Tool Box

BUILDING EFFICIENCY

- National Leader
- Energy Benchmarking
 - $\geq 50,000$ sq.ft.
(82% of all floor space)
- Green Building Code
- Results:
 - Use reduction=2%/yr
 - 7%/yr for DC Govt
- Next Steps:
 - Energy Performance Std?
 - Financing

STUDIES

- Microgrid feasibility studies
- Climate Change Adaptation

ALTERNATIVE HEATING & COOLING

- Passive Cooling
 - Green Roof
 - Cool Roof
 - Tree Shade?
- DC Water's Sewer Heat Recapture Pilot

RESILIENCY

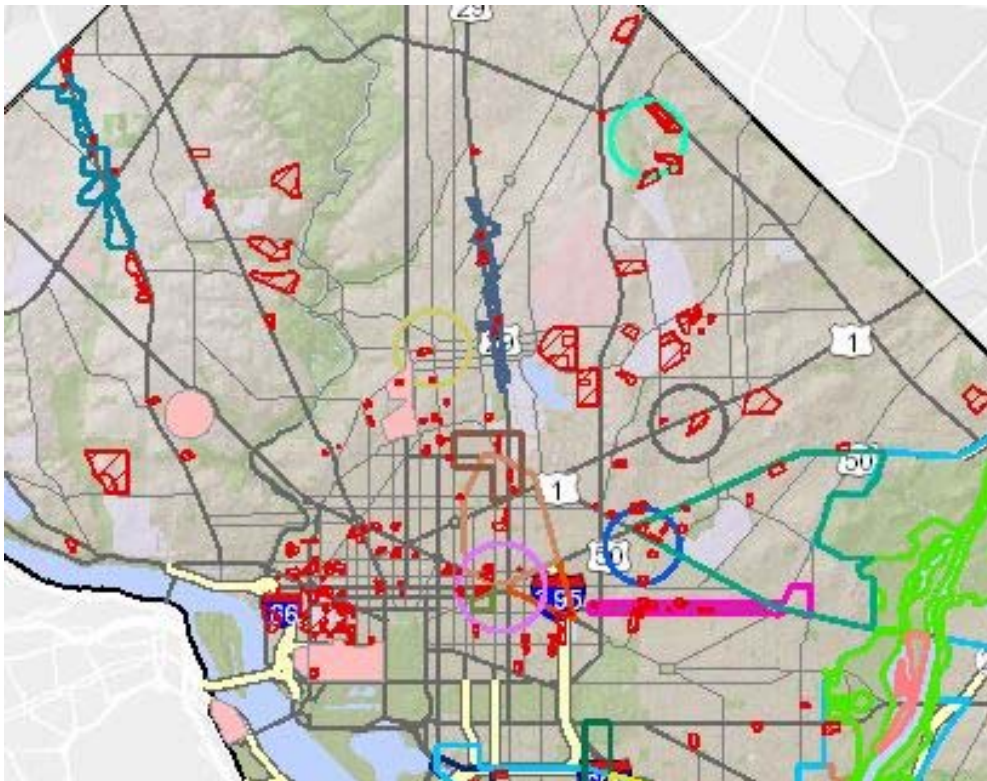
- Neighborhood Energy Center

FINANCING

- Green Bank

Office of Planning: Maps

atlasplus.dcgis.dc.gov

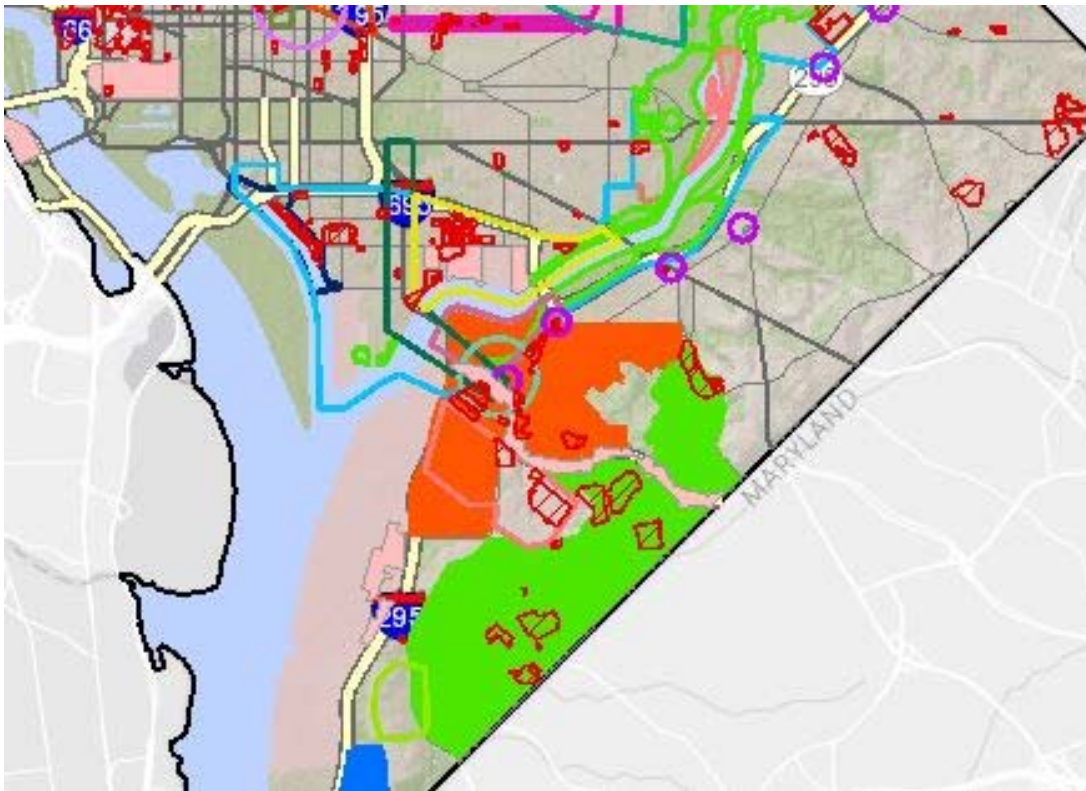


Maps showing locations of:

- Economic Development Zone
- Planned Unit Development
- Potential Districts
- District Revitalization Areas

Office of Planning: Maps

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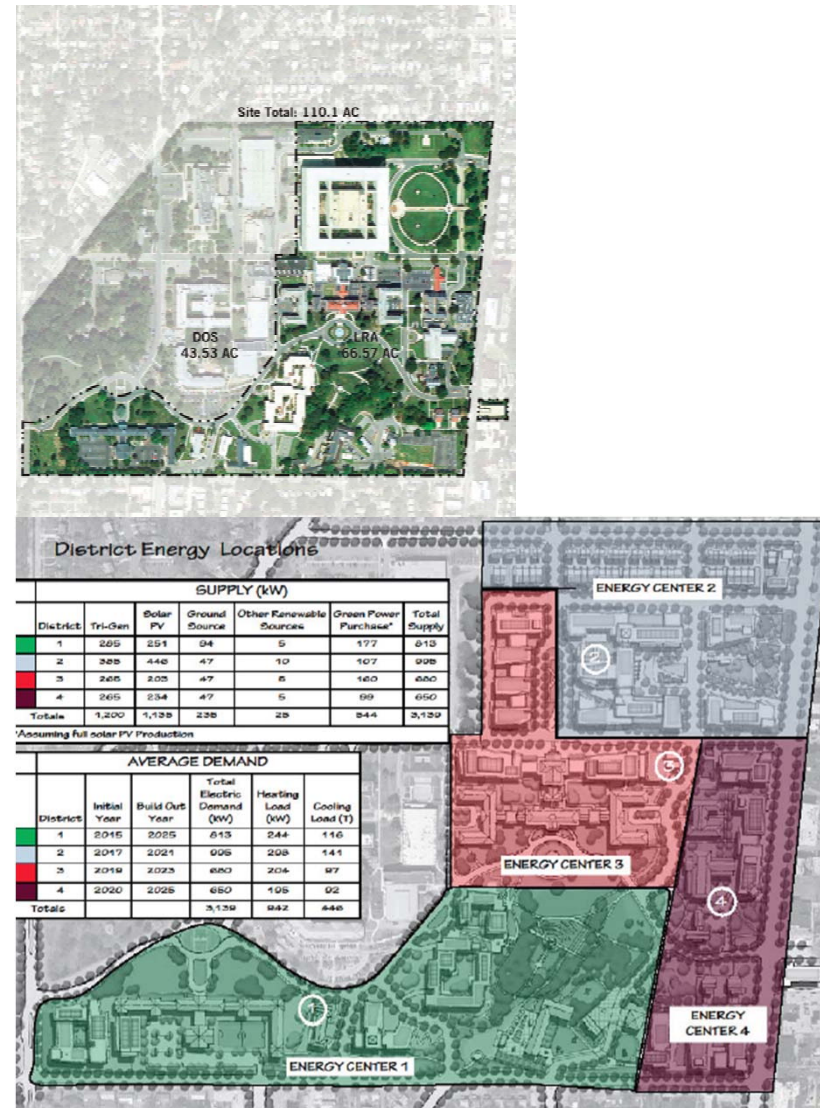
Maps showing locations of:

- Property boundaries
- Air Emission Sources
- Others

Microgrid: Walter Reed Campus

Deputy Mayor's Office for Planning and Economic Development

- 4M sf
- Three-phased development each with its own tri-gen plant
- About \$1B investment
- 1 MD-subdivisions (15-20 LLCs)
- Recip. NG-fired CHP
- Rooftop PV (3 MW +)
- Other renewable options



Microgrid: Langston Dwellings

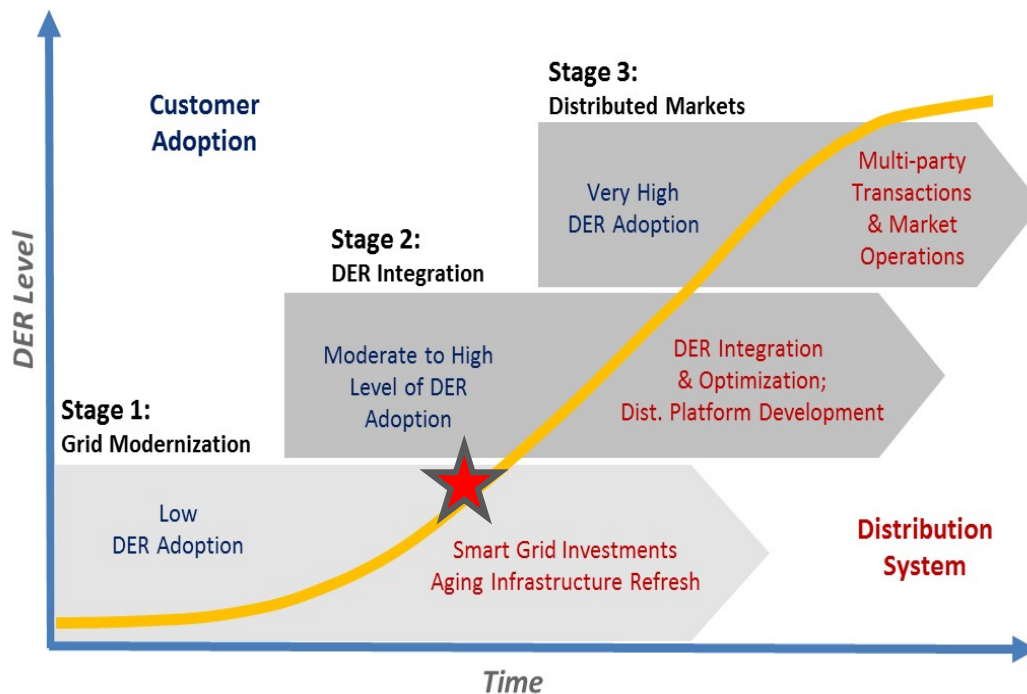


DC Housing Authority

- Net-Zero Community
- 274 Residential Units
- Decommissioned Coal-Fired Power Plant
- Feasibility Studies (3 options)

- Option 1: CHP using natural gas fuel cell
- Option 2: Geoexchange system with solar PV
- Option 3: Solar PV with heating upgrades

Distribution System Operator

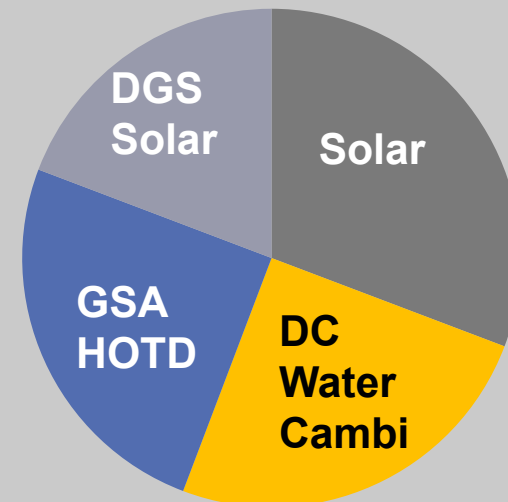


Source: DRAFT DOE technical paper, August 2015

When Do We Need This?

5% of Peak Demand through DER = approx. 120 MW

Current: about 50 MW (more if adding nearby solar and demand response)



About 2018 to 2020?

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