The Case Western Reserve University Campus Grid

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CWRU Campus Grid Network

- 138KV
- 11.2KV
- 2.4KV
- 480V

- Backup Generators
- Transformers
- Circuit Breakers
- Lines
- Lumped Loads

- Glennan Building Microgrid
- Tomlinson
- North Campus

Eulid Ave
Low Voltage Network Inside Buildings

**Generation:**
- Natural Gas DGs
- Wind, Solar
- Energy storage System

**Loads:**
- Linear loads
- Motors, power electronics,
- Nonlinear lighting
Features of the CWRU Microgrid Testbed

- Utilize backup generators in parallel operation.
- Mainly reply on the existing medium to low voltage (11.2KV – 120V) distribution system network.
- Can break up into small microgrids at the individual building level.
- Allow integration of more solar, wind, energy storage systems
Medical Center Company (MCCo) and CWRU Facilities

- The campus grid is jointly owned and managed by
  - Medical Center Company (MCCo), MV section
  - CWRU Facilities department, LV section
- Participate in PJM emergency DR program
  - 2.5 MW capacity
  - Deployed a few times a year

(Picture: Campus grid single tie to 138KV sub-transmission network of Cleveland Public Power)
In Picture: 100-KW Wind Turbine on Campus and 60KW Solar Panels on Adelbert Gym
Additional Building Facility Equipment

Glennan building 200 KW natural gas backup generator set

Real-time sensor data display for an air handler unit in the CWRU Peter B. Lewis building
Direct Digital Metering and Controls