



The Case Western Reserve University Campus Grid

7/24/2014

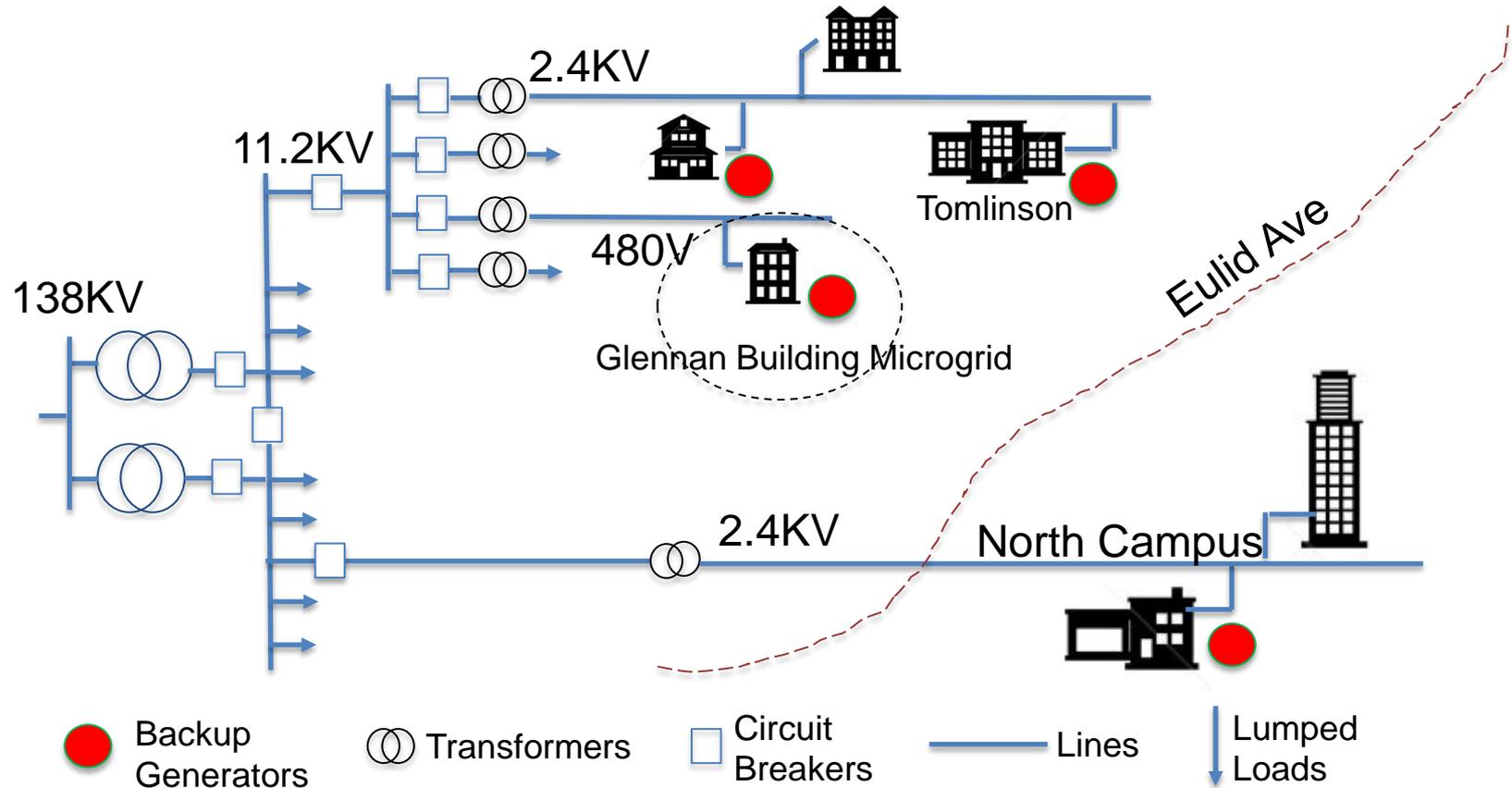
Mingguo Hong, CWRU



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OF ENGINEERING

CASE WESTERN RESERVE
UNIVERSITY

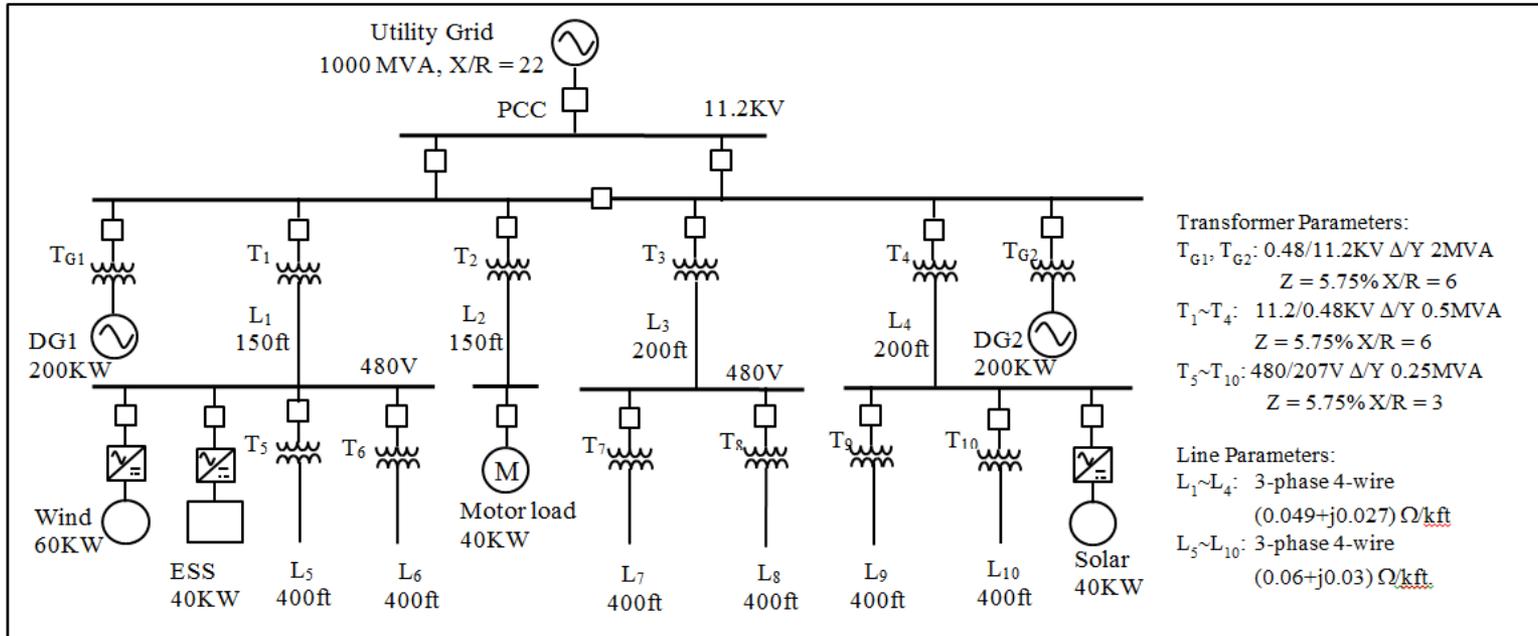
CWRU Campus Grid Network



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Low Voltage Network Inside Buildings



Generation:

- Natural Gas DGs
- Wind, Solar
- Energy storage System

Loads:

- Linear loads
- Motors, power electronics,
- Nonlinear lighting



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Features of the CWRU Microgrid Testbed

- Utilize backup generators in parallel operation.
- Mainly rely 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



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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

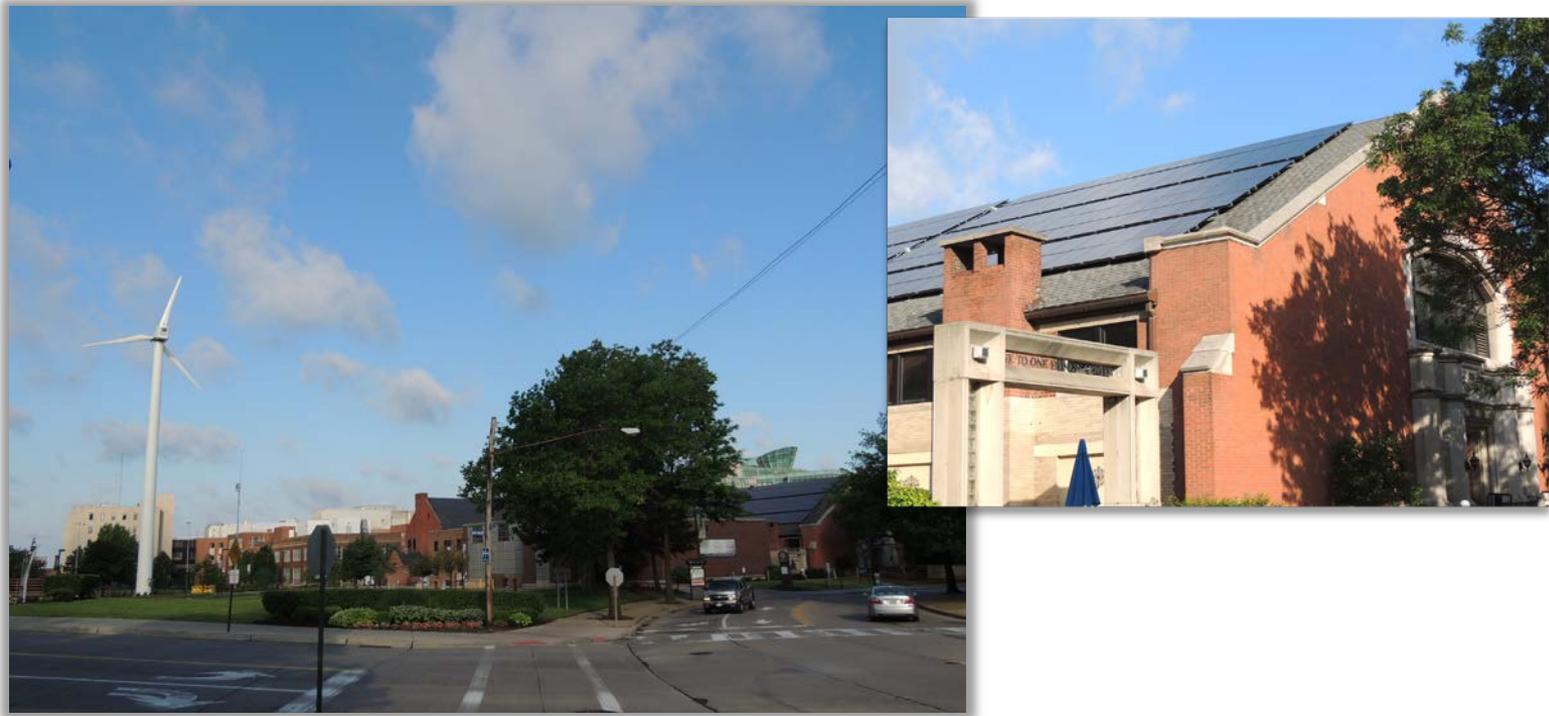
(Picture: Campus grid single tie to 138KV sub-transmission network of Cleveland Public Power)



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In Picture: 100-KW Wind Turbine on Campus and 60KW Solar Panels on Adelbert Gym



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Additional Building Facility Equipment



Glennan building 200 KW
natural gas backup generator set



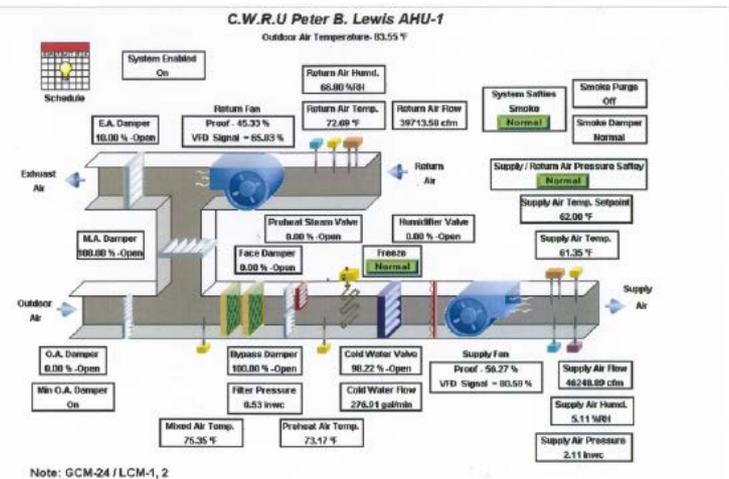
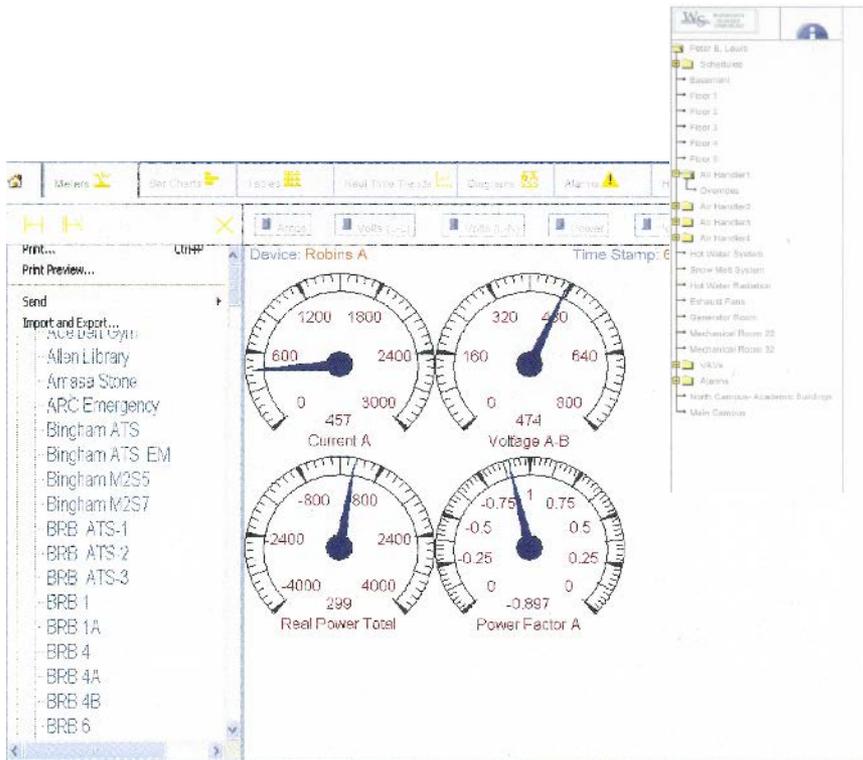
Real-time sensor data display for an air
handler unit in the CWRU Peter B. Lewis building



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Direct Digital Metering and Controls



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