

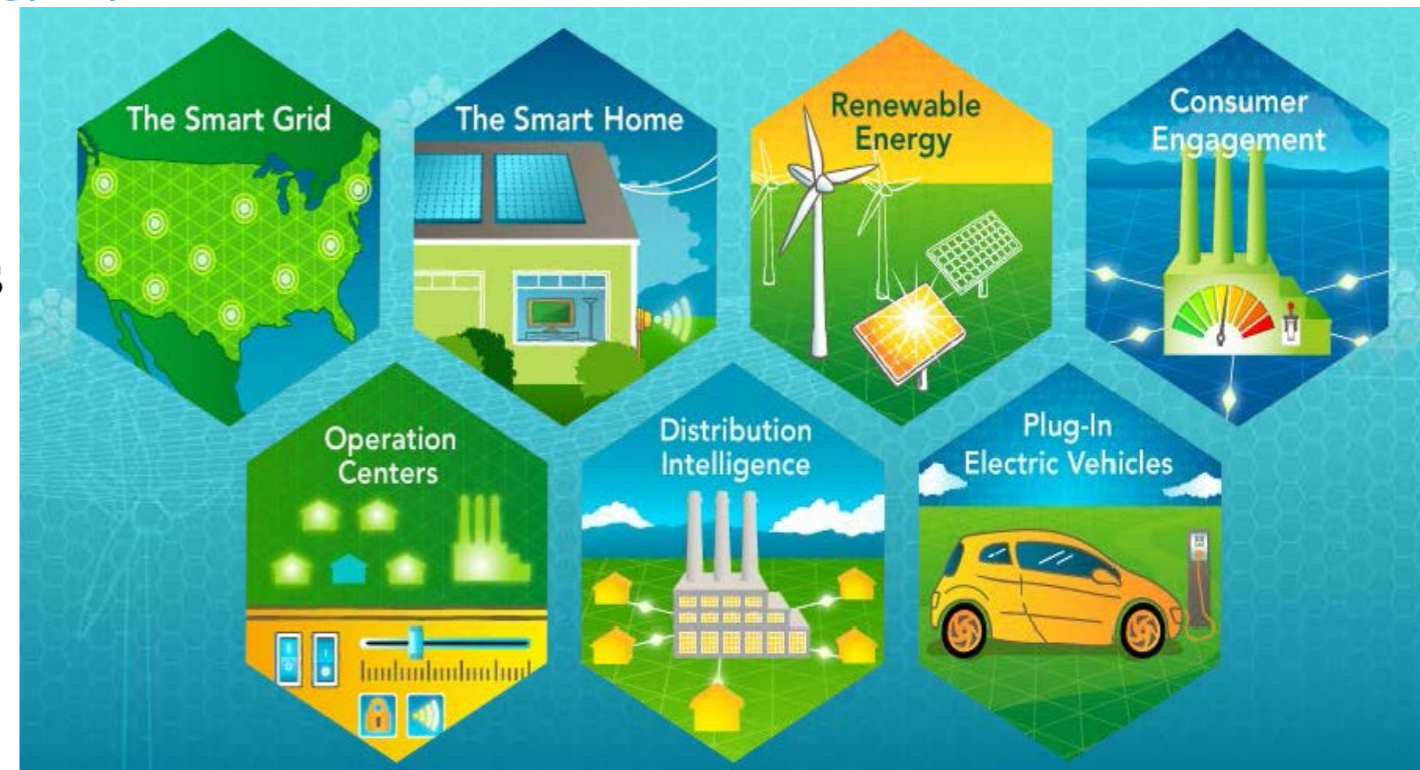
Status Report on RISES Cluster

April 21, 2017

Research Focus

Resilient, Intelligent and Sustainable Energy Systems (RISES) Cluster

- Advanced controls of networked systems
- Cyber-physical security
- Data analytics and electricity market
- Microgrids
- Optimization of complex systems
- PV modules and systems
- Public policy of resilient energy systems
- Resilient infrastructure systems
- Integration of renewable resources, smart grid
- Transportation and smart city



RISES Cluster Faculty

Founding members:

- Zhihua Qu (distributed control and optimization, robust control, energy systems)
- Robert Reedy (grid integration of PV systems, utility interaction)
- Winston V. Schoenfeld (PV cells and modules, PV manufacturing technologies)
- Wei Sun (power systems, restoration)
- Azadeh Vosoughi (smart grid communication)
- Qun Zhou (electricity market, data analytics for power systems)
- Damla Turgut (IoT, big data)
- Naim Kapucu (network governance, decision making in complex environments)
- et al.

RISES Cluster Faculty

New cluster faculty members hired in 2016 and 2017:

- Aleksandar Dimitrovski
ECE, power systems; joined in 2016 from Oak Ridge National Lab
- Kelly Ann Stevens (accepted)
Public Policy; 2017 PhD from Syracuse; multi-disciplinary program at CMU
- Qifeng Li (accepted)
ECE, convex optimization and power systems; 2016 PhD from ASU; postdoc at MIT
- Kristopher Davis (accepted)
MSE, PV modules and system; 2015 PhD from CREOL; research faculty at FSEC
- Junjian Qi (accepted)
ECE, dynamic analysis of power systems and cyber security; 2013 PhD from Tsinghua University; postdoctoral research at Argonne National Lab
- ???
???, smart city

Other new faculty members hired in 2016 and 2017

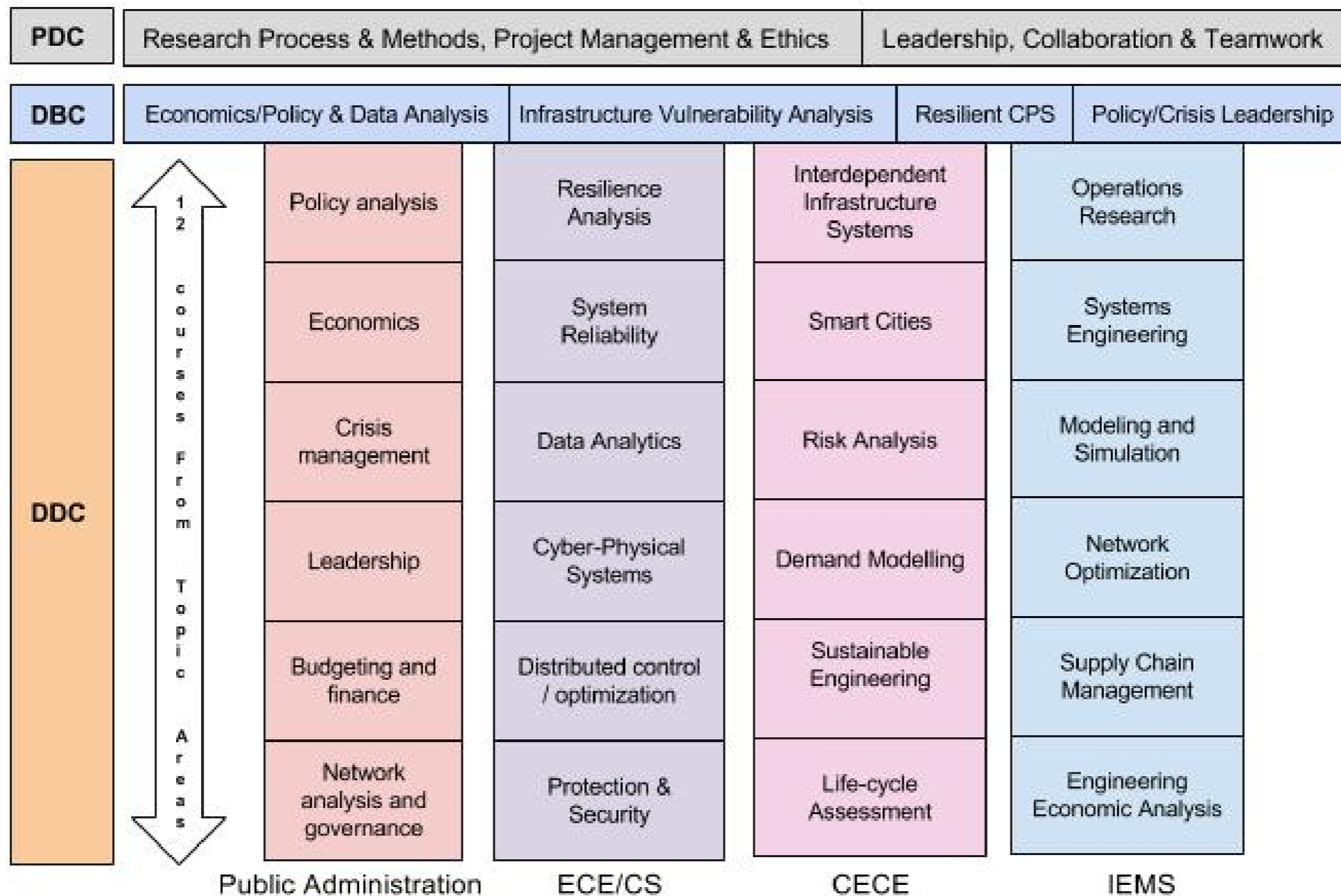
- Yaser Fallah
ECE, electric and autonomous vehicles, communication; joined in 2016 from WVU
- Samiul Hasan
CECE, transportation networks, cascading failures in interdependent infrastructure systems

RISES Curricula

Professional Development Curriculum (PDC)

Disciplinary Breadth Curriculum (DBC)

Disciplinary Depth Curricula (DDC)



RISES Power Curriculum

EEL 4932 Global Energy Issues
EEL 4205 Electric Machinery
EEL 4216 Fundamentals of Electric Power Systems
EEL 5245 Power Electronics I
EEL 4294 Introduction to Smart Grids
EEL 5268 Communications and Networking for Smart Grid
EEL 5291 Distributed Control and Optimization for Smart Grid
EEL 5xxx Power System Economics
EEL 6208 Advanced Machines
EEL 6255/5xxx Advanced Power Systems Analysis
EEL 6246 Power Electronics II
EEL 6269 Advanced Topics in Power Engineering
EEL 6272 Smart Power Grids Protection
EEL 6xxx Data Analytics in Power System
EEL 6xxx Power System Resilience
EEL 6xxx Power System Reliability

Current Projects at RISES Cluster

Large national-level competitive awards received:

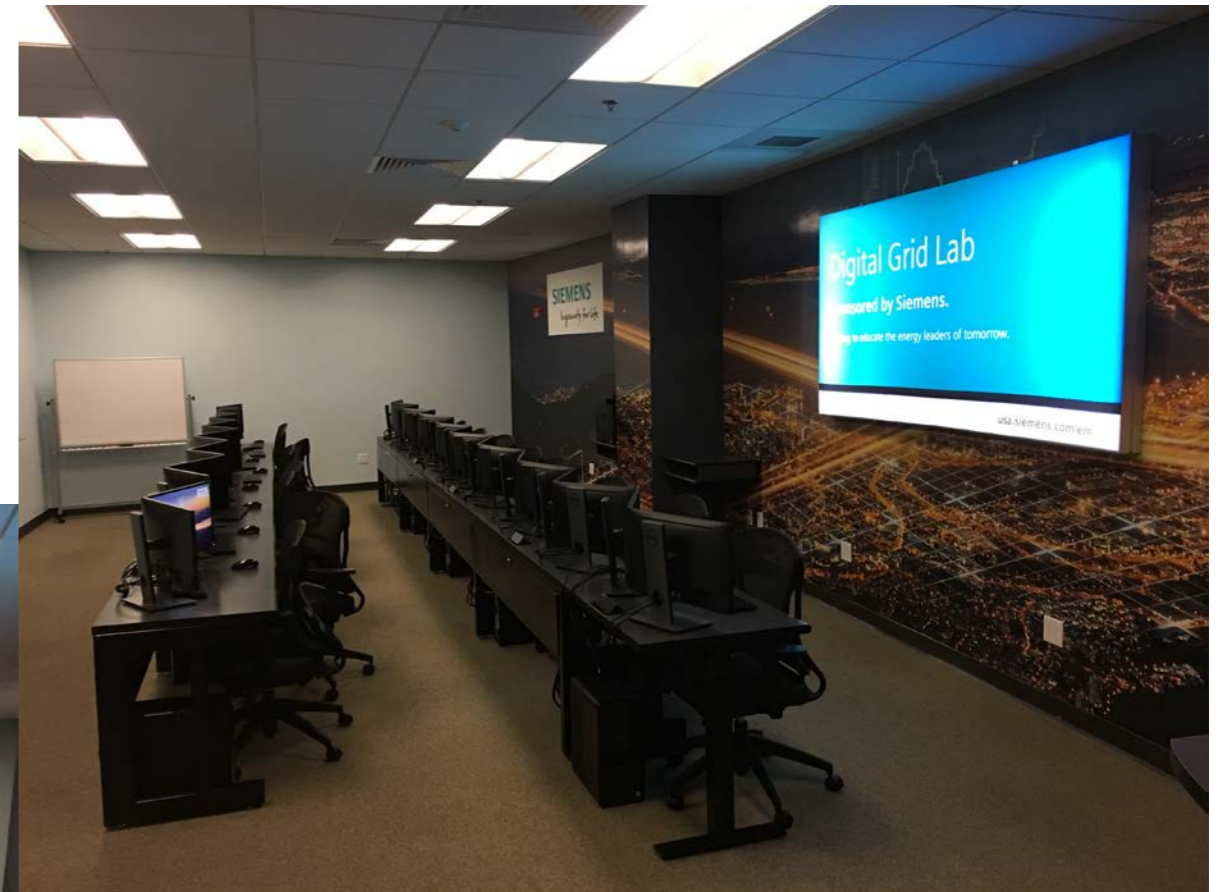
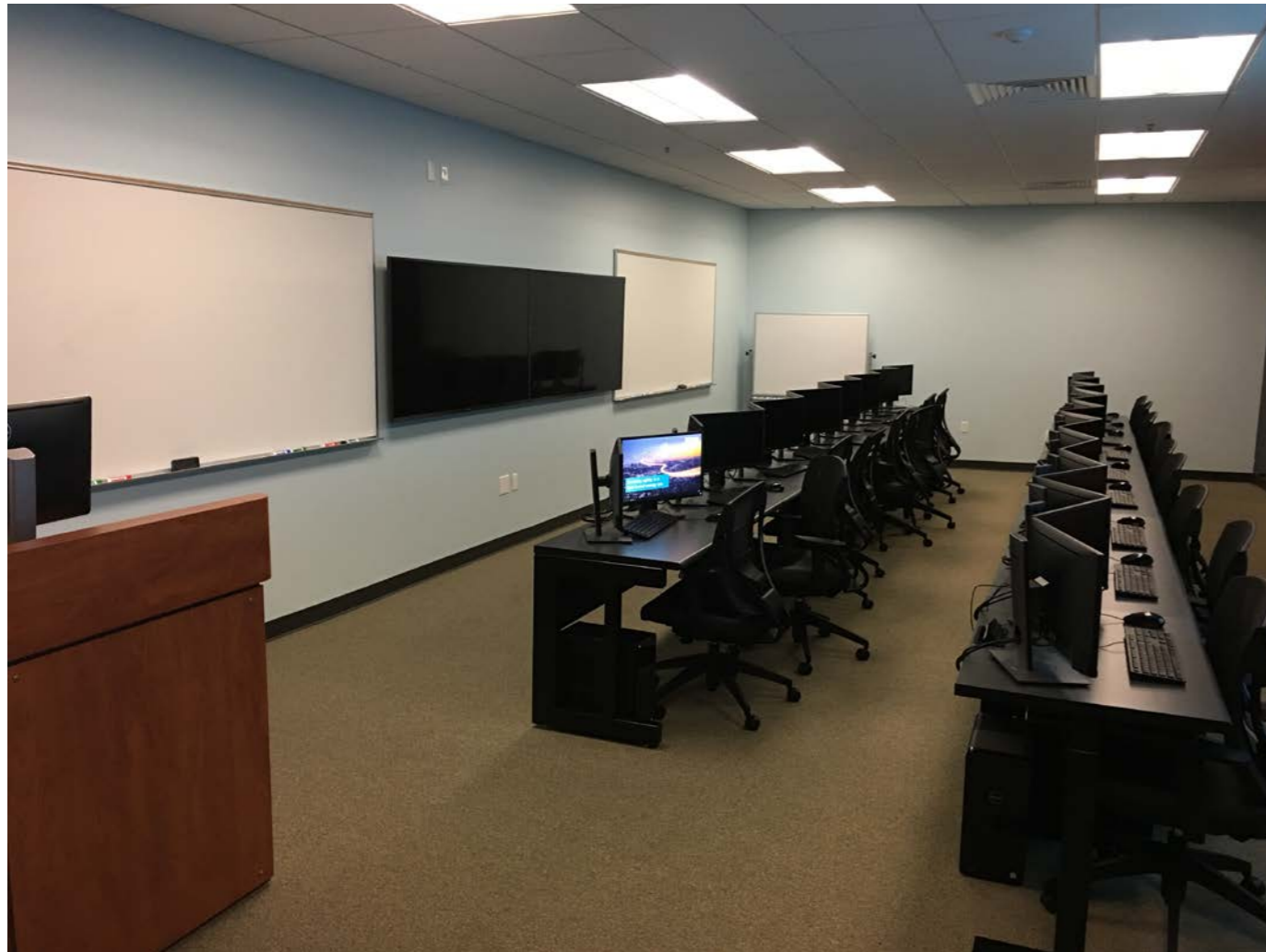
- Protecting Critical Timing Infrastructure, A Cooperative Network Precision Time Protocol (CN-PTP), BAA PNT (HSHQDC-15-R-B0002), \$1.5M, 2017-2019.
(Coleman Aerospace and UCF; UCF PI: Z. Qu; UCF portion \$520K)
- Scalable/Secure High-Penetration Solar Integration, \$2M, 2017-2020
(PI: Z. Qu, DoE, ENERGISE program)

- Higher Efficiency PV Modules, \$1.125M, 2016-2019
(PI: K. Davis, DoE)
- Strategic expansion of GEARED, \$1M, 2016-2019
(PI: Z. Qu, DoE, STEP program)

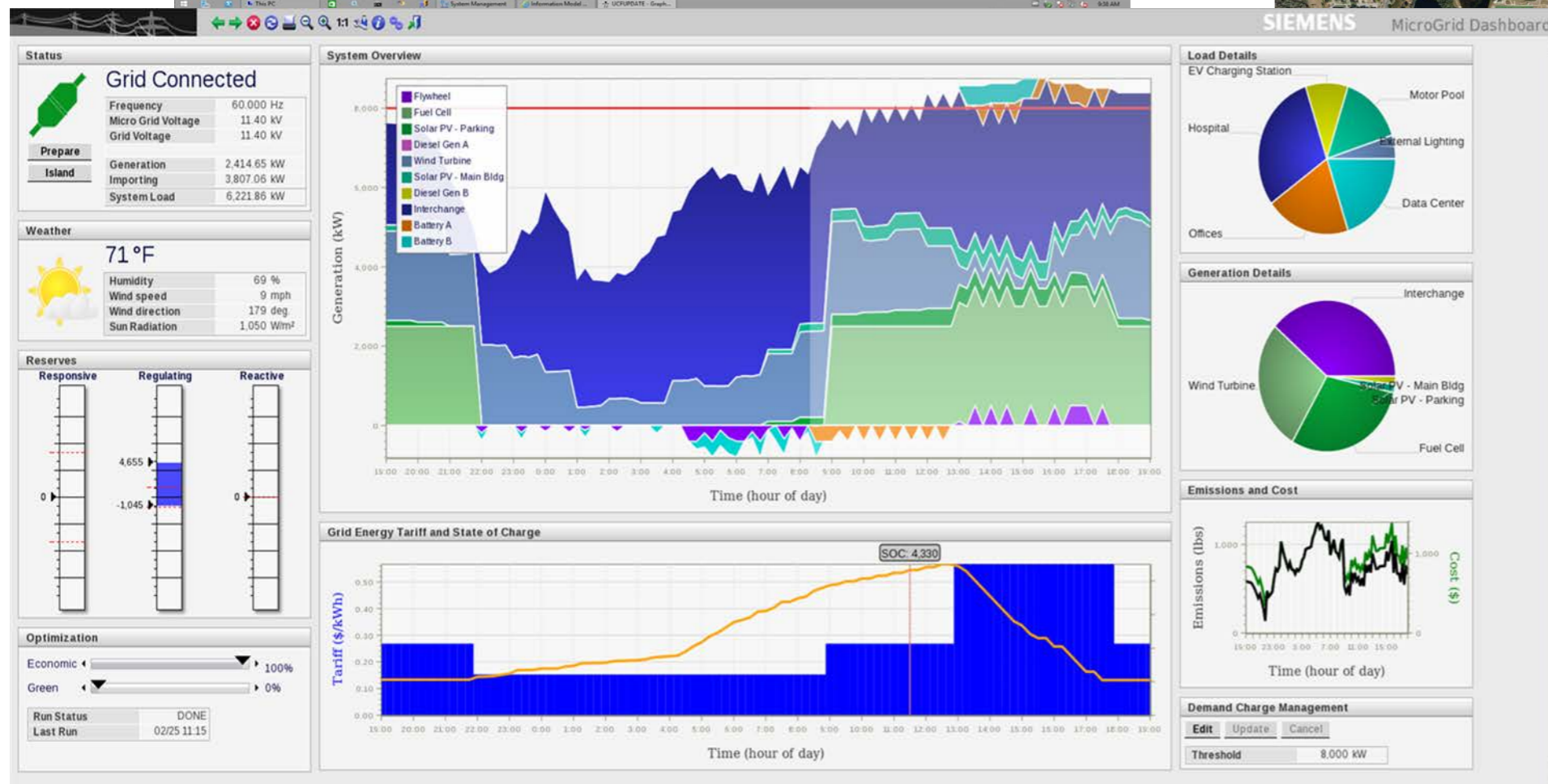
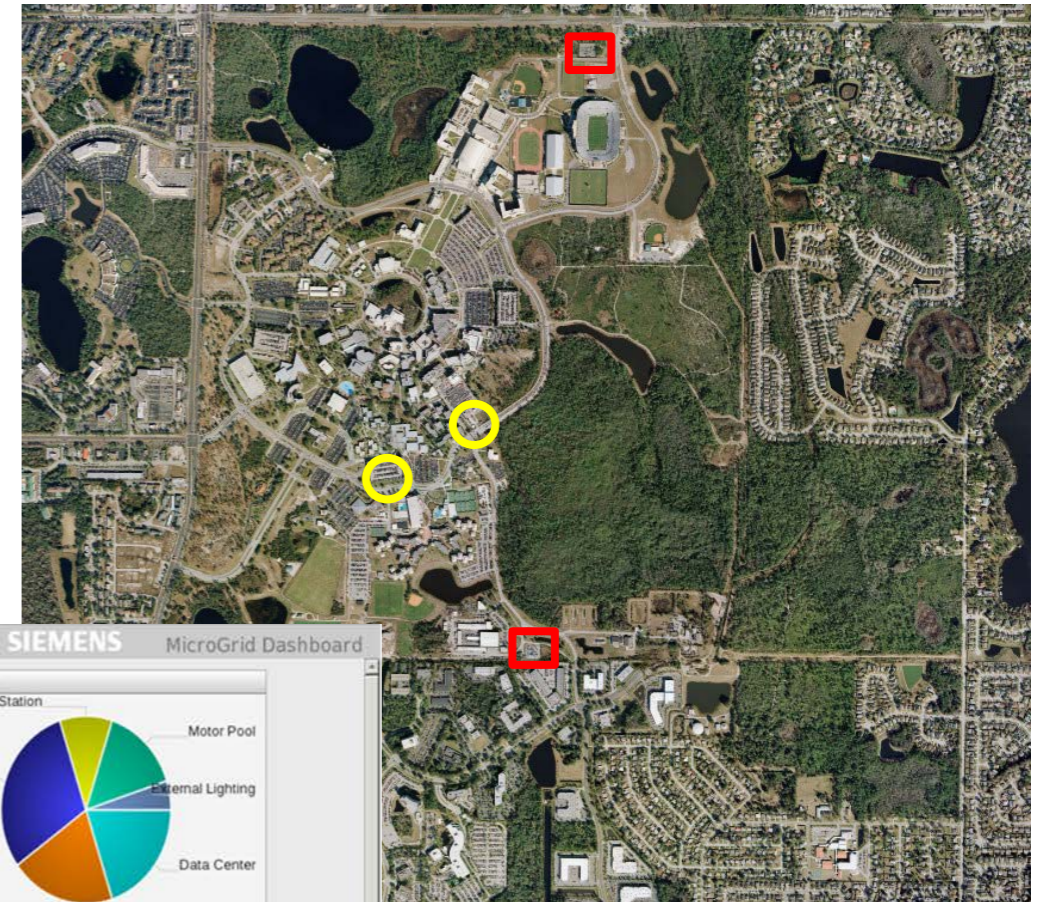
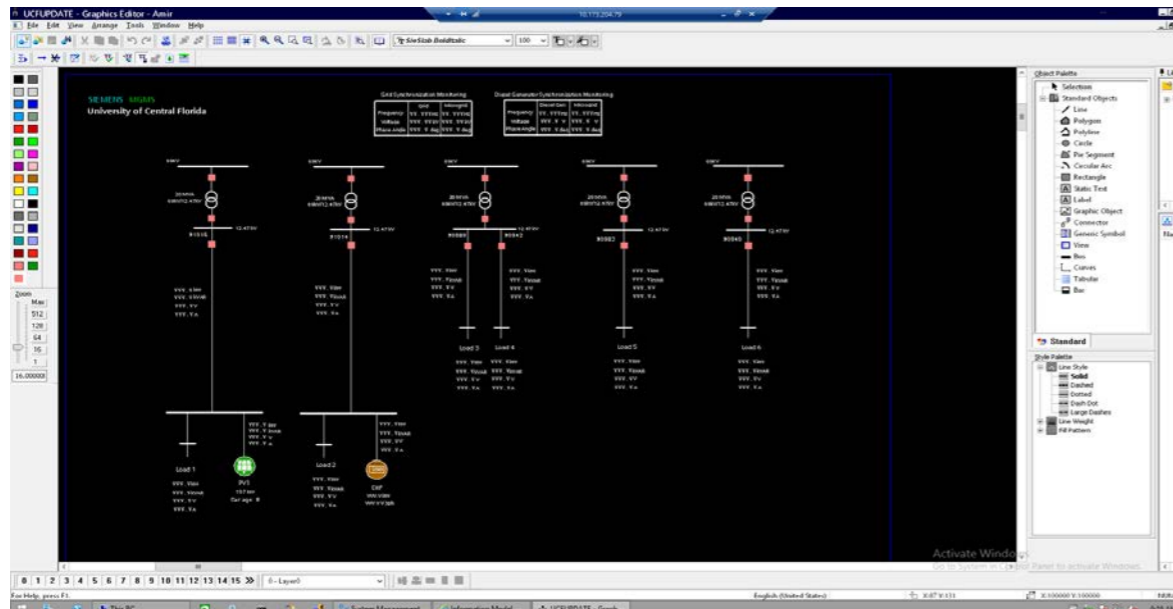
- FEEDER, \$3.2M, 2013-2018
(PI: Z. Qu, DoE, GEARED program)
- EVTC, \$3M, 2013-2017
- PVMC, 2013-2017

Facilities of RISES Cluster

- Siemens' Digital Grid Lab (\$750K donation)
- 6 labs at IRIF
- A technician to be hired



UCF Microgrid and Siemens Software



New Lab Facilities (To be developed)

- Cyber-Physical Security Laboratory (potential sponsor: Northrop Grumman)
- Power System Protection and Control Laboratory (potential sponsor: ABB)
- PV Module Fabrication and Characterization Laboratory (???)
- Microgrid Control Laboratory (potential sponsor: MPSA)
- Power System Transient Simulation Laboratory (potential sponsor: Duke Energy or Florida Power & Light)
- Power Systems Testing Laboratory (potential sponsor: OUC)
- Energy Storage Testing Facility (as a part of UCF Solar Farm) (potential sponsor: ESA)

Thanks for Your Support!