



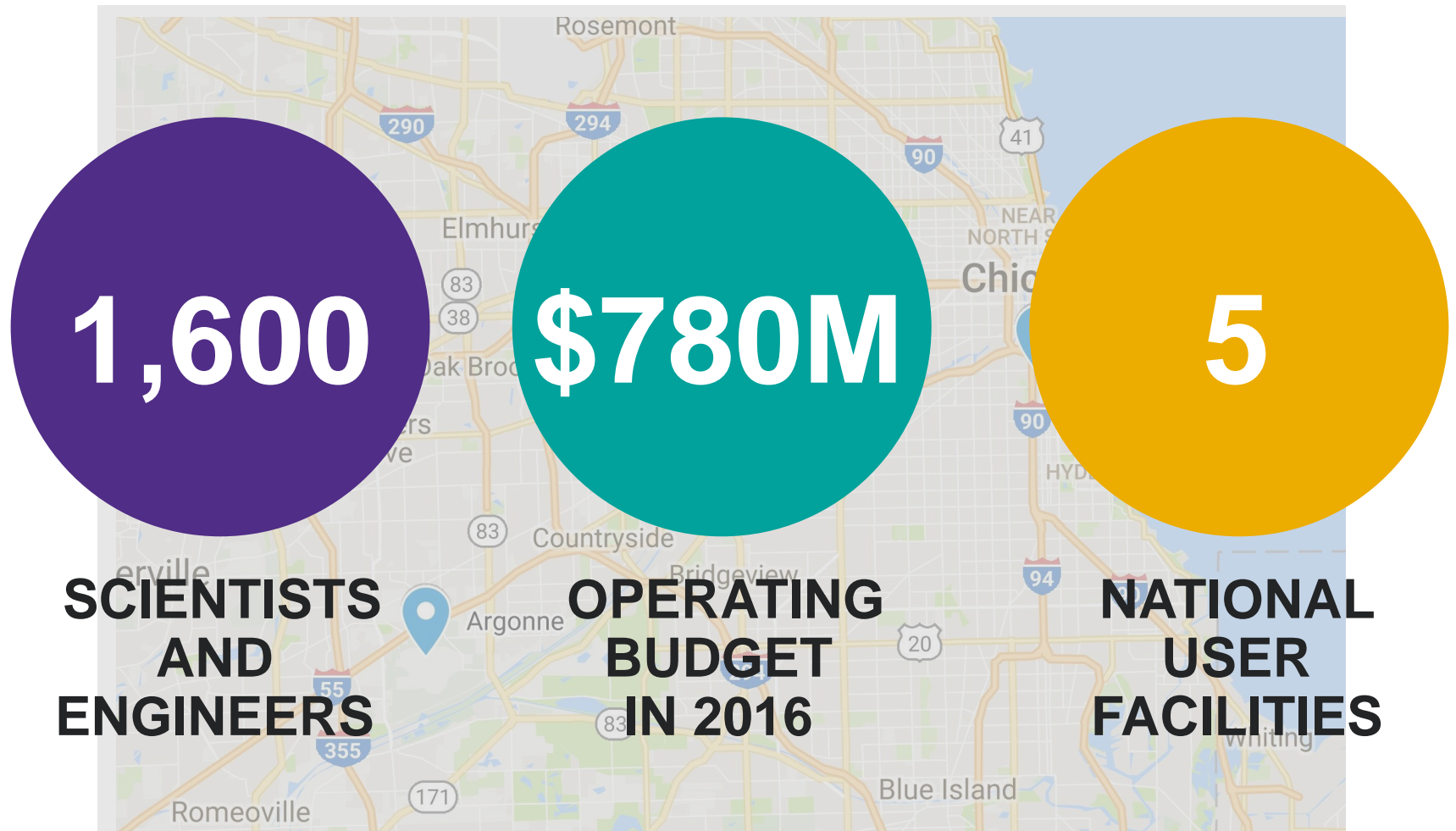
CRITICAL INFRASTRUCTURE & MICROGRIDS

Where We Are and Where We Are Headed

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Chicago Advanced Energy Stakeholders Breakfast - March 2, 2017

ARGONNE IS YOUR NEIGHBORHOOD NATIONAL LABORATORY



ARGONNE'S URBAN SCIENCE AND ENGINEERING PROGRAM



Energy/Grid

Buildings

Transportation

Water

Environment

Socio -
Economics

Critical Infrastructure

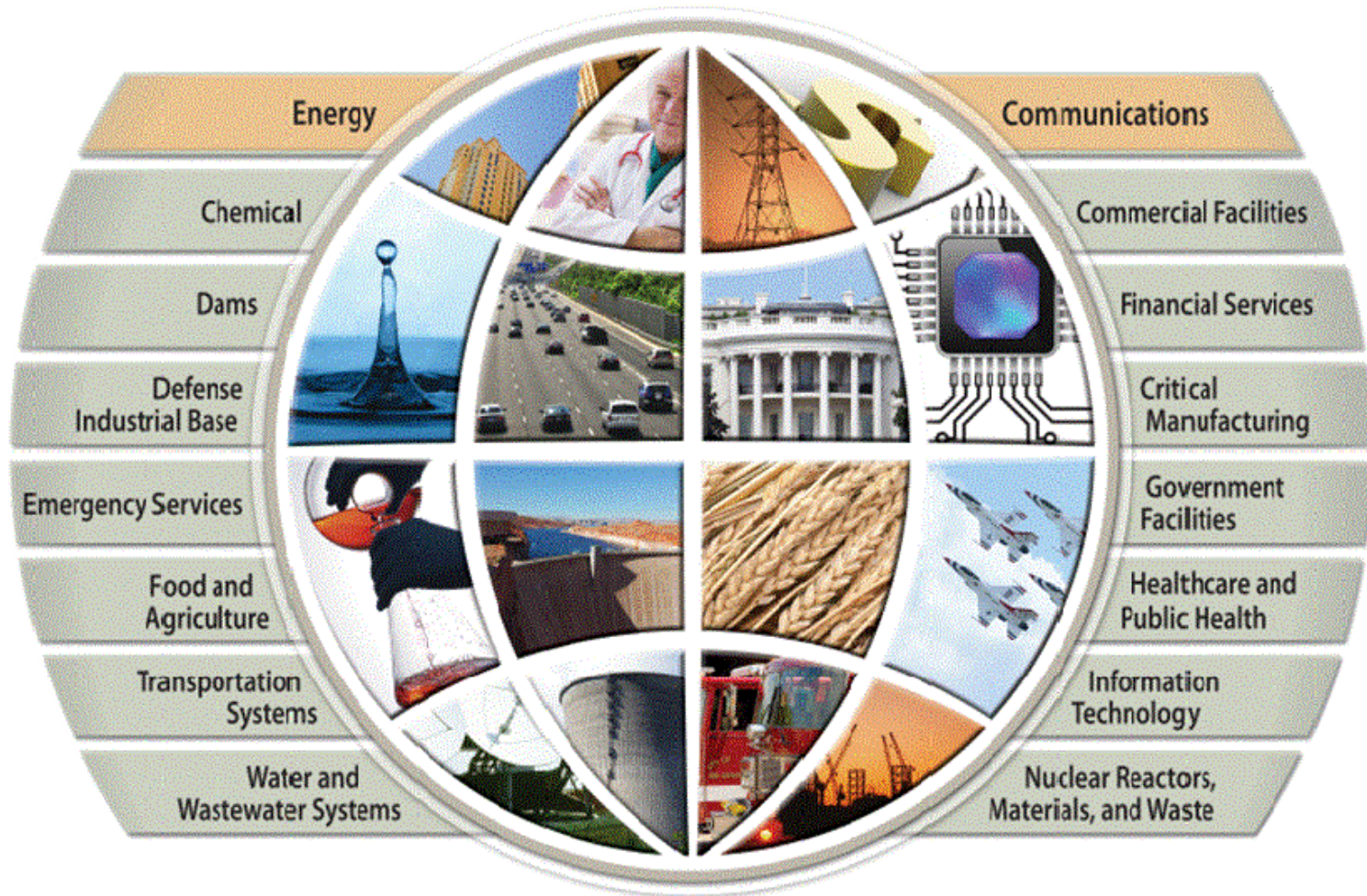
Sensors and Data

Coupled System Modeling and Optimization

Resilient Analysis and Design

CRITICAL INFRASTRUCTURE

Where are we today?

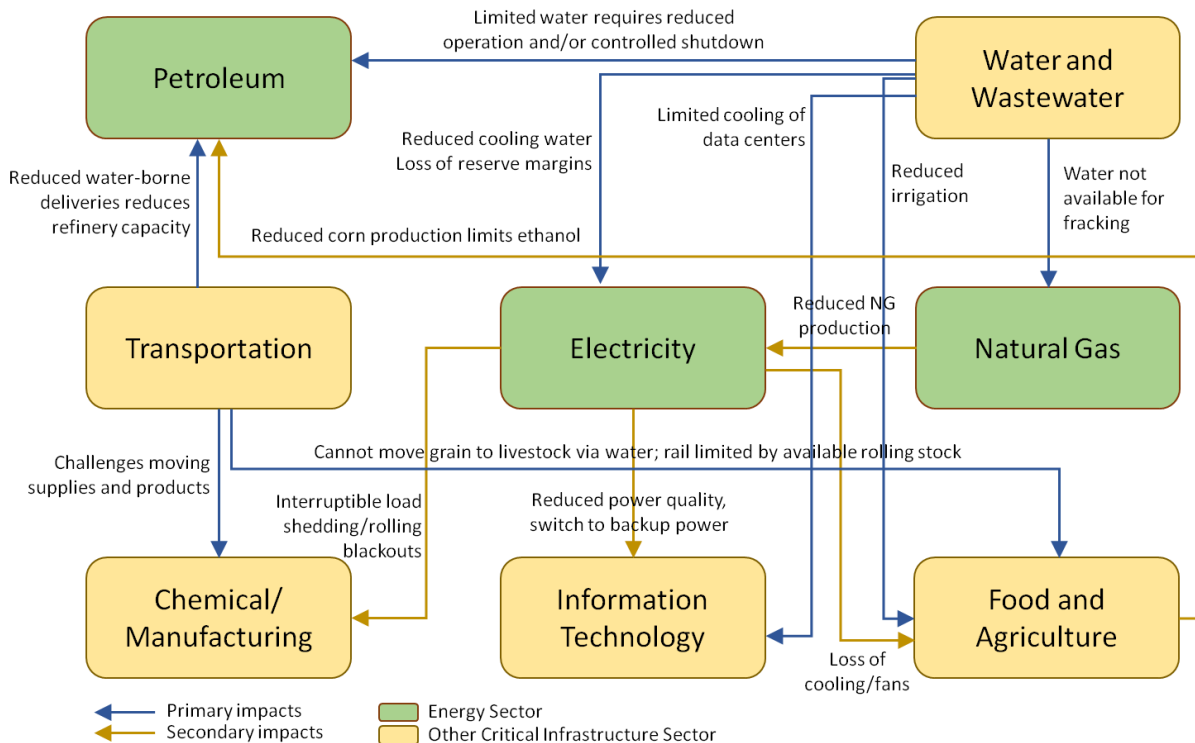


<http://www.sandia.gov/nisac/wp/wp-content/uploads/nisac-sectors2.gif>

CRITICAL INFRASTRUCTURE

Where are we going? - Interdependencies

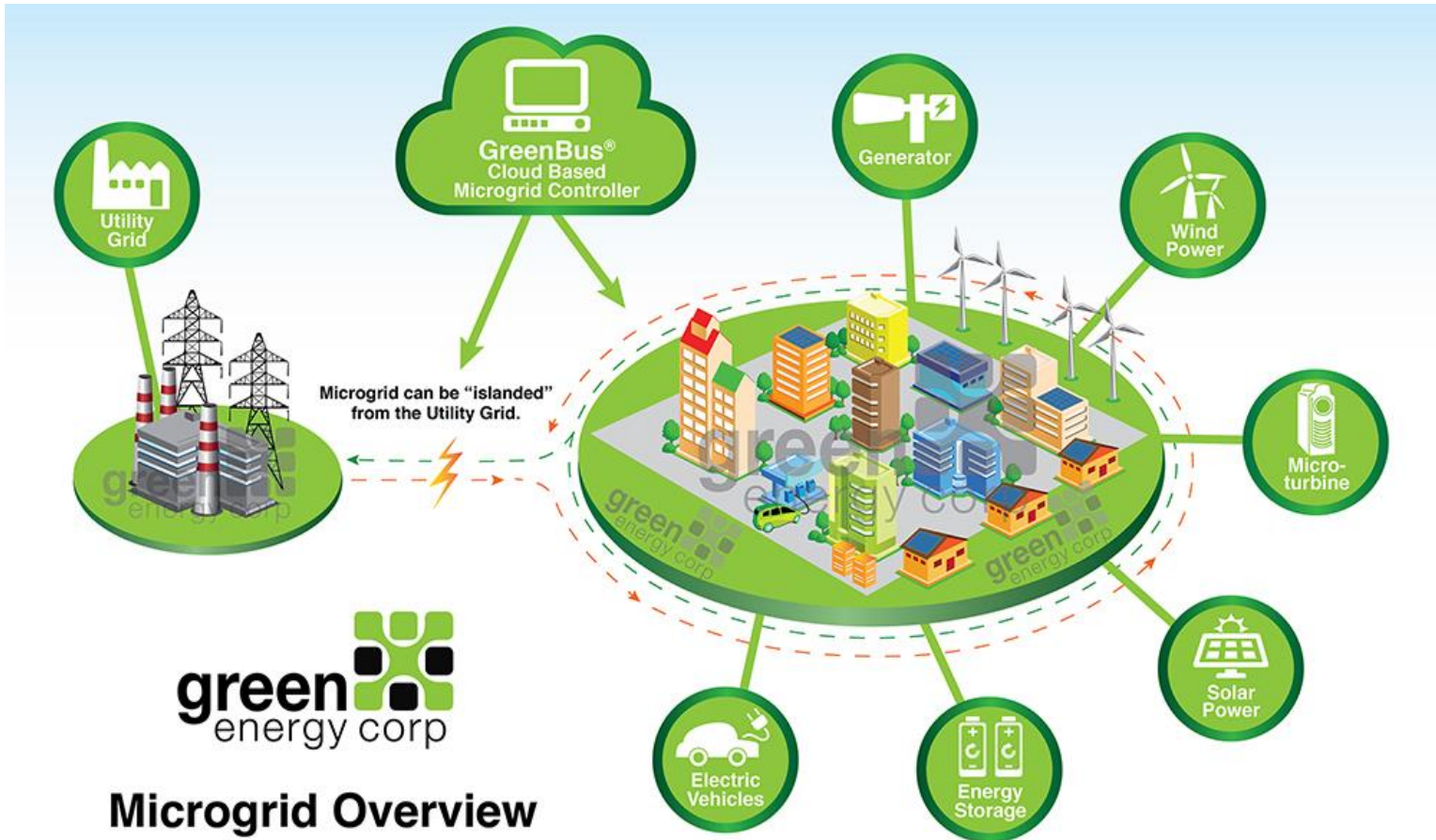
Long-Term Drought Interdependencies



From <http://nexightgroup.com/mapping-interdependencies-and-cascading-disruptions-in-critical-infrastructure-sectors-a-naseodoe-workshop/>

MICROGRIDS

Where are we today? Isolated Microgrids



<http://www.greenenergycorp.com/wp-content/uploads/2014/07/Microgrid-art-web2.jpg>

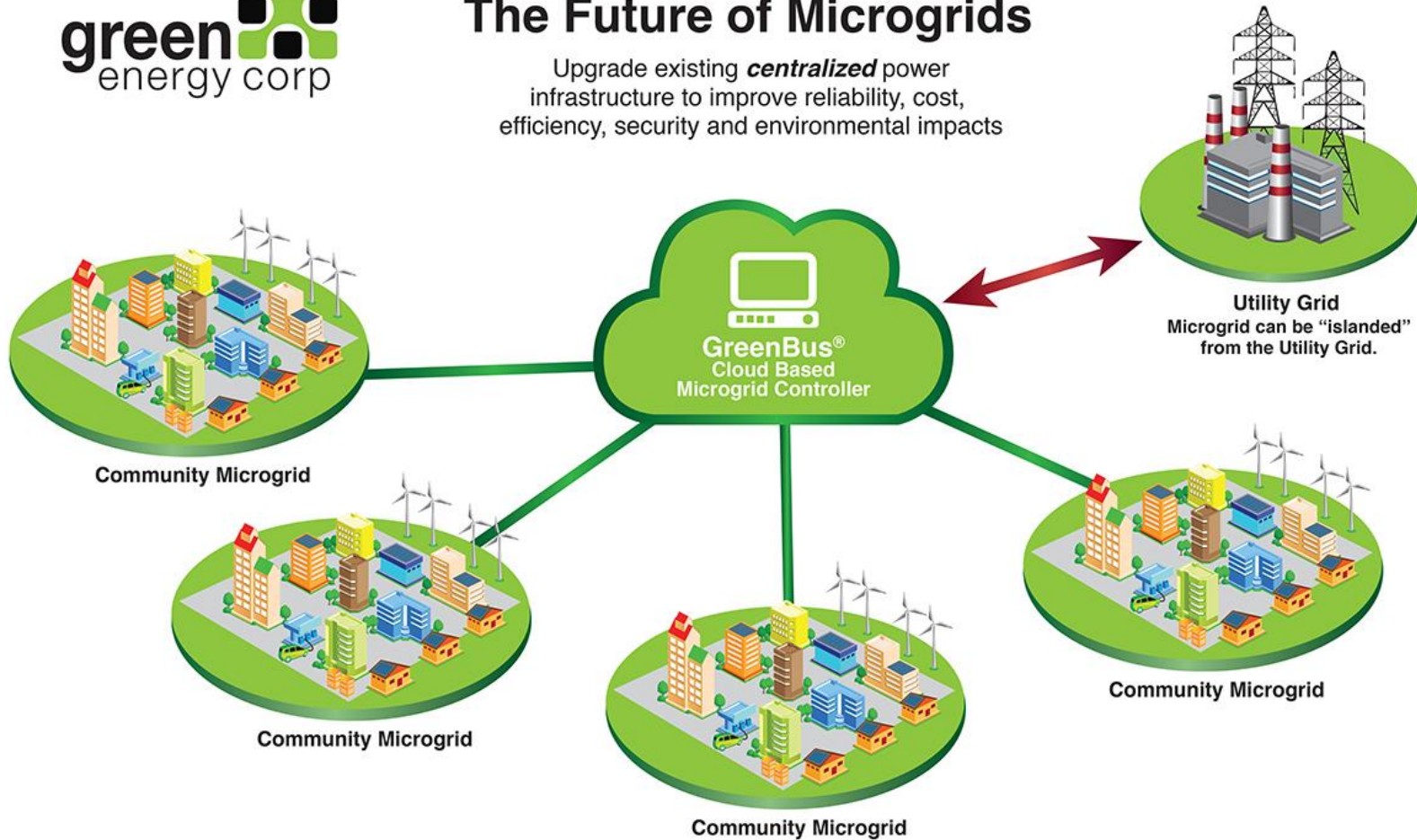
MICROGRIDS

Where are we going? Coupled and Clustered Microgrids



The Future of Microgrids

Upgrade existing *centralized* power infrastructure to improve reliability, cost, efficiency, security and environmental impacts



<http://www.greenenergycorp.com/wp-content/uploads/2014/07/Microgrid-art-web2.jpg>

AND NOW, ONTO OUR DISCUSSION LEADERS