



NORWICH
UNIVERSITY™



About Norwich University (NU)

- Founded in 1819
- Oldest Private Military College in the Nation
- Online Programs
- National Center for the Study of Counter Terrorism and Cyber Crime
- NSA and DHS designated National Center of Excellence in Cyber Security and Cyber Defense
- DOD Center of Excellence in Digital Forensics



Norwich Legacy

- ✓ The American System of Education started at Norwich
- ✓ Norwich founder emphasized a useful and practical education
- ✓ The first private college in the nation to teach engineering
- ✓ Birthplace of the Reserve Officers' Training Corps (ROTC)
- ✓ First college to establish a Peace Corps Preparatory Program
- ✓ One of the first institutions named an NSA Center of Excellence in Information Security Education

NORWICH UNIVERSITY



President Richard Schneider, PhD
Rear Admiral, USCGR (Ret.)



- **Four Academic Colleges:**
 - Liberal Arts
 - Science & Mathematics
 - Professional Programs
 - Graduate & Continuing Studies ("CGCS")
- **Three Research Centers:**
 - Peace and War
 - Cybersecurity and Forensics
 - Global Resilience & Security
- **Norwich University Applied Research Institutes:**
 - Cyber Conflict Research Institute
 - Defense Technologies Research Institute
 - Institute for Advanced Sciences Convergence
 - Learning Technologies Research Institute
 - International Clean Water Institute
 - Institute for the Study of Culture and Language
- **Sullivan Museum & History Center**
- **Colby Symposium**





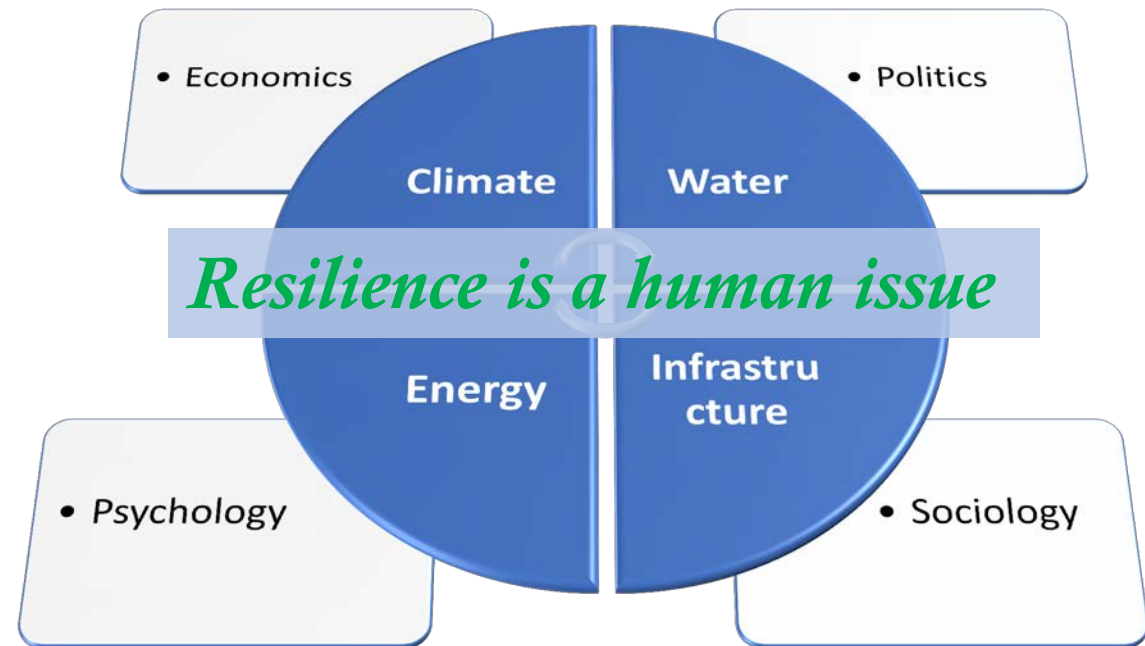
Installation Innovation
10 Feb 2020
San Antonio, TX

Norwich University Energy Track



CGRS Mission


To craft creative, innovative, and sustainable solutions for building resilient communities, through inter-disciplinary research and design collaboration.





| What is the Energy Track?

- Department of the Army Grant – Phase 1 Analysis 2019
- A “roadmap” (plan) toward the development of a curriculum that supports operational and installation **energy resiliency** that:
 - Supports CGRS’s mission of “resilient community building” through **research and technology driven, innovative, and hands-on curricular enhancement** in the energy sector
 - Explores the intersection of ***technology, policy, and sustainment***
 - Promote ***mission readiness of future military and civilian leaders*** and currently deployed forces



2019 NU Energy Track Activities

- 3 Round Table discussions with Subject Matter Experts (SME's)
 1. Fundamentals of Energy and Threat Vectors
 2. Public Private Partnerships
 3. Funding mechanisms, Public-Public Partnerships, Cyber
- NU Stakeholder engagement
 - Faculty debriefs
 - Surveys
- Roadmap/plan: curricular enhancements, experiential learning, technology partnerships, resource requirements

NU Energy Resilience Project Mission: *Drive Generational Change in the Army for Energy (Installation and Operations)*

Knowledge–Education–Culture: will Shape Army/DoD Policy

Entry Level

Courses, Modules, Capstone Research, Internships, Concentrations

Mid Career

Bachelors, Masters, Graduate Certificates, Professional Education

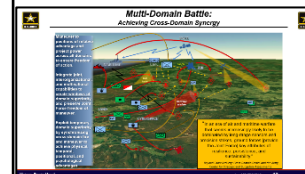
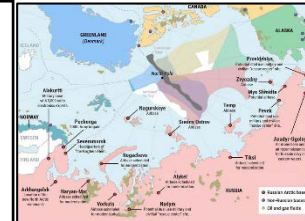
Senior Leaders

Leader Seminar, Graduate Certificates, Professional Development

Research & Development

- Internships
- Policy
- Energy Security
- Cyber - Energy
- Resilient Design
- Climate - Energy

Products: Publication, Whitepapers, Technology, Curriculum



Impacts on Army

- Human-centered approach supports mission and innovation
- Continental: Resources, Competition and Threats
- Climate impacts and resource scarcity
- Peer-Peer competition
- Threat postures
- Diversified energy sources
- Rapidly changing operational energy environment
- Cyber and cyber-physical
- Homeland defense

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Energy Fundamentals

- Power generation, demand, storage, transmission, distribution
- Capabilities, gaps, requirements
- Supply chain and contracting
- Cyber penetration testing, ICS, vulnerability management

Energy Risk Analysis

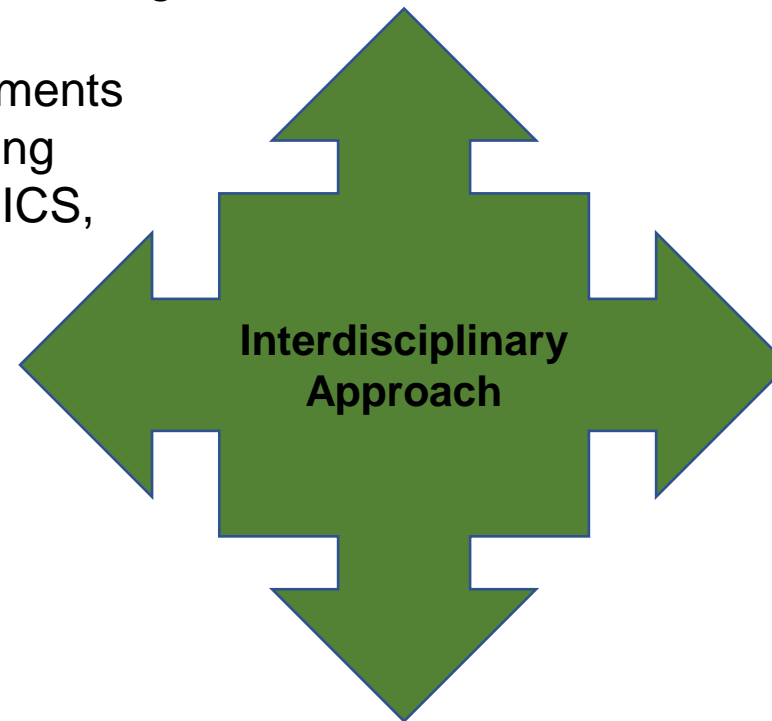
- Requirements vs energy capabilities
- Threats and hazards
- Vulnerabilities
- Consequences
- Criticalities
- Interdependencies
- Cyber
- Exercises (DECIDE platform)

Energy Policy

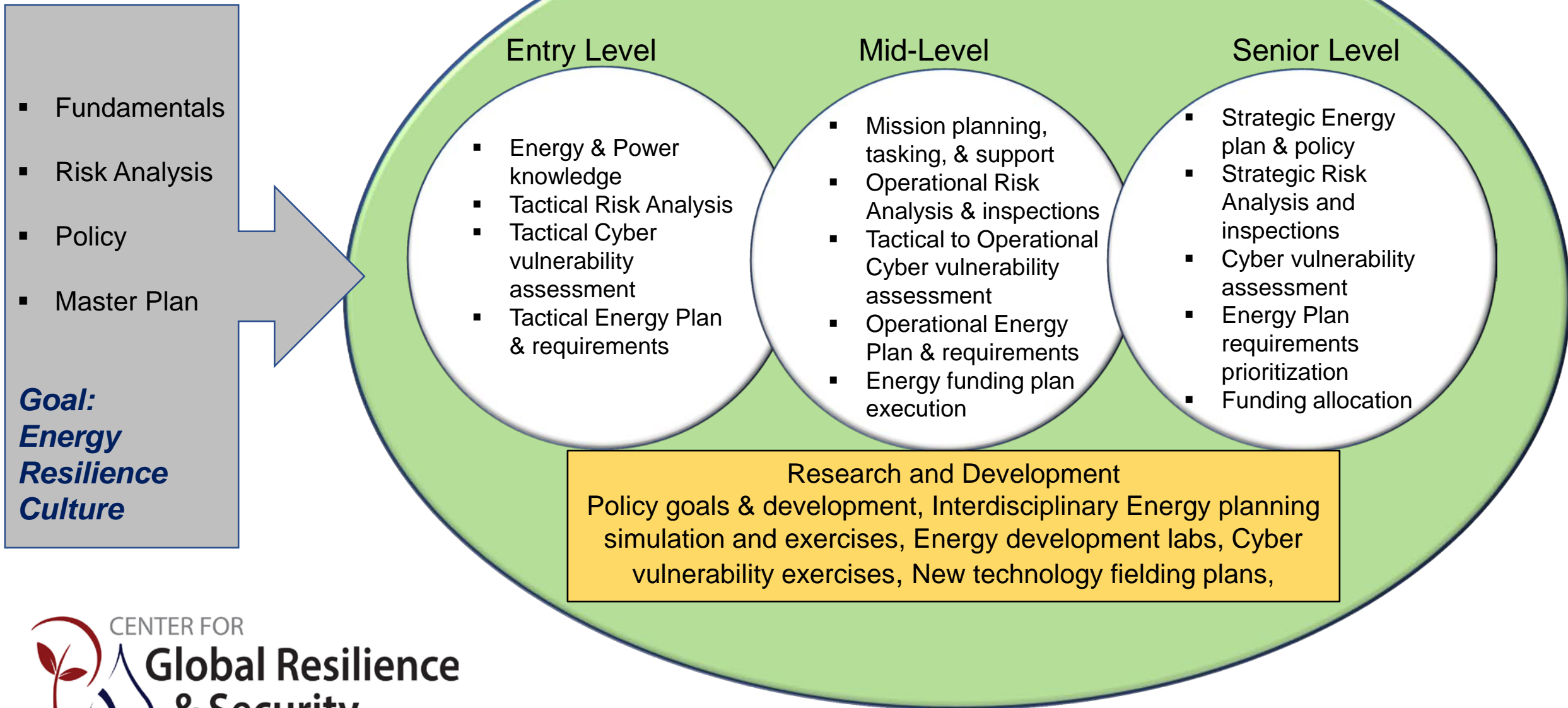
- Governance
- Risk authority
- Funding & Partnerships
- Cyber policy, vulnerability management
- Supply Chain and contracting
- Leadership and Crisis Management

Energy Master Plan

- Master plan integration
- Define energy boundaries & data
- Critical infrastructure needs
- Growth requirements
- Address demand, production/conversion/distribution
- Planning components – condition, growth, conservation improvements, energy diversity, environmental, new projects, improvements, costing, economic evaluation – funding/phasing/scheduling



- Engineering
- Leadership
- Cyber
- Finance
- Supply chain
- Contracting
- Partnerships
- Exercises



Population/Topic Concentrations	Energy Fundamentals	Energy Risk Assessment	Energy Policy	Energy Master Plan
Entry Level	Bachelor's - Engineering, Cyber, Business	Bachelor's - Tactical mission & energy assets, Cyber	Bachelor's - Governance awareness, funding, partnerships, Cyber protection	Bachelor's -requirements determination process, implement solutions, rapid fielding testing
Mid-Career	Norwich Pro CPE – Types, Use, Storage, Distribution	Bachelor's-Master's-Certificates-CPE: Tactical to Operational mission & energy assets, impact on missions	Certificates-CPE – governance coordination, funding planning, partnership interaction, Cyber penetration, Exercises	CPE – requirements validation & prioritization, funding, Cyber capability, master plan integration
Senior Level	Norwich Pro CPE – Types, Use, Storage, Distribution	CPE & Seminar – strategic mission and capability, Cyber, partnerships, exercises (DECIDE)	CPE & Seminar – mission and capability, Cyber, partnerships, exercises, funding policy; graduate certificate	CPE & Seminar – culture, master plan integration, funding options, Cyber policy, exercise integration
Research and Development	Bachelor's & Master's Engineering, Business, Public Administration, Cyber & Exercises	Modeling development, Cyber vulnerability, exercises	Seminar or conference - Monitor and test new development for implementation	Requirements integration, micro grid options, new technology planning

Selected References

Congressional Research Reports:

- Critical Infrastructure: Emerging Trends and Policy Considerations for Congress - R45809 July 8, 2019 Brian E. Humphreys Analyst in Science and Technology Policy [-redacted-@crs.loc.gov](#)
- Selected Homeland Security Issues in the 116th Congress, R45701 June 21, 2019 William L. Painter, Coordinator Specialist in Homeland Security and Appropriations [-redacted-@crs.loc.gov](#)
- Department of Defense Energy Management: Background and Issues for Congress, R45832 July 25, 2019 Heather L. Greenley Analyst in Energy Policy [-re-acte--@crs.loc.gov](#)

Department of Defense, Annual Energy Management and Resilience Report (AEMRR), Fiscal Year 2017 – dated July 2018 - <https://www.acq.osd.mil/eie/Downloads/IE/FY%202017%20AEMR.pdf>

Government Accounting Office Reports

- DEFENSE INFRASTRUCTURE - Improvement Needed in Energy Reporting and Security Funding at Installations with Limited Connectivity, January 2016 - <http://www.gao.gov/products/GAO-16-164>, View GAO-16-164. For more information, contact Brian J. Lepore at (202) 512-4523 or leporeb@gao.gov or Frank Rusco at (202)
- DOD RENEWABLE ENERGY PROJECTS - Improved Guidance Needed for Analyzing and Documenting Costs and Benefits - Highlights of GAO-16-487, a report to congressional committees, View GAO-16-487. For more information, contact Frank Rusco at (202) 512-3841 or ruscof@gao.gov or Brian J. Lepore at (202) 512-4523 or leporeb@gao.gov.