



AUGUST 21-23, 2018 • CLEVELAND, OHIO

# The Power of Partnerships

Federal Energy Management Program and  
Department of Homeland Security:  
Resilience Framework

NREL/PR-7A40-72253





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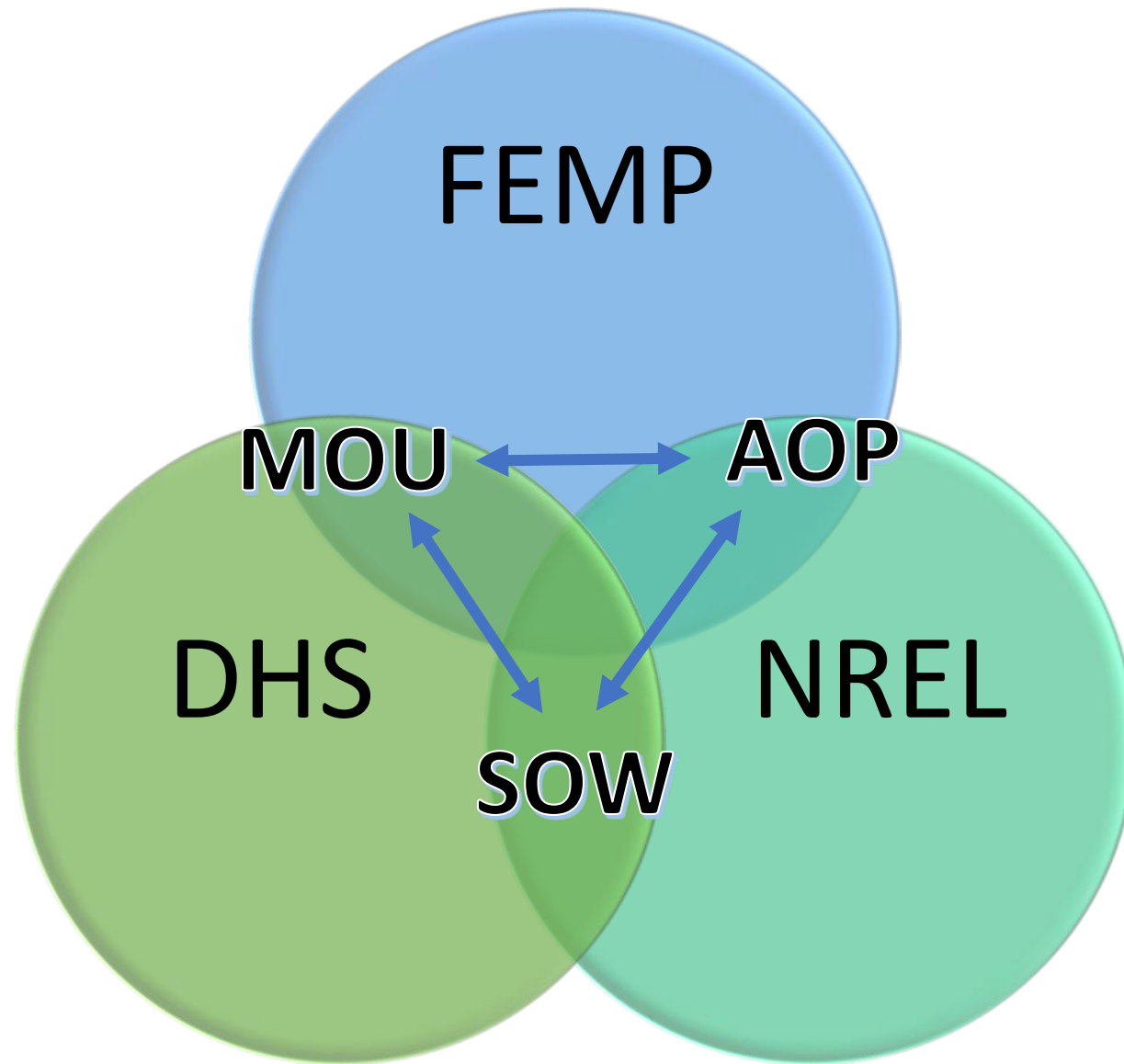
Support to DHS Energy Management Program

# Resilience in Partnerships: DOE/FEMP – NREL – DHS

*Working Together for Success*







# The Beginning of a Partnership

DOE-DHS MOU Objectives, Actions, and Status Now

# DOE-DHS MOU Highlights

## MEMORANDUM OF UNDERSTANDING

BETWEEN THE

U. S. DEPARTMENT OF ENERGY

AND THE

U.S. DEPARTMENT OF HOMELAND SECURITY

COLLABORATION IN A STRATEGIC PARTNERSHIP TO ADVANCE FEDERAL  
CRITICAL INFRASTRUCTURE RESILIENCE

### **I. Purpose**

The purpose of this memorandum of understanding (MOU) is to establish a mechanism for cooperation and partnership between the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Federal Energy Management Program (FEMP) and the U.S. Department of Homeland Security (DHS) Chief Readiness Support Officer (CRSO), hereinafter also referred to each as a “Party” or collectively as “the Parties.” The Presidential Policy Directive/PPD-21 advances a national unity of effort to strengthen and maintain security, functioning, and resilient critical infrastructure. This partnership will strengthen coordination of and amplify existing efforts dedicated to advancing the Nation’s critical infrastructure by developing a resilience framework to apply across the Homeland Security Enterprise. This MOU is intended as an umbrella agreement under which particular activities are executed including, but not limited to, developing the DHS Resilience Framework, establishing resilience performance metrics and monitoring guidelines, identifying best practices for resilience technologies and solutions, and providing associated technical support.

- DOE-FEMP signed a Memorandum of Understanding with DHS
- Provides technical support in the development of this framework
- Provides pilot projects to serve as examples

# DHS Executive Secretary Tasking

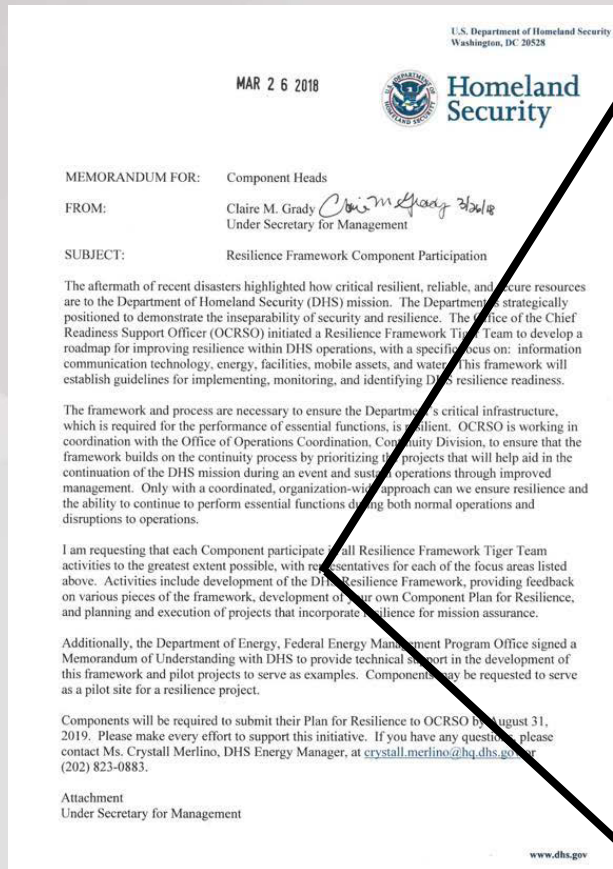
Each Component participate in all Resilience Framework Tiger Team activities to the greatest extent possible, with representatives for each of the focus areas

## Activities:

- Development of the DHS Resilience Framework
- Providing feedback on various pieces of the framework
- Development of your own Component Plan for Resilience
- Planning and execution of projects that incorporate resilience for mission assurance.

**\*\*Components will be required to submit their Plan for Resilience to OCRSO by August 31, 2019.**

- MGMT ExecSec 1159974
- Signed by Ms. Claire M. Grady, Under Secretary for Management on March 26th, 2018
- Sent from Tom Chaleki, Chief Readiness Support Officer



# DHS Resilience Framework Document



## RESILIENCE FRAMEWORK

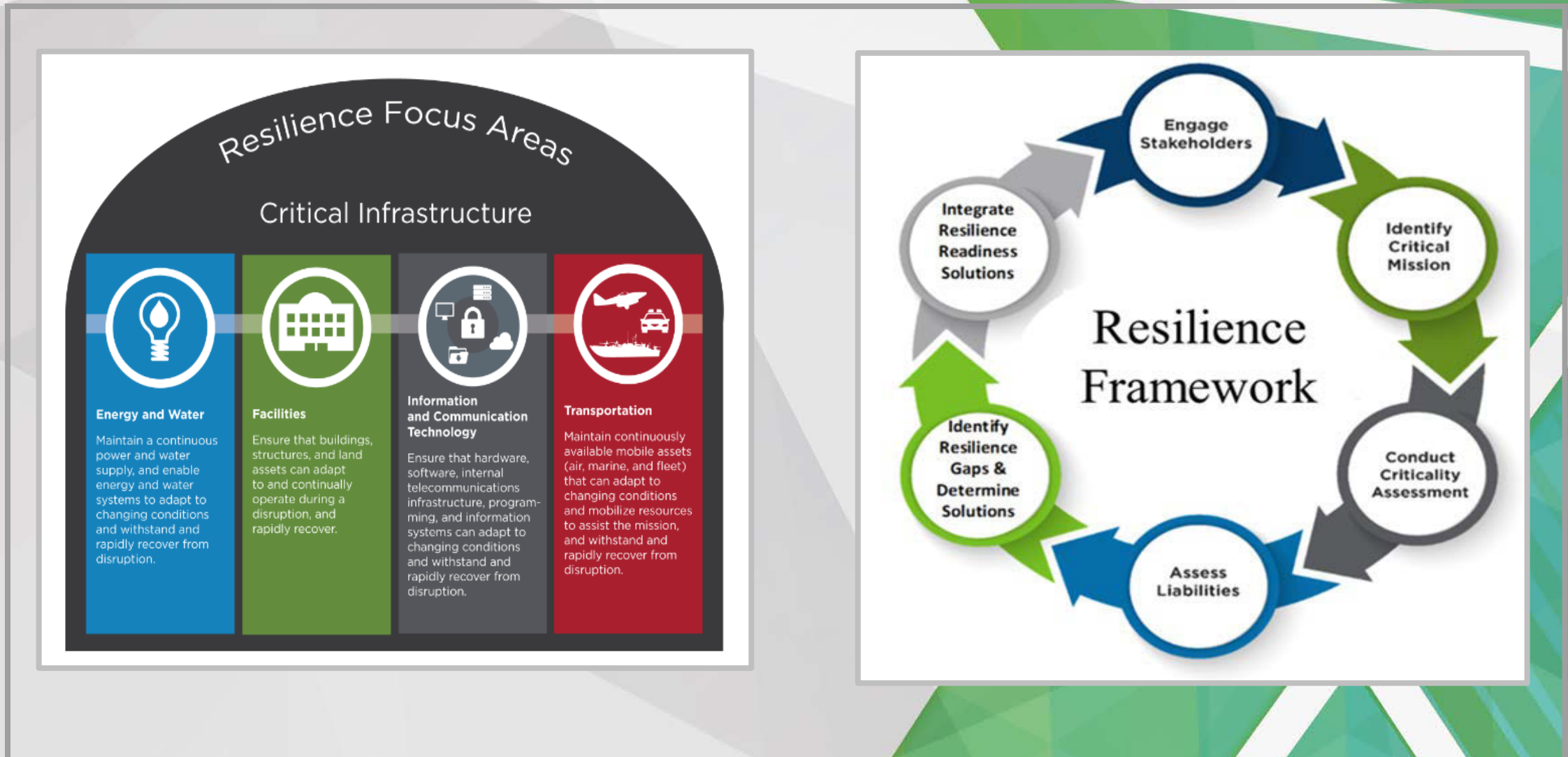
Providing a roadmap  
for the Department in  
Operational Resilience  
and Readiness.



U.S. DEPARTMENT OF  
HOMELAND SECURITY  
**Homeland  
Security**

- MGMT ExecSec 1167723
- Signed by DHS, Ms. Claire M. Grady, Under Secretary for Management on August 15, 2018
- DHS Components will begin developing their Plans for Resilience which are due by August 31, 2019

# DHS Resilience Framework



Federal Continuity Directive 1: <https://www.fema.gov/media-library/assets/documents/86284>

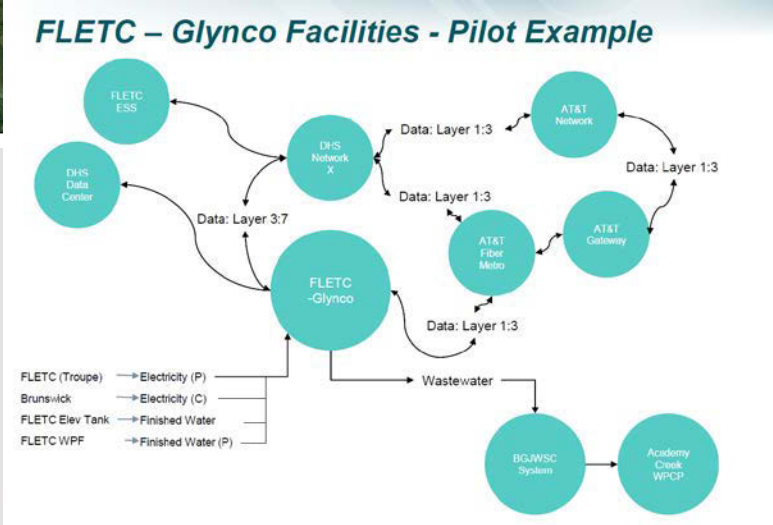
Federal Continuity Directive 2: <https://www.fema.gov/media-library/assets/documents/132803>

# DHS Resilience Readiness Assessment

- Developed to holistically evaluate, capture information, and score sites to qualitatively assess resilience readiness
- Used to establish the baseline resilience of critical mission assets

Resilience Planning Guidance							
Assess Baseline							
Process-based Information	Energy and Water	Information and Communication Technology	Facilities	Transportation			
Recovery Plans							
Emergency Management Plan							
Cyber Plan							
Continuation of Operations Plan (COOP)							
Memorandum of Understanding (MOU)							
Site Master Plan for Development							
Critical Mission Functions							
Information Sharing							
Communication							
First Responders							
					Score		
		Step	Metric Category	Information Communication Technology	Energy and Water	Facilities	Transportation
Operational Data	Energy a	1	Preparedness/Planning				
Energy Consumption per Building		1.1	Stakeholder Identification	● 3	● 3	● 3	● 3
Water Consumption per building		1.2	Critical Mission Identification	● 3	● 3	● 2	● 3
Fuel Consumption by Mobile Assets		1.3	Criticality Assessment	● 3	● 3	● 2	● 3
List of Backup Generators		1.4	Risk Assessment	● 3	● 3	● 3	● 3
Fuel Storage on-site		1.5	Cyber Plan	● 3	● 3	● 3	● 1
		1.6	Information Sharing	● 3	● 3	● 3	● 1
Geospatial Data	Energy a	1.7	Business Continuity Plan	● 3	● 3	● 3	● 3
Electrical System Maps		2	Construction Mitigation Measures				
Natural Gas Maps		2.1	Natural hazards	● 3	● 3	● 3	● 3
Water and Wasterwater Maps		2.2	Standoff distance	● 3	● 3	● 2	● 3
Facility Maps		3	Alternate Site Mitigation Measures				
Communication Network Maps		3.1	Mitigation with Alternative Sites	● 3	● 3	● 3	● 3
		4	Resource Mitigation Measures (Redundant Sources)				
		4.1	Electric	● 3	● 3	● 3	● 3
Historical Data	Energy a	4.2	Natural Gas	n/a	● 3	● 3	n/a
Grid Outages		4.3	Communications & IT	● 1	● 3	● 3	n/a
Utility Disruption		4.4	Transportation	n/a	● 3	● 3	● 2
After-Action Plans		4.5	Water	n/a	● 3	● 3	n/a
Weather Related Events		4.6	Wastewater	n/a	● 3	● 3	n/a
		5	Response Capabilities Onsite				
		5.1	Incident command capability	● 3	● 3	● 3	● 3
		6	Response Capabilities Offsite				
		6.1	First responders interaction (mutual aid)	● 3	● 3	● 3	● 3

# DHS Resilience Pilot Sites



Components	Sites
Custom Border & Protection (CBP)	CA - Port Authority location AND Delaware Port Authority
Federal Emergency Management Agency (FEMA)	National Emergency Training Center
Federal Law Enforcement Training Center (FLETC)	Glynco Campus Cheltenham Campus
US Coast Guard (USCG)	Base Portsmouth



# Resilience in Partnerships: DOE/FEMP – NREL – DHS

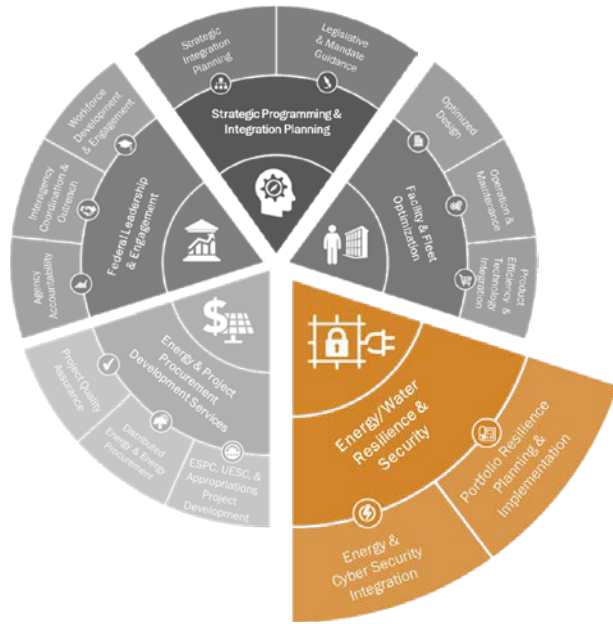
*Working Together for Success*



# Federal Energy Management Program: “Wheelhouse”



# Federal Energy Management Program: *Focus*



**Key Program Engagements**

- DOE/ FEMP – DHS Partnership
- DOE/FEMP – NASA Partnership

<p><i>Administration Priorities:</i> American Security</p> <p>Resilience and Reliability for Mission Assurance</p>	
<p>Portfolio Resilience Planning &amp; Implementation</p>	<p>3 comprehensive partnerships with agencies to implement resilient planning at Agency and Site level</p> <p>Developing a <b>systematic and integrated approach to strategic resilience planning</b> that addresses continuity of operations focus areas including energy and water requirements, communications, transportation, facilities and technology solutions</p>
<p>Energy &amp; Cyber Security Integration</p>	<p>Addressing cyber control systems, storage of data and reporting protocols and processes</p> <p>Focusing on:</p> <ul style="list-style-type: none"> <li>• Managing dynamic control systems at the point of facility and grid integration</li> <li>• Federal Building Metering Guidance implementation addressing control system security BP s</li> <li>• Facility Related Control Systems for Security Assessment Tool development</li> </ul>

# Federal Energy Management Program: Partnership with Department of Homeland Security (DHS)

*FEMP is assisting DHS in developing a comprehensive approach to resilient portfolio planning that addresses continuity of operations focus areas including energy and water requirements, information communication technologies, transportation and facilities.*



- ✓ Develop Framework
- ✓ Test approaches
- ✓ Document Lessons Learned
- ✓ Establish valuation & metrics
- ✓ Develop replicable, cost effective models for wide-scale adoption

**Result:** DHS is currently rolling out this framework at the agency level & to the majority of components including FEMA, USGC, CBP, and TSA.



Location (Pilot Sites)



Focus Areas Critical Infrastructure



Methodology for Components to Develop Resilience Plan

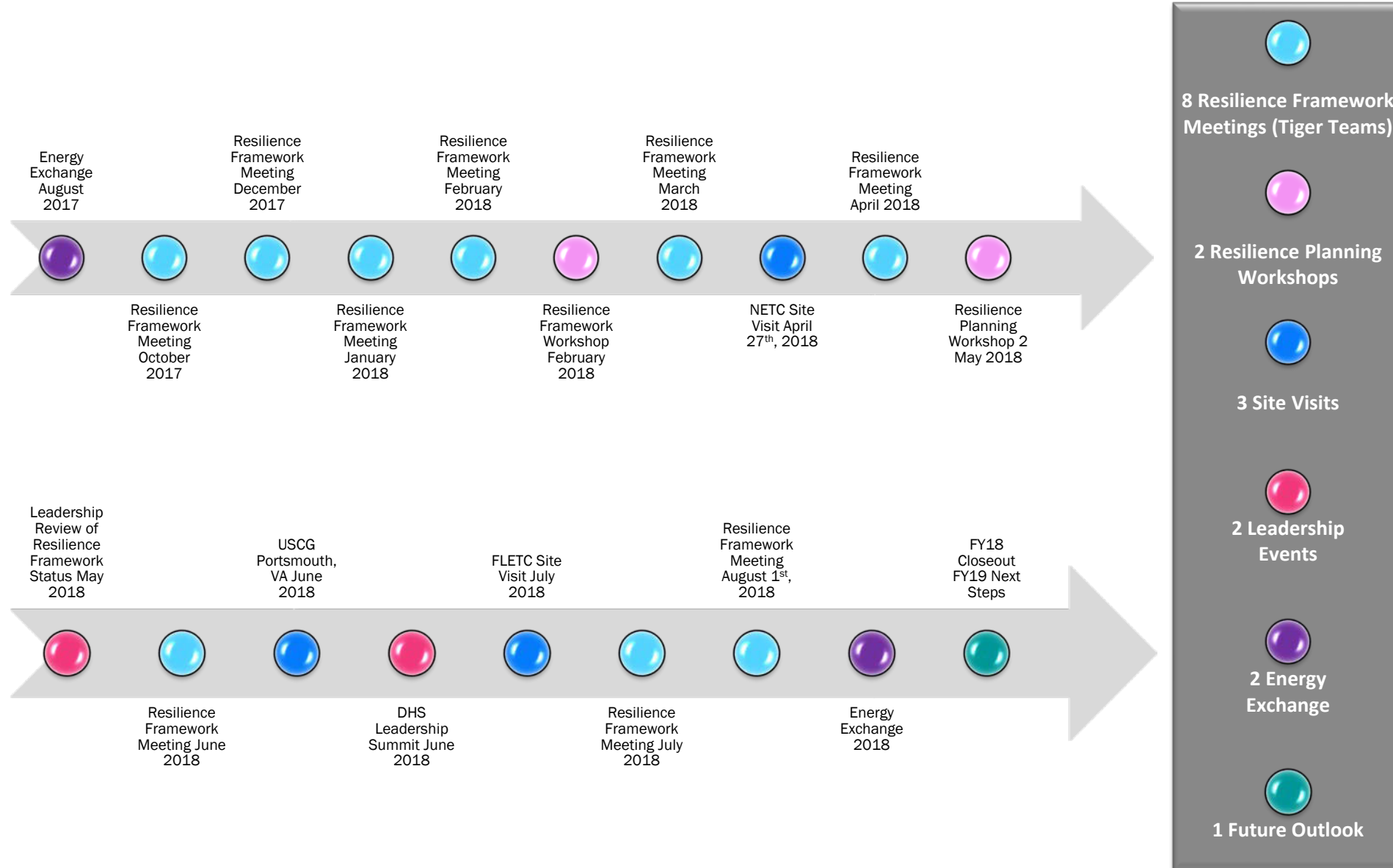


Determine Resilience Readiness for Project Development



Integrate and Measure Resilience Readiness

# RECAP – POAM



# DOE – DHS MOU in FY18

## Achievements

- DHS Resilience Framework document sent to Exec Sec August 6<sup>th</sup>, 2018
- Established resilience performance metrics and monitoring guidelines
- In the process of identifying best practices for resilience technologies and solutions

- USCG Portsmouth Virginia (FEMP and NREL)
- FLETC Glynco Georgia (FEMP and NREL)
- NETC FEMA Maryland (FEMP and NREL)

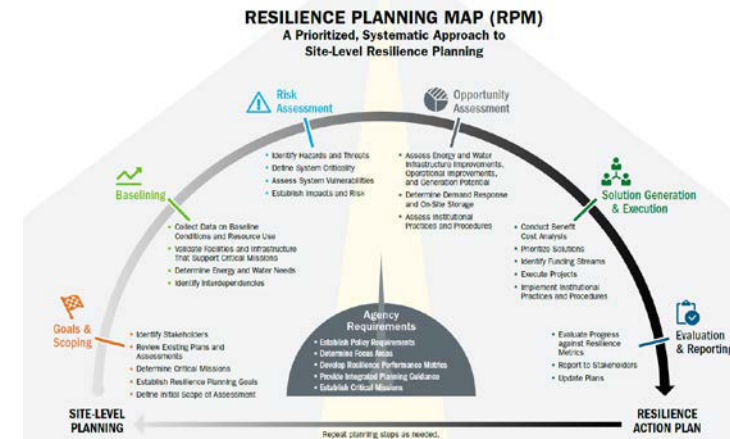


- Developing Steps
- Set up meeting with Components
- Performa Analysis
- Outcome to implement enterprise wide (DHS) and other agencies (FEMP RPM)

- Providing associated technical support and engaging with selected DHS Component Pilot Sites.
- Deploying solutions and processes for resilience planning in the Resilience Planning Map (RPM)
- Leveraging lessons learned and templates for the Pre-Energy Exchange RPM training class

## MOU Next Step – Report Due Date

- DOE and DHS will collaborate in preparing a report that documents the activities undertaken and the results of those activities, as well as provide an evaluation of how well the partnership succeeded at meeting the MOU goals



# Resilience Planning Map

- **The FEMP Resilience Planning Map (RPM) assists organizations in planning for energy and water resilience across their portfolio by leveraging proven approaches and methodologies.**
- **The RPM addresses key elements of energy and water resilience planning including:**
  - Developing systems that can anticipate, avoid, prepare for, adapt, withstand, respond to, and recover rapidly from anticipated and unanticipated events
  - Ensuring availability and reliability sufficient to provide for mission assurance and readiness
  - Supporting critical assets and other mission essential operations related to readiness
  - Executing or rapidly re-establishing mission essential requirements







# Future Development

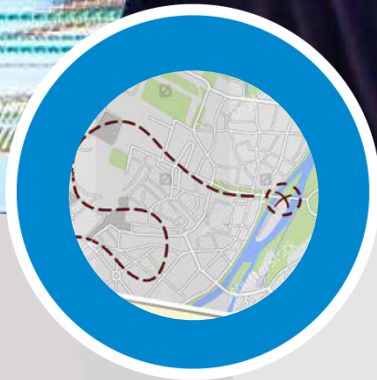
- Collaboration in the upcoming year will focus on development of agency-neutral resources
- Adding to the robustness of the FEMP tool suite
- Collaboration between DOE/FEMP, DHS, and NREL enables complex solutions to complex problems



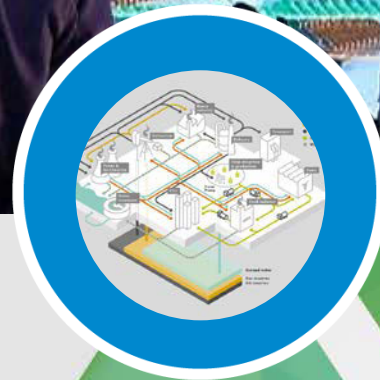
Tools



Templates



Guidance Documents



Infographics

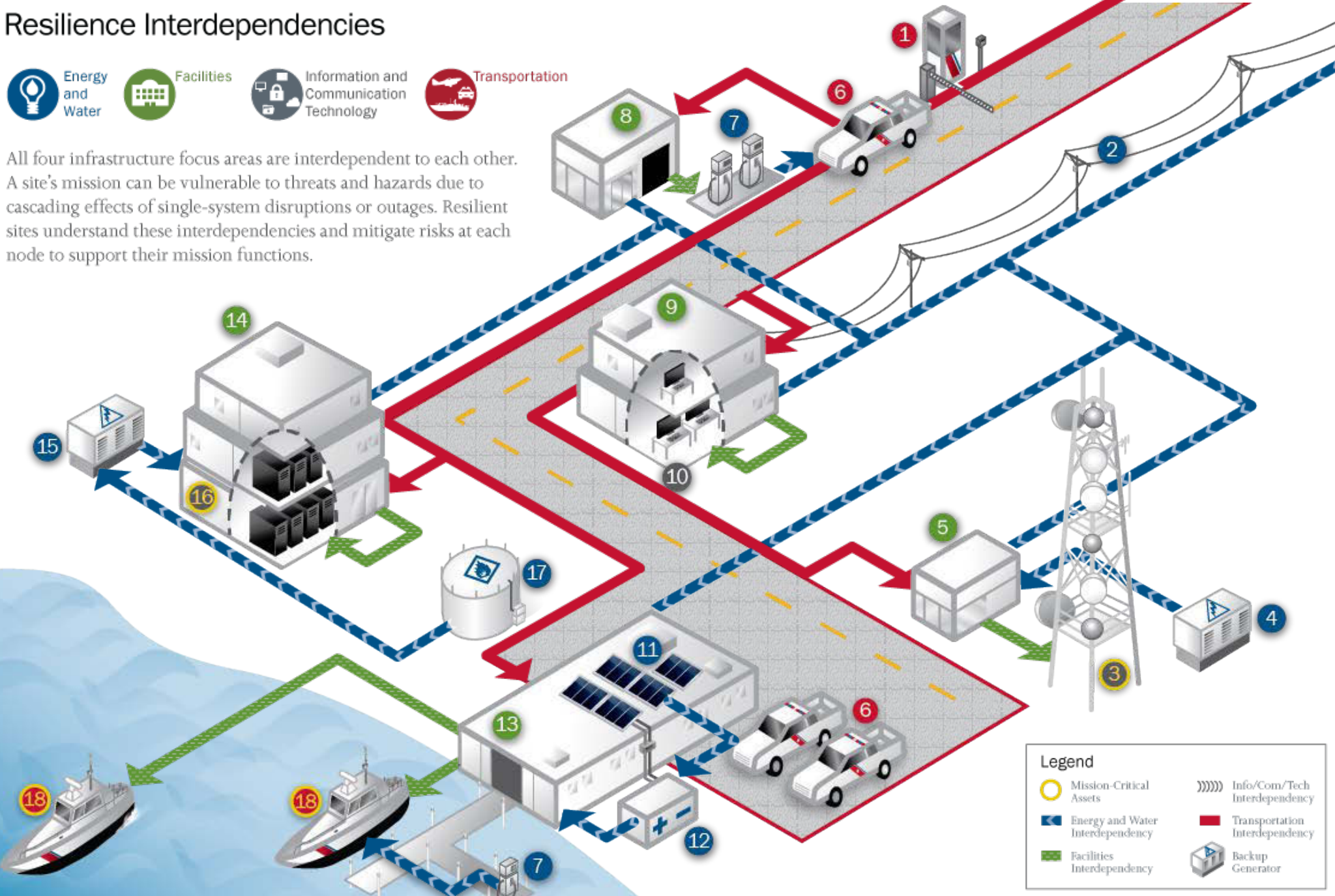


Documents Libraries

# Resilience Interdependencies



All four infrastructure focus areas are interdependent to each other. A site's mission can be vulnerable to threats and hazards due to cascading effects of single-system disruptions or outages. Resilient sites understand these interdependencies and mitigate risks at each node to support their mission functions.



1. Guard Station
2. Electric Utility
3. Communication Tower
4. Back-up Generator
5. Tower Support Building
6. Fleet Vehicles
7. Fueling Pumps
8. Pump Support Building
9. Office Support Building
10. Work Stations
11. Photovoltaic Panels
12. Back-up Battery
13. Fleet Support Building
14. Server Support Building
15. Back-up Generator
16. Servers
17. Fuel Storage
18. Fleet Rescue Vehicles

**Legend**

Mission-Critical Assets	Info/Com/Tech Interdependency
Energy and Water Interdependency	Transportation Interdependency
Facilities Interdependency	Backup Generator

# Leveraging Existing Partnerships

Structured agreements with DOE and other  
Federal agencies



# NREL Overview

## Focus Areas



### Renewable Power

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Solar  
Wind  
Water  
Geothermal



### Sustainable Transportation

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Bioenergy  
Vehicle Technologies  
Hydrogen



### Energy Efficiency

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Buildings  
Advanced Manufacturing  
Government Energy Management



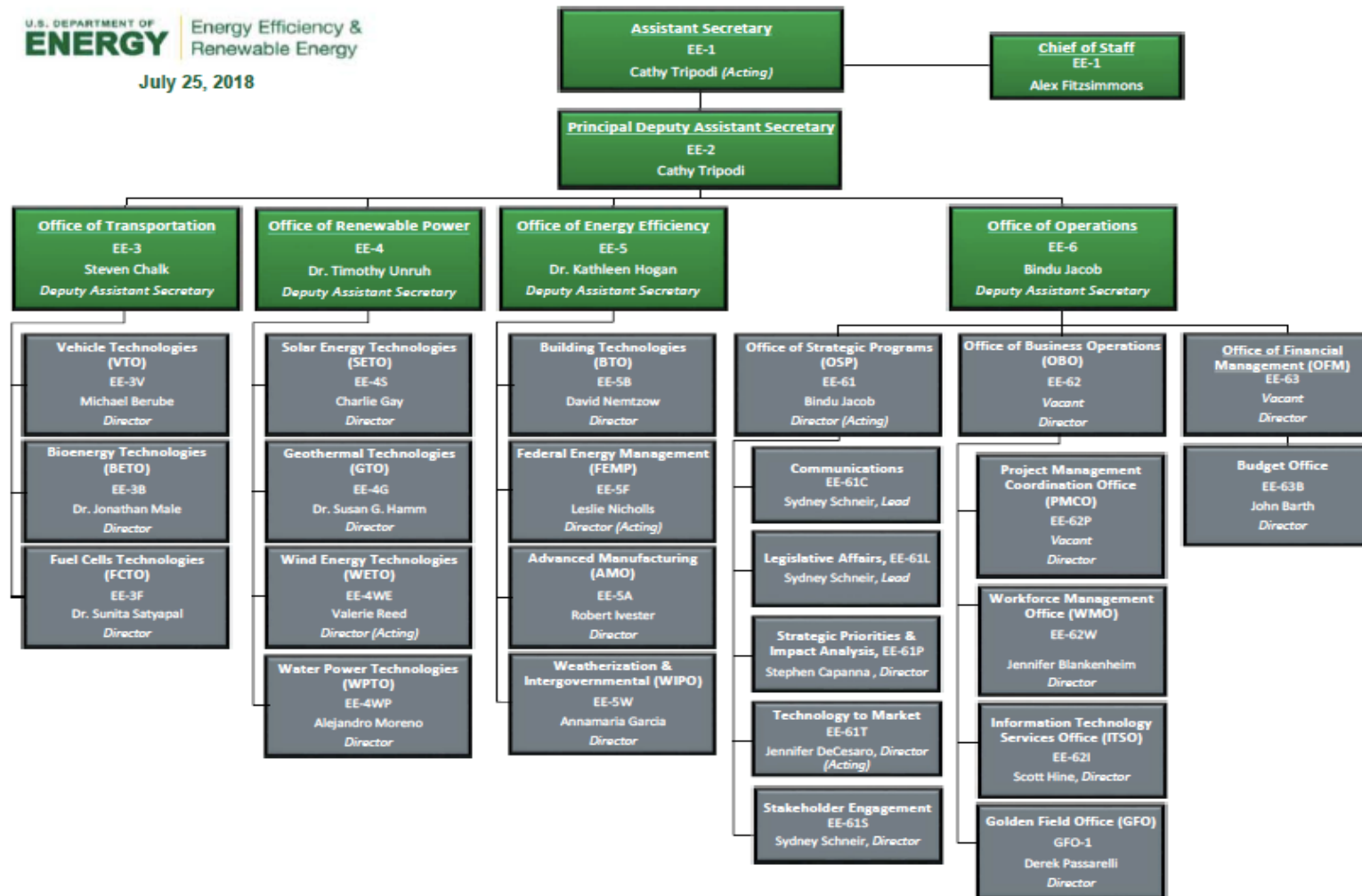
### Energy Systems Integration

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Grid Modernization  
High-Performance Computing  
Data and Visualizations

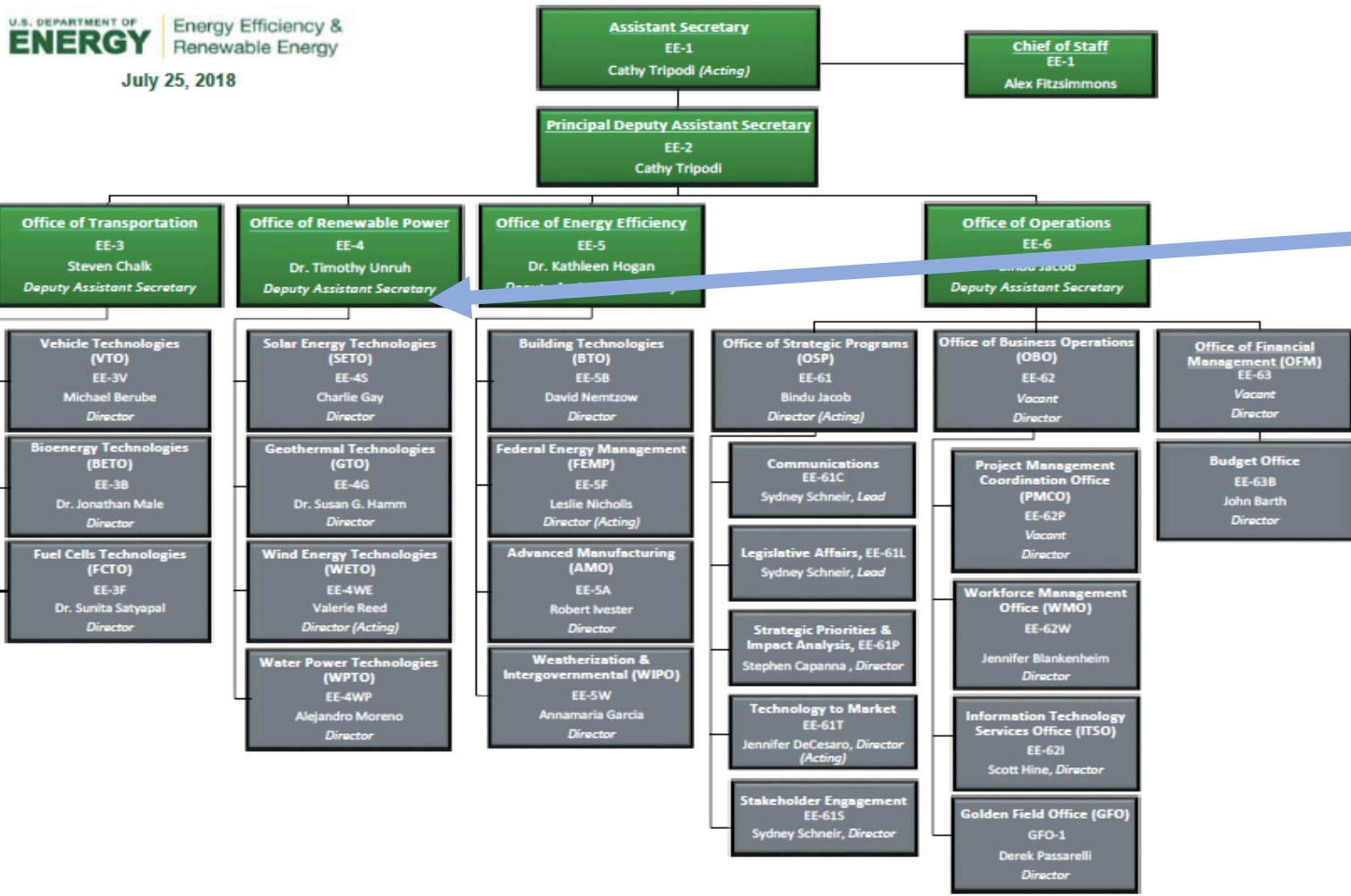
# EERE Organization

U.S. DEPARTMENT OF  
**ENERGY** | Energy Efficiency &  
Renewable Energy  
July 25, 2018



# EERE-NREL Alignment

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy  
July 25, 2018



- Renewable Power**
  - Solar
  - Wind
  - Water
  - Geothermal
- Sustainable Transportation**
  - Bioenergy
  - Vehicle Technologies
  - Hydrogen
- Energy Efficiency**
  - Buildings
  - Advanced Manufacturing
  - Government Energy Management
- Energy Systems Integration**
  - Grid Modernization
  - High-Performance Computing
  - Data and Visualizations



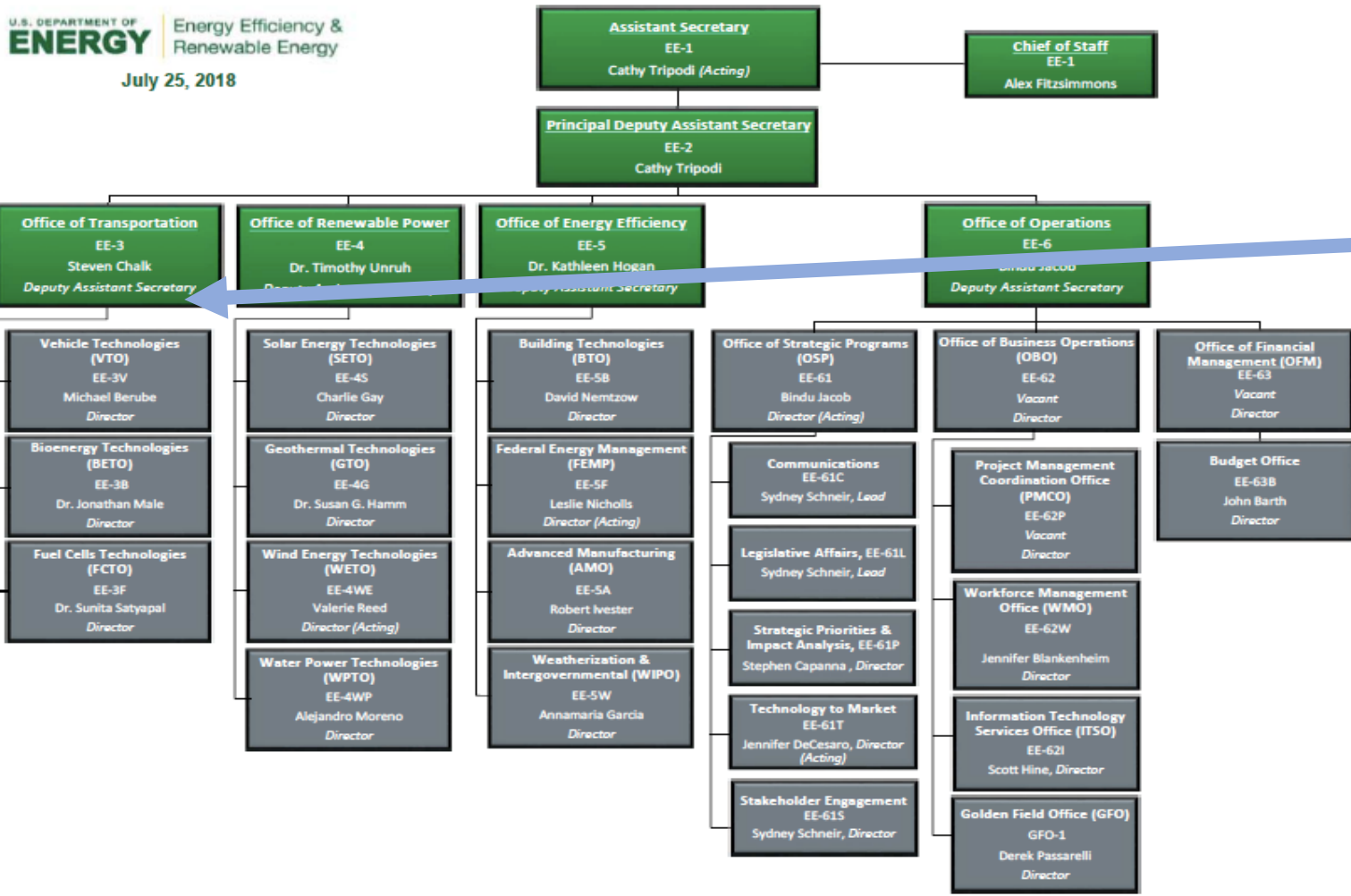
# EERE-NREL Alignment

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy  
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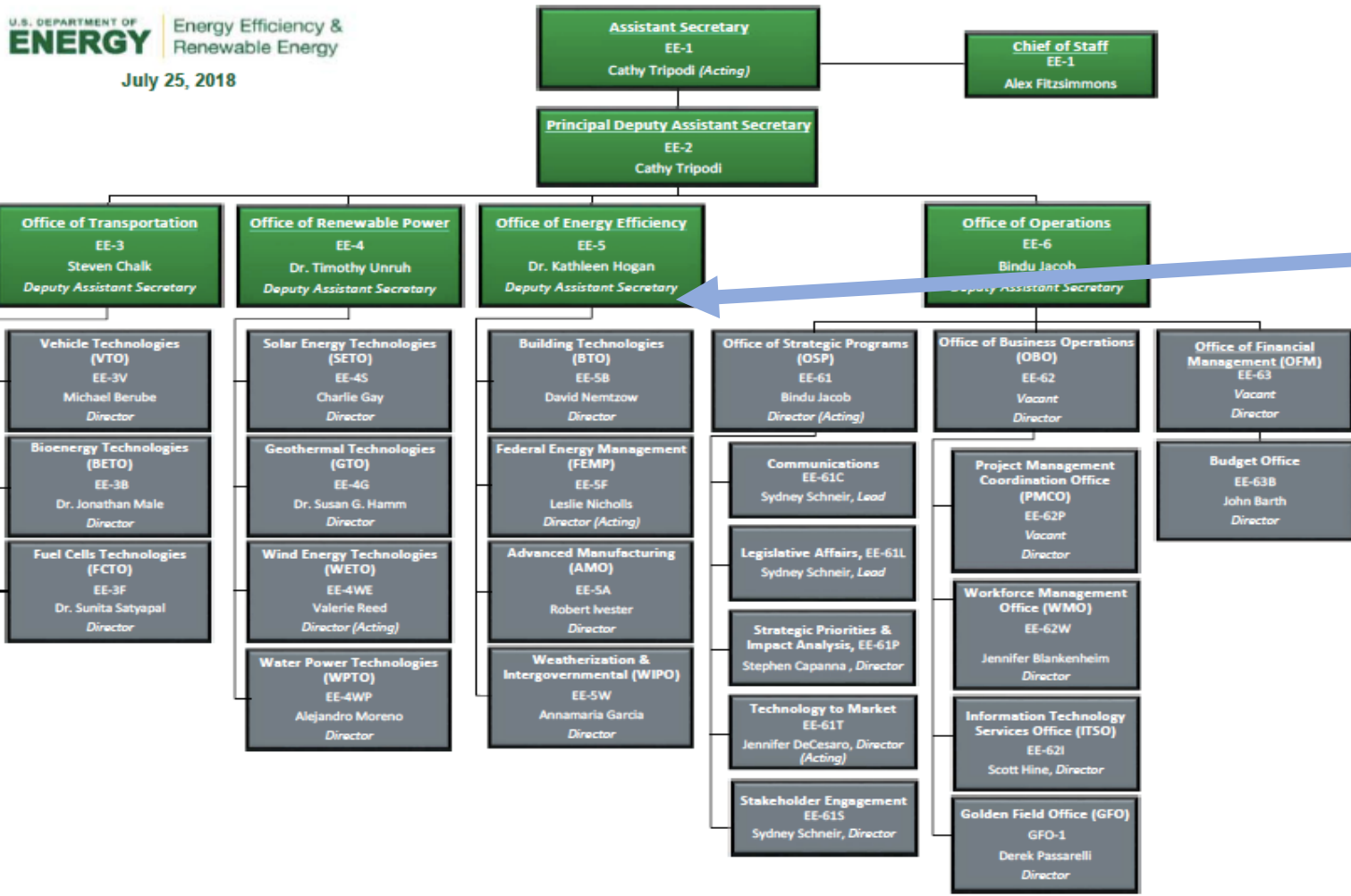
- Power**
  - Solar
  - Wind
  - Water
  - Geothermal
- Sustainable Transportation**
  - Bioenergy
  - Vehicle Technologies
  - Hydrogen
- Energy Efficiency**
  - Buildings
  - Advanced Manufacturing
  - Government Energy Management
- Energy Systems Integration**
  - Grid Modernization
  - High-Performance Computing
  - Data and Visualizations

NREL | 2



# EERE-NREL Alignment

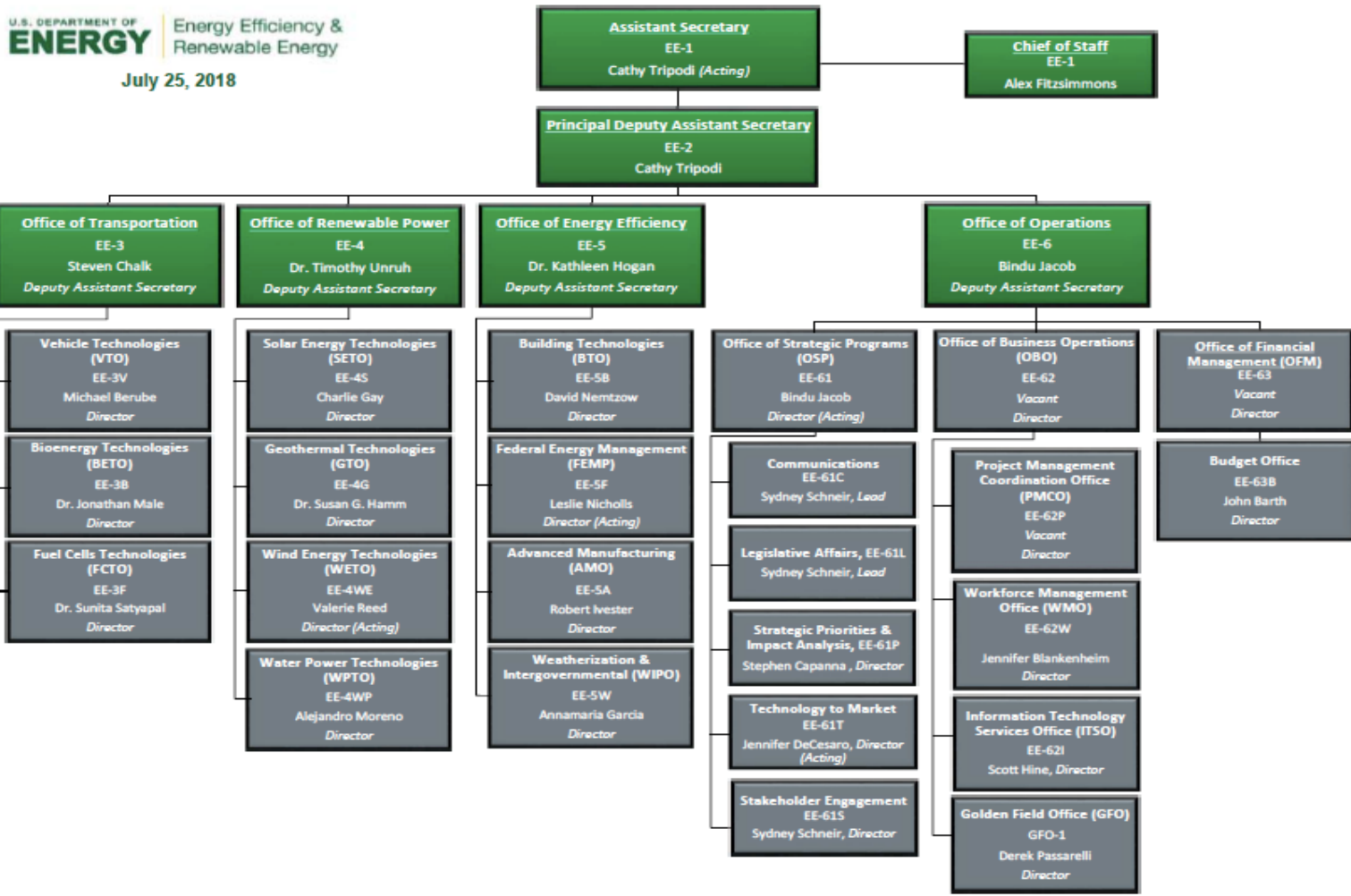
U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy  
July 25, 2018



- Renewable Power**
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# EERE-NREL Alignment

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy  
July 25, 2018



2018 - EE-5F Federal Energy Management Program Office - National Renewable Energy Laboratory

**EE-5F Federal Energy Management Program Office**

**Fiscal Year 2018 Annual Operating Plan**

*Submitted By*  
National Renewable Energy Laboratory

Source: EERE's FY18 AOP Development System  
Report Generated on: November 13, 2017

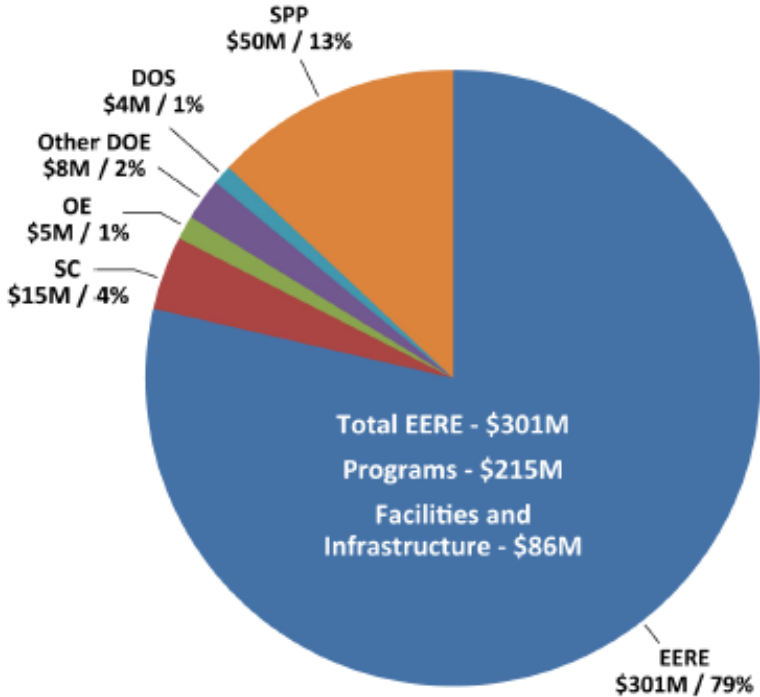
Report includes all EE-5F Federal Energy Management Program Office, Active, Pending Approval Projects

PRE-DECISIONAL DOE DOCUMENT, NOT FOR DISTRIBUTION

# NREL Strategic Partnership Projects

- 150+ SPP research and applied engineering projects with federal agencies
- Leverages DOE-funded capabilities and develops new capabilities for DOE's benefit

FY 2017 Costs by Funding Source (\$383M)

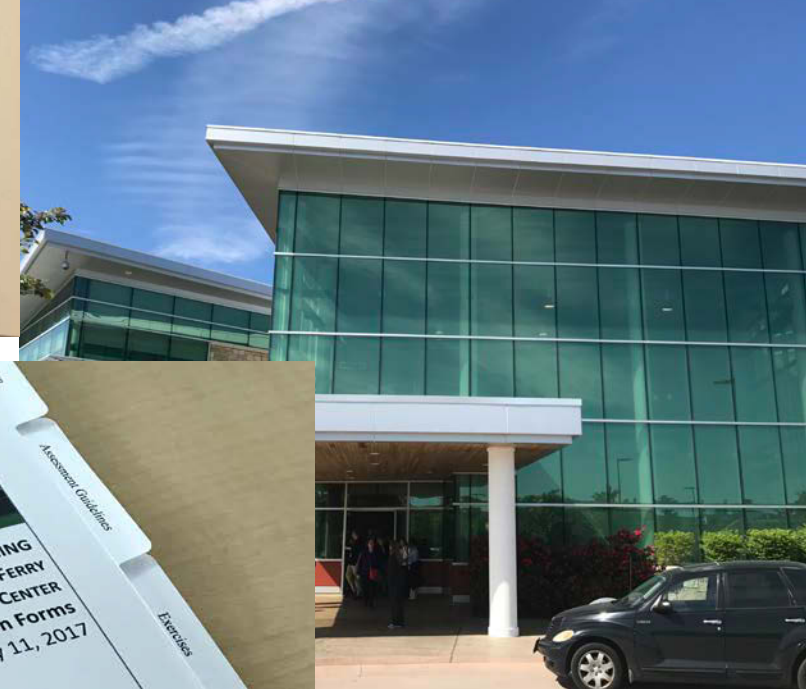


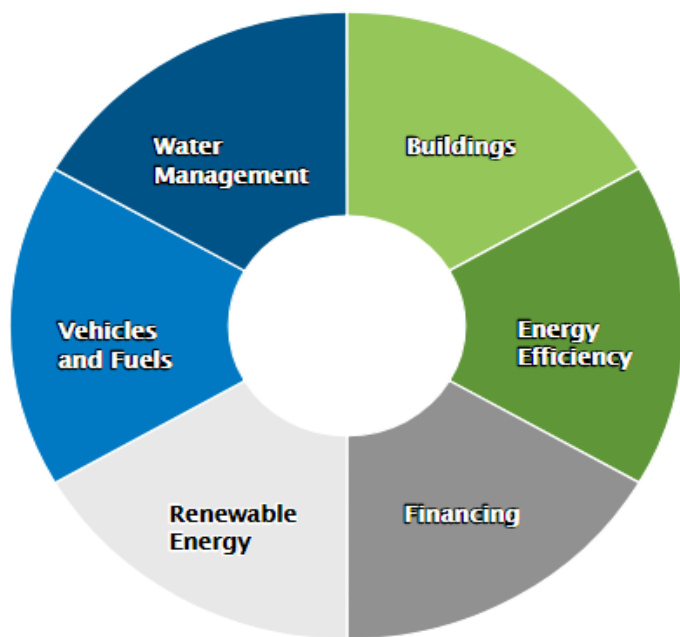
# NREL → DHS: DHS Energy Management Program

Interagency Agreement with NREL



# DHS and NREL: Energy Management Program





[SHOW ALL PROJECTS](#)



**Homeland Security**

↓	Title	↓	Topic	↑	Component	↑	Fiscal Year	↓	Summary
<b>NEW</b>	<a href="#">FY 2017 Energy Management by the Numbers: Department of Homeland Security</a>		Energy Efficiency, Renewable Energy, Buildings, Water Management		Department of Homeland Security		2018		This infographic presents DHS overall energy management achievements for FY 2017.
	<a href="#">Decreased Maintenance; Strengthened Borders – U.S. Customs and Border Protection, Yuma, AZ, and El Centro, CA</a>		Energy Efficiency, Financing		Mission Sustainable Energy, U.S. Customs and Border Protection		2017		This video case study details a \$3 million ESPC LED lighting project at the southwest border.
	<a href="#">Energy Assessment Toolkit</a>		Energy Efficiency, Renewable Energy		Mission Sustainable Energy		2017		This fact sheet covers the devices necessary to collect building performance information to conduct energy evaluations at different levels.
	<a href="#">Energy Efficiency and Renewable Energy Assessment for the Tyndall Reactive Materials Group</a>		Energy Efficiency, Renewable Energy		Science and Technology Directorate		2017		This report summarizes the results from an energy efficiency and renewable energy assessment conducted at the S&T TRMG site in Panama City, Florida.

# Ongoing Partnership

- Support overall energy program
- Integration of Resilience Framework into Energy, Environmental, and Sustainability Programs
- Support Component Plans for Resilience
- Conduct Training and Workshops
- Conduct Assessments
- Support Program Communications efforts



# Best Practices

Planning for Success

# Planning For Success: FEMP

- Leadership Buy-In
- Develop a POAM – Project Objectives and Milestones
- Engage other Stakeholders within the organization
- Define terminology
- Drive Success Through Common Understanding of Task

# Planning For Success: DHS

- Form Partnerships with External Experts – DOE, DoD, other Federal Agencies, Academia, Laboratories
- Obtain Leadership Support EARLY
- Bring Together Working Group (or Tiger Team)

# Planning For Success

- PLAN, PLAN, PLAN
- ENGAGE, ENGAGE, ENGAGE
- DELIVER, DELIVER, DELIVER

**Thank You**



# Disclaimer

This work was authored by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Federal Energy Management Program. The views expressed in the presentation do not necessarily represent the views of the DOE or the U.S. Government. The U.S. Government retains and the publisher, by accepting the article for publication, acknowledges that the U.S. Government retains a nonexclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this work, or allow others to do so, for U.S. Government purposes.