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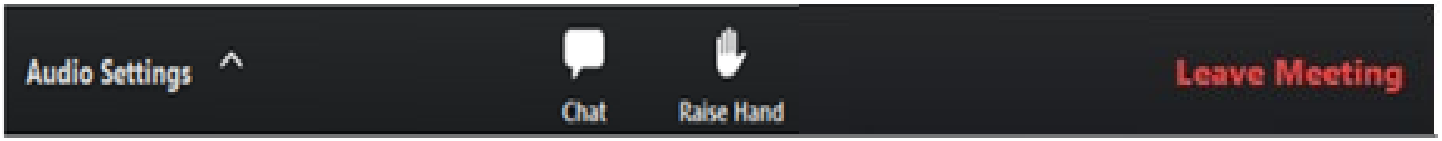
Liquid Fuels Shortage Planning Workshop for Pennsylvania Healthcare Facilities

May 2021

Tom Wolf, Governor

Patrick McDonnell, Secretary

Logistics



The webinar is being recorded; participants will be muted upon entry.

If you have any technology issues, please contact Larisa.Crewalk@icfnext.com or feel free to send Larisa a private chat.

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Workshop Purpose

Provide guidance to the healthcare sector on:

1. Planning for **extended power outages;**
2. Acquiring, storing, and resupplying the **liquid fuels** that fuel backup power generators and vehicles and provide heat to healthcare facilities;
3. Improving facilities' **long-term resilience** to power outages and liquid fuels disruptions.

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Workshop Agenda

- **Introductory Remarks**–John Kerecz & Brian Moore (*Department of Environmental Protection Energy Programs Office)*
- **Threats and Vulnerabilities in the Fuel Supply Chain** – Matt Kelly (*ICF)*
- **Best Practices for Power Emergency Planning in the Healthcare Sector**– Eric Cote (*Powered for Patients)*
- **Introduction to the Guidebook and Template Planning Tools** – Matt Kelly (*ICF)*
- **Best Practices for Fuel Delivery:** *Pennsylvania Petroleum Association- Matt Hurley (Tevis Energy), Bruce W. Spiridonoff (Tevis Energy), Mike Adams (Adams Petroleum Products)*
- **Long-Term Fuel Resiliency Strategies** – Adam Agalloco (*ICF)*

This workshop is being recorded
and will be available publicly on the DEP website.

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Introductory Remarks

John Kerecz & Brian Moore

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Energy Programs Office

Energy Assurance

Planning for Energy Security and Resiliency

John Kerecz
Energy Program Specialist
Energy Programs Office

Tom Wolf, Governor

Patrick McDonnell, Secretary

DEP's Energy Programs Office (EPO)

DEP's Energy Programs Office (EPO) supports energy policies and programs that prevent pollution, protect our environment, improve public health, and ensure access to affordable energy options for all Pennsylvanians.

Our shared approach to our mission focuses on:

- Conservation and Efficiency
- Advanced Energy Technologies
- Energy Security and Resiliency
- Education and Outreach
- Climate

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Responsibilities – DEP & ENAP

- DEP - Emergency Support Functions 10 & 12 (Energy)
  - Oversees monitoring, maintaining, and restoring the supply of energy and energy distribution infrastructure within PA
- EPO assists in fulfilling the requirements of the Energy Assurance Plan (ENAP), which is required by the U.S. Department of Energy and addresses:
  - Preparedness to prevent, mitigate and/or enable a rapid recovery response to the disruption or shortage of energy supplies.

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DEP's Role During Events

- Coordinates the logistics of Commonwealth agencies' response to energy-related emergencies including
  - PA Public Utilities Commission on priority power restoration
  - PA Emergency Management Agency to distribute Commonwealth-owned generators as needed
  - Trade Organizations
  - Industry

- Works with fuel industry and other Commonwealth agencies to facilitate waivers to assist in energy supply, including:
    - Transportation (includes Weight, Hours, & Distance)
    - Environmental (includes Boutique Fuels*)
    - Agriculture (includes Biofuels)
    - Revenue (Taxes)

Supporting the Healthcare Sector

- Today's workshop is part of a larger DEP effort to encourage and assist energy-related emergency planning across sectors.
  - Over the past few years we have been working on building awareness on fuel related issues and helping provide resources for stakeholders to address these issues.
  - In 2019-2020, DEP hosted similar workshops focused on assisting County officials with fuel shortage planning.
- Today we will be focusing on resources that can assist the healthcare facilities prepare for and respond to events that may impact back-up power:
  1. **Fuel Shortage Planning Guidebook** with information and tips on planning for power outages and fuel disruptions to healthcare facilities.
  2. **Fuel Shortage Planning Template** to help healthcare facilities document and assess their fuel needs and onsite fuel storage.




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Energy Programs Office

Thank you!

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Energy Programs Office

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DEP Website: www.dep.pa.gov

Liquid Fuels Overview

Matt Kelly

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Health Systems' Energy Use

Facility Function	Power and Fuel Needs
 Medical Transportation	Requires fuel
 Medical Equipment	Depends on power
 Supply Chain	Needs power for temperature control and storage
 Building Functions	Need power for normal operations, fuel for backup generator
 Food and Water	Requires power and water

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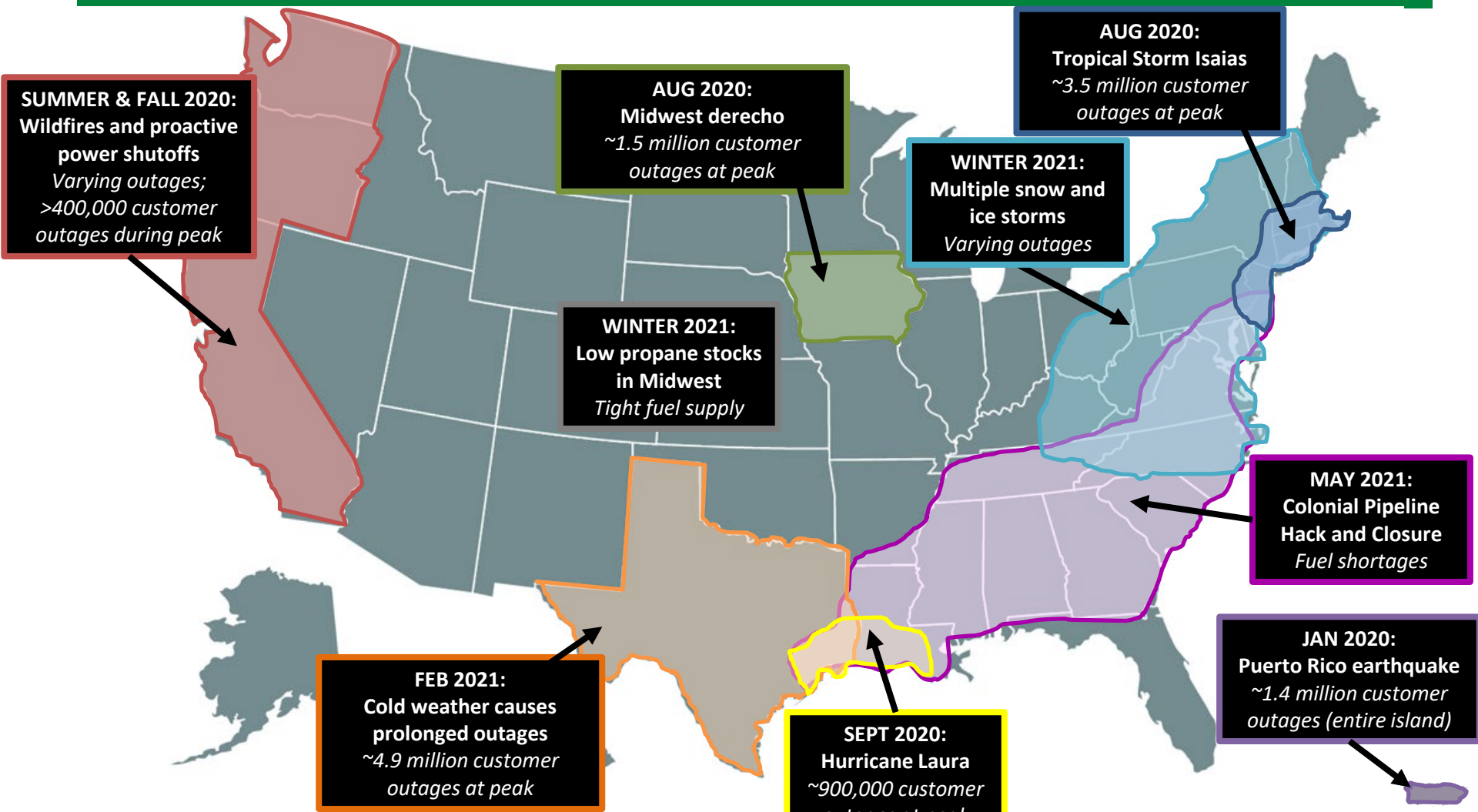
Recent Large-Scale Disruptions to Energy Systems



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Recent Events in Healthcare Sector

Generator glitch causes power outage at Polk hospital during Hurricane Irma

Doctors, staff use flashlights for 3.5 hours

Hurricane Irma: Hialeah Hospital Has 2 Hours Of Power Left

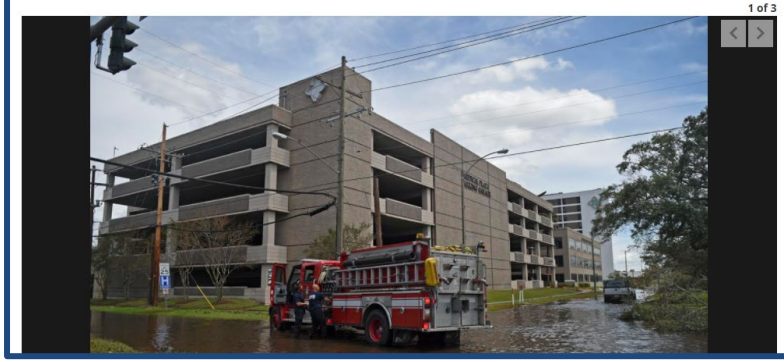
Hialeah Hospital has less than two hours of generator power left due to a diesel shortage, according to Sen. Marco Rubio.

Geoff Dempsey, Patch Staff
Posted Sun, Sep 10, 2017 at 11:16 pm ET | Updated Sun, Sep 10, 2017 at 11:22 pm ET

Facing weeks without water service, Lake Charles hospital evacuates after Hurricane Laura

By SAM KARLIN and ANDREA GALLO | Staff writers **UPDATED AUG 28, 2020 AT 6:22 PM** 4 min to read

1 of 3



Texas hospitals are running out of water amid power outages. Some are evacuating patients for safety.

Generator at Milwaukie care facility dies amid power outage, PGE crews respond

by Allison Mechanic, KATU Staff | Saturday, February 20th 2021

Thousands of Texans depend on dialysis treatments. Extended power outages put their lives at risk.

Dialysis patients need treatments for hours at a time, multiple times a week. Power and water outages forced local centers to shut down.

BY **NEELAM BOHRA** FEB. 18, 2021 5 PM

California Hospitals And Nursing Homes Brace For Wildfire Blackouts

By Barbara Feder Ostrov
SEPTEMBER 10, 2019

REPUBLISH THIS STORY

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Threats and Hazards in Pennsylvania

York County, 2014

Delaware County, 2014

Philadelphia County, 2019

Lancaster County, 2019

Chester County, 2020

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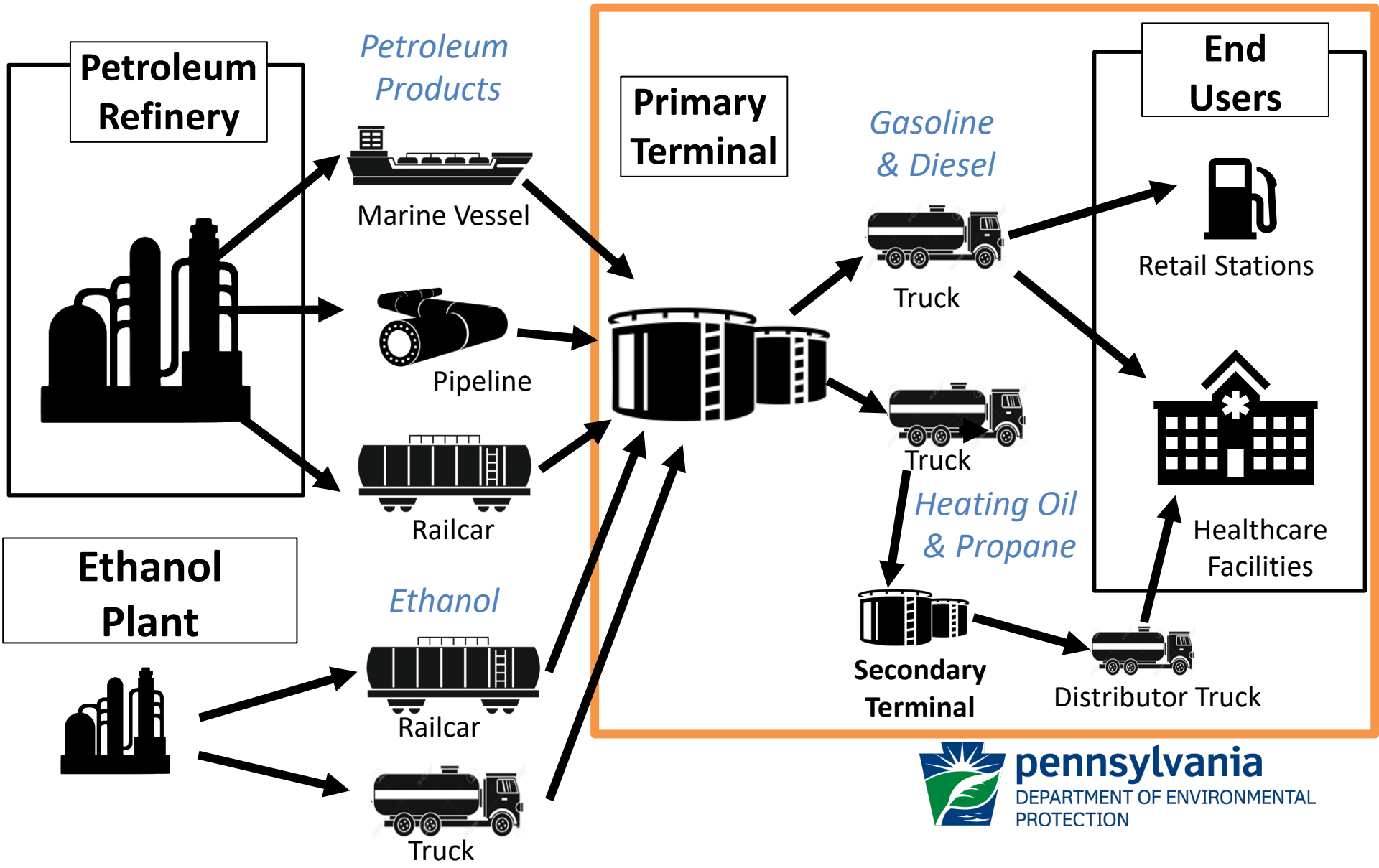
Fuel Distribution to Healthcare Facilities



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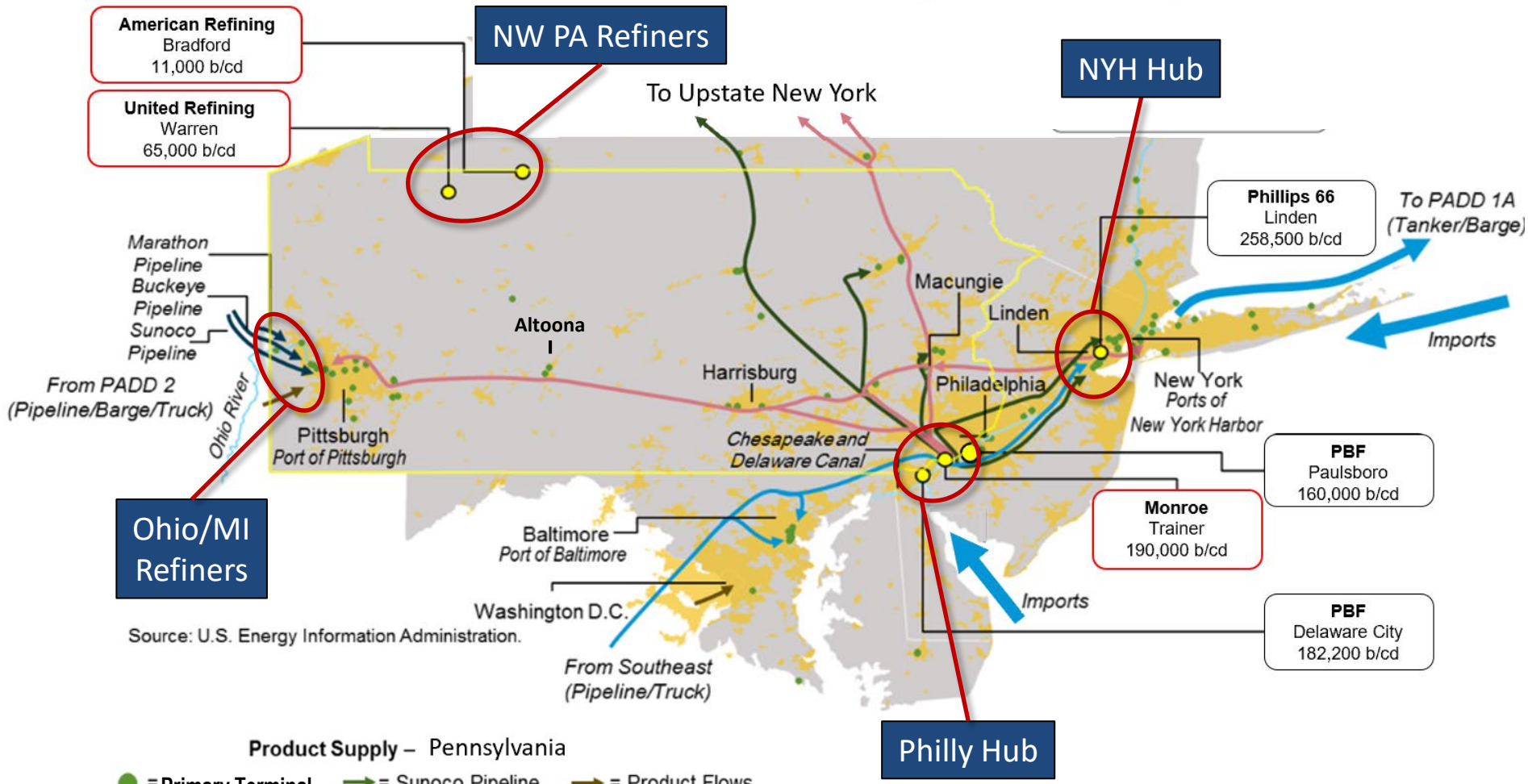
Pennsylvania Petroleum Fuels Infrastructure



Primary Terminal

eia

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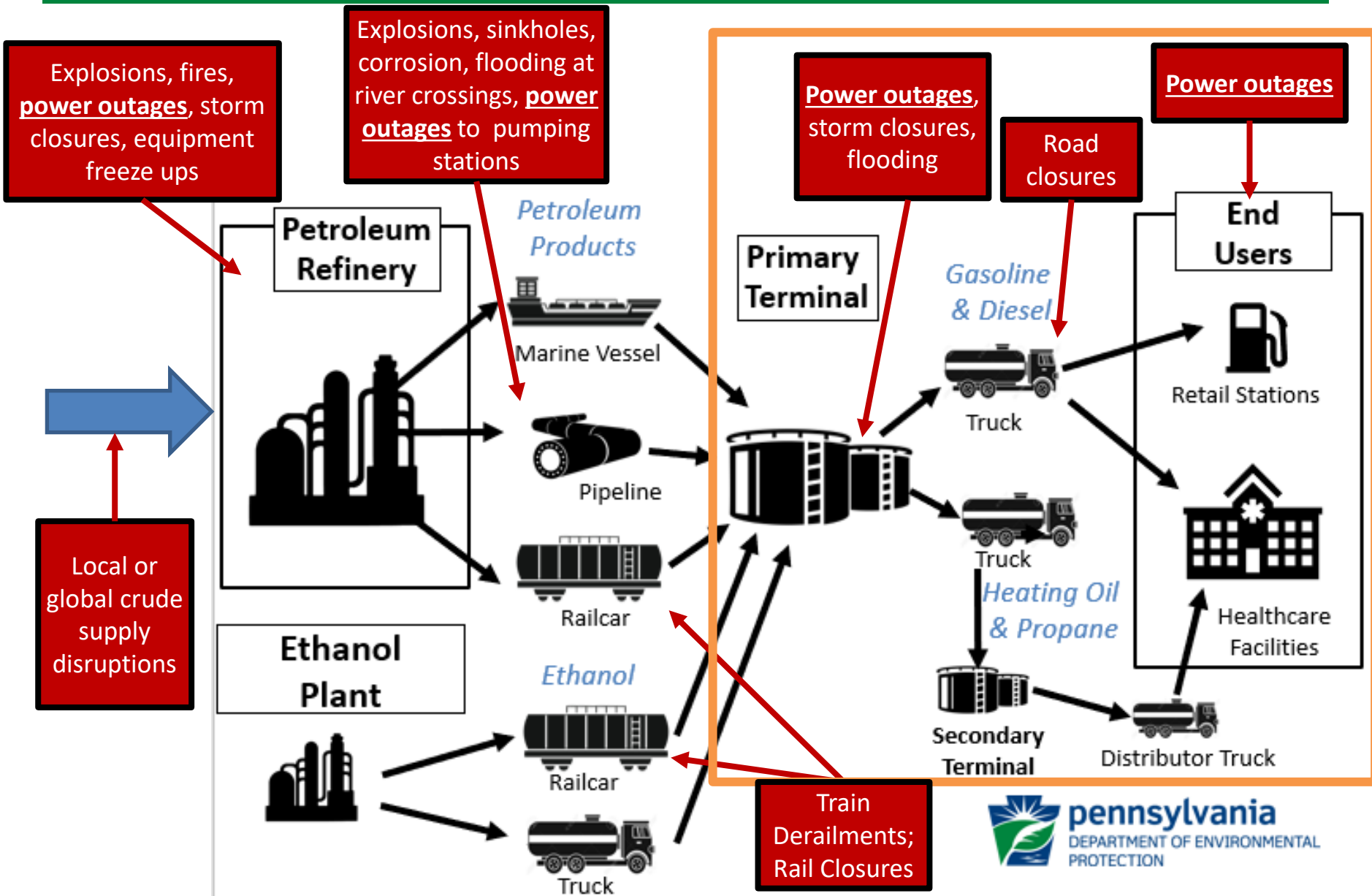
Liquid Fuels Supply Chain Vulnerabilities



POWERED For Patients™

Safeguarding Power in Critical Care Facilities

Best Practices for Power Emergency Planning in the Healthcare Sector

Eric Cote

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Powered for Patients: A Case Study

- Powered for Patients is a 501c3 non-profit that works to safeguard emergency power in critical healthcare facilities and accelerate response when emergency power faces a mechanical or fuel threat during power

POWERED For Patients™

Safeguarding Power in Critical Care Facilities

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Advancing Emergency Power Preparedness

- Powered for Patients advances its mission by:
- Developing and promoting best practices in safeguarding emergency power
- Facilitating increased collaboration between government officials, utilities and healthcare facilities to accelerate collective response when emergency power is threatened during power outages

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The Consequences of Emergency Power Failure

- Deaths in Hurricane Katrina were attributed to emergency power failures resulting from lack of fuel
- Numerous emergency evacuations of hospitals and skilled nursing facilities have been triggered by mechanical failures of emergency power systems or lack of fuel during power outages

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Emergency Power Failure Lessons Learned

- Superstorm Sandy – Flooding took out six New York City area hospital emergency power systems
- Hurricane Matthew – Southeast Regional Medical Center – Partial evacuation due to failure of emergency power
- Hurricane Laura – Emergency evacuation of patients dependent on life sustaining equipment when single generator failed

Little Sisters of the Poor Emergency Power Failure

- Failure of facility's 40 plus year old generator during Hurricane Isaias triggered emergency evacuation
- Better planning could have prevented catastrophic and irreversible loss of generator

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Little Sisters of the Poor Emergency Power Failure

- Emergency Power Lessons Learned
- Patients in single generator facilities with no redundant emergency power face greater risks when emergency power is threatened
- Older generators lack modern features such as automatic shutoff controls that are triggered when certain events occur, i.e., lack of cooling fluids, requiring extra vigilance by maintenance staff to avoid catastrophic loss of generator

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Little Sisters of the Poor Emergency Power Failure

- Emergency Power Lessons Learned
- Lack of knowledge about availability of portable oxygen bottles from local fire department delayed a decision to shut down the overheating generator, leading to a catastrophic and costly failure
- Heed warnings from generator service providers about overhauling or replacing outdated equipment

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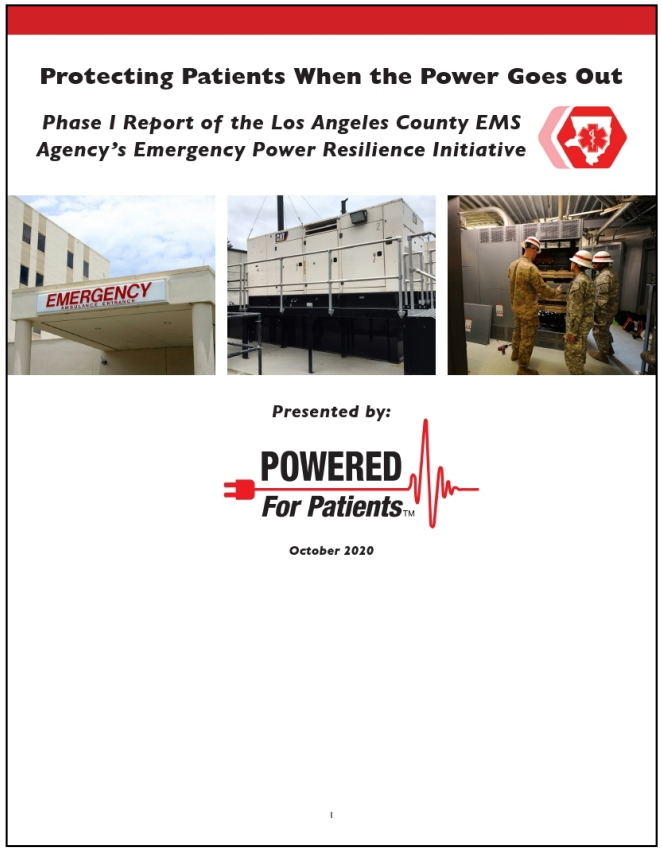
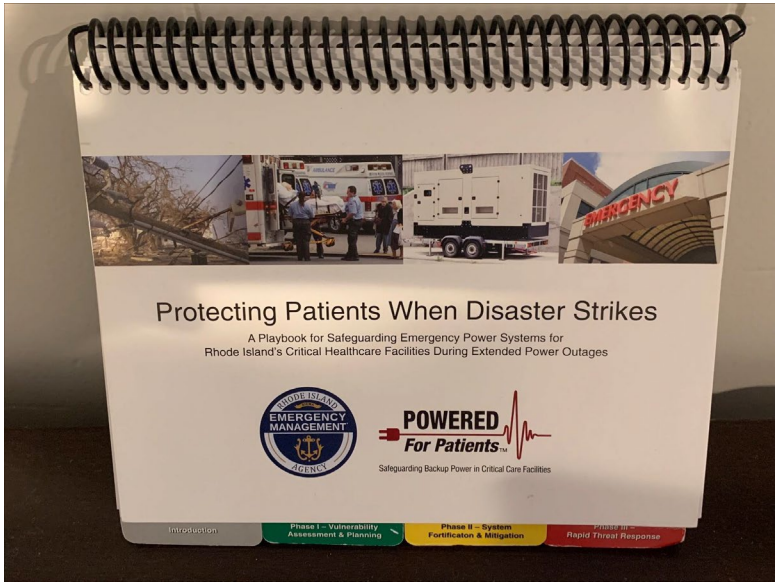
Lessons Learned from Powered for Patients Initiatives

- RI Emergency Management Agency
- Los Angeles County EMS Agency





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RI Emergency Management Agency Project

- Assessment of Emergency Power Threat Reporting Process
- Creation of new, early warning protocol at the first sign of a threat to emergency power
- Development of Playbook to guide actions of all stakeholders before, during and after disaster
- Playbook includes helpful Power Safety Tips and Checklists for Facility Managers

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The Value of Early Warning

- Government officials can help service providers overcome obstacles in getting to client sites quickly and can accelerate deployment of generators (when timely repair is not possible); can also gain valuable head start for potential evacuation planning
- Electric utilities can accelerate restoration process (when possible)

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Los Angeles County EMS Agency Initiative

- Multi-phase, four-year initiative launched in 2019 to better safeguard emergency power and accelerate response when emergency power at critical healthcare facilities is threatened during power outages

EMERGENCY MEDICAL SERVICES AGENCY
LOS ANGELES COUNTY

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Los Angeles County EMS Agency Initiative

Key Phase I Activities

1) Assessment of Emergency Power Threat Reporting and Response Protocols
2) Creation of Emergency Power Asset Inventory of Non-federal Assets
3) Evaluation of Emergency Power Systems at LA County Hospitals

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Los Angeles County EMS Agency Initiative

Key Phase I Activities

4) Facilitating Greater Collaboration with Electric Utilities

5) Facilitating Greater Collaboration with Generator Service, Fuel and Rental Providers

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Los Angeles County EMS Agency Initiative

Key Phase I Findings Relevant to Pennsylvania

1) Many of LA County's 14 single-generator, acute care hospitals are relying on seriously outdated generators.

- 2 - 60 years +
- 2 - Between 50 and 59 years old
- 5 - Between 40 and 49 years old
- 1 - Between 30 and 39 years of age
- 4 – Between 1 and 10 years of age

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Los Angeles County EMS Agency Initiative

Key Phase I Findings Relevant to Pennsylvania

2) Lack of redundant emergency power in single generator hospitals poses increased risk of emergency evacuation when emergency power faces a threat during a power outage. Outdated generators face a higher risk of failure.

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Los Angeles County EMS Agency Initiative

Key Phase I Findings Relevant to Pennsylvania

Estimated # of Single Generator Hospitals in Pennsylvania (based on LA County numbers): 38

Estimated # of generators between 60 and 69 years old	Estimated # of generators between 50 and 59 years old	Estimated # of generators between 40 and 49 years old	Estimated # of generators between 30 and 39 years old	Estimated # of generators between 0 and 10 years old
5	5	13	5	10

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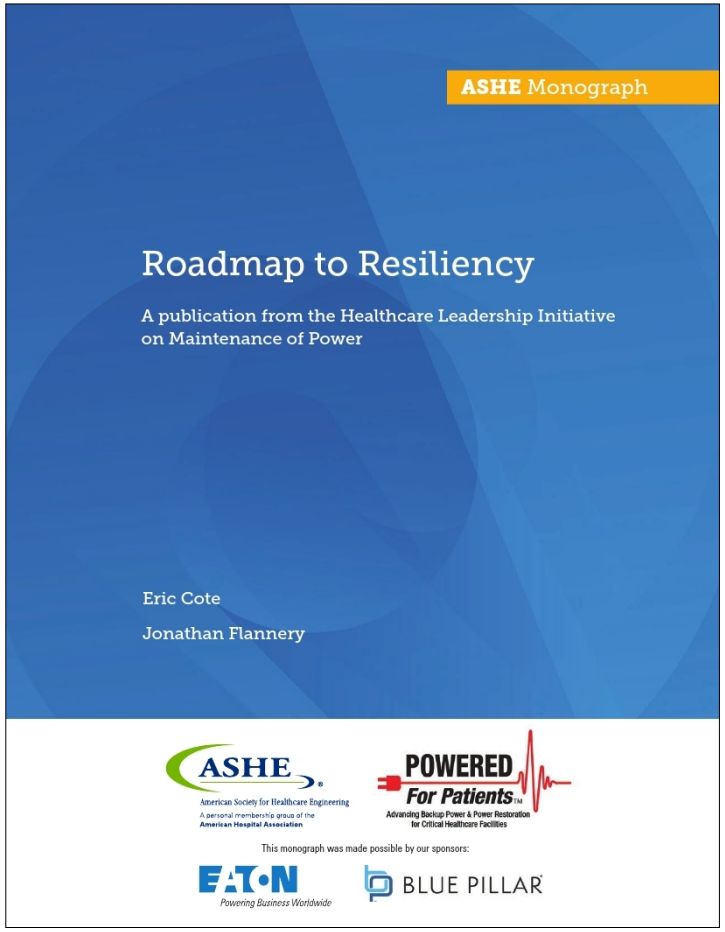
Los Angeles County EMS Agency Initiative

Life Expectancy of Emergency Power Equipment



Generators	30 years
ATS	25 years
Main switchgear	30 years
Emergency switchgear	30 years
Paralleling gear	25 years
Fuel storage tanks (above ground)	30 years
Fuel storage tanks (below ground)	25 years
Transformers	30 years
Motor control centers	30 years

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Los Angeles County EMS Agency Initiative

Key Phase I Findings Relevant to Pennsylvania

3) Lack of clear protocol for emergency power threat reporting by facilities and lack of clarity on response roles among ESF-8 and emergency management agencies increases risk for patients when emergency power is threatened during outages.

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Los Angeles County EMS Agency Initiative

Key Phase I Recommendations Relevant to Pennsylvania

1) Develop comprehensive Emergency Power Threat Reporting and Response Protocol to include an Early Warning and Status Update Protocol.
2) Create a risk classification for hospitals with more vulnerable emergency power systems.

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Los Angeles County EMS Agency Initiative

Key Phase I Recommendations Relevant to Pennsylvania

3) Stepped-up engagement with electric utilities to accelerate prioritized power restoration.

4) Create an Emergency Power Industry Working Group to facilitate coordination between government and generator service, fuel and rental providers when responding to emergency power threats at critical facilities.

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Automating Early Warning

- Power P.I.O.N.E.E.R. (Power Information Needed to Expedite Emergency Response)
- Harnesses Fault Detection & Diagnostic Technology in place in a growing number of U.S. hospitals. Leading providers include:
  - Schneider Electric
  - Eaton
  - Blue Pillar
  - Siemens
  - Automated Logic

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Automating Early Warning

- Automated, real time text and email alerts when emergency power is threatened accelerates diagnosis and repair
- Technology helps uncover source of mechanical problem that may not be readily evident during visual inspection of failing equipment

Automating Early Warning

- Hudson, FL Hurricane Hermine Hospital Case Study

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Additional Detail on Power P.I.O.N.E.E.R. Tool

- Until development of P.I.O.N.E.E.R., no hospital had ever been asked to share generator threat information with government officials or utilities during a power outage
- Initial deployments slated for Los Angeles County's single-generator hospitals

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Questions?

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Introduction to the Guidebook and Template Planning Tools

Matt Kelly

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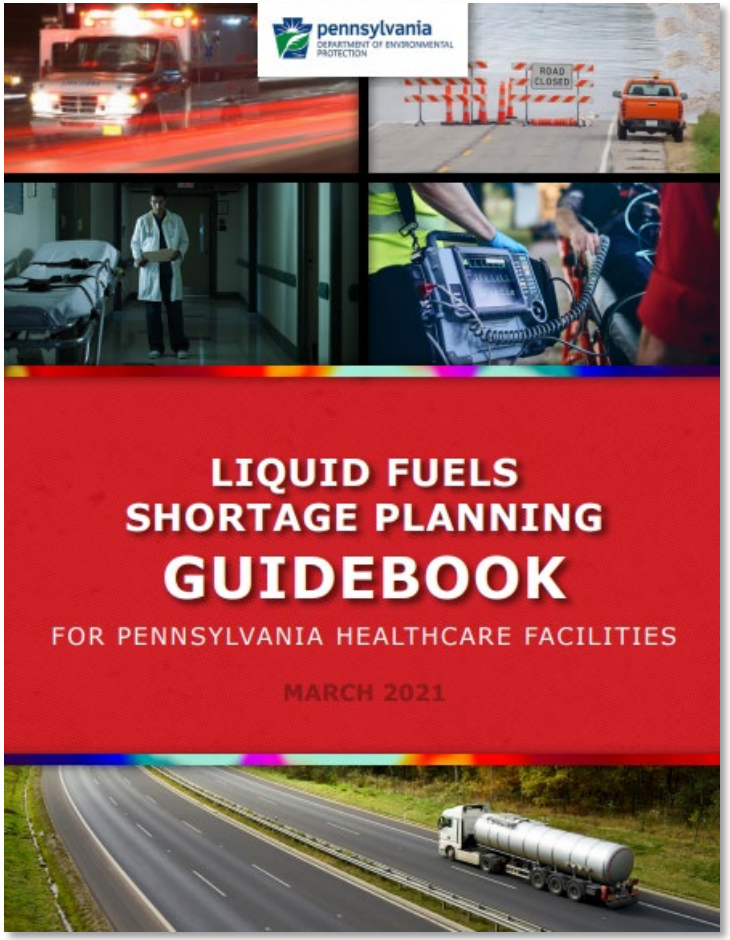
Liquid Fuels Shortage Planning Guidebook

Available on DEP website

- Provides general information on the fuels industry and guidance on planning for liquid fuels shortages.
- Provides detailed instructions on documenting liquid fuels needs and onsite storage availability at healthcare facilities.
  - Accompanying Template may also be helpful
- Provides links to additional reference material and resources



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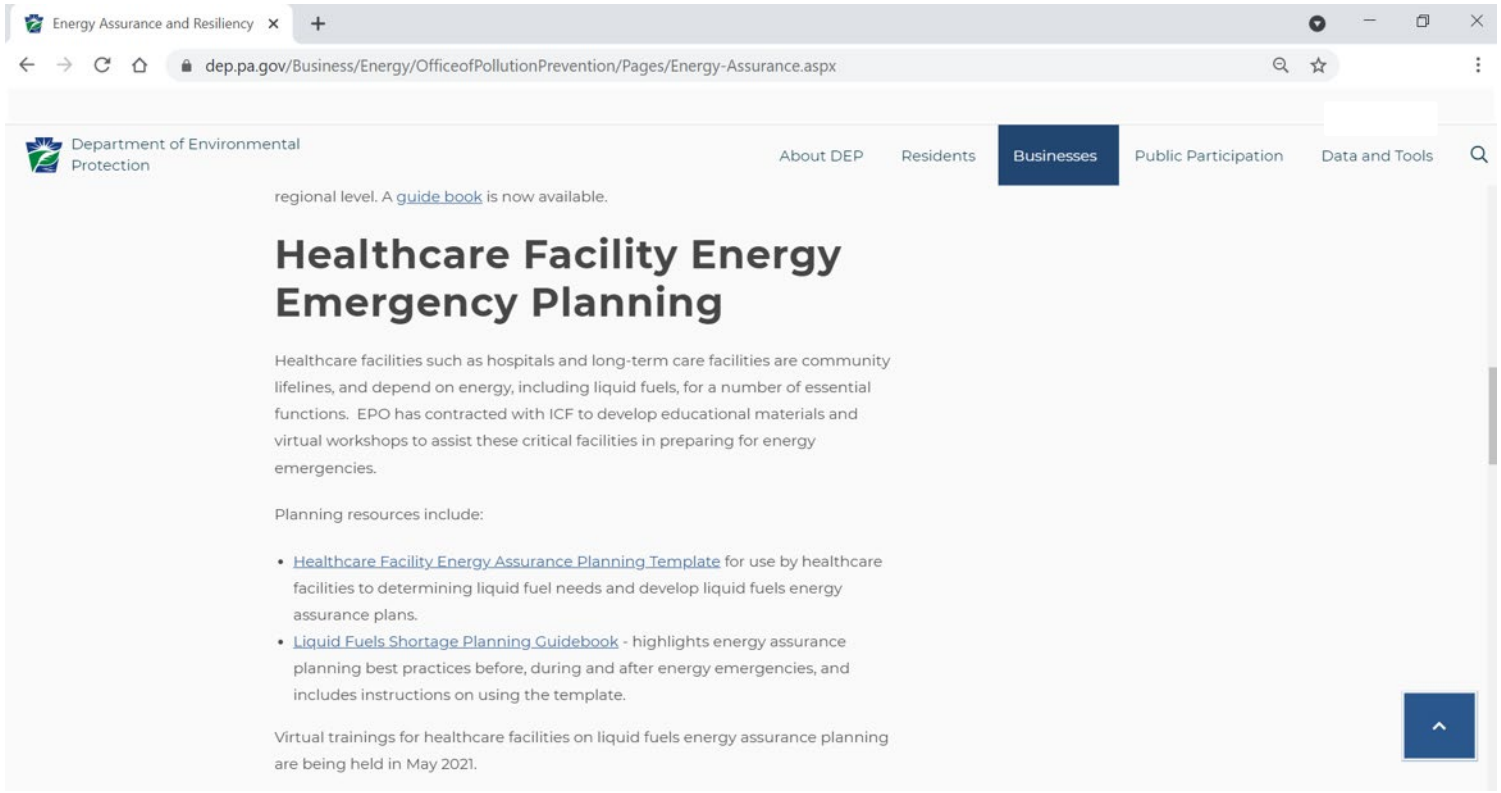
Liquid Fuels Shortage Planning Resources



Website:
https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/Pages/Energy-Assurance.aspx

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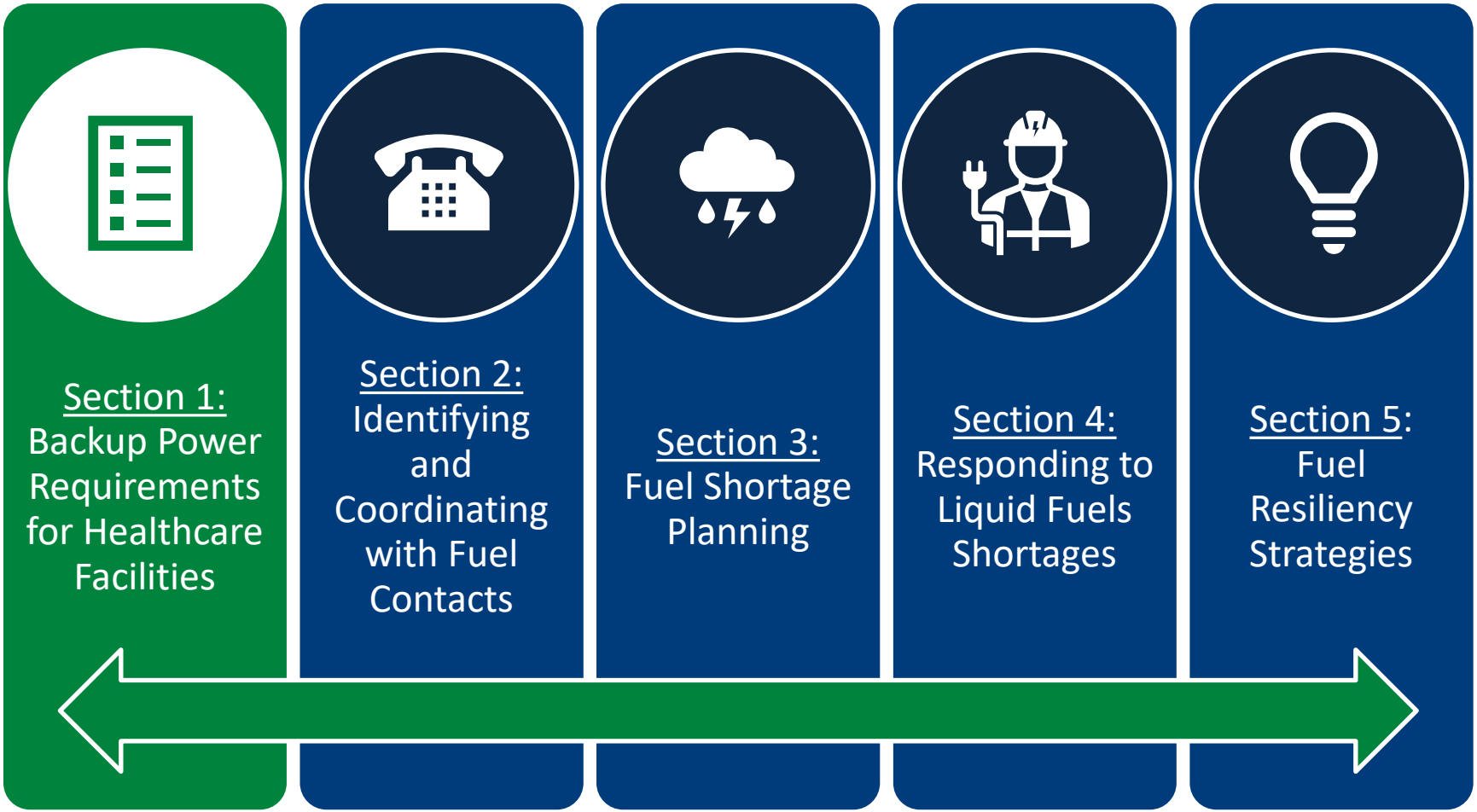
Liquid Fuels Shortage Planning Guidebook



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Summary of Requirements

- **Centers for Medicare & Medicaid Services (CMS):** Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers
- **National Fire Protection Association (NFPA):** NFPA 99 , NFPA 99 Tentative Interim Amendment (TIA) 12-3, and NFPA 110
- **Commonwealth of PA:** 28 Pa. Code 151.41, Chapter 151 of the PA DOH hospital regulations

Broadly, regulations:

- Require CMS-regulated facilities to have backup power systems and develop plans for emergency situations.
- Address the location, operation, and testing of generators for backup power systems.
- Do ***not*** specify how much fuel must be stored onsite or minimum required generator run time prior to refueling.

Key Resource for Understanding Federal Requirements: https://asprtracie.hhs.gov/cmsrule

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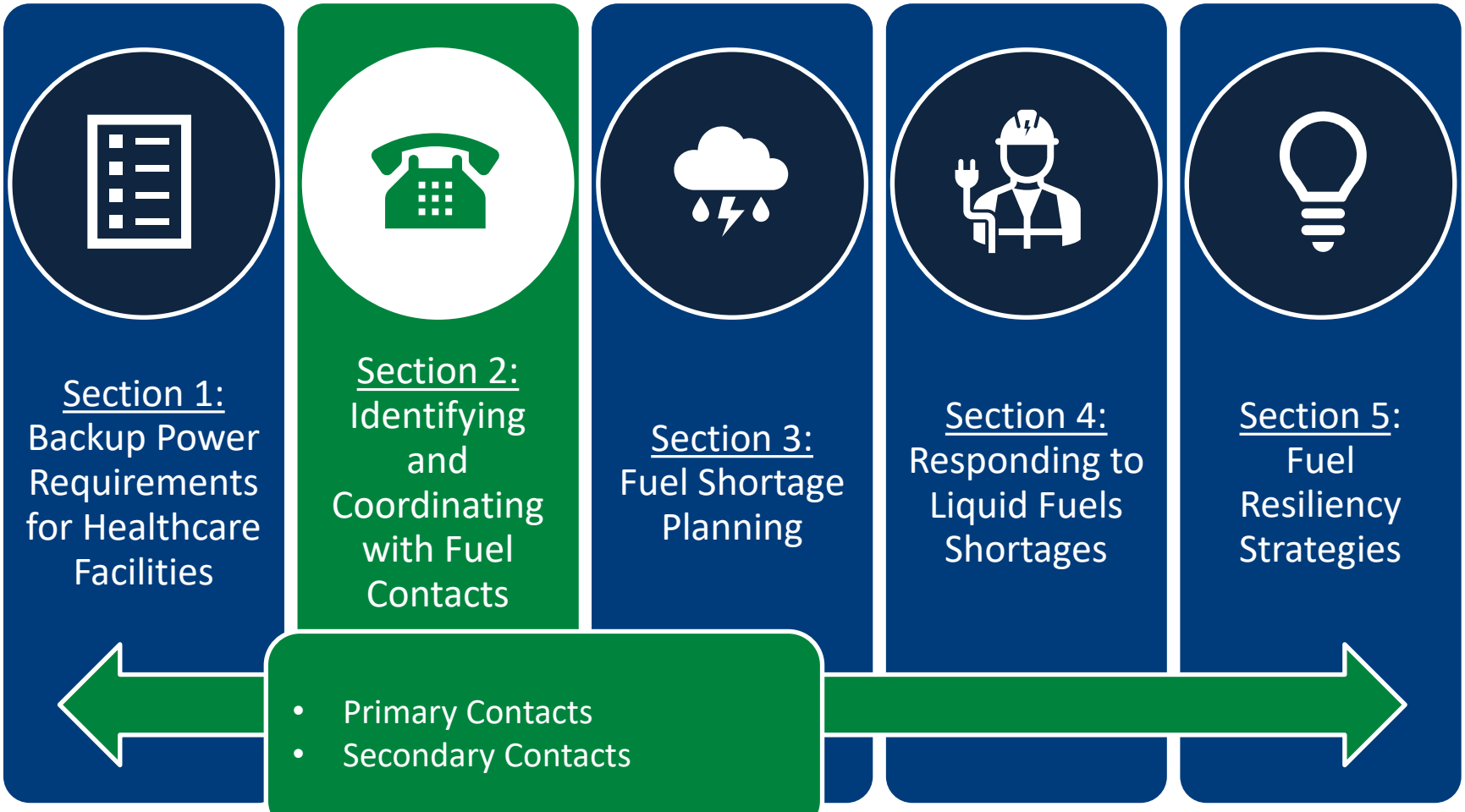
Liquid Fuels Shortage Planning Guidebook



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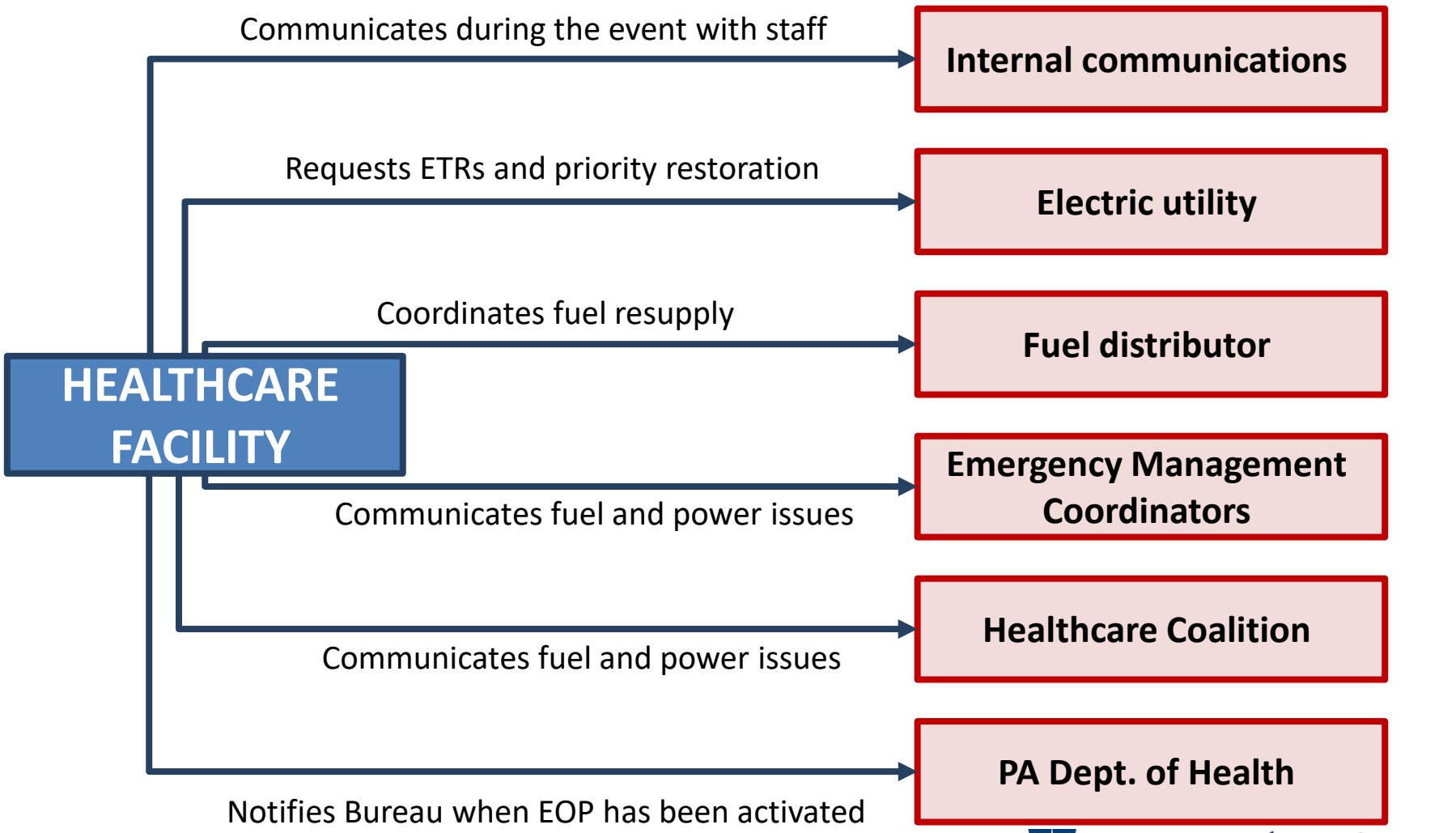
Key Contacts for Healthcare Facilities



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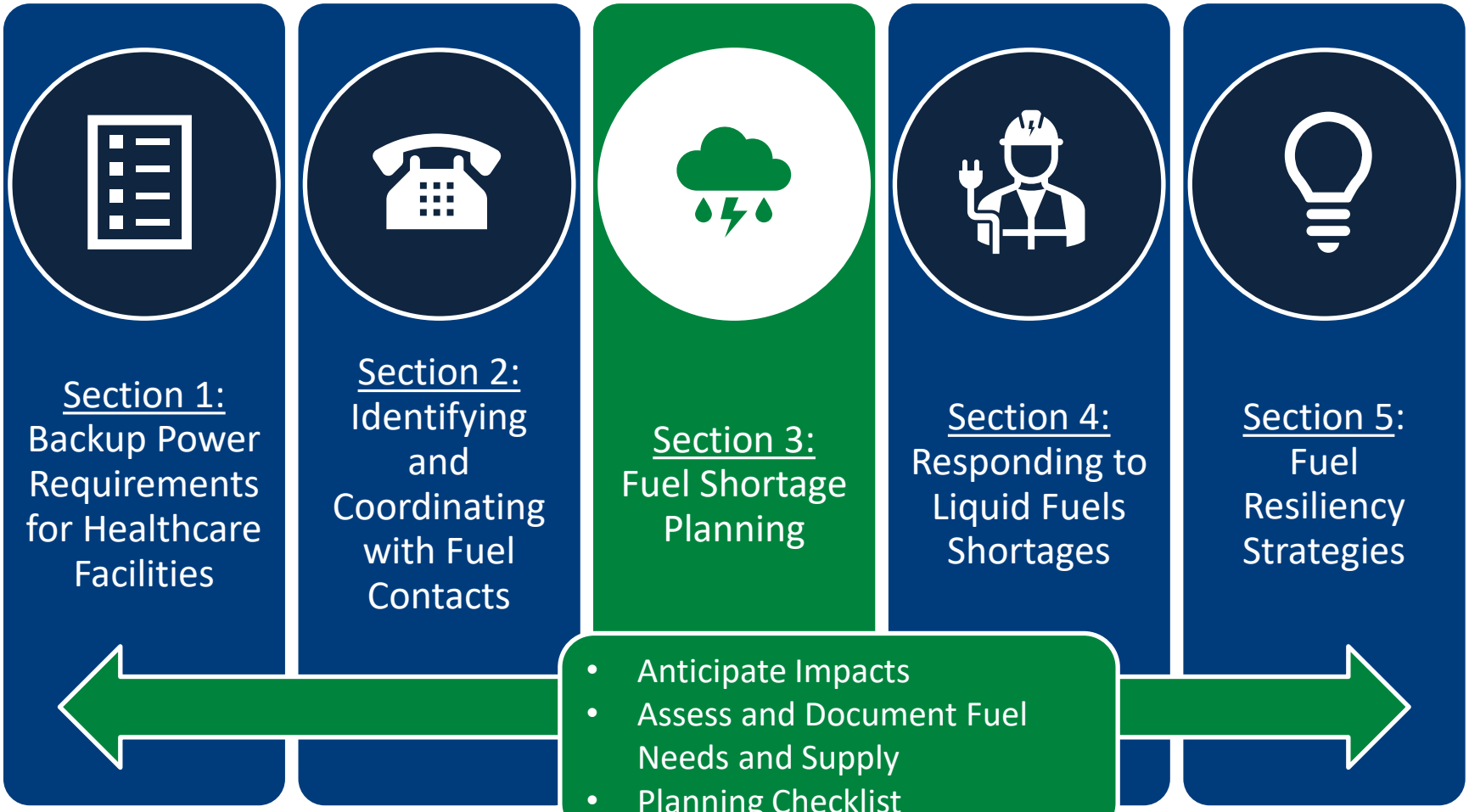

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Supporting Critical Infrastructure

Critical Infrastructure	Vulnerabilities Affecting Healthcare Sector
 Transportation	Blocked or closed roads
 Electric Utilities	Power outages
 Communications	IT systems and patient call system outages
 Water and Wastewater	Water treatment and water distribution outages

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Anticipate Impacts on Energy Systems

Consider how a prolonged loss of power would affect facility functions, including:

- ❑ HVAC and lighting
- ❑ Medical equipment
- ❑ Temperature control for patient spaces and medical supplies
- ❑ Food prep and storage
- ❑ Laundry services

Ask: Which of these functions can be "shed" to reduce the electric load on generators?

Consider how the facility would be affected if supporting infrastructure fails, including:

- ❑ IT systems and servers
- ❑ Communications
- ❑ Water treatment
- ❑ Roads and other transportation infrastructure
- ❑ Liquid fuels supply chain

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Tools to Assess Liquid Fuels Needs and Storage Capacity

Fuel Needs and Storage						Generators						Fuel Distributor Supplying Facility		
Type of Fuel	Emergency Demand (Gallons per Day)	Total Fuel Storage Capacity (Gallons)	Average Fuel Storage Volume (Gallons)	Estimated Fuel Reserve Duration (Hours)	Frequency of Fuel Delivery (Days Between Deliveries)	Generator Onsite (Y/N)	Generator Power Initated (Manually/ Automatically)	Capacity (kW)	Patient Care and Critical Services Served by Generator	Estimated Burn Rate-Full Load (Gallons/Hour)	Estimated Run Time (Hours)	Distributor	Point of Contact of Distributor	Phone Number of Distributor

Name of person filling out form: _____

Contact information: _____ **Date:** _____

BUILDING WORKSHEET

Fill out one sheet for each building in the healthcare facility.

Building Name: _____

Address: _____ Primary building uses: _____

POINT OF CONTACT FOR BUILDING

Name: _____ Title: _____

Phone: _____ Email: _____

Description of facility energy needs (Egress lighting, temperature control, medical equipment, ventilation, transportation, food refrigeration and preparation, water supply, sanitization, security systems, fire alarms, electronic health records, access to medication, etc.)

Does this building have a backup generator? ☐ Yes, one ☐ Yes, multiple ☐ No

If yes, answer the following questions for each generator:

GENERATORS AND GENERATOR FUEL

Description of patient care and critical services supported by the generator:

What fuel does it use? ☐ Diesel ☐ Other: _____

How does it power on? ☐ Automatically ☐ Manually

Generator capacity: _____ kW

Identifying generator capacity: *Your generator will likely have two capacities listed in its specifications: a maximum and the rated wattage. The maximum represents the largest amount of electricity a generator can produce. In practice, however, generators cannot be run at full capacity for extended periods of time. For a more realistic estimate for power generation, record the rated power, which is the amount of power that the generator can produce for long periods of time.*

Est. burn rate (full load): _____ gallons per hour

Estimating burn rate: *The U.S. Department of Health and Human Services ASPR Technical Resources, Assistance Center, and Information Exchange (TRACIE) has compiled a list of resources to help with burn rate estimation. These tools vary in complexity but generally take inputs on the generator capacity and load under which the generator is operating to estimate burn rate. Generators burn more fuel per hour under higher loads. A simple table for estimating the burn rate by capacity for diesel generators is available here.*

Template: Excel spreadsheet that compiles info for multiple buildings, generators, and vehicles

Guidebook Appendix A: Worksheet that helps the user collect information and contains tips and links for reference

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Building Worksheet: Generator Fuel

Name of person filling out form: _____

Contact information: _____ **Date:** _____

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Tracks:

- **Volumes of stored generator fuel**
- **Duration of generator run time**
- **Distributor contact info**

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Building Worksheet: Other Fuel

Does this building use other fuel not associated with generators? ☐ Yes ☐ No

If yes:

NON-GENERATOR FUELS

Fuel type: _____

Emergency demand for non-generator fuel: _____ gallons per day

Estimate emergency demand for non-generator fuel: *Review recent fuel bills to understand peak demand. If the facility has a submeter monitoring real-time fuel use, this data may also be helpful.*

Total fuel storage capacity: _____ gallons

Average fuel storage volume: _____ gallons

Total fuel storage capacity vs. average fuel storage volume: *Storage tanks are not typically filled to their maximum capacity on a given day under normal operations. Estimate the average volume in the storage tank on a normal day, as distinguished from the total fuel storage capacity of the tank. A simple estimation for facilities that lack storage volume data is to estimate the available storage as halfway between the threshold the facility has negotiated with the distributor for when the storage tank should be refilled and the volume immediately after a fuel delivery (typically full).*

Frequency of fuel delivery: _____ days between deliveries

Estimated fuel reserve duration: _____ hours

Estimating fuel reserve duration: *Divide average available storage capacity by the emergency demand. Then multiply by 24 to find duration in hours.*

FUEL DISTRIBUTOR FOR FACILITY

Primary Distributor Name: _____

Account number: _____

CONTACT INFORMATION

Name: _____ Phone: _____

Email: _____

Fuel(s) supplied: ☐ Diesel ☐ Heating oil ☐ Other: _____

Notes on contract *(Emergency fuel delivery contract established, credit limit, etc.)*

Tracks:

- **Volumes of heating fuel**
- **Distributor contact info**

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Vehicle Worksheet

Name of person filling out form: _____

Contact information: _____ **Date:** _____

VEHICLE WORKSHEET

Fill out one sheet for each type of vehicle owned by the healthcare facility.

Company: _____

Vehicle type: _____ **Vehicle count:** _____

POINT OF CONTACT FOR VEHICLES:

Name: _____ Title: _____

Phone: _____ Email: _____

VEHICLES AND VEHICLE FUEL USE

What fuel does the vehicle type use? ☐ Gasoline ☐ Diesel ☐ Other: _____

Emergency demand for vehicle fuel: _____ gallons per day

Estimating emergency demand for vehicle fuel: *This value should represent the total amount of fuel used by all vehicles of this type. Facilities can estimate this by:*

1. *Estimating on average how many miles the vehicles travel daily and then convert to a gallon equivalent using average fuel economy.*
2. *Alternately, consider how frequently the vehicles refuel (weekly, for example) and then divide the tank size by the number of days. Multiply the final number by the number of vehicles.*

Total fuel storage capacity: _____ gallons

Average fuel storage volume: _____ gallons

Total fuel storage capacity vs. average fuel storage volume: *These fields are intended to estimate onsite fuel storage used for storing vehicle fuel, as well as fuel stored within vehicles. In most cases, total fuel storage capacity is the fuel tank capacity for the vehicle type, multiplied by the number of vehicles. In contrast, the average fuel storage volume is the amount of fuel actually available for use on a given day. This number will necessarily be a rough estimate. If all vehicles are refueled at the end of the day, this number might be close to the total fuel storage capacity. However, if vehicles are used less frequently, tanks may typically be about half full.*

Estimated fuel reserve duration: _____ ***hours***

Estimating fuel reserve duration: *Divide average available storage capacity by the emergency demand. Then multiply by 24 to find duration in hours.*

Percentage of vehicle fuel needs met by offsite filling locations/retail stations: _____ %

If onsite fueling occurs: Frequency of delivery: _____ days between deliveries

Tracks:

- **Volume and duration of stored vehicle fuels**
- **Distributor info**

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Using the Template/Worksheet

Questions to Guide the Facility's Emergency Planning

- Is the **estimated run time** calculated for the backup generator appropriate for the building, given its function, patient population, and other factors?
- What **load could be shed** from a generator if needed to extend its run time in a fuel shortage? When would you consider shedding it? What building functions would be turned off to achieve this, and how many additional hours would be gained by doing this?
- Should the **fuel storage associated with the backup generators** be increased to allow generators to run longer during emergencies?

Additional Tools: Planning Checklist

Actions	When?	Responsible Party Contact Information	Notes
Generators			
Identify essential facility functions and minimum electricity needs.	Once, and update as needed		
Test generators and perform maintenance as needed.	Monthly, per NFPA guidance		
Maintain a list of key spare parts for your emergency power system, and stock parts as needed.	Once, and update as needed		
If generator is serviced by outside contractor(s), have contract for servicing generator. Understand contractor's capacity to provide service during emergencies when demand for servicing is high.	Once, and update as needed		
Prepare a written protocol with steps to take when transitioning to generator power and safety protocols. Review safety procedures with staff electricians and other facility managers annually.	Annually		
Fuel			
Calculate backup fuel needs and determine schedule for refueling, coupled with what threshold in tank would trigger the resupply of fuel.	Once, and update as needed		

Planning checklist in Guidebook

- Lists actions facility managers can take to prepare for liquid fuel shortages
- Has 3 main sections: generators, fuel, and key contacts
- Fill in info on contacts and notes and edit as needed

Continues in Guidebook

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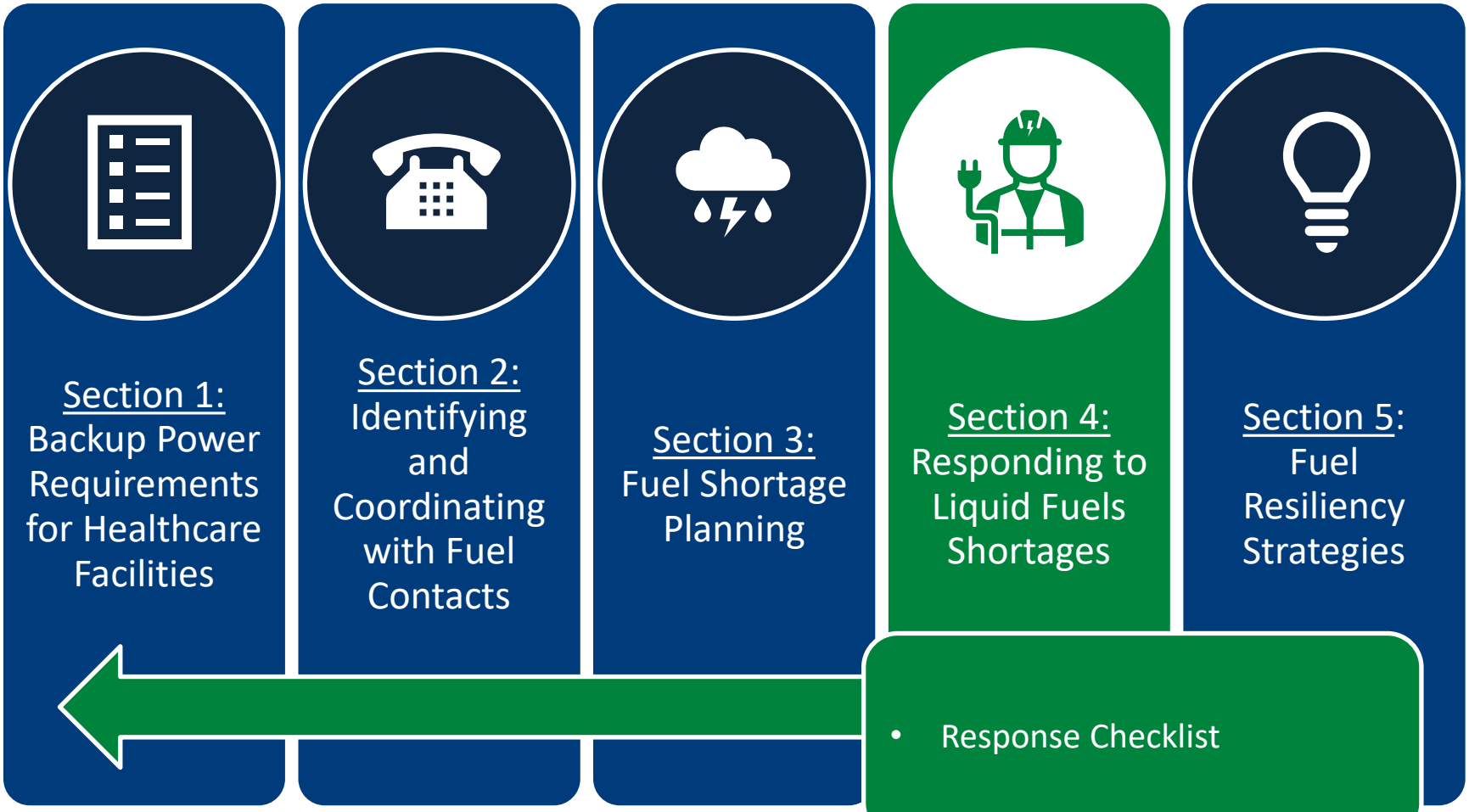
Liquid Fuels Shortage Planning Guidebook



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Response Checklist

Actions	When?	Responsible Party Contact Information	Notes
Healthcare Facility			
Activate emergency operations plan.	Once initially and as necessary		
Maintain awareness of facility operations, including: - Monitor generator(s) status. - Monitor facility power needs and prioritize needs. - Monitor fuel in storage for backup generation.	Continually		
Ensure that there is communication capability between patient care units and incident command to ensure patient safety through primary or redundant communications systems and platforms.	Continually		
Ensure that the facility has an executable plan in place to evacuate or transfer patients, should the situation warrant. Communicate to staff any potential power delays or curtailments necessary. Inform staff of refueling concerns, estimated restoration times from your utility, and any other factors that would affect the decision to shelter in place versus evacuate.	Continually		
Verify that safety protocols are being followed, including: - Emergency power systems do not feed power back to the grid. - Utility lines connecting to the facility have not been removed.	Continually		
Activate Recovery Plan - Have plan to phase out backup generators as power comes back online. - Identify mechanism to ensure resupply from fuel distributor. - Conduct after-action review and determine lessons learned. - Conduct thorough testing of building systems before coming back online, and ensure that no damage occurred while operating on generator power.	Continually		

Continues in Guidebook

Response checklist in Guidebook

- Lists actions facility managers can take to respond to liquid fuel shortages
- Has 4 main sections: healthcare facility, electric utility, fuel distributor, and government/regulatory
- Fill in info on contacts and notes and edit as needed

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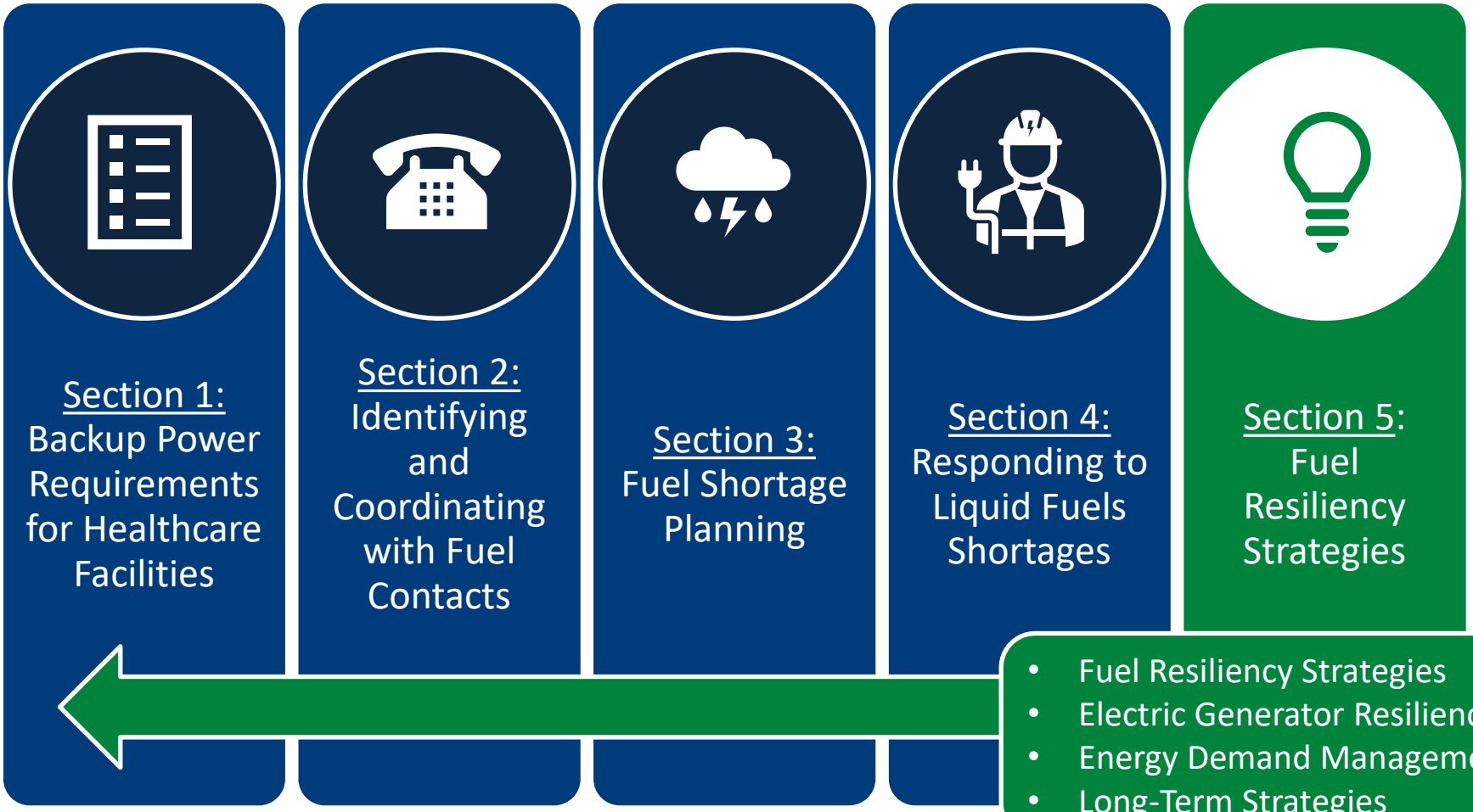
Liquid Fuels Shortage Planning Guidebook



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Best Practices to Improve Resilience

- **Backup generation**
- **Fuel needs**
- **Fuel storage**
- **Distributors**

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Best Practices to Improve Resilience

Backup generation

- Maintain sufficient backup generation and reassess emergency power needs regularly.
- Flood-proof generators and all associated equipment, and test generators regularly.
- Identify a source for replacement generators before disaster.
- Develop an emergency power load shedding plan in the event of a partial loss of emergency power.
- Maintain adequate supplies of consumable generator parts on site.

Best Practices to Improve Resilience

Fuel needs

- Assess and document fuel needs.
- Develop a back up plan to fill fuel tanks if main access point is flooded, i.e., consider filling tank from vent pipe.

Fuel storage

• Store adequate fuel volumes onsite and test fuel regularly from 3 elevations of fuel tank.

•Have a qualified vendor periodically "polish" diesel fuel to ensure reliability when it is needed.

Best Practices to Improve Resilience

Distributors

- Discuss emergency preparedness with primary distributor and establish contract with backup fuel distributor.
- Be sure supplier knows key details of your emergency power fuel system, so the distributor can plan accordingly, such as:
  - What is the length of fill from the truck?
  - Are there any tank accessibility issues?
  - Is there gravity drop?

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Suggested Questions for Distributors

1. Is my facility a priority customer?
2. How do you manage supply shortages?
3. How many trucks and drivers do you have?
4. Do you anticipate access issues with the transportation routes between your fuel supply and my facility?
5. Are there formal contracting structures that would help increase my facility's access to fuel during an event?

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Questions?

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05/26/2021

Emergency Fuel Preparation Overview

***Goal of Meeting**: Discuss factors that can prevent emergency power generators from running during a disaster event, along with proactive solutions to help ensure 100% uptime.*

Matt Hurley- *Commercial Fuels Manager, Tevis Energy*
Mike Adams- *Vice President, Adams Petroleum Products*
Bruce W. Spiridonoff- *Executive Vice President, Tevis Energy*

Will Your Emergency Generator Run During a Disaster Event?

- **Generator Reliability**
  - Ongoing Generator Maintenance?
  - Fuel Stability?
- **Fuel Supply/Distribution Reliability**
  - Longevity of onsite fuel supply
  - Will your fuel supplier show up?
    - Overloaded on fuel orders
    - Equipment accessibility
  - Emergency fuel contractual agreement in place?

Solutions to Help Ensure Generator Uptime

Generator Maintenance

- Routine Maintenance
- Regular Running of Equipment
- Fuel Filtering & Polishing
- Fuel Additives & Stabilizers

Fuel Supply/Distribution

- Keep Fuel Storage Tanks Full
- Direct Contact Information for your Fuel Company & Know What Needs Fueled
- Emergency Fuel Assurance Contract
  - Dedicated Fuel Delivery Assets
  - Regionalized
- Ensure a reputable fuel supplier with resources to handle your need

Questions?

Thank you!

Long-Term Fuel Resiliency Strategies

Adam Agalloco

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Investing in Long-Term Resilience

- Backup generation provides a temporary source of power for facilities.
- Consider resilience projects that improve long-term resilience through:
  - Reducing overall electricity use
  - Onsite generation
  - Reduced dependence on liquid fuels
- Investing in long-term resilience may also lower carbon emissions and energy costs.

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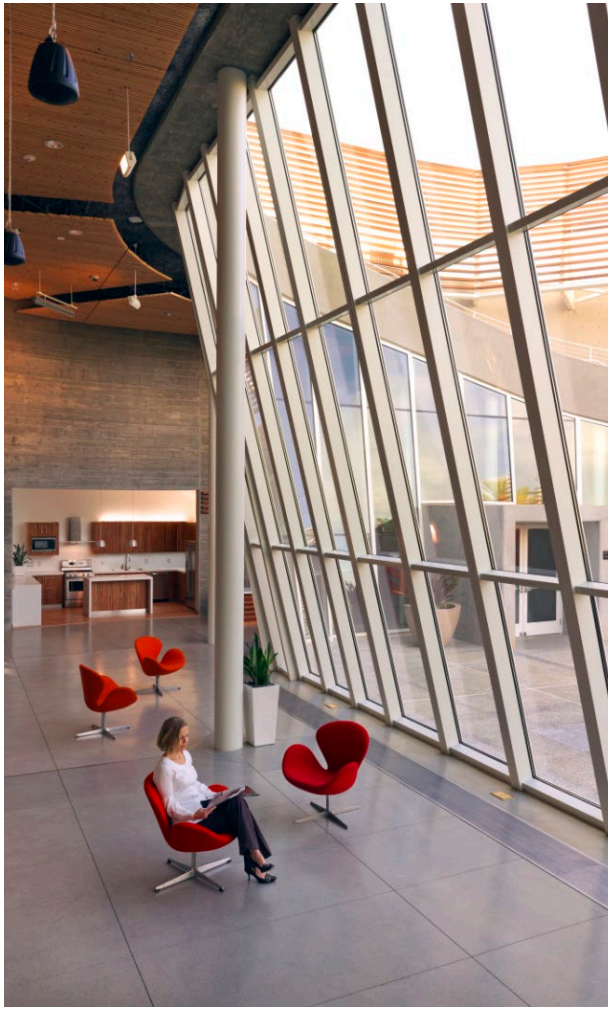
Long-Term Resilience Options

- Local generation
  - Combined heat and power (CHP)
  - Solar generation
  - Microgrids
- Energy demand management
  - Energy efficiency improvements
  - Utilities' management programs



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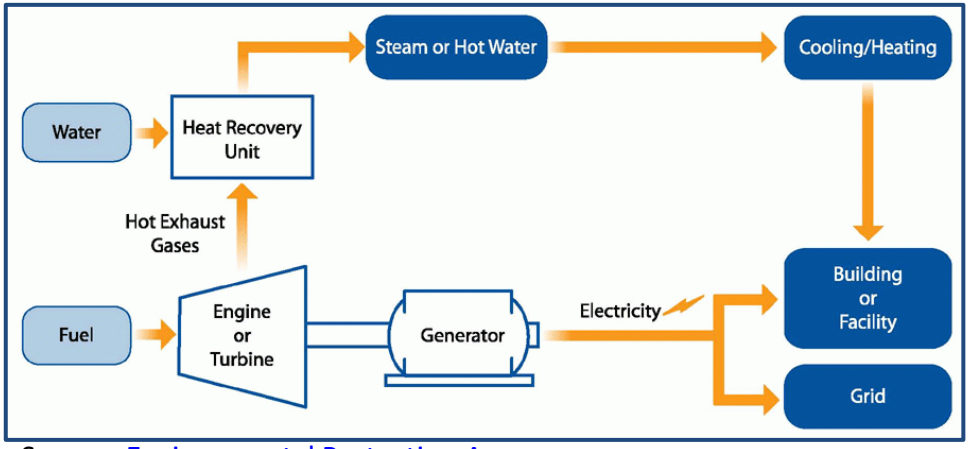
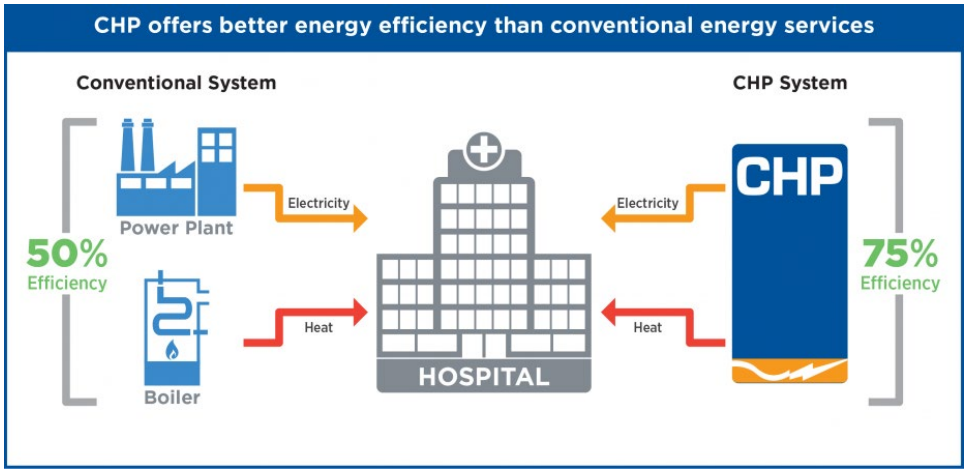
Combined Heat and Power (CHP)

- Also called “”cogeneration”
- Generates electricity onsite and uses the resulting waste heat to generate additional electricity or hot water/steam for use in the facility
- Produces both electricity and heat at high efficiencies, reducing emissions and potentially energy costs



Source: Environmental Protection Agency



Source: Environmental Protection Agency

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Solar Generation

- Generates clean, carbon-free power
- Cannot operate during a grid-level power outage unless specifically designed to “island” (disconnect from grid)
- Solar panels capable of islanding increase the facility’s resilience to grid-level power disruptions, especially when paired with a battery system

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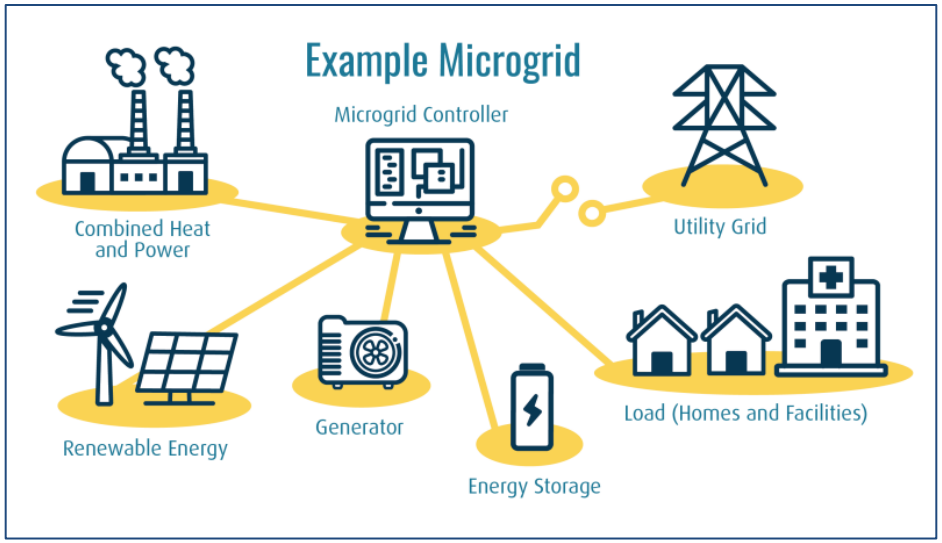
Microgrids

- Relatively small, independently controlled power systems
- Can operate even when the larger grid is experiencing outages
- Can run on a variety of generation sources:
  - Generation can be onsite or offsite
  - Generation with renewable fuels can increase sustainability



Source: National Association of State Energy Officials

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Energy Management Improvements

Examples include:

- Lighting and building control upgrades
- Utilities' load and energy management programs

Benefits include:

- Reduced energy costs
- Lower overall electricity load
- Thermal temperatures maintained for longer
- Less fuel needed to operate the facility

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Questions?

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Thank you for attending!

Please complete the short survey after the webinar to receive continuing education credit and help guide future work on this topic.

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