Kentucky Perspective on Hazard Mitigation and Energy Resilience

KENTUCKY OFFICE OF ENERGY POLICY



Office of Energy Policy's Mission

To support the utilization of Kentucky's energy resources for the betterment of the Commonwealth while protecting and improving our environment.



What is Resilience?

Energy Assurance is a broad term but in general means having the confidence or certainty in the ability to respond to an energy emergency or disruption. This confidence or certainty comes from three main categories of activities: preparation and planning, mitigation and response, and recovery. Central to all of this is education, outreach, and communication.

Energy Security can mean the uninterrupted availability of energy sources at affordable prices.

Energy Reliability can be thought of as the ability of an energy production system to provide consistent and expected levels of energy under stated conditions for a specified period of time.

Resilience means the ability to withstand and reduce the magnitude and/or duration of a disruptive event and includes the capability to anticipate, absorb, adapt to, and rapidly recover from such an event.



Kentucky's Energy Sector Risk Profile

Kentucky had 305 Major Disaster Declarations, 0 Emergency Declarations, and 5 Fire Management Assistance Declarations for 11 events between 2013 and 2019.

Annualized Frequency of and Property Damage Due to Natural Hazards, 2009–2019



Tornado Risk to Kentucky's Electricity Infrastructure



Data Sources: NOAA and USGS



Hazard Mitigation?

Hazard Mitigation is defined as **any sustained action taken to reduce or eliminate the long-term risk to life and property from hazard events**. It is an on-going process that occurs before, during, and after disasters and serves to break the cycle of damage and repair in hazardous areas.



Putting It All Together





Traditional Energy Sector Mitigation Measures

Back-up Power Supplies

Utility Undergrounding

Utility Pole Replacement

Vegetation Management

Flood proofing critical infrastructure

- Raising Structures
- Securing tanks
- Building berms or flood walls



Emerging Energy Sector Mitigation Solutions

Distributed Energy Resources

Microgrid\Community Enclaves or Resilience Hubs

Energy Efficiency Codes (Building for resilience)

Affordable Housing and Energy Efficiency

Smart Grid Improvements

- Advanced Metering Infrastructure
- Increased SCADA penetration
- Automatic Switching of circuits and circuit reconfiguration
- Dual feeds into critical facilities, redundant systems

Regional re-fueling centers

Fuel Diversification and Fuel Conservation (Energy Efficiency in Transportation)

Energy Efficiency Financing Mechanisms

Demand Response programs



Examples in Action

Energy efficiency is key to people staying in their homes longer and being comfortable and healthy.

Energy Efficiency allows business to remain operational.

Energy conservation and demand response are essential in power restoration.



West Kentucky Rural Electric Cooperative December 12, 2021 · 🚱

ATTENTION! Members from Fancy Farm back toward Mayfield on and along Hwy 80, please take immediate steps to conserve energy. Your circuit is threatening to overload. Turn down the heat, delay dishwashing and clothes drying and other electric appliances. Thank you!!

🖒 191

42 Comments 1.5K Shares



West Kentucky Rural Electric Cooperative December 14, 2021 · 🚱

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Energy conservation is no longer needed and the system is stable. Your support helped us put more people on at a critical time--thank you!



49 Comments 85 Shares



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Building for Resilience

Structural Insulated Panels:

- Kentucky Habitat for Humanity Structural Insulated Panel Training and Veteran Housing Project
- COAP, Inc: "To provide sustainable, affordable, safe, energy efficient, and dry housing to moderate, low, and very low income Harlan, Bell, and Leslie Counties of Kentucky families and individuals."

Building for Resilience with Concrete: Insulated Concrete Forms training with the National Ready Mix Concrete Association

Energy Star Certification of affordable housing unit with Housing Development Alliance and energy efficiency and construction job training for those in addiction recovery

Starting January 1, 2019, any new P-12 school built to accommodate more than 50 students will be **required to provide a storm shelter large enough for all of the school's occupants**.



Morgan County Storm Shelter built with ICF



Energy Savings Performance Contracting and PACE Financing

Local government's through ESPC can improve energy efficiency and resilience through performance contracting

PACE financing allows commercial facilities to complete efficiency projects including those that increase resilience and pay for it via additional property tax assessment



Ivy Knoll Senior Retirement Community, located in the City of Covington, made significant building improvements to systems that were outdated or extremely energy inefficient.

Senior living facilities are critical areas of need in the COVID-19 response. These energy efficiency measure ensure these facilities remain operational and meet the comfort needs of residents.



Norton Healthcare Audubon Hospital

Hospitals are critical facilities. These energy efficiency measure ensure these facilities remain financially healthy, operational and meet the comfort needs of patients and staff.



Energy Efficiency enabled the facility to add essential capacity, save utility costs, and improve operations.

Building automation enables efficiency.

A hybrid energy plant to combine gas air cooled chillers with thermal storage.

All of these measures makes Norton Healthcare more resilient.



Learning from the Past: West Liberty, Kentucky

March 2, 2012 EF3 tornado ripped through the community.

Goal: To rebuild itself with a 21st century, lower-cost, sustainable infrastructure, and develop a path to create job-producing business opportunities, increasing the tax base and attract new residents to West Liberty.

Energy Efficiency Education Dashboard

Appalachian Regional Commission Grant

LEED Certification

Affordable Sustainable Housing



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