Energy Systems and Enterprise Resilience

Course syllabus

Recorded and self-paced. Watch on your own schedule.
Available Friday, January 29, 2027.
Eight recorded sessions of one hour each, about eight hours in total.
Awards the SSF Certificate of Completion, and counts toward the SSF Resilient Energy Certificate and the Comprehensive Certificate.

Register at ssfworld.org/energy-systems-and-enterprise-resilience/

Taught by Joseph Fiksel, Ph.D.

Author of Resilient by Design. Former VP, Battelle. Professor Emeritus, The Ohio State University.

Course overview

Most enterprises, including municipalities, depend on energy they do not fully control. Grid outages, fuel price shocks, cyber-attacks on pipelines and grid operators, and extreme weather events are increasingly impacting operations, supply chains, and balance sheets. Most organizations still carry energy as a facilities line item and discover their actual exposure in the midst of an outage.

This course integrates the concepts of risk management, business continuity, and enterprise resilience, with a focus on energy systems. It draws on Dr. Fiksel's proven design-for-resilience framework, and includes numerous case studies of leading organizations that have built up resilience against energy-related shocks and stresses, as well as other types of disruptions.

The course distinguishes between operational resilience, the capacity to recover rapidly from business interruptions, and strategic resilience, the capacity to anticipate and adapt to turbulent change in the business environment. It also elucidates the potential synergies and trade-offs among resilience, sustainability, and profitability, and demonstrates how resilience improvement has delivered measurable value for both shareholders and stakeholders.

Other courses in the program explain how electricity markets and distributed energy systems work. This course shows how decision-makers can deploy those energy systems effectively in a way that minimizes exposure to crises and enables them to adapt and flourish amidst global challenges.

Who should enroll

This course is designed for professionals who are responsible for decisions about risk, continuity, or capital investment in organizations that depend on reliable, affordable energy. No engineering background is required, but it lays a foundation for deeper dives into specific energy technologies.

- Enterprise risk managers, business continuity planners, and crisis management leads
- Corporate sustainability officers reconciling decarbonization commitments with reliability
- Facilities, energy, and operations managers responsible for critical loads and deliverables
- Supply chain and procurement leaders exposed to energy disruptions among suppliers
- Finance and capital planning professionals balancing resilience with other investments
- Government officials responsible for operational continuity and mission achievement
- Consultants advising organizations on risk and resilience for climate and other hazards

- Educators updating their insights into energy resilience concepts and methods

Course organization

The course is organized into three blocks, totaling approximately eight hours.

- Block I defines enterprise risk, resilience, and the fundamental role of energy systems.
- Block II examines how organizations actually performed under recent energy disruptions.
- Block III provides tools for improving resilience and closes with the logical business case.

BLOCK I

The Role of Energy Systems in Enterprise Resilience

Session 1 · The Risk Landscape

The urgent need for enterprise resilience in a turbulent and complex business environment

- Definition of energy resilience for an enterprise
- Limits of conventional enterprise risk management
- The need for both operational and strategic resilience
- Examples of preparedness for unforeseen black swan events

Session 2 · Disaster Risk Reduction

Interdependencies and potential disruptions in global energy and material networks

- The United Nations Sendai Framework for disaster risk reduction
- Energy-related pressure points and potential for cascading disruptions
- The importance of collaboration between businesses and communities
- Selected international examples of resilient risk management practices

Session 3 · Taking a Systems Approach

Triple Value framework for integrated understanding of resilience and sustainability

- Overview of interactions among industrial, social, and environmental systems
- The nexus between sustainability and resilience, and potential synergies or conflicts
- How circularity contributes to resilience, sustainability, and shareholder value creation
- Examples of simulation tools to model system dynamics and potential future scenarios

BLOCK II

Energy Resilience in Action

Session 4 · Resilience Assessment

Energy-related risk exposures, vulnerabilities, capabilities, and resilience costs and benefits

- Case studies of significant energy-related disruptions and responses from government and industry
- The SCRAM™ methodology for identifying and balancing an enterprise's vulnerabilities and capabilities
- Integrating energy resilience metrics with sustainability and financial performance metrics
- Analytical tools for estimating the expected net benefits of alternative resilience strategies and tactics

Session 5 · System Interactions

Accounting for key links among businesses, communities, and environmental resources

- External factors: grid failures, economic fluctuations, supply chain delays, malicious interference
- Importance of collaboration among utilities, businesses, local governments, and civil society
- Value of resilience practices such as onsite generation and storage, microgrids, demand flexibility

Session 6 · Strategic Foresight

Anticipating fundamental shifts that may disrupt enterprise continuity or viability

- Impacts of technological changes: data centers, electrification, artificial intelligence technology
- Impacts of structural changes: global warming, geopolitical pressures, regulatory policies
- Industry and government examples of disaster risk reduction and post-event recovery
- Application of simulation methods to future scenarios, stress testing, and policy development

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BLOCK III

Developing Resilient Systems

Session 7 · Innovative Approaches

Stepwise innovation process for balancing resilience with other management priorities

- Basic principles of life cycle concurrent design applied to design for resilience (DFR)
- Value of resilience practices such as onsite generation and storage, microgrids, demand flexibility
- Opportunities to develop capital investments with inherent no-regrets resilience benefits
- Examples of advanced methods: adaptation pathways, probabilistic decision analysis

Session 8 · The Value Proposition

Resilience challenges, industry and government opportunities, and monetization methods

- Contributions of enterprise resilience to company shareholder value and community prosperity
- Evaluating costs of disruptions and benefits of resilience interventions, including intangible value
- Making a business case to senior leadership for process improvement and innovation
- Conclusions and review of key points in the course

About the instructor



Joseph Fiksel, Ph.D.

Former VP for Life Cycle Management, Battelle; Professor Emeritus, The Ohio State University

Joseph Fiksel is one of the original thought leaders in the field of corporate design for sustainability and resilience. He has consulted for multi-national companies, government agencies, and industry consortia. He co-founded the Center for Resilience at Ohio State, as well as the Sustainability Institute, and authored the seminal book Resilient by Design.

Much of Joseph's work has focused on risk management and performance improvement in the energy sector, with clients ranging from the Electric Power Research Institute to major utilities such as American Electric Power, Duke Energy, and ComEd. At Ohio State he led the development of innovative tools for modeling of energy and material flows, identifying opportunities for decarbonization, circularity, and waste reduction.

What you will learn

- Why energy dependence is a ubiquitous risk, often overlooked in traditional risk management
- Opportunities to enhance both operational and strategic energy resilience in your organization
- How to assess key vulnerabilities and resilience capabilities, within and beyond the fence line
- Where sustainability and resilience goals align or conflict, and how to manage the trade-offs
- Recent energy disruptions that show why some enterprises recover more quickly than others
- How to apply design principles, resilience indicators, and simulation tools to energy decisions
- How to quantify the cost of disruption and build a value proposition for resilience investment

AFTER THIS COURSE

You will be able to make a credible business case to senior leadership for energy resilience, and to lead the implementation of strategic initiatives to build resilience into your organization.

How the course runs

ON-DEMAND INSTRUCTION

Eight one-hour recorded sessions taught by Joseph Fiksel, available for self-paced, on-demand use. Every session consists of a detailed slide presentation with voice-over explanation.

COURSE MATERIALS

Downloadable slide decks, references, and reading lists accompany each block.

ENERGY BASICS 101 PRIMER

About 30 minutes, recorded, included with registration and available immediately. Covers the fundamentals of electricity, energy, and power for students with limited technical background. Optional, and no engineering background is required to take the course.

PRACTITIONER WEBINAR SERIES

Ongoing access to the SSF Practitioner Webinar Series, which runs separately from the course and continues with no end date.

QUALIFYING QUIZ

A short end-of-course quiz confirms your working command of the material. Seventy percent is passing, with two retakes available. Passing the quiz releases your Certificate of Completion and credits the course toward the Resilient Energy and Comprehensive Certificates.

Credential from this course

You will receive the SSF Certificate of Completion, awarded after passing the qualifying quiz.

This course also counts toward the SSF Resilient Energy Certificate (any four of the seven program courses) and the SSF Resilient Energy Comprehensive Certificate (all seven). See the full program for the other courses and how the credentials work together.

$495

Registration fee

ssfworld.org/energy-systems-and-enterprise-resilience/

PART OF A LARGER PROGRAM

The SSF Resilient Energy Certificate Program

This is one of seven courses in the SSF Resilient Energy Certificate Program. Each course stands on its own. Together, they cover the full working landscape of the U.S. energy sector, taught by senior practitioners in each domain.

See the full program: https://ssfworld.org/ssf-resilient-energy-certificate/