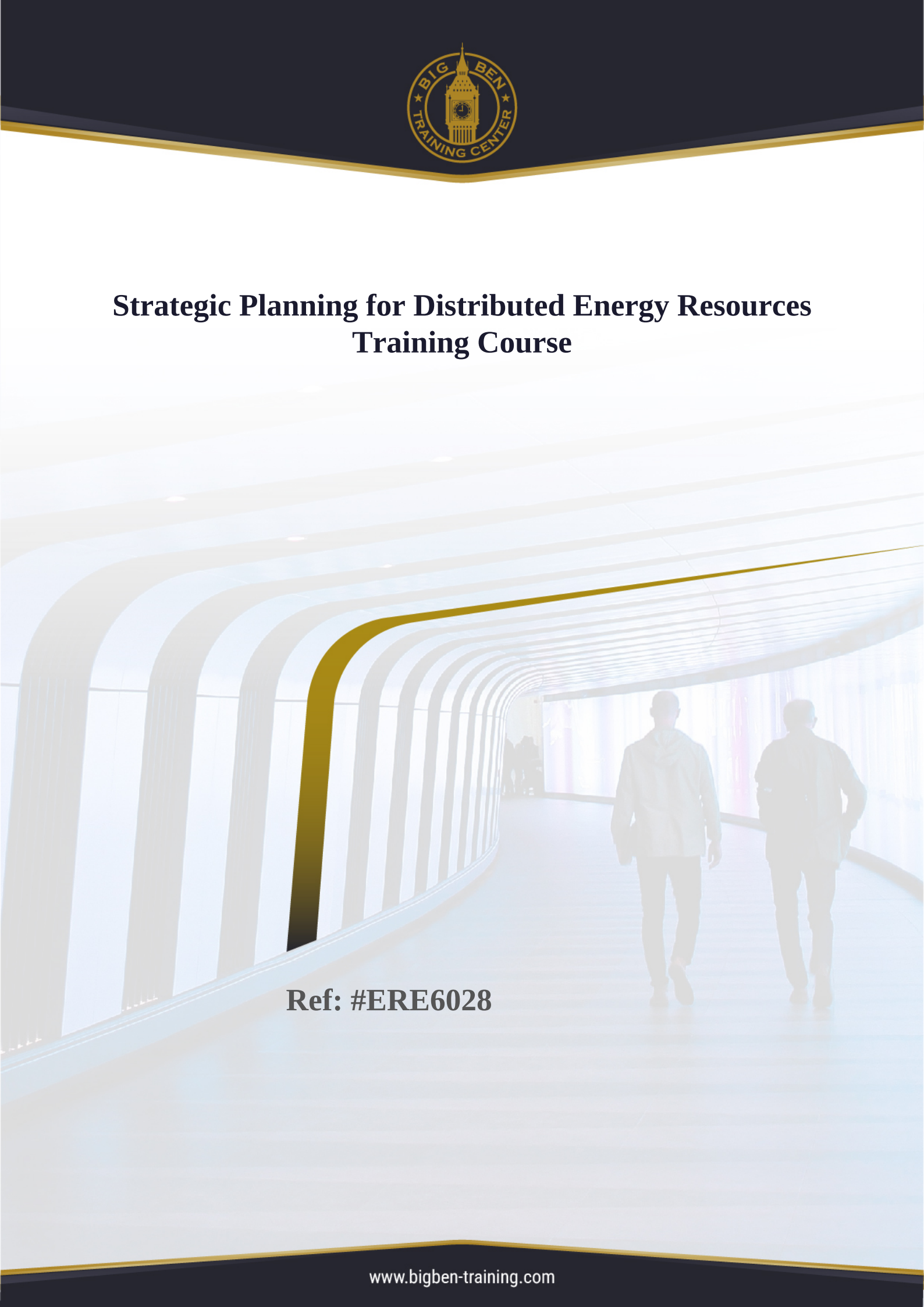
Strategic Planning for Distributed Energy Resources Training Course



Ref: #ERE6028

Course Introduction / Overview:

The "Strategic Planning for Distributed Energy Resources" training course, offered by BIG BEN Training Center, provides a deep understanding of the modern energy landscape. This course focuses on the complex and evolving field of distributed energy resources (DER), a critical component of smart grids and sustainable energy systems. A foundational text in this area is "Distributed Generation: The Power and Promise" by John W. Twidell, which highlights the integration of these resources. This course delves into all aspects of DER, from solar PV and wind power to battery storage and electric vehicles, exploring how they are changing traditional utility models. Participants will learn how to plan for DER integration, manage their impact on grid stability, and optimize their performance. We will cover a range of topics, including the economic analysis of DER projects, regulatory frameworks, and the use of advanced energy management systems. The course emphasizes the importance of a strategic approach to DER, moving beyond basic deployment to a more integrated, and grid-responsive management model. Professionals will acquire practical skills in forecasting, site selection, and interconnection planning. This comprehensive training is essential for anyone aiming to navigate the complexities of a decentralized power system and leverage distributed energy for greater efficiency, resilience, and sustainability.

Target Audience / This training course is suitable for:

- Electrical and power system engineers.
- Utility and grid operators.
- Renewable energy project managers.
- Energy policymakers and regulators.
- Urban planners and developers.
- Consultants in the energy sector.
- Researchers and academics focus on smart grids.
- Government agencies and public utility personnel.

Target Sectors and Industries:

- Electric utilities and grid operators.
- Renewable energy generation companies.
- Energy consulting firms.
- Government agencies and regulatory bodies.
- Real estate development.
- Technology and software companies specializing in energy management.
- Transportation sector with a focus on EV charging infrastructure.
- Industrial and commercial facilities.

Target Organizations Departments:

- Strategic planning departments.
- Grid modernization and smart grid teams.
- Distribution and transmission departments.
- Asset management and engineering departments.
- Regulatory and compliance departments.
- Renewable energy and sustainability departments.
- Research and development departments.
- Energy management departments.

Course Offerings:

By the end of this course, the participants will have able to:

- Formulate a strategic plan for integrating DER.
- Assess the economic viability of distributed generation projects.
- Analyze the impact of DER on-grid stability and reliability.
- Master interconnection standards and agreements for DER.
- Utilize advanced software for DER management and control.
- Understand the role of energy storage in DER systems.
- Navigate regulatory policies and incentives for distributed resources.
- Develop a framework for managing a portfolio of DER assets.
- Plan for the integration of electric vehicles and smart charging infrastructure.
- Design resilient and decentralized power systems.

Course Methodology:

This course uses a highly interactive and practical methodology to ensure a comprehensive understanding of distributed energy resources. The training combines expert-led lectures with a hands-on approach, allowing participants to directly apply theoretical concepts. We will use case studies to explore real-world scenarios, such as the planning and deployment of a microgrid in a commercial area or the integration of a large-scale solar farm into an existing utility grid. These case studies will address the technical, economic, and regulatory challenges involved. The program will also include group exercises and workshops, encouraging collaboration among participants as they work through complex planning problems. Participants will engage with simulation and modeling software, which allows them to design and test various DER configurations and their impact on grid performance. This approach ensures that participants gain practical skills in forecasting, site selection, and financial analysis. Feedback sessions and Q&A segments will be a constant feature, ensuring that all participants can grasp the material. This methodology, championed by BIG BEN Training Center, is designed to build the confidence and expertise needed to manage the complexities of modern decentralized power systems.

Course Agenda (Course Units):

Unit One: Foundations of Distributed Energy Resources

- Introduction to distributed energy resources (DER).
- Types of DER, including solar PV, wind, and energy storage.
- The role of DER in modern power systems and smart grids.
- Economic drivers and benefits of DER.
- Policy and regulatory frameworks for DER deployment.
- Grid impact and technical challenges of high DER penetration.
- Planning and forecasting for DER growth.

Unit Two: DER Interconnection and Grid Integration

- Interconnection standards and procedures.
- Technical requirements for safe DER integration.
- Impact on distribution grid voltage and power flow.
- Advanced grid control and management for DER.
- Smart inverters and their functionalities.
- Hosting capacity analysis.
- Microgrid design and operation.

Unit Three: Energy Storage and Electric Vehicles

- The role of energy storage in DER.
- Types of battery energy storage systems (BESS).
- Applications of BESS for grid stability and peak shaving.
- Planning for electric vehicle (EV) charging infrastructure.
- Vehicle-to-grid (V2G) technology.
- Smart charging and demand response.
- Case studies on energy storage and EV integration.

Unit Four: Economic Analysis and Business Models

- Cost-benefit analysis of DER projects.
- Financial models for distributed generation.
- Revenue streams for DER owners.
- Market design and participation for DER.
- Value of resilience and reliability.
- Performance monitoring and evaluation.
- Business models for aggregators and virtual power plants.

Unit Five: Strategic Planning and Future Trends

- Developing a comprehensive DER strategic plan.
- Stakeholder engagement and community planning.
- Cybersecurity for DER systems.
- Future of DER and emerging technologies.
- Artificial intelligence in DER management.
- Policy trends and future regulations.
- Final case study: Developing a DER roadmap for a municipality.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Given the rapid advancements in technology and policy, what is the most significant long-term challenge facing strategic planning for distributed energy resources, and how can current methodologies be adapted to address it?

What unique qualities does this course offer compared to other courses?

This training course distinguishes itself by offering a holistic and strategic perspective on distributed energy resources (DER), a subject often treated from a purely technical standpoint. Unlike other courses that may focus solely on the engineering aspects of solar panels or batteries, this program provides a comprehensive view that includes planning, economic analysis, and regulatory navigation. The curriculum is designed to give participants a robust understanding of the entire DER lifecycle, from initial site selection and financial modeling to grid integration and long-term asset management. The course places a strong emphasis on real-world applications through detailed case studies and practical exercises. Participants will learn how to solve complex, multi-faceted problems, such as integrating large-scale DER projects into an aging grid or developing a business model for a virtual power plant. The program's content is continuously updated to reflect the latest trends in technology, policy, and market dynamics. This unique approach, which combines technical expertise with strategic foresight, equips professionals with the skills needed to lead in the rapidly evolving energy sector. It ensures that participants can confidently plan and manage distributed energy projects that are not only technically sound but also economically and environmentally sustainable.