



AI022: AI Strategy for Energy Utilities

Training Description:

The **AI Strategy for Energy Utilities** program is a comprehensive five-day course designed to equip energy and utility professionals with the knowledge and practical frameworks required to develop, evaluate, and implement an effective Artificial Intelligence strategy within the energy sector.

The training course explores how AI, machine learning, generative AI, advanced analytics, digital twins, intelligent automation, and predictive technologies can transform utility operations, asset management, customer services, energy trading, grid management and organizational decision-making.

Participants will learn how to identify high-value AI opportunities, assess organizational readiness, prioritize AI use cases, develop business cases, manage data and technology requirements, address cybersecurity and responsible-AI risks and build a practical AI roadmap aligned with corporate and energy-transition objectives.

The training course combines strategic concepts, industry applications, case studies, interactive exercises, and practical workshops to enable participants to translate AI opportunities into an actionable utility AI strategy.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand the strategic role of AI in modern energy and utility organizations
- ✓ Identify high-value AI applications across generation, transmission, distribution and customer operations
- ✓ Assess AI maturity, data readiness, technology capabilities and organizational readiness
- ✓ Develop and prioritize AI use cases based on business value, feasibility, risk and strategic alignment
- ✓ Understand the role of machine learning, generative AI, predictive analytics, computer vision, IoT, and digital twins
- ✓ Develop business cases and estimate AI-related benefits, costs and ROI
- ✓ Establish appropriate data, technology, governance, cybersecurity and responsible-AI requirements
- ✓ Design an AI operating model covering people, processes, technology, data and governance
- ✓ Develop an AI implementation roadmap and portfolio of initiatives
- ✓ Establish KPIs and performance measures for AI programs
- ✓ Manage organizational change, workforce implications and AI adoption
- ✓ Create an executive-level AI strategy and implementation plan for an energy utility

By the end of the five days, participants will have moved from **understanding AI → identifying opportunities → assessing readiness → building business cases → establishing governance → developing an actionable AI strategy and roadmap** specifically suited to the energy and utilities environment.

Training Designed for:

This training course is intended for Utility executives and senior managers, Strategy and business planning professionals, Digital transformation leaders, AI, data science, and analytics professionals, IT and OT managers, Energy operations and asset management professionals, Generation, transmission, and distribution managers, Grid modernization and smart-grid professionals, Engineering and technical

managers, Innovation and technology leaders, Risk, compliance, cybersecurity, and governance professionals, Customer experience and commercial managers Sustainability and energy-transition professionals and Project and program managers involved in digital transformation.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

AI AND THE FUTURE OF THE ENERGY UTILITY

❖ Module 1: Understanding AI in the Energy Sector

- AI fundamentals and terminology
- Artificial Intelligence vs. Machine Learning vs. Deep Learning
- Generative AI and Large Language Models
- Predictive analytics and intelligent automation
- Computer vision and natural language processing
- AI, IoT, cloud, edge computing, and digital twins
- From traditional utilities to AI-enabled utilities

❖ Module 2: The Strategic Impact of AI

- How AI is changing the energy value chain
- AI and the transformation of utility business models
- AI for operational excellence and cost optimization
- AI for reliability, resilience, and sustainability
- AI and the energy transition
- AI-enabled decision-making

❖ Module 3: AI Applications Across the Utility Value Chain

- Power generation optimization
- Predictive maintenance
- Transmission and distribution optimization
- Grid balancing and forecasting
- Renewable energy forecasting
- Energy demand forecasting
- Fault and outage prediction
- Smart-meter analytics
- Customer service and personalization
- Energy trading and market analytics

❖ Workshop:

AI Opportunity Mapping: Identify potential AI opportunities across the participant's utility value chain

DAY TWO:

IDENTIFYING AND PRIORITIZING AI USE CASES

❖ Module 1: AI Use-Case Identification

- Identifying business problems suitable for AI
- From business challenges to AI opportunities
- Use-case discovery techniques
- Operational vs. strategic AI use cases
- Generative AI use cases for utilities
- Human-in-the-loop AI applications

❖ Module 2: High-Value Utility AI Use Cases

- Predictive asset maintenance
- Load and demand forecasting
- Renewable generation forecasting
- Grid optimization
- Vegetation and infrastructure monitoring
- Leak and anomaly detection
- Equipment failure prediction
- Intelligent outage management
- Customer demand management
- Automated inspection
- AI-powered knowledge management
- Generative AI for engineering and operations

❖ Module 3: AI Use-Case Prioritization

- Business value assessment
- Technical feasibility
- Data availability
- Implementation complexity
- Risk and regulatory considerations
- Strategic alignment
- Time-to-value
- Cost-benefit analysis

❖ Workshop:

AI Use-Case Prioritization Matrix: Score and rank potential AI initiatives according to value, feasibility, risk and strategic importance.

DAY THREE:

DATA, TECHNOLOGY, GOVERNANCE AND RESPONSIBLE AI

❖ Module 1: Data Strategy for AI

- Why data is the foundation of AI
- Utility data sources
- SCADA, IoT, smart meters, GIS, ERP, CRM and EAM data
- Data quality and data availability
- Data integration and interoperability
- Data lakes and modern data platforms
- Real-time and historical data

- Data ownership and stewardship
- ❖ **Module 2: AI Technology Architecture**
 - Cloud, hybrid and edge AI
 - AI platforms and infrastructure
 - Machine learning platforms
 - Generative AI architecture
 - APIs and enterprise integration
 - Digital twins and AI
 - OT/IT integration
 - AI model lifecycle management
- ❖ **Module 3: AI Governance and Cybersecurity**
 - AI governance frameworks
 - Responsible AI principles
 - Privacy and data protection
 - AI transparency and explainability
 - Model risk management
 - AI bias and reliability
 - Cybersecurity risks associated with AI
 - Critical infrastructure protection
 - Third-party AI/vendor risks
 - Regulatory and compliance considerations
- ❖ **Workshop:**
AI Readiness Assessment: Evaluate organizational readiness across data, technology, people, governance, cybersecurity and processes

DAY FOUR:

BUILDING THE AI BUSINESS CASE AND OPERATING MODEL

- ❖ **Module 1: Developing the AI Business Case**
 - Defining the business problem
 - Establishing baseline performance
 - Quantifying AI benefits
 - Cost estimation
 - ROI and payback analysis
 - Operational and financial benefits
 - Risk-adjusted business cases
 - Measuring intangible benefits
 - Building an AI investment portfolio
- ❖ **Module 2: AI Operating Model**
 - Centralized vs. decentralized AI models
 - AI Center of Excellence
 - Roles and responsibilities
 - Data science and AI teams
 - Business and technology collaboration
 - AI product ownership
 - Governance structures

- Vendor and partnership strategies
- ❖ **Module 3: People, Skills and Change Management**
 - AI skills required by utilities
 - Workforce transformation
 - AI literacy
 - Upskilling and reskilling
 - Managing employee adoption
 - Human-AI collaboration
 - Change resistance
 - Building an AI-driven culture
- ❖ **Workshop:**
AI Business Case Development: Develop a preliminary business case for a selected utility AI use case, including benefits, costs, risks, KPIs and implementation requirements.

DAY FIVE:

DEVELOPING THE UTILITY AI STRATEGY AND ROADMAP

- ❖ **Module 1: Creating the AI Strategy**
 - AI vision and strategic ambition
 - Alignment with corporate strategy
 - Strategic AI priorities
 - AI principles and policies
 - AI portfolio management
 - Strategic objectives and KPIs
 - Defining the target AI maturity level
- ❖ **Module 2: AI Roadmap and Implementation**
 - From pilot to production
 - AI proof-of-concept strategy
 - Scaling successful AI initiatives
 - Short-, medium-, and long-term priorities
 - AI implementation phases
 - Dependencies and critical enablers
 - Investment planning
 - Quick wins vs. transformational initiatives
- ❖ **Module 3: Measuring AI Success**
 - AI performance indicators
 - Operational KPIs
 - Financial KPIs
 - Customer KPIs
 - Reliability and asset-performance KPIs
 - Sustainability KPIs
 - AI adoption and maturity metrics
 - Benefits realization
- ❖ **Module 4: Executive AI Strategy Presentation**
Participants develop and present an AI Strategy and Roadmap for an Energy Utility, covering:
 1. Current-state assessment

2. AI vision and strategic objectives
3. Priority AI use cases
4. Data and technology requirements
5. Governance and cybersecurity
6. AI operating model
7. Business cases and investment priorities
8. People and capability requirements
9. Implementation roadmap
10. KPIs and benefits realization

❖ Final Workshop

Utility AI Strategy Simulation: Teams present their proposed AI strategy to an executive-level review panel and receive feedback on strategic alignment, feasibility, value creation, risk and implementation.

❖ Course Conclusion

❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

USD TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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