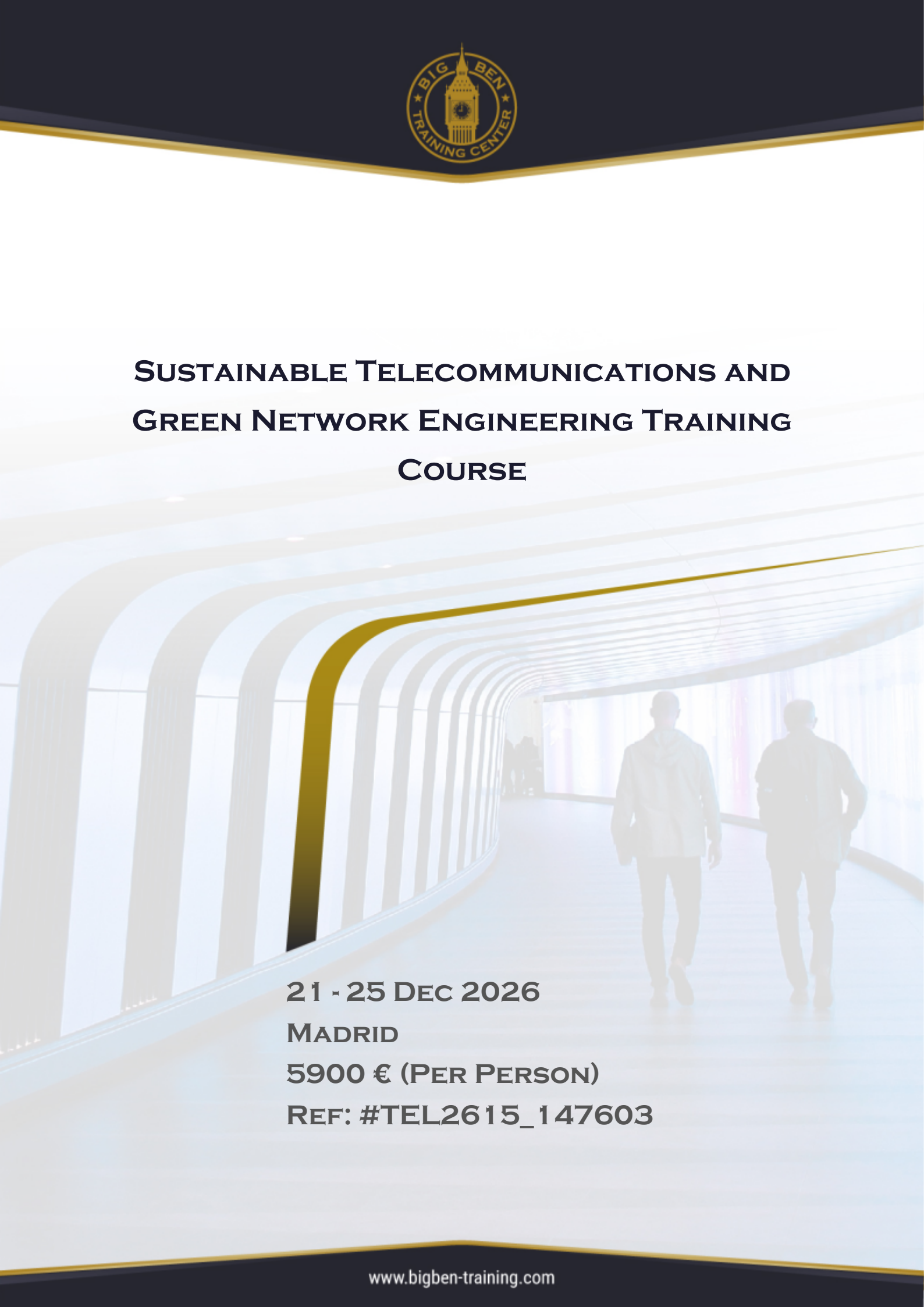
Sustainable Telecommunications and Green Network Engineering Training Course



21 - 25 Dec 2026

Madrid

5900 € (Per Person)

Ref: #TEL2615_147603

Course Introduction / Overview:

The global telecommunications sector is at a critical juncture, facing the dual challenge of explosive data growth and the urgent need for environmental sustainability. This course provides a comprehensive exploration of green network engineering, a field dedicated to minimizing the environmental impact of communication technologies. Participants will delve into the principles of energy-efficient network design, sustainable operations, and the integration of renewable energy sources. Drawing on the foundational concepts discussed by experts like J. E. M. H. van der Heijden, and in texts such as "Green Communications: Principles, Concepts and Practice," this program moves beyond theory to offer practical, actionable strategies. At BIG BEN Training Center, we have designed this curriculum to equip professionals with the skills to reduce the carbon footprint of network infrastructure, manage electronic waste responsibly, and align technological advancements with corporate sustainability goals. This training is essential for building resilient, cost-effective, and environmentally conscious telecommunication networks for the future, ensuring that connectivity and ecological responsibility go hand in hand. This course will empower you to lead the green transition within the ICT industry, transforming operational challenges into opportunities for innovation and sustainable growth.

Target Audience / This training course is suitable for:

- Telecommunications Engineers.
- Network Architects and Planners.
- IT Infrastructure Managers.
- Sustainability and CSR Officers.
- Project Managers in the ICT sector.
- Regulatory and Policy Makers.
- Data Center Operations Managers.
- RF and Wireless Communication Specialists.
- Technology Consultants focused on sustainability.
- Operations and Maintenance Supervisors.

Target Sectors and Industries:

- Telecommunications Service Providers (Mobile and Fixed-line).
- Internet Service Providers (ISPs).
- Data Center and Cloud Computing Companies.
- Network Equipment Manufacturers.
- Governmental and Regulatory Bodies.
- Energy and Utilities Sector.
- Consulting Firms specializing in technology and sustainability.
- Large Enterprises with significant IT infrastructure.
- Smart City Development Projects.

Target Organizations Departments:

- Network Engineering and Design.
- Operations and Maintenance (O&M).
- Corporate Social Responsibility (CSR) and Sustainability.
- Information Technology (IT) and Infrastructure.
- Strategic Planning and Development.
- Research and Development (R&D).
- Procurement and Supply Chain Management.
- Regulatory Compliance and Policy.
- Project Management Office (PMO).

Course Offerings:

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

- Analyze the energy consumption patterns of various network components and infrastructures.
- Design and implement energy-efficient network architectures and protocols.
- Evaluate and integrate renewable energy solutions for powering telecommunications sites.
- Develop comprehensive strategies for managing and reducing electronic waste (e-waste).
- Apply network virtualization and cloud technologies to enhance energy efficiency.
- Measure and report the carbon footprint of telecommunications operations.
- Understand the impact of 5G and IoT on network energy consumption and sustainability.
- Formulate a business case for green networking initiatives, highlighting ROI and environmental benefits.
- Navigate the regulatory landscape and international standards for sustainable telecommunications.
- Lead the development and implementation of a corporate green ICT strategy.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and immersive learning experience that bridges theory with real-world application. This course utilizes a blended approach, combining expert-led presentations with interactive group discussions, practical workshops, and in-depth case study analyses. Participants will engage in hands-on exercises, such as calculating the power usage effectiveness (PUE) of a data center and modeling the carbon footprint of a network segment. We emphasize collaborative learning through team-based projects where participants will develop a green network proposal for a hypothetical organization. These activities are designed to simulate real-world challenges and encourage innovative problem-solving. Our trainers facilitate sessions that encourage active participation, ensuring that every individual can contribute their unique insights and experiences. Continuous feedback is a cornerstone of our approach, with structured Q&A sessions and peer reviews to reinforce learning and clarify complex concepts. This participant-centered methodology ensures that attendees leave not just with knowledge, but with the confidence and practical skills to implement sustainable telecommunications strategies within their own organizations.

Course Agenda (Course Units):

Unit One: Foundations of Green Telecommunications

- Introduction to sustainable engineering and its role in ICT.
- The environmental impact of the telecommunications industry.
- Key drivers for green networking: economic, regulatory, and social.
- Understanding the carbon footprint of network infrastructure.
- Core concepts: Energy Efficiency, Power Usage Effectiveness (PUE), and Carbon Usage Effectiveness (CUE).
- Global standards and regulations for green ICT.
- The lifecycle assessment of network equipment.

Unit Two: Energy-Efficient Network Architectures and Hardware

- Designing energy-aware fixed and wireless access networks.
- Low-power hardware components and system-on-chip (SoC) solutions.
- Advanced cooling technologies for network equipment and data centers.
- Energy-saving techniques in routing and switching protocols.
- Sleep modes and adaptive link rate management.
- Optimizing radio access networks (RAN) for energy efficiency.
- Case studies of green hardware implementation by leading vendors.

Unit Three: Sustainable Network Operations and Management

- The role of Software-Defined Networking (SDN) in energy management.
- Network Functions Virtualization (NFV) for resource optimization.
- AI and machine learning for predictive energy consumption management.
- Dynamic resource allocation and traffic shaping for efficiency.
- Implementing energy-aware network monitoring and control systems.
- Strategies for reducing power consumption during low-traffic periods.
- Best practices in green data center operations.

Unit Four: Renewable Energy and Circular Economy in Telecom

- Integrating solar and wind power for cell towers and base stations.
- Hybrid power solutions and energy storage systems (ESS).
- Challenges and opportunities of off-grid and micro-grid telecom sites.
- Principles of the circular economy for network hardware.
- Strategies for electronic waste (e-waste) reduction, reuse, and recycling.
- Sustainable procurement policies for ICT equipment.
- Designing for disassembly and end-of-life management.

Unit Five: Future Trends, Strategy, and Policy Implementation

- The energy implications of 5G, 6G, and the Internet of Things (IoT).
- Green coding and sustainable software development practices.
- Developing a corporate green telecommunications strategy and roadmap.
- Building a business case for sustainability initiatives.
- Stakeholder engagement and corporate social responsibility reporting.
- The future of green communication technologies.
- Final project: Creating a comprehensive green network implementation plan.

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:

How can the telecommunications industry effectively balance the exponential growth in data demand with the urgent imperative for a reduced global carbon footprint?

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

This course distinguishes itself by offering a holistic and strategic perspective on sustainable telecommunications, moving beyond purely technical solutions. While other programs may focus narrowly on specific energy-saving hardware or protocols, this curriculum integrates engineering principles with crucial business, policy, and lifecycle management considerations. We provide a unique emphasis on the circular economy within the telecom sector, addressing the critical challenge of e-waste through practical strategies for reuse, recycling, and sustainable procurement. The curriculum is forward-looking, directly addressing the sustainability challenges and opportunities presented by emerging technologies like 5G, IoT, and AI-driven network management. Rather than just presenting information, the course is built around actionable frameworks for developing and implementing a corporate green ICT strategy, complete with methods for building a compelling business case. Participants will leave not only with technical knowledge but also with the strategic acumen to lead transformative sustainability initiatives, making this a comprehensive leadership program for the next generation of environmentally conscious technology professionals.