

1. Record Nr.	UNINA9910877176703321
Autore	Daneshvar Mohammadreza
Titolo	Interconnected Modern Multi-Energy Networks and Intelligent Transportation Systems : Towards a Green Economy and Sustainable Development
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2024 ©2024
ISBN	9781394188789 1394188781 9781394188765 1394188765
Edizione	[1st ed.]
Descrizione fisica	1 online resource (475 pages)
Collana	IEEE Press Series on Power and Energy Systems Series
Altri autori (Persone)	Mohammadi-IvatlooBehnam Anvari-MoghaddamAmjad RazzaghiReza
Soggetti	Sustainable development Renewable energy sources
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- About the Editors -- Preface -- Chapter 1 The Necessity for Modernizing the Coupled Structure of Intelligent Transportation Systems and Multi-Energy Networks -- 1.1 Introduction -- 1.2 Applications of Intelligent Transportation Systems -- 1.3 Coupled Structure of ITSs and Multi-Energy Networks -- 1.4 Summary -- References -- Chapter 2 Green Transportation Systems -- 2.1 Introduction -- 2.1.1 Motivation and Problem Description -- 2.1.2 Literature Review -- 2.1.3 Chapter Organization -- 2.2 History of Transportation -- 2.3 Transportation Expansion Issues -- 2.3.1 Urbanization's Growth -- 2.3.2 Traffic Growth -- 2.3.3 Environmental Issues -- 2.4 Definition of Green Transportation -- 2.5 Advantages of Green Transportation -- 2.6 International Agreements -- 2.7 Challenges to GT -- 2.7.1 Institutional Challenges -- 2.7.2 Regulatory Challenges and Barriers -- 2.7.3 Technology-related Barriers -- 2.7.4

Financial Barriers -- 2.7.5 General Admission -- 2.8 Green Transportation's Effects on Multi-Energy Networks -- 2.9 Implementation Strategies for the Green Transportation System -- 2.9.1 Actions Performed to Promote Green Transportation -- 2.10 New Technologies for Green Transportation -- 2.10.1 Energy Technology -- 2.10.2 Environmentally Friendly Technologies -- 2.10.2.1 Greener Tires -- 2.10.2.2 Reusing Energy -- 2.11 Intelligent Transportation System -- 2.11.1 Vehicle Communication in Intelligent Transportation -- 2.12 Conclusion -- References -- Chapter 3 Techno-Economic-Environmental Assessment of Green Transportation Systems -- 3.1 Introduction -- 3.2 Technologies for Green Transportation Systems -- 3.2.1 Eco-Friendly and Energy-Efficient Technologies -- 3.2.2 Intelligent System Technologies -- 3.2.3 Integrated Management Technologies -- 3.2.4 Distributed Ledger Technologies. 3.3 Economic Implications of Green Transportation Systems -- 3.3.1 Cost Saving -- 3.3.2 Job Creation -- 3.4 Environmental Implications of Green Transportation Systems -- 3.4.1 Lowering Emission of Pollutants -- 3.4.2 Improving Human Health Status -- 3.5 Conclusion -- References -- Chapter 4 Urban Integrated Sustainable Transportation Networks -- 4.1 Introduction -- 4.2 Necessity of Sustainable Transportation -- 4.2.1 Impact of Conventional Transportation on Climate Change -- 4.2.2 Impact of Transportation-related Emissions on Public Health -- 4.2.3 Role of Road Transportation in Carbon Emissions -- 4.2.4 Existing Global Energy Market -- 4.2.5 Potential Approaches for Mitigating Emissions -- 4.3 Challenges and Opportunities Associated with the Implementation of Sustainable Transportation -- 4.3.1 Growing Car Sector -- 4.3.2 Urban Growth -- 4.3.3 Transformation Cost -- 4.3.4 Planning Challenges -- 4.3.5 Safety Risks -- 4.3.6 Security Challenges -- 4.3.7 Social Benefits -- 4.3.8 Environmental Benefits -- 4.3.9 Economic Benefits -- 4.4 Modes of Sustainable Transportation -- 4.4.1 Walk -- 4.4.2 Bicycle -- 4.4.3 Electric Bike/Scooter -- 4.4.4 Carpooling -- 4.4.5 Electric Car -- 4.4.6 Public Transportation -- 4.5 Sustainable Transportation in Modern Urban Advancement -- 4.5.1 Importance of Sustainable Transport in Urban Growth -- 4.5.1.1 Urban Planning -- 4.5.1.2 Smart Cities -- 4.5.1.3 Economic Growth -- 4.5.1.4 Promoting Sustainable Transport -- 4.6 Infrastructure for Sustainable Transportation -- 4.6.1 Governance -- 4.6.2 Interaction with Electricity Infrastructure -- 4.6.2.1 Electric Buses and the Power Grid -- 4.6.2.2 Operational Strategies -- 4.6.2.3 Compensation for the Minimum Demand Reduction -- 4.6.2.4 Flexible Operation of E-mobility -- 4.6.3 Features of Integrated Sustainable Transportation Networks. 4.6.3.1 Transport Resilience and Sustainability -- 4.6.4 Transition to a Sustainable Transportation -- 4.7 Conclusion -- References -- Chapter 5 Multi-Energy Technologies in Green and Integrated Transportation Networks -- 5.1 Introduction -- 5.2 Definition of Green Transportation -- 5.3 Technological Development and Managerial Integration for Green Transportation -- 5.3.1 Energy-Efficient Technology -- 5.3.2 Eco-Friendly Technology -- 5.3.3 Intelligent Transportation System (ITS) -- 5.3.4 Integrating Systems: Efficiency by Design -- 5.3.5 Energy Re-using -- 5.3.6 Solar Impulse Technology -- 5.3.7 Integrated Management for Green Transportation -- 5.3.7.1 Infrastructure Development -- 5.3.7.2 Alternative Measures in Urban Transportation -- 5.4 Definition and Features of Integrated Multi-Energy System -- 5.4.1 Definition of Integrated Multi-Energy System -- 5.4.2 Major Characteristics of Integrated Multi-Energy System -- 5.4.3 Role and Effects of Multi-Energy Conversion Systems in Green and Integrated Transportation Networks -- 5.5 Electric Vehicle Integration with

Renewable Energy Sources -- 5.5.1 Electric Vehicle Integration with Wind Energy -- 5.5.2 Electric Vehicle Integration with Solar Energy -- 5.6 Hybrid Fuel Cell/Battery Vehicle Systems -- 5.6.1 PEMFC-Based Fuel Cell Vehicle Systems -- 5.6.2 SOFC-Based Fuel Cell Vehicle Systems -- 5.6.3 Present Situation of Fuel Cell Vehicle Technology -- 5.6.4 Confronts of Fuel Cell Vehicle Technology -- 5.7 Barriers and Challenges -- 5.7.1 Societal Barriers and Challenges -- 5.7.2 Technological Barriers and Challenges -- 5.7.3 Financial Barriers and Challenges -- 5.8 Conclusion -- References -- Chapter 6 Flexible Operation of Power-To-X Energy Systems in Transportation Networks -- Table of Acronyms -- 6.1 Introduction -- 6.1.1 Problem Description and Motivation -- 6.1.2 State of the Art. 6.1.3 Contributions and Organization -- 6.2 Power to Hydrogen -- 6.3 Power to Methane -- 6.4 Power to Chemical (P2C) -- 6.4.1 Power to Diesel (P2D) -- 6.4.2 Power-to-Formic Acid (P2FA) -- 6.4.3 Power to Methanol (P2Me) -- 6.5 Power to Heat (P2H) -- 6.6 Power to Transport (P2T) -- 6.7 Power Demand Flexibility -- 6.8 Conclusion -- References -- Chapter 7 Integration of Electric Vehicles into Multi-energy Systems -- Abbreviations -- 7.1 Introduction -- 7.2 Multi-energy Systems Structure -- 7.2.1 General Aspects of MES Modeling -- 7.2.2 Energy Hub Concept -- 7.2.3 MES Modeling Process and Challenges -- 7.3 Integration of EVs in MES -- 7.3.1 Integration of EV with RES -- 7.3.1.1 Integration of EV with Wind Energy -- 7.3.1.2 Integration of EV with Solar Energy -- 7.3.2 Integration of EV with Power Grids -- 7.3.2.1 EV and Distribution Systems -- 7.3.2.2 EV and Microgrids -- 7.3.2.3 EVs and Homes/Buildings -- 7.3.2.4 EV and EH -- 7.3.2.5 EV and Virtual Power Plants -- 7.3.3 EV Charging/Discharging Strategies -- 7.3.3.1 Vehicle-to-Everything (V2X) -- 7.3.3.2 Smart Bidirectional Charging -- 7.4 Conclusion -- References -- Chapter 8 Self-Driving Vehicle Systems in Intelligent Transportation Networks -- 8.1 Introduction -- 8.2 Brief History -- 8.3 Literature Review -- 8.4 Advantages and Challenges -- 8.5 Sensing -- 8.6 Perception -- 8.6.1 Object Detection and Tracking -- 8.6.2 Simultaneous Localization and Mapping -- 8.7 Planning and Control -- 8.8 Conclusion -- Acknowledgment -- References -- Chapter 9 Energy Storage Technologies and Control Systems for Electric Vehicles -- Acronyms -- 9.1 Introduction -- 9.2 Fuel Cell -- 9.2.1 Types of Fuel Cells -- 9.2.1.1 Proton Exchange Membrane Fuel Cell -- 9.2.1.2 Phosphoric Acid Fuel Cell (PAFC) -- 9.2.1.3 Alkaline Fuel Cell -- 9.2.1.4 Molten Carbonate Fuel Cell -- 9.2.1.5 Solid Oxide Fuel Cell. 9.2.1.6 Direct Methanol Fuel Cell -- 9.3 Battery Technologies for Electric Vehicles -- 9.3.1 Lead-Acid Batteries -- 9.3.2 Nickel-Cadmium Battery (NiCd) -- 9.3.3 Nickel-Metal-Hydride (Ni-MH) -- 9.3.4 Lithium-ion (Li-ion) -- 9.3.4.1 Lithium Cobalt Oxide (LiCoO₂, LCO) -- 9.3.4.2 Lithium Manganese Oxide (LiMn₂O₄, LMO/Spinel) -- 9.3.4.3 Lithium Iron Phosphate (LiFePO₄, LFP) -- 9.4 Overview of Brushless Motor -- 9.4.1 Mathematical Modeling of BLDC Motor -- 9.4.1.1 Electric Model of BLDC -- 9.4.1.2 Mechanical Model of BLDC -- 9.5 BLDC Motor Control Strategy for Electric Vehicles -- 9.5.1 PI Controller -- 9.5.2 PID Controller -- 9.5.3 Fuzzy Logic Controller -- 9.5.3.1 Fuzzification -- 9.5.3.2 Fuzzy Inference -- 9.5.3.3 Defuzzification -- 9.6 Simulation Results -- 9.7 Environmental Impact of EVs -- 9.8 EVs and Modern Technologies -- 9.9 Challenges and Perspectives of EVs -- 9.10 Conclusion -- Acknowledgments -- References -- Chapter 10 Electric Vehicle Path Towards Sustainable Transportation: A Comprehensive Structure -- Nomenclature -- 10.1 Introduction -- 10.2 Optimum Design of EVs -- 10.3 Characterization of EV Battery System -- 10.3.1 Thermal Management of Battery -- 10.3.2 Assessment of Battery

System -- 10.4 Control System of EVs -- 10.5 Reliability Assessment of EV -- 10.6 Assessment of EV Charging Station -- 10.6.1 Location Assessment for EV Charging Station -- 10.6.2 Characterization of Charging Station -- 10.7 Worldwide Policy Framework for EV -- 10.8 Electric Vehicles on the Sustainability and Reliability of Transportation Network -- 10.9 Recent Trends and Future Challenges -- References -- Chapter 11 Electric Vehicle Charging Management in Parking Structures -- 11.1 Introduction -- 11.2 EV Charging Management Schemes -- 11.3 Fair Charging Management -- 11.3.1 Preliminaries on á-Fairness -- 11.3.2 Generic-Fair Energy Allocation Algorithm. 11.4 Delay-Fair Charging Management.

Sommario/riassunto

This book, 'Modern Multi-Energy Networks and Intelligent Systems: Towards a Green Economy and Sustainable Development,' explores the integration of intelligent systems with multi-energy networks to promote sustainability and a green economy. It discusses the modernization of energy infrastructures, the role of renewable energy sources, and the application of intelligent technologies in energy systems. The book aims to address environmental challenges through innovative energy solutions and sustainable development practices. It targets professionals, researchers, and policymakers in the fields of energy systems and sustainable development.
