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Nota di contenuto	Foreword -- Preface -- Introduction -- PART I - ADAPTING -- ENERGY SYSTEM MODELS TO INFORM SDGs -- 1. Implications of the NetZero Transition Across Spectrum of SDG Indicators: Linking Global Energy System and CGE Models -- 2. Accelerating the Performance of Large-Scale TIMES Models in the Modelling of SDGs -- 3. On the Fairness and Feasibility of Implementing Low-Energy Demand Scenarios to Achieve Net Zero -- 4. A Global and Regional Energy System Analysis of Carbon Dioxide Removal as Climate Sustainable Action considering Land and Water Challenges -- 5. Structure Applications, and Future Perspective

of the TEMOA-Italy Model -- PART II – INCREASING RENEWABLE ENERGY USING ENERGY SYSTEM MODELS -- 6. Assessing the Impact of Climate Variability on Wind Energy Potential in Decarbonization Scenarios in Energy Systems Models -- 7. Clean and Affordable Norwegian Offshore Wind to Facilitate the European Low-Carbon Transition -- 8. The Nordics as Green Fuel and Power Hub? -- 9. Modelling Circular Economy in the Spanish Pulp and Paper Industry in TIMES. - 10. Estimating the Cost of Decarbonising an Economy -- PART III – INFORMING ENERGY SECURITY WITH ENERGY SYSTEM MODELS -- 11. Modelling of Demands of Selected Minerals and Metals in Clean Energy Transition with 1.5–2.0 °C Mitigation Targets -- 12. Security of Supply – Emission Free Energy Carriers and the Impact of Trade to Achieve the 1.5 °C Target -- 13. The Gas Crise and the Impact on the Pathway to a Climate Neutral Energy System till 2045 -- 14. Net Zero Transition in Ukraine: Implications for Sustainable Development Goals and Energy Security -- 15. From Dependency to Diversification: How SDG7 Can Help Algeria Overcome Dutch Disease -- PART IV – ENGAGING WITH POLICY-MAKERS ON ENERGY SYSTEM MODELS -- 16. Analysis of Low Carbon Transition Pathways by Using an Interdisciplinary Approach -- 17.Crossing Points Between Sustainable Municipalities and Sustainable Energy Systems -- 18. Application of the TIMES model in the World Bank's Country Climate and Development Reports in Europe and Central Asia -- 19. Translating TIMES Scenario Results into Policy Insights to Underpin Climate Action in Ireland -- 20. Retrospective of French Prospective Exercises: Chronicle of A Failure.

Sommario/riassunto

This open access book brings together concrete analyses from around the world, spanning various scales, that shed light on strategies for implementing essential energy and climate transitions within the broader context of UN Sustainable Development Goal (SDG) imperatives. Specifically, the book exemplifies the advancement, adaptation, and utilization of energy systems models to address intricate policy issues around pathways to achieve net-zero emissions, enhance energy security, optimize investments, and understand their societal implications. It explores the intricate connections between the SDGs concerning energy, climate action, and other developmental priorities such as employment and economic growth, industrial innovation, urban development, responsible consumption and production, and collaborative partnerships. Organized into four sections, the book illustrates the necessary adjustments of energy system models to guide SDGs, evaluates the role of modeling to advance both renewable energy and energy security, and showcases how energy systems are harnessed to engage with international, national, and local policymakers. This book is available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.