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foundations / Susana Lopez-Querol, Liang Cui, and Subhamoy Bhattacharya - Reliability of wind turbines / Shuangwen Shen and Ryan O'Connor - Practical method to estimate foundation stiffness for design of offshore wind turbines / Saleh Jalbi, Masoud Shadlou, and Subhamoy Bhattacharya - Physical modeling of offshore wind turbine model for prediction of prototype response / Domenico Lombardi, Subhamoy Bhattacharya, and George Nikitas -- ; Part IV. Generation of electricity. Energy and carbon intensities of stored wind energy / Charles J. Barnhart - Small-scale wind turbines / Patrick A.B. James and AbuBakr S. Bahaj - Integration into national grids / Jurgen Weiss and T. Bruce Tsuchida -- ; Part V. Environmental impacts of wind energy. Life cycle assessment: meta-analysis of cumulative energy demand for wind energy technologies / Michael Carbajales-Dale - Environmental and structural safety issues related to wind energy / Kaoshan Dai, Kewei Gao, and Zhenhua Huang - Wind turbines and landscape / Marc van Grieken and Beatrice Dower - Global rare earth supply, life cycle assessment, and wind energy / Zhehan Weng and Gavin M. Mudd -- ; Part VI. Financial modeling/wind economics. Economics of wind power generation / Magdi Ragheb -- ; Part VII. Investment, growth trends, and the future of wind energy. Growth trends and the future of wind energy / Lauha Fried, Shruti Shukla, and Steve Sawyer -- Index.

Sommario/riassunto

Wind Energy Engineering: A Handbook for Onshore and Offshore Wind Turbines is the most advanced, up-to-date and research-focused text on all aspects of wind energy engineering. Wind energy is pivotal in global electricity generation and for achieving future essential energy demands and targets. In this fast moving field this must-have edition starts with an in-depth look at the present state of wind integration and distribution worldwide, and continues with a high-level assessment of the advances in turbine technology and how the investment, planning, and economic infrastructure can support those innovations. Each chapter includes a research overview with a detailed analysis and new case studies looking at how recent research developments can be applied. Written by some of the most forward-thinking professionals in the field and giving a complete examination of one of the most promising and efficient sources of renewable energy, this book is an invaluable reference into this cross-disciplinary field for engineers. Contains analysis of the latest high-level research and explores real world application potential in relation to the developments Uses system international (SI) units and imperial units throughout to appeal to global engineers Offers new case studies from a world expert in the field Covers the latest research developments in this fast moving, vital subject