

1. Record Nr.	UNINA9911138534703321
Autore	Breeze Paul A
Titolo	Power generation technologies / / Paul Breeze
Pubbl/distr/stampa	Oxford, : Newnes, 2005
ISBN	1-281-00934-2 9786611009342 0-08-048010-1
Edizione	[1st ed.]
Descrizione fisica	1 online resource (289 p.)
Disciplina	621.3121
Soggetti	Electric power production Electrical engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Front cover; Title page; Copyright page; Table of contents; List of figures; List of tables; First chapter; 1 Introduction to electricity generation; History of the electricity generation industry; The evolution of electricity generation technologies; The politics of electricity; The size of the industry; End notes; 2 Environmental considerations; The evolution of environmental awareness; The environmental effects of power generation; The carbon cycle and atmospheric warming; Controlling carbon dioxide; The hydrogen economy; Externalities; Life-cycle assessment; The bottom line; End notes 3 Coal-fired power plants Types of coal; Coal cleaning and processing; Traditional coal-burning power plant technology; Boiler technology; Steam turbine design; Generators; Emission control for traditional coal-burning plants; Coal treatment; Low nitrogen oxides burners; Sulphur dioxide removal; Nitrogen oxides capture strategies; Combined sulphur and nitrogen oxides removal; Particulate removal; Mercury removal; Carbon dioxide; Advanced coal-burning power plant technology; Fluidised-bed combustion; Integrated-gasification combined cycle; Environmental effects of coal combustion Financial risks associated with coal-fired power generation The cost of coal-fired electricity generation; End notes; 4 Gas turbines and combined cycle power plants; Natural gas; Natural gas costs; Gas

turbine technology; Modern gas turbine design; Advanced gas turbine design; Reheating; Intercooling; Mass injection; Recuperation; Distributed generation; Combined cycle power plants; Micro turbines; Environmental impact of gas turbines; Nitrogen oxides; Carbon dioxide; Carbon monoxide and particulates; Financial risks associated with gas-turbine-based power projects; Technological risk
Fuel risk The cost of gas turbine power stations; End notes; 5
Combined heat and power; History; Applications; CHP technology; Piston engines; Steam turbines; Gas turbines; Micro turbines; Fuel cells; Nuclear power; Environmental considerations; Noise; Heat; Energy efficiency; Financial risks; Cost of CHP; End notes; 6
Piston-engine-based power plants; Piston engine technology; Engine size and speed; Spark-ignition engines; Compression engines; Dual fuel engines; Stirling engines; Co-generation; Combined cycle; Environmental considerations; Emission control; Carbon dioxide; Financial risks
Costs End notes; 7
Fuel cells; The fuel cell principle; Fuel cell chemistry; Catalysts; Hydrocarbon gas reformation; Types of fuel cell; Phosphoric acid fuel cell; Proton-exchange membrane fuel cell; Molten carbonate fuel cells; Solid oxide fuel cells; Environmental considerations; Financial risks; Fuel cell costs; End notes; 8
Hydropower; The hydropower resource; Hydro sites; Dams and barrages; Run-of-river project; Reservoir projects; Turbines; Impulse turbines; Reaction turbines; Francis turbine; Propeller and Kaplan turbines; Generators; Small hydropower; The environment; Inundation
Sedimentation

Sommario/riassunto

Paul Breeze provides a concise and readable description of the spectrum of different power generation technologies available today, from traditional fossil fuels and the better established renewables such as wind and solar power, to emerging renewable such as biomass and geothermal energy. Technology solutions such as combined heat and power, and distributed generation are also explored. However, this book is more than just an account of the technologies - for each method the author explores the economic and environmental costs and risk factors. Those involved in planning and
