

CONTENTS

Publisher's Note	vii	Energy Payback	120
Introduction	ix	Energy Policy	122
Contributors	xv	Energy Poverty	130
Aerobic Cellular Respiration	1	Energy Storage Techniques	132
Air Conditioning	4	Enthalpy	135
Alternative Energy	7	Entropy	137
Ampère, André-Marie	12	Exergy	138
Animal Power	14	External Combustion Engine	140
Atomic Energy Commission	18	Faraday, Michael	145
Batteries	21	Flex-Fuel Vehicles (FFV)	147
Biodiesel	26	Flywheels	149
Biomass Energy	29	Fossil Fuels	151
Boilers	33	Franklin, Benjamin	156
Breeder Reactors	37	Frequency	159
Building Envelope	38	Fuel Cells and Energy Efficiency	161
Capacity (Electricity)	41	Fundamentals of Energy	164
Cellulosic Ethanol	43	Gas Energy Transmission	171
Chernobyl	45	Gasoline and Other Petroleum Fuels	172
China Syndrome (Nuclear Meltdown)	49	Geothermal and Hydrothermal Energy	175
Clausius, Rudolf	51	Geothermal Energy	182
Climate and Weather	53	Gibbs, Josiah Willard	185
Climate Neutrality	58	Green Buildings	187
Coal and Energy Production	60	Green Energy Certification	190
Cogeneration and Electricity Generation	69	Greenhouse Gases and Human Industry	193
Cold Fusion	72	Heat Transfer	201
Communication to Garner Support for Energy Development	74	Helmholtz, Hermann von	204
Computers and Energy Use	79	Hertz, Heinrich	206
Corn Ethanol	81	High-Intensity Light-Emitting Diodes (LEDs) and Energy Conservation	208
Dams	85	Hybrid Vehicles and Energy Security	211
Daylighting	89	Industrial Revolution and Machine Power	215
Demand-Side Management (DSM)	91	Internal Combustion Engine	221
Diesel, Rudolf	93	Isotopes, Radioactive	224
Einstein, Albert	97	Isotopes, Stable	226
Electric Grids	100	Joule, James	229
Electric Potential	103	Kinetic Energy	233
Electricity Energy Transmission, Secondary	106	Liquid Fluid Energy Transmission	235
Embodied energy	108	Mechanical Energy Transmission	239
Energy and Power	111	Natural Energy Flows	243
Energy Conservation	113	Natural Gas	244
Energy Independence and Security Act of 2007	116	Nuclear Power Plants	250
Energy Intensity	118	Ocean Current Energy	255
		Ocean Thermal Energy Conversion	256
		Ocean Wave Energy	258

Oil and Petroleum	261	Thompson, Benjamin (Count Rumford)	330
Oil Shale and Tar Sands	267	Thomson, Joseph John	332
Otto, Nikolaus	269	Thomson, William (Lord Kelvin)	334
Photovoltaics (PVs)	273	Tidal Power Generation	336
Potential Energy	277	Units of Measurement	341
Propane	280	U.S. Department of Energy (DOE)	344
Rankine, William	283	Volta, Alessandro	349
Renewable Energy	284	Waste Heat Recovery	353
Renewable Energy Resources	289	Watt, James	355
Rotational Power	294	Watt	357
Sadi Carnot	299	Wave Properties	359
Solar Concentrator	300	Wavelength	360
Solar Energy	303	Westinghouse, George	363
Solar Thermal Systems	309	Wheat Ethanol	366
Steam and Steam Turbines	312	Willis Carrier and Air Conditioning	368
Steam Engines	313	Wind Energy	370
Stirling, Robert	315	Work and Energy	375
Sugar Beet Ethanol	317	Work-Energy Theorem	378
Sugarcane Ethanol	319	Bibliography	381
Sun Day	322	Glossary	405
Tesla, Nikola	323	Organizations	429
Thermochemistry	326	Subject Index	431
Thermodynamics and Energy	328		