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| Nota di contenuto | Title Page; Copyright Page; Contents; Preface; About The Book; About The Author; 1 Introduction to Energy Systems; 1.1 Energy Sources and Distribution of Resources; 1.1.1 Fossil Fuels; 1.1.1.1 Natural Gas; 1.1.1.2 Petroleum; 1.1.1.3 Coal; 1.1.1.4 Oil Shale; 1.1.2 Nuclear; 1.1.3 Renewables; 1.1.3.1 Biomass and Municipal Solid Waste; 1.1.3.2 Hydroelectric; 1.1.3.3 Solar; 1.1.3.4 Wind; 1.1.3.5 Geothermal; 1.2 Energy and The Environment; 1.2.1 Criteria and Other Air Pollutants; 1.2.1.1 Carbon Monoxide and Organic Compounds; 1.2.1.2 Sulfur Oxides; 1.2.1.3 Nitrogen Oxides; 1.2.1.4 Ozone<br>1.2.1.5 Lead 1.2.1.6 Particulate Matter; 1.2.1.7 Mercury; 1.2.2 Carbon Dioxide Emissions, Capture, and Storage; 1.2.3 Water Usage; 1.3 Holistic Approach; 1.3.1 Supply Chain and Life Cycle Assessment; 1.4 Conclusions; References; 2 Thermodynamics; 2.1 First Law; 2.1.1 Application to a Combustor; 2.1.1.1 Methane Combustor Exhaust Temperature; 2.1.2 Efficiency Based on First Law; 2.2 Second Law; 2.2.1 Quality Destruction and Entropy Generation; 2.2.2 Second Law Analysis; 2.2.3 First and Second Law Efficiencies; 2.3 Combustion and Gibbs Free |

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2.4.1 Gas Phase 2.4.2 Vapor-Liquid Phases; References; 3 Fluid Flow Equipment; 3.1 Fundamentals of Fluid Flow; 3.1.1 Flow Regimes; 3.1.2 Extended Bernoulli Equation; 3.2 Single-Phase Incompressible Flow; 3.2.1 Pressure Drop in Pipes; 3.2.2 Pressure Drop in Fittings; 3.3 Single-Phase Compressible Flow; 3.3.1 Pressure Drop in Pipes and Fittings; 3.3.2 Choked Flow; 3.4 Two-Phase Fluid Flow; 3.4.1 Gas-Liquid Flow Regimes; 3.4.2 Pressure Drop in Pipes and Fittings; 3.4.3 Droplet Separation; 3.5 Solid fluid Systems; 3.5.1 Flow Regimes; 3.5.2 Pressure Drop; 3.5.3 Pneumatic Conveying
3.6 Fluid Velocity in Pipes 3.7 Turbomachinery; 3.7.1 Pumps; 3.7.1.1 Centrifugal Pumps; 3.7.1.2 Axial Pumps; 3.7.1.3 Rotary Pumps; 3.7.1.4 Reciprocating Pumps; 3.7.1.5 Specific Speed; 3.7.1.6 Net Positive Suction Head; 3.7.1.7 Pumping Power; 3.7.1.8 System Requirements and Pump Characteristics; 3.7.2 Compressors; 3.7.2.1 Centrifugal Compressors; 3.7.2.2 Axial Compressors; 3.7.2.3 Reciprocating Compressors; 3.7.2.4 Rotary Screw Compressors; 3.7.2.5 System Requirements and Compressor Characteristics; 3.7.2.6 Compression Power and Intercooling; 3.7.3 Fans and Blowers; 3.7.4 Expansion Turbines
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4.1.2.8 Heat Transfer from Tubes with Fins

Sommario/riassunto

Comprehensive and a fundamental approach to the study of sustainable fuel conversion for the generation of electricity and for co-producing synthetic fuels and chemicals  Both electricity and chemicals are critical to maintain our modern way of life however environmental impacts have to be factored in to sustain this type of lifestyle. Sustainable Energy Conversion for Electricity and Co-products provides a unified, comprehensive and a fundamental approach to the study of sustainable fuel conversion in order to generate electricity and optionally coproduce synthetic fuels and chemicals.