

1. Record Nr.	UNINA9910828740703321
Titolo	Energy recovery [[electronic resource] /] / Edgard DuBois and Arthur Mercier, editors
Pubbl/distr/stampa	Hauppauge N.Y., : Nova Science Publishers, c2009
ISBN	1-61728-402-5
Edizione	[1st ed.]
Descrizione fisica	1 online resource (343 p.)
Altri autori (Persone)	DuBoisEdgard MercierArthur
Disciplina	662/.87
Soggetti	Waste products as fuel
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- ENERGY RECOVERY -- CONTENTS -- PREFACE -- BIOGAS RECOVERY FROM LANDFILLS -- ABSTRACT -- I. INTRODUCTION -- II. REGULATORY CONSIDERATIONS -- A. U Landfill Directive 1999/31/EC -- B. RCRA Regulations -- C. CAA Regulations -- D. CWA Regulations -- III. SANITARY AND BIOREACTOR LANDFILLS -- A. Development of Sanitary Landfills -- B. Bioreactor Landfills -- 1. Anaerobic bioreactor landfills -- 2. Aerobic bioreactor landfills -- 3. Aerobic-anaerobic bioreactor landfills -- C. Features Unique to Bioreactor Landfills -- D. Potential Advantages of Bioreactor Landfills -- IV. LANDFILL GAS (LFG) -- A. Landfill Gas Characteristics -- 1. Density and viscosity -- 2. Heat value content -- 3. Non-methane organic compounds -- 4. Water vapor -- 5. Others -- B. Landfill Gas Composition -- C. Landfill Gas Yield -- D. LFG Emission -- 1. LFG Generation -- 1.1. LFG generation mechanisms -- Volatilization -- Biological decomposition -- Stage I. Hydrolysis/aerobic degradation -- Stage II. Hydrolysis and fermentation -- Stage III. Acetogenesis -- Stage IV. Methanogenesis -- Stage V. Oxidation -- 1.2. Factors affecting LFG generation -- 1. Site characteristics -- 2. Waste characteristics -- 3. Age of the waste -- 4. Temperature -- 5. Pressure -- 6. Moisture content and movement -- 7. Atmospheric conditions -- 8. Oxygen concentration -- 9. Hydrogen concentration -- 10. Precipitation -- 11. Density of the waste -- 12. Nutrients and trace metals -- 13. Acidity -- 14. Inhibitors -- 2. LFG Transport -- 2.1. LFG transport mechanisms -- 2.2. Factors affecting

LFG transport mechanisms -- E. LFG Production Enhancement Methods -- 1. Leachate recirculation -- 2. pH buffering -- 3. Sludge addition -- 4. Temperature control -- 5. Reduced waste particle size -- 6. Cell design, daily cover and compaction of waste -- 7. Pre-treatment -- V. LANDFILL GAS BEHAVIOUR. A. LFG Movement and Migration -- B. Monitoring of LFG -- C. LFG Hazards -- 1. LFG explosion hazard -- 2. LFG asphyxiation hazard -- 3. Landfill odors -- VI. MODELING OF METHANE GAS GENERATION AND EMISSION FROM LANDFILLS -- A. General -- B. U.S.E.P.A. Model - Landgem -- 1. Model description -- 1.1. Input Parameters -- Methane generation potential (L_0) -- Methane generation rate (k) -- C. IPCC-First Order Decay (FOD) Model -- 1. Model description -- 1.1. Input Parameters -- Degradable Organic Carbon (j DOC) -- Decay rate/methane generation rate ($j k$) -- D. Regression Models -- F. Other Models -- VII. LANDFILL GAS ENERGY SYSTEMS -- A. LFG Collection System -- Passive venting -- Physical barriers -- Pumping extraction systems -- B. LFG Pretreatment System -- C. LFG Utilization System -- 1. Combustion technologies (Flaring Practices) LFG flaring -- 1.1. Open flame flares -- 1.2. Enclosed flame flares -- 1.3. Other enclosed combustion technologies -- 2. Non-combustion technologies -- 2.1. Energy recovery technologies -- 2.2. Gas to product conversion technologies -- VIII. CASE STUDY: CALGARY BIOCELL PROJECT -- A. Introduction -- B. The Calgary Biocell: Background and Construction Phase -- C. Operation of the Calgary Biocell -- 1. Biocell stage 1: Anaerobic decomposition with gas extraction -- 2. Biocell stage 2: Aerobic decomposition -- 3. Biocell stage 3: Mining for recovery of useful/recyclable products -- D. Summary and Conclusions -- REFERENCES -- NOTATIONS -- LANDFILL GAS: GENERATION, MODELS AND ENERGY RECOVERY -- ABSTRACT -- 1. INTRODUCTION -- 2. LANDFILL GAS CHARACTERISTICS AND GENERATION MECHANISMS -- 3. MATHEMATICAL MODELS FOR LANDFILL GAS PRODUCTION PREDICTION -- The Triangular Model -- First Order Decay Model: The Scholl Canyon Equation -- Software Application of First Order Decay Model: Landgem -- Modified First Order Model. 4. THE ESTIMATION OF K AND L_0 IN THE MODELS -- 5. APPLICATION OF THE MODELS TO A STUDY CASE -- 6. ENERGY RECOVERY -- 7. MANAGEMENT OPTION TO IMPROVE ENERGY RECOVERY -- CONCLUSION -- REFERENCES -- ENERGY AND MATERIAL RECOVERY FROM BIOMASS: THE BIOREFINERY APPROACH. CONCEPT OVERVIEW AND ENVIRONMENTAL EVALUATION -- ABSTRACT -- 1. INTRODUCTION -- 2. APPROACHING BIOREFINERY: DEFINITION, CRITERIA AND CHARACTERISTICS -- 2.1. Background and Current Status -- 2.2. Criteria for Biorefinery System -- 2.3. Fossils vs. Biomass as Raw Materials -- 3. OVERVIEW OF BIOREFINERY FEEDSTOCKS, PROCESSES AND PLATFORMS -- 3.1. Biorefinery Feedstocks -- 3.1.1. Sugar crops -- 3.1.2. Starch crops -- 3.1.3. Oil based materials -- 3.1.4. Grasses -- 3.1.5. Lignocellulosic materials -- 3.1.6. Organic residues and others -- 3.2. Technological Processes -- 3.2.1. Thermochemical processes -- 3.2.2. Biochemical processes -- 3.2.3. Mechanical/physical processes -- 3.2.4. Chemical processes -- 3.3. Platforms -- 3.3.1. Biogas -- 3.3.2. Syngas -- 3.3.3. Hydrogen -- 3.3.4. C6 sugars -- 3.3.5. C5 sugars -- 3.3.6. Levulinic acid -- 3.3.7. Furfural -- 3.3.8. Pyrolytic liquid -- 3.3.9. Vegetable oil -- 3.3.10. Organic juice -- 4. LIFE CYCLE ASSESSMENT OF BIOREFINERY SYSTEMS: A CASE STUDY -- 4.1. Introduction to LCA -- 4.2. Goal and Scope Definition -- 4.2.1. Biorefinery: scope and system boundaries -- 4.2.2. Biorefinery material products -- 4.2.3. Biorefinery energy products -- 4.2.4. Fossil reference system -- 4.2.5. Functional unit -- 4.2.6

Allocation -- 4.3. Life Cycle Impact Assessment -- 4.3.1. Results and interpretation -- 4.3.2. Allocation results -- 5. CONCLUSION -- REFERENCES -- PINCH TECHNOLOGY FOR WASTE HEAT RECOVERY APPLICATIONS IN OIL INDUSTRY -- INTRODUCTION -- TARGETING USING GRAPHICAL METHOD -- Constructing the Composite Curves -- TARGETING USING ALGEBRAIC METHOD. Information needed -- 1. Constructing Temperature Interval Diagram -- 2. Constructing Tables of Exchangeable Heat Loads and Cooling Capacities -- 3. Constructing Thermal Cascade Diagrams -- TARGETING USING MATHEMATICAL PROGRAMMING METHOD -- CONSTRUCTING THE GRAND COMPOSITE CURVE (G.C.C) -- Multiple Utility Targeting/Selection using Grand Composite Curve (GCC) -- Understanding and Applying the Grand Composite Curve -- HEAT EXCHANGERS NETWORK (HEN) SYNTHESIS -- The Pinch Design Method -- HEN DESIGN METHOD -- Four Streams Problem Example -- Start at the Pinch -- The CP(FCp) inequality for individual matches -- The CP (FCp) table -- The "tick-off" heuristic -- Streams Splitting -- PART II. HEAT INTEGRATION APPLICATIONS IN OIL INDUSTRY -- Oil and Gas Separation Plant Process Description -- Heat Integration Application in Oil and Gas Separation Facility -- CONCLUSION -- REFERENCES -- TREATMENT OF SECONDARY SLUDGE FOR ENERGY RECOVERY -- ABSTRACT -- 1. INTRODUCTION -- 2. SECONDARY SLUDGE TREATMENT METHODS -- 2.1. Incineration -- 2.2. Pyrolysis -- 2.3. Gasification -- 2.4. Direct Liquefaction -- 2.5. Supercritical Water Oxidation (SCWO) -- 2.6. Anaerobic Digestion -- 3. DISCUSSION AND COMPARISON OF TREATMENT METHODS -- 4. CONCLUSIONS -- ACKNOWLEDGMENTS -- REFERENCES -- ENERGY RECOVERY FROM WASTE: COMPARISON OF DIFFERENT TECHNOLOGY COMBINATIONS -- ABSTRACT -- MSW Characteristics and Pre-treatment -- Combustion with Energy Recovery -- Gasification with Energy Recovery -- Pyrolysis with Energy Recovery -- Anaerobic Digestion -- Comparison of Thermal Processes -- Comparison of Integrated Energy Recovery Systems -- CONCLUSION -- REFERENCES -- ENERGY RECOVERY FROM WASTE INCINERATION: LINKING THE SYSTEMS OF ENERGY AND WASTE MANAGEMENT -- ABSTRACT -- INTRODUCTION -- DEVELOPMENT OF WASTE INCINERATION IN SWEDEN -- Historical Development. Waste Incineration in Sweden Today -- Waste incineration and district heating -- Waste incineration and combined heat and power production -- Waste and Connection to the Material Market -- CONNECTION BETWEEN COUNTRIES IN THE EUROPEAN UNION VIA LEGISLATION AND TRADE AND THE IMPACT ON THE SWEDISH WASTE INCINERATION -- European Legislation Affecting Energy and Waste -- European Differences in Waste Management and Use of District Heating -- Impact on Waste Incineration in Sweden of Waste Trade with Some European Countries -- Impact on Waste Incineration of Trade in Electricity -- DISCUSSION OF TWO POLICY INSTRUMENTS -- Introduction of a Tax on Incinerated Waste in Sweden -- Green Electricity Certificates and Waste Incineration -- MODELS AS DECISION SUPPORT -- Models and How to Handle the Double Function of Waste Incineration -- CONCLUSION -- ACKNOWLEDGMENTS -- REFERENCES -- EXPERIMENTAL ANALYSIS OF A COMBINED RECOVERY SYSTEM -- ABSTRACT -- INTRODUCTION -- EVAPORATIVE COOLING SYSTEMS -- HEAT PIPE SYSTEMS -- EXPERIMENTAL INSTALLATION -- EXPERIMENTAL MEASUREMENTS -- SENSIBLE HEAT RECOVERED -- Combined System -- Analysis of Results -- Temperature -- Evaporative cooling system -- Analysis of Results -- Heating and cooling mode analysis -- Heat Pipes System -- Analysis of Results -- Temperature -- LATENT HEAT RECOVERED -- Analysis of Results -- Air Flow -- Temperature -- VxT

interaction -- TOTAL HEAT RECOVERED -- Evaporative Cooler --
Analysis of Results -- Airflow Analysis -- Temperature -- SUMMARY --
Sensible Heat -- Latent Heat -- Total Heat -- CONCLUSIONS --
ACKNOWLEDGMENTS -- REFERENCES -- ENERGY RECOVERY SYSTEMS
FROM INDUSTRIAL PLANT WASTE: PLANNING OF AN INDUSTRIAL
PARK LOCATED IN THE SOUTH OF ITALY -- ABSTRACT --
INTRODUCTION -- 1. A STRATEGY FOR SUSTAINABLE MANAGEMENT OF
INDUSTRIAL PARKS -- 1.1. Environmental Qualification of Industrial
Parks.
1.2. Principles of Industrial Ecology.
