



Matthias Kühle-Weidemeier (Herausgeber)  
**Waste-to-Resources 2011- IV International  
Symposium MBT and MRF**  
Mechanical biological waste treatment and material  
recovery facilities

Matthias Kuehle-Weidemeier

**Waste-to-Resources 2011**  
**IV International Symposium**  
**MBT and MRF**

Mechanical biological waste treatment and material  
recovery facilities

Proceedings

24<sup>th</sup> – 26<sup>th</sup> of May 2011

Organiser  
**wasteconsult**  
INTERNATIONAL

In co-operation with  
Universität  
Rostock



Trade fair partner



Supported by



Gold Sponsor

**Vecoplan**<sup>®</sup>

Cuvillier Verlag

<https://cuvillier.de/de/shop/publications/363>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen,  
Germany

Telefon: +49 (0)551 54724-0, E-Mail: [info@cuvillier.de](mailto:info@cuvillier.de), Website: <https://cuvillier.de>

# Content

## I General Topics and Basics of Mechanical-Biological Waste Treatment

**MBT Processes and Identification of the Appropriate Technology** 1  
*M. Kühle-Weidemeier*

**Importance, Targets and Technical Concepts of Mechanical-Biological Treatment in Various Countries** 2  
*W. Müller*

**A Comparison of Two Biological Treatment Processes for Residual Waste Management** 18  
*T. Yates*

## II International Aspects of MBT and MRF

**Composting of Municipal Solid Waste in the Districts of Lomé (Togo): Experimental Process Study and Agronomic Use Potential** 30  
*K.E. Koledzi, G. Baba, G. Tchangbedji, K. Agbeko, G. Metejka, G. Feuillade, J. Bowen*

**Biological Mechanical Treatment of Municipal Solid Waste in China: Lab and Field Application** 51  
*F. Lv, N. Yang, L. Shao, P. He*

**The Role of MBT in Increasing the Number of Composting Facilities in Iran** 57  
*N. Mokhtarani, M. Khaleghi Sarnamy, B. Mokhtarani*

**German GHG Mitigation Lighthouse Project MBT Plant Gaobeidian (PR China)** 69  
*F. Kölsch, M. Ginter, K. Fricke*

**Waste Management in the Arabian World** 81  
*A. Nassour*

**Management of Municipal Solid Waste (MSW) in Santiago de Chile. Part I: Recycling and Pre-Treatment of MSW** 92  
*K.-R. Bräutigam, T. Gonzalez*

**Mechanical-biological Pre-Treatment of MSW** 110  
*J. Vogdt, \*, B. Wens*

**Municipal Waste Treatment in Poland – facts and myths** 127  
*M. Rybaczewska-Błażejowska*

<b>MBT/MRF State of Art in Norway and Possible Development within Norwegian Landfill Regulation and Local Conditions</b>	135
<i>F. Syversen</i>	

### **III Waste Management Strategies**

<b>Comparing the Carbon Benefit of Material Recovery in Contrast to Energy Recovery from Waste and the Need for Regulatory and Financial Mechanisms to Encourage Best Practice</b>	147
<i>N. Cawthorne, S. Kay</i>	

<b>Municipal Solid Waste Sorting and Treatment in Romania: Strategies of Energy Recovery from Two Pilot Case Studies</b>	158
<i>G. Ionescu, E.C. Rada, A. Badea, M. Ragazzi, T. Apostol</i>	

<b>Municipal Solid Waste Management Policies and Problems in Naples</b>	167
<i>S. Romano</i>	

<b>From Waste- to Resource-Management</b>	177
<i>G. Schock</i>	

### **IV MBT Technology**

<b>Maximum Recovery of Residual Waste with Maximum Yield Technology</b>	192
<i>G. Person, M. Schreiber</i>	

<b>Mechanical-Biological Waste Treatment Using VM-Press Instead of a Conventional Mechanical processing step</b>	204
<i>K. Dirkes</i>	

<b>KOMPOFERM® - Modular Waste Transforming Systems for MBT Technology: Case Study MBT Varna (BG)</b>	571
<i>I. Steinberg</i>	

### **V MBT Plants and Operational Experiences**

<b>Current Status and Prospects of Mechanical-Biological Treatment in Germany</b>	210
<i>T. Grundmann</i>	

<b>The Impact of Increased Differentiated Collection On Existing MBT Plants and Possible Upgrading Scenarios: The Experiences of a Central Italian Plant</b>	223
<i>F. Di Maria*, M. Marionni</i>	

<b>Plant Interconnection and Gas Supply to the Regional Gas Grid at the Waste Management Centre Pohlsche Heide</b>	235
<i>B. Schulte</i>	

<b>Pre-Processing of Municipal Solid Waste Before Anaerobic Digestion – CAPEX and OPEX as Model Calculation</b>	238
<i>M. Langen</i>	
<b><u>VI Optimisation of Mechanical-Biological Treatment</u></b>	
<b>Ways to Increase the Gas Yield of Anaerobic MBT Plants</b>	246
<i>R. Wallmann</i>	
<b>Optimisation of MBT Considering Energy Efficiency and Protection of Resources and Climate</b>	247
<i>K. Ketelsen, K. Kanning, C. Cuhls</i>	
<b>Refitting MBTs for Extended Recovery of Renewable Energy / Refuse Derived Fuels (RDF)</b>	263
<i>U. Wiegel</i>	
<b>Experimental Optimisation of Static Composting Reactors</b>	273
<i>K. Weichelt</i>	
<b>An Innovative Approach for Grape Marc Treatment: Bio-drying before Combustion</b>	284
<i>S. Ciuta, E. C. Rada, A. Badea, M. Ragazzi, C. Marculescu, T. Apostol</i>	
<b>Mechanical Dewatering of Digestate. – Necessity and Potentials</b>	290
<i>P. Schalk</i>	
<b>Turning of MBT Windrows with Simple Technology – Investigations of the Process Performance</b>	300
<i>K. Runge</i>	
<b>Large-Scale Composting of Biowaste and MSW by Using the TAIM WESER Composting-System</b>	313
<i>D. Polster</i>	
<b>Adaption of a German MBT Process to the Boundary Conditions of Newly Industrialized Countries - Results of a pilot plant operated in Thailand</b>	326
<i>S.M. Platz, M. Schaub, U. Menzel</i>	
<b>Efficient Processing of Household Waste and MBT Scrap with BHS-Rotorshredder</b>	342
<i>C. Hein</i>	
<b>MBT Larnaka, Cyprus – Waste Treatment Technology from Komptech</b>	353
<i>M. Wellacher</i>	
<b>Construction of MBT (KBA) Hard</b>	359
<i>R. Schu</i>	

## **VII Emissions and their Treatment**

**Emission, Leakages and Measures for Emission Reduction in Anaerobic MBT Plants** 578  
*C. Cuhls*

**Release of VOCs and Leachate During Bio-Drying of MSW with Higher Water Content** 366  
*N. Yang, N. Qiang, L. Shao, P. He*

**Municipal Solid Waste Bio-Drying : Odour Problem of Three Configurations** 375  
*E.C. Rada, M. Ragazzi*

## **VIII Minimising Emissions and Purification of Biogas**

**Emissions of the Aerobic Waste Treatment in Dependence of Shape and Method of Operation of the Windrows** 387  
*B. Gamerith, R. Lugmayr, A. Lübke*

**Efficient Desulphurization of Biogas based on a newly designed technology** 394  
*J. Stockinger*

## **IX Landfilling of Pre-Treated Waste**

**Economic Comparison of Landfilling with and without Anaerobic Pre-Treatment** 403  
*G. Burkhardt, N. Müller, L. Streff*

**Potential of the Microbial Methane Oxidation to Mitigate Lean Gas Emissions of MBT Waste** 417  
*S. Bohn, J. Jager*

## **X Waste Analytics and Process Control**

**New Findings on the Chlorine Analysis of Refuse Derived Fuels (RDF)** 430  
*S. Schade-Dannewitz*

**Heating Value of Residues and Waste Derived Fuels from Different Waste Treatment Methods** 446  
*I.-S. Antonopoulos, A. Karagiannidis, E. Kalogirou*

**The Role of MBT on the Stabilization of Residual Household Waste Before Landfilling at MBT Alveol (France): Physical and Chemical Assessment** 459  
*T. Chantou, G. Feuillade, D. Mausset, G. Matejka, J. Bouzid*

## **XI Sensor Based Sorting in MBT Plants and Processing of RDF**

**Current Status and Perspectives for Processing Commercial Waste for Material and Energy Recovery** 472

*R. Oetjen-Dehne, M. Kanthak*

**Sensor Based Sorting of the Heavy MBT Fraction to Comply with Landfill Acceptance Criteria. – Practical Experience and Comparison to Other Solutions** 484

*M. Meirhofer, A. M. Ragossnig, S. Pieber, M. Sommer*

**Splitting of Heterogeneous Waste by Sensor-based Sorting as a Basis for Optimized Material-Specific Waste-Routing** 497

*S. Pieber, A. M. Ragossnig, M. Sommer, M. Meirhofer, A. Curtis, R. Pomberger*

## **XII Avoiding and Fighting Fires in MBT and Recycling Plants**

**Self-Ignition of Deposits Containing Recycling Materials – an Underestimated Phenomenon?** 510

*A. Berger, S. Krüger, U. Krause, K.D. Wehrstedt*

**Stationary Compressed Air Foam Fire Extinguishing Technique** 523

*J. Meyer*

## **XIII Production, Material Flow Balance and Commercialisation of Secondary Materials**

**Processing and Energy Recovery from the High Calorific M(B)T Output Fractions** 533

*M. Nelles*

**Production and Utilization of Solid Recovered Fuels (SRF) in Austria** 546

*K. E. Lorber, R. Sarc*

**Decoding interdependencies between primary and secondary raw material markets by means of the Capacity Model** 561

*H. Klampfl, R. Pomberger, G. Schmidt*