Projekte für IGW Fricke & Turk GmbH und Pöyry Environment GmbH Dep./Abt. IGW, Witzenhausen

Research and Development

Design of Processing Facilities

Strategy Development and Expert Reports

Environmental Monitoring

Public relations campaigns

Training/Education

**Research and Development**

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<tr>
<th>Year</th>
<th>Project Description</th>
<th>Client/Location</th>
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<td>2006 ongoing</td>
<td>Evaluation of composting and AD technologies with respect to different stability parameters relevant in the UK and across Europe</td>
<td>Various clients</td>
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<tr>
<td>2004 – 2007</td>
<td>LuxCycle - Research project on continuous dry mono-fermentation of energy crops (Luxembourg)</td>
<td>Centre de Recherche Public Gabriel Lippmann</td>
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<tr>
<td>2003 – 2004</td>
<td>Development of renewable energy facility and bio-fuel crop production system (United Kingdom)</td>
<td>Snowie Ltd; Stirling, Scotland</td>
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<td>2002 – 2004</td>
<td>Assessment of the performance of a ballistic separator for material separation in MBT processes for the Stadler company (Germany)</td>
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<td>2002 – 2003</td>
<td>Expert report, engineer services (Germany)</td>
<td>City Cleansing Company of Berlin BSR</td>
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<td>2001 – 2004</td>
<td>MBT Buchen (Germany)</td>
<td>ISKA GmbH, Ettingen</td>
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<td>2001 – 2002</td>
<td>Trials on the landfill behaviour of MBT treated waste (Germany)</td>
<td>ABZ Hanover</td>
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<td>2001</td>
<td>Capability of the Linde tunnel composting technology to treat landfill leachate (Germany)</td>
<td>Linde BRV, Böle (Switzerland)</td>
</tr>
<tr>
<td>2001</td>
<td>Decomposition trials with ball mill output (Germany)</td>
<td>Rethmann Entsorgungswirtschaft GmbH &amp; Co. KG, Lünen</td>
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<tr>
<td>2001</td>
<td>ISKA process MBT plant Buchen (Germany)</td>
<td>U-Plus GmbH</td>
</tr>
<tr>
<td>2001</td>
<td>Preparation of solutions to compare the variants for residual waste treatment (Germany)</td>
<td>Rural District of Bad Tölz-Wolfratshausen</td>
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<td>2001</td>
<td>Treatment trials at mechanical treatment plant Wilsum (Germany)</td>
<td>Rural district of Grafschaft Bentheim</td>
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<td>2001</td>
<td>Trials to assess the suitability of MBT treated fines fraction as landfill restoration layer (Germany)</td>
<td>Rethmann Kreislaufwirtschaft GmbH &amp; Co.</td>
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<tr>
<td>Year Range</td>
<td>Project Description</td>
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<tr>
<td>2000 – 2001</td>
<td>Assessment of the maturation of digestate from a Valorga plant with respect to stabilisation and options for the exhaust air cleaning (Germany) Steinmüller Rompf Wassertechnik GmbH &amp; Co</td>
<td></td>
</tr>
<tr>
<td>2000 – 2001</td>
<td>Scientific-technical trials „Anaerobic and aerobic treatment of residual waste“ (Germany) KOGAS GmbH</td>
<td></td>
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<tr>
<td>2000</td>
<td>Concept development and cost determination for the further operation of the landfill including a MBT (Germany) WEV Westsächsische Entsorgungs- und Verwertungsgesellschaft mbH Markkleeberg</td>
<td></td>
</tr>
<tr>
<td>1997 – 1998</td>
<td>Evaluation of the OxiTop® System as a means of determining respiration activity (Germany) WTW, Weilheim</td>
<td></td>
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<tr>
<td>1997</td>
<td>Demonstration of the equivalency of bio-mechanical treatment of residual waste with incineration and preliminary planning of a bio-mechanical waste treatment plant</td>
<td></td>
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<tr>
<td>1996</td>
<td>Assessment of the Biodegma mobile aeration system for the biological treatment of residual waste (Germany) Biodegma and WGV Recycling GmbH Quarzbichl</td>
<td></td>
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<tr>
<td>1996</td>
<td>Assessment of the Kessler &amp; Luch reverse aeration system for the biological treatment of residual waste WGV Recycling GmbH Quarzbichl (Germany)</td>
<td></td>
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<tr>
<td>1996</td>
<td>Performance test of a membrane to reduce odour in a windrow composting (Germany) WGV Recycling GmbH Quarzbichl</td>
<td></td>
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<tr>
<td>1995 – 1998</td>
<td>Research and development project SAGA (Germany) Southern Hesse working group on waste management (SAGA)</td>
<td></td>
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<tr>
<td>1995 - 1999</td>
<td>Collaborative research project on the biological treatment of waste to be landfilled (MBT); funded by the Germany Ministry for Education and Research (BMBF): &quot;Stabilisation of residual waste through bio-mechanical treatment and its effects on the landfill&quot;</td>
<td></td>
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<tr>
<td>1995 - 1996</td>
<td>Project within the collaborative research project on the biological treatment of waste to be landfilled (Germany) WGV Recycling GmbH Quarzbichl</td>
<td></td>
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<tr>
<td>1993 - 1994</td>
<td>Development and testing of dedicated containers for the collection of organic waste (Germany) SSI Schäfer, Neunkirchen</td>
<td></td>
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<tr>
<td>1991 - 1992</td>
<td>Experiments on biodegradation of residual waste, material flows and optimisation of the bio-mechanical processing operation in Schaffhausen (Switzerland) Bühler-Miag, Braunschweig</td>
<td></td>
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<tr>
<td>1991</td>
<td>Development of a compost based growing media (Germany) City of Munich</td>
<td></td>
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</tbody>
</table>
Dr. Wolfgang Müller

1989 - 1990
Development and testing of a reed bed waste water treatment plant for the purification of leachate from a composting operation (Germany)
Ministry of the Environment, Federal State of Hesse, Wiesbaden

Design of Processing Facilities

2009 -ongoing
AD facility for source separated organic kitchen waste (12,000 tpa) and green waste (6,000 tpa) in Novi Ligure (Italy)
Client: SRT
Basic design, final design, tender preparation and evaluation, detail design review, supervision of commissioning

2009
RDF production plant (mechanical preparation of RDF from residual waste fractions 220,000 tpa)
KDHEC, Korea
Modelling of mass balances and recycling rates, Plant process design, cost calculations

2009
MBT plant (mechanical preparation of RDF from residual waste fractions 100,000 tpa)
Symevad, France
Modelling of mass balances and recycling rates, Plant process design, cost calculations

2008 - 2009
RDF production plant (mechanical preparation of RDF from commercial waste fractions, 120,000 tpa)
L&T, Finland
Plant process design, cost calculations, drafting of procurement documents

2008 -ongoing
AD facility for source separated biowaste (32,000 tpa) (dry system, horizontal digestor)
Client: WGV Recycling GmbH
Feasibility study, All engineering duties and responsibilities, from planning and construction to control of entire warranty period

2008
Optimisation of a 25,000 tpa MBT in Germany
Client: KAEV Niederlausitz

2008 - 2009
RDF production plant (mechanical preparation of RDF from commercial waste fractions, 120,000 tpa)
L&T, Finland
Plant process design, cost calculations, drafting of procurement documents

2008
Development of a basic design for underground RDF preparation facility (90,000 tpa) as part of an integrated waste treatment facility; Korea

2008 -2009
AD facility for source separated food waste (25,000 tpa) and MSW derived organics (45,000 tpa) for UK waste contractor
2007-2008 Arc21 (Northern Ireland): 100,000 tpa in-vessel composting facility for source separated biowaste
Technical advisor for the evaluation of tenders; technical expert in a law suit

2007 Development of a basic concept for RDF preparation from household and commercial waste in Korea

2007-2008 AD facility for source separated food waste (30,000 tpa) for UK waste contractor

2007 Development of a treatment approach for Korean Food Wastewater through Anaerobic Digestion for Korean private company

2005 - 2007 Composting plant Helsinki, Finland
Capacity enhancement of an existing plant from 30,000 tpa to 69,000 tpa

2004 - 2007 Lancashire County Council, UK:
PFI contract procurement (build and operate) for a network of:
− 2 MBT facilities processing 350,000 tpa MSW through mechanical pre-processing, anaerobic digestion and aerobic maturation
− 2 aerobic composting facilities processing 110,000 tpa of green & kitchen waste
− 1 MRF facility processing 75,000 tpa dry recyclables

2004 – 2000 NEWS, UK
150,000 tpa MBT for MSW including mechanical pre-processing, anaerobic dry digestion and aerobic maturation

2002-2004 Biogas plant at the landfill “Am Breitenberg”, District Werra-Meißner, Germany

2003 - 2006 Dorset County Council, UK:
120,000 tpa MBT for pre-processing and composting of MSW;
Feasibility study, basic design, cost studies

2002 – 2003 MBT Schöneiche, Germany
BSR Berliner Stadtreinigungsbetriebe

2001 – 2005 MBT Schöneiche, Germany
Märkische Entsorgungsanlagen-Betriebsgesellschaft mbH (MEAB)

1999 – 2000 Landfill Diebesstieg, Germany
City of Salzgitter

1999 MBT Halle-Lochau, Germany
MBT 100,000 tpa
Abfallwirtschaft Halle-Lochau GmbH

1997 – 1998 Composting plant Bützberg, Germany
Fa. Bühler Deutschland GmbH, Braunschweig

1997 – 1998 MBT Lübben-Ratsvorwerk, 36,000 t/yr (Germany) - Kommunaler Abfallentsorgungsverband Niederlausitz, Lübben

1997 Landfill Schöneiche and MBT Vorketzin (Germany)
Märkische Entsorgungsanlagen-Betriebsges. mbH, Neu Fahrland
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<td>1997</td>
<td>MBT Schöneicher Plan, 350,000 t/y (Germany)</td>
<td>Berliner Städtereinigung, Berlin</td>
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<td>1996</td>
<td>MBT Kirschenplantage (Germany)</td>
<td>Publicly owned waste management company for the District of Kassel</td>
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<td>1995</td>
<td>Composting facility Mechernich (Germany)</td>
<td>District Euskirchen</td>
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<tr>
<td>1995</td>
<td>Design and test of an improved window aeration system -</td>
<td>Publicly owned waste management company for the District of Kassel</td>
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<td>1995</td>
<td>Improvement of an M.U.T. composting plant (Danotrommel)</td>
<td>Katowice (Poland, 1995)</td>
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<td>1994 - 1995</td>
<td>Landfill Vogelsang (Germany)</td>
<td>MBT pilot plant and composting plant – City Heilbronn and Ministerium of Environment Baden-Württemberg</td>
</tr>
<tr>
<td>1994 - 1995</td>
<td>Test and design of an improved window aeration</td>
<td>Kessler &amp; Luch, Gießen (Germany, 1994 – 1995)</td>
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<tr>
<td>1993</td>
<td>MBT Deggendorf (Germany)</td>
<td>ZAW Zweckverband Abfallwirtschaft Donau-Wald</td>
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<td>1993</td>
<td>MBT Quarzbichl (Germany)</td>
<td>WGV GmbH, Eurasberg</td>
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Environmental Monitoring

2006  Waste audits (Germany)  
ISKA GmbH, Ettlingen  

2004  Odour monitoring MBT Canford (United Kingdom)  
District Canford  

2004  Performance test of mechanical preparation of residual and commercial waste (Germany)  
Stratmann - Stadler Anlagenbau GmbH  

2004  Trials of mechanical preparation of residual waste (Germany)  
Stadler Anlagenbau GmbH  

2004  Waste audit of residual waste (Germany)  
Thöni Industriebetriebe GmbH  

2003  Waste audit of residual waste and recyclables District Canford (United Kingdom)  
District Canford  

2002  Waste audits (Germany)  
Fa. Stadler  

1998  Analyses (Germany)  
Waste Management Board Saale-Orla  

1996  Waste audits (Germany)  
District of Rendsburg-Eckernförde  

1995  Assessment of odour emissions (Germany)  
South Hesse Working Group on Waste management (SAGA)  

1994 – 1996  Waste audits (Germany)  
City of Heilbronn  

1991 - 1995  Waste audits (Germany)  
Five districts within the Waste Management Board Donau-Wald  

1991 – 1992  Waste audits (Germany)  
District of Cham  

1991 – 1992  Waste audits (Germany)  
City of Rosenheim  

1990 - 1991  Waste audits (Germany)  
City of Munich  

1990  Waste audits (Germany)  
District of Garmisch-Partenkirchen  

Strategy Development and Expert Reports

2006  Modelling costs of food waste collection  
ORA/Bedfordshire  

2006  Technical and economical assessment of the ISKA MBT plants  
Buchen und MBA Heilbronn (Germany)  
Fricke Beratungen Göttingen (Germany)  

2005  Feasibility Study "Processing of leachate"  
Jaakkko Pöyry Infra Soil & Water Ltd. (Finland, 2005)  

2003 - 2004  Ecological assessment of different options to recover food waste oil and grease (Austria)  
Environmental Association Vorarlberger Gemeindehaus, Dornbirn (Austria)
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<tr>
<th>Year</th>
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<tr>
<td>2003</td>
<td>Feasibility study on the utilization of UK supermarket waste with anaerobic digestion including design and cost calculations</td>
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<td>2003 - 2004</td>
<td>Residual waste, biologically stabilized residual waste - SYNCOAL (Italy)</td>
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<td></td>
<td>Thöni Industriebetriebe GmbH</td>
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<td>2002</td>
<td>Energy crops – Potential and feasibility study of anaerobic digestion</td>
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<td></td>
<td>Ministry of the Environment Luxembourg</td>
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<tr>
<td>2001 - 2003</td>
<td>Residual Waste Management Concept Vorarlberg (A)</td>
</tr>
<tr>
<td>2000 - 2001</td>
<td>Technical report “Energy recovery” on behalf of City Cleansing of Berlin BSR, large scale trials on the preparation of RDF from MBT screen overflow for various industrial options</td>
</tr>
<tr>
<td>2000 - 2002</td>
<td>Feasibility studies including costings and technical assessment for MBT Cröbern, operational since 2005</td>
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<td>2000</td>
<td>Waste treatment facility Wiesbaden LHW (Germany)</td>
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<td></td>
<td>Waste management company City of Wiesbaden</td>
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<td>1999 - 2000</td>
<td>Cost assessment of building and operating a MBT plant (Germany)</td>
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<tr>
<td></td>
<td>BUND Kreisverband Meiningen</td>
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<td>1998 – 1999</td>
<td>Landfill Lampertheimer Wald (Germany)</td>
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<td></td>
<td>Abfallwirtschaft district Bergstraße, Lampertheim</td>
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<td>1998 - 1999</td>
<td>MBT Wiesbaden (Germany)</td>
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<tr>
<td></td>
<td>Waste management company City of Wiesbaden</td>
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<tr>
<td>1998</td>
<td>Ideas competition Wiesbaden (Germany)</td>
</tr>
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<td></td>
<td>Disposal company of the state capital Wiesbaden</td>
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<tr>
<td>1998</td>
<td>Proof of equivalence and MBT pre-concept</td>
</tr>
<tr>
<td></td>
<td>District Heppenheim (Germany)</td>
</tr>
<tr>
<td>1995 - 1997</td>
<td>Waste management improvement measures in Katowice (Poland)</td>
</tr>
<tr>
<td></td>
<td>Ministry of Environmental Protection and Water Management (ESMU) Warszawa (EU-funded project)</td>
</tr>
</tbody>
</table>
2004 - 2009 Lancashire County Council, UK:

- PFI contract procurement (build and operate) for a network of:
  - 3 MBT facilities processing 510,000 tpa MSW through mechanical preprocessing, anaerobic digestion and aerobic maturation
  - 3 aerobic composting facilities processing 165,000 tpa of green/kitchen waste
  - 2 MRF-facilities processing 75,000 tpa dry recycables

2002 - 2006 Biogas plant at the landfill “Am Breitenberg”, District Werra-Meißner, Germany

2003 Feasibility study on the utilization of UK supermarket waste with anaerobic digestion including design and cost calculations

2004 - 2005 NEWS, UK: 150,000 tpa MBT for MSW including mechanical preprocessing, anaerobic dry digestion and aerobic maturation

2002 - 2004 Assessment of the performance of a ballistic separator for material separation in MBT processes for the Stadler company

2000 - 2001 Technical report “Energy recovery” on behalf of City Cleansing of Berlin BSR, large scale trials on the preparation of RDF from MBT screen overflow for various industrial options

2001 - 2003 Residual Waste Management Concept Vorarlberg (A)

2000 - 2002 Feasibility studies including costings and technical assessment for MBT Cröbem, operational since 2005

1997 Demonstration of the equivalency of bio-mechanical treatment of residual waste with incineration and preliminary planning of a bio-mechanical waste treatment plant

1995 - 1999 Collaborative research project on the biological treatment of waste to be landfilled (MBT); funded by the Germany ministry for education and research (BMBF): “Stabilisation of residual waste through bio-mechanical treatment and its effects on the landfill”

Public relations campaigns

1996 Improvement of the source separation of organic waste in the City of Katowice (Poland) - population 9,000 - City of Katowice (Poland)

1995 Six months training course to become an “expert in biological waste treatment and recycling” (Germany)
Employment Centre Kassel, Institute for Agricultural Education, Witzenhausen

1994 Introduction of source separation collection for organic kitchen and garden in the district of Straubing (Germany)

1993 Development and production of a media package about waste minimisation and recycling for tourism operators in the District of Garmisch-Partenkirchen (Germany)
District of Garmisch-Partenkirchen

1993 Introduction of source separation collection for organic kitchen and garden in the City of Straubing (Germany)
1991 - 1993  Introduction of source separation collection for organic kitchen and garden in the district of Cham Germany
1991 – 1992  Introduction of source separation collection for organic kitchen and garden in the City of Rosenheim (Germany)
1990 – 1996  Introduction of source separation collection for organic kitchen and garden in the City of Munich (Germany)
1991  Introduction of source separation collection for organic kitchen and garden in the City of Munich (Germany)
1991  Introduction of source separation collection for organic kitchen and garden in the District of Garmisch-Partenkirchen (Germany)

Trainings/Education

1996 - 1997  Nine months training course to become an "expert in biological waste treatment and recycling" (Germany)
Job Centre Kassel, Institute for Agricultural Education, Witzenhausen
1996  Trainee course "ENERGY, WASTE AND REFUSE" - IFOA Istitutio Formazione Operatori Aziendali (Italy)
Co-operation with DEULA Witzenhausen
1995  Six months training course to become an "expert in biological waste treatment and recycling" (Germany)
Employment Centre Kassel, Institute for Agricultural Education, Witzenhausen
1992  Training course in "Composting" for employees of the supply and disposal industries (Germany)
Institute for Advanced Vocational Training, Mühlhausen
1991  One week training course for staff of composting plants (Germany)
Waste Management Board Donau-Wald
1988  Four week training course on organic waste management for waste management company staff (Austria)
Roth GmbH, Graz
1987 - 1989  Advanced training courses for waste management consultants (one year graduate training course) (Germany)
Job Centre Celle
1987 – 1989  Course in „Composting and ecological waste management“ within a re-training program to become a gardener/landscaper (Germany)
Job Centre Celle