

ecosan – newsletter - no. 22 - 11/2006 - english



This regular electronic news bulletin from the ecosan programme of GTZ, Germany, addresses a network of friends and professionals involved in initiatives and projects in the field of closed-loop wastewater management and sanitation.

Dear friends and colleagues!

Welcome to GTZ's ecosan newsletter issue no. 22!

The latest editions of the English version are distributed directly via e-mail in the globally readable, text-only format. You can also download German, French, Spanish, English and Chinese versions as easy-to-read pdf files from our web-site.

!!! Downloads:

German: <http://www2.gtz.de/Dokumente/oe44/ecosan/nl/de-ecosan-nl22-2006.pdf>

Spanish: <http://www2.gtz.de/Dokumente/oe44/ecosan/nl/es-ecosan-nl22-2006.pdf>

French: <http://www2.gtz.de/Dokumente/oe44/ecosan/nl/fr-ecosan-nl22-2006.pdf>

English: <http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-ecosan-nl22-2006.pdf>

Chinese: <http://www2.gtz.de/Dokumente/oe44/ecosan/nl/cn-ecosan-nl22-2006.pdf>
(from January 2006)

* For organisational reasons, the Chinese version is published later than the others.

Your ecosan team hopes you enjoy the current issue!

Your contributions

This medium lives through interaction. So please keep sending your suggestions, requests and information to be published via this newsletter to the addresses at the end of this issue. Thank you in advance for any contribution!



Contents

- In-House News** - Report from the DWA/BMZ/GTZ ecosan Symposium on the October 26th – 27th 2006 in Eschborn
 - Now online: new project and technical data sheets
 - Changes in the GTZ ecosan team
- News from the IWA specialist group - ecosan** - News from the IWA specialist group on “ecological sanitation”
- News from EcosanClub** - Report from the 4th Shit Happens Event on “Closed loop oriented wastewater systems in alpine areas”
- News from WASTE and EcosanClub** - Kick-off meeting of the EU funded ROSA project
- World Toilet Expo Bangkok** - “World Toilet Expo & Forum 2006”, November 16th – 18th in Bangkok, stresses the importance of sustainable sanitation systems
- Ecocity6** - Ecocity 6 takes place from the December 3rd to the 6th in Bangalore
- News - general** - New WHO Guidelines on the safe use of wastewater, excreta and greywater in agriculture and aquaculture now available!!
 - Germany lobbies the United Nations to make 2008 the International Year of Sanitation
 - Hans Huber receives the German Environment Prize for the development of innovative wastewater management solutions
 - The MDG Joint Monitoring Programme of UNICEF and WHO now recognises composting toilets as “improved sanitation”
 - The UNDP Human Development Report 2006 makes water and sanitation supply a central theme
 - “Sanitation is Dignity” – German Toilet Organization exhibition travels to Switzerland
 - World Toilet College carries out first two week course on sustainable sanitation in Indonesia
- Jobs** - Algeria: Advisor for Water Management Regulation - Algier – GTZ
 - Bolivia: Advisor Water Sector (PROAPAC) - La Paz – GTZ
 - Mongolia: Team member, Mongolia, Ulan Bator – GTZ
 - Water and Sanitation jobs with the German Development Service, DED
- News from the pilot projects - German Cooperation** - Mediterranean region: The “EMWater project”
 - Burkina Faso: ecosan in peripheral neighbourhoods of Ouagadougou – project officially launched 7th November 2006
 - China: ecosan Projekt Expo 2010 Shanghai
 - Germany: DEUS 21 – Decentralised Urban Infrastructure Systems
 - Germany: EU Demonstration project in Berlin
 - The Philippines: an ecosan vision for the town of Cagayan de Oro
 - India: Overview of the ecosan projects of the IESNI
 - Jordan and Palestine: The “MEDWA Project”
 - Global: EU-project SWITCH aims at Sustainable Urban Water Management in the City of the Future
- News from the pilot projects - other organisations** - China: update on the China-Sweden Erdos Eco-Town Project
 - Burkina Faso: Report from the course “ecological sanitation to achieve the MDGs in Sub-Saharan Africa”
- Publications ...on the web** - Ecosan and urban agriculture – M. Sc. Thesis
 - UNICEF Report Card on Water and Sanitation
 - Guidelines for Sustainable Water Management in Tourism Facilities – SWAMP Report
 - The road not taken: how traditional excreta and greywater management may point the way to a sustainable future

- Internet courses** 01/03-21/06/07 Online Short Course Ecological Sanitation - UNESCO-IHE
- Trainings and courses** 27/11-07/12/06 International theoretical and practical ecosan course, Tepoztlán, Mexico
- Events – new**
- 29-30/11/06 2nd International BNS Workshop & Symposium: “Business Unusual”, Bremen, Deutschland
 - 05-06/12/06 15th Annual Conference "Biogas und Bioenergie in der Landwirtschaft", Wolpertshausen, Germany
 - 31/1-02/2/07 16th Annual Conference of the Fachverband Biogas e.V. with exhibition: „Biogas im Wandel“, Leipzig, Deutschland
 - 06-09/03/07 World Biofuels Markets, Brüssel, Belgien
 - 21-23/03/07 Fourth International Conference on Sustainable Water Resources Management, Kos, Griechenland
 - 20-22/06/07 Energy 2007, The New Forest, UK
 - 27-29/06/07 4th International Conference on The Impact of Environmental Factors on Health; Malta
 - 12-14/09/07 New directions in urban water management, Paris, Frankreich
 - 11/06-14/09/08 EXPO Zaragoza 2008: Water for Sustainable Development, Zaragoza, Spain
- Events – reminders**
- 12-16/12/06 The Philippines: EAS Congress 2006
 - 10-15/03/07 USA: 16th Annual Technical Education Conference and Exposition
 - 12-13/03/07 Germany: Advanced Sanitation
 - 21-24/03/07 Tunisia: Meda Water Int. Conference on Sustainable Water Management
 - 05-07/09/07 Portugal: ECOSUD 2007
 - 01-05/10/07 Italy: Sardinia Symposium 2007
 - 28/10-1/11/07 Australia: 2nd IWA-ASPIRE Asia-Pacific Regional Group Conference and Exhibition
 - March 2009 Turkey: 5th World Water Forum

In-House News **Report from the DWA/BMZ/GTZ ecosan Symposium on the October 26th – 27th 2006 in Eschborn**

Organisers: DWA (German Association for Water Wastewater and Solid Waste Management), BMZ, GTZ (Society for Technical Cooperation)

The expert symposium “New Sanitation Concepts (ecosan) – International Project Experience and Dissemination Strategies“, organised by the DWA, BMZ and GTZ, took place on the 26th and 27th October in Eschborn. The focus of the symposium was on the numerous reports from international projects and the demonstration and feasibility ecosan in Germany. The symposium was completed by a podium discussion with international guest speakers and the “ecosan-Stammtisch”.

In his welcoming address, Dr. Andreas Kuck (GTZ Eschborn) was delighted to welcome more than 100 participants who had come from all around the world to attend, including Canada, India, China and the Philippines. As a special guest he welcomed Hans Huber, the winner of this year’s German Environment Prize. He spoke with pride of the completed renovation of the sanitation system in the GTZ building which now separately collects urine and brownwater for reuse, making it a suitable location to welcome friends and promoters of closed loop sanitation. Dr Uschi Eid, the Chair of the UN Secretary General’s Advisory Board on Water and Sanitation sent a written greet to the participants stressing that the issue of sanitation supply must be at the top of political agendas. Dr Eid stated that a good wastewater management will contribute decisively to the fight against water related diseases, and a general positive economic development.

A complete report of the symposium by Christian Schneider (DWA) will appear in the February 2007 issue of the DWA Magazine “Korrespondenz Abwasser”. It can be downloaded in a provisional version from the link below.

The DWA-BMZ-GTZ symposium proceedings are available in printed form from the DWA and in digital form from the GTZ web-site. Here the written contributions and presentations in pdf format) can be downloaded.

!!! Download:

Symposium report from the DWA Magazine "Korrespondenz Abwasser" (German)

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/de-ecosan-dwa-bmz-gtz-taunungsbericht-2006.pdf>

Symposium Flyer (German / English)

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/de-ecosan-dwa-bmz-gtz-symposium-flyer-2006.pdf>

Proceedings (German / English)

<http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/9249.htm>

!!! Contact: christine.werner@gtz.de

!!! Contact: schollbach@dwa.de, christian.schneider@dwa.de

New ecosan Project Data Sheets

To document the great variety of ecosan projects currently being implemented, the GTZ has been publishing project data sheets for some time. This series has now been expanded with 4 new interesting projects.

The ecosan project data sheets provide information on a wide range of projects. The series presents projects from the South and North, using high tech and low tech, in urban and rural areas, on a small and large scale and from different cultural contexts. The data sheets contain concise information on technical, organisational and financial aspects of the project, and describes particular experiences and "lessons learned".

The newly published project sheets are: "Urine separation in an eco-settlement in Linz, Austria", "Greywater recycling in the Hotel Arabella, Offenbach, Germany", "ecosan in Chordeleg, Ecuador" and "Urine separation in Kunming, China".

The GTZ ecosan team do not wish to limit the data sheets only to projects where the GTZ intervene, and would like to invite other institutions, groups and individuals to present their experiences this series. The GTZ have therefore placed a template on the ecosan web-site that can be used to provide project information that can be sent to the ecosan team as a new proposal for the data sheet series.

!!! Download the NEW project data sheets and the template for data sheet proposals:

Newly published project data sheets:

017 ecosan project in SolarCity Pichling, Linz, Austria **[New]**

<http://www.gtz.de/de/dokumente/en-ecosan-pds-017-solarcity-linz-2006.pdf>

018 Greywater recycling in Hotel Arabella Sheraton Am Büsing Palais, Offenbach, Germany **[New]**

<http://www.gtz.de/de/dokumente/en-ecosan-pds-018-germany-offenbach-arabella-2006.pdf>

019 Ecological sanitation pilot project in Chordeleg, Canton Chordeleg, Azuay Prov., Ecuador **[New]**

<http://www.gtz.de/de/dokumente/en-ecosan-pds-019-chordeleg-ecuador.2006.pdf>

020 Urine diverting dry toilets project, Kunming, China **[New]**

<http://www.gtz.de/de/dokumente/en-ecosan-pds-020-china-kunming-2006.pdf>

Or direct from the GTZ ecosan homepage under:

<http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/9399.htm>

Template for project contributions:

<http://www.gtz.de/de/dokumente/en-ecosan-project-data-sheet-template-2005.doc>

!!! Please send your contributions to the ecosan project data bank to ecosan@gtz.de

New and revised ecosan technical data sheets

For the choice and design of technical components for ecosan systems there is still only a limited amount of information available. The ecosan technical data sheets from the GTZ ecosan team aim to help close this information gap.

The ecosan technical data sheets are published at first as drafts to encourage feedback and collect additional information. This feedback is then integrated into the document and a final version is published. Some of the first published data sheets were addressing urine separating systems, dehydration toilet systems and vacuum technology. Newly published sheets now discuss compost toilets. Data sheet 03A provides a general description of compost toilets. Sheets 03B1 to 03B4 contain technical information on one, two and multiple chamber compost toilets, toilets with removable collectors and toilets with automatic mixing devices. Data sheet 03C presents information on compost toilet system producers.

The following chapters of existing data sheets have also been revised and updated: "01 Urine separation" of data sheet 01B1, "02 Dehydration Toilets" of data sheet 02A, and sheets 02B1 to 02B5. The series of data sheets on dehydration toilets have also been expanded with data sheets 02C1 and C2 with detailed plans of dehydration toilets from different countries, and a range of information for users of dehydration systems.

As always we would be extremely pleased to receive comments and improvement suggestions on the technical data sheets. We would be particularly interested in plans that can be reproduced, sketches and designs, as well as further information on possible technical variations, pictures, graphics etc.

!!! Download: New or revised technical data sheets

01. Urine diversion

- 01.B1 Urine diversion - Toilets **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-01-b1-urine-diversion-toilets-2005.pdf>

02. Dehydration toilets

- 02.A Dehydration toilets - General description **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-a-dehydration-toilets-general-description-2005.pdf>
- 02.B1 Dehydration toilets - Double vault with urine diversion **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-b1-dehydration-toilets-double-vault-ud-2005.pdf>
- 02.B2 Dehydration toilets - Single vault with urine diversion **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-b2-dehydration-toilets-single-vault-ud-2005.pdf>
- 02.B3 Dehydration toilets - Without urine diversion **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-b3-dehydration-toilets-without-ud-2005.pdf>
- 02.B4 Dehydration toilets - With movable containers **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-b4-dehydration-toilets-movable-containers-2005.pdf>
- 02.B5 Dehydration toilets - Traditional dehydration toilets in Yemen **[revised]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-b5-dehydration-toilets-traditional-yemen-2005.pdf>
- 02.C1 Dehydration toilets - Construction plans - selected examples **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-c1-dehydration-toilets-plans-2006.pdf>
- 02.C2 Dehydration toilets - User instructions - selected examples **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-02-c2-dehydration-toilets-user-instructions-2006.pdf>

03. Composting toilets

- 03.A Composting toilets - General Description **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-a-composting-toilets-general-description-2006.pdf>
- 03.B1 Composting toilets - Single-vault composting toilets **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-b1-single-vault-composting-toilets-2006.pdf>
- 03.B2 Composting toilets - Multiple-vault composting toilets **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-b2-multiple-vault-composting-toilets-2006.pdf>
- 03.B3 Composting toilets - Movable bucket/bin composting toilets **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-b3-movable-bin-composting-toilets-2006.pdf>
- 03.B4 Composting toilets - Composting toilets with mixing devices **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-b4-mixing-composting-toilets-2006.pdf>
- 03.C Composting toilets - Manufacturers and commercially available composting toilets **[New]**
<http://www.gtz.de/de/dokumente/en-ecosan-tds-03-c-manufacturers-composting-toilets-2006.pdf>

All technical data sheets can be found on the GTZ ecosan homepage under:
<http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/9397.htm>

!!! Please send your comments to the drafts to ecosan@gtz.de

Changes in the GTZ ecosan team

We are pleased to welcome the following new interns to the GTZ ecosan team:

- **Hiywot Belayneh** from Ethiopia is studying her Master of Science degree (MSc) in Agricultural Economics at the Hohenheim University, Stuttgart (Germany), and will soon complete her master thesis on WTO Membership and Trade growth in Developing Countries. She is interested in the area of natural resources management and has been carrying out her internship in Eschborn since November 2006 to April 2007.
- **Sören Rüd** completed his bachelor studies in Environmental and Resource Management at the Brandenburg Technical University in Cottbus (Germany). In his bachelor thesis he examined the possibilities for wastewater management in a rural region in Mexico. His internship with the team in Eschborn runs from November 2006 to February 2007.
- **Clement Klutse** from Togo graduated in Economics at the University for Economy and Politics in Hamburg two years ago, majoring in management and marketing. He wrote his thesis on the topic of "Diversity Management". Clement's internship with the GTZ ecosan Team is from October 2006 to January 2007.
- **Eve Menger-Krug** studied geo-ecology at the University of Karlsruhe. She had an internship with the ecosan team in Eschborn from January to April 2006, and has worked with the project team since August 2006. She is going to begin an internship from December 2006 to April 2007 working with ecosan in India.
- **Veronika Zacharias** studied Economy at the Johannes-Gutenberg University in Mainz (Germany). Following her internship from August to October 2006, she continues working with the GTZ ecosan team in Eschborn.

News from the IWA specialist group on ecosan

News from the IWA specialist group on "ecological sanitation"

Dear members of the IWA specialist group on "ecological sanitation"!

Since issue nr. 21, the GTZ ecosan newsletter contains a contribution for the members of the IWA specialist group on "ecological sanitation". All members of the group are cordially invited to submit their own contributions.

Ecological Sanitation Specialist Group (SG) meeting at the biannual conference in Beijing.

- At this meeting Günter Langergraber was elected additional co-chair to the group. Günter Langergraber has long been active in the field of ecological sanitation i.e. by organizing an ecosan workshop at the IWA Small06 conference in Mexico City. Currently he is the coordinator of the EU-project ROSA (see below).
- The name of the specialist group was discussed again. The issue was not fully resolved but we meanwhile continue to use "Ecological Sanitation" as this is better known than "Resources Management Sanitation", which was suggested two years ago at the biennial conference in Marrakech.
- Participation in the EcoSanRes email discussion forum was encouraged for discussion and sharing of information.
- A suggestion on a cluster of IWA SG conferences in Mexico in the fall of 2009 was discussed. The suggestion is to coordinate SG conferences of the SGs "Water Reuse", "Developing Countries" and "ecological sanitation". The ecological sanitation SG supports this idea and plans for a SG conference in Mexico in the fall of 2009.
- An open workshop on ecological sanitation at the conference "Advanced Sanitation" 12-13 March 2007 in Aachen, Germany was suggested, as there will be a strong ecosan attendance at this conference. At this conference there will also be a meeting of the ecological sanitation SG (see below).
- The EU funded projects NETTSAF (<http://www.netssaf.org>) and ROSA (<http://rosa.boku.ac.at>) were shortly introduced. The IWA headquarter is directly involved in the NETTSAF-project, in which large scale implementation of sustainable sanitation in West Africa is aimed. Well prepared suggestions for implementation of sustainable sanitation should have good chances to get funded.

News from the IWA specialist group on ecosan

For the full minutes go to our home page: <http://www.ecosan.org/>

Sanitation21: At the Beijing conference also the Sanitation21 Task Group met. This group is preparing a framework for analysis of sanitation, which has since been circulated in draft form and will soon be published. Ralf Otterpohl is one of the members of the advisory group on this important work.

Next Specialist Group meeting: Monday 12 March at 17.00 at the conference "Advanced Sanitation" 12-13 March 2007 in Aachen, Germany

!!! Contacts:

Ralf Otterpohl (chair; otterpohl@tuhh.de)

Håkan Jönsson (co-chair; Hakan.Jonsson@bt.slu.se),

Günter Langergraber (co-chair; Guenter.Langergraber@boku.ac.at)

Report from the 4th Shit Happens Event on "Closed loop oriented wastewater systems in alpine areas"

The 4th Shit Happens event on the topic of "Closed loop oriented wastewater systems in alpine areas" took place on the 7th November 2006 at the University of Natural Resources and Applied Life Sciences in Vienna.

Presently in Austria there are around 700 alpine huts with a total sleeping capacity of 39 000, with a further 1000 private huts. Many of these are already fitted with a wastewater system conforming to legal requirements, however many others require urgent attention and action. During this event different ideas had been presented on how a sustainable sanitation system for this environment might actually look and this was discussed using examples from practice.

Peter Kapelari from the Austrian Alp Association provided an overview of the difficulties and problems of wastewater disposal in alpine areas, with the emphasis of his presentation being on the challenges facing planners and operators of huts. Gunnar Amor, a planner specialised in water supply and wastewater management in alpine areas, then presented one concept of how a closed loop sanitation system can be implemented using the example of the Bettelwurf hut in Karwendel, Tirol. Christian Gschnitzer, the manager of the Bettelwurf hut added to this presentation with his experience of the operation and maintenance of the system in practice. Wolfgang Becker, from the University of Innsbruck concluded by discussing the problem of sludge management in mountainous regions and presented different approaches to addressing this.

!!! Download: Presentations and the complete summary <http://www.ecosan.at>

!!! Contact: Elke Müllegger elke.muellegger@ecosan.at

News from WASTE and EcoSanClub

Kick-off meeting of the EU funded ROSA project

The new EU-funded project "ROSA - Resource Oriented Sanitation concepts for peri-urban areas in Africa" started on October 1, 2006 (3 years duration). The Kick-off meeting was held from October 16-20 2006 in Austria hosted by BOKU University, the co-ordinator of the project.

As a route to sustainable and ecologically sound sanitation ROSA promotes resource-oriented sanitation concepts that shall be applied in four cities in East-Africa, namely Arbaminch (Ethiopia), Nakuru (Kenya), Arusha (Tanzania) and Kitgum (Uganda). EcoSan-Club and WASTE are partners in the ROSA consortium that includes 5 European partners as well as 2 partners from each of the East African countries, a university and an end-user. Beside EcoSan-Club and WASTE the European partners are: BOKU - University of Natural Resources and Applied Life Sciences, Vienna (co-ordinator), Hamburg University of Technology, and London School of Hygiene and Tropical Medicine.

Partners in Ethiopia are Arba Minch University and Arba Minch Town Water Service, Egerton University and the Municipal Council of Nakuru in Kenya, the University of Dar es Salaam and Arusha City Council in Tanzania, and Makerere University and Kitgum Town Council in Uganda.

!!! **Contact:** Dr. Guenter Langergraber, co-ordinator ROSA project
Guenter.Langergraber@boku.ac.at

!!! **Download:**
http://www.tu-harburg.de/aww/forschung/pdf/beschreibung_tutech151017.pdf

World Toilet Expo - Bangkok

"World Toilet Expo & Forum 2006", November 16th – 18th in Bangkok, stresses the importance of sustainable sanitation systems

Organised by Thailand's Ministry of Public Health (MPOH), the World Toilet Organization (WTO) and Meeting Planners International (MP), the second "World Toilet Expo & Forum" recently took place in Bangkok.

Both Isabel Blackett (World Bank WSP) and Dr Uschi Eid in their keynote speeches addressed the progress and setbacks that have been whilst striving to achieve the MDGs. Dr Eid was speaking as acting chair of the United Nations Secretary General's Advisory Board on Water and Sanitation, and addressed the concrete actions that the board has put forward in its "Hashimoto-Action-Plan" which now requires support.

A complete thematic block and a podium discussion at the conference was devoted to ecological sanitation concepts. Speakers here included Christine Werner (GTZ ecosan programme) and Mr. Lin Jiang (Jiu San Society, Guanxi Committee). On the second and third day thematic blocks addressed issues of "Health, Achievability and Security", with the third day being completed by an excursion.

!!! **Download:** „Recommendations of the UN-Secretary General's Advisory Board (UNSGAB) on Water & Sanitation for the Achievement of the Sanitation Related Millennium Development Goals“ Keynote from Dr. Uschi Eid, Acting UNSGAB Chair
<http://www2.gtz.de/Dokumente/oe44/ecosan/en-world-toilet-organisation-keynote-bangkok-2006.pdf>

!!! **Download:** „Compendium of action“ of the United Nations Secretary-General's Advisory Board on Water and Sanitation:
http://www.unsgab.org/Compendium_of_Actions_en.pdf

!!! **Download:** „Closing the loop through ecological Sanitation“ Christine Werner, head of the GTZ-ecosan programme
<http://www2.gtz.de/Dokumente/oe44/ecosan/en-ecosan-closing-the-loop-2006.pdf>

!!! **Further information:** <http://www.worldtoiletexpo.com/home>

Ecocity 6

Ecocity 6 takes place from the December 3rd to the 6th in Bangalore

Organiser: Ecocity Builders, Project Agastya and 25/Bangalore

The "International Conference for sustainable eco-city development (ecoCity 6)" takes place in Bangalore from the December 3–6 2006, and is a part of the "International Convention of the Cities of the Future".

Ecosan will be discussed in Symposium 4 "efficient and sustainable management of urban infrastructure". Additional themes to be discussed are: integrated sustainable water and resource management, integrated sustainable solid waste management; health and sanitary infrastructure; services and energy; urban transport management; air and soil pollution; public security; eco-tourism; urban poverty and unemployment.

The latest information on the programme can be seen at the address below or asked for at the secretariat.

!!! **Information:** <http://www.tciconferences.com/ecocity2006/ecocity2006.htm>

!!! **Contact:** Secretariat: ecocity6@gmail.com

Conference organiser: Mr. Rajeev Kumar, project.agastya@gmail.com

News - general

New WHO Guidelines on the safe use of wastewater, excreta and greywater in agriculture and aquaculture now available!!

The long awaited updated guidelines from the World Health Organisation (WHO) on the use of wastewater, excreta and greywater in agriculture and aquaculture have now been presented to the public at the 5th IWA World Water Congress in Peking. This third edition of the WHO Guidelines marks an important departure from the presentation of static standards and norms to best practice guidance in risk assessment and management for the use of this increasingly important water, nutrient and energy resource.

The Stockholm Framework provides the basis for establishing health based targets, and the guidelines describe possible risk management interventions for the various phases from the generation of wastewater, excreta and greywater to the consumption of produce for which they are used. The guidelines are issued in four volumes, each with a different focus and target audience.

Ecosan systems and system components are comprehensively discussed in the new WHO guidelines, and recommended as proven technologies for many situations. Volume 2 on "Wastewater use in agriculture", Volume 3 on "Wastewater and excreta use in aquaculture" and Volume 4 on "Excreta and greywater use in agriculture" are now available online at the WHO-website below.

!!! **Information:**

<http://www.who.int/mediacentre/news/new/2006/nw03/en/index.html>

!!! **Download:** Volume 2 (21,93 MB), Volume 3 (15,44 MB) & Volume 4 (18,42 MB)

http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html

Germany lobbies the United Nations to make 2008 the International Year of Sanitation

Together with Brazil, China, The Czech Republic, Egypt, France, Italy, Japan, Kenya, Mozambique, the Philippines, Singapore, Tajikistan and Thailand the Federal Republic of Germany have proposed to the UN General Assembly that 2008 is declared "International Year of Sanitation (IYOS)". A decision is expected from the General Assembly by the end of the year. It is therefore essential that as many countries as possible add their voices to this initiative to ensure that sanitation is given its deserved position at the top of the political agenda.

Should the UN decide in favour of "International Year of Sanitation 2008", a UN organisation will be given the responsibility of coordinating the relevant UN activities. Among the existing suggestions for this year is the organisation of a global sanitation conference. As there is only a little more than a year to 2008, all ecosan enthusiasts should begin thinking how they can cooperate with this initiative in order to promote sanitation in general, and ecosan in particular, so that the sanitation MDG can be achieved as sustainably as possible.

!!!**Download:** Draft Resolution from October 2006 for IYOS 2008 from Brazil, China, Czech Republic, Egypt, France, Germany, Italy, Japan, Kenya, Mozambique, Philippines, Singapore, Tajikistan and Thailand

<http://www.un.org/ga/61/second/proposalslist.html> [search for „A/C.2/61/L.16“]

!!! **Download:** Proposal from the German Federal Republic (german)

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-international-year-of-sanitation-United-nations-2006.pdf>

Hans Huber receives the German Environment Prize for the development of innovative wastewater management solutions

On the 29th October 2006, the German President, Horst Köhler, presented the German Environment Prize, worth 500000 €, to Mr Hans Huber, head of Hans Huber AG in Berching, Bavaria, and the ecosystem researcher Prof. Dr. Ernst-Detlef Schulze. Hans Huber, entrepreneur, was honoured for his groundbreaking drinking water treatment and wastewater management systems, currently being used mainly in developing and emerging countries.

“As a visionary businessman, Huber seeks technical solutions for the urgent world wide water crisis. He sees wastewater as a resource and has dedicated himself to the recovery and reuse of this valuable good” said Dr. Fritz Brickwedde, general secretary of the DBU (the German Federal Environment Foundation). Hans Huber also spoke of the importance of the water and wastewater sector in emerging and developing countries in his speech, explaining that he wants to develop “feasible technologies for countries that have not been as fortunate as Germany”.

Excerpts from recent interviews with the prize winner Hans Huber and additional information on the ceremony in Dresden can be found on-line.

Information: http://www.dbu.de/123artikel25997_106.html und <http://www.huber.de>

The MDG Joint Monitoring Programme of UNICEF and WHO now recognises composting toilets as “improved sanitation”

"It is a tragedy that the world may not reach the water and sanitation MDGs. Safe drinking water and basic sanitation are so obviously essential to health that they risk being taken for granted," said Dr Anders Nordström, Acting Director-General of WHO. "Efforts to prevent death from diarrhoea and other diseases are doomed to failure unless people have access to safe drinking water and basic sanitation."

According to Nordström the joint monitoring report of UNICEF and WHO underlines the importance of the new WHO strategy on public health and environment to radically reduce the global burden of disease through preventive health measures. "Only by tackling the root causes of diseases such as water and sanitation can we reduce the 24% global burden of global disease caused by the environment." said Nordström.

In the most recent report of the JMP ("Meeting the MDG Drinking water and sanitation target – the urban and rural challenge of the decade") it is worth noting that the JMP has changed its monitoring criteria, and is thus responding to the stimulus of the Hashimoto Plan of Action. Composting toilets, previously not considered by the JMP, have been placed on the list of "improved sanitation", whilst flush toilets where excreta is flushed to the street, yard or plot, open sewer, a ditch, a drainage way or other location has now been placed firmly in the unimproved category (Page 4). Whilst it remains unclear just what can be considered as a "composting toilet", and whether the change in the monitoring criteria has had an effect on the coverage statistics, this development in the monitoring programme can be greeted as a move towards a greater focus on sustainable sanitation systems. The recognition that it is not enough to simply count toilets, but that only sustainable systems can protect health and the environment in the long term, seems to have struck a chord here.

UNICEF / WHO (2006) "Meeting the MDG Drinking water and sanitation target – the urban and rural challenge of the decade" – WHO, Geneva & UNICEF, New York; 45 pages

!!! Download:

Report

http://www.who.int/entity/water_sanitation_health/monitoring/jmpfinal.pdf

Radio interviews

http://www.who.int/water_sanitation_health/monitoring/jmp2006radio/en/index.html

Press release

<http://www.who.int/mediacentre/news/releases/2006/pr47/en/index.html>

The UNDP Human Development Report 2006 makes water and sanitation supply a central theme

“With regard to water supply and sanitation, the world is suffering from a surplus of conference activities and a deficit of credible actions. The wide array of international actors is standing in the way of a strong international voice for water supply and sanitation” said Kevin Watkins, main author of the report on human development 2006.

“National governments need to develop credible plans and strategies to deal with the water and sanitation crisis. But we also need a global action plan, in which the G-8 states actively participate, in order to focus the fragmented international efforts, to mobilise funds and to initiate political activity, and that will bring water supply and sanitation into the spotlight and place it at the top of the development agenda” according to Watkins.

According to the report, the action plan would function as a “virtual mechanism”. A useful comparison that has been made is the global fund to combat AIDS, tuberculosis and malaria, which is being lead by a small secretariat with minimum of bureaucracy.

“I support completely the demand for a global action plan to deal with the increased crisis in the field of water supply and sanitation” said UNDP administrator Kemal Dervis. As highlighted in the human development report 2006, all eight MDGs are dependent on each other. If the water supply and sanitation goal can therefore not be reached, the hope of reaching the other goals will fade rapidly.

In a virtual conference organised by the UNDP and the Stockholm Water Institute (SIWI), the recommendations of the “Human Development Report” (HDR-2006) were discussed by experts. The participants praised the report’s clear recommendations to increase the political importance of sanitation and to improve its financing. The progressive opinion expressed in the report is that only sustainable sanitation systems can contribute to human dignity, equity and economic development, stressing the results of a WHO study which showed that for every dollar invested in sanitation, a return of 8 dollars can be expected.

It is however regrettable that the report then presents a series of conventional, end-of-pipe sanitation systems, and does not refer to closed-loop solutions at all. Additionally, the coverage rates given in the report would appear to be at times too high.

The complete internet discussion can be read on the link below:

!!! Information: Internet discussion

<http://www.waterfair.org/forum.spring?forumThread=187&page=1>

!!! Download: Human Development Report 2006 (7,88 MB) <http://hdr.undp.org>

“Sanitation is Dignity” German Toilet Organization exhibition travels to Switzerland

During the first week of October 2006, pedestrians at Paradeplatz in Zuerich and Esplanade du Flon in Lausanne were witness to an extraordinary exhibition: brightly coloured cut-out figures, hiding behind everyday objects (such as umbrellas and waste bins) in an attempt to maintain dignity while relieving themselves without having access to a toilet. The campaign “Sanitation is Dignity“, which was previously shown in Singapore and Berlin with the financial support of CWS, informs the general public in industrialised nations about the desolate sanitation conditions in many parts of the world and raises awareness for sustainable sanitation approaches. Wide media coverage of this “taboo subject” carries the message to a maximum number of people.

With its work, GTO – as a member of the World Toilet Organization (WTO) – aims to support other organisations working for improvements in sanitation. The event in Switzerland also initiated interest in the creation of a Swiss Toilet Organisation. Eawag/Sandec and the “Umwelt- und Gesundheitsschutz Zuerich” support the development of the new WTO-Partner. Pictures of the event and more information about the campaign can be found on the GTO web site.

Organisations interested in organising a similar event in their towns or cities can contact the GTO directly.

People and organisations interested in working with, supporting or operating with the new STO can also contact the GTO.

!!! Information: <http://www.germantoilet.org>

!!! Download: "Sanitation is Dignity"- Event brochure (english):

http://www.germantoilet.org/images/gto_sanitation_is_dignity_broschuere_lq.pdf

!!! Kontakt: thilo.panzerbieter@germantoilet.org

World Toilet College carries out first two weeks course on sustainable sanitation in Indonesia

From the 30th of October to the 9th of November 2006, the World Toilet College (WTC) trained Indonesian engineers, stakeholders, decision makers, architects, contractors and university students in sustainable sanitation in Banda Aceh.

As the capacity building arm of the World Toilet Organization, the WTC, provides its students with a mix of theoretical and practical experiences, as they learn about sustainable sanitation practices and apply their skills under supervision within actual projects. Funded by the Red Cross Singapore Society, this initial course will be paralleled early next year in Meulaboh and includes the construction of public toilets in 13 locations.

In the near future the World Toilet College seeks to extend its network to other countries in collaboration with local partners and academic institutions.

!!! Information: <http://www.worldtoilet.org>

!!! Contact: anita@worldtoilet.org

Jobs

Algeria: Advisor for Water Management Regulation - Algier – GTZ

The competencies of the water sector institutions (Ministry for Water, Regional Authorities) should be improved.

The main tasks are to advise, support and accompany the process in the relevant sector institutions (Ministry for Water, the national water supply and sanitation utility) throughout the conception and implementation of new regulating mechanisms. This includes, supporting the conception of the new regulating model, the creation of new structures, and advising the development of the new normative framework.

Time period: March 2007 - December 2009

Further information:

http://www.gtz.de/de/karriere/stellenmarkt/detail_fachgebiete.asp?fachgebiet=Umwelt+und+Infrastruktur&anzeige=60070852

Bolivia: Advisor Water Sector (PROAPAC) - La Paz – GTZ

The programme aims to provide advice to the Bolivian partners to improve service delivery of water and sanitation on a national level and in specific regions of Bolivia.

You will assume the coordination of the component "sector strategy and advising the reform process". Your main tasks will be to advise, support and accompany the process in the relevant sector institutions (Ministry for Water, vice ministries for potable and waste water, regulating authorities and decentralised institutions) as well as the implementation of the strategies and instruments that have been developed. Additionally, you will be responsible for supporting the sector institutes in their organisational development (Ministry for Water, FUNDASAB, regulating authorities) as well providing advice for the development of the new normative framework.

Time period: 07/01/01 - 07/12/31

Further information:

http://www.gtz.de/de/karriere/stellenmarkt/detail_fachgebiete.asp?fachgebiet=Umwelt+und+Infrastruktur&anzeige=60070626

Mongolia: Team member, Mongolia, Ulan Bator – GTZ

The programme “Strengthening integrated town development and competitiveness of the construction sector in Mongolia“ should create strategies for integrated town development whilst maintaining cost and resource efficient living areas.

You will develop proposals for the introduction of updated construction standards to improve construction quality and the energy balance of buildings (energy, water supply and wastewater management etc.). You will develop proposals to connect informal training activities in the construction sector with an employment and income generating housing construction programme for middle and lower income groups. You will develop energy and cost efficient building types for the large scale housing construction.

Time period: 06/09/01 - 09/08/31

Further information:

http://www.gtz.de/de/karriere/stellenmarkt/detail_fachgebiete.asp?fachgebiet=Umwelt+und+Infrastruktur&anzeige=60067256

Water and Sanitation jobs with the German Development Service, DED

The German Development Service currently has a large number of posts in “Water and Sanitation Supply”. An up to date overview of all these posts can be found under:

All DED Job descriptions in the water sector under:

http://www.ded.de/cipp/ded/custom/pub/content_lang,1/oid,311/ticket.g_u_e_s_t/~/Entwicklungshelfer_und_-stipendiaten.html

Please enter “Wasser” in the search mask.

Only some of the jobs currently available are presented below:

Water Engineer / Civil Engineer for Water and Sanitation Supply, Burkina Faso

Technical advice in the German development co-operation programme for Water and Sanitation supply in small and medium sized towns in Burkina Faso.

PP-Nr: 7019-BFA-WS

Water supply and wastewater engineer / solid waste manager / Construction engineer / Environmental engineer

Carry out a feasibility study and its implementation for water supply and wastewater and solid waste management with the town council of Wobulenzi to improve in particular the wastewater and solid waste management in poor areas of the town.

PP-Nr: 6749-UGA-Wasser

News from the pilot projects German cooperation

Mediterranean region The “EMWater project”

The EMWater Project started in 2003 for four year period in the Mediterranean countries o Turkey, Jordan, Lebanon and Palestine. The aim is to guarantee the water supply in the Mediterranean region through appropriate solutions in wastewater treatment and reuse. This should be achieved through the creation of an expert network, thus improving knowledge transfer and regional cooperation between the member countries. In addition to the knowledge transfer, a focal point of the project is the organisation local and regional training courses on a yearly basis and the creation of an internet learning platform for technicians.

Five different low-cost installations for wastewater treatment and reuse have been developed for the project and for training and demonstration purposes. These different technologies have been chosen to ensure compliance with existing relations on water reuse, thus easing maintenances. All the installations are equipped with a tertiary treatment step and their efficiencies will be tested and compared over a longer time period.

!!! Information: <http://www.emwater.org>

!!! Contact: andreas.bethmann@inwent.org

Burkina Faso: ecosan in peripheral neighbourhoods of Ouagadougou – project officially launched November 7th 2006

Financed within the framework of the EU ACP Water Facility, the project “Assainissement écologique dans les quartiers périphérique de la ville de Ouagadougou” brings together the GTZ, CREPA and the national water supplier in Burkina Faso, ONEA - three organisations with a wealth of experience in sanitation promotion and ecological sanitation. The main aim of the project is to work with the actors in peripheral neighbourhoods to facilitate their access to sustainable, safe and affordable sanitation systems that will protect human health, contribute to food security, will enhance the protection of natural resource and the promotion of small and medium sized businesses.

Project activities began in July 2006 with a range of preparatory activities, with awareness raising actions benefiting greatly from the experience of ONEA, who have been carrying out a strategic plan for sanitation in Ouagadougou over the last 10 years. Theatre and musical groups have already produced a huge number of songs and sketches with evening information sessions in the neighbourhoods attracting large crowds and creating a real demand for ecosan systems.

The official open-air launch of the project took place on the 7th November at La Place de la Nation with the crowds being addressed by the enthusiastic mayor of Ouagadougou, a junior minister from the Ministry for Agriculture and Water Resources and the Managing Director of CREPA, with participants then invited to attend an exhibition showing different aspects of the collection, treatment and reuse of excreta and greywater. The official launch was accompanied by an intensive radio and television advertising campaign, and was attended by community groups from each of the 4 sectors involved in the project. The whole ceremony only lasted perhaps 3 hours but had a very positive dynamic and was quickly followed by a large number of requests from people who wanted get involved.

On the evening of the launch, a 30 minutes documentary on ecosan, the Burkina experience so far and the project was broadcast on national television. The documentary was shown in the local language Mooré, but will soon be available in French, English and other local language for a wider distribution.

The terms of reference for a detailed base line study are currently being finalised and work will begin on this with all the actors in the coming weeks.

!!! Further information on the project (in French) can be downloaded from:

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/fr-burkina-faso-project-ouagadougou-start-2006.pdf>

!!! Contact: christine.werner@gtz.de and Patrick Bracken, pocb123@yahoo.com

China ecosan Project Expo 2010 Shanghai

In the context of the town partnership between Shanghai and Hamburg, the Hamburger Stadtentwässerung (HSE) has drawn up an innovative, closed-loop oriented infrastructure system for a settlement of around 500 people in the east of Chonming Island. It will be the first phase of the Dongtan Eco-city construction project. Several pilot settlements with their own character but the same supply and removal infrastructure are to be joined to create a settlement of up to 25 000 people by 2010 in time for the Expo-Shanghai. By 2030 a maximum number of 500 000 inhabitants are planned for Dongtan. The new town plan, Dongtan Eco-village includes an ecologically oriented agriculture. The concept considers the particular boundary conditions of Chonming Island in the choice of technical components and the connection of individual elements to form a complete system. The implementation of a small scale closed loop system is planned that will use technologies such as constructed wetlands, biogas digesters and vacuum technology to allow split stream collection and reuse.

!!! Download:

<http://www.gtz.de/de/dokumente/de-innovative-staedtische-infrastrukturen-expo-projekt-shanghai-text-2006.pdf>

!!! Contact: Ulf Rakelman ulf.rakelman@hhse.de

Germany up-date on the DEUS 21 Project in Knittlingen

In Knittlingen near Pforzheim, Baden-Württemberg, the DEUS project (Decentralised Urban Infrastructure Systems), supported by the German Federal Ministry for Education and Research (BMBF), is in implementation. Through the use of decentralised water supply and wastewater treatment systems the environment should be protected and costs should be minimised.

Under the coordination of the Fraunhofer Institute, two research institutes and six industrial partners are building sustainable water infrastructure for around 100 residential plots.

The demonstration project DEUS 21 should show a more sustainable form of wastewater management that allows an almost complete recovery and use of the contents of the wastewater is possible. The carbohydrates can be used to generate biogas and renewable energy, and the nitrogen and phosphorous content can be used as fertiliser in agriculture. Technical analyses have already shown that the treated wastewater is of a quality conforming to the limit values given in the wastewater regulations. Depending on the socio-economic conditions, the technology can be modified so that wastewater can be used for fertilising irrigation. No hygienic problems result from this practice as parasites and pathogens are removed by micro-filtration.

A recent article on the project is now available on-line:

!!! Download:

<http://www.gtz.de/de/dokumente/de-dezentrale-urbane-infrastruktur-systeme-knittlingen-text-2006.pdf>

!!! Information:

http://www.igb.fraunhofer.de/www/gf/Umwelt/wassermanagement/dt/DEUS_Knittel.d.html

!!! Contact: Prof. W. Trösch walter.troesch@igb.fraunhofer.de

Germany EU demonstration project, Berlin

The Berlin Water Competence Centre (KWB), together with the Berlin Water Service (BWB) and Veolia Water, is carrying out an EU project testing and analysing two different sanitation concepts in the buildings of the BWB at the Stahnsdorf wastewater treatment plant. One system employs urine separation toilets and simple gravity collections, with the faeces being composted by worms, whilst the other is a vacuum system with faeces being anaerobically digested. The project is researching the ecological and economic implications of the systems as well as acceptance and agricultural aspects. One of the estimations based on project results has shown for example that the yellow water (urine) of Berlin could cover 40% of the nitrogen and 75% of the phosphorous needs for agriculture in the state of Berlin-Brandenburg.

An article is now available online presenting an overview of the project and some of the results:

!!! Download:

<http://www.gtz.de/de/dokumente/de-sanitation-concept-separate-treatment-demo-projekt-berlin-text-2006.pdf>
<http://www.gtz.de/de/dokumente/de-sanitation-concept-separate-treatment-demo-projekt-berlin-pres-2006.pdf>

!!! Contact: Dr. Anton Peter-Fröhlich Anton.Peter-Froehlich@bwb.de

The Philippines ecosan Vision for Cagayan de Oro

The ecological sanitation concept has been successfully introduced to Cagayan de Oro City, Philippines, through the establishment of urine-diverting dehydration toilets in several allotment and school gardens of the city. It is part of a holistic approach concerning public health, nutrition, food security and urban environmental planning as a joint effort between academia, the local government, the urban poor communities and the German Government through CIM, GTZ and the German Embassy. Based on the positive impacts of the pilot activities on the communities, the city government in cooperation with the Xavier University and its partners from Germany are in the process of integrating this approach into the overall city planning in order to achieve the Millennium Development Goals.

Available on-line is now a recent ppt-presentation and an article describing the ecosan vision for Cagayan de Oro and the possible next steps:

!!! Download:

<http://www.gtz.de/de/dokumente/en-city-wide-urban-ecosan-concept-philippines-text-2006.pdf>
<http://www.gtz.de/de/dokumente/en-city-wide-urban-ecosan-concept-philippines-pres-2006.pdf>

!!! Information: <http://puvep.xu.edu.ph/>

!!! Contact: Dr. R. Holmer rholmer@xu.edu.ph, Claudia Woelk Claudia.woelk@gtz.de

India Overview of the ecosan projects of the Innovative Ecological Sanitation Network India (IESNI)

The chair of the Indian Water Works Association (IWWA) provided an overview of the activities of the Innovative Ecological Sanitation Network India (IESNI) at the DWA-BMZ-GTZ ecosan symposium on the 26 – 27 October in Eschborn. In order to address the growing demand the IWWA together with GTZ Seecon and other partners are planning the creation of an ecosan foundation to directly address the construction of pilot and demonstration installations and support knowledge management and networking.

The presentation of Mr Dayanand Panse and a draft final report on the state of implementation of different IESNI projects in India is now available online.

!!! Download:

<http://www.gtz.de/de/dokumente/en-innovative-ecosan-network-india-progress-text-2006.pdf>
<http://www.gtz.de/de/dokumente/en-innovative-ecosan-network-india-progress-pres-2006.pdf>

!!! Download: Report of Martin Wafler

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-ecosan-case-studies-draft-report-iesn-2006.pdf>

!!! Contact: Dayanand Panse dbp40@rediffm.com,
Christine Werner christine.werner@gtz.de

Jordan and Palestine The "MEDWA Project"

Two years ago the MEDWA project began, setting itself the goal of addressing the many problems of Jordan and Palestine using holistic socio-economic and technical approaches. In the first phase emphasis has been placed on capacity building and raising awareness of the project. In the current phase six different demonstration systems for water collection and storage, wastewater treatment and reuse are being realised.

The wastewater pilot plants use constructed wetlands and aim recovering the effluent and the biomass from the plant. Additionally the project is supporting the introduction of home gardens. Thanks to an improved soil structure and reduced evapotranspiration through permaculture the harvest per area could be increased and the water use reduced considerably. Following several permaculture training courses, 45 home gardens are currently being built. In several years an evaluation of the potential of permaculture will then be made.

!!! Information: <http://www.medwa.org>

!!! Contact: office@austria.hilfswerk.at or markus.lechner@econsan.at

Global EU-project SWITCH aims at Sustainable Urban Water Management in the City of the Future

The EU-funded "SWITCH project" is a 5-year project which began in early 2006 with the aim to achieve a paradigm shift in urban water management to promote sustainable, healthy and safe urban water systems. SWITCH (Sustainable Water management Improves Tomorrow's Cities' Health) aims at the development, application and demonstration of a range of tested scientific, technological and socio-economic solutions that contribute to the achievement of sustainable and effective urban water management schemes in 'The City of the future'.

This paradigm shift will be realized by a consortium of 32 organisations from 13 countries under the coordination of UNESCO-IHE. SWITCH has a budget of about 25 million Euros, funded by the European Commission. SWITCH will operate via three interactive activity clusters (research, training, and demonstration), and will engage in full-scale testing of new solutions in nine demonstration cities across the globe namely, Accra, Beijing, Belo Horizonte, Birmingham, Bogota, Hamburg, Lodz, Tel Aviv and Zaragoza. Alongside the demonstration cities, there are a number of study sites to address specific research questions via field work in real life field conditions.

The work is split into six work packages and several sub-themes, of which the following may be of special interest for the ecosan community: Urban Water Paradigm Shift (Development of a strategic approach and of indicators for sustainability and risk assessment); Storm Water Management (Environmental change studies for stormwater control and reuse options) Efficient Water Supply & Use (Demand management for optimization of urban water services; Safe water reuse; Urban water supply and use - other productive reuses); Waste Water (Eco-sanitation and decentralised waste water management in an urban context; Management of industrial emissions. Urban Water Planning (Use of urban water (fresh and wastewater) for urban agriculture and other livelihood opportunities.)

One of the sub-themes within SWITCH is dedicated to research and demonstration in the field of eco-sanitation (ecosan) and decentralised urban wastewater management. This part aims to:

- Evaluate the operational functioning and performance of current ecosan demo-projects in and outside the EU
- Develop treatment processes for removal of pharmaceuticals from urine and black water
- Develop strategies and guidelines for agricultural use of nutrients recovered by ecosan systems

- Compose guidelines / technical standards for the technology components of urban ecosan systems
- Develop a demonstration project in Beijing and / or of Chong Qing, PR China
- Disseminate the results e-learning, various trainings and stakeholder seminars.

The research, training and demonstration activities will be carried out by the consortium's staff members and associated MSc and PhD students. For example, a Student from Sri Lanka has just begun her MSc thesis with the topic of "Comparison of sanitation systems for urban and peri-urban areas considering urban agriculture - Case study of Accra (Ghana) and Lima (Peru)" at UNESCO-IHE (expected completion date is April 2007). At this stage we are keen to get in touch with sanitation stakeholders in Lima, and would welcome anyone wishing to take part in this MSc research to contact us.

!!! **Information:** <http://www.switchurbanwater.eu/>

!!! **Contact:**

Elisabeth von Münch (UNESCO-IHE): e.vonmunch@unesco-ihe.org

Adriaan Mels (Wageningen University, theme coordinator): Adriaan.Mels@wur.nl

!!! **Download:** MSc thesis proposal

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-research-proposal-kalyani-master-2006.pdf>

News from the pilot projects

- other cooperation

China update on the China-Sweden Erdos Ecotown Project

An update on the China-Sweden Erdos Ecotown Project (Dongsheng District, Erdos Municipality) is currently available. The project employs UDDTs in multi-storey buildings in urban areas in China. The update discusses the lessons learned in the implementation and contains figures of the system.

!!! **Download:** Text

<http://www.gtz.de/de/dokumente/en-introduction-sweden-china-eco-town-project-text-2006.pdf>

!!! **Download:** Presentation

<http://www.gtz.de/de/dokumente/en-introduction-sweden-china-eco-town-project-pres-2006.pdf>

Burkina Faso Report from the course "ecological sanitation to achieve the MDGs in Sub-Saharan Africa"

UNESCO-IHE conducted a regional "refresher course" on ecosan together with CREPA at the headquarters of CREPA. The course was held during 2-7 October 2006 with the title "Ecological Sanitation to Achieve Millennium Development Goals in Sub-Saharan Africa". A Video conference was one of the innovative features of the course. It connected for two hours students and experts in four countries, namely Burkina Faso, The Netherlands, Germany and Sri Lanka, and was highly appreciated by the participants. Video conferencing can be a great tool for teaching and capacity building on ecosan, reducing the need for expensive and CO₂-emitting air travel.

A two page report from the refresher-course is now available for download.

!!! **Download Report:**

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-unesco-ihe-report-burkina-faso-2006.pdf>

!!! **Informationen Programme:**

<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-unesco-ihe-programme-burkina-faso-2006.pdf>

!!! **Kontakt:** e.vonmunch@unesco-ihe.org

Publications

MSc Thesis on ecosan and urban agriculture

... on the web

This masters thesis from the Engineering for Development Institute of the University of Southampton (<http://www.eng4dev.soton.ac.uk>) describes the historical development of urban sanitation systems, ecosan and urban agriculture and is stressing the potential of combining ecosan with urban agriculture to improve the hygiene situation and food security in today's cities.

Puddy, D.: „Closing the Loop: Ecosan and Urban Agruculture“. MSc-Thesis submitted at the University of Southampton, 2006.

!!! Download:

<http://www2.gtz.de/Dokumente/oe44/ecosan/en-ecosan-urban-agriculture-dissertation-2006.pdf>

UNICEF Report Card on Water and Sanitation

According to the UNICEF report “Progress for Children: A Report Card on Water and Sanitation” from September 2006, almost one billion girls and boys live without access to a sanitation system, with direct and indirect consequences on their health as a result of unhygienic living conditions (chronic malnutrition through recurring diarrhoea, infections etc.).

UNICEF: Progress for Children, A Report Card on Water and Sanitation, Number 5, September 2006.

Download: <http://www.unicef.org/progressforchildren/2006n5/index.html>

Guidelines for Sustainable Water Management in Tourism Facilities

A comprehensive study on sustainable water management in tourist facilities is the result of the work of the EU SWAMP project (Sustainable Water Management and Wastewater Purification in Tourism Facilities).

In the first part of the guidelines a general description of sustainable sanitation concepts is given. This is followed by a detailed description of available technologies using many illustrated examples. The report is concluded with a short description of a step-wise approach to decision making in the implementation of water management systems.

The aim of the guidelines is to promote a holistic approach to water supply and wastewater treatment in the context of tourist areas and facilities. They are intended to assist decision makers in the tourism branch to find sustainable solutions and to provide experts with the necessary know how to correctly implement an ecosan project.

Regelsberger [ed.] (2005) “Guidelines for Sustainable Water Management in Tourism Facilities.” – Arbeitsgemeinschaft Erneuerbare Energien GMBH, Gleisdorf, Austria. Pp.124. ISBN 3-901425-99-3

!!! Download: http://www.swamp-eu.org/pub/SWAMP_guidelines.pdf

!!! Information: <http://www.swamp-eu.org>

!!! Contact: m.regelsberger@aee.at

The road not taken: how traditional excreta and greywater management may point the way to a sustainable future

Bracken, P., Wachtler, A., Panesar, A. and Lange, J. (2006): „The road not taken: how traditional excreta and greywater management may point the way to a sustainable future.“ – Paper presented at the IWA Conference on Water and Wastewater Technologies in Ancient Civilizations, 28-30 October 2006, Heraklion, Greece

This conference contribution provides examples from throughout the centuries and across cultures of closed-loop sanitation systems. It proposes that current centralised end-of-pipe systems introduced around 150 years ago may actually prove to be a technological dead-end - expensive to build, operate and maintain, and out of step with traditional wastewater management philosophy.

!!! Download:

<http://www2.gtz.de/Dokumente/oe44/ecosan/en-traditional-management-sustainable-future-2006.pdf>

Internet course

Online Course: Ecological Sanitation – UNESCO IHE short course

01. March – 21. June 2007

Organizer: UNESCO- IHE Institute for Water Education

This internet-based training course on ecosan is believed to be the first fully moderated online course on ecosan.

The course is designed for mid-career professionals from low-income countries or countries in transition who deal with planning, design, operation and management aspects of urban or peri-urban sanitation systems, and who work for local councils, government departments, the private sector, consulting firms, NGOs, universities or water supply agencies.

The course presents options for sustainable sanitation in low-income countries, which will contribute to achieving the Millennium Development Goals in the area of sanitation and in related fields such as reducing poverty and hunger, improving lives of slum dwellers, reducing child mortality and ensuring environmental sustainability.

Participants complete the course part-time at their own computer in a period of four months with a workload of 140 hours (8 hours per week), and will be assessed on the basis of small assignments per subject, multiple-choice quizzes, their contribution to the online discussion and the final individual assignment.

Cost for the course is 550 Euro. A limited number of scholarships to cover the course fee are available.

To get maximum benefit out of this course, a reliable and fast (ideally 512 kbps) internet connection is necessary. Large files can also be sent to the participants on a CD if necessary.

!!! Information: <http://www.unesco-ihe.org/education/ilarning.htm>

!!! Contact: e.vonmunch@unesco-ihe.org

Application deadline: **1 February 2007**

Trainings and courses

Mexico International theoretical and practical ecosan course 27 November – 07 December, Tepoztlán

Organiser: SARAR Transformación SC, Tepoztlán
SEI – Stockholm Environment Institute and EcoSanRes

The “Curso Internacional Teórico-Práctico de Saneamiento Ecológico”, is for everyone interested in alternative sanitation systems and aims to train ecosan project managers.

The main topics covered include ecosan systems, types of grey water irrigation, rain water harvesting, composting and reuse of urine in agriculture. The theory will be expanded upon during excursions and practical experience.

Language: Spanish

Application deadline was 15th November 2006.

!!! **Information:** <http://www.sarar-t.org>

!!! **Contact:** gabrielacarmona@prodigy.net.mx

Events

Germany 2nd International BNS Workshop & Symposium: “Business Unusual New 29th – 30th November 2006, Bremen

Organiser: BORDA

During the symposium, leading representatives of local and national key institutions of German development cooperation will set the stage for presentations from distinguished policy makers and practitioners who will visualize milestones, challenges and key-criteria of successful dissemination programs from South Asia, South East Asia and Africa. Discussions with members of the Regional Panels will enable to share findings of policy makers and practitioners with an interested and critical audience.

!!! **Informationen:** <http://www.borda-net.org/modules/news/article.php?storyid=59>

!!! **Contact:** BNS@borda.de

Germany 15th Annual Conference “Biogas and Bio-energy in agriculture” 5th – 06th December 2006, Wolpertshausen

Organiser: International Biogas and Bio-energy Competence Centre (IBBK) and the Society for the Promotion of Sustainable Biogas and Bio-energy Use (FnBB e.V.)

The annual conference traditionally looks back on the “Biogas year”, and provides important inputs for future developments. Over two days the conference will look at: political boundary conditions, innovative gas and heat use, substrate growth, storage and fermentation, and process biology in four intensive seminars.

Parallel to the conference, as in previous years, a contact exhibition has been organised allowing direct contact to, and exchange between, plant producers and component manufacturers.

!!! **Information:** <http://www.biogas-Zentrum.de/ibbk>

!!! **Contact:** info@biogas-zentrum.de

Germany **16th Annual Conference of the expert group Biogas e.V. with an exhibition: "Biogas im Wandel"**
31st Jan – 2nd Feb 2007, Leipzig

Organiser: Fachverband Biogas e.V.

The annual conference takes place at a time of great change in the biogas branch. The boom in recent years has brought forth a lot of new developments – new energy plants, new process experiences, new actors on the market, new forms of biogas use etc. The expert group invites all those interested to participate in the programme of presentations.

!!! Information: <http://www.biogas.org/>

!!! Contact: info@biogas.org

Belgium **World Biofuels Markets**
06th – 09th March 2007, Brüssel

Organiser: Green Power Conferences

World Biofuels Markets is the premier business networking congress and exhibition for the global renewable fuels industry. The inaugural event attracted over 450 participants from 45 countries, over 650 high level executives are expected in 2007.

!!! Information: <http://www.worldbiofuelsmarkets.com/>

!!! Contact: annie.ellis@greenpowerconferences.com

Greece **Fourth International Conference on Sustainable Water Resources Management**
21st – 23rd Mai 2007, Kos

Organiser: Wessex Institute of Technology

Conference themes include: Water management and planning, Waste water treatment and management, Urban water management, Water quality, Pollution control, Water and health.

!!! Contact: zbluff@wessex.ac.uk

!!! Information: <http://www.wessex.ac.uk/conferences/2007/waterresources07/>

!!! Deadline for abstracts: as soon as possible

UK **Energy 2007**
20th – 22nd June 2007, The New Forest

Organiser: Wessex Institute of Technology

This International Conference aims at bringing together researchers and practitioners from academia, industry and government interested in current developments in energy systems, and will include topics related to Sustainability in Energy Production, Energy Storage and Distribution and Energy Management.

!!! Information: <http://www.wessex.ac.uk/conferences/2007/energy07/>

!!! Contact: rswinburn@wessex.ac.uk

Malta **4th International Conference on the Impact of Environmental Factors on Health**
27th – 29th June 2007, Malta

Organiser: Wessex Institute of Technology

The conference aims to provide a forum for the dissemination and exchange of information on the diverse aspects of the impact of environmental factors on health across different disciplines. Topics include: Risk analysis, Water quality issues, Food contamination, Housing and health, Education and training.

!!! **Informationen:** <http://www.wessex.ac.uk/conferences/2007/health07/index.html>

!!! **Contact:** zbluff@wessex.ac.uk

France **New directions in urban water management**
12th – 14th September 2007, Paris

Organiser: UNESCO-IHP

UNESCO's International Hydrological Programme is approaching the end of its Sixth Phase of IHP (2202-2007) and an end-of-phase Symposium related to Urban Water Management activities will be held on 12-14 September 2007 at UNESCO Headquarters, Paris. This event will be an occasion for bringing together leading international urban water management experts to discuss new concepts, approaches and technologies for dealing with urban water problems. There will also be the opportunity to learn about IHP-VI urban water management projects results and outputs.

Symposium topics include: Processes and interactions in the urban water cycle, Integrated urban water system interactions: complementarities among urban water services, Urban water security, human health and disaster prevention, Socio-economic and institutional aspects in urban water management, Urban water education, training and technology transfer.

!!! **Download:** First announcement and call for abstracts/papers for the Symposium.
<http://www2.gtz.de/Dokumente/oe44/ecosan/nl/en-unesco-urban-water-management-flyer-2006.pdf>

!! **Download:** UNESCO-GTZ Publication "Capacity Building for ecosan"
<http://www.gtz.de/de/dokumente/en-ecosan-capacity-building-2006.pdf>

!!! **Deadline for submission of extended abstracts:** 30. November 2006

!!! **Contact:** SymposiumUWM2007@unesco.org

Spain **EXPO Zaragoza 2008: Water for Sustainable Development**
11th June – 14th September 2008, Zaragoza

Organiser: Bureau International des Expositions (BIE)

The organisers expect 6 million visitors and the participation of 70-90 countries, as well as international organisations, NGOs and companies.

Key themes include: water, a scarce resource; water for life; waterscapes; and, water, an element linking peoples.

The EXPO includes a Water Tribune based on the theme of 'Water and Sustainable Development', which will include: themed weeks consisting of sector seminars and meetings culminating in an international Conference on Water and Sustainable Development; a forum for citizen participation; and parallel events by international bodies and associations.

Output shall be given by the International Declaration of Zaragoza on Water and Sustainable Development.

!!! **Contact:** expo2008@vardagroup.org

!!! **Information:** <http://www.expozaragoza2008.es>

Events Reminder **The Philippines EAS Congress 2006**

12th – 16th December 2006, Quezon City

Organiser: PEMSEA/DENR

The East Asian Seas (EAS) Congress is a major event on sustainable coastal and ocean management that addresses key issues and problems affecting the region's shared seas.

International organizations, experts and multi-sector stakeholders will come together to actively participate in a dynamic and interactive working environment designed for knowledge exchange and capacity-building in developing strategies to implement the MDGs and WSSD goals for the region's coasts and oceans.

!!! **Information:** <http://www.pemsea.org/eascongress/index.htm>

!!! **Contact:** congress@pemsea.org

USA 16th Annual Technical Education Conference and Exposition

10th – 15th March 2007, Baltimore/Maryland

Organisation: National Onsite Wastewater Recycling Association (NOWRA)

NOWRA is the largest organization in the USA dedicated solely to educating and representing members within the onsite and decentralized industry. The overall program theme will be Integrated Water Resource Management and Distributed Systems. Session topics include: management, assessment and monitoring of decentralized systems within a watershed, applications of integrated water resource management in watersheds, nutrient reduction strategies, re-use and reclamation successes, bio mimicry applications, groundwater impacts of medical discharges, citizen involvement in planning decentralized systems, and more.

!!! **Contact:** shc@umn.edu

!!! **Information:** <http://www.nowra.org/?p=645>

Germany Advanced Sanitation

12th -13th March 2007, Aachen

Organisation: Institute of Environmental Engineering RWTH Aachen University (ISA) and the International Water Association (IWA)

Conference topics include:

- Decentralized Wastewater Systems (on-plot systems)
- Advanced Systems for Urban and Rural Sanitation
- High-Tech Systems for Wastewater Treatment
- Non-Conventional Wastewater Treatment Systems, Concepts and Technologies
- Ecological/Environmental/Sustainable Sanitation (source control, separation systems, reuse systems, closed loop sanitation systems, etc.)
- Decision Support Systems: Centralised vs. Decentralised Wastewater Systems

- Economics (financing and cost recovery, cost-effective sanitation, pricing and tariffs, capital efficiency, utility finance, benchmarking, cross and direct subsidies, etc.)
- Social aspects
- Case studies

!!! Information: <http://www.advancedsanitation.de/>

!!! Contact: lambertz@advancedsanitation.de

Tunisia **Meda Water International Conference on Sustainable Water Management**

21st – 24th March 2007, Tunis

Organiser: Conference Partnership (Centre de Recherches et des Technologies des Eaux (CERTE), Tunisia AEE Institute for Sustainable Technologies (AEE-INTEC), Austria; Associazione Ambiente e Lavoro Toscana -ONLUS (ALT), Italy; Tübitak-Marmara Research Center (MRC), Turkey; Water Research & Pollution Control Department, National Research Center (NRC) , Egypt; Institut Agronomique et Vétérinaire Hassan II, Wastewater Treatment and Reuse Unit, Marocco; Department of Geography and Regional Research, University of Vienna, Austria; TU Berlin, Central Co-operation and Department for chemical engineering', Germany; University of Hannover, Center for Further Education, Germany; Fachvereinigung Betriebs- und Regenwassernutzung e.V. (fbr), Germany)

Conference topics:

- Water systems for small rural communities, remote tourist facilities, and periurban areas;
- Household-centred water management;
- Rainwater harvesting for domestic use;
- Industrial water management and cleaner production;
- Integration of wastewater reuse in the overall water resources management;
- Best technologies/systems for sustainable treatment of urban wastewater in the Mediterranean area;
- Risk assessment;
- Approaches for the assessment and valuation of safe wastewater agricultural reuse;
- Relevant policies and socioeconomic instruments;
- Guidelines and quality standards for reclaimed water;
- Case studies; and
- Demand management.

!!! Information: <http://www.zer0-m.org/medawaterconf/>

!!! Contact: Dr. Ahmed Ghrabi (LEE): ahmed.ghrabi@inrst.rnrt.tn;
Dr. Latifa Bousselmi (LEE): latifa.bousselmi@inrst.rnrt.tn;
Dipl.-Ing. Dr. Barbara Regelsberger (AEE INTEC): b.regelsberger@aee.at

Portugal **ECOSUD 2007**

5th – 7th September 2007, Coimbra

Organiser: Wessex Institute of Technology, University of Coimbra, University of Siena

The aim of the conference is to encourage and facilitate the interdisciplinary communication between scientists, engineers and professionals working in ecological systems and sustainable development. Emphasis will be given to those areas that will most benefit from the application of scientific methods for sustainable development, including the conservation of natural systems around the world.

The Conference objectives have evolved over the years, seeking to integrate thermodynamics, ecology and economics into “ecodynamics”.

!!! **Submissions deadline:** send abstracts as soon as possible

!!! **Information:** <http://www.wessex.ac.uk/conferences/2007/eco07/index.html>

!!! **Contact:** zbluff@wessex.ac.uk

Italy **Sardinia Symposium 2007**
1st – 5th October 2007, Cagliari

Organiser: International Waste Working Group (IWWG) and Environmental Sanitary Engineering Centre (CISA)

The symposium will focus on innovative aspects of Waste Management, presenting new technologies, describing the state of the art and related case studies, discussing the main controversial subjects, sharing experiences among different countries, valuating social and economical balances. The Symposium will include oral presentations, poster sessions, specialized sessions and specific Workshops. Before the start of the Symposium, training courses will be offered by IWWG under the supervision of international leading experts.

!!! **Contact:** info@sardiniasymposium.it

!!! **Information:** http://www.sardiniasymposium.it/SARDINIA_eng/index_eng.html

Australia **2nd IWA-ASPIRE Asia-Pacific Regional Group Conference and Exhibition**
28th October – 01st November 2007, Perth

Organisation: Australian Water Association (AWA) and International Water Association (IWA)

The conference will focus on the design, operation, maintenance and management of water and wastewater systems. Innovations in the field, case studies on safe and reliable systems for removal of nutrients, water reuse, and methods of better operation will also be discussed. There will be a specific emphasis on issues facing the Asia-Pacific Region. Ecosan-relevant topics are especially wastewater treatment and onsite and small scale systems.

!!! **Information:**

<http://www.awa.asn.au/Content/NavigationMenu2/Education/NationalInterestEvents/ASPIRE2007/default.htm>

!!! **Contact:** aspire@awa.asn.au

!!! **Download the first announcement and call for abstract submittal:**

<http://www.awa.asn.au/Content/NavigationMenu2/Education/NationalInterestEvents/ASPIRE2007/AspireCFALoRes.pdf>

!!! **Deadline for Submission of Abstracts:** **March 30th 2007**

Turkey **5th World Water Forum**
March 2009, Istanbul

Organiser: World Water Council

!!! **Information:** <http://www.worldwatercouncil.org/>

Links and Tips

Links on the GTZ ecosan-Homepage

You'll find an extensive list of interesting links on our homepage at:

<http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/9837.htm>

and

<http://www2.gtz.de/ecosan/english/links.htm>

We would greatly appreciate your calling our attention to additional links of interest:

ecosan@gtz.de

Virus information

Sometimes viruses steal our addresses from other computers and use them to distribute themselves. We know that this problem is common for e-mail addresses that have been saved by many people, but unfortunately, we cannot prevent this from happening.

We would therefore recommend that you ensure all your mails are scanned by an up-to-date virus scanner and that you do not open any obscure attachments. Our newsletter is sent simply as text, with no attachments of any sort, instead, documents are always offered as download-links from our website. **If you do receive a mail from us with an attachment claiming to be related to the newsletter, do not open the attachment.**

Homepage

Would you like to know more about GTZ's sectoral project ecosan or about the subject in general?

If so, visit our homepage (expansion and update in progress):

<http://www.gtz.de/ecosan> (new)

<http://www2.gtz.de/ecosan>

Newsletter

If you would like to contact the administrators of this newsletter please send an e-mail to:

owner-ecosan@mailserv.gtz.de

Your proposals for contributions to the newsletter, and any inquiries and comments you may have are always welcome.

Contact

The GTZ ecosan team:

Christine Werner, Hagen von Bloh, Nicola Raeth, Carola Israel

GTZ, Division 44: Infrastructure and Environment
ecosan project – ecologically and economically sustainable wastewater management and sanitation systems

Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) GmbH

P.O. box 5180

D-65726 Eschborn, Germany

Phone: ++49-6196-79-4220

Fax: ++49-6196-79-7458

christine.werner@gtz.de

hagen.bloh-von@gtz.de

nicola.raeth@gtz.de

carola.israel@gtz.de

**Mailing list /
Newsletter**

**- user
information**

How to use the ecosan mailing list

You can interact with the Majordomo software of our mailing list server by e-mailing commands to:

majordomo@mailserv.gtz.de

Commands must be the only text in the e-mail, and not as part of the subject line! You can send several commands in one and the same e-mail message. Just be sure to start a new line for each command.

If you attach a signature block to the end of your e-mailed messages, the Majordomo software could perhaps mistake it for another command, so please enter the word "end" by itself in the line below the last command.

Useful mailing-list commands:

subscribe ecosan

Use this command to subscribe to the ecosan mailing list

subscribe ecosan your.name@xy.org

Use this command to receive the newsletter at an address other than that listed in your registration (e.g., if you send the e-mail from your workplace account, but wish to have the newsletter sent to your private e-mail address).

unsubscribe ecosan

Use this command to cancel your subscription.

unsubscribe ecosan your.name@xy.org

Use this command to de-register your receiving address, if this differs from the one from which you are currently using to send the request.

info ecosan

Use this command to request general introductory information about the ecosan mailing list.

index ecosan

Use this command to obtain a list of files sent so far via the mailing list.

get ecosan <filename>

Use this command to obtain a specific file sent via the mailing list (e.g., an archived newsletter).

help

Use this command to obtain information on how to use the Majordomo software.

end

Use this command to terminate a list of commands, e.g., especially if your mailer attaches an automatic signature.

ecosan sector program

Deutsche Gesellschaft fuer Technische
Zusammenarbeit (GTZ) GmbH
P.O. Box 5180
65726 Eschborn, Germany
T +49 6196 794220
F +49 6196 797458
E ecosan@gtz.de

I <http://www.gtz.de/ecosan>

