

EDITORIAL

Dear reader,

“Life can multiply until all the phosphorus is gone, and then there is an inexorable halt which nothing can prevent.” This sentence was written by the science fiction author Isaac Asimov. Writing in 1959, he continues: “We may be able to substitute nuclear power for coal power, and plastics for wood, and yeast for meat and friendliness for isolation – but for phosphorous there is neither substitution nor replacement.”

Phosphorus is indeed essential for all of us. It is a component in DNA molecules, and it is involved in the metabolism of all living cells, including plant cells. Phosphorus is therefore a key component of artificial fertiliser. In wastewater technology, phosphorus plays two different roles: on the one hand it is a pollutant which must be removed from the wastewater flow, because even at relatively low concentrations it can lead to algal bloom. On the other hand, it has recently come to be seen as a resource which can be retrieved from wastewater and marketed in plant fertiliser. KWB will now be working together with 14 European partners on this topic in the P-REX project supported by the EU. Our goal is to increase the average rate for recycling phosphorus from sewage sludge to 80%. We will be reporting on progress at regular intervals in the future.

Andreas Hartmann
Berlin Center of Competence for Water, Managing Director



LATEST NEWS

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Research for pure drinking water in India

Scientists from KWB and the Free University Berlin have travelled to India once more in order to prepare the construction of trial plants for the improvement of the quality of drinking water. In particular, the suitability of near-natural processes for water purification are to be tested, such as river bank filtration, aquifer recharge, and soil filtration (“constructed wetlands”). Currently, much of the drinking water in India is drawn directly from polluted rivers, which repeatedly leads to hygienic problems. The EU project Saph Pani (Hindi for clean water) is coordinated by the School of Life Sciences (FHNW) in Muttensz, Switzerland. In addition to KWB, and FU Berlin, the participants include DHI-WASY, Veolia Water India, UNESCO-IHE, and the Dresden University of Applied Science (HWT).

<http://www.saphpani.eu>

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Phosphorous recycling from sewage sludge

KWB coordinates new European joint project

The goal of P-REX is to contribute to the wider implementation and marketing of technologies for the retrieval of phosphorus from sewage sludge in Europe. The three-year research and demonstration project has an overall budget of € 4.4 million and will be supported by the EU in FP7 with € 2.9 million. There are 15 project partners from seven European countries, including nine SMEs.



Phosphorous is a key constituent of plant fertiliser. Everybody in Europe consumes about two grams of this element every day in their food. What the body does not need is excreted in the urine, and finds its way to the wastewater treatment plant. Since the availability of phosphorus is limited but demand on global markets is steadily increasing, it is now more important than ever to retrieve as much as possible from wastewater. The European research initiative P-REX is intended to assist with establishing efficient, marketable technological solutions for

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NEWS FROM THE KWB NETWORK OFFICE

Through their involvement in the projects P-REX and DEMEAU, KWB as well as Berlin enterprises and research institutions receive a 1.7 million € research grant from the EU FP7 programme. The total project volume amounts to 9 million €.

Within the FP 7 programme, the EU-funded research projects P-REX (phosphorus

recycling from sewage sludge, see page 1) and DEMEAU (demonstration of technologies for trace organics removal from drinking water and wastewater) get started in September 2012. The P-REX project which is coordinated by KWB, has an overall project volume of 4.6 million €, including EU funds to the amount of

3 million €, of which 1.1 million € have been attracted by the Berlin partners IASP at the Humboldt University Berlin, the Federal Institute for Materials Research & Testing and Kompetenzzentrum Wasser Berlin. The DEMEAU project volume totals 4.3 million €, including EU funds to the amount of 2.9 million €, of which 600.000 € go to the Berlin partners Ecologic gGmbH, Hydor GmbH and KWB. ●

TSB INNOVATION AGENCY BERLIN COORDINATES THE BERLIN INNOVATION FIELD FOR SUSTAINABLE WATER MANAGEMENT

An interview with Martin Schipper, Head of Energy Technology at the TSB Innovation Agency Berlin

Martin Schipper is a political scientist with an MSc in environmental management. Since January 2011 he has been in charge of the energy technology section at the TSB Innovation Agency GmbH, and in this function is also deputy manager for the Berlin-Brandenburg Energy Technology Cluster. Since August 2012, he has also assumed responsibility for the Berlin Innovation Fields for Environmental Engineering. The focus here is on sustainable water management and interface topics such as resource and raw material efficiency, and life-cycle management.

Mr Schipper, which specific tasks will TSB take on regarding the supervision of the Innovation Field 'Sustainable water management'?

TSB will be on hand for the regional actors from companies and scientific institutions as a contact partner for innovation- and technology-relevant topics. This will include offering support for technology transfer, research and development, networking, project formation, internationalisation, and PR work. In order to be able to target our services, we will be identifying specific needs and measures in the coming months. We want to work in close consultation with companies in the region, research institutions, networks, associations, and policy making bodies such as the Berlin Senate Department for Business, Technology and Research, and other Senate Departments. The innovation field coordination will be based on the existing structures and the remit of bodies such as KWB or the AQUANET network.

The water management sector is not like other commercial sectors. For example, water is not manufactured industrially. The market is characterised primarily by public authorities, which commission water utilities to carry out services and provide products. Will such features be taken into account when developing the new innovation field?

The commissioning bodies will play a central role in the development of the innovation field. We want to work together to promote current R&D topics, e.g. water distribution and wastewater disposal, planning of distribution networks and systems, and the improvement of mechanical and biological wastewater treatment. A further goal is to work together with the commissioning bodies on key topics which will create innovations and strengthen the value creation of the regional water management sector in the longer term. We also intend to work with

the commissioning bodies and to cooperate more closely with other actors from the water sector on strategic topics.

Research is an important basis for innovation. How can TSB support the further development of the research potential of the region in the water sector?

The research results of Berlin's universities and research institutions provide an important foundation for the economic potential of the region. Berlin has a very well-developed research landscape and companies in the region are carrying out numerous R&D activities so that we are in an excellent position compared with other regions of Germany. In order to make better use of these advantages in future, then in addition to tried and trusted measures in technology transfer and the networking of actors, attention should also be paid to topics such as training skilled personnel and promoting new innovative enterprises. Here TSB wants to work together closely with the trade associations, technology and new enterprise parks, and the Investment Bank Berlin (IBB) in order to make a contribution to the further development of the water management sector.

EU aims to promote the development of innovation in water management with so-called European Innovation Partnerships (EIPs). KWB has highlighted these efforts of the EU through its participation in the European Water Platform WssTP. What must we do in Berlin in order to be successful here?

Berlin already has expertise in the water sector and has established very good networks throughout Europe, and this gives it the opportunity to set its own accents in EU initiatives and programmes and further enhance the strengths of the region. An example of the involvement in Europe is the network developed by the Berlin Centre of Competence for Water with its research profile in Europe and internationally. Starting from there, European project proposals, for exam-

ple within the framework of the EIP, should be coordinated or supported by Berlin, and examined and implemented without delay. It is important that the actors from business, science, administration, and also intermediaries should work together on the relevant strategies in order to arrive at integrated solutions oriented towards the system as a whole, offering correspondingly high environmental advantages and improved efficiency.

One of the core elements of the joint innovation strategy of the Federal States of Berlin and Brandenburg (innoBB) is the cross-sectional topic of "Clean Technologies". This also includes the innovation field of sustainable water management. What role do water topics play in the cooperation between the two federal states?

Within the framework of the innovation strategy, sustainable water management has important interfaces to the regional clusters Energy technology, Health sector, Optics, ICT, Media, and Creative sector, and well as Mobility and Logistics. In addition there are also important links to other cross-sectional topics identified in innoBB, namely Materials, Production and Automation technology, and Security and Safety, which will also have to be taken into consideration in the implementation of the innovation field. Against the background of environmental protection and the response to climate change, there is considerable potential in the Berlin-Brandenburg region for innovation and value creation. This is demonstrated in particular in interdisciplinary approaches such as the Smart City and Smart Region strategies. For this reason, and in view of the growing international competition in the field of knowledge and technology, it is essential to intensify the cooperation between Berlin and Brandenburg. ●

Thank you very much for talking to us!
Bodo Weigert asked the questions.



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WATER RESEARCH IN BERLIN AND BRANDENBURG



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The tomato fish – Water conservation and CO₂ neutrality

It will only be possible to secure the supply of animal protein for the world's population by further expanding the most rapidly growing sector of the food industry - aquaculture. Compared with other sources of animal protein, sustainably reared fish have a lower environmental impact, consume less (virtual) water, use foodstuffs more efficiently, and have a small CO₂ footprint.

At the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) researchers have developed a low-emission aquaponics unit (ASTAF-PRO) for the combined growth of vegetables and fish in an enclosed greenhouse, in a project funded by the German Federal Ministry of Education and Research (BMBF).

In the unit, the fish tanks are linked to the plant trays. In this way the water is used twice, and biofilters can extract the metabolic products excreted by the fish to produce valuable fertiliser. A patented system regulates the supply of water and nutrients to the plants. By means of cold traps, water vapour transpired by the tomato plants is condensed and fed back into the fish tanks. The CO₂ formed in the fish tanks is taken up directly by the plants, and the use of an alternative energy supply means that there are no CO₂ emissions. A commercial company (agrathaer GmbH) will in future make the scientific results available for wider applications.

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RIKO – Risk analysis of microbial contamination of drinking water wells

Very high regional levels of precipitation in 2011 resulted in some German water utilities finding hygienically relevant microorganisms in water extracted from drinking water wells. The causes could be identified and quickly remedied. It is expected that similar extreme weather situations will occur more frequently in future, so that the risks of contamination will from now on have to be investigated more systematically than in the past.

Groundwater extracted for use as drinking water is protected against microorganisms by the retentive capacity of the sediment during riverside filtration, in combination with the professional installation of the water well itself. In the RIKO project, these framework conditions are to be subjected to closer scrutiny against the background of increasingly frequent extreme weather conditions. Measurements campaigns will be conducted around the wells during heavy rainfall and floods, including tracer tests, geophysical measurements, and the use of newly developed genetic probes (UT Thronicker) in order to identify unwanted water ingress to the wells. Enhanced monitoring and avoidance strategies will also be developed. It will be possible to transfer the strategies for risk minimisation developed in Berlin for use by water utilities elsewhere.

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Drinking water well at the river Havel in Berlin

© BWB

Evaluating strategies for managing combined sewer overflows

Overflows from combined sewers into the surface waters of Berlin cause considerable stress for the fish fauna. At the point of inflow, oxygen concentrations can drop so low that fish asphyxiate. The detention tanks which have been installed can mitigate the impact of such overflow events, but they are not able to prevent them completely.

In the MIA-CSO project, the impact of combined sewer overflows on the water quality of the river Spree and the Berlin canals was investigated over a period of three years. Measuring probes were deployed to continually register the pollution levels of the water in the sewers

© KWB



Checking measuring probes in the river Spree in Berlin

and in the surface waters. The results were used to validate a tool developed in the project for the planning of measures for combined sewer overflow management, e.g. further expansion of the detention capacity or decentralised treatment measures.

The MIA-CSO project was jointly managed by KWB, the Berliner Wasserbetriebe (BWB), and the Berlin Senate Department of the Environment (SenStadtUm). Funding was made available by Veolia and BWB.

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Spree 2011 – Pilot plant for combined sewer outflow storage goes into service

SPREE2011 is the prototype of a flexible, modular wastewater detention system, which in future will augment traditional storage basins made of concrete.

After more than seven years research and development work, supported among others by KWB, the BWB water utility, the DBU environmental fund, the German Federal Ministry of Education and Research, and the Stiftung Zukunft Berlin, the construction for the pilot plant LURITEC/SPREE2011 has now reached completion. The modular system installed in the river Spree has been developed for the storage of wastewater output from combined sewers but in can also be used with separate sewerage systems. It can also be installed in seawater, or in quickly flowing rivers, and it can be combined with a wastewater treatment facility. Prof Matthias Barjenbruch from the Technical University Berlin will monitor the technical operation of the plant for two years, followed by a two year evaluation period.

The official opening ceremony was held on 14 September 2012 in Berlin's Osthafen.

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Combined sewage store in the river Spree

>> continuation of page 1 (p-rex)

recycling phosphorous from sewage sludge. The European research initiative P-REX is intended to assist with establishing efficient, marketable technological solutions for recycling phosphorous from sewage sludge and increasing the recycling rate to 80 %. When selecting and evaluating best practice methods, regional conditions relating to wastewater generation will be taken into consideration, as well as the potential for the direct use of wastewater in agriculture. In addition to the evaluation of the recycling technologies, systematic investigations will also be carried out on the fertilising effects of the recycling products and their ecotoxicological impact.

Partners are Agro Plus (A), ASIO, spol. s r.o. (CZ), BSH Umweltservice AG (CH), Federal Institute for Materials Research and Testing (D), University of Applied Sciences Northwestern Switzerland FHNW (CH), Ingitec GmbH (D), IASP at the Humboldt University Berlin (D), Berlin Centre of Competence for Water gGmbH (D), LimCo International GmbH (D), Outotec Oy (FIN), P.C.S. Pollution Control Service GmbH (D), PFI Planungs-gemeinschaft GbR (D), Proman Management GmbH (A), Solintel M&P, S.L. (ES), Veolia Eau (F).

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FOCUS**Zwischenruf „Wasser: Achtung!“**

*A brochure on the secondary effects of climate change on water
With contributions on ecology, geophysics, climatology, spatial planning, agriculture, economics, medicine, and engineering
Published by: Leibniz Gemeinschaft e.V.*

The *Leibniz Gemeinschaft*, a group of affiliated institutions, has published a brochure in its “Zwischenruf” series dealing with the secondary effects of climate change on water. The team of authors draws attention to the fact that most decision-makers are now aware of the effects of climate change, such as increased risks of flooding, but this is not yet reflected sufficiently in policy decisions. In addition, many of the measures currently proposed are not adequate for the actual requirements in view of the high degree of complexity and the many interrelationships involved. The authors therefore call for the development of strategies for adapting to climate change which will offer greater protection for water resources in a broader interdisciplinary and transdisciplinary

EVENTS**24 September 2012****Climate Impacts in Germany**

Organiser: Potsdam Institute for Climate Impact Research (PIK)

Venue: Humboldt University Berlin

<http://klimafolgenkonferenz.de>

24–25 September 2012**wat Conference Debate on Water-related Topics**

Organiser: DVGW, BDEW

Venue: Fair Grounds Dresden

www.wat-dvgw.de

25 October 2012**32nd Berlin Water Workshop:**

Nitrogen elimination in inland waters – First results of the cooperative research NITROLIMIT funded by the German Federal Ministry of Education and Research

Organiser: Kompetenzzentrum Wasser Berlin together with project team NITROLIMIT

Venue: Berlin, Head Office Berliner

Wasserbetriebe, Neue Jüdenstraße 1

www.kompetenz-wasser.de

www.nitrolimit.de

30 October 2012**8th EWA Annual Brussels Conference**

European Year of Water – Upcoming Challenges

Organiser: EWA

Venue: Brussels, Representation of the State of Baden-Württemberg to the

European Union

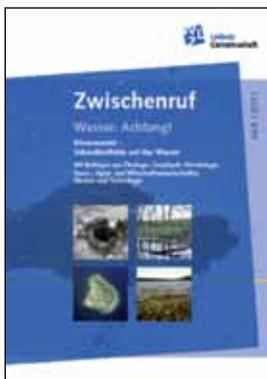
Contact: lorvik@ewa-online.eu

7–8 November 2012**Aachener Membran Kolloquium (AMK)**

Organiser: Chair of Chemical Process Engineering at RWTH Aachen University

Venue: Eurokongress Aachen

www.amk.rwth-aachen.de



approach. A total of ten contributions deal with relevant topics currently being worked on in the various institutes of the Leibniz Community.

<http://www.leibniz-gemeinschaft.de/medien/publikationen/zwischenruf>

**13–13 November 2012****European Resources Forum**

Organiser: German Federal Environment Agency

Venue: BEST WESTERN PREMIER Hotel

Steglitz International, Berlin

www.resourcesforum.eu

13–14 November 2012**26th Karlsruher Flockungstage on Sustainable Wastewater and Sludge Treatment**

Organiser: Karlsruhe Institute of Technology

Venue: EUROPAHALLE KARLSRUHE

<http://iswww.iwg.kit.edu/1420.php>

21–22 November 2012**IWRM Karlsruhe 2012 Interactions of Water with Energy and Materials in Urban Areas and Agriculture**

Organiser: Fraunhofer ISI, KIT, GWP, TZW

Venue: Congress Centre Karlsruhe

www.iwrm-karlsruhe.com

23–26 April 2013**Wasser Berlin International – Trade Fair and Congress for Water and Wastewater**

www.wasser-berlin.com

**about us**

The Berlin Centre of Competence for Water (Kompetenzzentrum Wasser Berlin, KWB) is a public-private partnership company. Its associates are the TSB Technologiestiftung Berlin, the Berliner Wasserbetriebe, the Berlinwasser Holding and VeoliaWasser. The KWB stands as a network node to strengthen the position of Berlin as an international centre in the field of water economy and technology. Partners and actors are scientific facilities, public institutions, companies as well as multipliers from public and private sectors.

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