

# LeAF Letter

Number 11, July 2009

With this newsletter LeAF (Lettinga Associates Foundation) aims at informing the reader on its projects, courses and other activities performed in the field of implementation of environmental protection and resource conservation technologies

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## Dear Readers,

Just before summer holidays start, we hope you will have some moments to spend on reading our LeAF Letter. Wishing you a pleasant break and a fresh start,

Best regards,  
Marjo Lexmond  
Managing director

## Professor Gatze Lettinga received the Lee Kuan Yew Water Prize

On June 24 Professor Gatze Lettinga received the Lee Kuan Yew Water Prize 2009 from the hands of President SR Nathan of Singapore. The Award Ceremony and Banquet was the highlight of the Singapore International Water Week (SIWW), which was held on June 23-27. On June 23 Professor Lettinga delivered the 2<sup>nd</sup> Singapore Water Lecture. Among the many important guests was His Royal Highness Prince Willem-Alexander.



*Professor Lettinga delivering the 2<sup>nd</sup> Singapore Water Lecture*

The Lee Kuan Yew Water Prize is an international award recognising an individual or organisation for outstanding contributions in the field of water. Professor Lettinga received the prize for his work on anaerobic technology. In particular the unpatented UASB reactor was mentioned. For us at LeAF this important recognition of Professor Lettinga's work is a great honour, as the anaerobic treatment concept is the fundament on which LeAF is built.



*His Royal Highness Prince Willem-Alexander and Professor Lettinga during the SIWW.*

Several people from LeAF accompanied Professor Lettinga to Singapore and were present at this great event and other activities during the week. The SIWW proved an excellent platform for networking. Great interest was shown in anaerobic technology and we at LeAF look forward to elaborate the practical implementation of it in the region.

For more information contact Marjo Lexmond (marjo.lexmond@wur.nl)

## Update on the NEWEN project



LeAF is glad to inform you that the first activities of the programme NEWEN (Netherlands and Western Balkans Environmental Network) took place. NEWEN is a capacity building programme, initiated by LeAF, with six partners from the Western Balkans (WB) and three Dutch universities and institutes. Project activities include workshops in the WB for scientists and policy makers, MSc fellowships, training courses for university staff and government officials from WB, fieldwork at a contaminated site in the WB and a closing symposium to disseminate the key outcomes of the project.

The most recent activity, a regional workshop for professionals from universities and governmental organizations took place in Durres, Albania on June 11 and 12. The topic of the workshop was Urban Solid Waste Management in the Western Balkans and it was co-organised by the Agricultural University of Tirana and LeAF. In total 20 participants from WB universities and governmental organizations took part in the workshop.



*Participants of the workshop in Durres, Albania.*

Some of the past activities organised in The Netherlands are a course on Research Methodology in a multi-disciplinary setting and a course on Modernization of Environmental Science Education for the WB university staff, both organised this year by Wageningen University and Research centre (WUR) through Wageningen International. Moreover, the first MSc students from the WB region have successfully started their post-graduate studies at Wageningen University and Unesco-IHE in Delft.

The NEWEN programme has been developed as part of the current Regional Program on Environment Western Balkans of the Embassy of the Kingdom of the Netherlands in Belgrade and will run until May 2011.

For more information about the project and upcoming activities please check the website (<http://www.newenproject.org>), or contact Darja Kragic Kok ([darja.kragic@wur.nl](mailto:darja.kragic@wur.nl)).

### **LeAF's involvement in projects related to human pharmaceuticals and the environment**

Human pharmaceuticals are consumed in large quantities. It is predicted that amounts will only increase, because of improving health care and longer life expectations. Current sanitation systems, characterised by a high degree of dilution, do not sufficiently remove these compounds. They are discharged to surface water, forming a threat to aquatic life and re-entering the water cycle. Source control, the separation of wastewater streams containing increased concentrations of pharmaceuticals and their target treatment, is a way to minimise emissions to the environment.

Despite the lack of legislation on required emission reductions, research is carried out worldwide on emissions, occurrence and fate of pharmaceu-

ticals in different environmental compartments. Also in the Netherlands various projects have been initiated. Up to now LeAF participated in three of them:

#### **Anderen**

Within a project commissioned by STOWA, LeAF, WU-ETE and Grontmij, the feasibility of separate collection and subsequent use of urine as a fertiliser for energy crops is investigated at the demonstration site Anderen. At the location a total of 20 urine separation toilets were installed. The main research question was whether there is a risk of pharmaceuticals reaching the groundwater when urine is being applied to the field. The fate of 8 representative pharmaceuticals in soil was assessed, divided in laboratory tests on biodegradation and sorption/desorption. It could be concluded that very persistent and hydrophilic compounds, may, on a longer term, contaminate groundwater resources. Longer term experiments are needed to answer the many questions that still remain. Field tests, coordinated by Grontmij, are being carried out at this moment.



*Pharmaceuticals tested in projects Anderen and Sleen*

#### **Sleen**

The project "Sorption and oxidation of selected pharmaceutical compounds from separately collected human urine", commissioned by STOWA and Waterboard Velt and Vecht was performed by WUR, LeAF and Grontmij. Separation toilets were installed in a nursery home, characterised by a high consumption of pharmaceuticals. Urine was subjected to advanced treatment for pharmaceuticals removal, consisting of oxidation techniques and sorption onto activated carbon, in both laboratory and pilot scale set-ups.



*Urine before and after oxidation with ozone*

Activated carbon and ozonation are able to eliminate many pharmaceuticals, at least in their parent form. Interaction with the complex matrix of urine is an issue regarding process optimisation.



## PILLS/SLIK

In the SLIK project, part of the European Interreg project PILLS, a first demo installation for a separate treatment of hospital wastewater will be built next year in Zwolle. Waterboard Groot Salland is project coordinator. Other partners are Isala Clinics, Municipality Zwolle, Province of Overijssel, Ministry of Environment (VROM), Ministry of Transport, Public Works and Water Management, STOWA, Vitens and RIVM. In 2010 research will be performed into the optimal process configuration of various combinations of advanced biological and physical-chemical treatments (MBR, activated carbon, ozone, UV/H<sub>2</sub>O<sub>2</sub>, nanofiltration), to guarantee the required removal of pharmaceutical compounds, pathogens and wastewater toxicity. LeAF is actively involved in various project activities within the preparation phase, such as working out the research strategy and the selection of a broad range of representative pharmaceuticals to be monitored.

For more information please contact Katarzyna Kujawa-Roeleveld ([katarzyna.kujawa@wur.nl](mailto:katarzyna.kujawa@wur.nl))

## Development of a small scale kitchen waste digester for application in the UK

Since the end of last year LeAF has been involved in a project on decentralised small scale anaerobic digestion of mainly kitchen waste. The project was initiated by a UK organisation called the Community Composting Network (CCN). The aim is to develop a practical guide to the construction and operation of small scale anaerobic digesters for kitchen waste in the UK. Since the implementation of the Animal By-Products Regulations, the community composting of food waste has been a serious challenge to members of the CCN, to the extent that to comply with the legislation, some projects had to stop their activities. Investing in systems was needed to comply with the regulations, and it was felt that small scale AD was worth serious investigation as an alternative to aerobic composting of kitchen waste.

After an initial period of exploring the idea of small scale anaerobic systems in the industrialised world the "Micro AD project" was set-up, and LeAF was contracted to provide expert advice. The project consists of four phases:

- Identify and define suitable systems.
- Create an assembly guide and operational manual for a robust small scale system.
- Test build a demo plant to test the manual and gain practical experience
- Install pilot plants in a number of project sites, and provide training and support.

The first phase is now finished, and to disseminate its outcomes CCN held a seminar on June 27<sup>th</sup> in Birmingham in the UK. The main aim was to encourage members of the CCN and other interested parties to become more familiar with the technology.



*Cath Kibbler (CCN) presenting at Birmingham seminar*

The first phase report (and other project information) is available on the CCN MicroAD website: <http://www.communitycompost.org/events/microAD.htm>

For more information contact Henri Spanjers ([henri.spanjers@wur.nl](mailto:henri.spanjers@wur.nl))

## Lectures at Politecnico di Milano

Henri Spanjers will give two public lectures at the Department of Environmental, Hydraulic, Infrastructures and Surveying Engineering (DIAR) of the Politecnico di Milano, Milan, Italy.

- Anaerobic digestion: state of art and anaerobic treatment of industrial effluents (with special attention for textile and dairy). Thursday September 17, 14:30-17:30
- Bioenergy and water - decentralised sanitation and reuse (DESAR). Friday September 18, 9:30-12:30

For more information contact Henri Spanjers ([henri.spanjers@wur.nl](mailto:henri.spanjers@wur.nl))

## Colophon

LeAF (Lettinga Associates Foundation) is an independent knowledge centre working on the development and implementation of sustainable environmental protection technologies with the aim of (re-)utilisation of valuable compounds in waste and wastewater and the improvement of the quality of life of people living in countries in transition. LeAF has close ties with Wageningen University and one of its aims is to bridge the gap between research and practical application. LeAF does not receive donor funding and earns its income from projects related to applied research, consultancy tasks, organisation of courses, biological tests, etc.

Twice a year LeAF will distribute this LeAF Letter amongst its clients, relations, and others interested in environmental technologies for waste and wastewater treatment.

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