



## **Project BioCrete**

Task ID: 9  
Date: 2008-01-17  
Participant: All (DTI)  
Name: PNY/DK

### **Preface**

*“BioCrete” is the acronym for a LIFE supported project “Utilisation of ash from incineration of wastewater sludge (bio ash) in concrete production”. The project activities have been defined in 10 tasks, and the present report is the final report for one task, summarising purpose, task progress, results and experiences. The report is written by the task coordinator, as identified by initials for participant and name. The project period is June 2005 to December 2007, and the project includes 4 participants: Avedoere Wastewater Services (AWS) as beneficiary, Lynettefaellesskabet (LYNIS) and Unicon Ltd. (UNICON) as partners and Danish Technological Institute (DTI) as consultants.*

## **Final report for Task 9**

### **“Dissemination programme of results”**

#### **Introduction**

The main target of the dissemination programme is to spread the knowledge obtained within the project to increase awareness of the use of bio ash in concrete in order to reduce the environmental impacts from bio ash disposal.

#### **Task progress**

Dissemination of the results from the project has been an ongoing process. The project website [www.biocrete.dk](http://www.biocrete.dk) was established in May 2006, a kick-off seminar was held in October 2006 and since then articles and presentations have been made; see the Appendix for the present complete list of activities. The dissemination will continue during the coming months and years and the project website will accordingly be updated.

The partners have been encouraged to make suitable construction projects – DEMO projects – available for the present project, so that experience in use of bio ash concrete in practice can be gathered and registered. The DEMO projects will be used as future references to support the dissemination of the use of bio ash concrete in Europe. There are plans regarding a possible big DEMO project using concrete with bio ash: AWS is going to renovate a 70.000 m<sup>3</sup> storm water basin. In the tender material the possibility of using bio ash concrete will be emphasised. However, this tender has not been elaborated yet. For the time being, no other DEMO projects are in progress.

#### **Results**

A kick-off seminar was held the 5<sup>th</sup> of October 2006 at Danish Technological Institute with participation of approximately 40 representatives of the different stakeholders. Among the participants were representatives from consulting engineers, municipalities, producers of ready-mixed concrete and concrete element producers. The possible reuse of bio ash in concrete production and the BioCrete project was discussed in 3 papers.

For each task at least a Final report has been published in English on the project website.

Samples of bio ash concrete and information on the BioCrete project is put on display at the AWS exhibition facilities; see Figure 1.



*Figure 1. "From ash to concrete". A poster on the LIFE BioCrete project and a small 'bridge' of bio ash concrete slabs at the AWS exhibition hall.*

The dry ash outlets at the WWTPs, see Figure 2, as well as silo and dosage facilities at the concrete production plants are in themselves interesting demonstration sites. These installations are on permanent display for interested people in the industry etc., and serve as an up-front evidence for the fact, that the production of bio ash concrete is indeed a reality.

Based on results from the technical tasks, articles have been published in Danish journals, and oral presentations can be found in the proceedings from conferences in Switzerland, Canada and Norway, see the Appendix for details.

As an activity in task 3, many persons with relation to European sludge incineration plants have been contacted, and thus been informed about the BioCrete project.



*Figure 2. The new dry ash outlet at AWS with screw conveyor and load bellows.*

### **Future activities (After LIFE communication plan)**

Papers and articles: Relevant national and international conferences and journals will be considered for presentation of the project results. An article for the Danish specialist journal "Dansk Beton", is planned to be published in the spring 2008.

Revision of standards: During 2008 it will be evaluated how it is advisable and possible to revise relevant concrete standards based on the project results, e.g. DS 2426, DS/EN 206-1 and contact to the standardisation committee CEN/TC 104 "Concrete and Related Products".

Future studies: At the present time the experiences from the project are used to investigate the use of bio ash in earth moist (or zero slump) concrete for concrete goods.

The website will be updated by DTI on a regular basis.

## Appendix

### List of dissemination activities

#### Kick-off seminar:

Copenhagen, Denmark, 2006-10-05. Whole day workshop (in Danish) "New knowledge on healthy and sustainable concrete construction works", organised by DTI and comprising 3 papers on bio ash concrete, and presented by Freddie Larsen (UNICON), Dan Kjersgaard (AWS) and Kirsten Eriksen (COWI).

#### Conferences:

- Davos, Switzerland, 2006-07-02/07 "Advances in Cement and Concrete". The paper "Some aspects of the use of sludge incinerator ash for the production of concrete" was presented by Jørn Bødker (DTI).
- Seville, Spain, 2007-06-04/08 "ERMCO – Concrete 2007". Folders on the BioCrete Project were on display.
- Moncton, New Brunswick, Canada, 2007-06-24/27 "Moving forward. Wastewater biosolids sustainability: Technical, Managerial and Public Synergy" organised by IWA specialist group on biosolids. The paper "The reuse of bio ash for the production of concrete. A Danish case study" was presented by Dan Kjersgaard (AWS).
- Lillehammer, Norway, 2007-09-16/19 "Sustainability in the Cement and Concrete Industry". The paper "The use of sludge incinerator ash in the production of concrete" was presented by Claus Pade (DTI).
- Bålsta, Sweden, 2008-06-08/11 "XX<sup>th</sup> Symposium on Nordic Concrete Research and Development" organised by Nordic Concrete Research. The paper "The use of sludge incinerator ash in the production of concrete" will be presented by Claus Pade (DTI).

Folders regarding the BioCrete Project were also on display at "Dansk betondag" 2007-09-20 in Copenhagen and at "Betonfeber" 2007-11-20/21 in Stockholm, Sweden.

#### Articles:

- An article (in Danish) "Bioaske på vej til dansk beton" in the specialist magazine "Dansk Beton" (Danish concrete) in May 2006.
- An article (in Danish) "Forsøg med bioaske i beton" by Pernille Nyegaard (DTI) was printed in a special issue regarding concrete in the Danish daily paper "Licitationen" 2007-02-16.
- An article "Use of bio ash in concrete production (LIFE05 ENV/DK/000153 BioCrete) was submitted to Life News in February 2007.

#### Meetings and courses:

The use of bio ash was mentioned at meetings held by the Danish concrete society in October 2006 and March 2007. The meetings were titled: "The concrete technology of today" and "Use concrete and spare the environment".

DTI has held 3 courses in 2006 and 2007 regarding concrete according to DS/EN 206-1, at which occasions the bio ash has been introduced.

#### Website:

www.biocrete.dk in both Danish and English. The website contains a description of the project and status for each task. The above mentioned papers, articles etc. can also be found at the site.