

# Clyde Bergemann News

Clean Energy Solutions

Edition 01/09



## ☐☐☐ South Korea – a successful nation sets new objectives

South Korea has the twelfth-largest national economy, is number one in the worldwide marine industry with shipbuilding companies like Hyundai Heavy Industries, Hanjin and Daewoo and is home of the world's third-largest steel producer, the Posco corporation. In addition to this, another impressive figure sees South Korea as the tenth-largest energy user with 96.7% of its energy feedstock imported in 2006. By mid-year 2008, one third of total imports was primary energy with the largest proportion being crude oil, mainly ordered from Arabian sources. Preferred supplier countries for coal are Australia, China, the Russian Federation, Canada and the USA. South Korea's hope to stay untroubled by the effects of the US-crisis, thanks to an achieved higher geographical diversification of its exports in recent years, is dashed. With a drop in export trade by 18% in December, the country is close to a slump. >> Page 2

## ☐☐☐ Content:

- |   |   |  |
|---|---|--|
| - South Korea - a successful nation sets new objectives > Page 2                                      | - US customer makes use of broad technology portfolio > Page 5  | - 60-year anniversary of German headquarters > Page 7                        |
| - Clyde Bergemann Power Group strengthens heat exchanger business by acquisition of TERMOTEC > Page 3 | - Dry fly ash conversion at Fayette Power Plant in the US > Page 5  | - International Sales Conference of the Clyde Bergemann Power Group > Page 7 |
| - Contract awarded for SO <sub>2</sub> mitigation > Page 3  | - Worldwide largest coal-fired power plant project uses on-load boiler cleaning by Clyde Bergemann > Page 6 | - Clyde Bergemann Power Group's new campaign takes off into 2009 > Page 8    |
| - Russia's largest coal-fired power plant receives new fly ash handling system > Page 4               | - Clyde Bergemann Atlanta wins bid for SMART CLEAN ISB on-load boiler cleaning system > Page 6              | - Events Diary > Page 8  |

## ☐ South Korea – a successful nation sets new objectives

### Extract of 'Planned investments in energy-saving technology by industry sector' 2008-2012

Industry Sector	Capital spending [in Won bn]	Main measures
Iron and steel	695.1	Equipment to recover energy, commercialisation of the FINEX technology
Cement	100.0	Use of waste heat for power generation (4 facilities are planned)
Textile	80.0	Build of CHP-units (use of residues, such as the ones out of textile colouration)

Source: MKE 2008

To maintain its position as leading export and technology nation, the Ministry of Knowledge Economy (MKE) presented the future industry policy in September 2008. Six areas have been defined as new growth markets, which are Energy & Environment, Transport Systems, New Information Technology, Convergence Technology, Biotechnology & Medical Technology and Knowledge-based Services. In total 22 high priority projects are assigned to these growth markets with the necessary funds. One main focus of the area "Energy & Environment" is the topic "Clean Coal Technologies".

The new energy policy until 2030, which has been announced by the government in August 2008, is based on the 3Es – Energy Security, Economic Efficiency and Environmental Protection. One important step to reach the country's long-term energy goals is to improve the energy intensity level to 0.185 TOE/US \$ 1,000 from the current level of 0.341 TOE/US \$ 1,000 which is far beyond the OECD average. The primary energy consumption will be reduced by 42 million TOE (TOE = tons of oil equivalent). Eight industry sectors with the highest energy consumption benefit from financial support when upgrading their facilities for more energy efficiency.

The long-term strategy aims at a different energy mix to reduce dependency of primary energy imports. Consequently, the use of fossil fuels will be reduced from 83% to a 61% share by 2030 in support of nuclear energy and renewables. By 2022, nuclear plants will account for 33% of the total generating capacity, while coal and gas-fired plants will decrease slightly to 29% and 23% respectively. The important thing here is that only 6% of the generated power will be supplied by gas-fired stations in the future, compared to 22% today. The portion of power generated by nuclear reactors increases from 34% to 48%. Renewables will have an increased share of 11%, coming from an actual level of 2.4%.

The forecast for power consumption sees a yearly growth of 2.1% by 2022. To meet demand, the government plans a capacity expansion of some 32 MW by building 12 nuclear plants, 11 gas-fired and 7 coal-fired stations.



Clyde Bergemann Power Group, alongside our local sales agent hosted a successful technology seminar in 2008

South Korea defines waste-to-energy as a renewable energy source. At the end of November 2008, the Danish financial newspaper "Børsen" reported that in the next 3-5 years at least 20 new waste incineration plants are expected to be built to get higher usage of this low carbon energy source.

"During a customer event which has been organised together with our local sales agent end of last year in Seoul, we were able to assure ourselves that this topic is very up-to-date. Our Shower Cleaning System "SCS" which is designed specifically for the needs of waste-to-energy plants was of main interest at this event," says Franz Bartels, President & CEO of the Clyde Bergemann Power Group.

#### Contact Details: ☐

Franz Bartels  
Clyde Bergemann Power Group  
eMail: f.bartels@CBPG.de

## ❖ Clyde Bergemann Power Group strengthens heat exchanger business by acquisition of TERMOTEC



The Heiligenkreuz Biomass Plant, Austria is installed with Clyde Bergemann TERMOTEC air condensers

The Clyde Bergemann Power Group has acquired the company "TERMOTEC Gesellschaft für Energie und Umwelttechnik GmbH", located in Wilnsdorf, Germany. This step increases the capabilities and capacities to market the new business unit for heat exchanging and energy recovery solutions, which has been established with the take over of Australian based company Senior Thermal in December 2006.

It is also the foundation of the European sales and manufacturing centre for economiser technology by Clyde Bergemann.

TERMOTEC was founded in 1982, currently counting 20 employees. Karl-Hermann Becker will continue his duties as Managing Director at the company, newly named Clyde Bergemann TERMOTEC GmbH (CBT).

CBT engineers and produces solutions for thermal process technologies and, as a special feature of competence, thermal processes where gases are applied in industrial heat exchanging procedures.

### ❖ Contact Details:

**Karl-Hermann Becker**  
Clyde Bergemann TERMOTEC, Germany  
eMail: kbecker@clydebergemann.de

## ❖ Contract awarded for SO<sub>3</sub> mitigation

Clyde Bergemann EEC has been awarded a multi-million dollar turnkey project to design, fabricate and install a dry sorbent injection system to reduce SO<sub>3</sub> emissions at three Mirant generating stations in Maryland. After an extensive testing period, Mirant chose hydrated lime as the dry sorbent due to its lower overall operating cost, availability and proven results.

The hydrated lime, which will be delivered to the sites via a PD truck, will be maintained in a 50-ton storage silo.

The lime will be metered out of a weigh hopper and pneumatically conveyed to injection points in the flue gas duct between the line booster fan and FGD absorber. A total of four separate systems is required to meet the injection requirements at all locations. The system delivery and installation takes place in three increments from May through September 2009.



Construction has begun at Mirant's facility located in Morgantown, Maryland in the US

### ❖ Contact Details:

**Jim Connor**  
Clyde Bergemann Atlanta, USA  
eMail: jconnor@clydebergemann.com

For large-scale boilers for energy production, the company supplies steam boilers with appertaining installations like economisers, air-preheaters and superheaters for utilising waste heat recovery and process steam handling and quenching. Complete air condenser plants are also part of the product range.

CBT also specialises in design and fabrication of turnkey steam boilers for biomass combustion. For the petrochemical industry, the company delivers air coolers and tube-and-shell heat exchangers as well as economisers and convection zones for cracking furnaces. For the environmental business, CBT markets systems for waste gas purification.

## ❖❖❖ Russia's largest coal-fired power plant receives new fly ash handling system



Reftinskaya GRES power plant

A contract to deliver fly ash handling equipment on all ten bituminous coal-fired units of Reftinskaya GRES, located in the Urals, has been awarded to Clyde Bergemann Doncaster (CBD), the Power Group's materials handling centre of competence in the UK.

The main objectives of this unique contract for ZAO ROS Postavka, a Russian engineering company and main EPC contractor, is to reconstruct the existing hydraulic ash handling system and create a new landmark pneumatic dry ash handling system at the affiliate of OGK-5 OAO, Reftinskaya GRES. The basic principles and detailed technical scheme have been approved by OGK-5 OAO main shareholders and international energy corporate group Enel.

The project scope includes delivery and commissioning of fly ash handling technology as well as unitised PLC control systems and a centralised compressed air plant, with staged deliveries throughout 2009.

The new system, which will initially work in conjunction with the existing hydraulic technology, will eliminate water usage and will provide OGK-5 OAO with a saleable by-product in the rapidly developing commercial market for fly ash in Russia.

The initial part of the project was awarded to CBD in December 2006 for the electrostatic precipitator fly ash handling equipment on Unit 6, which is currently operational and working in excess of all expectations. Once operational, the entire Reftinskaya GRES dry ash handling project is set to pave the way for future projects of this kind in the Russian power market. The project implementation is also aimed to improve the ecological situation in the region.

Placing coal-fired power plants all over Russia, would create a background for secondary industrial utilisation of fly ash and coal combustion materials and to dramatically reduce the atmospheric emission of NO<sub>x</sub>, SO<sub>x</sub> and SO<sub>2</sub>.

Following the contract award, Evgeniy Tutoraytis, Director General of ZAO ROS Postavka, along with Nikolay Gavlitin, First Deputy Director General, who is responsible for developing and managing the entire project, commented: "This is an exciting project for both ZAO ROS Postavka and CBD and is the culmination of a dedicated and focused effort of all involved from both parties."

Mark Heeley, CBD Sales Manager, commented: "ZAO ROS Postavka are renowned as a worthy general contractor and are pursuing a number of retrofit projects throughout Russia and CIS. Having obtained Reftinskaya GRES as a prestigious reference, and establishing a business relationship with ZAO ROS Postavka, will suitably position Clyde Bergemann for further growth in this market."

### Contact Details: ❖❖❖

Mark Heeley  
Clyde Bergemann Doncaster, UK  
eMail: mheeley@cbmh.co.uk

## US customer makes use of broad technology portfolio



Project example of Clyde Bergemann EEC: Installation of spray dry absorber and reverse air fabric filter technology at a New York waste-to-energy facility

Existing mercury regulations in many US-states are driving the demand for activated carbon for mercury control at a rapid pace. It is expected that demand will exceed domestic supply capacity in 2010 and beyond.

ADA Environmental Solutions, leading supplier of mercury control systems, has started construction of the largest powdered activated carbon manufacturing plant in the world which is located in Louisiana.

Clyde Bergemann Americas (CBAM), the US-arm of the Clyde Bergemann Power Group, is supplying an overall solution for this project thanks to its comprehensive technology portfolio.

The initial project for on-load boiler cleaning equipment for the facility's boilers was engineered and produced by Clyde Bergemann Atlanta, the Group's US-centre of competence for on-load boiler cleaning solutions. This supply will now be followed up by the provision of pulse jet fabric filters and spray dry absorber for air pollution control designed for SO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> and particulate control. The ordering party is BE&K located in Birmingham, Alabama.

The spray dry absorber utilises rotary atomiser technology for optimal emissions reduction.

The pulse jet fabric filter is a six module design developed specifically for ADA's requirements. Engineering and supply will be carried out by Clyde Bergemann EEC, the Group's centre of competence for air pollution control solutions. Their leading technology enables optimal emissions reduction. Headed by CBAM, one control system for all Clyde Bergemann equipment included in this project is currently being engineered. Negotiations are currently underway for the ash handling equipment and Clyde Bergemann Delta Ducon, CBAM's ash handling division, hopes to complement the package with their technology.

### Contact Details:

**Mike Newbury**  
Clyde Bergemann Americas, USA  
eMail:mike@clydebergemann.com

## Dry fly ash conversion at Fayette Power Plant in the US



Clyde Bergemann Americas technology trailer at the Fayette power plant

Clyde Bergemann Delta Ducon was awarded the contract to design, manufacture and deliver the modification of the fly ash system at the Lower Colorado River Authority's Fayette Power Project.

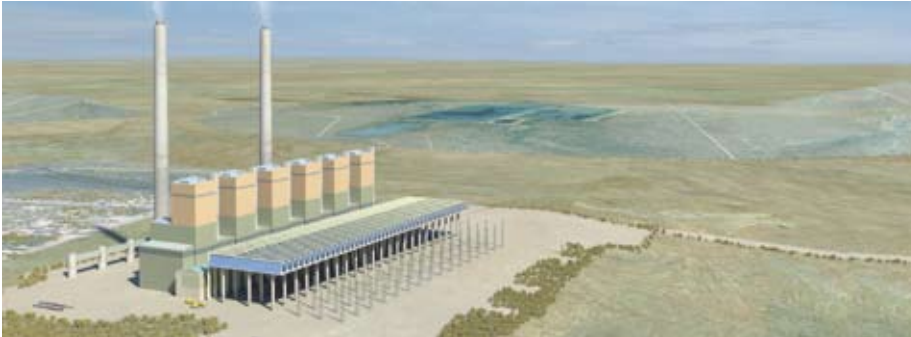
The existing fly ash system on Units 1 and 2 uses a fly ash pump to transfer water to hydrovactors which create a vacuum to pneumatically convey fly ash from the precipitators to a storage bin. The economiser/air preheater ash is handled the same way, but bypasses the storage bin, mixes with the water at the hydrovactor and is conveyed as a slurry to a storage pond.

The new system is completely dry and eliminates the environmental issues caused by the wet pond system. The new system will separate the fly ash and economiser/air preheater ash into two separate systems while changing the vacuum producing process. The fly ash handling system will be modified to replace the hydrovactors with mechanical vacuum pumps along with associated piping, valve and control changes. The economiser/air preheater ash system will be changed to convey the ash to a new storage silo with new mechanical vacuum pumps, associated piping, valves and control changes.

### Contact Details:

**Huiying Zhuang**  
Clyde Bergemann Americas, USA  
eMail: huiying@clydebergemann.com

## Worldwide largest coal-fired power plant project uses on-load boiler cleaning by Clyde Bergemann



Medupi Power Plant illustration

© GEA Group Corporation

Concluded by Hitachi Power Europe GmbH (HPE), Clyde Bergemann will supply state-of-the-art on-load boiler cleaning technology for the hard coal-fired power plants Medupi and Kusile, both located in South Africa. The two base-load power stations will be equipped by HPE with six supercritical boilers each. With a total generation capacity of 9600 MW, it is actually the largest project on the market. The operator of the station is Eskom, a South African electricity public utility.

With a value exceeding €18m, this contract represents the largest order in the history of Clyde Bergemann for the business field "Boiler Efficiency".

The scope of supply includes water cannons and the FACOS optimisation system for the combustion chamber as well as RK type sootblowers for the convection part. FACOS uses a sensor system to detect the position and intensity of fouling and slagging in the furnace area. The Cleaning Expert Module links the data with the current performance data of the steam generator and decides upon stored algorithms which cleaning action needs to be carried out and at what intensity.

The sensors then feed back the results of the cleaning operation and make the system a unique closed loop arrangement. The main point here is that FACOS not only regards the level of fouling but also the influence of the imminent cleaning operation on boiler performance.

This demand-driven process, which Clyde Bergemann has labelled as "SMART CLEAN ISB", results in more efficient cleaning inside the boiler's furnace. The heat absorption improves significantly with direct positive effect for boiler performance and efficiency. Experience with past installations also shows that fuel consumption is reduced, the boiler off-gas temperature stabilised and so CO<sub>2</sub> emissions lowered.

Delivery starts in May 2009 and ends 2013 with commissioning taking place up to early 2015.

Both power stations are part of Eskom's multi-billion rand expansion. Most of South Africa's power stations are coal-fired and Eskom has been struggling to meet electricity demand due to a lack of investment in new generation capacity and the country's ageing power generating infrastructure which has been unable to cope with the rising demand.

### Contact Details:

Bernd Köster

Clyde Bergemann GmbH, Germany  
eMail: bkoester@cbw.de

## Clyde Bergemann Atlanta wins bid for SMART CLEAN ISB on-load boiler cleaning system

Clyde Bergemann Atlanta has been awarded the contract for a SMART CLEAN ISB on-load cleaning system for two circulating fluidised bed boilers manufactured by Foster Wheeler including sootblowers, thermodynamic model and SMART Controls. The boilers will be operated by Entergy at their Little Gypsy power station. The estimated US \$1 billion project will

utilise circulating fluidised bed technology developed under the United States Government Department of Energy's Clean Coal Technology program and will use petroleum coke as its primary fuel. Delivery is scheduled for January 2010.

### Contact Details:

Jim Connor

Clyde Bergemann Atlanta, USA  
eMail: jconnor@clydebergemann.com

## 60-year anniversary of German headquarters



Employees of Clyde Bergemann Wesel, Germany congregate outside the German headquarters

Franz Bartels, President & CEO of the Clyde Bergemann Power Group, opened the ceremony with a speech in which he pointed out that the excellent market position of the company today has been a joint effort of all employees. That's why they and their families are the focus of the celebration.

Franz Bartels also looked back on the company's history with the transition from a sootblower supplier to a solution provider.

Many family members made use of the opportunity of live product demonstrations to see for themselves that boiler cleaning technology is interesting.

Several trials were set up especially for the children attending the event and held a great deal of enthusiasm and interest from them.

Blessed with great weather, the employees of Clyde Bergemann in Wesel, Germany enjoyed their day to the full in familiar atmosphere.

## International Sales Conference of the Clyde Bergemann Power Group



Participants of the Clyde Bergemann Power Group sales conference

Every year in November, Clyde Bergemann Power Group hosts a sales conference in Wesel, Germany where more than 100 key personnel of the Group's research and development and sales departments congregate to share knowledge and experience of product and market developments for new solutions.

Over the years it has become tradition for our newly acquired companies and co-operation partners such as EP Tech, TERMOTEC and RECOM Services, to open up this two day event with a presentation of their product range.

The experiences gained in numerous customer projects showed a growing preference to use biomass as fuel for electricity generation. In addition, results of the modernisation projects carried out worldwide proved that there are still many plants with untapped potential for optimisation and that modernisation will always pay off for the operator.

Michael Beckmann and Mikko Hupa, both professors at the German Technical University of Dresden and the Finnish university Åbo Akademi respectively, completed the sales conference agenda.

In their speeches they talked about development trends in power plant engineering and the latest findings in the area of ash analysis with a focus on ash generated from biomass.

## ✦ Clyde Bergemann Power Group's new campaign takes off into 2009



The destination is neither New York, London nor Shanghai - Clyde Bergemann Power Group (CBPG) is heading for Boiler Efficiency, Air Pollution Control, Materials Handling, Energy Recovery and Vacuum Belt Filter. All these terms stand for the five product units CBPG combines on its charter.

The Group's new image ad reflects this broad solution know-how with a wink. Similarly with a typical airport departure board, the names of the five product units are listed as destinations, all ready for boarding.

New Clyde Bergemann Power Group image ad

## ✦ Events Diary

APRIL	MAY	JUNE
<b>African Power &amp; Electricity Congress</b> 21st - 24th April 2009 Johannesburg, South Africa	<b>Electric Power Conference &amp; Exhibition</b> 12th - 14th May 2009 Chicago-IL, USA	<b>Heat Exchanger Fouling &amp; Cleaning</b> 14th - 19th June 2009 Schlading, Austria
<b>Russia Power</b> 28th - 30th April 2009 Moscow, Russia	<b>NAWTEC</b> 18th - 20th May 2009 Chantilly-VA, USA	<b>Clyde Bergemann Boiler Cleaning Symposium</b> 23rd - 24th June 2009 Atlanta-GA, USA
<b>VGB "Power Plants in Competition"</b> 29th - 30th April 2009 Prague, Czech Republic	<b>POWER-GEN Europe</b> 26th - 28th May 2009 Cologne, Germany	

**Editorial**

Publisher:

**Clyde Bergemann Power Group Inc.**

News Editors:

**Gillian Aird**

Clyde Bergemann Ltd, Scotland  
 eMail: gaird@clydebergemann.co.uk

**Sonja Mayer**

Clyde Bergemann GmbH, Germany  
 eMail: smayer@cbw.de

Printing:

**Strachan Office & Print Supplies**

Glasgow, UK