Low emission & fuel flexible biomass furnace

Dall Energy has developed a new, disruptive biomass gasification and combustion system. It reduces dust and particle emissions by more than 95%, it easily meets the demands in the new emission directives, and it offer a whole new set of other benefits:

- Lower investment: Simpler design with very few moving parts)
- Lower maintenance costs: No technical difficulties and low power consumption
- Very wide load window: Fast and easy modulation between 10 and 100% load
- Reduction of fuel cost: The technology is very fuel flexible, enabling conversion of a wide range of low-value fuels such as wet and dry biomass, organic waste streams, willow and pellets in the same furnace.

www.dallenergy.com
Sønderborg district heating company built a 9 MW Dall Energy Biomass system in 2014. The plant is operating unmanned and provides Sønderborg with clean CO2-neutral energy.

The biomass plant integrates several innovations of the Dall Energy Biomass concept:
- No particulate filter, because of extremely low dust lost from Biomass furnace.
- Two stage gas combustion for low NOx
- Two stage flue gas condensor for high efficiency

Technical specifications
- Thermal power: 9 MW
- Biomass fuel: Wood chips, wood wastes
- Efficiency: 115% (LHV)
- Turn down ratio: 1:10
- Dust < 20 mg/Nm3
- CO < 5 mg/Nm3
- NOx < 180 mg/Nm3
State of the art waste-to-energy plant with a ski slope on the roof

Copenhagen’s state of the art waste-to-energy plant sets new standards for environmental performance, energy production and waste treatment. Innovative technology and architecture integrate to form a future in which waste-to-energy plants are welcomed in any backyard. In 2018, Copenhageners and visitors will witness a waste-to-energy plant that is not only one of the best performing European plants in terms of energy efficiency, waste treatment capacity, and environmental consideration, but also in terms of visual rendition and local acceptance.

Quick facts on Copenhill
- Treats around 400,000 tonnes of waste annually produced by 500,000 – 700,000 inhabitants and at least 46,000 companies.
- Supplies a minimum of 50,000 households with electricity and 120,000 households with district heating.
- Recent tests at the ARC DynaGrate® demonstrated a burnout rate at 99% which places the grate as one of the best in the world.

www.volund.dk
Shenzhen, China – One of the world’s largest waste treatment facilities to date

The 165 MWe plant is among the world’s largest, and is scheduled to be completed in 2019. Once online, it will combust up to 5,600 tonnes of municipal waste per day, approximately one-third of the waste generated by Shenzhen’s 20 million inhabitants every year.

Quick facts
- First plant in China to use B&W Vølund’s DynaGrate® technology – B&W Vølund produced six DynaGrate’s to the plant
- The Shenzhen plant’s circular building is designed by Danish architects Schmidt Hammer Lassen and Gottlieb Paludan.
- The plant is expected to be an important showcase of the most advanced technology for environmentally friendly energy production in China.

www.volund.dk
Cost neutral refurbishment of Hvidovre Hospital

Energy Performance Contracting project at Hvidovre Hospital
This EPC project covers Hvidovre Hospital's entire area of 240,000 m². The project scope is €22 million with a simple payback of 10 years.
As significant energy savings match the total investment, the complete refurbishment is cost neutral for the hospital.

Significant savings and improved indoor environment
Because of the refurbishment, Hvidovre Hospital saves 23% on electricity, 40% on heating, and 7% on water. Savings are primarily a result of:

- A new Building Management System to manage and optimize all technical installations.
- Installation of 15,000 LED light fixtures that are managed by daylight and room occupancy.
- 1,500 kW solar panels mounted on the roof.
Energy-efficient Cooling System for Musikkens Hus

DESMI has delivered and installed highly efficient pumps, pipes and wells for intake of water from the fiord for the cooling system of Musikkens Hus.

As part of the project, an intake well was mounted at quayside and connected to a pump well provided with two highly efficient centrifugal pumps.

The pumps are part of the DESMI NSLV centrifugal pump series which are characterised by:
- High efficiency
- Low NSPH values
- Easy installation
- Minimal need for maintenance

The pumps are placed in a poly-ethylen (PE) well, and the regular adjustment of the pump capacity is ensured by energy-efficient frequency converters installed in the central cooling system.

www.desmi.com
High Efficiency & Big Savings at AffaldVarme Aarhus

DESMI has among others delivered a NSLH pump to AffaldVarme Aarhus. The pump was chosen on the basis of these parameters:

- High efficiency and thus better operating economy due to the internal coating.
- Easy access for maintenance as the pump is mounted on the motor, which means that there are no other bearings than the ones in the motor.

AffaldVarme Aarhus is responsible for the transmission system including running and maintenance of the main transmission system:

“We are pleased that the DESMI NSLH pump helps securing the district heating supply in Aarhus, and based on a saving of not less than 224,000 kWh per year compared to the previously used pump, the enthusiasm is big and the investment in the pump quickly breaks even”.

www.desmi.com
11 new houses with intelligent walls

In Ringsted you can find one of the initial 11 energy efficient houses build with Rockzero wall concept from ROCKWOOL.

Rockzero is a new and revolutionizing way to build homes with natural stone wool in both the construction and isolation part of the outer wall. It is produced in natural materials and meets the requirements of nearly Zero Energy Buildings. Moreover, it gives you a comfortable and safe indoor climate by minimising cold bridges, and securing good acoustics and fire safety.

Rockzero is one of our contributions to the effort of taking better care of the environment. – and it saves a family 20 % on heating.
62 sustainable homes for students, refugees and families

Roskilde Nord housing association is building new homes for students, refugees and families together with ROCKWOOL and the municipality of Roskilde. The project is called Tunet.

The vision is to create a special housing area with a strong focus on nature, community and, to a certain extent, self-sufficiency. Tunet is planned as a sustainable living area with a low energy construction and focus on circularity, making Rockzero a perfect match.

Rockzero is used as a construction and isolation solution in the outer walls and between the apartments. It secures more m2 due to thinner walls, and design freedom for the architect. Moreover, Rockzero guarantees a fungus-free and healthy indoor climate with good acoustics and fire safety.

www.rockwool.dk
LOGSTOR Detect – intelligent surveillance

AffaldVarme Aarhus
AffaldVarme Aarhus is a vital piece in the environmental objectives of the Danish municipality, Aarhus. In order to prolong the service life of the district heating network, they decided to monitor the pipelines 24/7 from a central unit - now with a new possibility to make systematic maintenance and renovation of the pipes.

This approach increases the service life of the DH pipe systems to beyond 30 years. By using LOGSTOR’s intelligent system, AffaldVarme Aarhus expects to implement a systematized surveillance in all of their pipe systems within a few years, thereby further improving their Total Cost of Ownership.

The advantages of the surveillance tool
- Any damage is detected before it may have major consequences
- Repair costs are minimized
- The service life of the pipe system is prolonged
- Safe heat supply

www.logstor.com
Heat recovery from sintering tunnel ovens

During sintering in the tunnel oven, large amounts of heat are released in the form of flue gasses, and precisely this heat is what FJ Industries, along with exodraft, saw an opportunity to reuse.

By reusing waste heat from flue gasses, FJ Industries could reduce their CO2 emissions significantly – while also reducing their energy costs considerably.

The heat recovery solution provided by exodraft converts the hot flue gasses into hot water which is subsequently used to heat FJ Industries’ premises and warm up bathwater and water for general purposes.
Heat recovery from aerosal can production

Since October 2016, German based G. Staehle GmbH has been heating their 7,500m² warehouse with a flue gas heat recovery system from exodraft.

A high degree of flexibility and communication guaranteed that the integration between the building and the production line through chimney and heat exchanger technologies could be realized in a timely manner.

While commissioning the new plant, it was soon clear that the performance data promised in the offer from exodraft had been completely met if not exceeded.
Silkeborg Forsyning relies on the sun

The World's largest solar heating installation
Silkeborg Forsyning, a gas fire power station, in 2016 built a giant solar heating system when converting the CHP plant. Solar heating is a proven technology with a solid history, and the solar yield now covers 20% of 11,000 customers’ heat demand. The CO2 emission was reduced by 15.7 tonnes a year, a first step towards the 2030 goal to achieve a CO2 neutral heat supply.

12,436 solar collectors (156,964 m² aperture are) are spread on a 50-hectare area and neutralized an expected heavy cost increase. Hence the citizens are protected against major increases of the heating bill.

www.arcon-sunmark.com
High energy efficiency – Methanol fuel cells

Danish Power Systems is producing HT PEM fuel cells (High Temperature Polymer Electrolyte Membrane). They produce electrical energy and heat using renewable fuels, preferably methanol, facilitating increased energy efficiency and virtually no pollution.

In collaboration with Danish SerEnergy and other companies, the fuel cells are assembled into stacks (systems) in order to power e.g. methanol vehicles, power generators and telecom towers.

Danish Power Systems has also established excellent R&D relationships with leading universities and companies worldwide bringing us closer to an expanding fuel cell market.

Danish Power Systems has received funding from the Danish Ministry of Energy for development of fuel cells.

www.daposy.dk
Climate-friendly combined heat and power station in Elsinore

Green transition and renovation
In the spring of 2017 Forsyning Helsingør had four new BROEN Ballomax® DN500 Trunnion valves with DBB outlet valves welded into the existing power station (all four valves are 150° C / PN25). Two BROEN Ballomax® valves function as main shut-off valves between the new biomass plant and the combined heat and power station. Two other BROEN Ballomax® valves with AUMA gear function as bypass valves, that can direct the supply pipe water from the biomass plant into the steam boiler for further heating, if the temperature is not sufficiently high, before it is circulated to the users. With a maximum flow capacity of 2,400m3/h, temperatures of up to 120° C and a pressure of up to 25 bar, it is important that the valves function correctly.
Sustainable and energy efficient Danish district heating solution

BROEN Ballomax® – designed to last
The plates of a large heat exchanger is where the heat is transferred to the outside circuit distributing heated water for the town and the connected local industrial plants. In a closed loop the water circulates back to the plant, where it is again heated up in the heat exchanger, distributed to the households and then the re-circulation continues – driven by the pump station of the heating plant. In the pump station the BROEN Ballomax® ball valves play an important role as reliable and efficient shut off valves for controlling the flow through the different pipelines, where a valuable stream of hot water supplies the town of Aabybro with hot water. Giant amounts of water push through the components every day and long lasting reliability is required for any opening and closing mechanism.

www.broen.dk
Pioneering city-wide sustainability planning

The City of Cambridge, Massachusetts in the USA engaged Ramboll to develop a low carbon energy supply masterplan identifying how it can transition its energy supply toward low- or zero-carbon sources. Ramboll’s study shows that electrification of buildings with grid-supplied electricity can play a central role, but achieving acceptable levels of cost and environmental efficiency necessitates the introduction of district energy systems in areas of high energy demand. Achieving a future low carbon energy supply for Cambridge must be considered in the context of a regional clean energy transformation.
Assisting China in transforming the energy sector

The global leader of this trend is China where Ramboll has become the first foreign advisor to design the foundations for 100 turbines at SPIC Binhai North H2 Offshore Wind Farm in the Jiangsu province – and in 2017 foundations for the 75 turbines of SPIC Binhai South H3 offshore wind farm in the Yellow Sea. Ramboll has a market share of more than 60% of offshore wind foundations installed worldwide. The foundations have a bearing capacity capable of supporting turbines even in weak seabed soils – as is the case for Binhai North H2, which will be located 22 km off the coast in an area prone to earthquakes and soft soil conditions.