



Grant Renecke,
Combustion
Technology

Boiler Energy Efficiency

Considering the strict design codes that all boiler makers around the world have to adhere to, what really differentiates boiler manufacturers? In reality, quality, solid after-sales service, integrity and experience are a given, no matter whose door one knocks on. "SA Mechanical Engineer" caught up with Grant Renecke, managing director of Combustion Technology, to find out more.

Cape-based Combustion Technology, like most of its competitors, prides itself on its modern and highly efficient solutions. Specialising in oil and gas burners and boiler installations, conversions from

coal firing to natural gas firing, the company has offices in Cape Town and Johannesburg as well as an extensive dealer network servicing the rest of the country.

It is the exclusive boiler distributor for Bono Energia, IVAR and Unical Boilers, Limpsfield & Riello Burners and Autoflame Combustion Management Systems. Undoubtedly, a solid choice when choosing a boiler expert, but then again so are many other companies.

Combustion Technology, however, have the proverbial Ace up their sleeve. Their partner Limpsfield Engineering is the only company in the world to guarantee oxygen levels of sub 3% throughout the complete burner firing range.

Grant solidly believes in this capability to such an extent that he puts his money where his mouth is. "We give a written guarantee on a whole project that if we do not meet these very specific emissions standards, we reimburse," he says.

Carbon tax impact

While the environmental discussion has had a slower offtake in Africa than in the rest of the world, where reducing carbon emissions is a definite business imperative, the pending carbon tax is going to hit South Africa hard.

Energy efficiency has become the distinguishing factor but considering that manufacturers are only required to prove that their products conform to the maximum continuous rating (MCR), it begs the question, how many actually offer efficiency?

The premise of this move by the government is simple – to tax direct emissions associated with business activities. Practically it means any company emitting greenhouse gas will have to pay up and secondly, the cost of electricity will be higher.

Making a good quality boiler is no longer the differentiating factor. Paging through any given brochure will show that the world's manufacturers are all meeting the EN12953 and other codes promising efficiency of 90% plus which can be moved up a



Limpsfield burner

notch or two with an economizer.

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"This all sounds well and good but what is actually happening when you shift off that point?" Grant states. "No boiler in the world runs at MCR for any serious length of time. Delivering an efficiency of 90% plus is often just not the case."

Dramatic increase

Cost is a factor and natural gas not only delivers the efficiency, but it is also cheaper overall. Grant and his team have proven this time and time again. When ABInBev embarked on an aggressive programme to reduce its carbon emissions and subsequent carbon footprint by installing two new gas fired boilers and converting two existing coal fired boilers to natural gas fired, they called on the team at Combustion Technology.

The reduction in energy usage was extraordinary

while the coal boiler efficiency increased dramatically from around 70% to consistently running between 80 to 83% on natural gas. Production energy usage improved from between 175-154MJ/HI to 105-99MJ/HI on natural gas.

"Coal is often chosen based on an initial cost estimation, but with gas you are not only saving in terms of emissions, but on a number of other aspects including electrical power, labour, cleaning and maintenance," Grant highlights. "Gas, while it is more expensive per energy unit, brings an overall cost saving to a project."

With coal, at best, only using 70% of the energy compared with a gas-fired boiler where 90% energy use is guaranteed, less gas is also needed to deliver the same amount of energy.

Considering the sheer cost of running a boiler plant, savings are critical. "The solution is to ensure that the boiler works at continuous levels of efficiency, throughout the boiler and burner's firing range. The products and guarantee we offer is what differentiates us and saves our clients' money," Grant emphasizes.

He has determined that a company wasting between 3 and 5% of energy could in essence pay for a new boiler every five years regardless of its size. "Our customers who have opted for gas-fired boilers are seeing the rands and cents savings, but more importantly, they are reducing emissions which is fast becoming a critical element in the business environment.

Downstream benefits

"The downstream benefits of having better quality steam and improved reliability in their boiler operations also results in better overall plant productiv-

ity." At face value, one could argue that if the boiler is already 90% efficient how could it effectively be improved by any more than 10% unless Grant has developed a way of making energy perhaps?

"Not at all," he says. "All of this is linked to the downstream processes of a company and making sure that the boilers adapt and are set up correctly for particular processes. It is then a matter of ensuring that emissions stay within the limits set, thereby achieving practical efficiency."

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With gas offering very real fuel savings and considering that it stands a very good chance of being exempt from the carbon tax, it is the way of the future. "Ironically the biggest complaint about gas more often than not from companies is the price. The trick in all of this, however, is to reduce the energy consumption, reduce fuel usage by being more efficient which is exactly what we offer and which results in immediate cost reductions."

Watchful eye

In the automated world with clever machines that no longer require people to be in the boiler house, monitoring systems can be challenging. With much trust placed in automated systems, it is easy to forget that these are just machines after all.

Grant says boiler management services are critical in this modern-day environment providing much-needed monitoring which is vital to understand, in real-time, how any given boiler in a plant is performing.

"Who is checking on the boiler in an operation is an important question," he explains. "For optimum efficiency, you have to know what is going on in a boiler house 24/7. Our management systems provide the necessary data, monitoring fuel usage and emissions as well as all boiler and burner functions, water levels and temperature, and pressure for example."

Installing a management system brings further fuel bill savings to a company thanks to the ability of such a system to read O₂, CO and CO₂ emissions which enables the user to know immediately when fuel is being wasted but also to track where and when any problems arise. In addition, monitoring the changing ambient conditions, the varying CVs and the conditioning of fuel, are all critical factors in an efficient operation.

For Grant, however, it is about more than just having the products and technology available to service customers well. It's a commitment to deliver solutions that are real. "Energy efficiency cannot just happen on paper," he concludes. "It has to translate into the balance sheet of the business and we guarantee to do exactly that."

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