

AES places energy efficiency at the top of the menu in the food and beverage sector

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South Africa's food and beverage sector plays an important role in maintaining food security. Conversely, this energy-intensive industry is under considerable pressure from retailers and consumers alike, to absorb ever-growing input costs and help curb rapidly increasing food price inflation.

Associated Energy Services (AES), South Africa's leading operations and maintenance service provider to the steam and boiler sector, believes that it can help food and beverage sector manufacturers deal with their many challenges.

AES Commercial Director Dennis Williams sums up the sector's key production-related performance challenges in three words: efficiency, quality and reliability. Consequently - and as one of the country's largest users of thermal energy - Williams says the food and beverage industry needs an energy management ally.

"One of the idiosyncrasies of the food and beverage sector is that not only is thermal energy a key input in the beneficiation process, but this usually exceeds electricity requirements - by two or three times.

Electrical energy is dense and easy to use and - except during load shedding - is there whenever one needs it. But thermal energy has to be converted into a usable format on site. That is where AES comes in," he explains.

The complexities do not end there. The applications for energy in the food and beverage production sector are vast, and can include everything from spray drying coffee creamers to the heating of raw materials ahead of processing, as happens during beer production. One manufacturer may use steam for cooking and canning vegetables; while another - such as the dairy industry - uses it for pasteurising. Temperature control of work spaces and 'clean-in-place' (CIP) processes, which include cleaning and sanitation to meet stringent health and safety standards, are also important. This means reticulating steam throughout the food and beverage processing and production facility to operational areas.

To add to this, different manufacturers and product categories come with their own specific requirements which means creating bespoke solutions for individual clients.

Food for thought

At food processing and production facilities, AES is responsible for the whole chain of control, starting with selection and availability of the right fuel and continuing on to the actual generation of steam and its delivery to the processing plant.

Strong and longstanding relationships that depend on good communication and education - and include an on-the-ground understanding of exactly how a particular plant and business operates - are paramount in this process.

Williams says that proper design and planning of reticulation systems are crucial: "In older plants, AES often finds that, because of space and time constraints, processes are not ideally situated when it comes to energy supply - and may even include thermally active pipelines which are actually just dead-ends due to haphazard expansions over the years, reducing efficiencies," he advises.

Addressing such design and operational footprint inefficiencies and limitations needs to be done in partnership with the client.

While AES can generate a thermal energy carrier efficiently, it is down to the client to use it optimally. "We can generate the thermal carrier, but if the client wastes it – or uses it poorly in their production process - then they negate our efforts at the front-end. They will need more steam than necessary, and we will need to burn more fuel to provide it. That is why the partnership between AES and our clients is so pivotal, and why we strive to build a mutually beneficial understanding and synergy at all times," he explains.

Serving up solutions

Williams says that AES has a number of success stories in the food and beverage sector.

"AES took over operations at a large FMCG (fast-moving consumer goods) client's pilot facility, which was struggling with overall energy efficiency due to a lack of technical expertise and resulting challenges with the plant and equipment on site.

We guaranteed an improvement in the operating efficiency in the boiler house and a reduction in the use of heavy furnace oil. We put one of our own boilers on the site to bolster their capacity, installed further capacity to support their production, took over management of and trained their staff and implemented AES's operating practices and management systems," he recalls.

These combined efforts reduced fuel consumption and carbon footprint at the facility by an impressive 21%.

AES went on to operate a second - and larger - site for the same company where the situation was even more dire in terms of skills shortages.

“There, we delivered a 35% reduction in cost of fuel and carbon footprint. Over the years, that has enabled us to expand our footprint within the company to five sites.”

During this time, AES has reconfigured steam generation facilities, introduced changes to fuel and ash handling systems, addressed health and safety issues and improved the general reliability of the plants.

Although cost constraints remain a priority, Williams says that sustainability – especially for multinationals operating in South Africa – is becoming a big focus. The reduction of emissions and waste, the choice of environmentally-friendly or ‘green’ fuels such as biomass or natural gas and water-saving as priorities.

Frozen foods go ‘green’

On this point, AES recently assisted with an evaluation of conversion to natural gas by an internationally-owned frozen foods manufacturer, which had made commitments to reduce the carbon footprint of its South African facilities.

“Our involvement extended from specification of a suitable boiler for the gas burner systems, site location, reticulation of the gas pipeline and engaging with gas vendors regarding price and availability of fuel,” Williams says.

An ongoing project at a much larger sister plant began with identifying a sustainable and cost effective biomass route. The AES team has travelled to Europe and South America, reviewing over 15 fuel and technology options in detail. Risk and fuel supply assessments culminated in a preliminary roll-out plan.

When it comes to saving water, Williams says that managing condensate, an inevitable by-product of the process, is “the low hanging fruit”.

“Even in instances where it has a much lower temperature, that condensate still has value. We can include this with any make-up water that goes back into the boilers and reduce water, fuel and chemical consumption for treatment purposes,” he notes.

Future-proofed energy and food processing

Change in the food and beverage processing and production industry requires ongoing and constant engagement with clients, Williams maintains.

“We walk through the reticulation process. We do thermal imaging and talk to them about whether or not steam traps are functioning correctly, make recommendations about things like reticulation

dead-ends and where they can be isolated. Strategic input includes conducting a high-level energy audit - which provide very high-level cost impacts,” he says.

Then comes the innovation component, as demonstrated during a recent project: “We operate a biomass boiler with an economiser (or heat exchanger). Hot flue gas coming out of the boiler passes through this before it goes up the stack. We now circulate water going into the boiler through that heat exchanger to heat it - which reduces fuel usage.”

Williams believes that most food and beverage manufacturers are aware of the need to maximise efficiency and ensure that operations are sustainable. Although there are many high-tech operations in South Africa’s food and beverage sector, there are even more that have to continue to do the best they can with what they have.

However, small changes can have a large impact.

“AES’s role is to help optimise expansions and improvements to existing food and beverage production processes. It is very much a supportive, synergistic partnership. Together, we can make these companies more competitive in the market place both locally and internationally,” Williams concludes.

Ends

(1285 words)

Note to Editors:

AES is a pioneering, innovative, reliable and experienced steam and boiler operations and maintenance (O & M) service provider. The company has been in existence for over 25 years and is widely regarded as the leading O & M provider in steam and boiler operations and maintenance service in South Africa. Target industry sectors include power generation, chemical, plastics and rubber, timber, pulp and paper, textiles, food and beverage, dairy, poultry and mining.

AES’s purpose is to assist industrial plants to optimise their energy production processes, and achieve energy usage best practices, through the following offerings: the mitigation of risk and the reduction of plant downtime; the procurement of efficient fuel combustion; assistance with the care of assets over the plant’s lifetime; diversification of the plant’s energy resources; improvement in site operations; and a reduction in carbon footprint.

AES subscribes to the highest ethics and operates according to high safety standards, process excellence and product and service innovation, exhibiting a commitment to quality, technology

advancement and the development of human capital. AES invests heavily in training and the promotion of talented people on an equal opportunity basis into the industrial operations environment. The company believes that making a positive difference to communities and the environment is the best way to ensure that everyone benefits from good work.

AES is ISO 9001, 14001 and 45001-certified, ensuring that the company maintains a focus on achieving, benchmarking and optimising its processes and activities.

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