

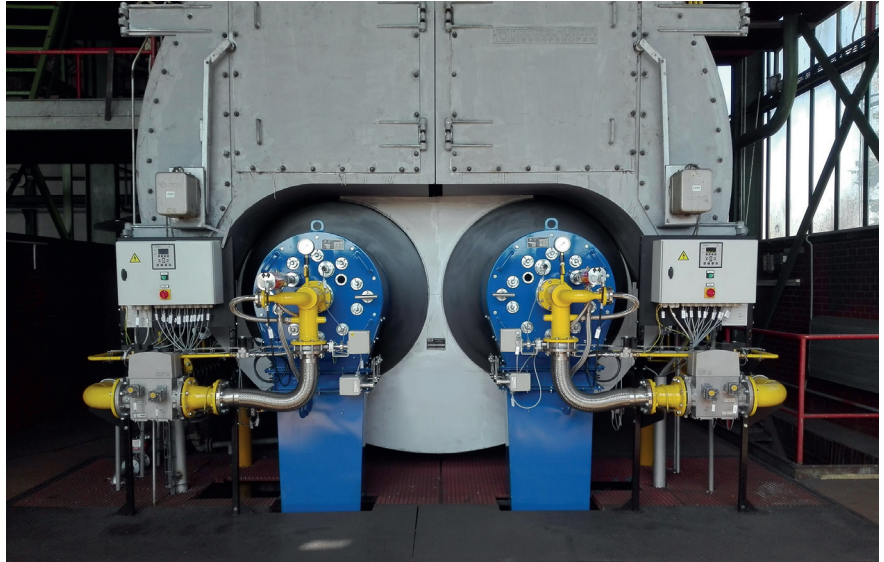
A “Natural” Choice for Energy Production

The push towards a greener path of energy production is becoming more and more prevalent across many countries within the European Union and around the world. Environmental regulations and reduced emission requirements, with many including deadlines for switching to a more sustainable and environmentally friendly fuel, are increasingly putting pressure on energy generation plants to make changes in their production processes.

Many of these measures are aimed squarely at the greening of existing coal or oil boilers, which produce steam for energy production. The preferred replacement fuel of choice is natural gas, as its CO₂ emissions during combustion are 50 % less than coal. This significantly reduces the cost of emission allowances.

Two paths to green

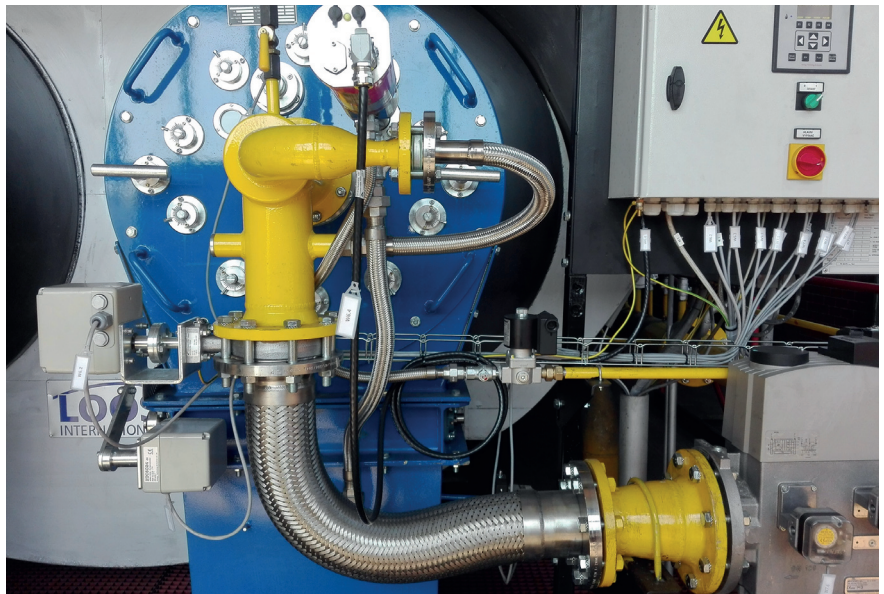
When making the change to natural gas, there are two methods that can be employed. The first is to completely replace the plant that uses coal or oil as fuel with a new natural gas-fired combined-cycle (NGCC) plant. This method requires a very large investment and takes an extended period of time to complete. In addition, the decommissioned plant would then be an asset that no longer provides value and could become a liability over time (remaining fuel on site, security, maintenance, etc.).



Front view of a 15 MW gas boiler



Detail of the burner



Close-up of natural gas connections

The second method is to convert a current boiler, such as a coal-fired boiler, to natural gas. This method is far less expensive and not as time intensive as building, equipping and putting a completely new NGCC plant into operation. As many coal-fired boilers currently in use are older units with dated technology, which means they are less efficient and more costly to operate than modern natural gas boilers, this conversion could be a good option for many energy generation plants. It's interesting to note that along with their efficiency, natural gas boilers also provide far better dynamic parameters - quicker start up speeds, more flexible output performance changes

and a wider control range - thereby keeping the same max power output but allowing for lower min. power output.

Making the switch to natural gas

If you're considering conversion to natural gas, there are a few things to keep in mind. The first is what type of boiler you currently have in your plant. The most technologically and economically suitable boilers for conversion to natural gas are those that use oil and coal granulation as fuel. But don't worry if this is not your case. Grate and fluidized boilers can also be adapted for separate combustion of natural gas, although the transition is a little

more involved and less economically advantageous.

It's also important to note that even when using cleaner burning natural gas as fuel, emissions of NO_x and CO remain and will be an important area to address. The installation of low-emission burners is usually adequate to keep emissions of these gases low, although some cases could require additional primary measures, such as flue gas recirculation.

While on the subject of emissions, a distinct advantage to mention is that the switch to natural gas does not require the installation of a desulfurization unit (FGD) unit. Dust (suspended particulate matter) filters, electrostatic

precipitators or fabric filters (depending on each case) would also no longer play an important role in the new combustion process and can be removed without suffering any negative consequences.

If one considers the operational and up-keeps costs associated with the removal of these two components, the switch to natural gas becomes a more financially viable option to go along with the positive effect on the environment.

Simplified Operations

When viewed from an operational point of view, the switch to natural gas greatly simplifies the technology needed for boilers and boiler rooms. An example would be the reduction of technology and processes associated with the supply and transport of coal for fueling coal-fired boilers. With the absence of coal, the grinding, removal of slag and ash, and transport/disposal of combustion by-products are effectively eliminated.

Adding up to a net positive effect

If all of the previous points are taken together, conversion to a gas-fired boiler requires



Detail of the burner with the supply of natural gas to the burner

make the change. But wait, an extremely important consideration, and make or break point in this conversion, is the availability of a natural gas pipeline near your factory with a capacity that can satisfy your needs. Remember that having a connection to a natural gas pipeline is

transitioning to natural gas or even other gas fuels, such as coke oven gas, blast furnace gas or a combination of several gas fuel options.

For many power plants, turnkey solutions are preferred, as they make the transition process quick and painless. When making an enquiry about natural gas boiler conversion, ask the engineering company about their know-how and experience. It's important for them to be highly experienced in carrying out complete engineering work that involves performing an initial feasibility study, processing thermal calculations of boilers, designing low-emission gas burners (type, number, power output and location) and processing complete detailed engineering of boiler reconstruction, which also includes complete gas connection piping and the gas reduction station.

You should be confident that the company you choose is able to realize all technical parameters and provide a reliable, efficient and long-term solution.

A cleaner and more profitable future

Conversion to natural gas boilers is a trend that is becoming increasingly necessary, and viable, for energy generation plants across the



Drying tubes of a coal-fired boiler

a very small investment compared to the greening of a boiler, which maintains the use of existing solid fuel. Advantages gained after conversion include reduced operational and maintenance costs, greater efficiency and quicker start-up speeds of the boiler from both a cold and warm state. With quicker start-ups of the boiler, it essentially becomes a "first choice" source of energy production that is capable of responding more quickly to dynamic changes in output.

Where's the gas?

You may now be thinking conversion to natural gas is a good idea and you're ready to

not enough. It is also necessary to ensure that this pipeline will provide a consistent, reliable and cost efficient supply of natural gas for the long-term. Support of the pipeline by the national government and local infrastructure plays an important role in its on-going viability for the future.

Choosing the right partner for conversion

Before deciding on a partner for conversion to a natural gas boiler, you should ensure they are experienced engineers in the field of power generation. It is important for them to competently assess your existing boiler and propose the most effective and efficient measures for



Placement of burners on three floors of a boiler with an output of 110 MW

world. In the end, it will not only have a positive impact on the environment, but also provide energy generation plants with higher efficiency, reduced operational costs and increased control range. It's a definite win-win situation for all sides going forward.

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