Harness the power of residual heat

Air-cooled dump condensers developed by **Bronswerk Heat Transfer** – a market leader in the design, engineering and production of complete heat-transfer products and processes – facilitate electricity generation using the residual heat from power stations, saving businesses money and mitigating their environmental impact.

A staggering amount of residual heat is released worldwide by electricity power stations, with 1kW of produced electricity resulting in nearly 2kW of residual heat. Reusing the residual heat in the power station itself is usually considered impractical, resulting in significant discharges into the environment.

An innovative solution proposed by Bronswerk Heat Transfer is to encourage the use of residual heat of nearby or relocated businesses that use combined heat and power (CHP), CHP processes or for-district heating.

To be effective for these applications, the output temperature level should be increased or upgraded. Though this results in a somewhat lower electric efficiency, the total efficiency and the economy of the power station is improved significantly, thus reducing the environmental load.

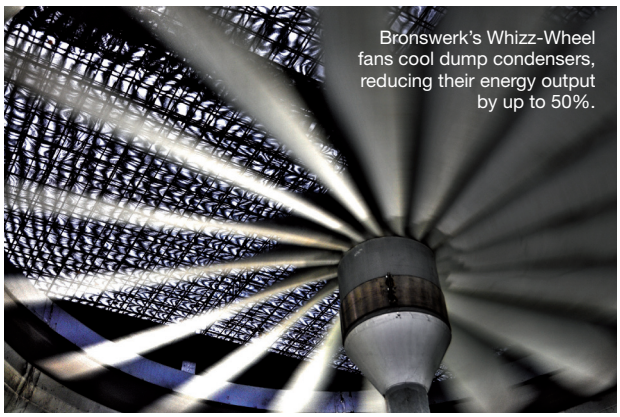
This CHP coupling needs a special modification to ensure operational flexibility and safeguarding because it is practically impossible to store or modify the residual heat flow. On the one hand the heat flow should always be readily available, while on the other it should be discharged swiftly into the atmosphere, when, for whatever reason, the neighbouring process cannot use the heat.

This function can best be executed by a special air-cooled dump condenser developed and successfully implemented by Bronswerk. It employs an innovative control and safety system that makes it eminently suitable for this crucial application. When the neighbouring process suddenly stops and heat cannot be absorbed momentarily, the dump condenser switches from standby to full capacity very rapidly, keeping the coupled systems reliable and sturdy.

In paper mills, for example, the steam consumption must be stopped immediately when the paper line breaks; steam then has to be liquefied instantly by the dump condenser. If these dump condensers are cooled by Bronswerk's Whizz-Wheel fans, they consume less than 50% of the energy of conventional fans – a tremendous energy and cost saving.

Removing pollutants from flue gases

Flue gases resulting from the incineration of diverse waste streams may contain substances that cannot be discharged. Therefore, removing pollutants from flue gases is an essential part of the process in an incineration plant. These gases require very special, expensive and rare materials so that the boilers can produce super-heat temperatures. Lower steam temperatures would reduce the efficiency of the steam turbines, resulting in lower electrical power from the same waste stream.



Bronswerk's Whizz-Wheel fans cool dump condensers, reducing their energy output by up to 50%.

A way to overcome this reduced efficiency is to reheat the low-temperature steam leaving the high-pressure section of the steam turbine. The superheated low-pressure steam then ensures that the turbine as a whole runs efficiently.

High-efficiency power generation for waste incineration is ensured by the reheater unit. Here, condensate in the low-pressure steam is separated and removed, and the dry low-pressure steam is reheated using high-pressure steam.

The unit that Bronswerk has developed for this application has been described by a client as "an extremely inventive system, including a condensate separator and a hot well, with interconnecting piping and a measuring and control system". If all waste incineration plants were designed with a compact, reliable and rigid reheater unit such as this, the electricity generated from waste would increase enormously.

Bronswerk is able to supply tailor-made novel designs for extremely complicated thermodynamic processes relating to residual heat challenges, resulting in dramatically improved efficiency, reliability and, above all, much improved operational economy for power stations. ■

Further information
Bronswerk Heat Transfer
www.bronswerk.com