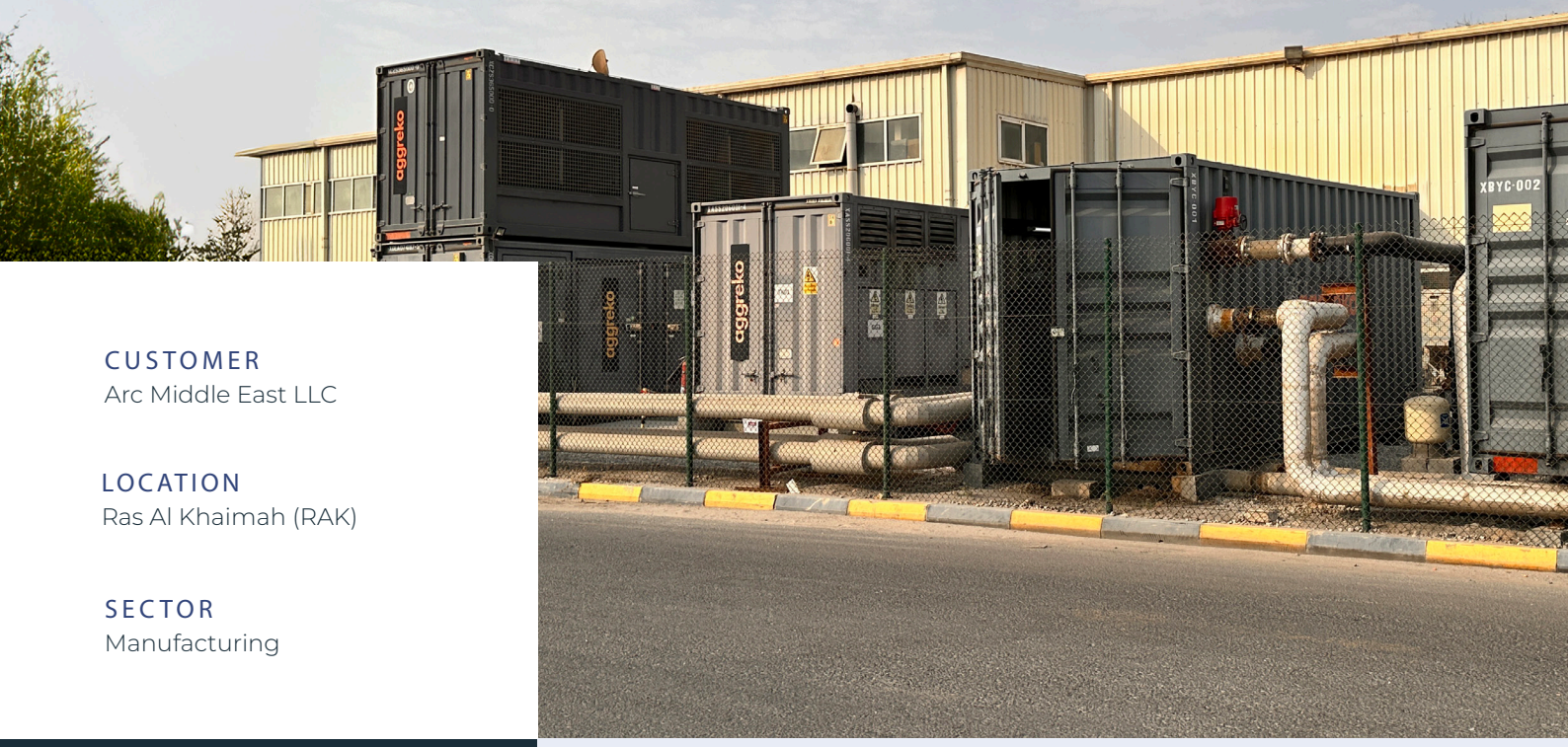
Turning waste into value: waste heat recovery solution powers cost-effective, sustainable cooling



CUSTOMER
Arc Middle East LLC

LOCATION
Ras Al Khaimah (RAK)

SECTOR
Manufacturing

KEY FACTS

Significantly
Reduced total cost of energy (TCoE)

Waste heat recovery skid
Assembled above generators to channel waste heat

4x 1.5 MW generators
Efficient and reliable power

THE CHALLENGE

Enhancing the client's energy cost efficiency by optimising their Total Cost of Energy (TCoE).

A ceramic manufacturer in Ras Al Khaimah encountered the dual challenge of reducing energy costs and supporting environmental sustainability. With fluctuating and often high fuel prices, the need for a cost-effective power generation solution became critical. The existing dependence on grid power presented a financial burden, particularly as grid prices continued to escalate.

The challenge was to identify and implement an energy solution that would lower the plant's Total Cost of Energy (TCoE) while remaining competitive with current grid power pricing. Beyond cost savings, the client sought to meet strict carbon reduction targets, underscoring their commitment to sustainability. The solution had to be both cost-effective and environmentally aligned, requiring a thorough analysis and strategy to optimise energy use, consider alternative technologies, and improve plant efficiency.

THE SOLUTION

Implementing a waste heat recovery skid and absorption chiller plant to maximise efficiency

Aggreko intervened to tackle these challenges by deploying a state-of-the-art power generation system featuring four 1.5 MW engines. These engines were selected for their reliability and efficiency in generating power for the manufacturing plant.

However, a considerable amount of energy from the fuel combusted by these engines is typically lost as exhaust heat and in the cooling system—a common inefficiency in many industrial settings. Acknowledging this, Aggreko devised an innovative solution: an absorption chiller plant designed to capture and convert this wasted heat.

The heat recovery system comprised of:

- **Waste Heat Recovery Skid:** Assembled above the generators to efficiently channel cooling system waste heat.
- **Insulated Pipe Work:** To transport the recovered heat to nearby absorption chillers.
- **Absorption Chiller Installation:** These chillers utilise the captured heat to produce chilled water, which is then used for process cooling within the plant.

This integration of waste heat recovery with the power generation system provided a dual benefit: efficient power generation and an effective cooling solution without additional energy input.

OUR DIFFERENCE

We help the utility industry meet their decarbonisation goals with customised energy solutions

THE IMPACT

Reducing reliance, operational costs and carbon footprint whilst optimising power supply

By converting waste heat into a resource for chilled water production, Aggreko enabled the ceramic manufacturing plant to significantly reduce its operational costs and carbon footprint. The chilled water generated by the absorption chiller meets the plant's process cooling needs, effectively turning what would be wasted energy into a valuable resource.

Key impacts include:

- **Cost Savings:** Reduced reliance on grid power and lower energy expenses due to self-generated power and cooling.
- **Sustainability:** Minimised carbon emissions, supporting the plant's environmental objectives.