

COMBINED HEAT AND POWER (CHP) FOR FOOD AND DRINK PROCESSING.

Cutting costs for meat processing plants.

Looking to cut down on your energy bills?
Have a look at our guide to how CHP can boost
the efficiency of your meat processing plant.

BUILT FOR IT.



What is CHP?

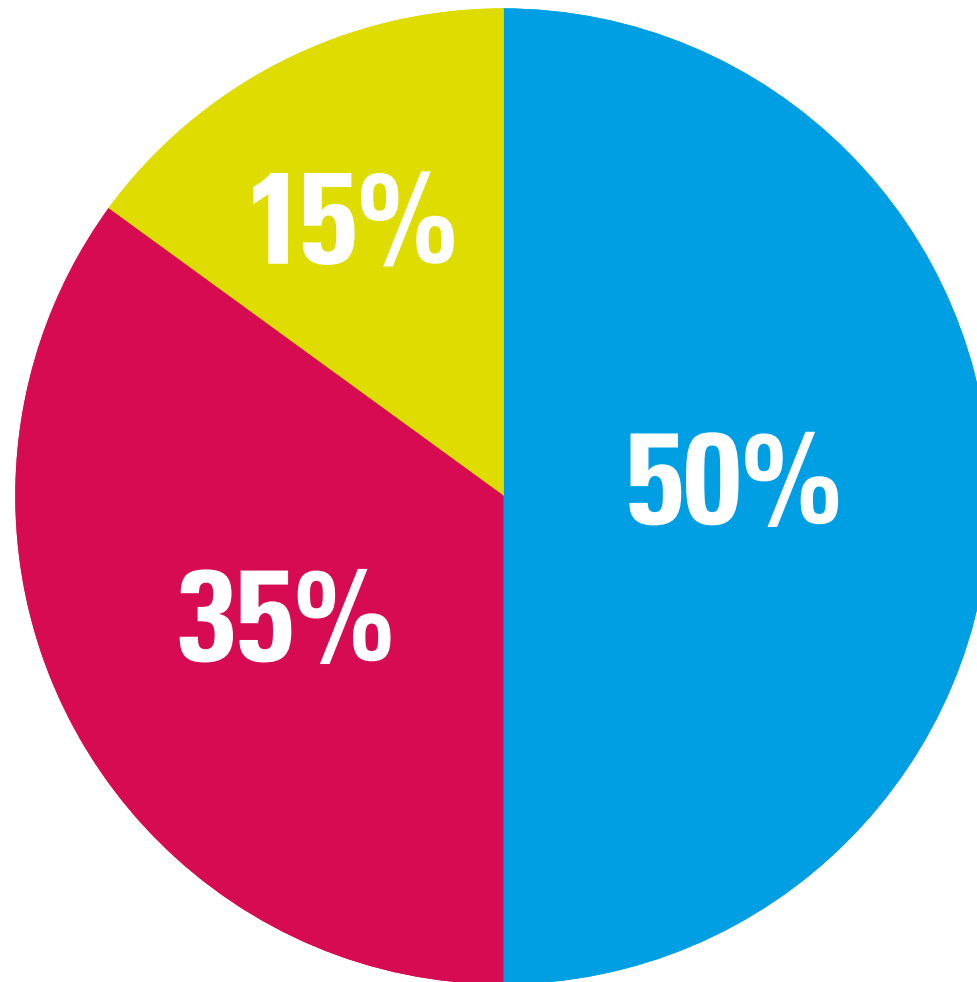
CHP stands for Combined Heat and Power and is sometimes known as cogeneration. It involves generating electricity while capturing the huge amounts of heat that is wasted in conventional power plants.

By taking advantage of this waste heat, CHP plants can reach efficiencies of more than 80%, while coal- and gas-fired plants struggle to achieve more than 40%.

FACT – There are well over 2,000 CHP schemes installed in the UK, with the capacity to generate 6,170MWe of electricity and 22,225MWth of heat.

FACT – The average efficiency of UK CHP schemes is 70%

Typical meat plant energy use



Steam and hot water Refrigeration Electricity

Processing demands

Between processing, refrigeration, hot water and steam, the meat industry consumes huge amounts of energy each year.

For many meat plants energy represents the fourth highest operational cost, after raw materials, waste disposal and labour. This means it is one of the key factors that determine competitive advantage.^[1]

Electricity is generally used to provide refrigeration and compressed air, as well as run lighting, ventilation and all the processing equipment, such as saws, hoists, and packing machines.

Hot water and steam are needed in sterilisation and cleaning, as well as scalding, heating and processing by-products.

The exact demands will vary from site to site as well as what a site is producing.

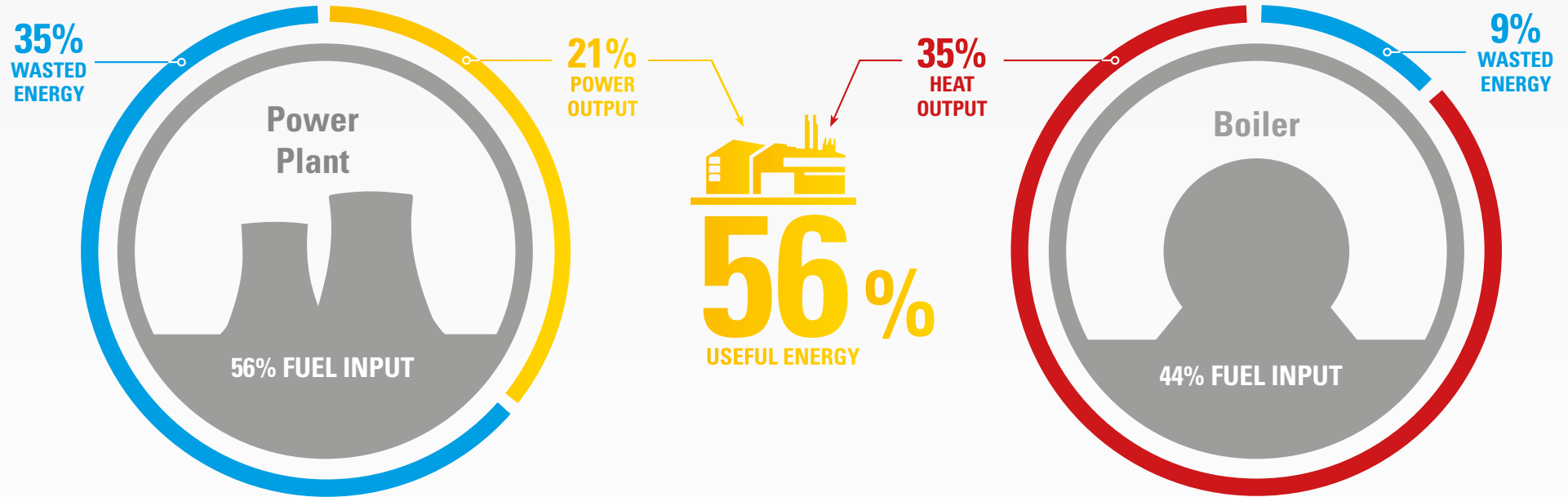
Pig plants, for example, may use as much as 80% of their energy to generate heat and hot water, compared to only around 30-50% in a sheep or cattle abattoir^[1].

Even so, on average it takes about 775 kWh of energy to produce a tonne of retail-ready beef and 685 kWh per tonne of sheep meat. Sites that carry out rendering operations also consume as much as a 50% more hot water and steam, though as they can share this with the main processing plant it is more efficient than carrying out the rendering separately.

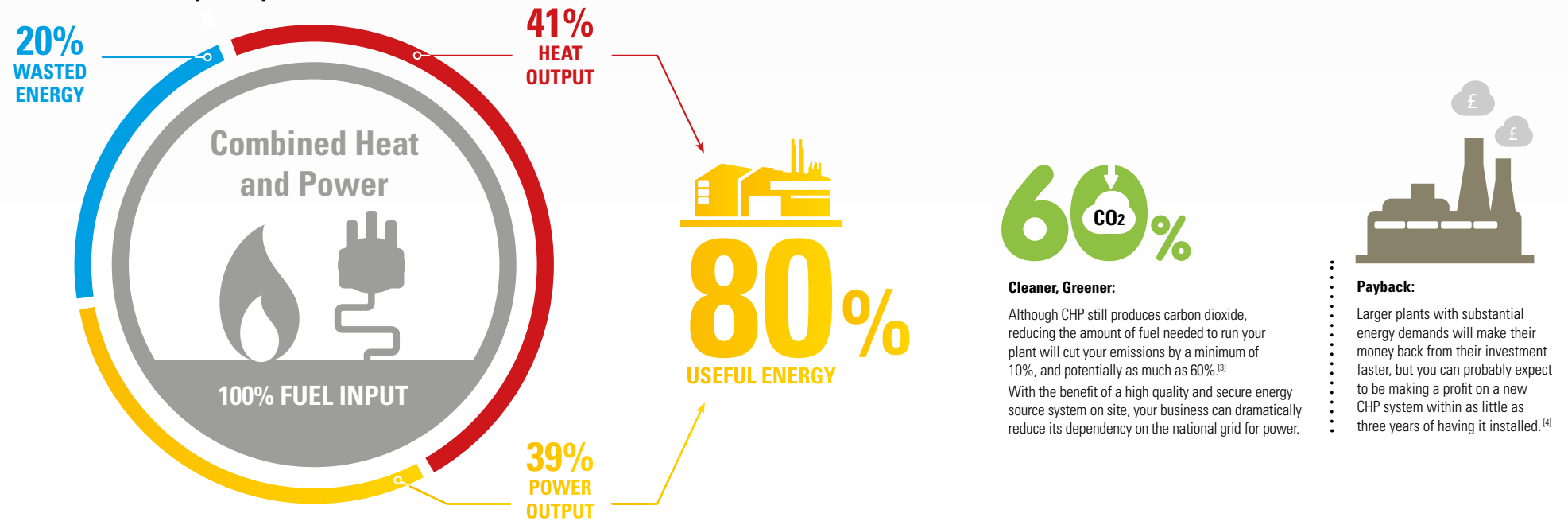
This high, regular demand for both heating and power make the meat industry an ideal candidate to take advantage of CHP.

Output for CHP compared to conventional power plants

Conventional boiler power plant



Combined heat and power plant



Trigeneration:

As well as producing heat, CHP technology can also provide extremely efficient cooling through a process known as Trigeneration, or Combined Cooling.

This can eliminate the need to run energy-intensive electrical refrigeration systems, which can take up as much as 30% of the power used in a processing plant^[2].

The exact savings this can offer will depend on several factors, such as the size of the operation and the products being processed. Sites preparing meat for export, for example, need more cooling and as such are better positioned to take advantage of trigeneration.

How do I know if CHP is right for my meat processing plant?

1. Know your annual heat and power requirements

One of the best ways to do this is to carry out a full energy audit. Since processing plants usually run for long, regular periods the demand for both heat and power is high and steady - perfect conditions for running an efficient CHP system.

2. Work out how much you currently pay for both heat and electricity generation

Knowing your billing figures will allow you or a consultant to put together a precise cost comparison for different CHP systems.

3. Determine what size system you need

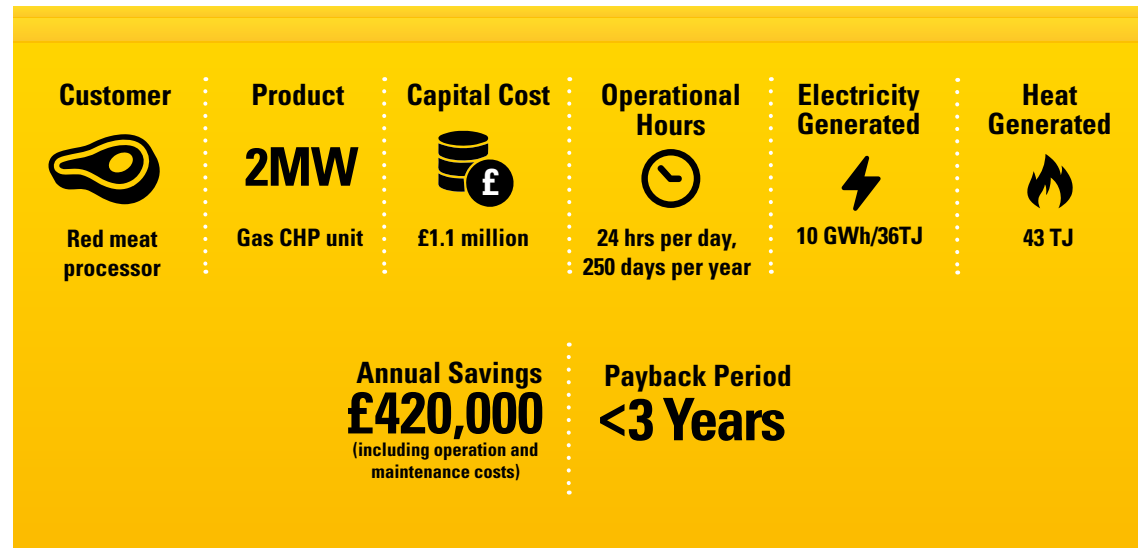
In most sectors that have constant, steady demand it is advised that CHP systems be sized to only provide the baseline heat. Otherwise you risk producing more heat than is needed, reducing the system's efficiency.

4. Contact a reputable supplier

CHP systems are a major investment and so working with a skilled, experienced supplier is vital. The cheapest solution to buy up-front may not necessarily be the cheapest to run for an extended period, and it's important that you secure an operations and maintenance contract at the time of installation.



Industry example:^[5]



About Finning:

Finning has a global reputation for developing CHP solutions that are durable, economic and reliable.

As well as providing high-quality systems and maintenance contracts, we offer a free feasibility service assessment to help you determine if the technology is right for you. To take advantage of this offer, visit <http://www.finningpower.co.uk/applications/chp/assessment.aspx>

References

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[2] Energy Consumption Guide for Small to Medium Red Meat Processing Facilities, Australian Meat Processor Corporation
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[3] The CHPQA Standard Issue 5, the Department of Energy and Climate Change
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[4] Why Use CHP? The Local Government Association
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[5] Red Meat Processing Industry Energy Efficiency Manual, Australian Meat Processor Corporation
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