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

Cutting costs for bakeries.

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

BUILT FOR IT.

What is CHP?

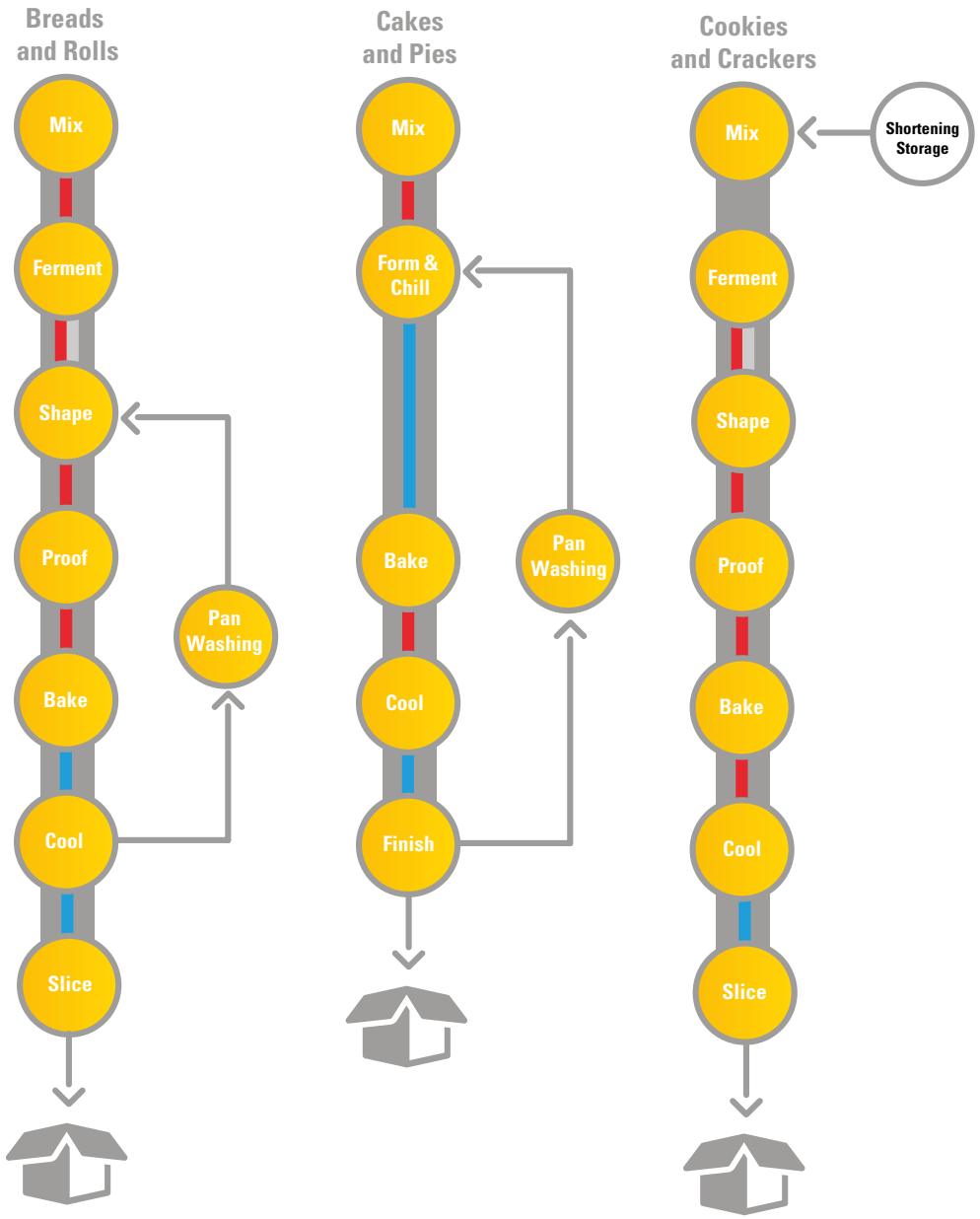
CHP stands for Combined Heat and Power and is sometimes known as cogeneration. It involves generating electricity while capturing the huge amounts of heat that is wasted in conventional power plants.

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%*

Bakery product production processes



Processing demands

Every single year industrial bakeries in the UK produce around 2.5m tonnes of baked goods. In the process they consume 2,000 GWh of energy and emit 570,000 tonnes of CO_2[1].

The baking process naturally uses huge amounts of heat and, in the case of cookie and cracker production, consumes as much as 78% of the total energy inputted[2]. Beyond this, the fermenting and proving processes also requires large quantities of steam. Pan and equipment washing alone consumes significant amounts of steam and hot water.

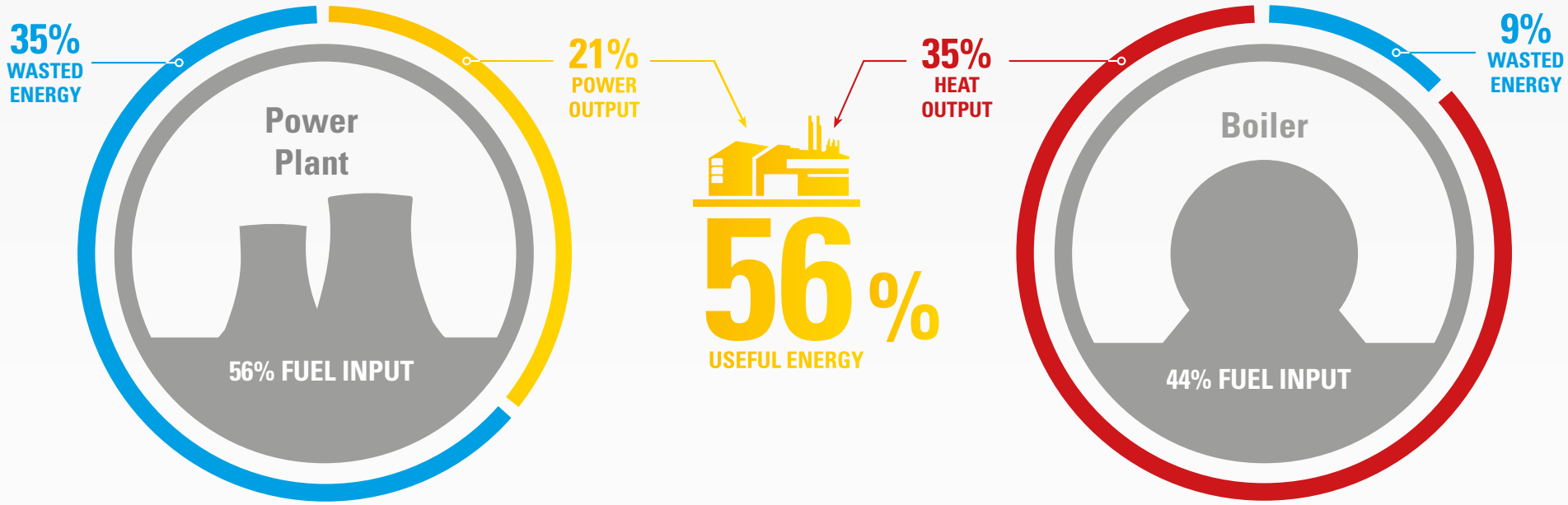
While bakeries will generally use much less electricity than heat, they still rely on this energy to provide refrigeration and compressed air, as well running lighting, ventilation and all the processing equipment, such as mixers and packaging equipment[1].

The exact demands will vary from site to site as well as what the plant is producing. A bakery making cakes, for example, will use more electricity in the mixing and finishing process than one that simply bakes bread and requires large amounts of heat and steam.

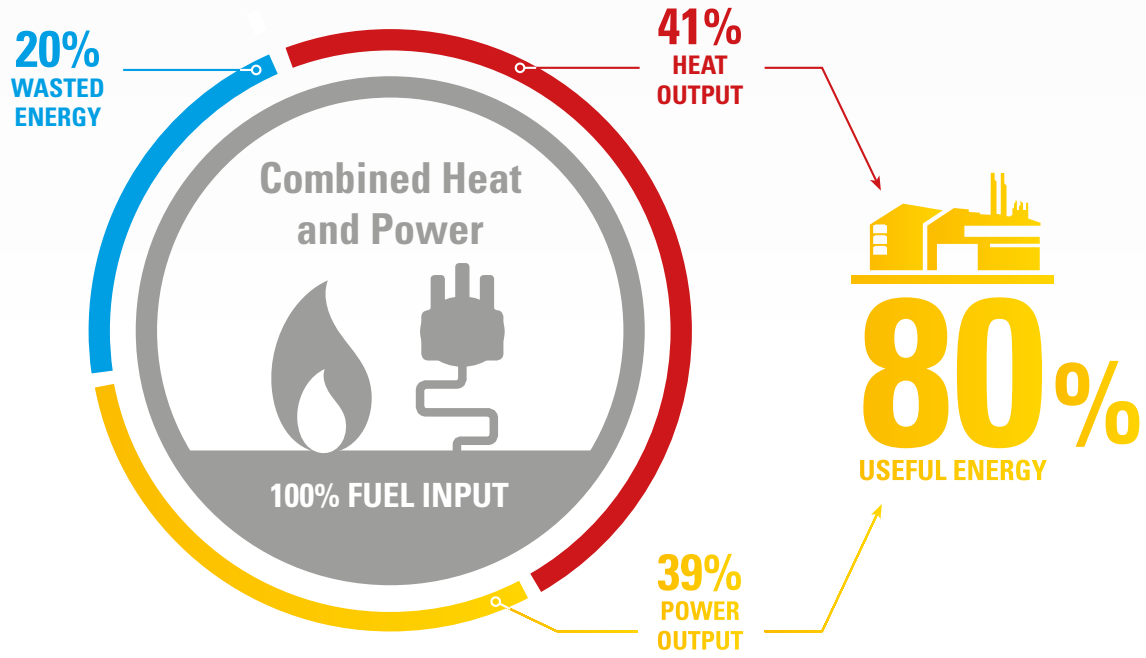
This high, regular demand for both heating and power makes the baking industry an ideal candidate to take advantage of CHP.

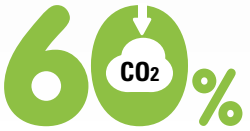
Output for CHP compared to conventional power plants

Conventional boiler power plant



Combined heat and power plant





Cleaner, Greener:

Although CHP still produces carbon dioxide, reducing the amount of fuel needed to run your plant will cut your emissions by a minimum of 10%, and potentially as much as 60%.[3]

With the benefit of a high quality and secure energy source system on site, your business can dramatically reduce its dependency on the national grid for power.

Payback:

Larger plants with substantial energy demands will make their money back from their investment faster, but you can probably expect to be making a profit on a new CHP system within as little as three years of having it installed.[4]

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.

The exact savings this can offer will depend on several factors, such as the size of the operation and the products being processed. Sites that produce frozen cakes and other cold products will obviously require much more cooling equipment and as such are ideally positioned to take advantage of trigeneration.

How do I know if CHP is right for my bakery?

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 bakeries 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 purchase price may not necessarily deliver the cost effective operation over an extended period, and it's important that you secure an operations' and maintenance contract at the time of installation.

Industry example:

Customer	Product	Capital Cost	Operational Hours
UK biscuit producer	1.2MW Gas CHP unit	£780,000	8,000 hours per year

Annual Savings
£290,000
(including operation and maintenance costs)

Payback Period
<3 Years

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 Efficiency Improvement and Cost Saving Opportunities for the Baking Industry, Ernest Orlando Lawrence Berkeley National Laboratory. http://eande.lbl.gov/sites/all/files/baking_guide_final_28dec2012c.pdf

[3] The CHPQA Standard Issue 5, the Department of Energy and Climate Change. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335471/CHPQAStandardIssue5.pdf

[4] Why Use CHP? The Local Government Association http://www.local.gov.uk/climate-change/-/journal_content/56/10180/3510573/ARTICLE