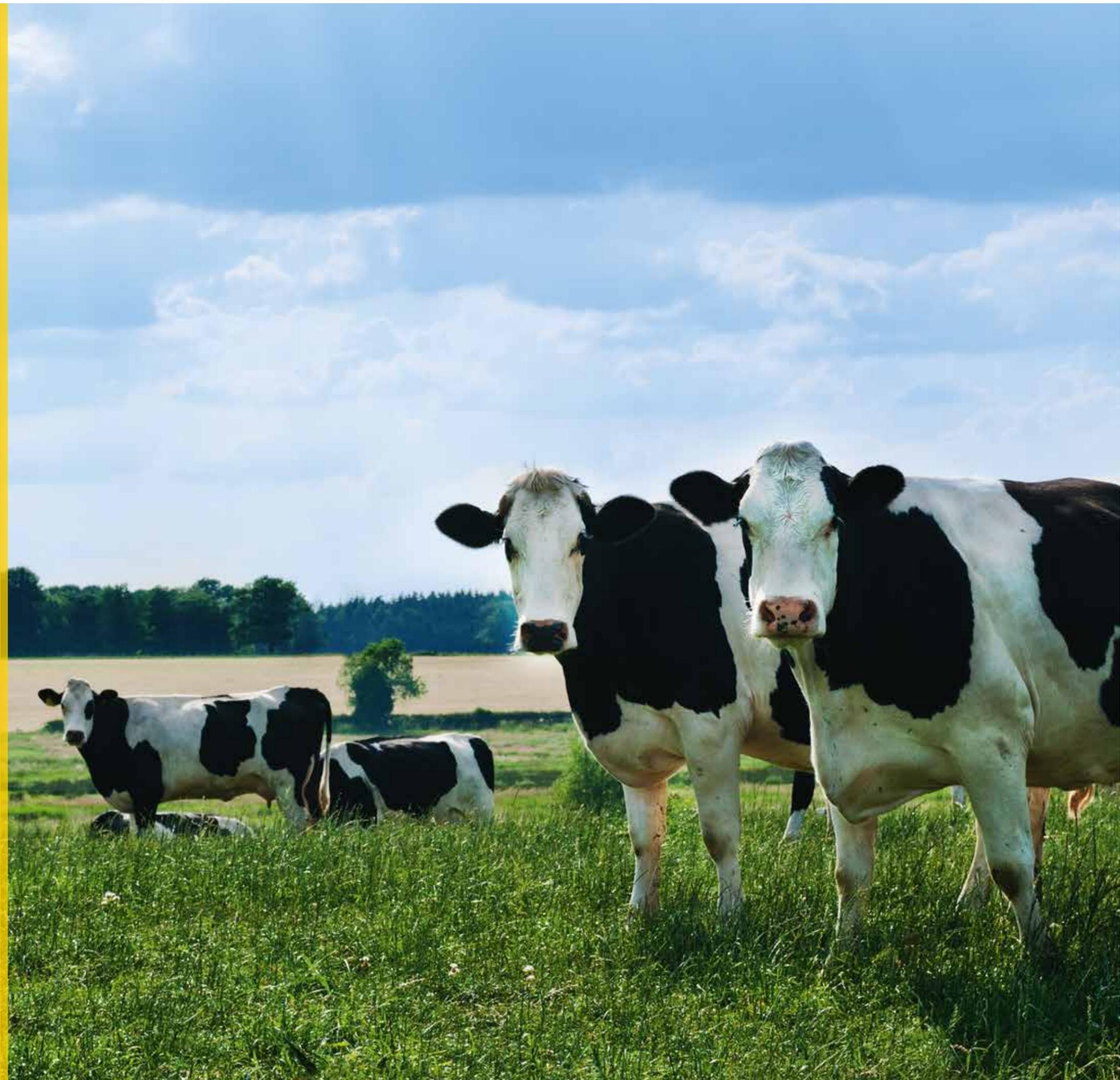


# COMBINED HEAT AND POWER (CHP) FOR FOOD AND DRINK PROCESSING.

## Cutting costs for dairies.

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

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

**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.

## Dairy demands

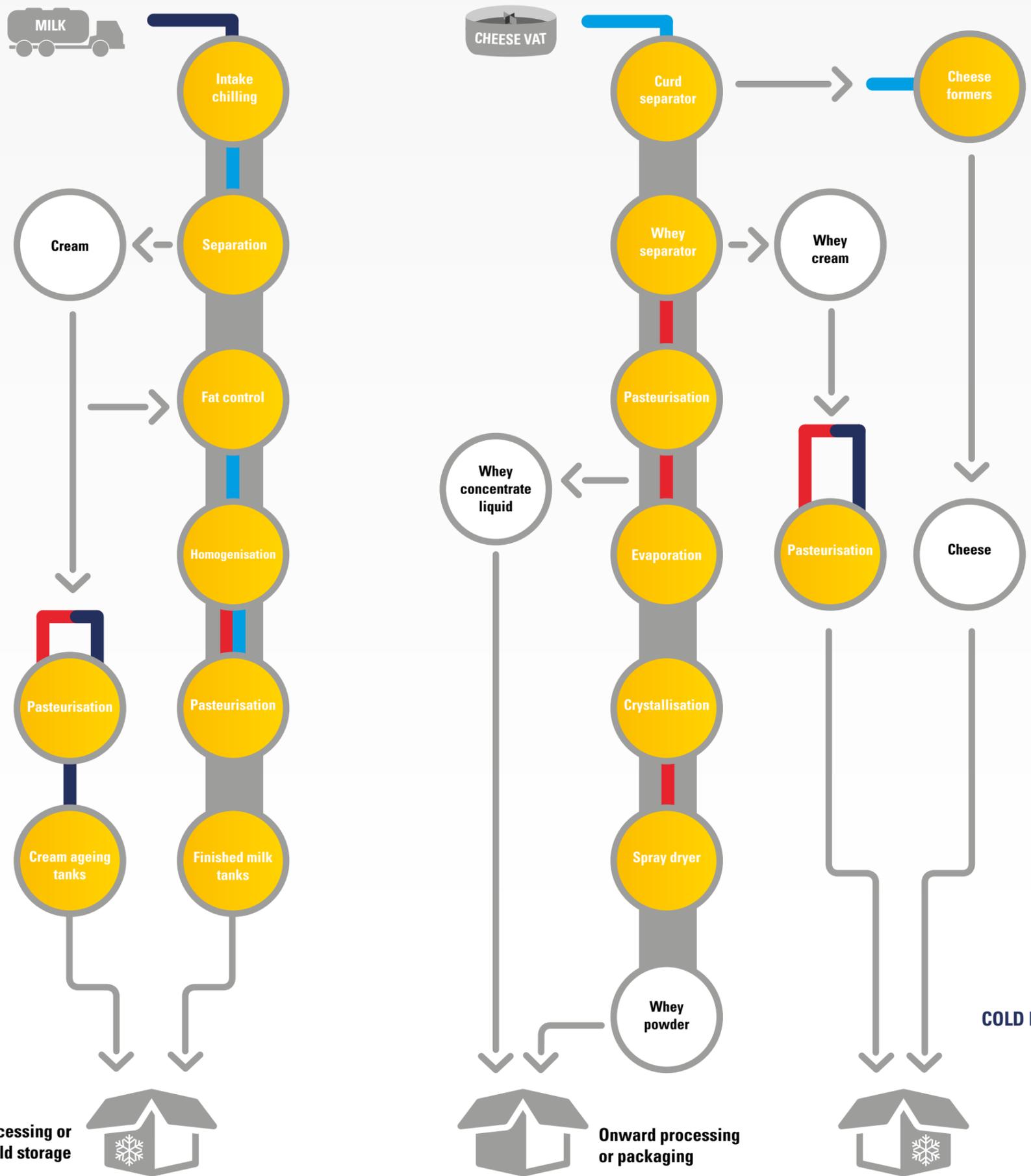
The exact power, heating and cooling demands of a dairy will vary significantly depending on what you're producing.

However, energy costs are always going to be one of your three biggest costs along with labour and raw materials.<sup>[1]</sup> Even the production of conventional fluid milk consumes around 0.95 MMBtu for each tonne of product, with cheese requiring almost four times as much.

The initial processing steps – clarification and pasteurisation – require large amounts of heat in order for the product to reach 95°C, as does the production of the steam needed to keep process equipment and product clean.

Spray drying powdered milk and condensing milk are particularly energy-intensive processes, and raw milk and other products need to be chilled throughout.

## Dairy Processing



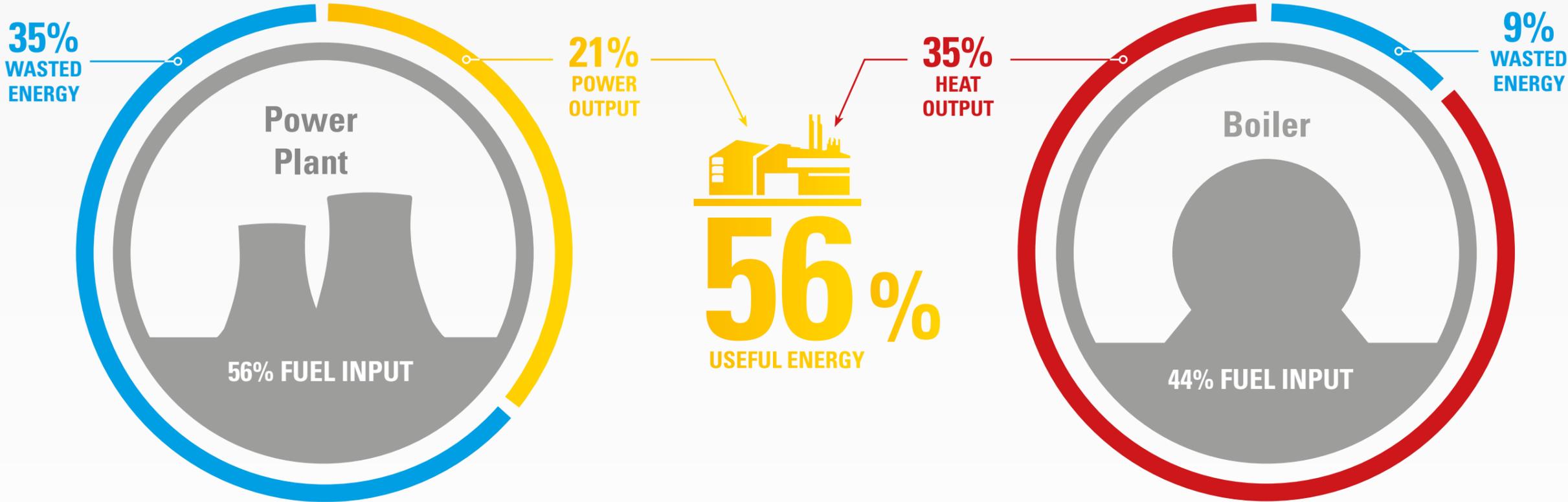
Onward processing or packaging to cold storage

Onward processing or packaging

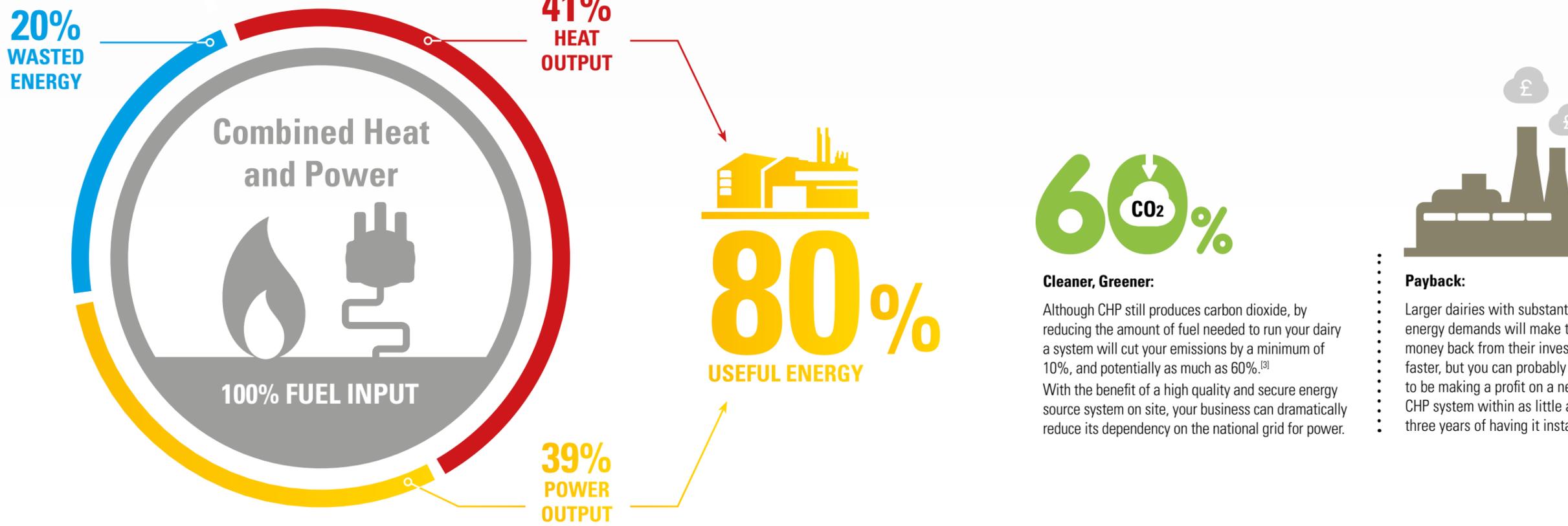
Key:  
COLD REFRIGERANT  
STEAM  
ELECTRICITY

# 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 cooling systems, which in many dairies are the biggest drains on power [2].

The exact savings this can offer will depend on several factors, such as the size of the operation and the products being processed. Around 66% of the energy needed to produce butter is consumed by cooling systems. For both cheese and fluid milk this figure is around 20% [1].

### How do I know if CHP is right for my dairy?

#### 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 dairies usually run 24/7, 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

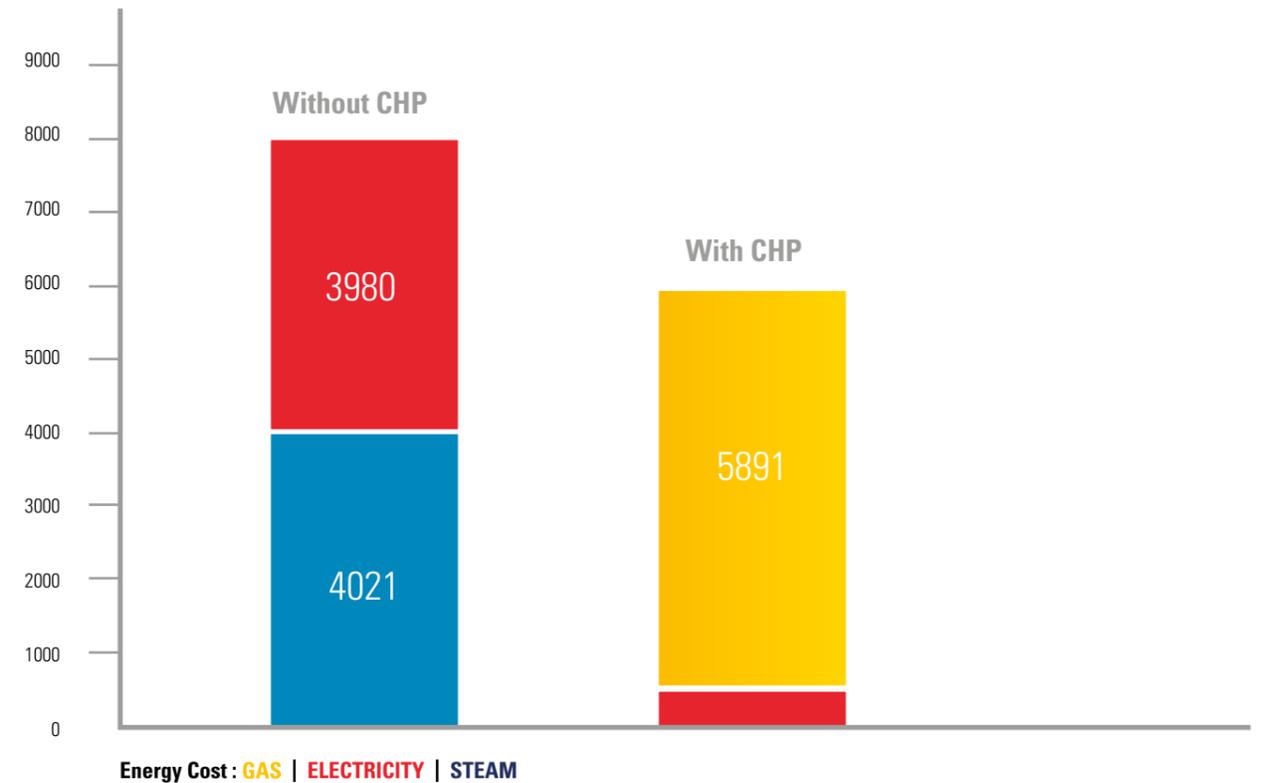
In most sectors that have constant, steady demand it is advised that CHP systems be sized to only provide the baseline heat. However, in many dairies the power demands will increase during peak milk season, so it can be advisable to size the system around that baseline and to sell any excess electricity back to the National Grid.

#### 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 examples [2]:

Customer: A major Irish dairy processor Energy Efficiency Without CHP: 58% **Energy Efficiency With CHP: 80%**



## 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:

[1] Dairy Processing | Energy Best Practice Guidebook, Focus on Energy. [https://focusonenergy.com/sites/default/files/dairyprocess\\_guidebook.pdf](https://focusonenergy.com/sites/default/files/dairyprocess_guidebook.pdf)

[2] Energy use in Dairy Processing, Bulletin of the International Dairy Federation [www.fil-idf.org/Public/Download.php?media=28569](http://www.fil-idf.org/Public/Download.php?media=28569)

[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](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](http://www.local.gov.uk/climate-change/-/journal_content/56/10180/3510573/ARTICLE)