

# WASTE-TO-ENERGY SOLUTIONS

Improve your productivity  
with alternative fuels



## FOSSIL FUELS SUBSTITUTION

The use of biomass and alternative fuels, such as municipal and industrial wastes offers higher environmental performance than landfill and incineration. It is a practical, cost-efficient and safe waste management option.

**880%**

INCREASE IN USE OF  
ALTERNATIVE FUELS  
FROM 1990 TO 2017

## WASTE BENEFITS

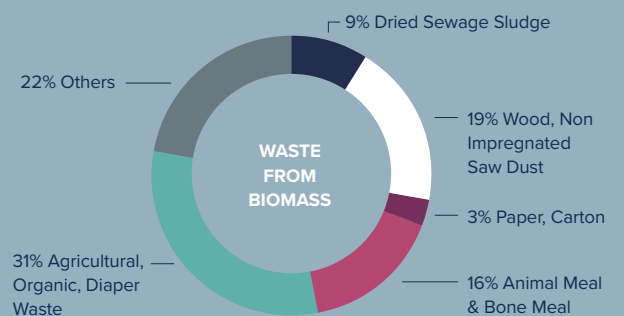
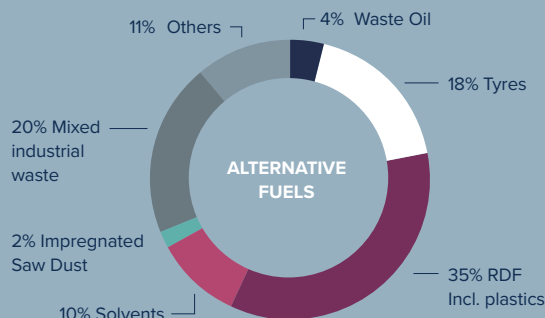
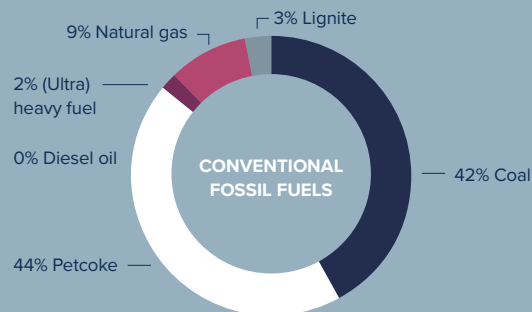
MATERIAL RECYCLING

**-18.3%**

CO<sub>2</sub> REDUCTION PER  
TONNES OF CEMENT  
PRODUCTS SINCE 1990

### THE BENEFITS OF FUELS SUBSTITUTION ARE MULTIPLE

- Reducing CO<sub>2</sub> emissions
- Reducing dependence on fossil fuels
- Material recycling
- Offering an alternative to landfill



# REDUCE YOUR FUEL COSTS WITH WASTE-TO-ENERGY SOLUTIONS. WITHOUT THE RISKS.

Embarking on an alternative fuels project is a great step towards reducing your environmental impact and your fuel costs. Turning waste into energy makes your plant more sustainable and profitable – but it can also introduce new risks to your process. You need an experienced partner to help you select the best solution for your facility.



Maximum alternative fuel substitution rates up to 100%



Overall system guarantee from the fuel receipt up to the clinker quality

## WHAT YOU GET



Customized solutions, from quick-start to complex



Research-based approach to ensure state-of-the-art performance

# SOLUTIONS OVERVIEW

## 1. WASTE SOURCING

A variety of different waste is collected and transported to one or more locations for pre-treatment.



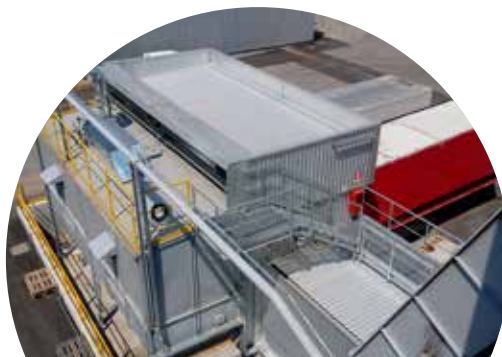
## 2. WASTE PREPARATION

A complex process of shredding, sorting, drying and sizing, converting the waste to different fuel qualities.



## 3. MATERIAL HANDLING AND STORAGE

The fuels are transported, stored and if necessary, dried to become part of the fuel mix.





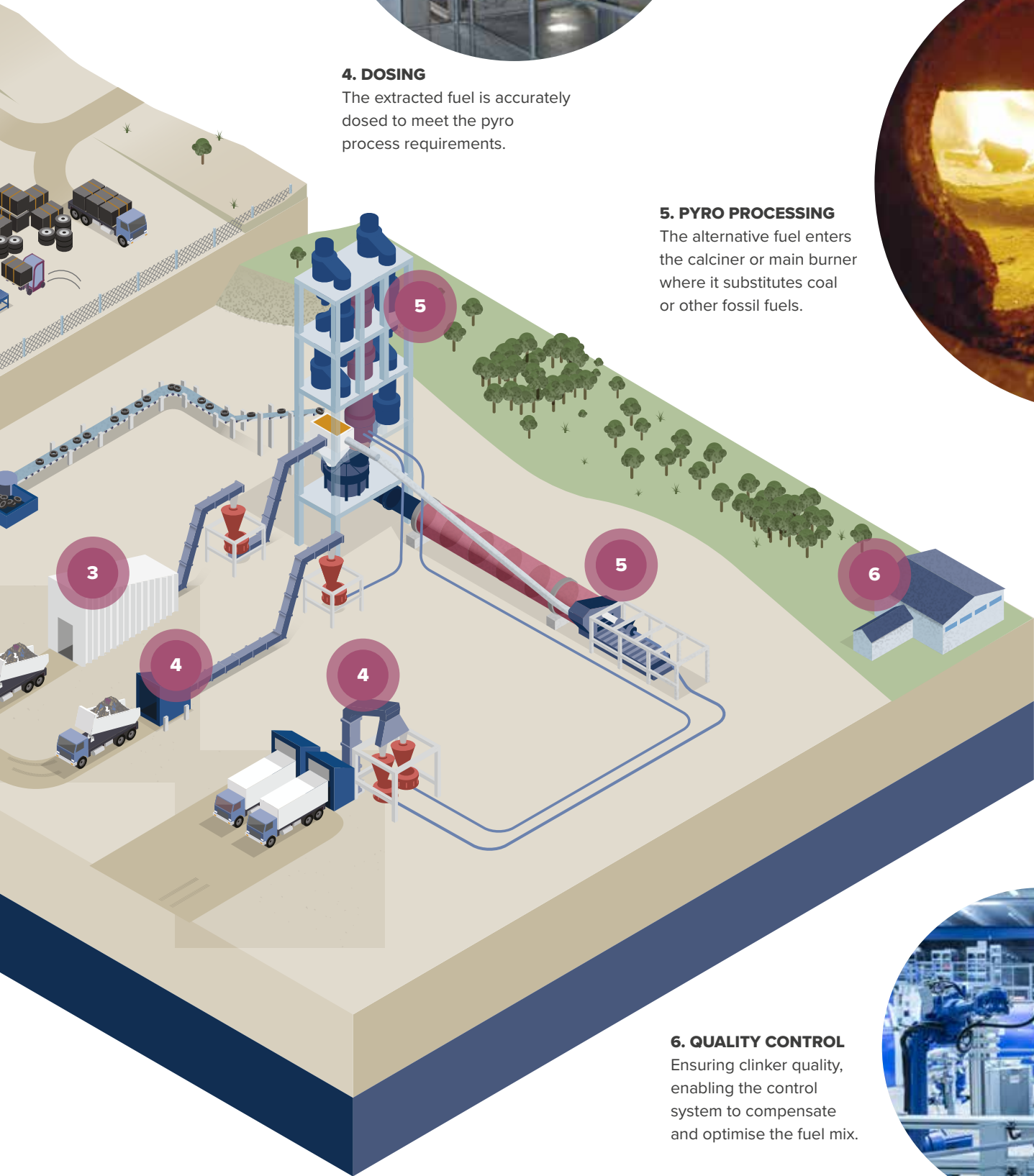
#### 4. DOSING

The extracted fuel is accurately dosed to meet the pyro process requirements.



#### 5. PYRO PROCESSING

The alternative fuel enters the calciner or main burner where it substitutes coal or other fossil fuels.



#### 6. QUALITY CONTROL

Ensuring clinker quality, enabling the control system to compensate and optimise the fuel mix.



# WASTE-TO-ENERGY PRODUCTS



## Docking Station

Our single and double docking stations are designed to allow for the safe, reliable and efficient receipt of bulk materials, including refuse-derived fuel (RDF), solid recovered fuel (SRF), biomass, household waste and more.



## ECS/ ProcessExpert Multi-fuel application

ECS/ProcessExpert advanced process control system maintains a consistent total heat value at the lowest possible cost, without comprising stability or quality.



## JETFLEX PLUS

Our JETFLEX® Burner is a highly flexible kiln burner, designed to produce the best flame shape and lowest NOx emissions for various fuel types and operating conditions.



## HOTDISC® Combustion Device and In-Line Calciner

The HOTDISC Combustion Device and In-Line Calciner is the best to substitute calciner fuel with a wide range of coarse alternative fuels – from sludge to whole truck tyres.



## Feedex™ Overhead Reclaimer

A robust and flexible storage and blending solution for alternative fuels. Suits a wide range of materials, giving you more opportunities to lead the way in sustainable processes.



## Pfister® TRW-S/D Rotor Weighfeeder

This feeder solution delivers the highest levels of accuracy and reliability both safely and efficiently, using our proven rotor weighfeeder technology.

## CUSTOMER STORY

# CHINA BEATS THE DIFFICULTIES OF WASTE INCINERATION

Located in Binyang, in the Guangxi region of South China, the Hongshuihe plant is one of the China Resources Cement (CRC) company's 40 production facilities in mainland China. So, when the city government needed help to reduce the waste in Binyang, it was an opportunity for CRC's top management to replace fossil fuels with waste as a cost-effective and sustainable alternative.

### A challenge

But waste incineration in China is a challenge. High level of water and organic substances makes it difficult to produce sufficient energy for energy-hungry processes such as cement production. CRC needed a premium technology which could handle the raw waste's characteristics. Evaluating FLSmidth's HOTDISC® combustion solution, CRC concluded it to be the most advanced solution in the market. Supplying other key products for the co-processing system, FLSmidth and our engineers handled the onsite installation and commissioning of the solution from start to end.

### Positive environmental impact

The facility already has a positive impact on the environment, scaling back the garbage mountains. All of the ash residue and



FLSmidth delivered a solution that achieved a waste feed rate of more than 300 tonnes per day, a straight 100% coverage of our fuel needs. The quality and quantity of clinker is the same as with conventional fuels, keeping emission levels well below limits, with best-in-class environmental performance.”

pre-treated waste can be used as alternative fuel and materials in cement production processes, and the process generates no solid waste or secondary pollutant emissions. Emissions of air pollutants are within national limits, and some indices, such as dioxin emissions, perform significantly better than EU emissions limits. The facility also meets all odour control standards and the sewage treatment and water discharge is in full compliance with local environmental requirements.

This project is not only helping to rid the city of its waste problem; it has also proven itself to be an important energy source at CRC's Hongshuihe plant. With it, CRC has taken a major step towards environmental protection while paving the way for sustainable development within the cement industry.

**FLSMIDTH**  
**Mission Zero**

**TOWARDS ZERO EMISSIONS IN CEMENT**



**Zero emissions**



**100% fuel substitution**



**Zero waste**



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