



Lagan Cement
LAGAN GROUP

Lagan Cement Kinnegad

International Energy Agency 21 Oct 2011

..Welcome !

Lagan Cement:
An Introduction

Lagan's
experience with
alternative fuels

Availability of
SRF Feedstock

Market
Demands/IE &
EU

Lagan Cement



Lagan Cement



Lagan Cement

Lagan Cement importing cement into Belfast N. Ireland for 25years.



700,000t Cement manufacturing plant in Kinnegad, commissioned 2002.



One of the most modern cement plants in Europe, operating to the highest quality and environmental standards.



Using Solid Recovered Fuel (SRF) since Jan 2009.



50,000 tonnes of alternative fuels used in 2010.

Lagan Cement: post Celtic Tiger

Ireland historically has been a net importer of cement.

Since 2008 cement consumption in Ireland has declined dramatically.

Plant operations are 24/7 and continuing to develop our position in export markets. (UK / benelux regions)

Increasing production will require higher quality alternative fuels. It is estimated that 76,000 tonnes of SRF will be required in 2011.

Zeeland Terminal



Quality and Environmental Stewardship at Lagan

Lagan Cement operates to the highest environmental standards internationally.

Lagan Cement is accredited to ISO 14001 and ISO 9000-2000.

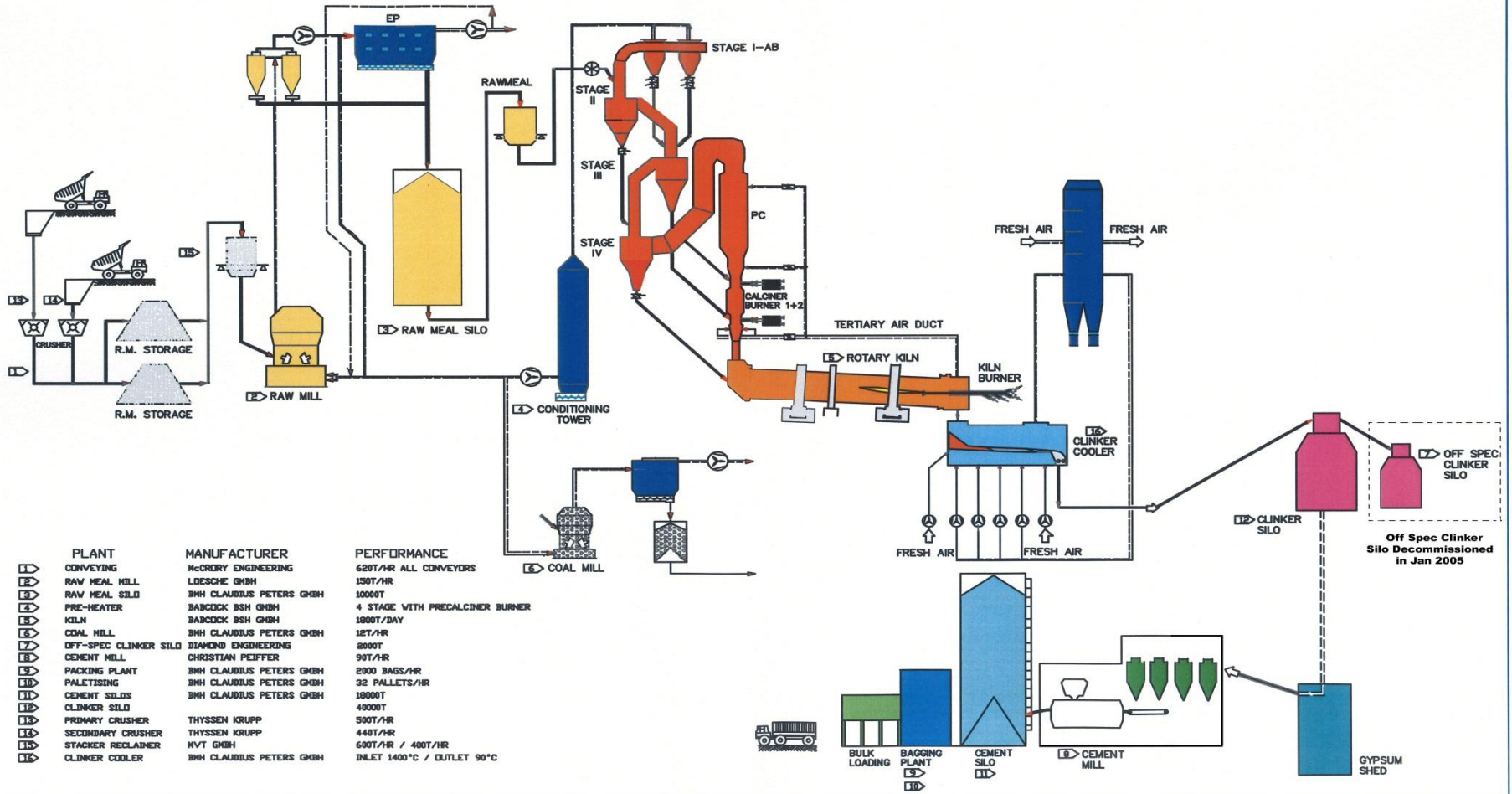
Lagan Cement produces cement to the European Standard IS EN 197.

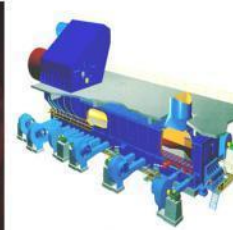
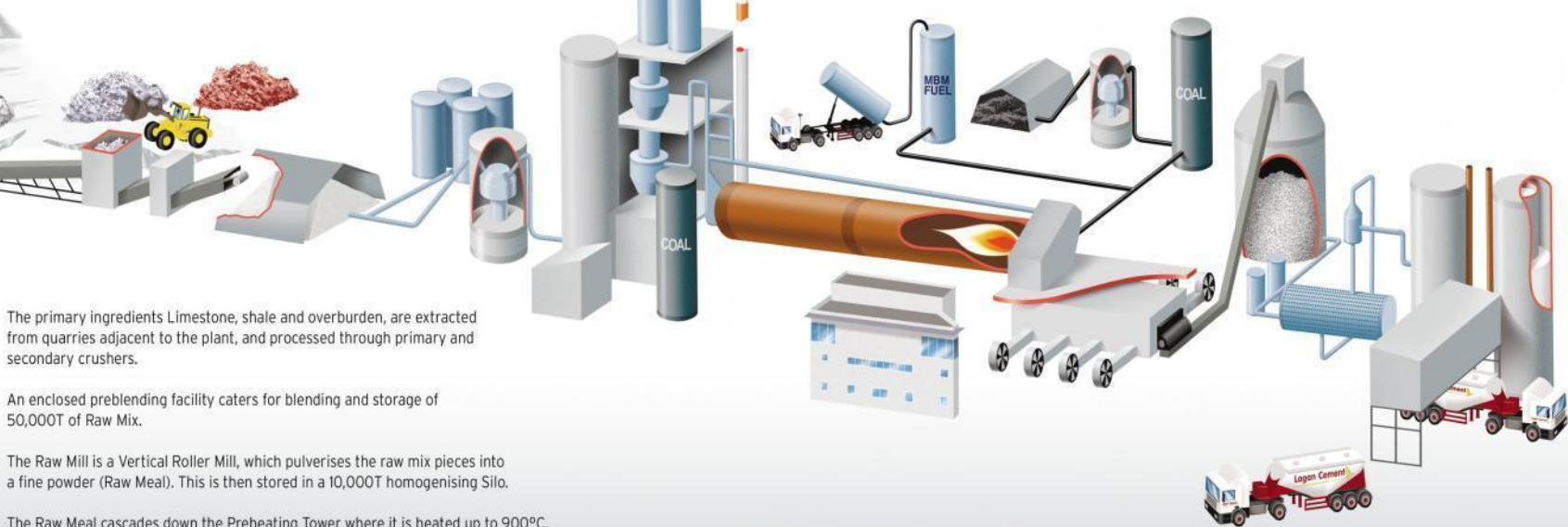
Lagan Cement makes safety its highest priority

Lagan Cement operates a good neighbour policy, actively contributes to various community support groups.

Plant Schematic

FROM RAW MATERIAL TO CEMENT



QUARRYING**CRUSHING****PRE-BLENDING****RAW MATERIAL MILLING****PRE-HEATING TOWER****KILN****CLINKER COOLING****CEMENT MILLING****CEMENT DISPATCH****QUARRYING & CRUSHING**

The primary ingredients Limestone, shale and overburden, are extracted from quarries adjacent to the plant, and processed through primary and secondary crushers.

PREBLENDING

An enclosed preblending facility caters for blending and storage of 50,000T of Raw Mix.

RAW MILLING & STORAGE

The Raw Mill is a Vertical Roller Mill, which pulverises the raw mix pieces into a fine powder (Raw Meal). This is then stored in a 10,000T homogenising Silo.

PREHEATING TOWER

The Raw Meal cascades down the Preheating Tower where it is heated up to 900°C, using a series of large cyclones, prior to feeding into the back end of the Kiln.

KILN

The Raw Meal is burned in the coal-fired kiln, where it is converted into Clinker nodules as it passes through the burning zone at material temperatures in excess of 1400°C.

KILN FLAME

The Kiln flame itself operates at temperatures of 2000°C.

CLINKER COOLER

The material exiting the kiln is known as clinker, and this is required to be cooled prior to storage in a 40,000T clinker storage silo.

CEMENT MILLING

The Cement Mill comprises of a large steel-ball mil, which grinds the clinker, in conjunction with a small amount of Gypsum, to yield Cement.

CEMENT DISPATCH

The milled Cement is stored in two large silos, prior to bulk despatch or being packed for despatch as bagged cement.

CONTROLLING

The entire process is very carefully monitored and controlled from a state-of-the-art Central Control Room.

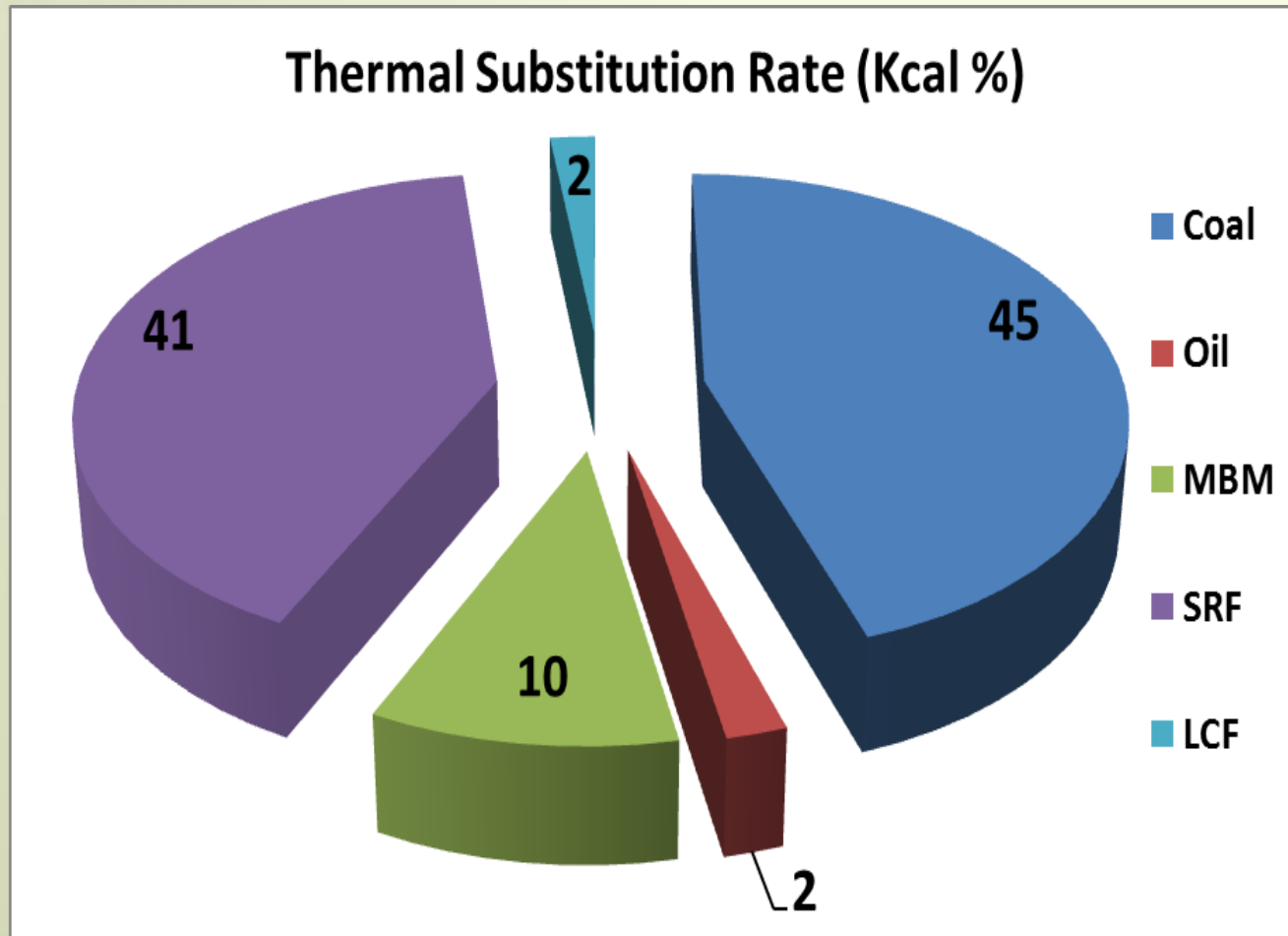
**CONTROLLING**

Preheating Tower

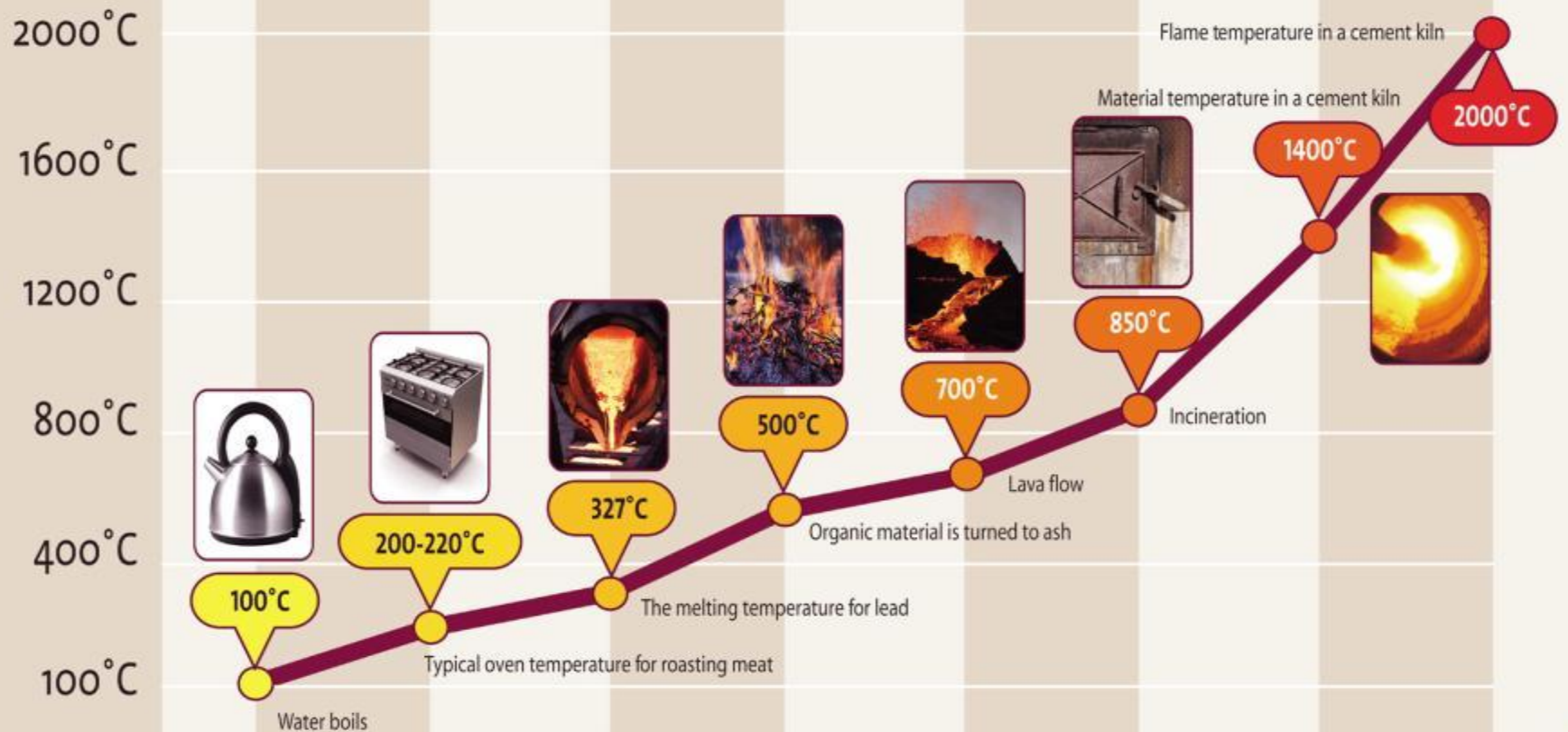




Fuel Mix composition



Cement Kiln Temperature



Between 1400 and 2000 deg C



SRF (Solid Recovered Fuel)



SRF Storage



Cement Kilns are excellent for co-fuelling because ..

- ▶ Extremely high Temperatures
 - Material temps exceed 1350 deg and Flame temps reach 2000 degC
- ▶ High residence times
- ▶ Alkaline environment (neutralising)
- ▶ High Thermal requirements (Up to 400 KT domestically)
- ▶ Existing Thermal requirement (required for important cement manufacture)
- ▶ Mineral matter recovery from the waste material being co-fuelled
thereby replacing virgin raw materials

SRF Co-fuelling in Cement Kilns makes good sense because ..

- ▶ Reduces requirement for Landfilling
- ▶ Avoids methane production from landfilling
- ▶ No Ash is generated, requiring further disposal as with incineration
- ▶ Replaces imported Fossil fuels with locally produced renewable greener' fuels derived from waste
- ▶ Supports domestic waste management requirements and local jobs in waste sector
- ▶ Utilises existing cement manufacturing infrastructure

The “ideal” cement fuel

- ▶ High calorific value
- ▶ Low moisture content
- ▶ Low chlorine content
- ▶ Low heavy metals (esp. Hg, Tl etc)
- ▶ High biogenic fraction/Carbon Neutral
- ▶ Sustainable
- ▶ Homogenous and produced to quality standard.
- ▶ Consistent !

Experience with alternative fuels

- ▶ Getting planning / IPPC licence approval is time consuming and costly.
- ▶ SRF is heterogeneous in nature, causing surging, plugging, flame cooling, deposits and build-ups.
- ▶ Alternative fuels such as SRF cause the following:-
 - Increased downtime
 - Refractory damage
 - Stop start production,
- ▶ The above combine to give increased unit production cost (net of fuel cost)

Market Demands for SRF (Ireland)

- ▶ Licenced (or imminently) capacity to utilise circa 400,000 T of SRF per year in Cement Manufacturing (Ireland)
- ▶ Lagan Cement increasing use in 2011 to exceed 50KT.
- ▶ Most of larger Waste companies have MBT and SRF production lines built, or are preparing to build.

Other Domestic factors

- ▶ Low landfill cost is a disincentive to resource recovery such as SRF production.
- ▶ EPA's 2009 waste report published:
 - Report warns that Ireland's landfill capacity reducing.
 - EPA have called for infrastructure alternatives to landfill, however infrastructure cannot be provided unless it is economically viable to do so.
 - Cement manufacturing - already an infrastructure in place – significant capacity to utilise SRF into the existing fuel demand for cement manufacture.

International Developments

- ▶ SRF use is growing in Europe and beyond.
- ▶ Countries like Switzerland have developed highly integrated waste management systems, resulting in zero landfill.
- ▶ In Switzerland zero landfill is achieved using a combination of MBT, SRF use in cement kilns and waste to energy plants (incinerators).
- ▶ SRF is being treated much more as a traded fuel commodity.
- ▶ Quality is being rewarded (in most instances)
- ▶ SRF Pricing is becoming more related to its fuel value.

CEN TC 343 “The SRF Standard”

- ▶ Purpose of CEN SRF standard is:
 1. To promote recovery and reduce disposal through the standardisation of SRF into quality classes.
 2. Promote use of SRF and improve energy security.
 3. Introduce common standards for SRF in order to promote free trade within Europe.
 4. To provide a standardised method to describe SRF.
 5. To standardise/harmonise the measurement of the biogenic fraction of SRF.

What CEN contains

- ▶ Sets up quality classes of SRF according to Hg, CV and Cl content.
- ▶ Sets fuel measurement criteria.
- ▶ Sets uniform mechanisms to determine the biogenic content.

CEN SRF

Classification property	Statistical measure	Unit	Classes				
			1	2	3	4	5
Net calorific value (NCV)	Mean	MJ/kg (ar)	≥ 25	≥ 20	≥ 15	≥ 10	≥ 3

Classification property	Statistical measure	Unit	Classes				
			1	2	3	4	5
Chlorine (Cl)	Mean	% (d)	≤ 0,2	≤ 0,6	≤ 1,0	≤ 1,5	≤ 3

- ▶ Class 1 is a high quality material
- ▶ Class 3 is typical of what is produced in Ireland.
- ▶ Class 4&5 are unacceptable in the cement industry.

Thank You

