



Environmental aspects – a business case

Lars Skaarup Jensen
General Manager, Alternative fuels



A FLSmidth case story of:

 FLSMIDTH
ALTERNATIVE FUELS

- Leveraging the great potential developing from the *strong global trends* of
 - Energy
 - Emissions control & climate change
 - Waste management
- Systematic innovation
 - Business
 - Technology

Technical University of Denmark



Certificate in
Entrepreneurial
Leadership

Lars Skaarup Jensen



- **General Manager, Alternative Fuels**
- Joined FLSmidth in 1996

Positions in FLSmidth:

- General Manager of Alternative Fuels (2007 -)
- Department manager in Fuel Systems (2005-2007)
- R&D and emissions specialist (1999-2005)
- PhD (1996-1999) - Low NOx calciners for cement production



Overview

- Environmental issues:
 - Overview
 - Opportunities related to emissions control

- The Alternative Fuels Initiative:
 - A strong trend in the cement industry
 - A strong business innovation case
 - A successfully implemented project

- Summary

Environmental issues & sustainability

Major focus areas in industry and society:

- Global warming
- Preserving resources (e.g fossil fuel, raw materials, water)
- Recycling and recovery (energy and materials)
- Waste management
- Emissions of harmful species:
 - to air
 - to water
- Nature conservation and quarry rehabilitation



Emissions control & monitoring

Demand for: Technology, knowledge and services

- Global warming
 - Cement production accounts for 8% of global CO₂ emissions
 - Landfill methane emissions are substantial (waste dumps)
- Other important emission components:
 - Dust
 - NO_x (tax being imposed on industrial emitters in Denmark)
 - SO₂
 - CO (strict limits apply in USA)
 - Heavy metals (Mercury is a hot topic in USA)
 - Organics, Dioxins, HCl, HF
- Stricter legislation and monitoring requirements
 - Tightening of legislation
 - When using of waste derived fuel (EU Waste Incineration Directive applies)



The alternative fuels initiative

ALTERNATIVE FUELS

- Launched in May 2007
- **Mission**
 - Ensure FLSmidth a leading position
 - Leverage market potential
- **Today**

A strong team of 35

 - consolidating and integrating alternative fuels globally in the FLSmidth organisation



Alternative Fuels is the dominating topic at cement conferences & seminars

- A global trend!
- A good indication of future importance
- A competitive parameter
- A strong FLSmidth profile!

**global
fuels**
CONFERENCE & EXHIBITION

London 4-5 February 2008

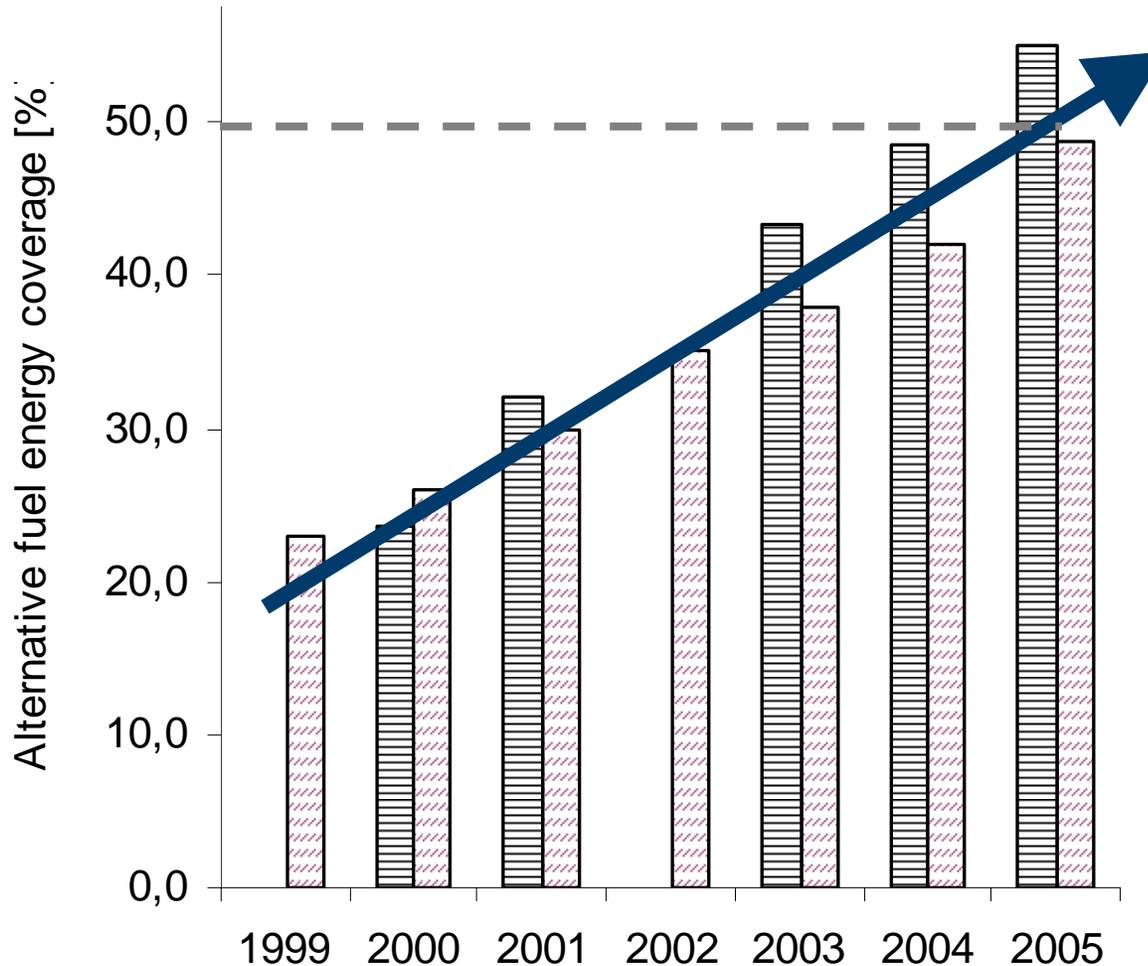


**Most innovative technology
for alternative fuel use:
FLSmidth for HOTDISC**



Growth in an construction downturn!

- German trend will become global



Rapid increase in alternative fuel usage during the past 5 years

- due to focus on lowering production costs in a cement market with excess production capacity



Global cement producers are rapidly increasing use of alternative fuels

Cement producer	Alternative Fuels fraction
Lafarge	9.8%
Holcim	11.4%
Heidelberg	17%
Cemex	7%

Why is Alternative Fuels such a strong trend and bound to become even stronger?

- **Energy**
Economics of fuel savings
- **Global warming**
Bio fuels reduces CO2
- **Waste management**
Developing world needs sustainable waste management systems



Economic calculation example (USA plant producing 1 million tonnes cement pr. year)

	Baseline	50% Alt. Fuel without production loss	50% Alt. Fuel with production loss
Alternative Fuel fraction	0%	50%	50%
Fuel cost (daily)	\$26,470.59	\$13,235.29	\$13,235.29
CO2 quota value	\$0.00	-\$6,394.74	-\$6,394.74
Extra operating costs	\$0.00	\$3,000.00	\$3,000.00
Value of lost clinker production	\$0.00	\$0.00	\$6,000.00
Total fuel related cost (daily)	\$26,470.59	\$9,840.56	\$15,840.56
Total savings (daily)		\$16,630.03	\$10,630.03
Annual savings		\$5,213,514.71	\$3,332,514.71

Bio fuels for cement plants

Cement production accounts for 8% of global CO₂ emissions

WWF vision (yearly by 2050)
Displace 0.4 Gt CO₂ by using bio fuels



The developing world needs sustainable waste management systems



WWF

Cement kilns can have an extremely positive effect on the waste management chain





Firing waste derived fuel





Results since launching Alternative Fuels in 2007

- The first projects have been successfully implemented
- Projects have been sold and are under implementation
- Many paid pre-engineering and feasibility evaluations shows that customers value the new offering by FLSmidth
 - Whole projects
 - Emissions expertise

A successfully implemented project

Germany 2007/2008

Results

- More alternative fuel
- Lower emissions
- More efficient use of production capacity
- Rapid implementation

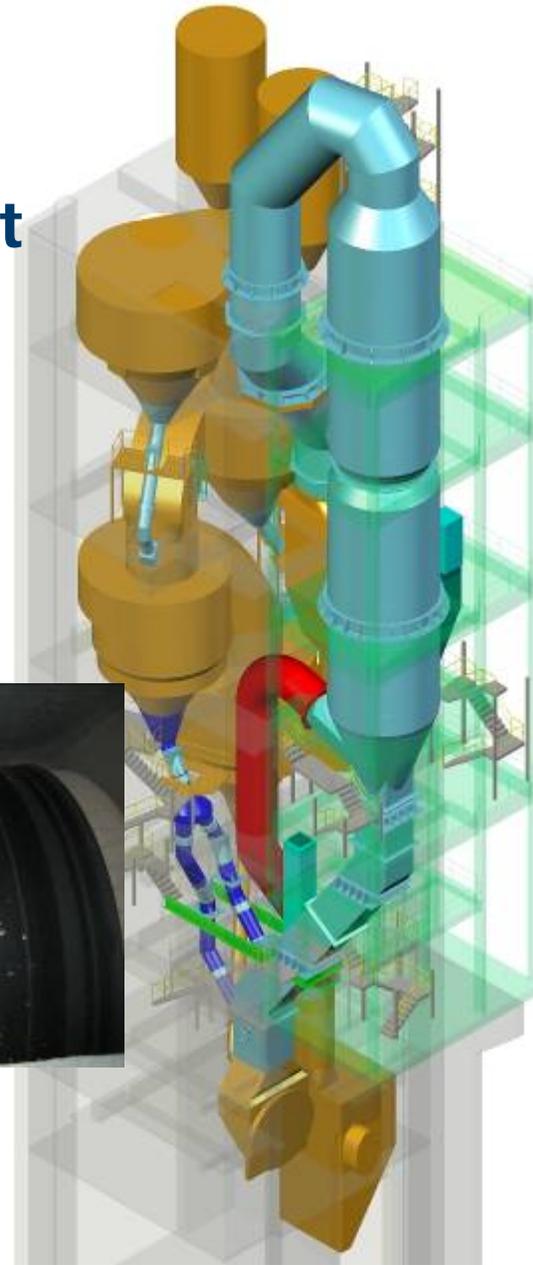




A successfully implemented project

Technology installed

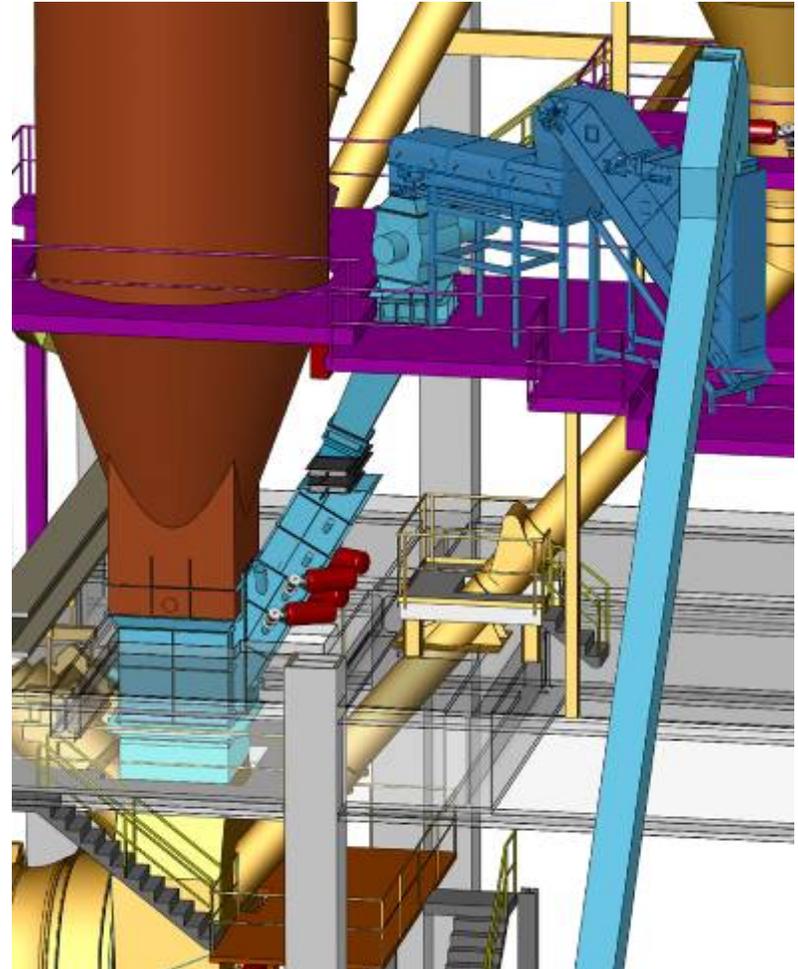
- Combustion and calcination system
- Fuel feeding systems (FLSmidth KOCH)
- Emission control installation





Project being installed in 2009

- Setting new standards
 - Flexibility
 - Minimize pre-processing requirements
 - One solution supplier





Customers value the new services and value proposition

- Feasibility evaluations
- Pre-engineering
- Partner during permitting



Summary

- **Many environmental aspects are business drivers**
 - FLSmidth addresses main society and industry needs
 - Emissions control is a strong industry focus area
 - Industry demands *technology, knowledge and services*

- **Alternative Fuels**
 - A strong industry trend
 - Driven by energy costs, climate change and waste management
 - Structured business innovation by FLSmidth

- **Results of the new Alternative Fuels business**
 - FLSmidth has established a strong global team of 35
 - Successfully implemented projects
 - Our customers value the new offering



Questions

Design
Build
Operate
Maintain

The preferred partner
of the cement and
minerals industries

Capital Market Day London 16.03.09 **FLSMIDTH**

The graphic features the words 'Design', 'Operate', and 'Maintain' in blue, and 'Build' in orange. To the left, two construction workers in blue overalls and white hard hats are looking at a set of plans. To the right, two men in business suits are also looking at plans. The FLSMIDTH logo is in the bottom right corner of the graphic.