COMPANY PROFILE & GLOBAL UPDATE

ASHTRANS EUROPE 2015
COPENHAGEN DENMARK

The 3rd international ASHTRANS Conference
ZAG is a global marketing, sales and strategic services company involved in the building and materials, steel-making, industrial process, power generation and abrasives industries.

ZAG sources, markets and sells a full complement of minerals and raw materials as well as intermediate and finished products. We execute all aspects of the logistics supply chain to bring these materials and products quickly and efficiently from source to the user.

ZAG also provides specialized strategic advisory and support services such as sourcing and freight, environmental assessment, market and feasibility studies and project management.
products

- CEMENT & CLINKER
- LIMESTONE & LIME SF
- SLAG & ACBF SLAG
- GBFS (SLAG GRANULES)
- GGBFS (SLAG POWDER)
- FLY ASH (BOTTOM, CONDITIONED & DRY)
- NATURAL & SYNTHETIC GYPSUM
- POZZOLANS, PUMICE & SILICA FUME
- IRON ORE & MILL SCALE
- IRON SILICATE GRANULES & POWDER
- ABRASIVES & GARNET
- BAUXITE & ALUMINA POWDERS
- CLAYS
- COAL, PET COKE & FUELS

services & projects

- MARKET INFORMATION & DATA
- STRATEGIC PLANNING
- FEASIBILITY STUDIES
- MARKET SURVEYS
- PURCHASING & SOURCING
- SUPPLY CHAIN MANAGEMENT
- CONTRACT NEGOTIATIONS
- FREIGHT MANAGEMENT & BROKERING
- OCEAN & LAND LOGISTICS
- STORAGE & DISTRIBUTION TERMINALS
- GRINDING PLANTS
- CO-PRODUCT/WASTE STREAM ANALYSIS & OPTIMIZATION
- COAL REGENERATION
# ZAG Relationships

## Customers
- USA
- CANADA
- AUSTRALIA
- NEW ZEALAND
- PNG
- SE ASIA
- UAE
- EUROPE
- EUROMED
- NORTH AFRICA
- EAST AFRICA
- INDIA

## Suppliers
- USA
- CANADA
- MEXICO
- JAPAN
- CHINA
- INDIA
- GERMANY
- FRANCE
- ITALY
- SPAIN
- TURKEY
- AUSTRALIA
- SOUTH AFRICA
ZAG “DNA” & CORE VALUES

- Competent Techno-Commercial Leadership Positioned in Each Region
- A Unique Multicultural Team of Like Minded But Very Different People
- Can-Do Self Starters Working Together In a Unified Global Network
- Totally Customer Focused To Provide a Complete Solution/Value Added Approach
- Dedicated to Building Sustainable Partnerships With Customers, Suppliers and Service Providers
Production in China has risen from 595 million tons per year in 2000, to nearly 2.2 billion tons per year in 2012.

- Global demand growing on average at 5% per year
- US recovery in full swing and outlook is bullish
- China slowing but still very significant
- Middle East has resumed a strong growth trajectory
- Emerging regions all moving ahead nicely
- Western (Southern) Europe still waiting for a recovery
OPPORTUNITY FOR LONG TERM IMPORT MARKET & SCM

• Imports resumed in 2015 mostly into Gulf Coast
• 10 million MT in 2015 & 20 million MT by 2018
• Fundamentals are there for sustained demand for many years
• Cement Imports PLUS More SCMs
GlobaL CAPACITY IMBALANCES

Over capacity in Europe- is it systemic? Will there need to be a “Japan-like” rationalization (90 million MT to 50 Million MT in 10 years)?

The China factor & potential “Overhang” -- 1.6 MT per capita per year of cement consumption

Race to meet Africa’s demand -- population expected to double from 1.2 billion to 2.5 billion by 2050

Insufficient Capacity in the USA – projected shortfall from 20 million MT to 40 million MT annually depending on “shutdown” scenarios
GLOBAL CLIMATE CHANGE

Can we really question whether it is real?

CO2 emissions – 3% average annual increase over last 10 years

Developed nations’ declines are more than being offset by Emerging nations’ increases

Heightened awareness, anger and social reactions

China has “declared war on pollution”

Inevitably, more Environmental restrictions & regulations
**Trends & Implications**

**INCREASED DEMAND FOR SCMS**

- Better Economics & Reduced Energy Costs & Increased Capacity & Output – more product to sell
- Improved Properties, Performance & Aesthetics - now universally understood and now being prescribed
- Lower CO2 emissions – easiest and quickest way to reduce the “Clinker Factor”
- Reduced raw material usage – helps with environmental sustainability
- Beneficial recycling of wastes and by products – less landfills, less spills and lower costs for other industries

- Convergence of Interests & Needs
- Addresses Social Pressures & Demands
GBFS Supply & Demand Update - it all starts with blast furnace iron production

BLAST FURNACE IRON (BFI) PRODUCTION (MMT)
Source: World Steel Association

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<td>38</td>
<td>483</td>
<td>709</td>
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<td>6.7</td>
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<td>Total World</td>
<td>505</td>
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- 38 Countries produce BFI
- 10 Countries produce 96% of BFI
- One country - China - produces 60% of BFI
GBFS Supply

- Over capacity in global steel
- Slow down in BFI production
- As countries develop, they build fewer blast furnaces
- “Mini Mills” are replacing costly integrated blast furnace complexes

- Steel slags do not have cementitious properties
- 270 Million MT of GBFS capacity is not expected to grow significantly
- Varying degrees of quality & properties
- Limited number of reliable suppliers

1.2 BILLION MT BFI

30% conversion

360 million MT BFS

75% conversion

270 million MT GBFS
Fly Ash Supply & Demand Update

Fly Ash is a Coal Combustion Product (CCP)

EUROPE
(source: ECOBA)

- FBC Ash: 2%
- Misc - SDA/FGD Other 1%
- Fly Ash: 66%
- Boiler Slag: 2%
- FGD Gypsum: 21%
- Bottom Ash: 8%

USA
(source: ECOBA)

- FBC Ash: 8%
- Misc - SDA/FGD Other 7%
- Fly Ash: 48%
- Boiler Slag: 2%
- FGD Gypsum: 22%
- Bottom Ash: 13%

GENERATION OF CCPs

- Boiler Slag: 2%
- FBC Ash: 8%
- FGD Gypsum: 22%
- Misc - SDA/FGD Other 7%
- Fly Ash: 66%
- Bottom Ash: 8%

FLY ASH/BOTTOM ASH APPLICATIONS

- Clinker, Cement & Concrete: 61%
- Structural (Fill & Embankments): 14%
- Waste Stabilization 9.5%
- Oil Field Services: 2.5%
- Road base/Soil Stabilization: 2%
- Mining: 9%
- Other/Miscellaneous: 2%
- Other/ Miscellaneous: 2%

(% of ash beneficially used)
Fly Ash Supply

Global CCP Prod.

Global FLY ASH Usage

- Global Average Utilization rate in all applications = 54%
- High of 96% in Japan
- Unlike steel, there are many more coal fired power plants being built or proposed – some 1200 new plants of which 70% will be in India and China
- So fly ash will be more available
- But it will be a question of where and what quality?
GLOBAL CEMENT DEMAND IS 4.4 Billion MT GROWING TO 6 Billion MT

CURRENT GBFS SUPPLY IS 270 million MT WITH LITTLE/NO GROWTH IN CAPACITY

CURRENT USEABLE FLY ASH SUPPLY IS 230 million MT

TOTAL SCM SUPPLY IS 500 million MT = 11% OF TOTAL CEMENT DEMAND
Seaborne Trade of SCM's

- GBFS
- FLY ASH

MILLION MT


ZAG INTERNATIONAL
Seaborne Trade of SCM’s

**GBFS**
- Globally traded
- Moved in bulk
- Safe & Easy to handle-grabs & outdoor storage
- Typically classified as a Product
- Consistent & dedicated manufacturing process

**FLY ASH**
- Typically supplied locally and regionally
- Possible to go long distances
- Challenging to handle - requires silos & self discharging vessels
- Typically classified as a waste material - restrictive permitting
- Inconsistent “manufacturing” process and dependent on coal sources

It’s a strategic business requiring a global perspective & presence