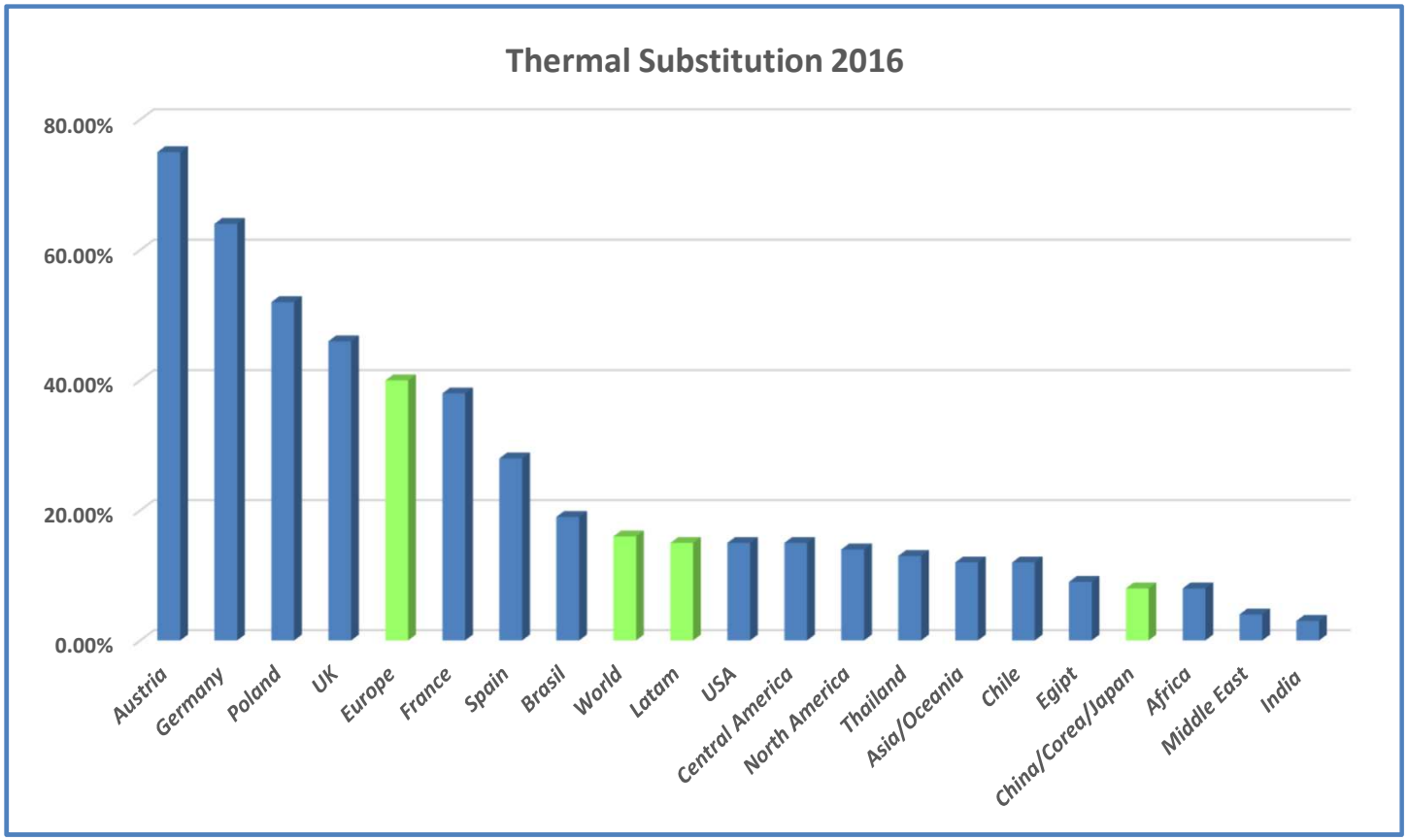
Maximazing Profitability while supporting the community through AFR's

Francisco Toscano Garcia
Managing Partner

September 2019
Shangai, China

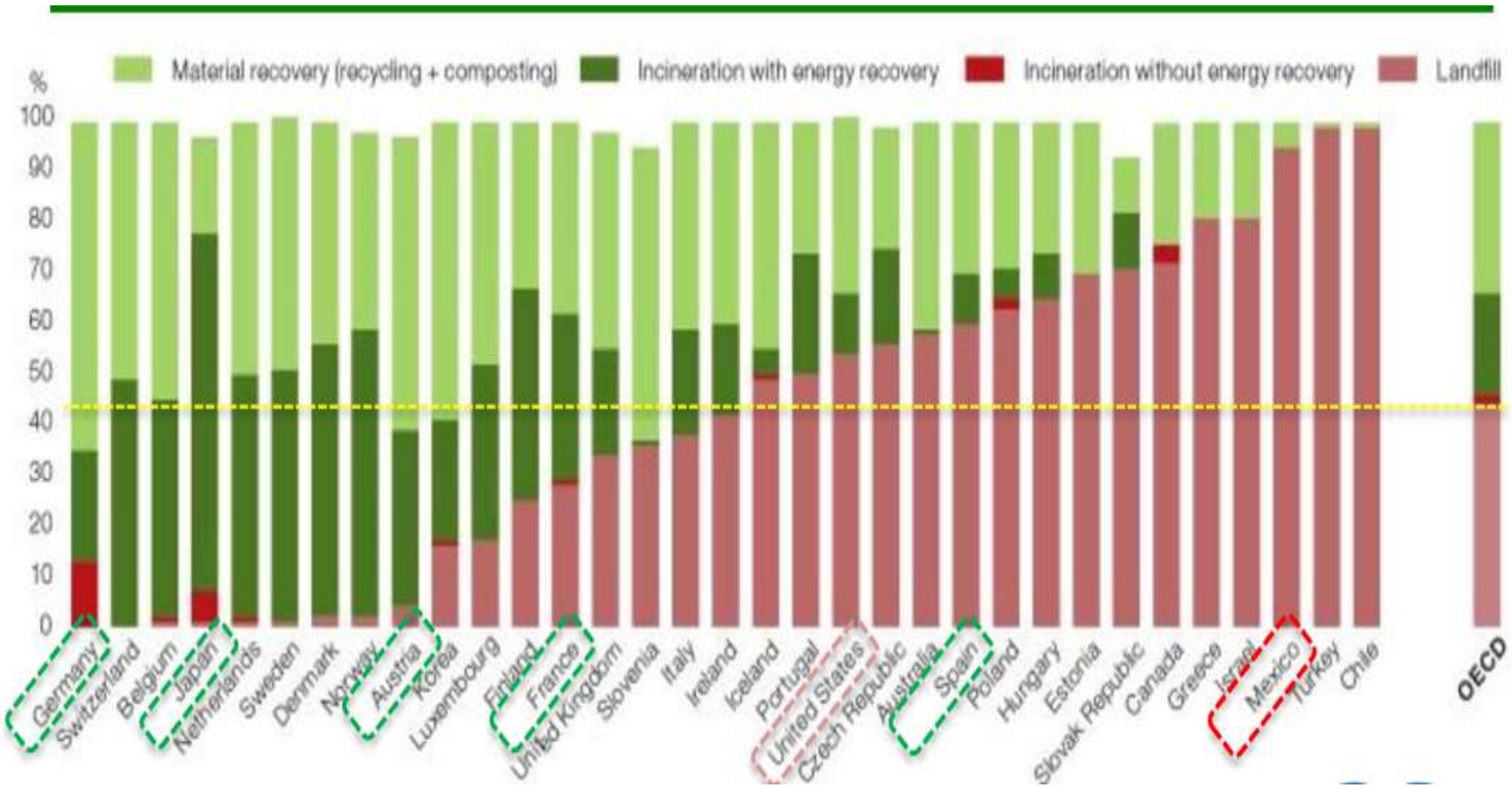
www.2TSustainability.com

The Cement Industry using alternative fuels



Source FICEM

Waste management



Source:
OCDE 2015
The World Bank

Waste management

Projected waste generation, by region (millions of tonnes/year)

Where is the opportunity?

The opportunity to increase in AFR is higher in developing countries.

WHY?

- Less legislation and enforcement
- More population = More waste generation
- Industry moving to cheaper countries.
- Less infrastructure for waste management

The biggest opportunity to support community by increasing the use for AFR is in Developing Countries.
This is where the Cement Industry can make the difference.

AFR Organization

With out AFR Organization

Hazardous

Big streams

Municipal

Not Easy Way Out

With AFR Organization

Hazardous

Big streams

Municipal

Solution

AFR Organization “Team Work”

Role of AFR Organization

External

- Obtain & Maintain License to operate.
- Permitting for collection , preparation and coprocessing.
- Sourcing the waste (customers) – sales & Logistics department
- Turn the waste into a fuel – (physical and chemical characteristics) – operations
- Manage legal topics (permits, documents, lobbying, etc)
- Administrative Issues
- Safety

Internal

Agree with cement plant:

- Characteristics
- Volumes
- Economical benefit.

(Partner). NOT CUSTOMER.

“People” The main Challenge

People from different areas must be prepared for the job.

- Commercial Look for the best waste “Beneffit”
- Logistic
- Preprocessing
- Coprocessing
- Administration

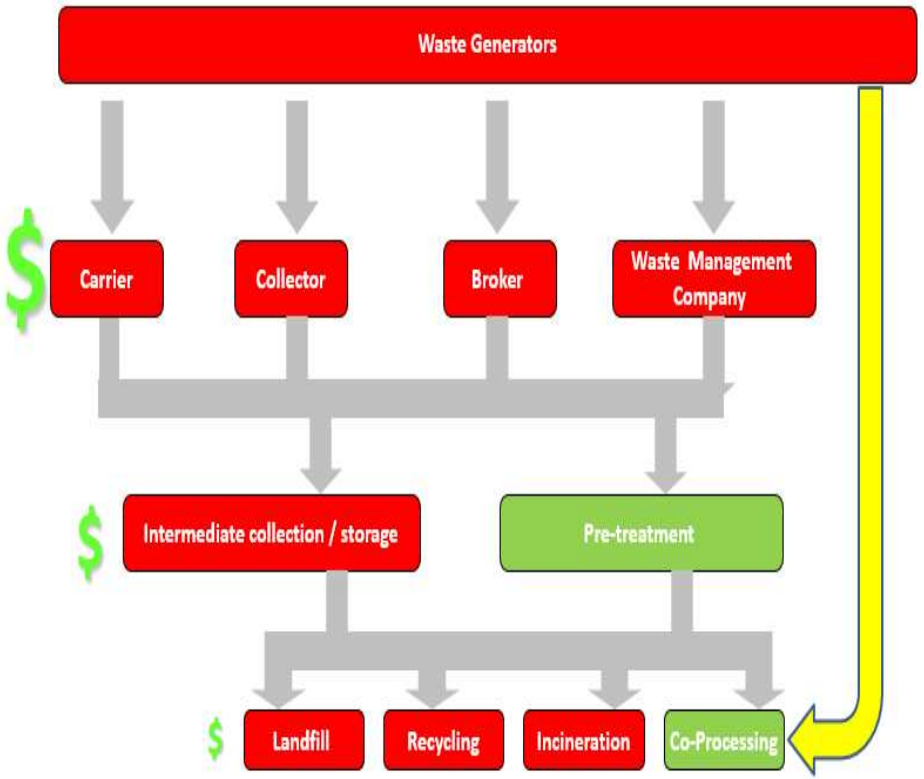
AFR is a complex business with several edges to attend.

- Stake Holders / License to operate
- Waste is generated all year long, even when the kiln is not running.
- AFR Quality
- Team work / Commitment
- Know your limits
- Safety

AFR Organization and Cement plant must have Common and shared targets “Team Work”

AFR Organization and Cement Plant .

Tipical Waste Market Value Chain



Taylor made

Which is the best option to approach the "Waste Market"

There are many things to be take into consideration to define what kind of market approach is needed:

- Legislation
- Type of waste available
- Type of kiln
- Quarry Characteristics
- Competitors
- Prices for the waste
- Price for traditional fuels in the burner
- Stake holders.
- Others

The goal is to reduce production cost through sourcing the best AFR possible.

Success History

Central Mexico Project 1997 – 1998

- **Cement plant with 2 million tons of cement capacity per year.**
- **2 Kilns with Calciner**
- **Traditional fuel, changing from fuel oil to Pet Coke 6,300 Kcal 4to 6% Sulfure.**
- **No tertiary air.**
- **90 km away from biggest industrial Area in Mexico.**

Vision: Cero Thermal cost

Goal: Continues increase of savings for AFR

Example big industrial Area (Mexico city)

Higher benefit, less variation with Hazardous Waste

Legislation

- Actual permit up to 20% of AFR, wide range of different type of waste.
- Legislation, similar to European but lack of reinforcement.
- Coprocessing was very new for authorities.

Waste Market

Hazardous Waste.

- Market managed by Collectors
- Main competitor for Hazardous waste is Landfill
- International companies looking for adequate waste disposal.

Non Hazardous – Municipal Waste.

- Zero separation (only few recyclables)
- Cheap cost for disposal.

Customers committed with environment and accepting to pay for the best type of waste dispossal.
80% Hazardous Waste – 20% Non hazardous waste

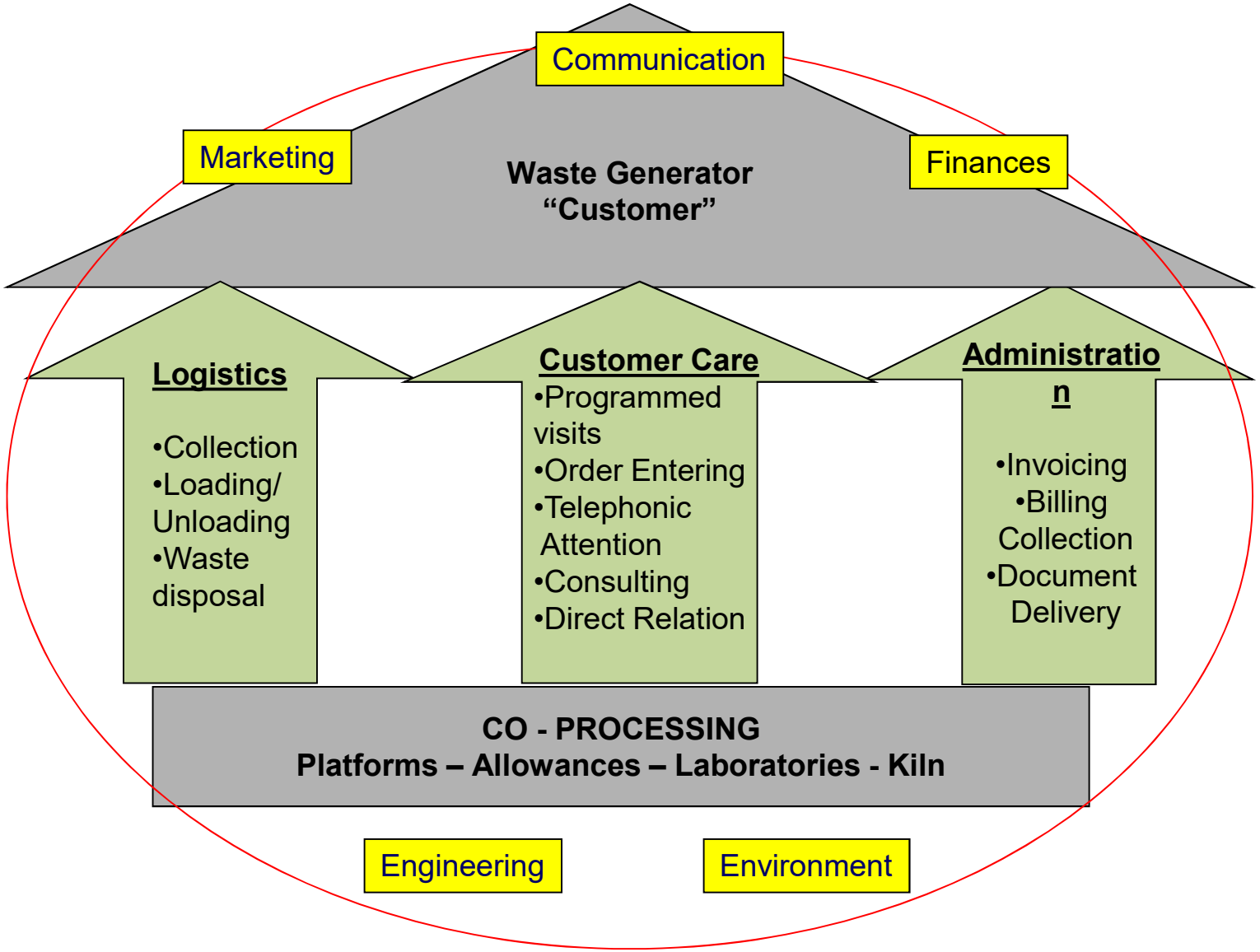
According to the waste generated per type of industry the targeted type of industry were:

- Automotive and Auto parts
- Paint industry
- Refineries
- Pharmaceutical
- Consumption products.

Signing very important contracts with companies like:

- PEMEX
- Volkswagen
- General Motors
- Loreal
- Procter
- Dupont
- Bayer

Market Aproach



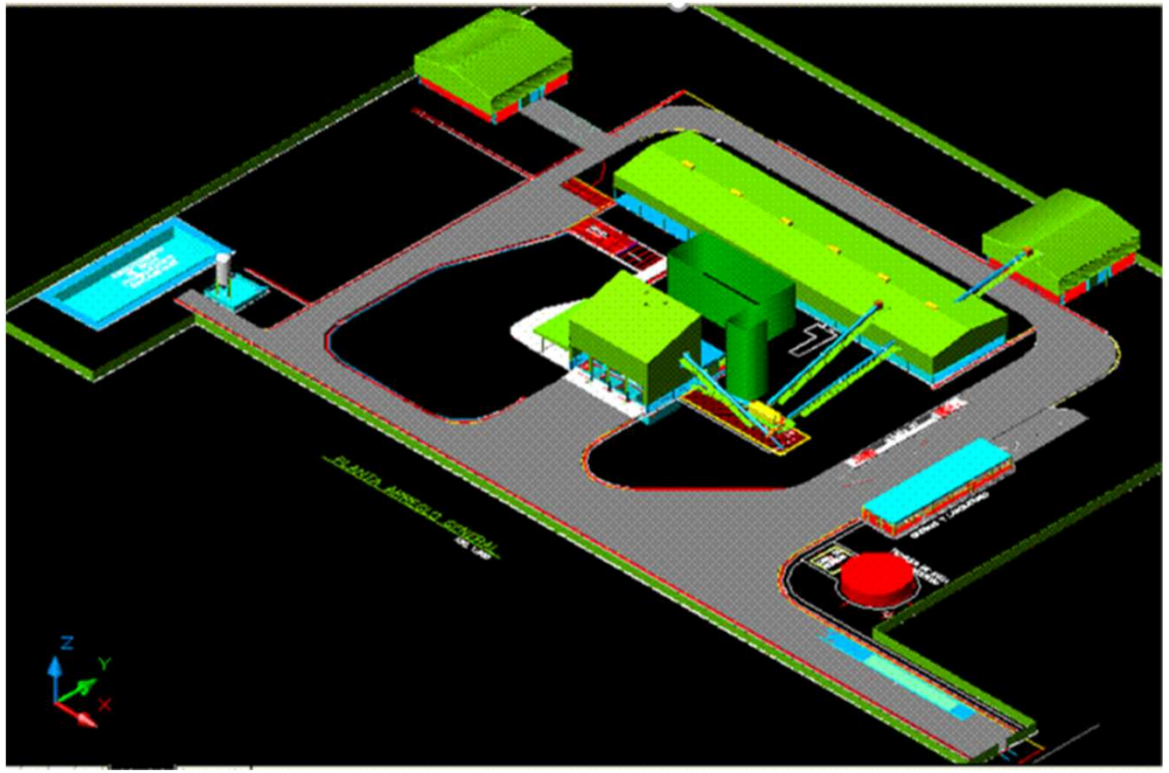
How to obtain waste

Pre processing Facility

Facilities.

Main Equipment

Shredder for coarse
Shredder for fines
Mobile Shredder
Mixer for sludge
Laboratory
Storage
Pits
Crane for pits
Tanks for liquids
Safety
Environmental Controls
Fire protection
Feeding points.
10,000 sq meters land



Alternative Fuels

Solid Coarse 4 inch
Fine Coarse 50 mm
Sludges
Shredded tire
Liquid

Total Capex 20 million USD
Starting Capex 10 million USD

Achievements

TSR	22%
AFR Tons per year	130,000
Benefit per ton of AFR	68 USD
Benefit per ton of clinker	5.5 USD
Total benefit per Year	8.8 million usd per year
Capex Return	2 years

Outcome, Sustained for more than 10 Years

Conclusions

Thank you very much

www.2TSustainability.com