

The 2016 Bi-annual Meeting of the Global WTER Council

ECOBELT® WA

Dry Incinerator Bottom Ash Handling System



The Magaldi Group

Dependable by Innovation since 1929

Magaldi Group - Company History

1929

Foundation of
Magaldi Industrie



1970

Introduction
of the Superbelt®
technology



1985

Introduction of the MAC®
technology for dry bottom
ash handling

1992

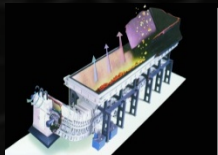
Foundation of **Magaldi
Ricerche & Brevetti** for R&D
of innovative technologies

1997

Foundation of **RRS** for
erection & operation of
industrial plants

2002

Foundation of **Magaldi
Power** for the power
sector



2015

Foundation of **MAGALDI Technologies**
Marketing and turn-key installation
in the US market

2008

Foundation of **MAGALDI Power India**
Marketing and turn-key installation in the
Indian market

2007

Foundation of **MAGALDI Power Germany**
Marketing and turn-key installation in the
Central European market

2004

Foundation of **MAGALDI Power Australia**
Marketing and turn-key installation in the
Australian market

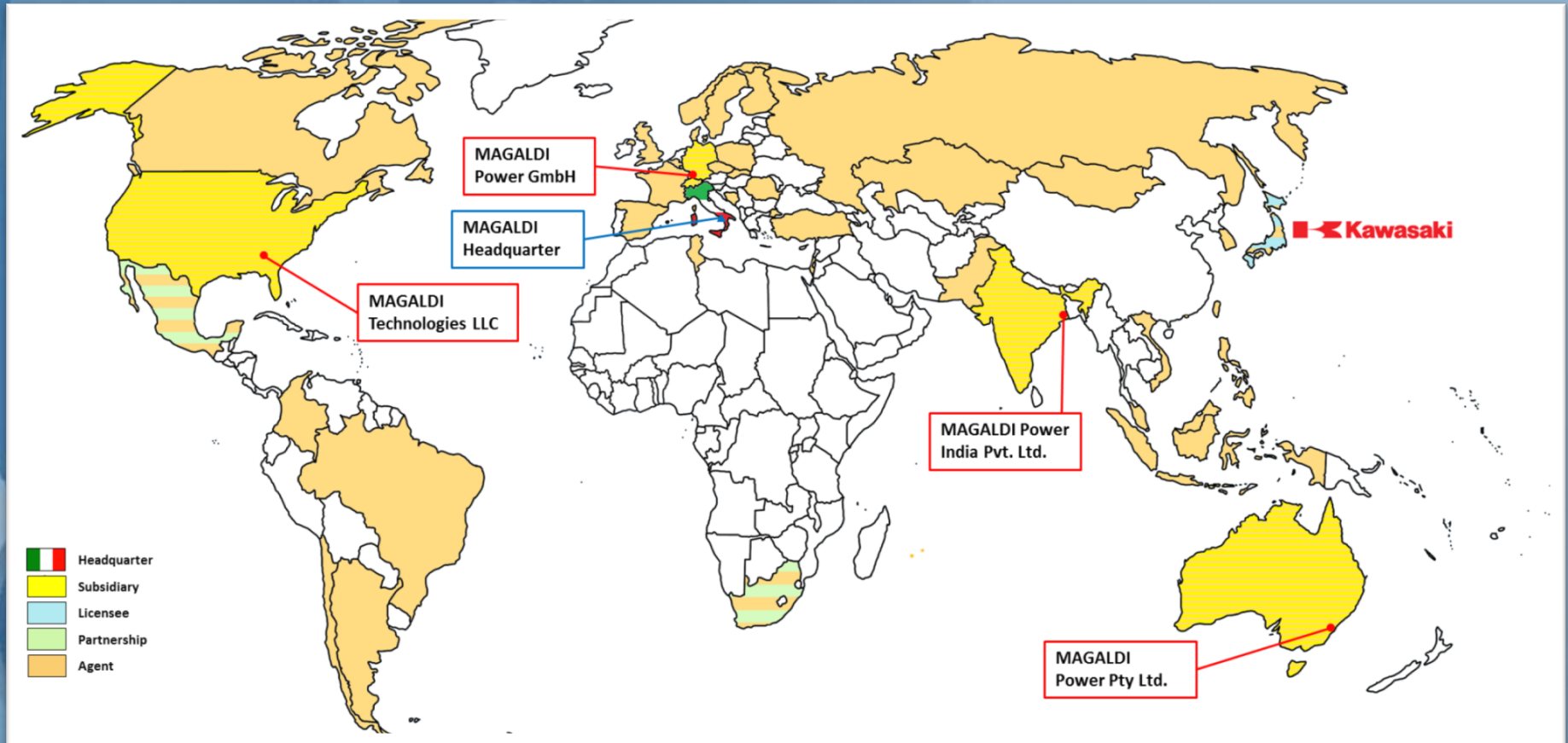
1929

2016

The Magaldi Group

Facts and Figures

- **Dry Bottom Ash Handling Systems installed worldwide:** 194 units (as of September 2016)
- **Superbelt® and Ecobelt® Conveyors installed worldwide:** over 800 units
- **Employees worldwide:** over 200 (>50% graduates)
- **Offices locations:** Australia, India, Germany, USA



The Magaldi Group

Facts and Figures: Waste-To-Energy

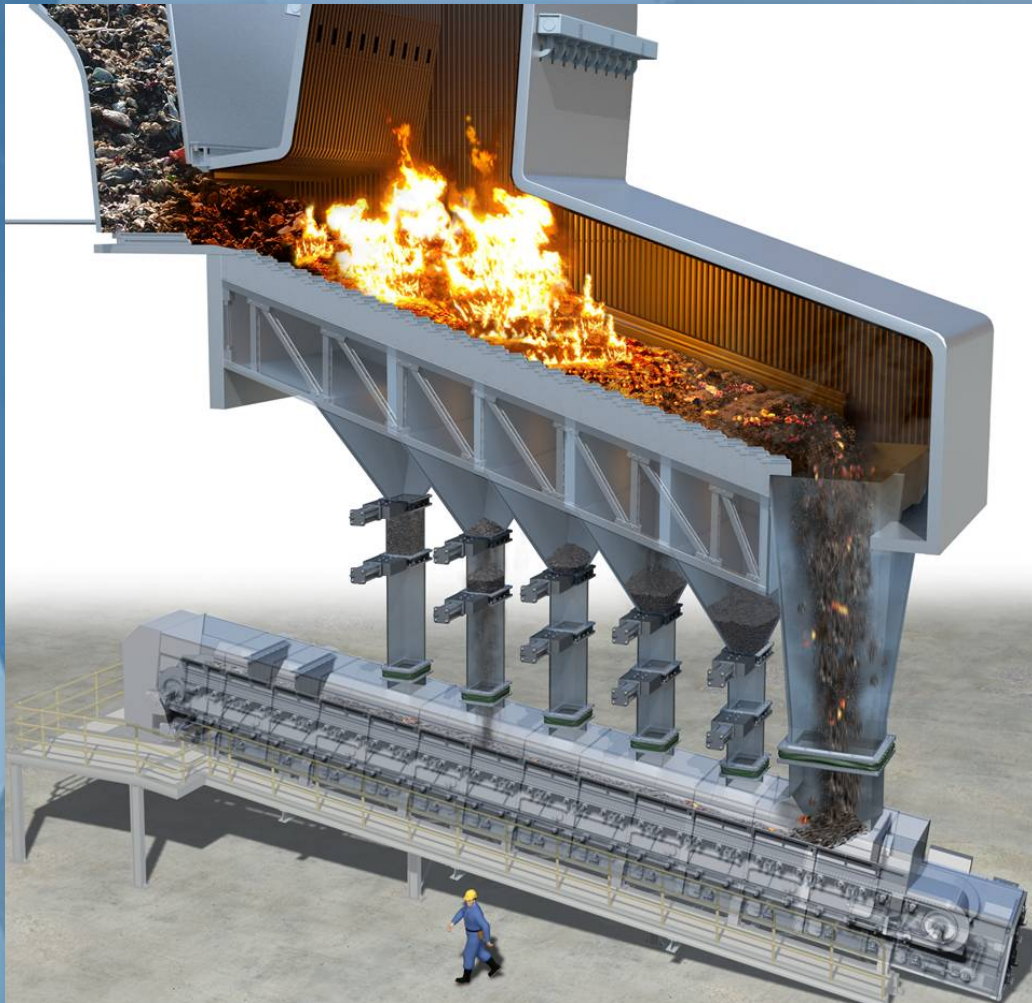
PLANT NAME/UNIT	UNIT SIZE	COMBUSTION SYSTEM	FUEL	IBA RATES [t/h]	COUNTRY	COD
KEZO Hinwil #2 - #3	2 x 21.8 MW _{th}	Grate Firing	MSW	2.6/4	Switzerland	06.2012
KEZO Hinwil #1	39.5 MW _{th}	Grate Firing	MSW	2.4/10	Switzerland	07.2015
KVA Horgen #2	14 MW _{th}	Grate Firing	MSW	0.9/5	Switzerland	07.2015
KHKW Hagenholz #2K1	48.1 MW _{th}	Grate Firing	MSW	8/10	Switzerland	Start-up
KHKW Hagenholz #2K3	48.1 MW _{th}	Grate Firing	MSW	8/10	Switzerland	Installation
ARIA San Vittore del Lazio #2	70 MW _{th}	Grate Firing	RDF	1.6/10	Italy	Q1-2017
ARIA San Vittore del Lazio #3	70 MW _{th}	Grate Firing	RDF	1.6/10	Italy	Q1- 2017
GESPI Augusta	2.7 MW _e	Rotary Kiln	Special and industrial wastes	0.6/1.5	Italy	10.2016



ECOBELT® WA System

Mechanical Handling of IBA: Main Features

The ECOBELT® WA for “Dry” Extraction of Incineration Bottom Ash



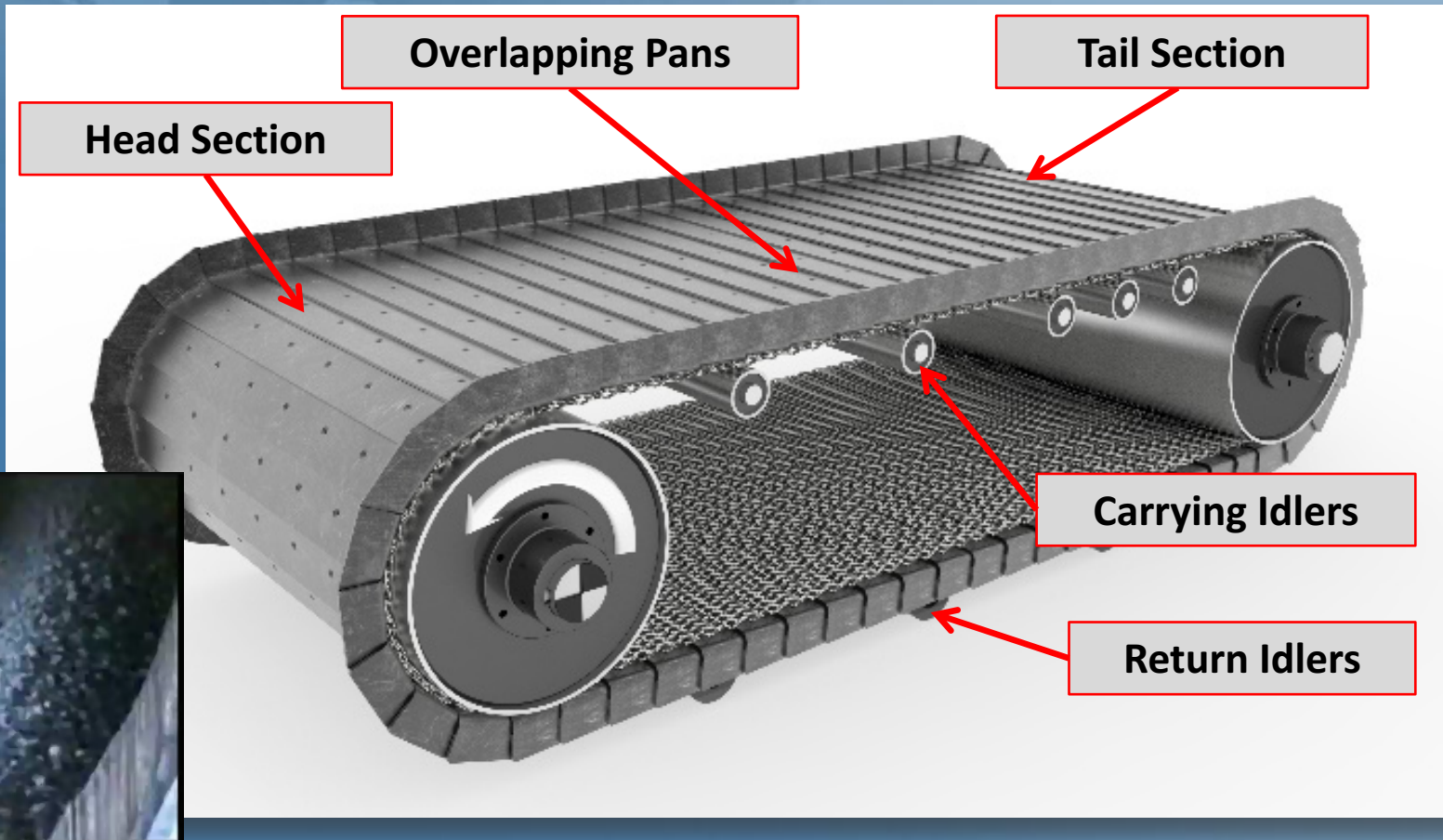
- Zero water usage. No contamination of water with heavy metals. No water treatment system required;
- Possibility to recover ferrous and non-ferrous metals from “dry” bottom ash downstream the system;
- Damage-tolerant design of the conveyors, ensuring high dependability, low wear, low power demand, long service-life, low O&M costs, safe operation and noise at the minimum levels;
- Potential heat recovery from bottom ash sensible heat and unburned residues (e.g. organic carbon) conversion.

ECOBELT® WA System

The Magaldi Superbelt®: Conveying Technology

The Magaldi Superbelt® performs like a conventional rubber belt conveyor.

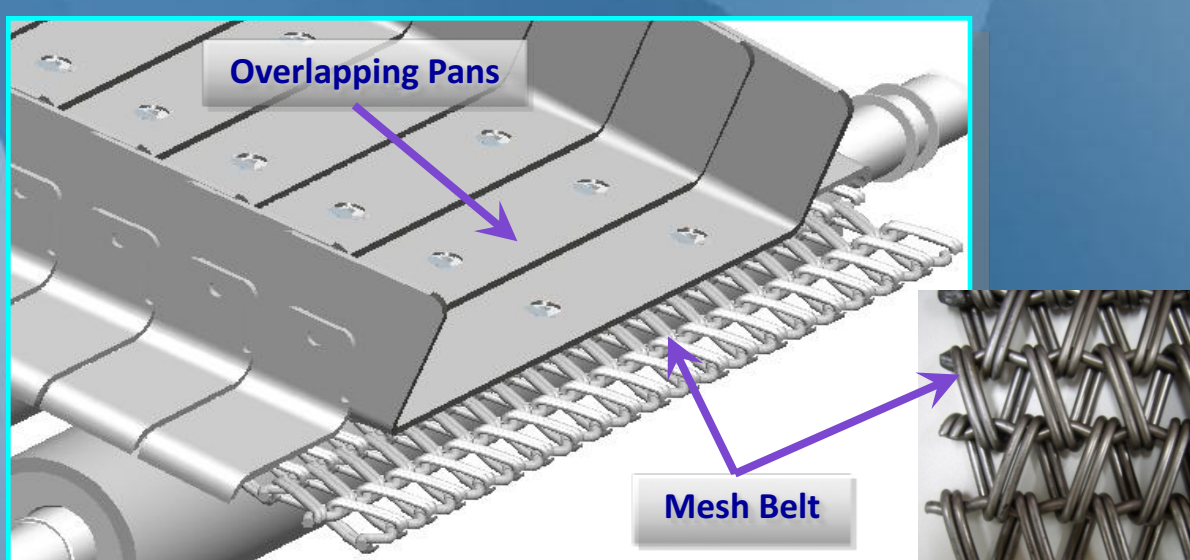
The Superbelt® is supported by carrying idlers and return idlers. The driving force is transmitted by friction between the head pulley and the mesh belt, while a pneumatic take-up device on the tail pulley provides a constant tension.



ECOBELT® WA System

The Magaldi Superbelt®: Main Features

- Damage tolerant design, multilink construction
- High temperature resistance and High tensile strength
- Free thermal expansions, with no permanent deformation
- Ability to absorb heavy impact loads
- No relative motion between ash and belt, thus no wear
- All roller bearings are installed outside the housing
- Maintenance is carried out from outside. No safety hazard for operators.



ECOBELT® WA System

The Magaldi Superbelt®: Outstanding Features

Ability to absorb
heavy shock
loads

Coal Bottom Ash Lumps



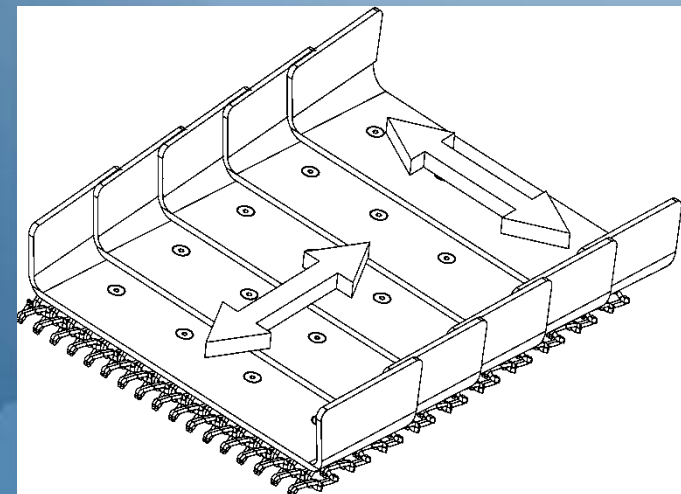
Steel Scraps



Afterburning of Unburned Residues

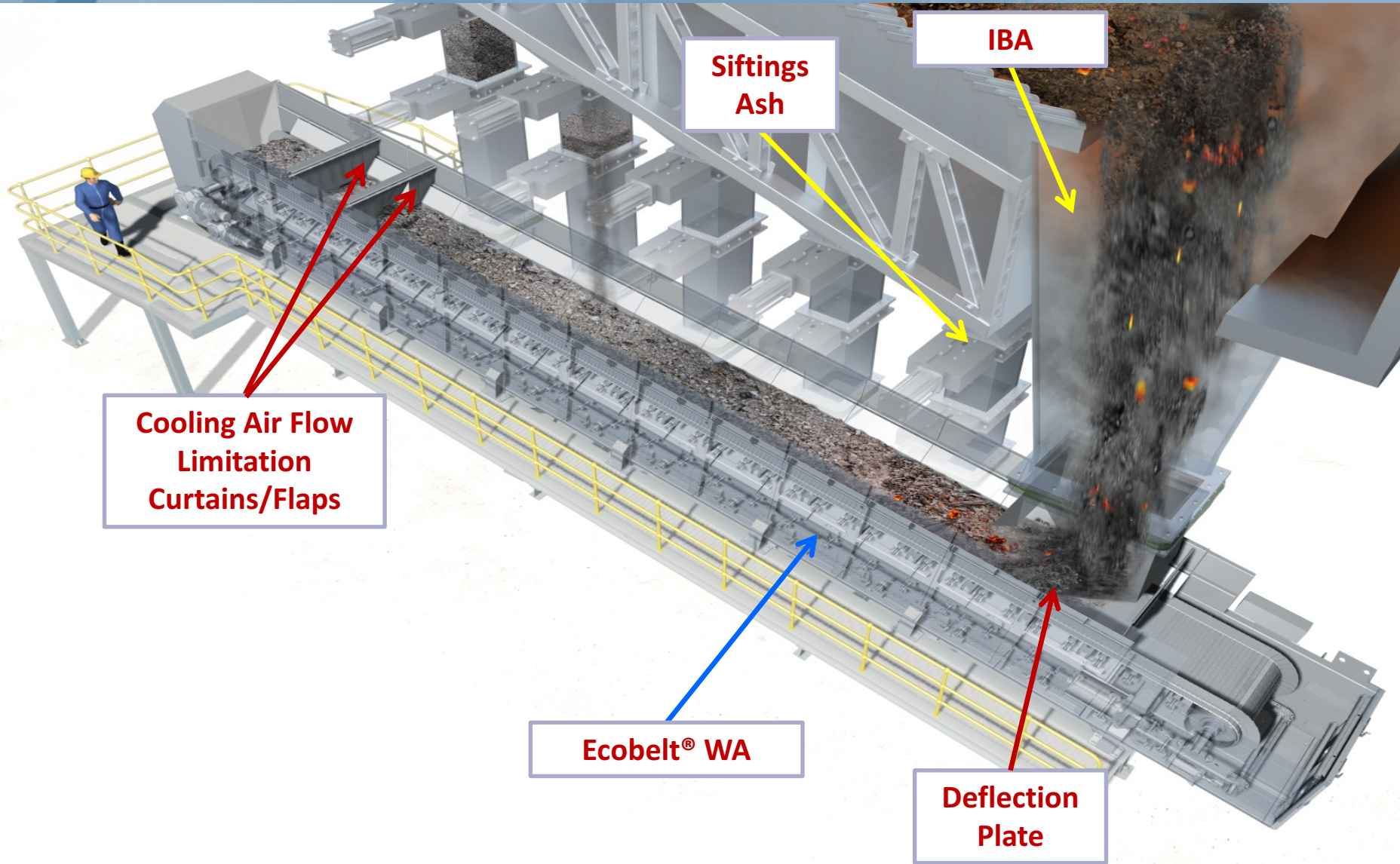


Free thermal
expansions
with no permanent
deformation



ECOBELT® WA System

Main Components



ECOBELT® WA System

Cross-sectional View

Special skirtboards are designed to contain the material on the Superbelt® and “to seal” the conveying tunnel.

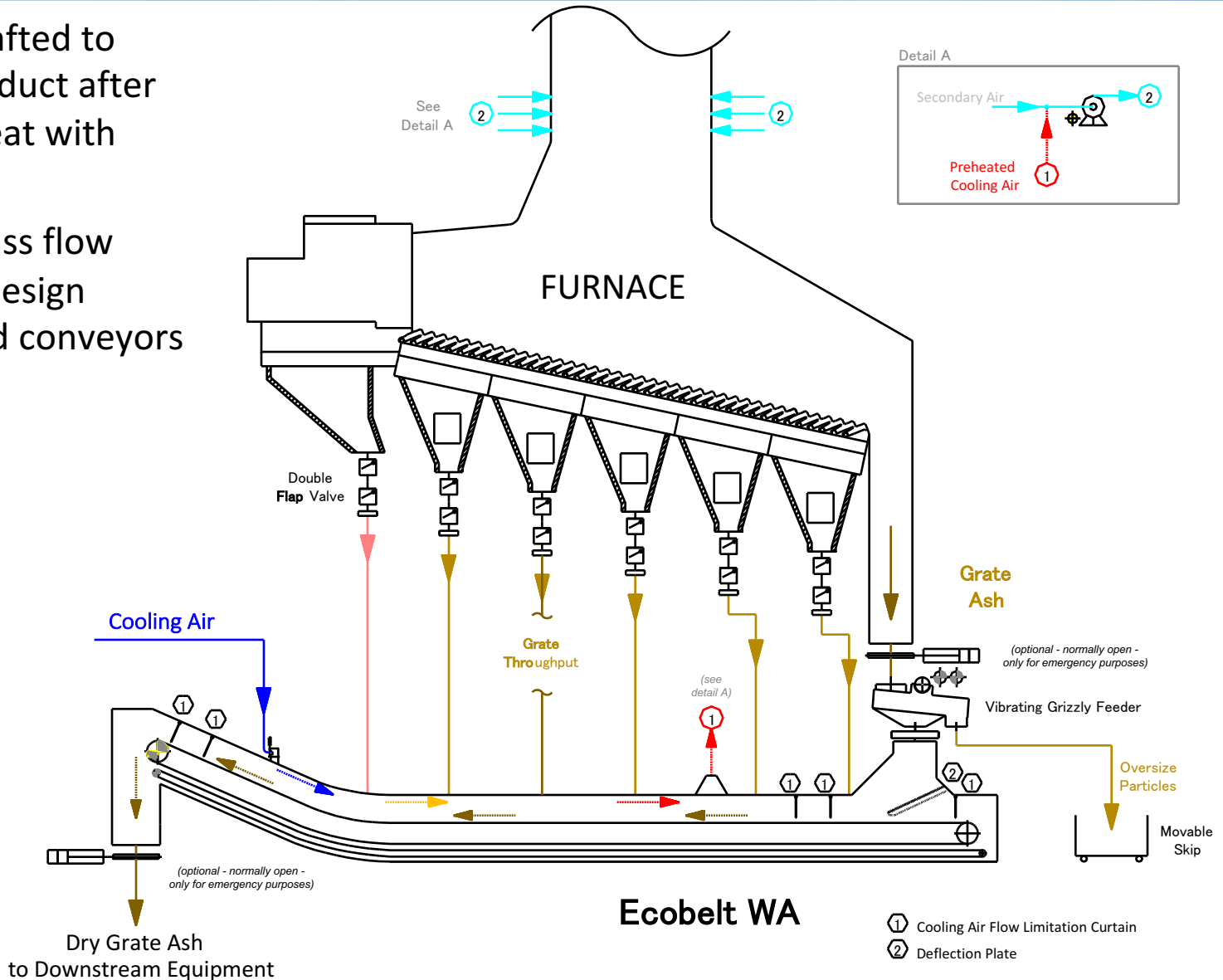
The amount of cooling air entering the furnace is limited by special curtains/flaps hinged to the conveyor covers, that allow the ash passage while preventing uncontrolled air backflow to the furnace.



ECOBELT® WA System

Configuration with Cooling Air to Secondary Air Duct

- Cooling air drafted to secondary air duct after exchanging heat with bottom ash.
- Cooling air mass flow according to design conditions and conveyors arrangement.

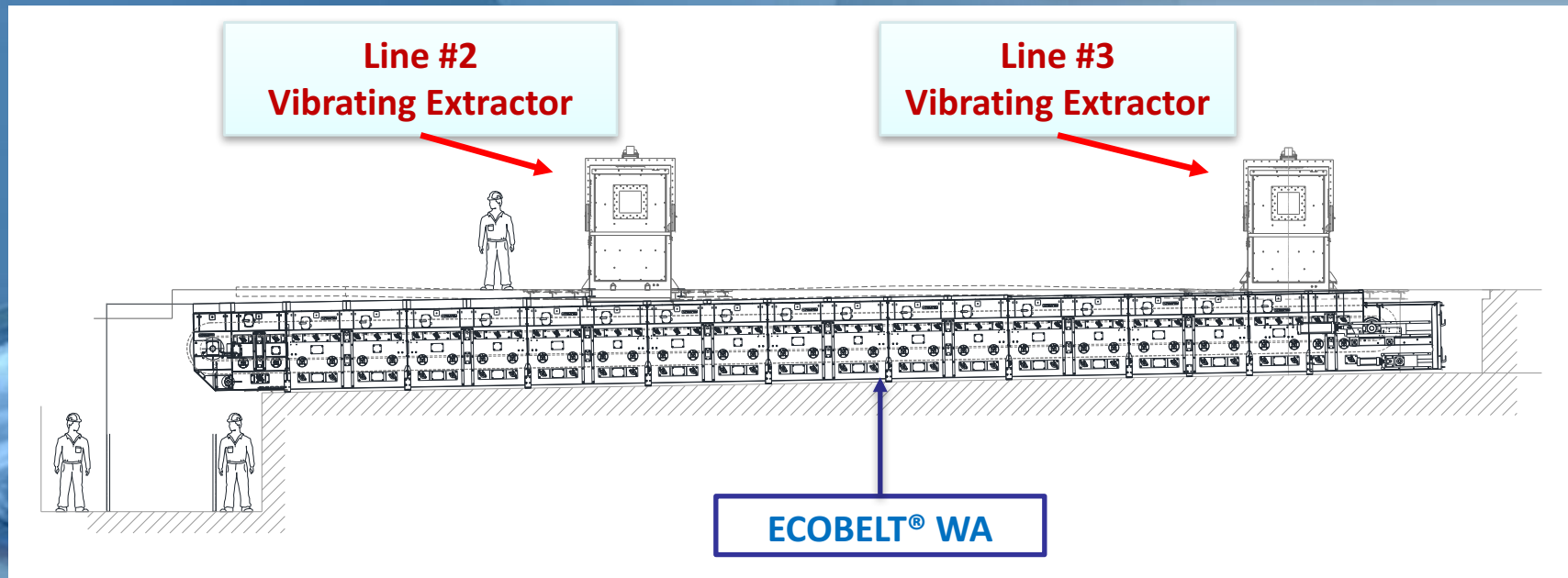


ECOBELT® WA System

Project Experience: KEZO Hinwil #2 & #3 [Hinwil, Switzerland]

The Magaldi Ecobelt® WA replaced the existing vibrating conveyors installed on the incineration lines #2 & #3.

Length	22 m
Lifting	(horizontal)
IBA Rate (Normal - Design)	2.6 - 4 t/h
Commercial Operation Date	June 2012

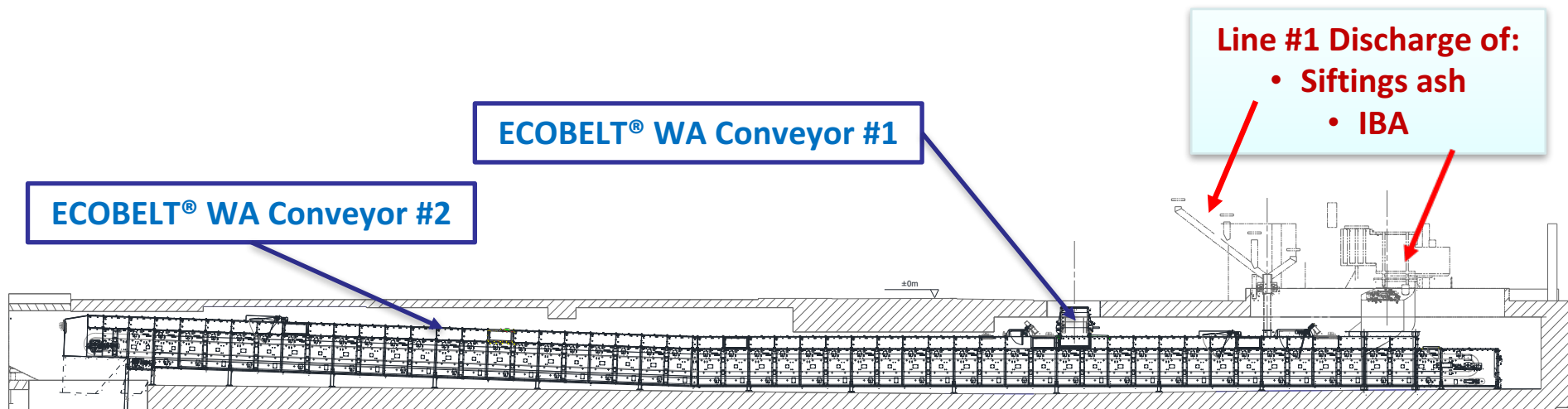


ECOBELT® WA System

Project Experience: KEZO Hinwil #1 [Hinwil, Switzerland]

After the successful operation of the Ecobelt® WA installed on the incineration lines #2 and #3, KEZO CHP Plant confirmed again the dry technology for the wet-to-dry conversion of the IBA handling system on the incineration line #1.

Length	60 m
Lifting	(horizontal)
IBA Rate (Normal - Design)	2.4 - 10 t/h
Commercial Operation Date	July 2015

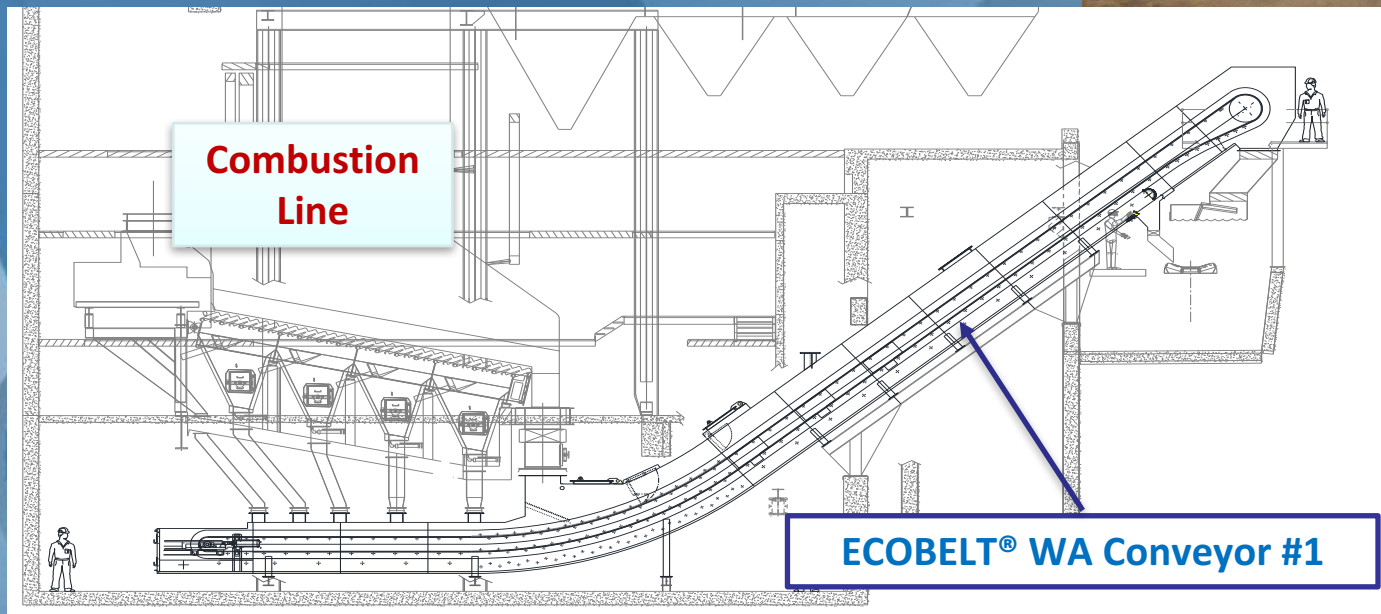


ECOBELT® WA System

Project Experience: KVA Horgen #2 [Horgen, Switzerland]

The Magaldi Ecobelt® WA replaced the existing wet Apron-based conveyor to achieve the metal separation from the dry slag produced by the incineration line #2.

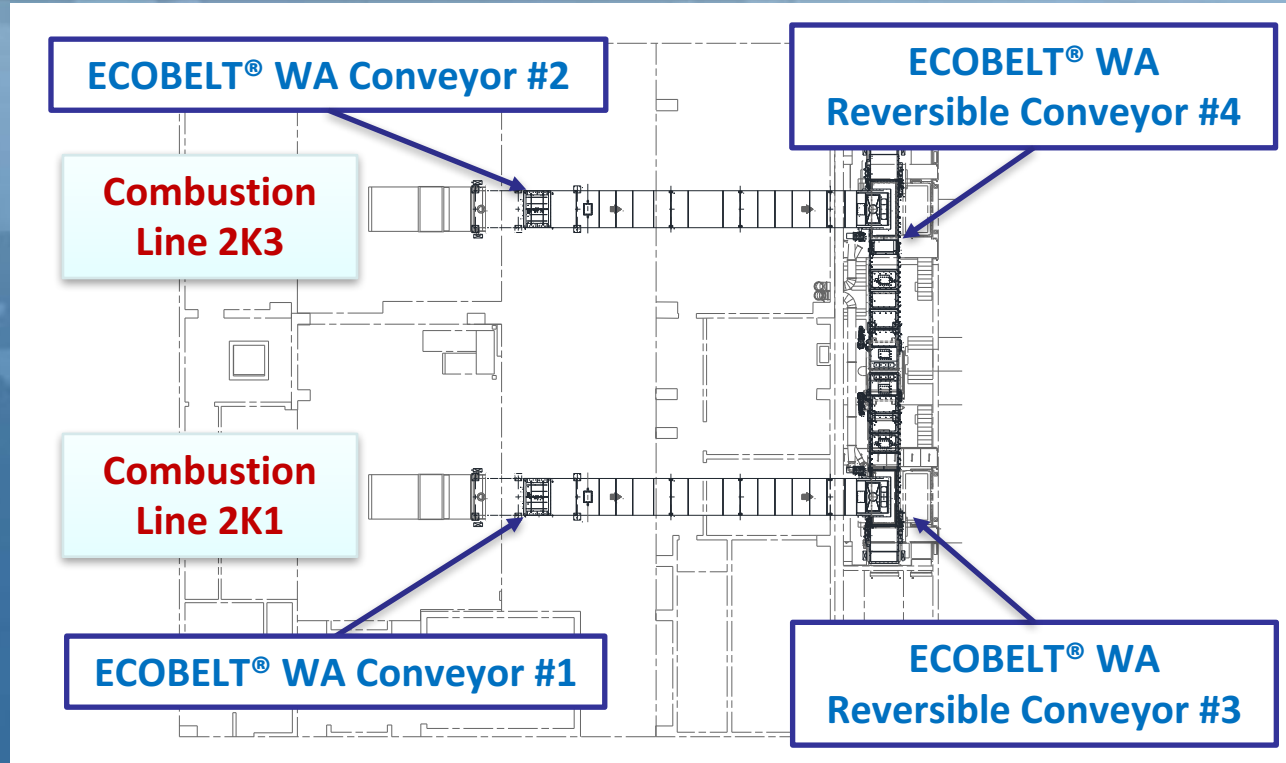
Length	30.4 m
Lifting	13 m
IBA Rate (Normal - Design)	0.9 - 5 t/h
Commercial Operation Date	July 2015



ECOBELT® WA System

Project Experience: ERZ Hagenholz #2K1 & #2K3 [Zurich, Switzerland]

The Magaldi Ecobelt® WA will replace the existing wet equipment (a vibrating feeder and a rubber belt conveyor per each line) to achieve the metal separation from the dry IBA produced by the incineration lines #2K1 and #2K3.

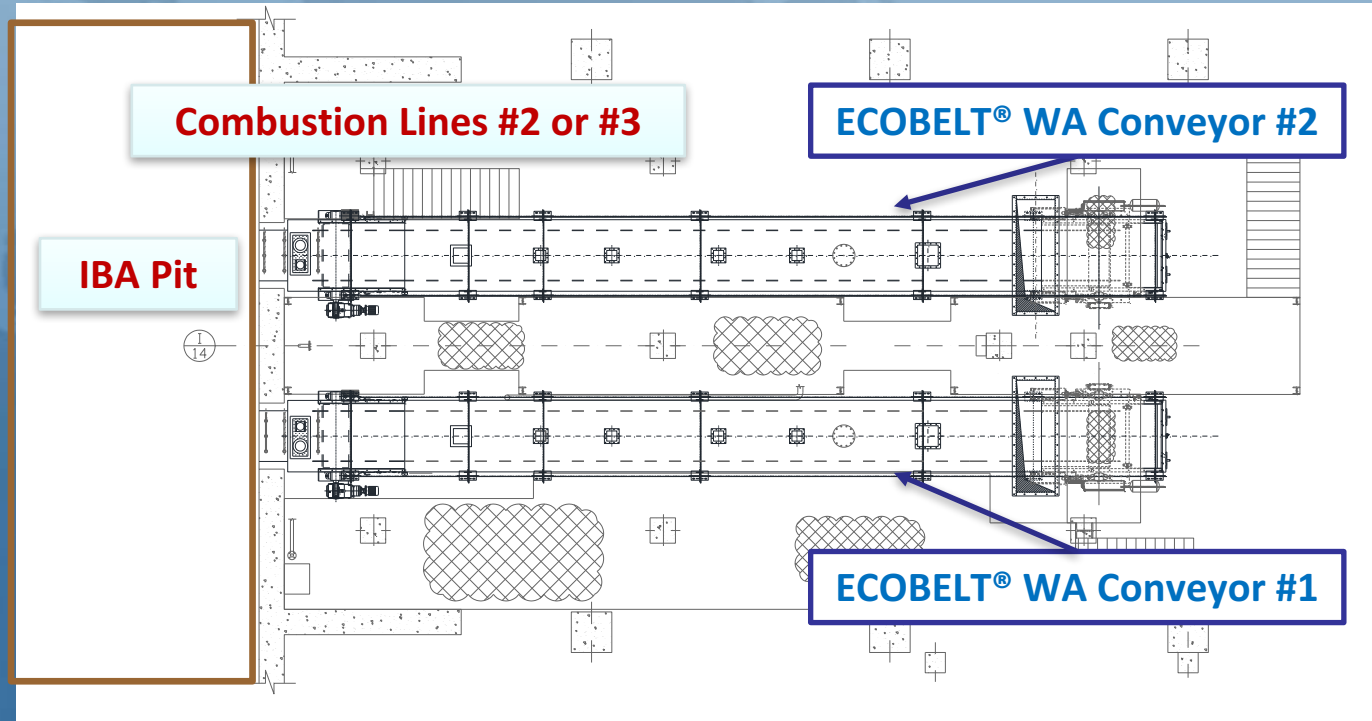


Length	22.5 m
Lifting	7 m
IBA Rate (Normal - Design)	8 - 10 t/h
Commercial Operation Date	Q4-2016

ECOBELT® WA System

Project Experience: ARIA #2 & #3 [San Vittore del Lazio, Italy]

The Magaldi Ecobelt® WA will replace the existing wet equipment (two Apron-based conveyors per each line) to handle in a dry way the bottom ash produced by the incineration lines #2 & #3 burning RDF.



Length	2 x 15.7 m
Lifting	2 m
IBA Rate (Normal - Design)	1.6 - 10 t/h
Commercial Operation Date	Q4-2016

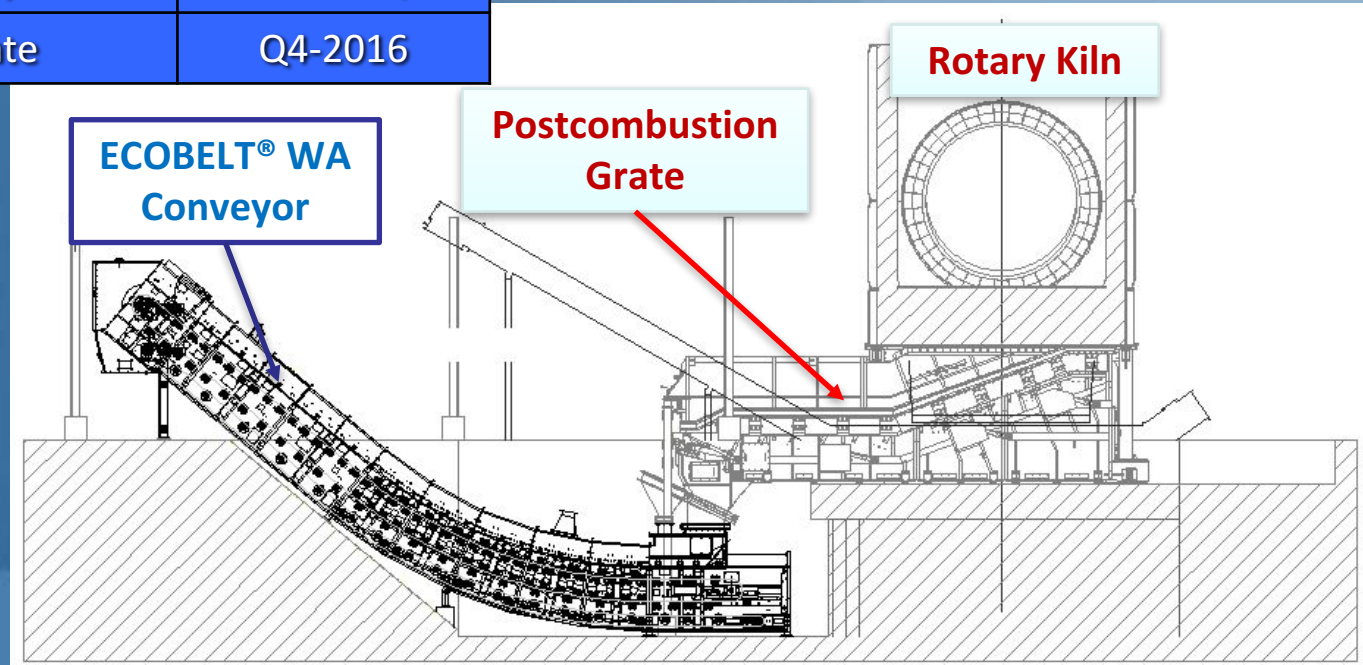


ECOBELT® WA System

Project Experience: GESPI #1 [Augusta, Italy]

The Magaldi Ecobelt® WA will replace the existing wet Apron-based conveyor to handle in a dry way the bottom ash produced by the rotary kiln #1 burning industrial and sanitary wastes.

Length	15.2 m
Lifting	6.4 m
IBA Rate (Normal - Design)	0.6 – 1.5 t/h
Commercial Operation Date	Q4-2016



ECOBELT® WA

Dry Incinerator Bottom Ash Handling System

Thank you for your attention!

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