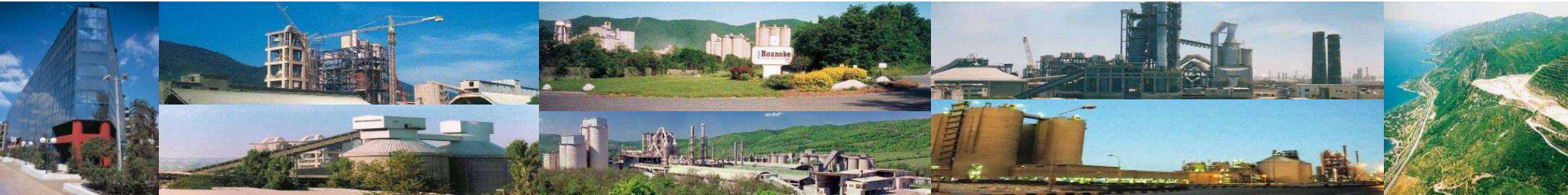




2010-2021 Environmental Improvements and Update



January 2022



2010 - 2019 TCE – IFC IMPROVEMENTS

- ESAP action plan Alexandria plant (ALX) /Beni Suef plant (BSF)
- Fugitive dust -Covered storages of materials in ALX
- Fugitive dust -Zero Spillage program initiated by ALX
- Clinker cooler filter upgrade ALX
- Emission Control Projects (All Filter Upgrade & Main Stack Gas analyzers)
- Operational Improvements- Expert Management system of kiln and RM
- Ambient air
- Visual Impact ALX
- Noise mapping ALX



2010 - 2019 ALX – IFC IMPROVEMENTS

	Budget KEGP	Implementati on year
ESAP action plan	114,002	2010-2019
Fugitive dust control-Covered storages of materials in ALX(incl fuels storage)	42,852+38,200 81,052	2017
Fugitive dust control-Zero Spillage program initiated by ALX	27,093	2017
Emission Control Projects (All Filter Upgrade & Main Stack Gas analyzers)	104,700	2019
Operational improvements -Expert Management system of kiln and RM-ALX	8,555	2018
Ambient air results	-	-
Noise measurements	150	2018
TOTAL	221,650	

2010 – 2019 BSF – IFC IMPROVEMENTS



	Budget KEGP	Implementation year
ESAP action plan	138,937	2010-2019
Fugitive dust control-Covered storages of materials, SF, in BSF	15,060	2017
Fugitive dust control-Zero Spillage program BSF	10,903	2017-2018
Emission Control Projects (Filter Upgrade & Main Stack Gas analyzers)	129,988	2017
Operational improvements -Expert Management system of kiln and RM	8,313	2018
Ambient air	1,171	2017
TOTAL	165,435	



Emission Control Projects ALX

No.	Project	Budget KEGP	Implementation year
1	Main ESP Upgrade to bag filter(ALX)	25,000	2012
2	Cement Mill 7 ESP Filter Upgrade	4,000	2014
3	Cement Mill 6 ESP Filter Upgrade	4,000	2015
4	SNCR project	7,700	2016
6	New Gas Analyzer for main stack	4,000	2017
5	Cooler Filter Upgrade	61,000	2019
Total		104,700	

BSF detailed list



Project Description	Project total cost in kEGP	Year	Status
BSF fuel storage	15,060	2017	Completed
SNCR for both lines	12,535	2017	Completed
PXP & QCX	8,313	2018	Pending L-1 commissioning
Ambient Air monitor device (2 devices)	1,171	2017	Completed
BSF-Super Sucker	6,332	2017	Completed
Gas analyzers (HCl, HF & TOC) with online connection to EEAA	6,111	2017	Completed
BSF Line 1 Filters Integration Project	111,342	2017	Completed
Road Sweeper	2,172	2018	Completed
Water dust suppression system for solid fuel storage	2,399	2017	Completed



IFC ESAP action plan

- *The Beni Suef Cement Company line 2 operations has improved its dust emission control to maintain 30 mg/Nm³ from all major emission point since end 2011. BSF line 1 will upgrade its kiln dust emission control to maintain within the limit of 100 mg/Nm³ as of end 2014 (if a complete replacement of the filters are needed the WBG guidelines for new units will be applied)*

BSF Line I filter upgrade to BF initiated operation 2016: Resulted in less than 30 MG/NM³.

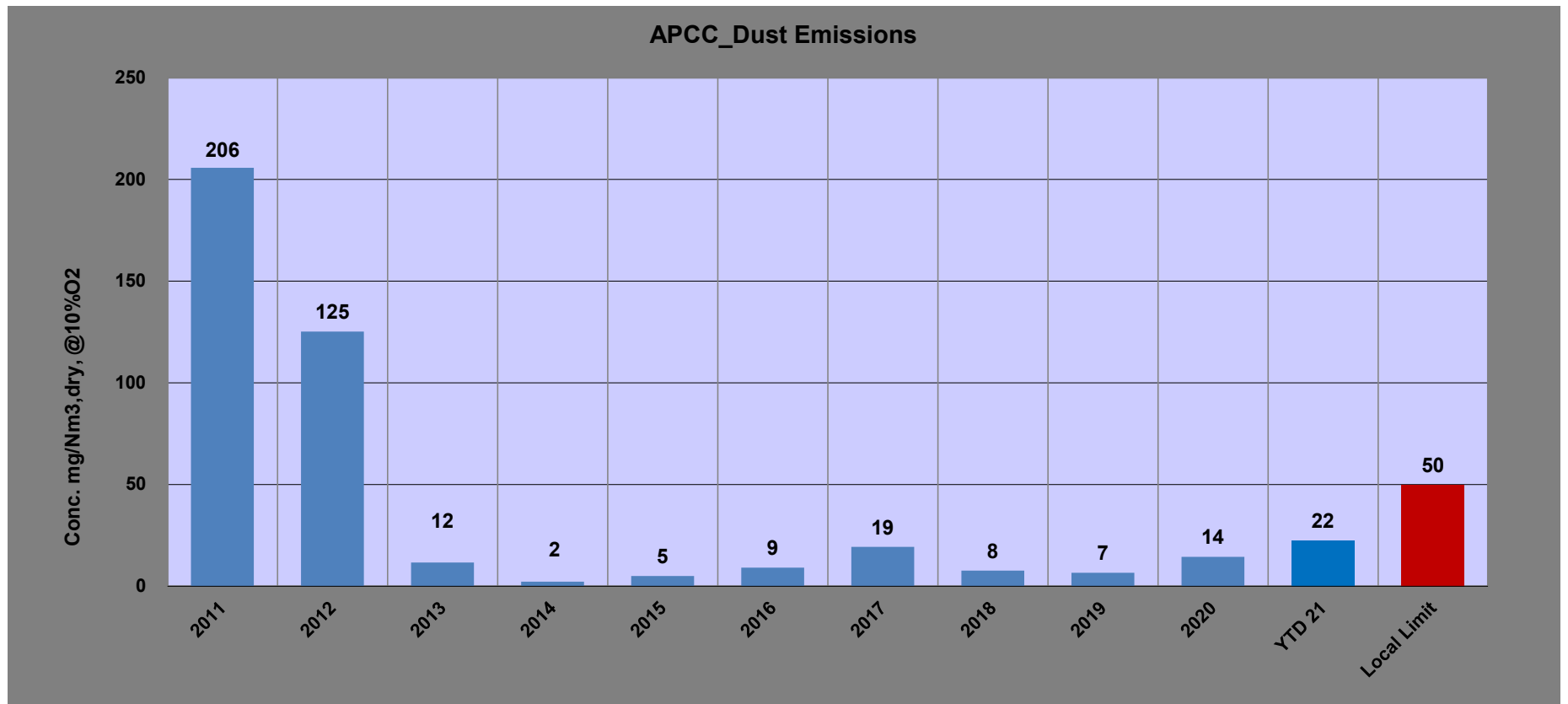
Cost 111,342 KEGP

- *Titan Egypt will upgrade the Alexandria Portland Cement Company (APCC) dust emission control during the summer 2012 to achieve 10 mg/Nm³ in main gas flow, and maintain 30-50 mg/Nm³ in the approximately 25-30% by-pass flow, resulting in final main Stack (kiln and bypass) emissions expected to meet the WBG guideline of 30 mg/Nm³ (new plants) although only 100 mg/Nm³ is required for compliance (existing plant).*

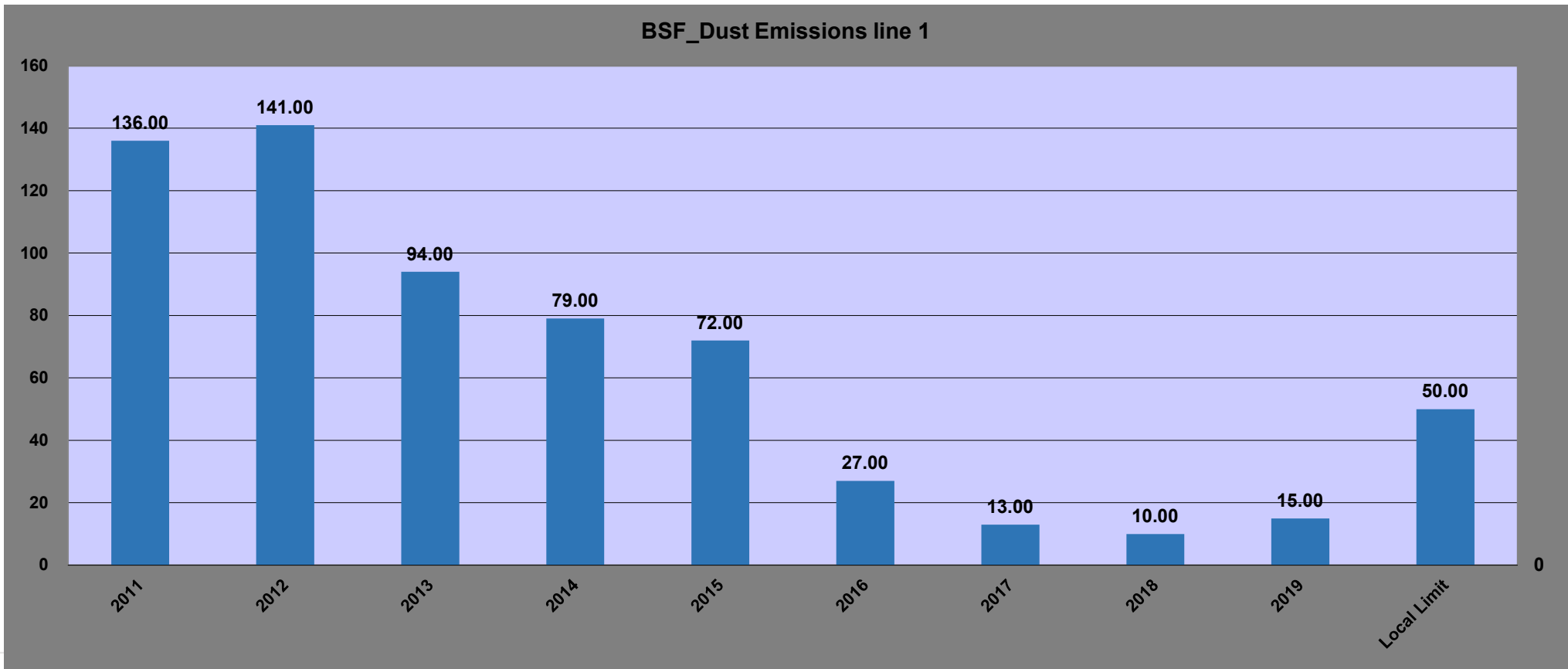
ALX Kiln filter upgrade to BF initiated operation 2012 : Resulted in less than 30 mg/nm³ for a full year of 2013.

Cost : 25.000 KEGP

ALX Dust Emissions



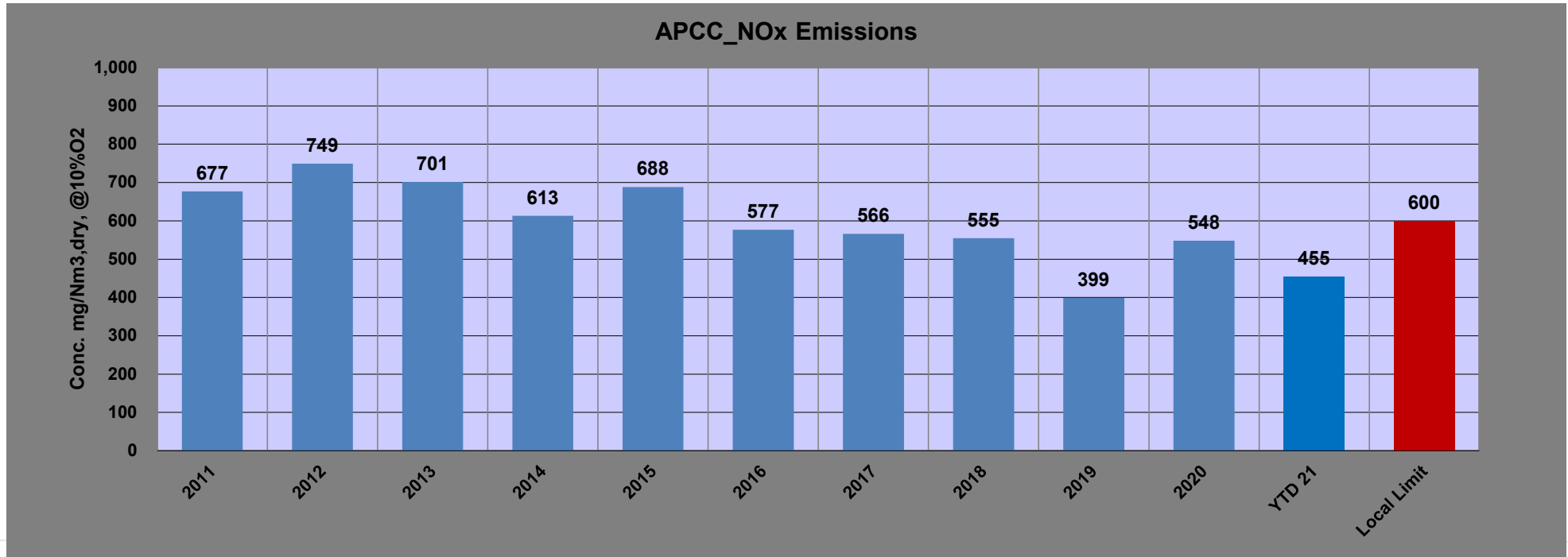
BSF Dust Emissions





IFC ESAP action plan

- APCC has experienced increasing NOx emission during the period 2008-2011. Initiatives are to be taken for relocating/replacing the secondary burners to achieve compliance with initial emission limits and WBG guidelines for NOx (600 mg/Nm³)
*SNCR installed in all **3 kilns of TCE** in 2015 stabilizing the NOx at less than 600 mg/NM³.*





IFC ESAP action plan

- *APCC has since 2010 removed old non-operational cement manufacturing lines and hereby created open areas within the production site. These areas have been used for open air storage of raw material during a period of transport interruptions. Such open air storage can cause diffuse emissions and APCC will develop a material handling plan, which will ensure that both active and non-active materials will be either covered or coated to be secured against fugitive dust.*

7 covered storages were installed for Gypsum, clinker, limestone, iron ore, 2 Clay storages, feeding points of CEM 8,9 cost : 42,852 KEGP. In operation all (see page 17)



IFC ESAP action plan

- Both the BSCC and APCC plants have experienced changed access to their raw material situation over the past two years. This has been due to activities out of control of BSCC and APCC (for example execution of right of way for a highway corridor). As a result BSCC and APCC are now examining and developing new raw material and quarrying plans. The new plans have to cover all existing active quarries and future quarries and shall include:
 - Raw material utilization plans, including:
 - A full quarry plan with maximum utilization of available raw materials (including blending needs) and with expected contours at end of quarry life indicated,
 - a five year (rolling) extraction plan,
 - detailed extraction plans for the next 12 months, and
 - Appropriate benching to allow, where applicable for rehabilitation and replanting.
 - The rehabilitation shall be part of daily operation and resulting in full rehabilitation at the end of operational life.

Mine Plan & Rehabilitation Plan Studies completed in the period 2013-2016 for all active quarries of APCC (Q#1 Limestone, Q#2 Limestone, Q#3 Limestone, Kassimeya Limestone, Wadi El Natroun Clay and Hammam Marl) and BSCC (Bayad Limestone, Clay 1, Clay 2 and Sand).

The studies covered all required items of the ESAP: annual extraction plan, 5-y mine plan and final plan at end of quarry life, as well as progressive and final rehabilitation plan.

IFC ESAP action plan



- *Both the BSCC and APCC plants have experienced natural gas shortages and have applied for the use of solid fuel, in addition to continue working on a plan to increase the use of alternative fuels (RDF and DSS). The transition to solid fuel has required the application for environmental permits, following an EIA process, per national requirements. The use of coal and pet coke has started in BSCC where a coal mill is operational and a second one is being constructed. The use of pulverized pet coke has started in APCC. A coal mill will be installed following permitting completion. Both BSCC and APCC will implement the regulatory requirements and good international industry practice to ensure safe operations, compliance with emission limits, and minimization of fugitive dust from the solid fuel storage areas.*

Covered /wind breaker storages for raw solid fuels have been constructed, state of the art, for both plants , in operation since 2016.

Alex Coal Storages 38,200 KEGP (21,000 KEGP for the Daily storage + 17,200 KEGP for the Main storage)

BSF Coal Storages 15,060KEGP



IFC ESAP action plan

- *BSCC and APCC are both located in areas where ambient monitoring of air quality would not reflect their emission control performance. Instead BSCC and APCC will ensure full compliance for point sources and prevent fugitive emission and make control data available to stakeholders.*
- Actual emissions are being disclosed on the web-portals of BSCC and APCC, showing the facilities actual emission control compliance, and allowing stakeholders to follow the performance. Continuous Emission Monitoring Systems (CEMs).
- Ambient air quality is measured on quarterly basis and submitted to authorities.
- APCC quarter average emissions are posted on the Company's web site starting from end of July 2016.
- Currently, SO_x, NO_x, dust emission, and water consumption is available on Web for both plants.
- Quarterly average emission data and water consumption for BSCC are being published starting from Q1 2017.

Control fugitive dust

Housekeeping Improvement



Control Fugitive dust



Sustain the Housekeeping by continuous cleaning using the new super sucker & Road sweeper



Repainting and Graffiti arts



Increasing the Green Areas 2000 m2





Covered storage raw materials & Fuels

- I. Covered Storages for Raw Materials & Clinker*
- II. Covered Storages for Solid Fuels*

Coverage Storage Projects ALX



No.	Project	Budget KEGP	Implementation year
1	Limestone Coverage Storage 1	840	2010
2	Clay Coverage Storage 1	1,166	2011
3	Clay Coverage Storage 2	2,051	2013
4	Coverage of external feeding point for cement mill 8&9	2,087	2016
5	Gypsum coverage Storage	5,000	2017
6	Iron Oxide coverage Storage	5,000	2017
7	Clinker coverage storage	26,708	2017
Total			42,852



Covered/wind breaker storages of SF in ALX-BSF

No	Project	COST (KEGP)	Implementation year	Progress
1	BSF solid fuels storage	15,060	2017	COMPLETED
2	ALX solid fuel daily storage	21,000	2016	COMPLETED
3	ALX solid fuel storage	17,200	2019	COMPLETED

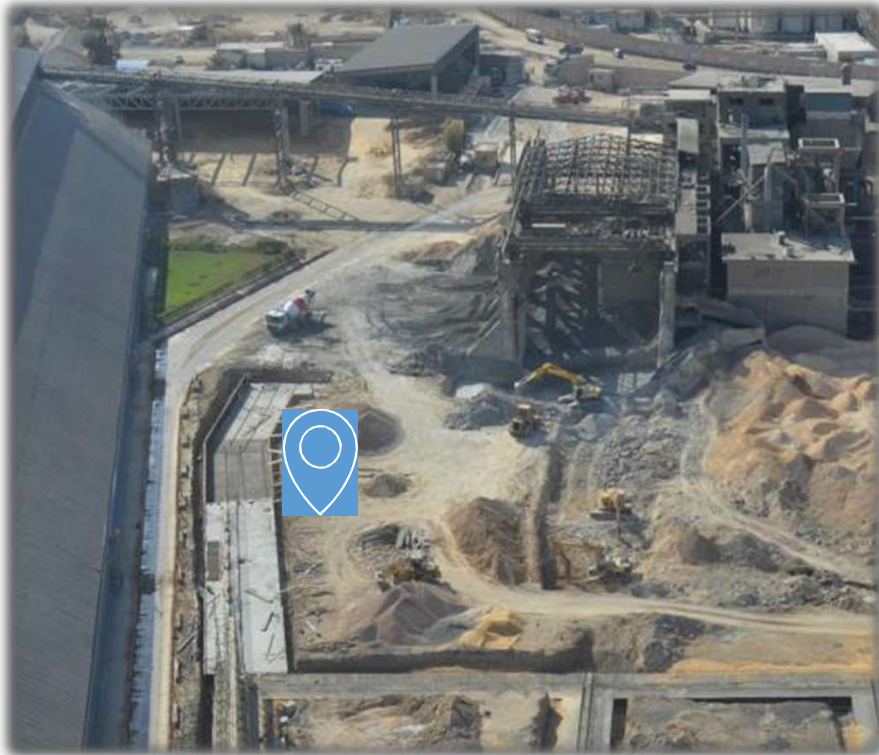
Covered storages Projects ALX



1&2. Gypsum coverage Storage & Iron Oxide coverage Storage



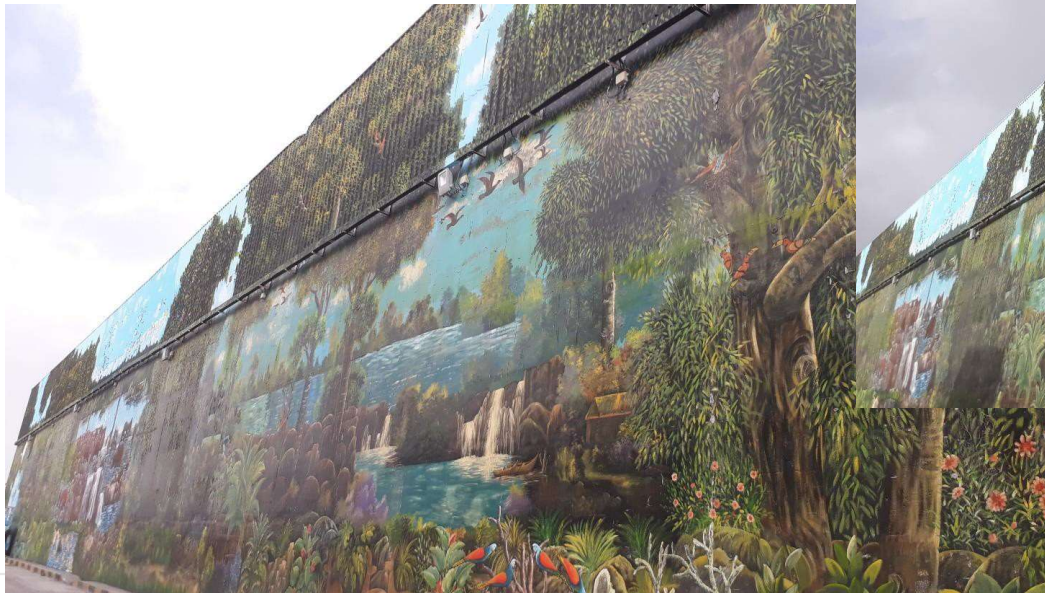
3. Clinker coverage storage





ALX Daily Solid Fuel Storage Project

Daily operation covered storage inside the plant



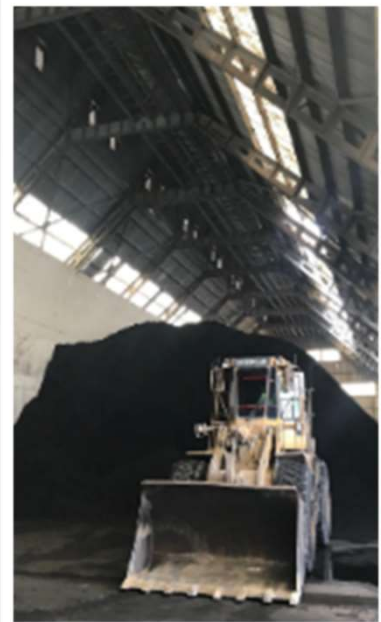
ALX Solid Fuel Storage Project

Daily operation covered storage inside the plant

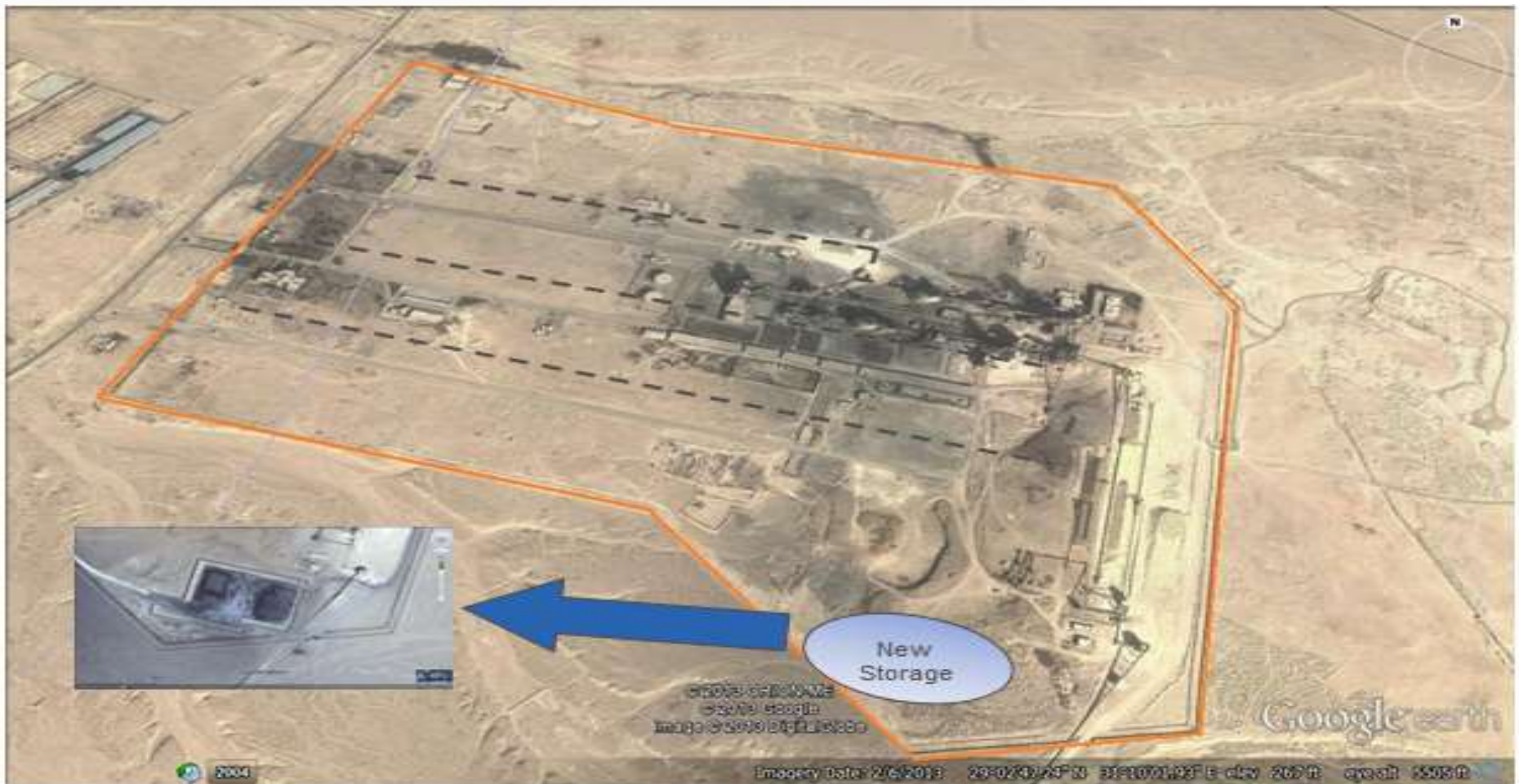


ALX Solid Fuel Storage Projects

2: New covered storage inside the plant (main storage):



BSF Solid Fuel Storage Project



BSF Solid Fuel Storage Project



Solid Fuel Storage Progress



BSF Solid Fuel Storage Project



Projects	Current Statues
<p>Solid Fuel Storage Yard</p> <p>Total Capacity : 50,000 ton</p> <ul style="list-style-type: none">- Total Area : 18,000 m²- Concrete Base- 4 Sides Wind Breaker- 3 High mast towers- Drainage System	<p>DONE</p>



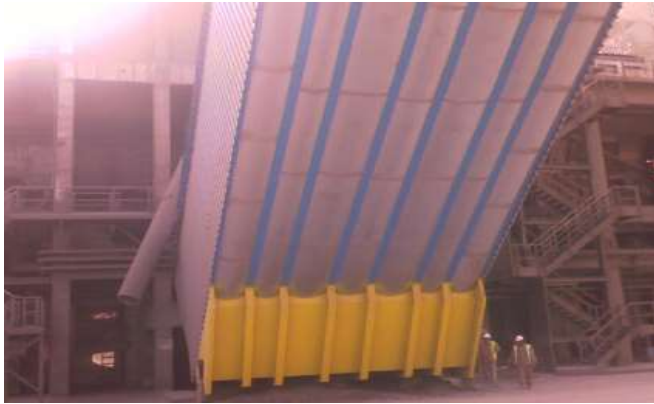
Zero Spillage program initiated by ALX

The implemented Projects:



No.	Project	Budget KEGP	Implementation year
1	Cladding for underneath of Clinker conveyers	591	2009
2	Cladding for cooler area	227	2011
3	Cladding for the back side of the plant at the boundary with Wadi Elkamar	1,658	2012
4	Stationary vacuum cleaner for Raw mill building	1,626	2013
5	Cladding for clinker Conveyer (pan 07 & 08)	1,058	2014
6	Cladding for clinker silo bag filters area, preheater, clinker feeder.	5,255	2014
7	Ramp and Coverage of Limestone feeding point	6,744	2014
8	Dust Suppression system for Reclaimer.	670	2015
9	Telescopic Chute for Bypass & Clinker off-spec Silo	84	2015
10	Road sweeper for the plant.	2,400	2017
11	ATEX Super sucker.	6,780	2017
Total		27,093	

Zero Spillage program initiated by ALX Cladding Projects





ATEX Super Sucker Truck





New Road Sweeper



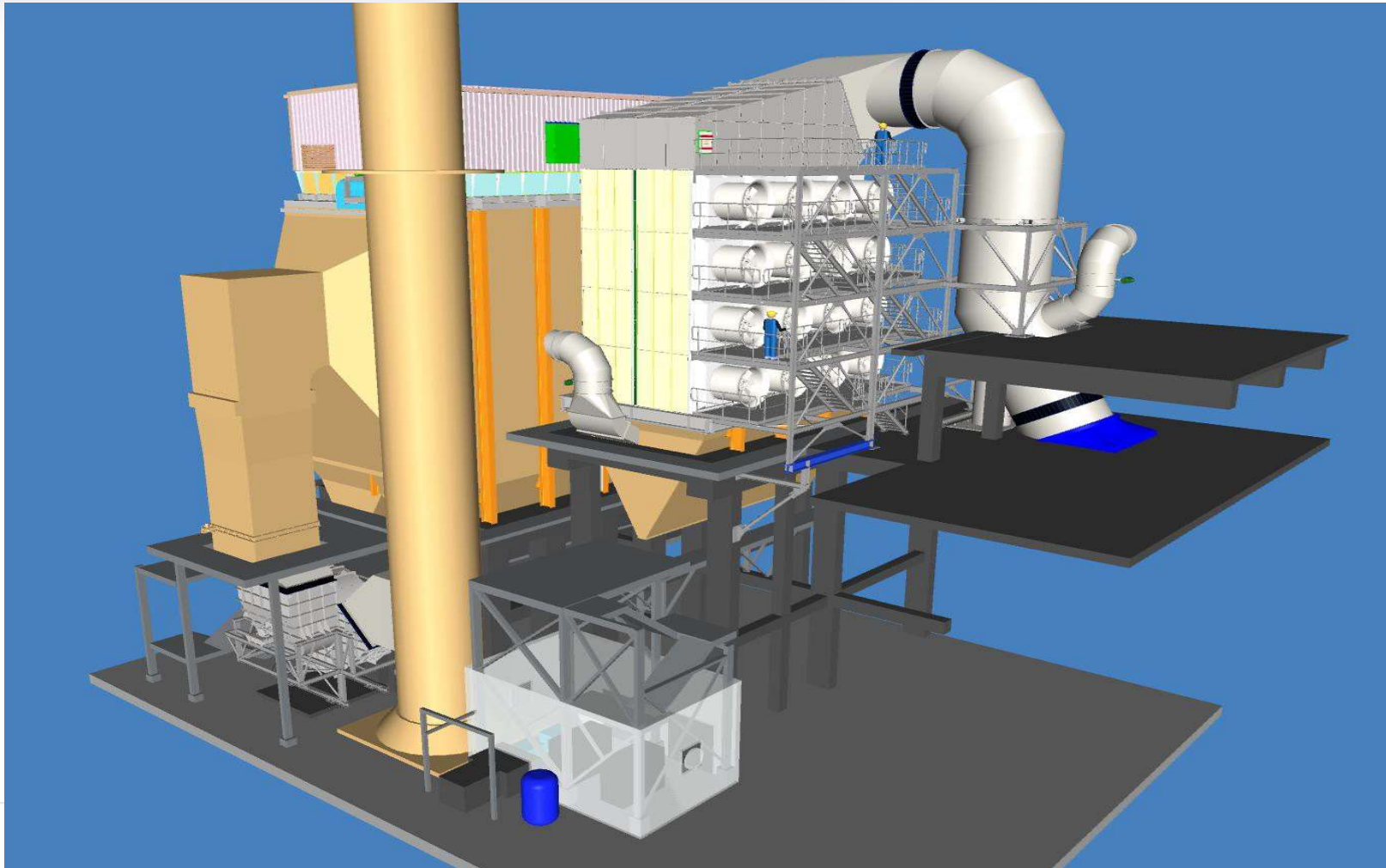
Packing Stationary Vacuum Cleaner



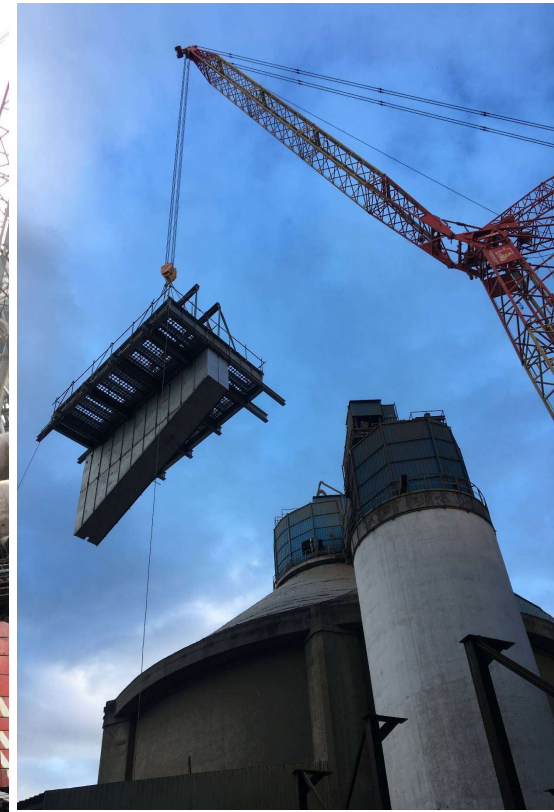
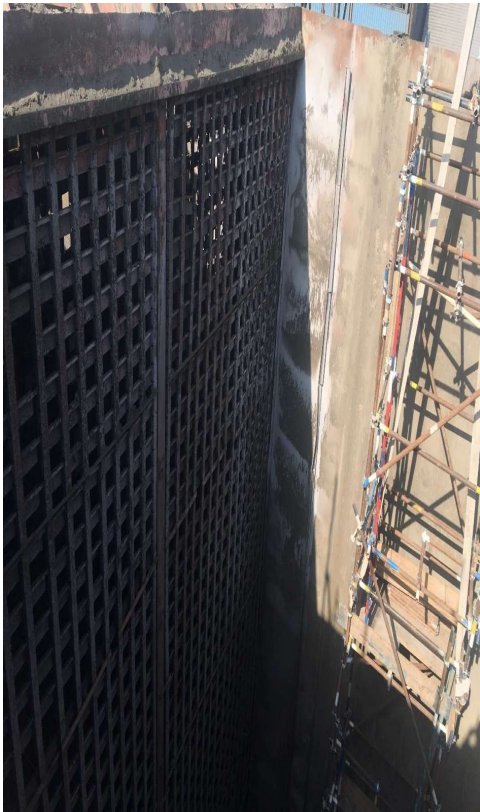
Increase Green Areas



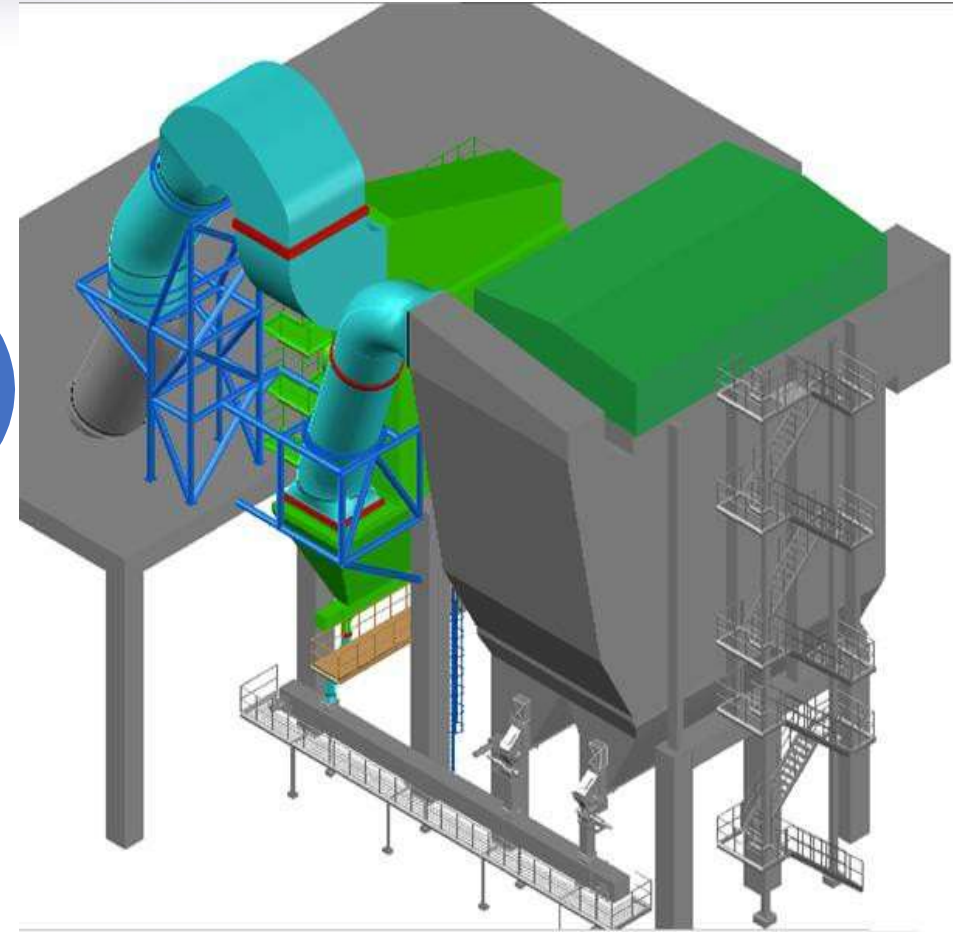
Cooler filter upgrade Project



Cooler filter upgrade Project



Filter Hot commissioning 7 th of January 2019



Adding Heat Exchanger after the cooler

Upgrade the existing ESP to Bag House



Dust emission
today > 100
mg/Nm³ dry

Dust emission
after upgrading
<5 mg/Nm³ dry



OPERATIONAL IMPROVEMENTS Control for Cooler Stack during upset condition

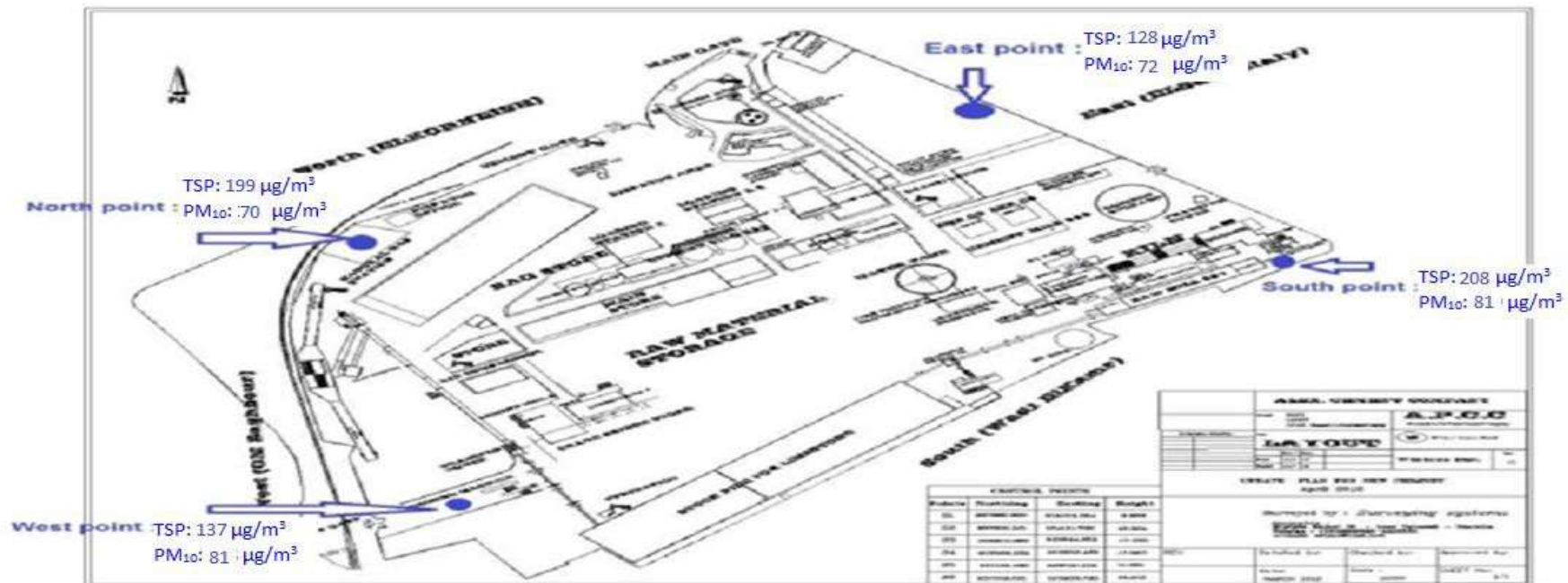
- *Improve kiln operation to minimize emissions. Done*
- *Optimize the PID for controlling the Cyclone 4 temperature. Done*
- *Stabilize the raw materials as possible using the new quarry of Gharbanayt . Done*
- *Install a fuzzy control system for optimum operation of the pyro line.... 2018. Done*
- *New CAPEX approved (3.6 m Euro) to upgrade the cooler filter to bag house...2018 Done*

ALX Ambient Air Measurements



Alex Plant-IFC vis

APCC Boudary Measurements



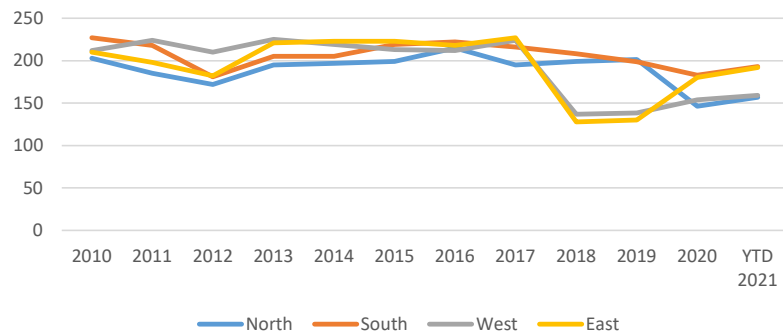
ALX Ambient air



APCC Abient Measurements

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	YTD 2021	Limit
TSP													
North	203	185	172	195	197	199	215	195	199	202	146	157	230
South	227	218	181	205	205	219	222	216	208	199	183	193	230
West	212	224	210	225	219	213	212	224	137	139	154	159	230
East	210	198	182	221	223	223	218	227	128	130	180	192	230
PM10													
North	No Measurements / No Available data							121	70	66	74	78	150
South								135	81	81	87	89	150
West								137	80	82	76	79	150
East								142	72	74	85	87	150

TSP



PM10

