

ANNEX II – EMISSION REDUCTION TARGETS

The emission reduction targets established in this document are the result of findings observed in the field, analysis of documents, and the criteria established for the analysis; IEMA may request other joint actions for the solution of issues reported herein.

Storage yards – CASP

Short term targets:

1. To carry out the control of vehicles entering the yard with identification, type and quantity of material being transported. **Time Limit: 12 months.**
2. To install, operate and maintain a wheel washing system, or any other system equally or more efficient at the exit of all yards to prevent dragging of material to external areas. **Time Limit: 12 months.**
3. To install a physical structure to define the piles with a permanent and visible identification of the materials for inspection. **Time Limit: 12 months.**
4. To install permanent and visible markers at the maximum height of the material piles for inspection. **Time Limit: 12 months.**
5. To adjust the yard spraying system, to ensure there are no fugitive emissions caused by the wind. **Time Limit: 12 months.**
6. To implement air pollution control measures for transfer car tips and nozzles cleaning yard operations. **Time Limit: 12 months.**
7. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter , preferably limiting the height of fall to 0.5m whenever possible. **Time Limit: 12 months.**
8. To ensure dump truck transporting raw material in bulk and finished products are covered and watertight preventing leakages and fugitive emissions in loading, transport and unloading operations. **Time Limit: 12 months.**

9. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter . **Time Limit: 12 months.**

Long term targets:

10. To install and maintain the paving and rainwater drainage systems of all roads used by vehicles transporting materials to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
11. To install wind fences, or any other measure of equal or higher efficiency, to reduce fugitive emissions resulting from wind blowing on the piles. **Time Limit: 05 years.**

Coal handling and storage yards

Short term targets:

12. To adjust the pile spraying system to ensure there is no dragging by the wind. The use of polymers or another material of equal or higher efficiency is indicated. **Time Limit: 12 months.**
13. To adjust the spraying system for yard roads to ensure there is no resuspension of dust resulting from traffic of vehicles and fugitive emissions caused by the wind. **Time Limit: 12 months.**
14. To install a physical structure to define the piles with a permanent and visible identification of the materials for inspection. **Time Limit: 12 months.**
15. To install permanent and visible markers at the maximum height of the material piles for inspection. **Time Limit: 12 months.**
16. To install, operate and maintain a wheel washing system, or any other system with equally or more efficient at the exit of all yards to prevent dragging of material to external areas. **Time Limit: 12 months.**
17. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter , preferably limiting the height of fall to 0.5m whenever possible. **Time Limit: 12 months.**

18. To ensure dump truck boxes transporting raw material in bulk and finished products are covered and watertight preventing leakages and fugitive emissions in loading, transport and unloading operations. **Time Limit: 12 months.**

Long term targets:

19. To install, operate and properly maintain the trays, side containment and cover of coal belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**
20. To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system – including transfer points between belts, hoppers and bins, to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 05 years.**
21. To install and maintain rainwater drainage systems of all roads used by vehicles transporting materials for storage, to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
22. To install wind fences, or any other measure of equal or higher efficiency, to reduce fugitive emissions resulting from wind blowing on the piles. **Time Limit: 04 years.**

Ore handling and storage yards

Short term targets:

23. To adjust the operating system and the double spraying systems with sprinkling before the entrance and during the dumper car operation to ensure there are no fugitive emissions during the operation. **Time Limit: 12 months.**
24. To adjust the pile spraying system in the yards to ensure there is no fugitive emissions caused by the wind. **Time Limit: 12 months.**
25. To adjust paved roads spraying system to ensure there is no resuspension of dust resulting from traffic of vehicles and fugitive emissions caused by the wind. **Time Limit: 12 months.**

26. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter , preferably limiting the height of fall to 0.5m whenever possible. **Time Limit: 12 months.**

Long term targets:

27. To install, operate and properly maintain the trays, side containment and cover of raw material fines belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**
28. To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system – including transfer points between belts, hoppers and bins, to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 05 years.**
29. To install and maintain the paving and rainwater drainage systems of all roads used by vehicles transporting materials to storage areas to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
30. To install wind fences, or any other measure of equal or higher efficiency, as a main measure to reduce fugitive emissions resulting from operation and wind blowing on the piles. **Time Limit: 05 years.**

Sinter Yards

Short term targets:

31. To install a physical structure to define the piles with a permanent and visible identification of the materials for inspection **Time Limit: 12 months.**
32. To install permanent and visible markers at the maximum height of the material piles for inspection. **Time Limit: 12 months.**
33. To install a controlling system for vehicles entering the yard with identification, type and quantity of material being transported. **Time Limit: 12 months.**
34. To install and/or adjust a wheel washing system, or any other system with equally or more efficient at the exit of all yards to prevent dragging of material to external areas. **Time Limit: 12 months.**

Other materials handling and storage yard (including emergency yards)

Long term targets:

35. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter , preferably limiting the height of fall to 0.5m whenever possible. **Time Limit: 03 years.**
36. To carry out transport/transfer, dumping, loading and unloading operations in a way to ensure there are no emissions of particulate matter . **Time Limit: 03 years.**
37. To install, operate and properly maintain the trays, side containment and cover of belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**
38. To install the paving and rainwater drainage systems of all roads used by vehicles transporting materials to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
39. To adjust the air emission control equipment for slag processing activities (cooling, crushing and screening). **Time Limit: 03 years.**
40. To install wind fences, or any other measure of equal or higher efficiency, as a main measure to reduce fugitive emissions resulting from operation and wind blowing on the piles and operate and maintain the green belt around all powdered materials storage yards as an additional measure. **Time Limit: 05 years.**

Belt conveyors (in general)

Medium term targets:

41. To identify all belt conveyors with the respective material transported in a visible way for inspection. **Time Limit: 24 months.**

Long term targets:

42. To install, operate and properly maintain the trays, side containment and cover of belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**
43. To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material, with an emission collecting and controlling to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 05 years.**
44. To adjust belt trippers installing an emission collecting and controlling system proper to its operation. **Time Limit: 02 years and 07 months.**

Briquetting

Short term targets:

45. To adjust a pile spraying system to ensure there is no dragging by the wind. **Time Limit: 12 months.**
46. To install a physical structure to define the piles with a permanent and visible identification of the materials for inspection. **Time Limit: 12 months.**
47. To install permanent and visible markers at the maximum height of the material piles for inspection. **Time Limit: 12 months.**
48. To adjust the spraying systems of all yard roads to ensure there is no resuspension of dust caused by the traffic of vehicles and wind. **Time Limit: 12 months.**
49. To implement periodic maintenance and cleaning on the operating equipment as well as air pollution control equipment. **Time Limit: 12 months.**
50. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter. **Time Limit: 12 months.**

Medium term targets:

- 51. To carry out revamping and/or replacement of air pollution control equipment presenting deterioration. **Time Limit: 02 years.**
- 52. To install an efficient collecting system for operation generated gases. **Time Limit: 02 years.**

Coal bins (Conventional Coke Plant)

Short term targets:

- 53. To adjust coal dispenser bins and storage towers to ensure there are no fugitive emissions. **Time Limit: 12 months.**
- 54. To cover all transfer points between chutes belts, hoppers and bins, kept in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system – including transfer points between, to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 12 months.**
- 55. To install, operate and properly maintain the trays, side containment and cover of belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 12 months.**

Medium term targets:

- 56. To check and adjust the air pollution control equipment in coal handling, crushing and transport operations to ensure there are no emissions resulting from non-conformities. **Time Limit: 02 years.**
- 57. To adjust the cover and side protections of the coal bin to minimize the action of the wind and fugitive emission. **Time Limit: 02 years.**

Conventional coke plant

Short term targets:

- 58. To have the company present a descriptive document detailing the emissions from the refractory heating system, including a process flowchart indicating the emission points. **Time Limit: 12 months.**
- 59. To adjust hoppers, screens and coke handling bins to ensure there are no fugitive emissions. **Time Limit: 12 months.**
- 60. To adjust the area drainage network to prevent water accumulation on the ground. **Time Limit: 12 months.**
- 61. To adjust the maintain the charging machines sealing system as well as the pollution emission control system to ensure there are no fugitive emissions during the coal charging operation in the batteries. **Time Limit: 10 months.**

Medium term targets:

- 62. To carry out maintenance in the ovens, doors, charging holes, ascending pipes and other Conventional Coke Plant battery components, including structure and masonry to ensure there are no air emissions, as well as no fall of material on the ground, structure or equipment in the following operations: coal charging, coal coking, and coke pushing. **Time Limit: 02 years.**
- 63. To adjust the coke pushing operation with the hot car in the batteries, to a proper operation and maintenance of the air pollution control system to ensure there are no fugitive emissions. **Time Limit: 02 years.**

Long term targets:

- 64. To adjust the transfer of coke from pushing to quenching operation in order to ensure there are no fugitive emissions. **Time Limit: 05 years.**
- 65. To adjust sealing of all doors, charging holes, ascending pipes and other coke battery components to ensure there are no fugitive emissions. **Time Limit: 4 years and 3 months.**

Heat Recovery Coke Plant

Short term targets:

66. To carry out maintenance in the ovens, doors, ducts and other Heat Recovery battery components, including structure and masonry to ensure there are no emissions , as well as no fall of material on the ground, structure or equipment in the following operations: coal charging, coal coking, and coke pushing. **Time Limit: 12 months**

Long term targets:

67. To adjust the pusher-charging machines (PCM) sealing system to ensure there are no fugitive emissions during the coal charging operation in the Heat Recovery batteries. **Time Limit: 04 years and 10 months.**
68. To adjust the hot car sealing system to ensure there are no fugitive emissions during the coke pushing operation in the Heat Recovery batteries. **Time Limit: 04 years and 11 months.**
69. To adjust all batteries coke oven doors sealing system to ensure there are no fugitive emissions. **Time Limit: 04 years.**
70. To adjust the pusher-charging machines (PCM) sealing system to ensure there are no fugitive emissions during the coal charging operation in the Heat Recovery batteries. **Time Limit: 04 years and 10 months.**
71. To adjust the hot car and its equipment to control pollutant emissions to ensure there are no fugitive emissions during coke pushing operation, coke transport in the hot car to the quenching tower of the Heat Recovery Coke Plant. **Time Limit: 04 years and 11 months.**
72. To install and maintain the paving and rainwater drainage systems of secondary roads around all the Heat Recovery coke plant area to ensure there is no resuspension of dust deposited on its surface nor water accumulation. **Time Limit: 03 years.**
73. To implement treatment for gases originated in the heat recovery coke plant for any circumstance that the recovery boiler is not in operation. **Time Limit: 05 years.**

Heat Recovery coke plant coal yard

Short term targets:

74. To install, operate and maintain a wheel washing system, or any other system with equally or more efficient at the exit of all yards to prevent dragging of material to external areas. To install a physical structure to define the piles with a permanent and visible identification of the materials for inspection. **Time Limit: 12 months.**
75. To install permanent and visible markers at the maximum height of the material piles for inspection. **Time Limit: 12 months.**
76. To ensure the height of the piles does not exceed 2/3 of the height of wind fences or another equipment duly technically justified by the manufacturer. This 2/3-height shall be clearly visible for inspection. **Time Limit: 12 months.**
77. To adjust the spraying system for yard roads to ensure there is no resuspension of dust resulting from traffic of vehicles caused by the wind. **Time Limit: 12 months.**
78. To ensure dump truck boxes transporting raw material in bulk and finished products are covered and watertight preventing leakages and fugitive emissions in loading, transport and unloading operations. **Time Limit: 12 months.**

Medium term targets:

79. To adjust the piles spraying system of powdered material in the powdered material storage yard to ensure there is no dragging by the wind. The spraying is to be carried out using polymers or another material of equal or higher efficiency is indicated. **Time Limit: 02 years.**
80. To adjust existing wind fences to protect the whole yard perimeters to reduce fugitive emissions resulting from wind blowing on the piles. **Time Limit: 02 years.**

Long term targets:

81. To carry out transport/transfer, loading and unloading operations of powdered material in a way to ensure there are no emissions of particulate matter . **Time Limit: 02 years and 07 months.**
82. To install and maintain the paving and rainwater drainage systems of all roads used by vehicles transporting materials for storage to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
83. To install, operate and properly maintain the trays, side containment and cover of coal belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**

84. To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system – including transfer points between belts, hoppers and bins, to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 05 years.**

Coke Screening

Short term targets:

85. To adjust the warehouse physical structure and/or adopt control measures to ensure there is no fugitive emission resulting from the coke screen operations. **Limit: 12 months.**
86. To adjust the systems for collection and control of emissions from coke screen activities and structures connected to this equipment. **Time Limit: 12 months.**

Tar settling unit

Short term targets:

87. To properly control emissions resulting from the processing of tar. Handling, mixing, storage and disposal of tar and/or tar sludge in open areas are not allowed. **Time Limit: 18 months.**

Coke wet quenching

Long term targets:

88. To install, operate and properly maintain an air pollution control system, to reduce fugitive emissions resulting from wet quenching in the quenching tower. **Time Limit: 02 years.**
89. To adopt proper control measures to ensure there are no fugitive emissions resulting from coke dumping in the quenching tower. **Time Limit: 05 years.**

Blast Furnaces

Short term targets:

- 90. To properly identify the taphouses in Blast Furnaces 1, 2 and 3, in a clear way for inspection. **Time Limit: 12 months.**
- 91. To adjust the operating control during pig iron production and tapping to ensure there are no gas emission . **Time Limit: 12 months.**
- 92. To adjust the operating control during the opening and closing of the pig iron taphole to ensure there are no gas emission . **Time Limit: 12 months.**
- 93. To adjust the collection system during the pig iron tapping operation to ensure there are no gas emission . **Time Limit: 12 months.**
- 94. To install, operate and properly maintain the fugitive emission control system resulting from the loading of granulated slag. **Time Limit: 12 months.**

Medium term targets:

- 95. To adjust the dedusting systems regarding the Blast Furnace units taphouses, to ensure there are no fugitive emissions. **Time Limit: 02 years.**
- 96. To check and adjust the taphole closing systems (pig iron/slag) and tilting nozzles, to ensure there are no fugitive emissions during the whole operating routine in the taphouses. **Time Limit: 02 years.**
- 97. To adjust dry pit operations to ensure there are no fugitive emissions. **Time Limit: 02 years.**

Long term targets:

- 98. To check and adjust the exhaust ventilation systems for the air pollution control systems and performance indicating instruments for raw material transportation operations, screening, silage, BF loading, pig iron/slag exit and loading of transfer cars to reduce gas and particulate matter emission . **Time Limit: 05 years.**
- 99. To install a duct and a stack in the fabric filters where only lantern pinions are installed, to allow sampling. **Time Limit: 05 years.**

100. To install and maintain the paving and rainwater drainage systems of all roads used by vehicles transporting materials for storage to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**

PCI Coal

Short term targets:

101. To adjust air pollution control systems for coal grinding, bin supply belt conveyors and PCI unit relief system sources to ensure there are no fugitive emissions. **Time Limit: 12 months.**

Medium term targets:

102. To adjust the drainage network of the area to prevent rainwater accumulation on the ground. **Time Limit: 02 years.**
103. To cover all transfer points between chutes belts, hoppers and bins, kept in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system – including transfer points between, to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 02 years.**
104. To adjust cover and side protection of coal bin to minimize the action of winds and dust emissions. **Time Limit: 02 years.**

Steel shop

Short term targets:

105. To check and adjust the steel shop process equipment to ensure there are no fugitive emissions. **Time Limit: 12 months.**
106. To adjust the handling and provisional storage of solid residues in the industrial unit to ensure there is no dragging of material by the winds. **Time Limit: 12 months.**

Medium term targets:

107. To adjust the drainage network for the steel shop area to ensure there is no water accumulation in the processing areas. **Time Limit: 02 years.**
108. To check and adjust the treatment systems for gases originating from pig iron /steel conversion operation to ensure there are no fugitive emissions. **Time Limit: 05 years.**
109. To adjust the steel shop converters operating doors to improve efficient in the collection of secondary dedusting. **Time Limit: 05 years.**
110. To install exhaust ventilation systems and air pollution control equipment based on the best practice available for the production of slabs (continuous casting). **Time Limit: 05 years.**

Long term targets:

111. To install and maintain the paving and rainwater drainage systems of all roads used by vehicles transporting materials for storage to ensure there is no resuspension of dust deposited on its surface. **Time Limit: 03 years.**
112. To check and adjust the air pollution control equipment, the performance indicating instruments, and the ventilation exhaust system for the Steel shop unit to ensure there are no fugitive emissions. **Time Limit: 02 years and 04 months.**
113. To check and adjust the air pollution control equipment, its performance indicating instruments and the local exhaust ventilation system resulting from pig iron unloading into the ladle, the desulfurization in ladles, the ladles, the removal of dumper car slag, desulfurization in dumper car, removal of supernatant, removal of ladle scrap, loading and unloading of converters and secondary refining emissions. **Time Limit: 03 years and 04 months.**
114. To install a collecting system and an air emission control equipment for the dumping operation from the dumping car and pig iron ingot production in the pig iron moulding machine, to ensure there are no emission of gas effluents without air pollutant control. **Time Limit: 03 years.**
115. To reduce the generation of gases in converter operation in the Steel shop, which is currently burned in the flares, increasing the percentage of gases going to controlled burning and/or to energy production. **Time Limit: 05 years.**
116. To install an exhaust ventilation system and equipment to control air pollution based on the best practice available for the whole steel shop

warehouse to collect diffuse and fugitive emissions from all sources and operations performed in this warehouse. **Time Limit: 05 years.**

117. To check, operate and properly maintain the high calcium and dolomitic lime transport and transfer systems. **Time Limit: 05 years.**
- o To adjust the trays, side containment and cover of all belt conveyors to ensure there are no emissions of particulate matter , projection and accumulation of residues and products on the ground, equipment and roads.
 - o To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads.
 - o To install the identification of stored material and belt conveyor with respective material, clearly visible for inspection.

Sinter Plant

Long term targets:

118. To check and adjust the control system for particulate matter resulting from handling, transport, lime ensilage, and lime dosage in a way to ensure there are no fugitive emissions. **Time Limit: 05 years.**
119. To install, operate and properly maintain the trays, side containment and cover of raw material and products from the sintering units belt conveyors to ensure there are no emissions of particulate matter and accumulation of materials on the ground and equipment in the unit. **Time Limit: 05 years.**
120. To adjust all transfer points between chutes covered, in good physical conditions and clean during the transportation of material, with an emission collecting and controlling system to ensure there are no fugitive emissions, projection and accumulation of residues and products on floors, equipment and roads. **Time Limit: 05 years.**
121. To install and adjust the dedusting systems to cover all equipment in the Sinter area to ensure there are no fugitive emissions during operation. **Time Limit: 05 years.**

122. To install and maintain the paving and rainwater drainage systems of the sinter plant area to ensure there is no resuspension of dust deposited on its surface nor water accumulation. **Time Limit: 03 years.**

Air Pollution control systems

Recommendations below refer to Pollution Control Equipment, regardless of the plant production unit and shall occur on a permanent basis.

Short term targets:

123. To check the exhaust ventilation system (ducts, pipes, **tramos**, sensors and fans) so that they are identified and fixed in case they present deficiencies (such as holes, cracks, corrosion, deposit of particulate matter in ducts, among others). **Time Limit: 12 months.**
124. To identify all air pollution control equipment, at least using tags containing the unit it belongs to, and application (dedusting, primary, secondary, etc.) visible for inspection. **Time Limit: 12 months.**
125. To install performance indicators for the control equipment to allow an immediate assessment of the whole control system, to correct possible operational non-conformities. The data shall be recorded on the company's industrial process site with access available to inspection. **Time Limit: 12 months.**

Medium term targets:

126. To adjust all local exhaust ventilation systems, as well as sampling holes and platforms in good conditions in order to ensure isokinetic samples in stacks. **Time Limit: 02 years.**
127. To gather evidence to verify the efficiency of the air pollution control equipment by collecting samples from the stacks after the adjustments. **Time Limit: 02 years.**
128. To permanently control the emissions of odorous substances resulting from activities developed in the company to ensure it does not cause inconveniences to the public outside the company, regardless of the source generating the odour. The control should include lagoons, storage of products and products residues including stagnant water in the drainage channels or damaged floors. **Time Limit: 02 years.**

Long term targets:

129. To carry out the calibration of **tramos** (static pressure and outflow) for all local exhaust ventilation systems after assessing their physical integrity in order to enhance their performance. **Time Limit: 03 years.**
130. To implement actions dully recorded to ensure there are no emissions without proper control during shutdowns (scheduled or not) due to malfunctioning of pollution control equipment, where automated systems (interlocking) must be installed whenever possible. **Time Limit: 03 years.**

Air Emissions Monitoring

Short term targets:

131. To collect and analyse gas effluents by sampling with accreditation from INMETRO, Norm ISSO/IEC 17.025. **Time Limit: 02 years.**