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ClimaEast

Support to Climate Change Mitigation and Adaptation in Russia and ENP East countries

Cement Plant Odra – Case Study

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GHG Inventory and MRV of Industrial Emissions Workshop, Tbilisi, 27-28 March 2017

Cement Plant Odra – Case Study Location

Cement Plant Odra – Case Study Location

Cement Plant Odra is located in the city of Opole in very close proximity to apartment districts

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Cement Plant Odra – Case Study

Panorama from heat exchangers tower

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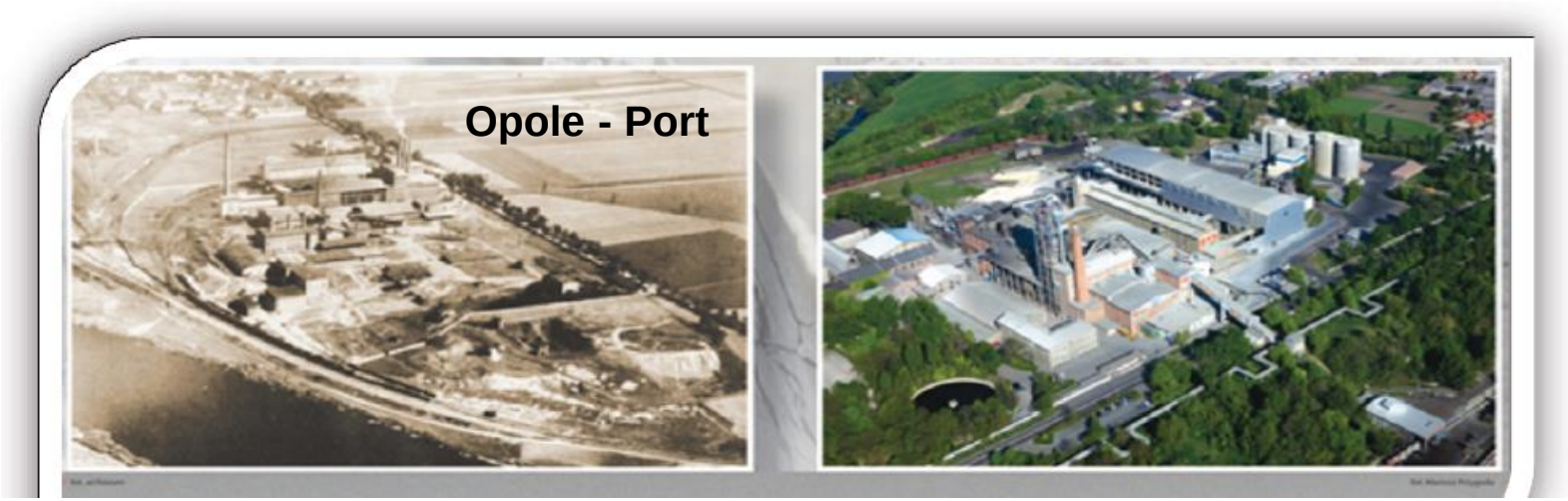
Cement Plant Odra – Case Study History

- 1872 Beginning of cement manufacturing
- 1899 Cement plant with 3 shaft furnaces
- 1911 New cement plant „Opole – Port” was built using wet technology – 3 rotary kilns with daily capacity 250 tonnes



Cement Plant Odra – Case Study History

- 1938 Annual cement production reached 200.000 tonnes
- 1947 Decision to rebuild the cement plant which was destroyed during the II World War (1939 – 1945)
- 1948 – 1951 Construction period. The biggest project within cement industry at that time
- 1951 Comissioning of 2 rotary kilns
- 1952 Comissioning of the kilns 3 and 4

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Cement Plant Odra – Case Study History

- 1960s Further modernisation and capacity building
- 1975 Annual record production volume was reached – 895.000 tonnes
- 1970s New modern, high capacity cement plants were comissioned (Kujawy – 1972, Małogoszcz – 1974, Ożarów and Górażdże – 1977) putting Cement Plant Odra into severe competition challenge
- 1980s Sustainable drop of production
- 1989 Independent international report prepared for the Polish government with recommendation to shut down Cement Plant Odra

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Cement Plant Odra – Case Study
Raw materials deposit

DAI
Proudly Incorporating HTSPE

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Cement Plant Odra – Case Study History

- 1992 Foreign investor highly evaluates the potential of raw materials deposit – unique composition of all raw materials needed for clinker or portland cement production
- 1992 Organizational transformation from „state enterprise” onto joint stock company with 100% shares yet possesed by the State
- 1993 Miebach (Germany) acquired majority stake in the Company – Privatisation agreement included investor’s commitment to run a modernization program – new era for Cement Plant Odra begins

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Cement Plant Odra – Case Study History

- 1993 – 1999 Implementation of complex modernisation program
  - Modernisation of the Kiln 1 – Wet technology was replaced by dry method of cement production
  - Daily production capacity reached 1.200 tonnes of clinker
  - Sound reduction of CO_2 and industrial emissions (dust, SO_2, NOx) followed the modernisation – Cement Plant Odra becomes environment friendly company
  - Automatic modern control and stearing system for the cement production line

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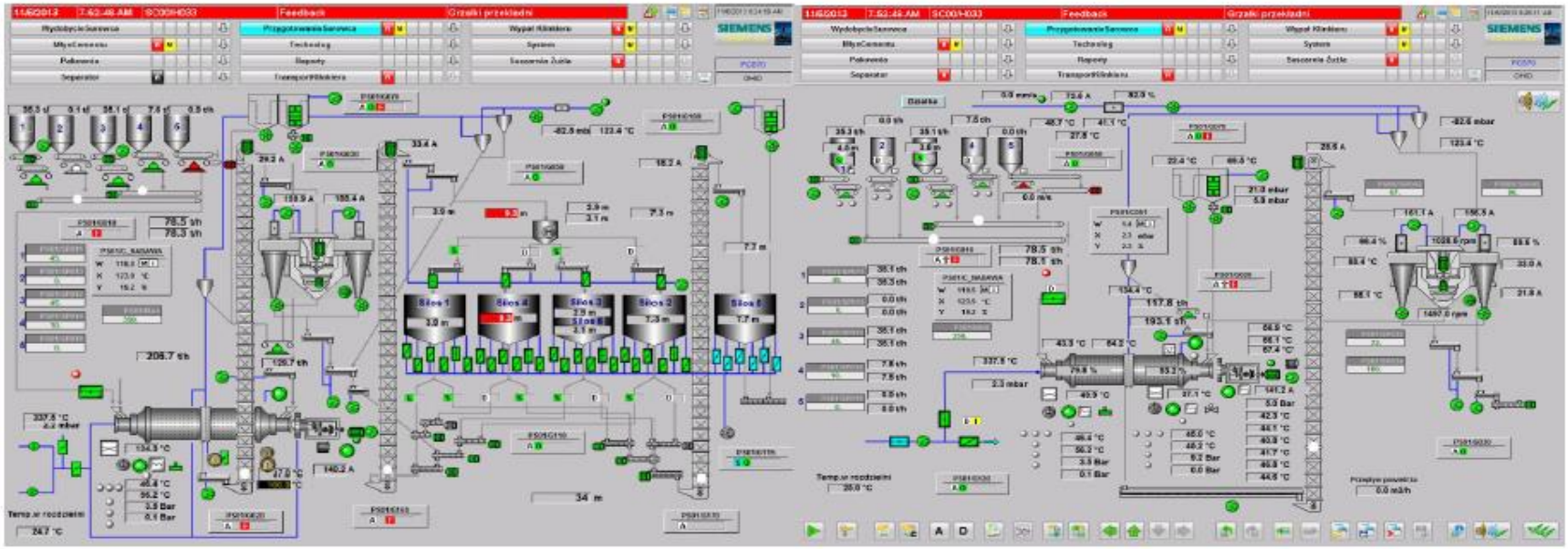
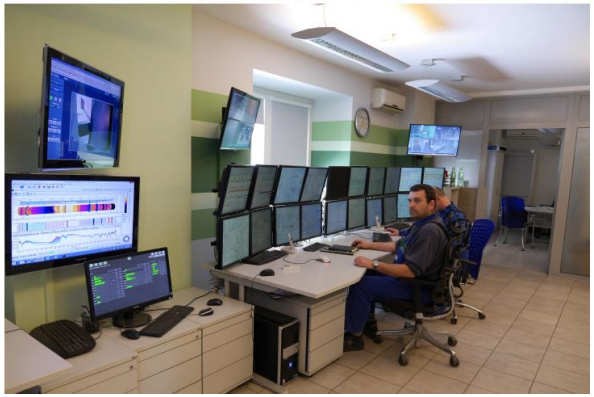
Cement Plant Odra – Case Study
State-of-the-art production control system





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Cement Plant Odra – Case Study History

- 1999 Municipal solid waste sorting plant built in Opole (first such project in Poland) producing „BRAM" (Brennstoff aus Mull) – alternative fuel from flamable part of municipal waste
- 2006! Comissioning of the plant – 7-year delay caused mainly due to:
  - Legal regulations concerning environment protection did not entirely cover such type of installation
  - Local community obstacles against „waste in the neighbourhood"
- 2003 – 2008

  Finding market niche and achieving leadership position in „Cement with additives"
  - One of the world biggest slag cement manufacturer
  - 35-40% share of cements with additives in total cement production comapared to 25% country average

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Cement Plant Odra – Case Study History

- 2004 Implementation of Integrated Management System according to ISO 9001 (Quality management) and ISO 14001 (Environmental management)
- 2008 Implementation of Microsoft Dynamics AX – state-of-the-art IT facility supporting management systems
- 2011 100th Anniversary of the Cement Plant Odra

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Cement Plant Odra – Case Study History

- 2013 Implementation of EMAS – voluntary Eco-Management and Audit Scheme
- 2015 Comissioning of instalation supplying alternative fuel to rotary kiln
- 2015 Comissioning of:
  - Separator installation for cement mills 1 – 4
  - Installation for drying and grinding blust furnace slag using a vertical roller-plate grinding mill

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Cement Plant Odra – Case Study
Environment protection related projects

- 2004 Replacement of fibric filters in cement mills with new generation filters
  - Sound reduction of dust emission
  - Meeting regulatory requirements
- 2006 New cement dispatch terminal
  - Fully automatic process – zero menpower
  - Acceleration of loading process
  - Reduction of dust emission
- 2006 Replacement of compressors with modern equippment
  - Reduction of electric energy
  - Compressed air cost reduction
  - Reduction of noise

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Cement Plant Odra – Case Study
Environment protection related projects

- 2007 Central control room – Simens PC 7 system
  - Constant monitoring of the process from one place
  - Prediction of breakdowns
  - Improvement of work efficiency and safety
- 2008 Replacement of clinker cooler with IKN modern clinker cooling equipment
  - Lowering clinker temperature to appropriate level
  - Rotary kiln efficiency improvement
  - Stabilizing of clinker burning process
- 2009 Refurbishment of buildings, roads, parking areas and production halls
  - Dust emission reduction
  - Safety of work upgrade
  - Public relations – company image improvement

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Cement Plant Odra – Case Study
Environment protection related projects

- 2009 Replacement of electrofilter serving the slag drying room with modern fiber filter
  - Dust emission reduction
- 2010 Covering the clinker and the slag storage hall
  - Dust emission reduction
- 2011 Replacement of electrofilter serving the rotary kiln with efficient modern fiber filter
  - Meeting EU requirements concerning dust emission limits

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Cement Plant Odra – Case Study
Environment protection related projects

- 2012 Change of raw materials transport – replacement of narrow-gauge railway track with enclosed conveyor belt system and building intermediate preblanding storageland
  - Reduction of diesel oil used for transportation
- 2012 Modernisation of cement mills filters by increase of the filtering surface
  - Improvement of effectiveness of exhaust gases treatment
- 2012 Modernisation of high voltage distribution station by equippment replacement and implementation of energy management system
  - Reduction of electric energy consumption

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Cement Plant Odra – Case Study
Environment protection related projects

- 2013 Watering system for raw materials storageland
  - Reduction of dust during piling the stone on the prism
- 2015 Installation dosing alternative fuel to the rotary kiln
  - CO_2 reduction
  - SO_2, NOx and dust reduction
- 2015 Dynamic separators for cement mills 1 – 4
  - Reduction of electric energy consumption
  - Quality improvement
- 2015 Installation for drying and grinding blust furnace slag with a vertical roller-plate grinding mill
  - Reduction of hard coal usage (CO_2, SO_2, NOx reduction)
  - Waste heat recovery

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Cement Plant Odra – Case Study
Environment protection related actions

- Shut down of the old sewage treatment station and building a new modern station linked with the city sewage treatment system
- Sound protection screens for all noisy pieces of equippment
- New Komatsu excavators for raw material quarry, which entirely eliminated blasting with related noise and seismic vibrations
- Use of 350.000 tonnes/annum of secondary raw materials (blust furnace slag, fly ashes, reagypsum)
- Use of alternative fuels

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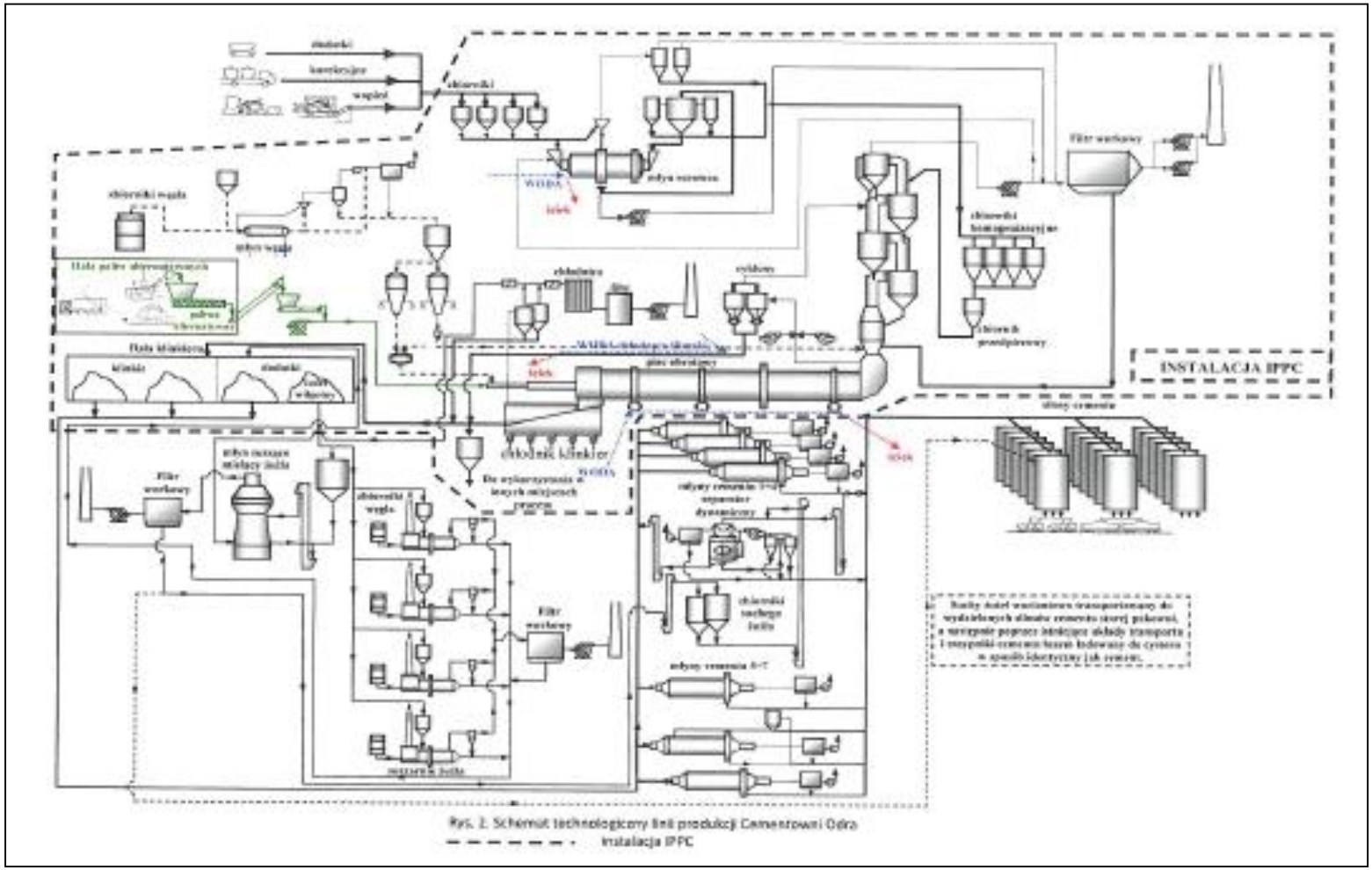
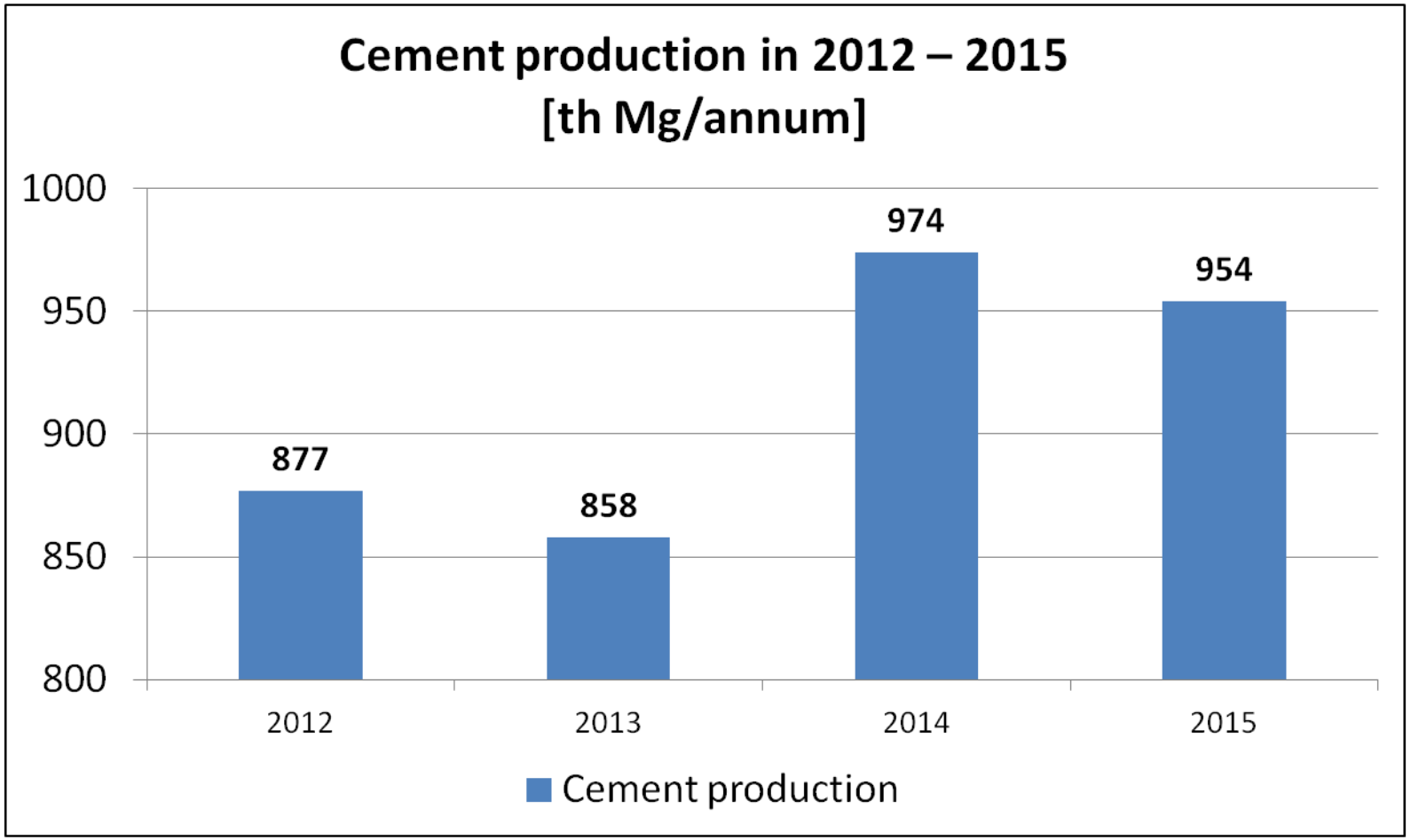
Cement Plant Odra – Case Study
Production process

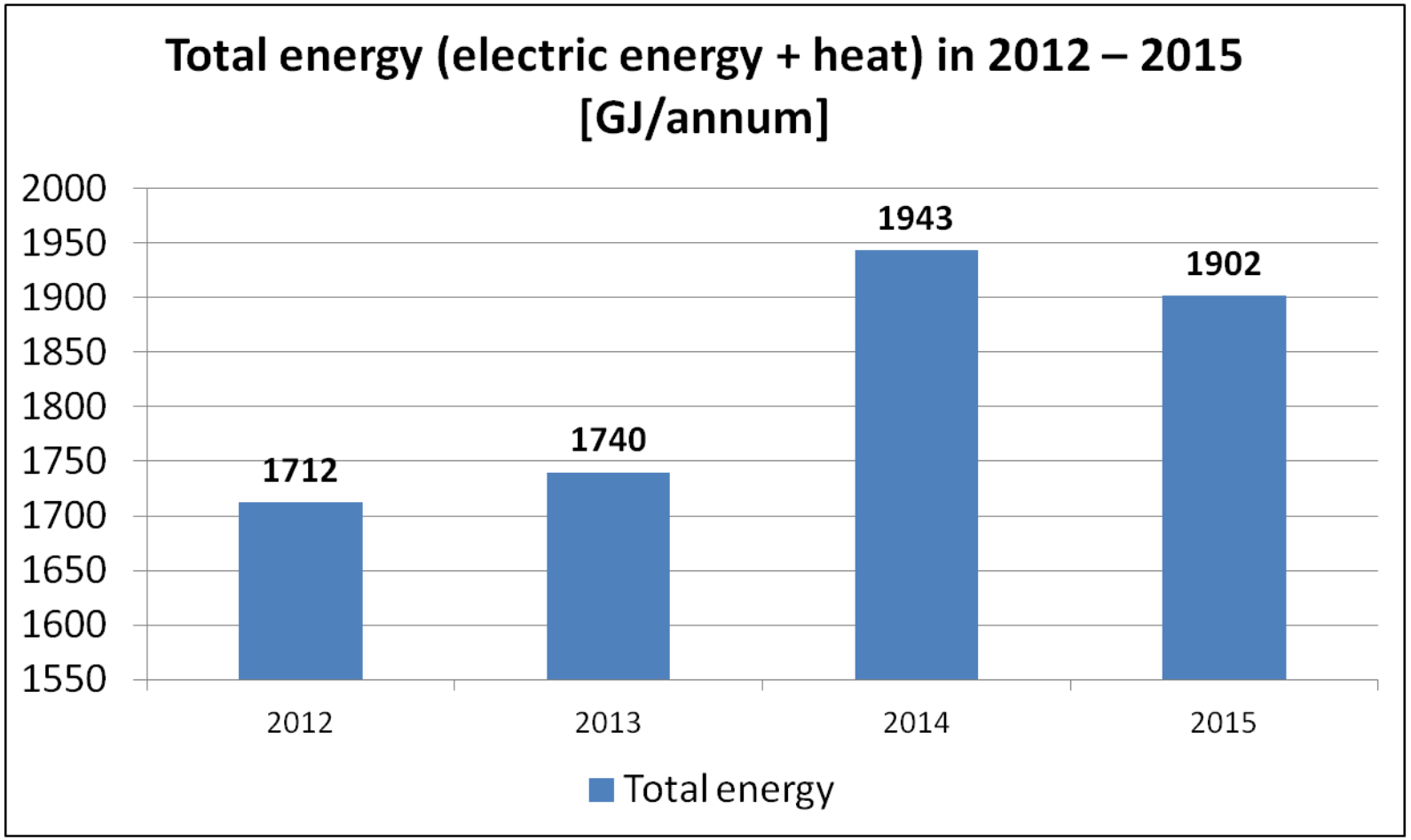


Rys. 2. Schemat technologiczny linii produkcji Cementowni Odra
Instalacja IPPC

Cement Plant Odra – Case Study
Industrial emissions



Cement Plant Odra – Case Study
Industrial emissions



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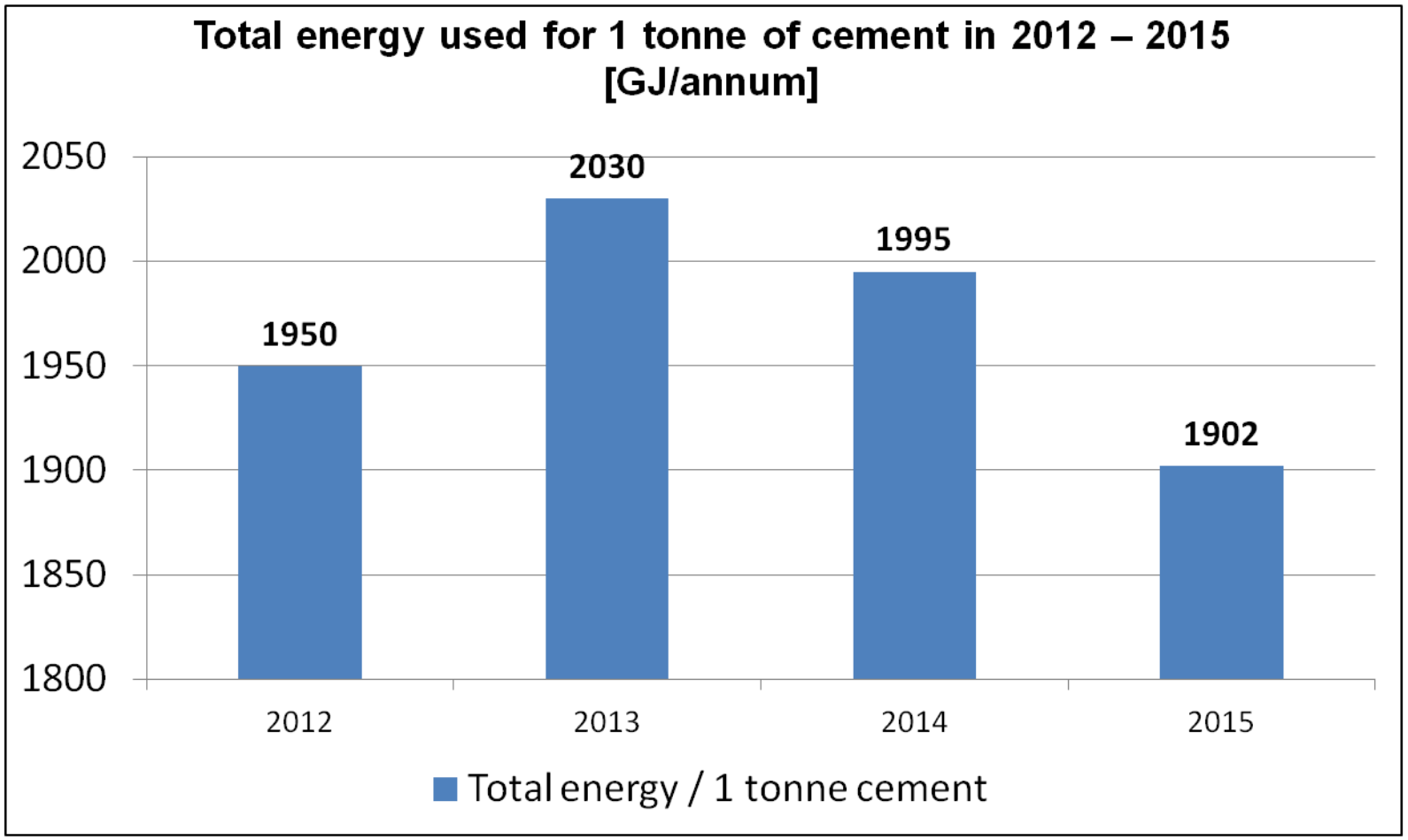
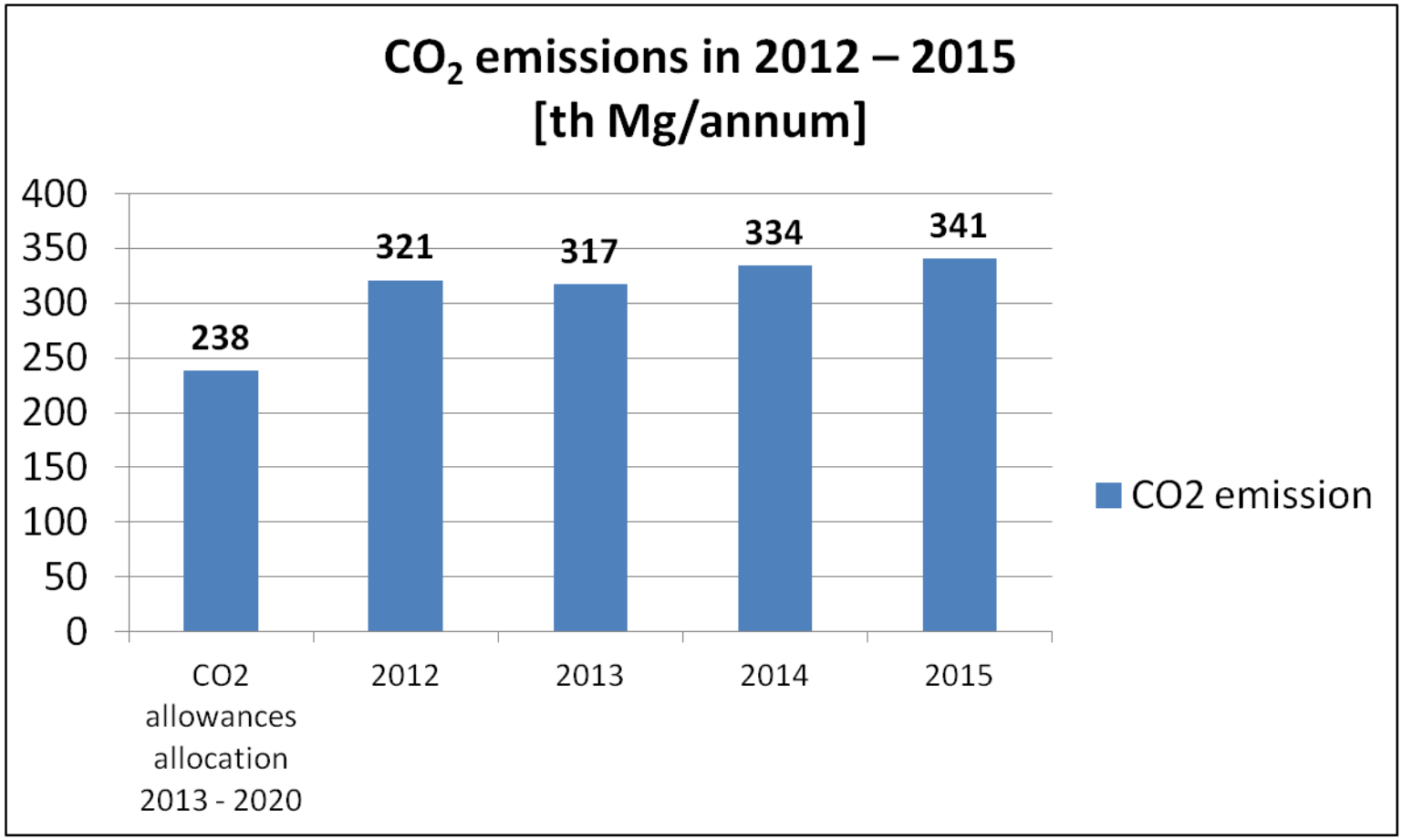
Industrial emissions



Cement Plant Odra – Case Study
Industrial emissions



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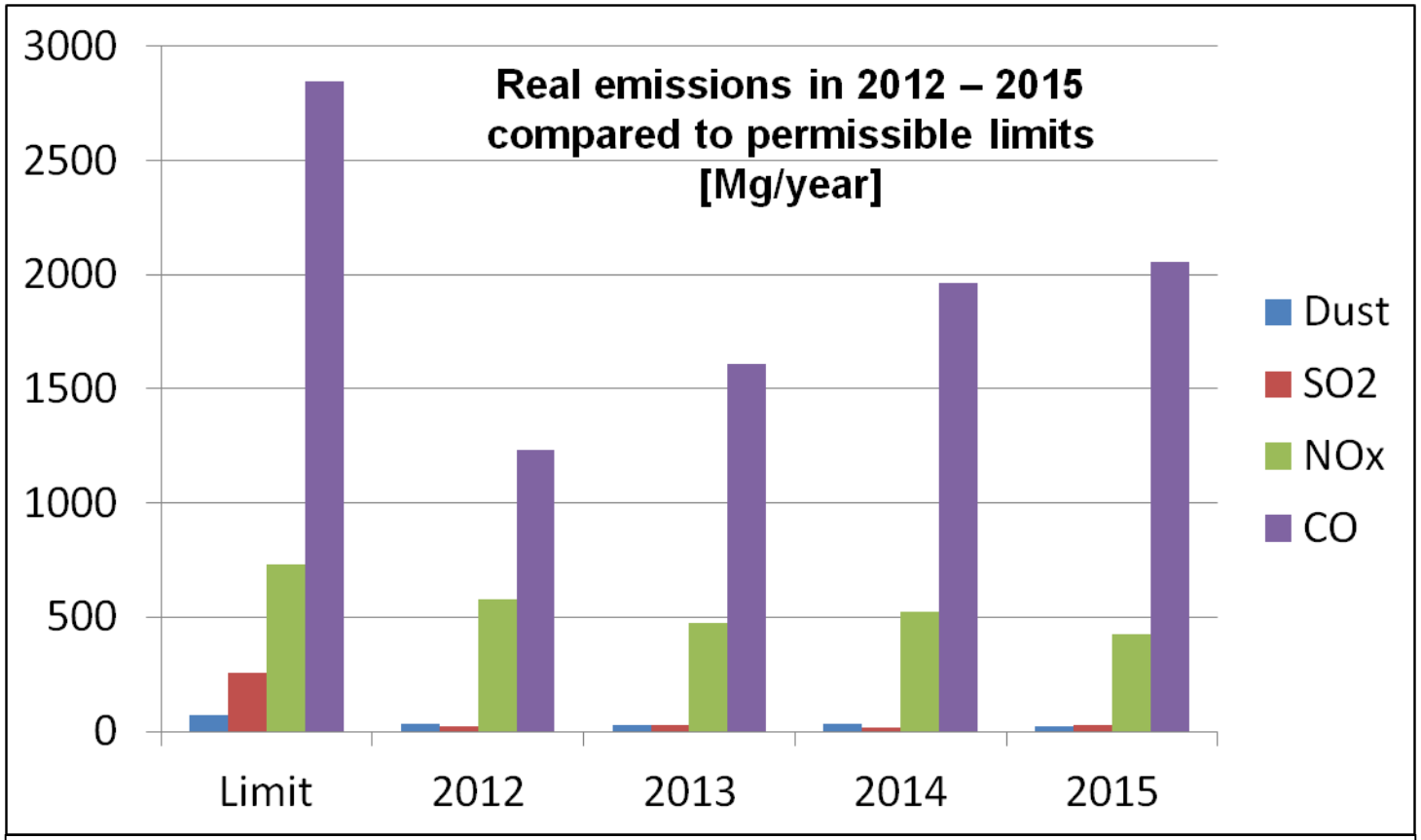
Cement Plant Odra – Case Study
Industrial emissions



Dust emission decreases
CO emission increase – due to production increase

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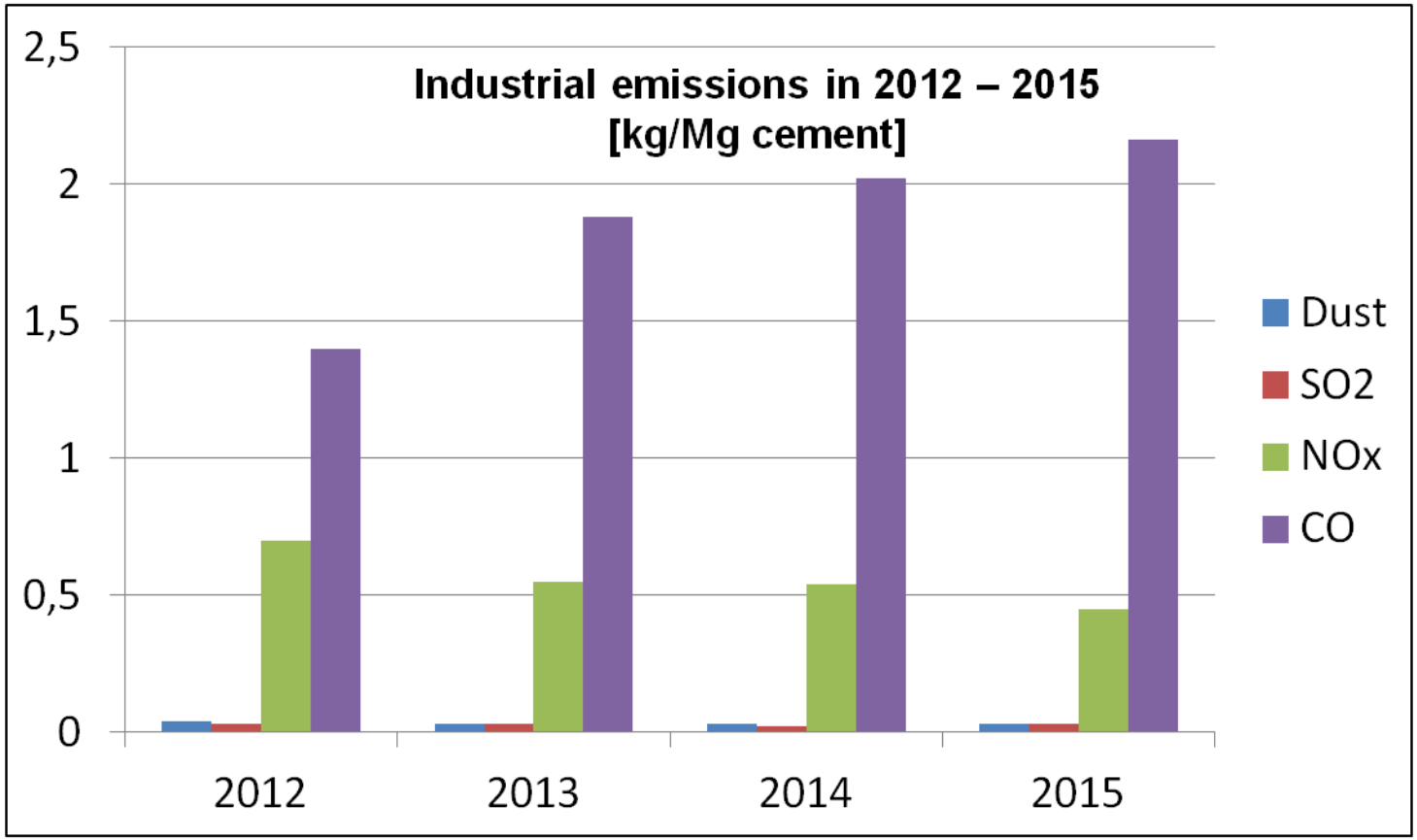
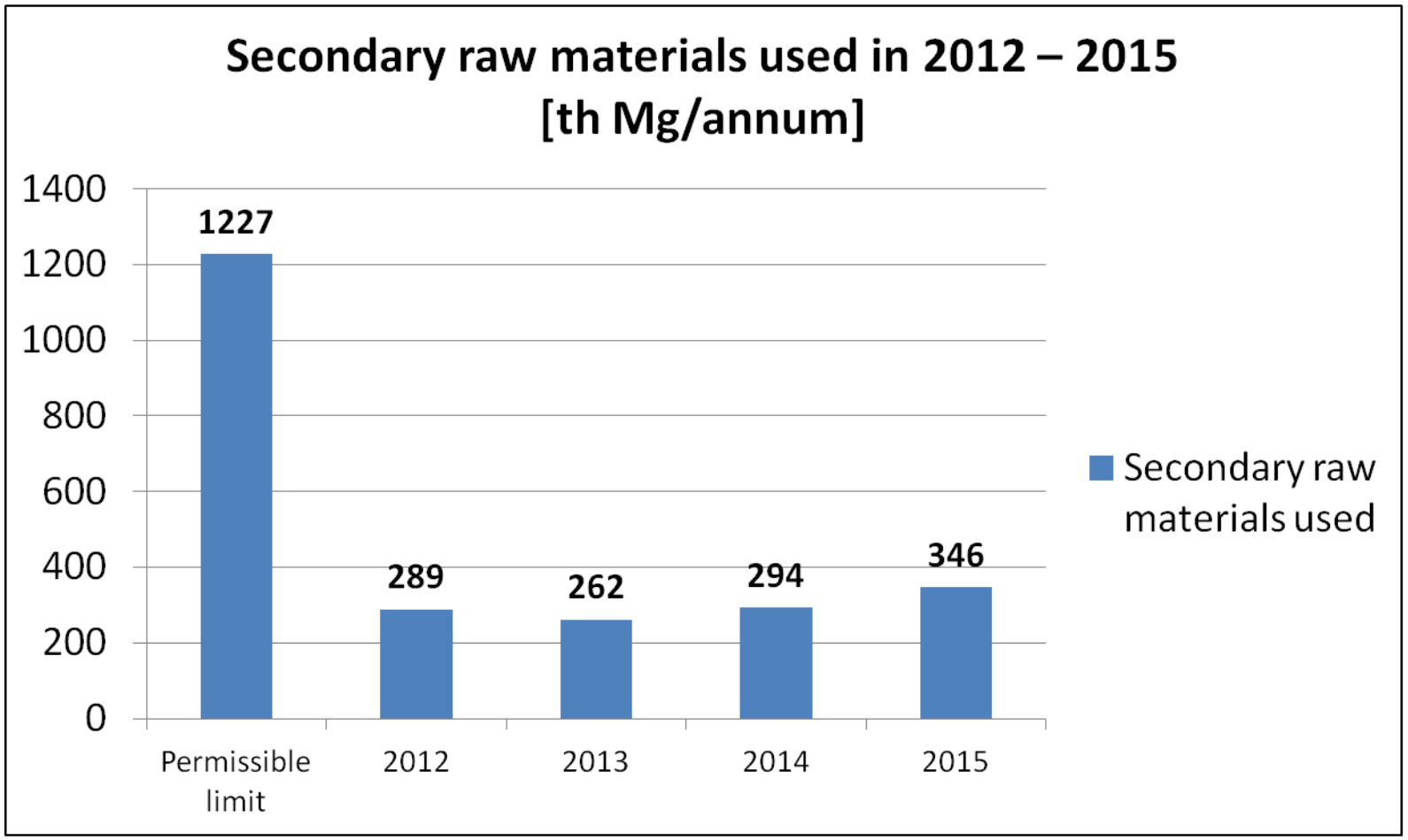
Cement Plant Odra – Case Study
Industrial emissions



Cement Plant Odra – Case Study
Industrial emissions



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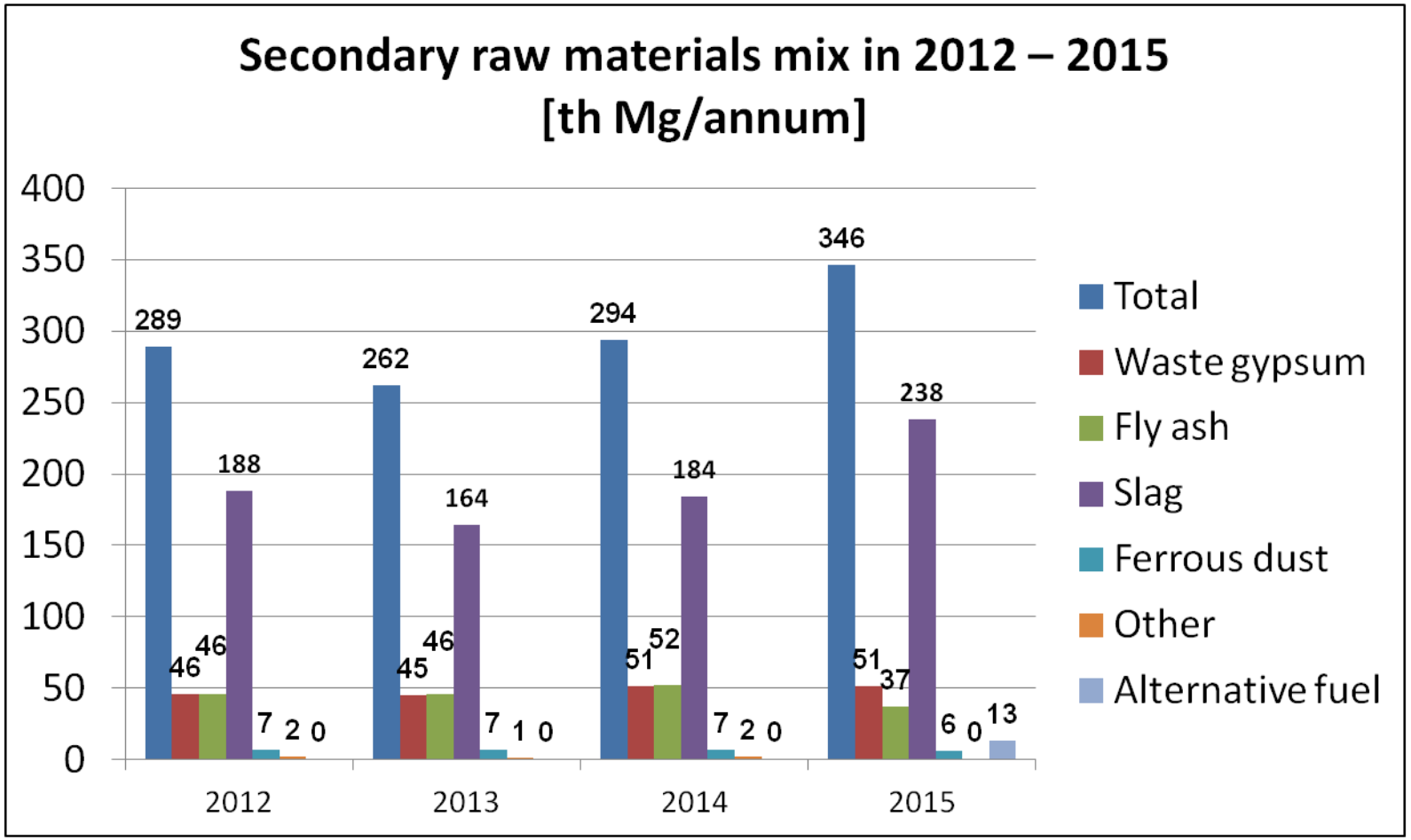
Cement Plant Odra – Case Study
Industrial emissions



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Cement Plant Odra – Case Study Modernisation in 2017 – 2018

Modernisation in 2017 – 2018

- NOx reduction from clinker burning installation
  - Selective Non-Cathalytic Reduction (SNCR)
  - Current parameter – 0,9021 kg/Mg clinker
  - Target – 0,8640 kg/Mg clinker

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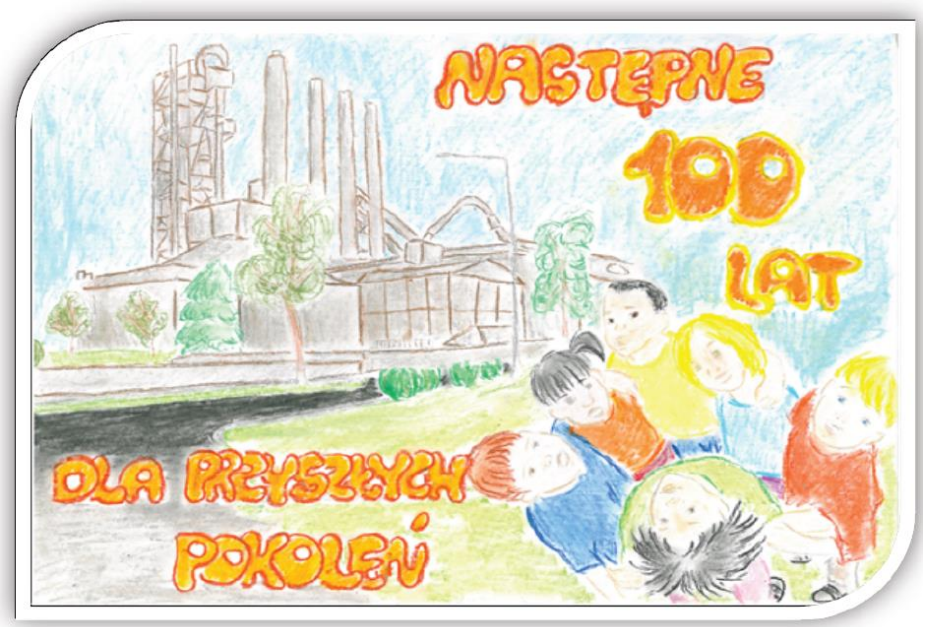
Cement Plant Odra – Case Study

History of Cement Plant Odra proves that success can be achieved as a result of:

– Gift from the nature
– Reliable investor
– Commited people
– Hard work
– Shot of luck



„Next 100 years for future generations”

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How to contact ClimaEast

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