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Trusted user of air, land and water



Basic information

- **Leading steelmaker** in Czech Republic
- Biggest producer of **safety barriers and pipes & tubes**
- Annual steel production:
 - **2.4 million tonnes**
- Annual production capacity:
 - **3.6 million tonnes**
- Number of AM employees in region:
 - **6500** (including c. 900 engineers)



ArcelorMittal Ostrava is a leading steel producer in the Czech Republic



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Comprehensive approach to environment



Waste reduction

- Goal: reduce volume of waste
- Ways to reuse waste:
 - High-volume wastes certified as products
 - Reuse of by-products directly in production
- **Waste generation trend**
 - 2000 waste generation: 834 332 tonnes
 - 2017 waste generation: 175 004 tonnes

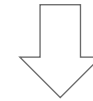


We reuse many by-products directly in our production as part of recycling

Water management

- 3 types of water in AMO
 - drinking water
 - utility water
 - operational auxiliary water
- All waste water is discharged into a single corporate sewer system that ends with sewage treatment plants
- The Wastewater Treatment Plant technology allows part of the treated waste water to return to the water distribution system for further use.
- AMO runs two end-of-site WWTPs

Total annual requirement
202 137 003 m³



Most water circuits are closed, only refilling the water consumed, e.g. due to evaporation.



Total annual water consumption
16 937 389 m³

Our aim is to maximize recirculation and reuse of water



Greenery planting

- Effective tool to combat dust and noise emissions
- Greenery planting in the neighbourhood 2008 - 2017 (examples)
 - Steel road: 170 trees + 1 576 shrubs
 - Tree planting in return for plastic cups collected during music festival: 1 111 trees
 - RUDNA street: 100 trees
 - Open door day: 608 trees
- Trees planted in AMO by external companies - replacement for tree felling
 - 300 trees + 300 shrubs



Since 2008 we have planted about 4 500 trees



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Air protection



Greening investments

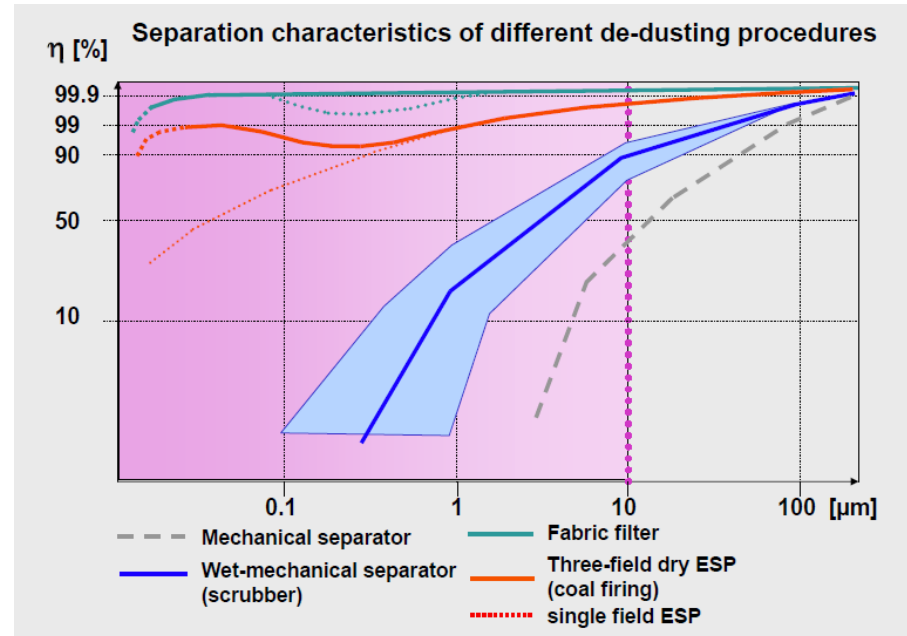
- 2003-2017 investment in the greening worth **CZK 8 billion (EUR 300 million)** of which **6 billion** from our resources
- Meeting **BAT limits since 2012** (4 years ahead)
- Installation of fabric filters with over **99% efficiency for PM1, PM2,5 and PM10** - verified by independent measurement
- 2015: technologies worth **CZK 2 billion (EUR 80 million)** incl. $\frac{3}{4}$ EU subsidies, mainly to control secondary emissions
- Projects **beyond legislative** requirements
- Annual costs for operation and maintenance > **CZK 200 million (EUR 7.7 million)**



Subsidies only granted for projects beyond legislative requirements!



Fabric filter - best available technique

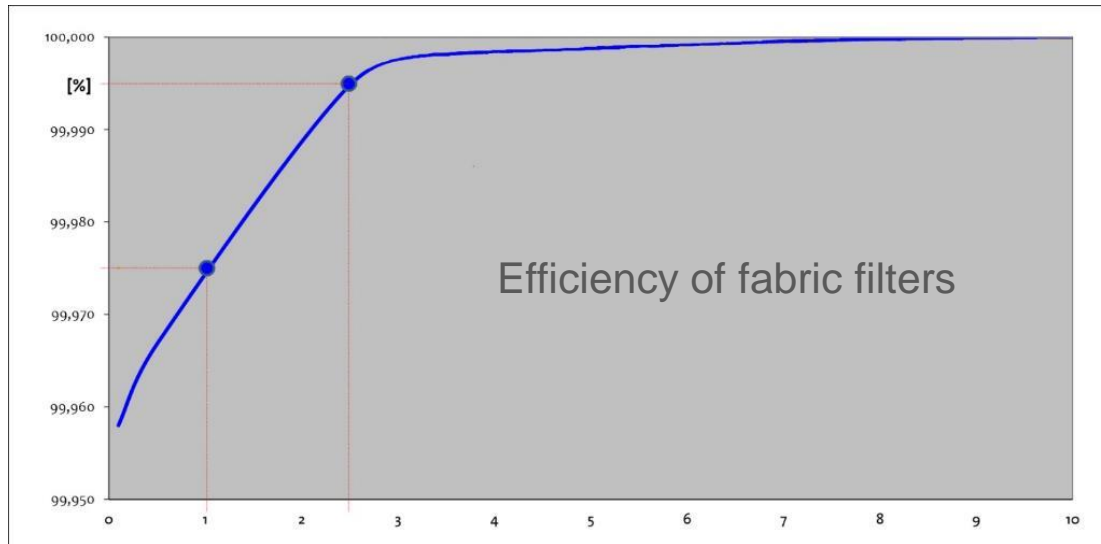


AIRS Code ^b	Type of Collector	Particle Size (μm)		
		0 - 2.5	2.5 - 6	6 - 10
16	Fabric filter - high temperature	99	99.5	99.5
17	Fabric filter - med temperature	99	99.5	99.5
18	Fabric filter - low temperature	99	99.5	99.5

Zdroj: U.S. EPA EMISSION FACTORS (Reformatted 1/95), APPENDIX B.2

Even the finest dust particles PM10, PM2.5 and PM1 captured with over 99% efficiency

Fabric filters - efficiency measured

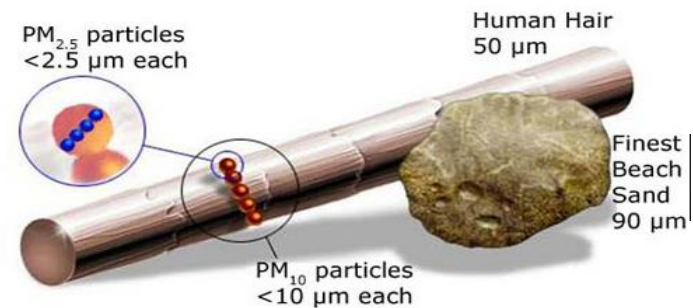


Similar efficiency for **PAH (incl. benzo (a) pyrene) and PCDD/F** - dosing of additives

37 fabric filters in operation to control ducted and non-ducted emissions

TECHNICKÉ SLUŽBY OCHRANY OVZDUŠÍ OSTRAVA spol. s r.o., Zkušební laboratoř měření emisí
Protokol číslo M/4844/2017/02

Sledovaná látka	PM ₁		
	Koncentrace c _{sn} (mg.m ⁻³)		Účinnost %
	vstup	výstup	
Datum odběru			
1.8.2017	38,7	0,11	99,72
2.8.2017	45,5	0,43	99,05
3.8.2017	29,2	0,31	98,94
Průměr	37,8	0,28	99,24



Average efficiency for PM1 = 99.2 %



Example: Sinter Plant North fabric filter



Area: 60 × 60 m
Filter building height: 22 m
Chimney height: 80 m
Pipes extracting flue gas: ø 3,9 m
Area of filtering fabric: 44,000 m²
(about 7 football fields)

Price: CZK 1 billion (EUR 40 million)

Commissioning: November 11, 2011

BAT - best available technique

2012 awards of the Economic Chamber of the CR and Ministry of Environment

Characteristics of the filter

- Efficiency of over 99 % capture **PM10, PM2,5 & PM1**
- C. **99 % PCDD / F and PAH** (dosing of additives)
- Silencers: noise levels reduced **15%**

Minimising dust as well as PCDD/F and PAH

Reduction of dust emissions

Reducing emissions of particulate matter (t)

39 715



1978

14 161



1993

2 062



2004

686



2013

379



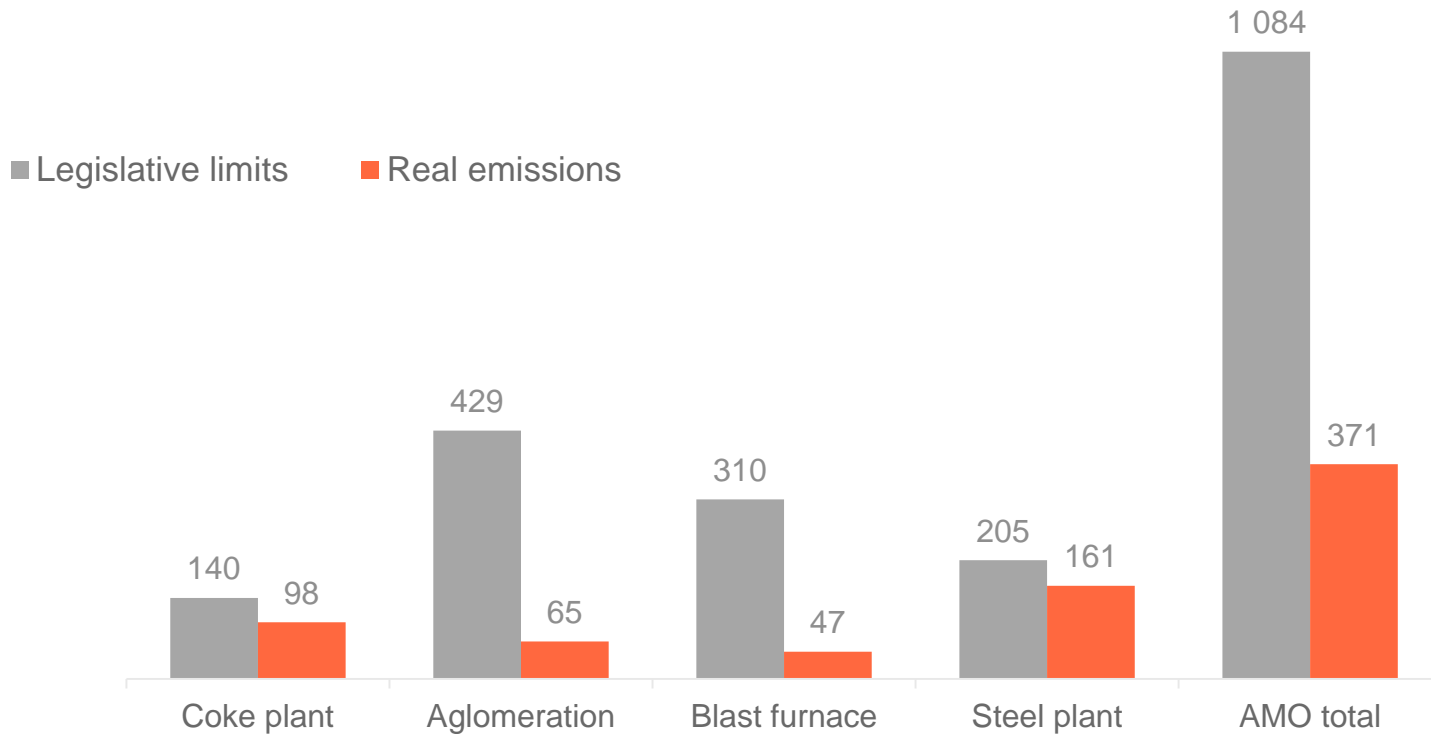
2017

Annual emissions of 379 tonnes are less than $\frac{1}{4}$ of the emissions compared to 2003

And 1 % compared to 1980s

Meeting EU BAT emission limits

Dust emissions (tonnes in 2017)



Dust emissions reduced to 371 tonnes, limits are 1 084 tonnes

Emissions of PAH

- Dosing of special additives into flue gas stream before fabric filters



2009 Change of legislation

Reduction of PAH by over 90 % since 2009



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Thank you for your attention!

