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)
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**

\[ 202 \, 137 \, 003 \, \text{m}^3 \]

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

**Total annual water consumption**

\[ 16 \, 937 \, 389 \, \text{m}^3 \]

**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
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. ¾ 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

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

<table>
<thead>
<tr>
<th>AIRS Code</th>
<th>Type of Collector</th>
<th>Particle Size (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0 - 2.5</td>
</tr>
<tr>
<td>16</td>
<td>Fabric filter - high temperature</td>
<td>99</td>
</tr>
<tr>
<td>17</td>
<td>Fabric filter - med temperature</td>
<td>99</td>
</tr>
<tr>
<td>18</td>
<td>Fabric filter - low temperature</td>
<td>99</td>
</tr>
</tbody>
</table>

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

Average efficiency for PM1 = 99.2 %

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

Annual emissions of 379 tonnes are less than ¼ of the emissions compared to 2003
And 1 % compared to 1980s
Meeting EU BAT emission limits

Dust emissions (tonnes in 2017)

- **Coke plant**: legislative limit 140 tonnes, real emissions 98 tonnes
- **Aglomeration**: legislative limit 429 tonnes, real emissions 65 tonnes
- **Blast furnace**: legislative limit 310 tonnes, real emissions 47 tonnes
- **Steel plant**: legislative limit 205 tonnes, real emissions 161 tonnes
- **AMO total**: legislative limit 1084 tonnes, real emissions 371 tonnes

Dust emissions reduced to 371 tonnes, limits are 1084 tonnes
Emissions of PAH

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

Reduction of PAH by over 90% since 2009
Thank you for your attention!