



# Investing for growth

Stefan Romedahl, President Boliden Mines

# Boliden Mines

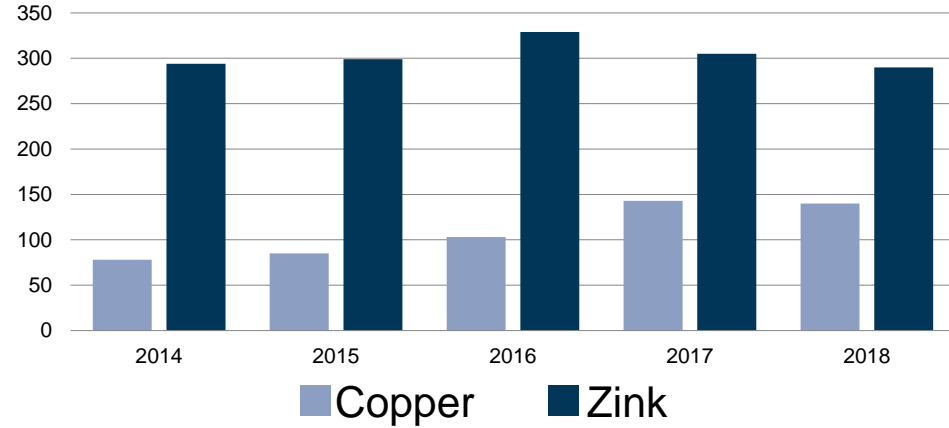
- Safety comes first
- 6 mining areas
- Staff functions (Headquarter in Boliden)
  - Finance, EHS, HR, Commercial
  - Exploration and Business development
  - Technical department
- 3,500 employees
- Metals in concentrate
  - copper, zinc, gold, silver, lead, nickel
  - cobalt, palladium, platinum, tellurium
- Most of the concentrate goes to our own smelters



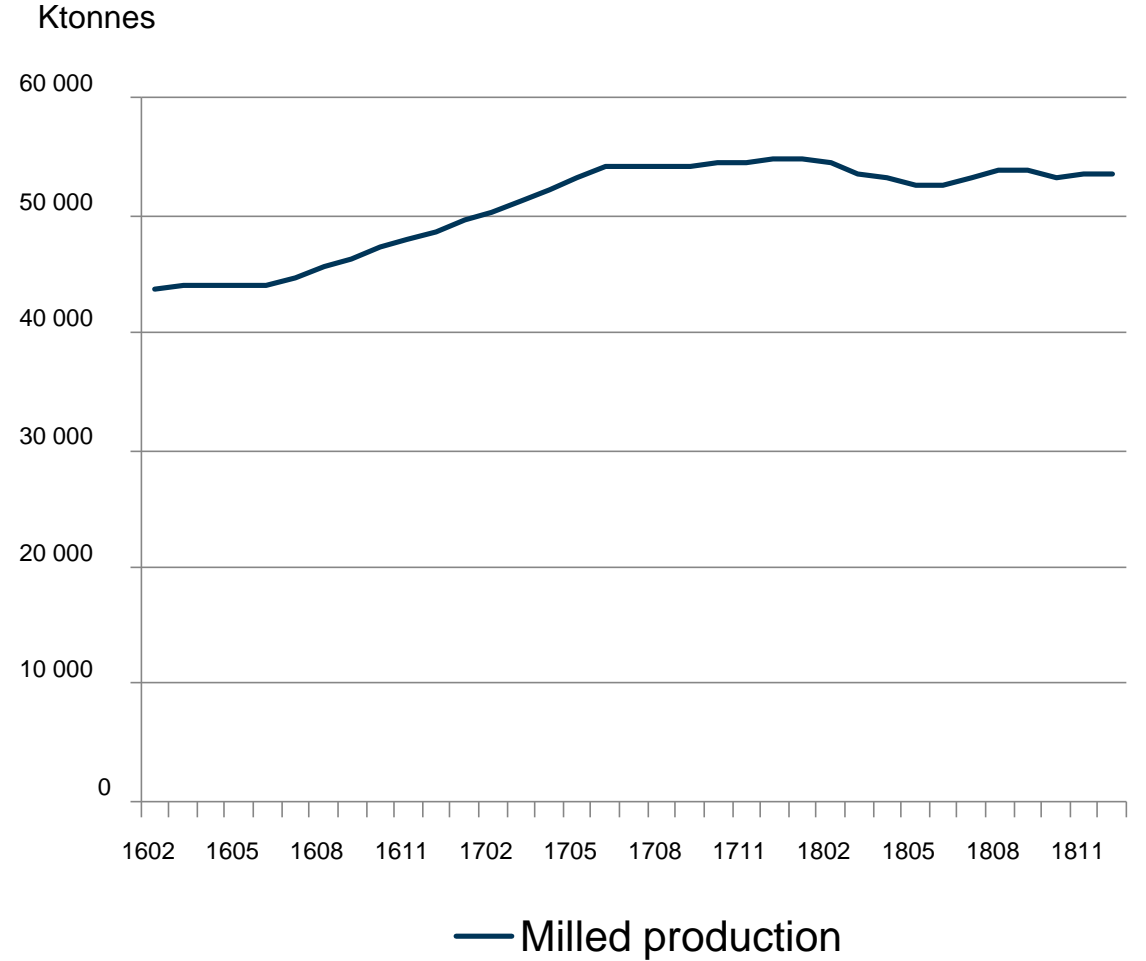
# Production and prolonging of operations



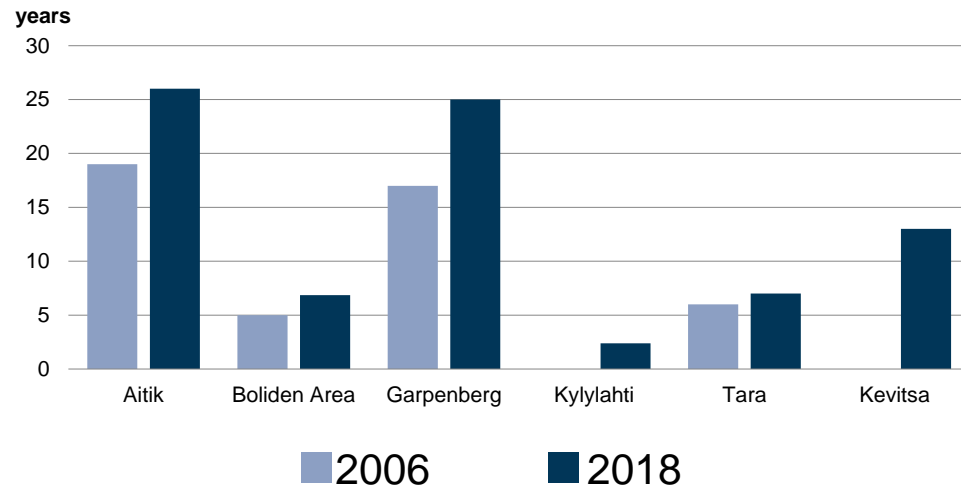
Production of metal in concentrate (Ktonnes)



Stable output in from all mines, R12



Long mine life for largest and most profitable mines



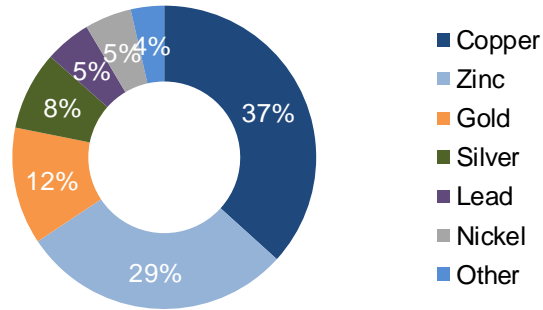
— Milled production



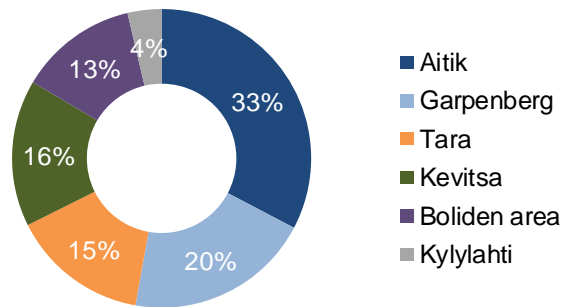
# Diversified portfolio and revenues

## 2018 Mine Revenue breakdown

By Commodity



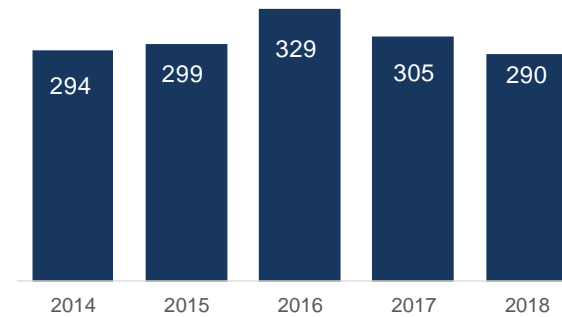
By Mine



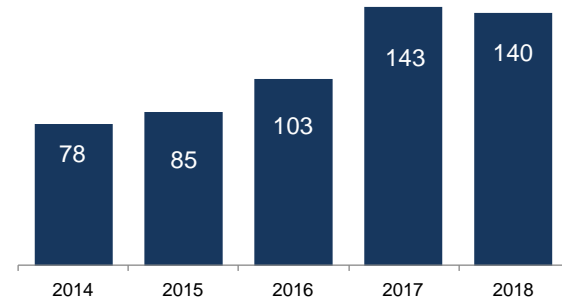
**Mines 2018 Revenues: 18,404 MSEK**  
**Mines 2018 EBIT: 6,451 MSEK**

## Copper and gold among key commodities

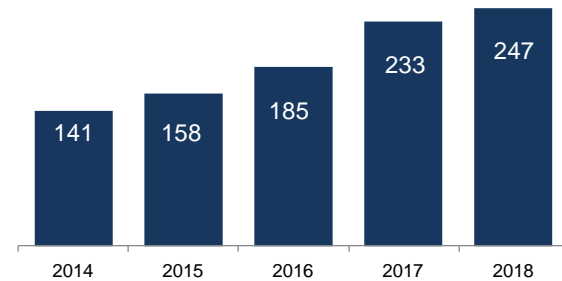
Zinc<sup>(1)</sup>  
(ktonnes)



Copper<sup>(1)</sup>  
(ktonnes)



Gold<sup>(1)</sup>  
(koz)



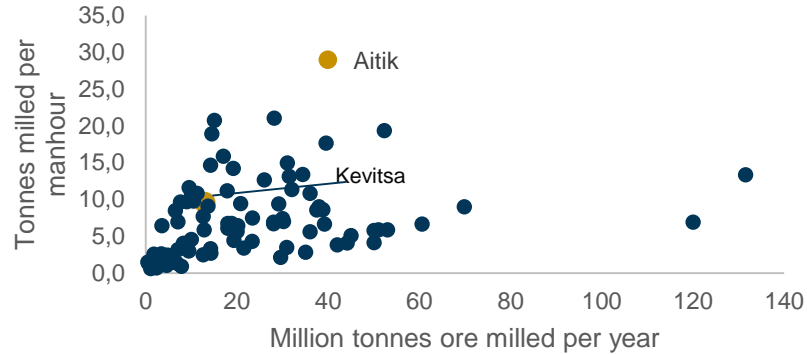
(1) Refers to production of metal in concentrate

# Successfully enhanced productivity and cost position in open pit and underground mines

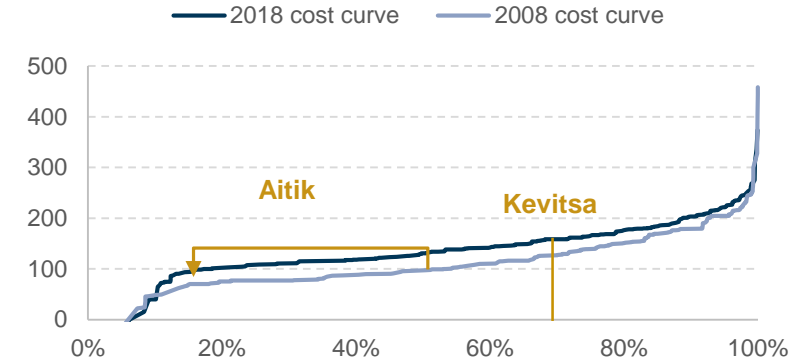


## Copper – Open Pit Mines<sup>(1)</sup>

We transformed Aitik into the world's most productive open pit copper mine

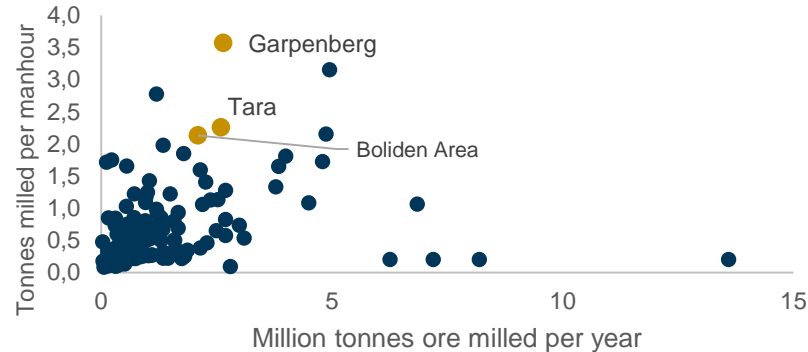


## Copper Cost Curve<sup>(2)</sup>

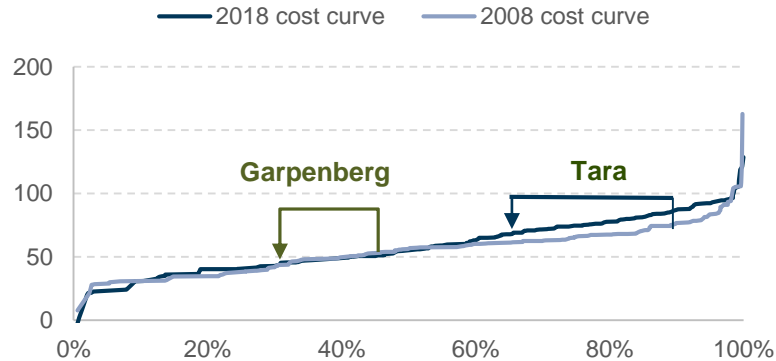


## Zinc – Underground Mines

We transformed Garpenberg into the world's most efficient underground mine



## Zinc Cost Curve<sup>(2)</sup>



Source: Wood Mackenzie

(1) Open pit and mines with both open pit / underground operations,

(2) C1 Cash Cost (US\$/lb) composite costing



# Mine design and technical know-how – critical for future competitiveness



A successful cocktail of electrification...

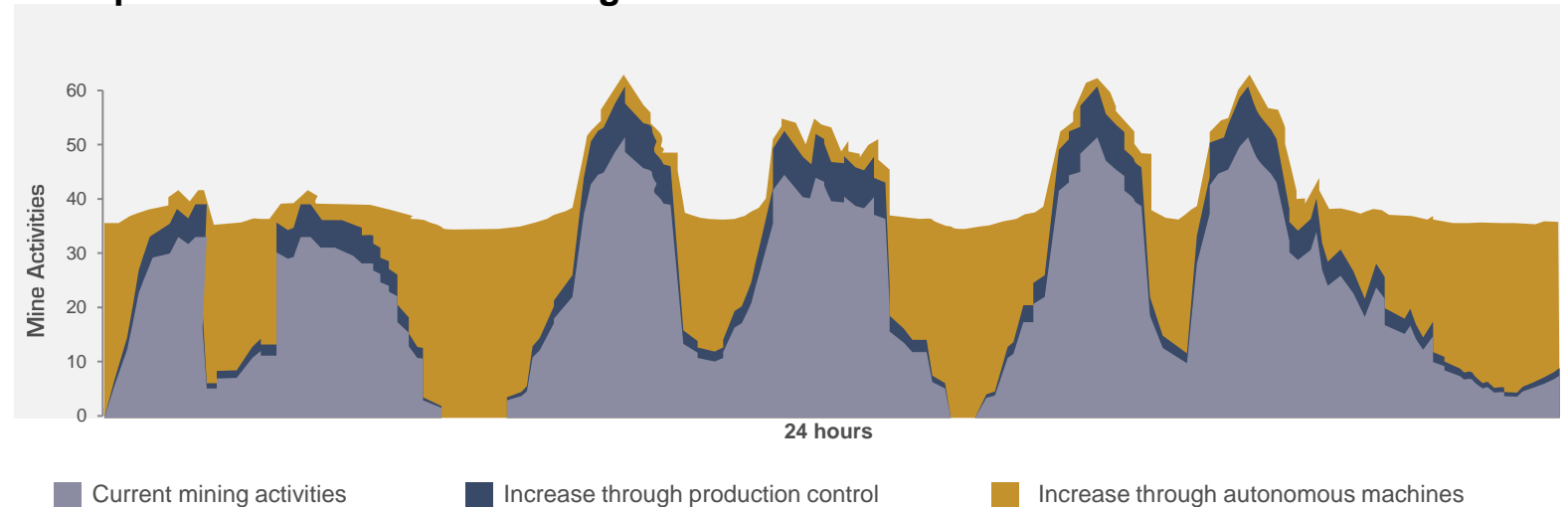


- Electrification, ventilation on demand
- 5G underground positioning system, driverless vehicles
- Mining Operating Control, tablets controlling all digital systems
- In-house technical department

...and automation



Example: Mine activities in underground mine

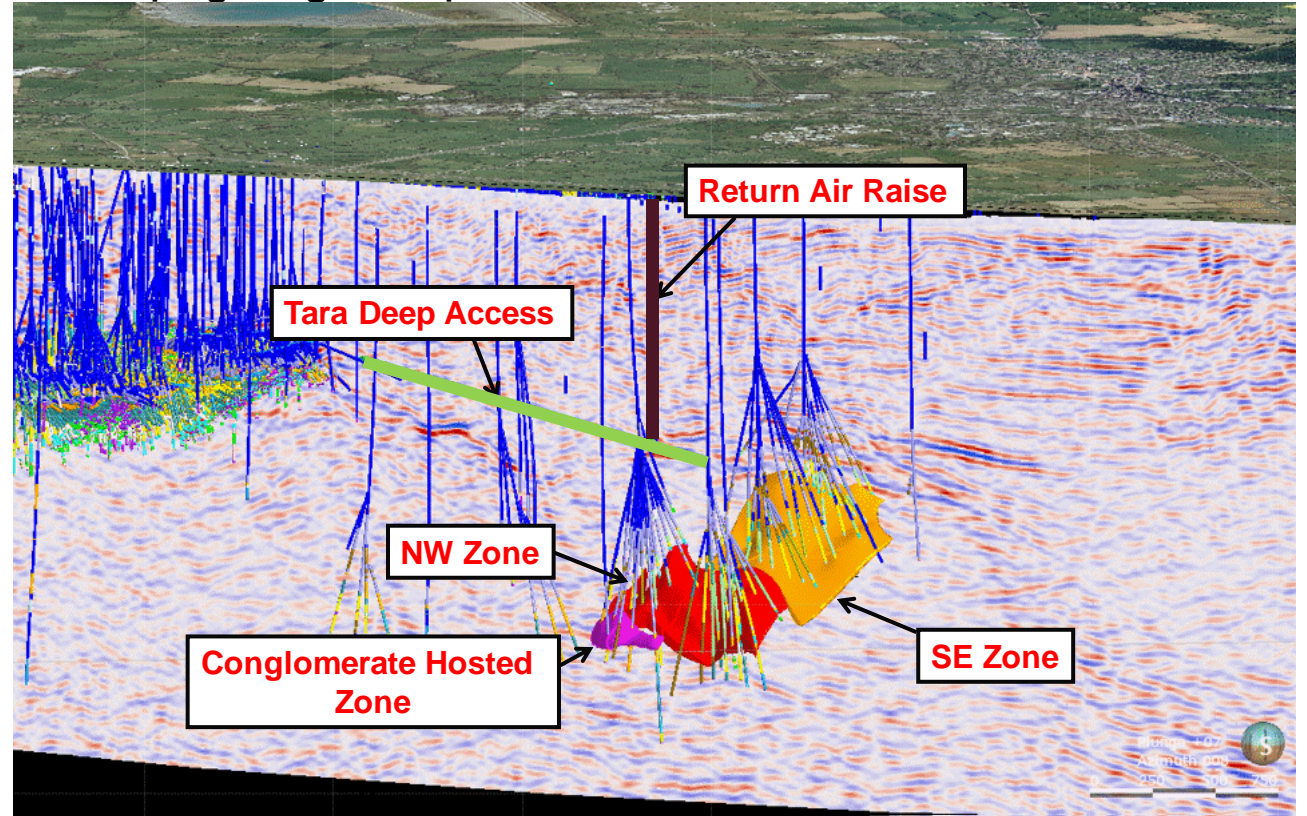


# Exploration and Mineral Resources & Mineral Reserves



- Exploration cost 520 MSEK (2018)
  - Drifts in Tara and Boliden Area
  - Increased exploration budget 2019 +10%
- Long life-of-mine in Aitik, Kevitsa and Garpenberg
- Increased inferred mineral resources in Tara Deep
  - Increase from 13.0 to 18.2 Mtonnes
  - Surface drilling
- Short life-of-mine in Kylylahti in existing ore body

Tara Deep – geological map



# Aitik

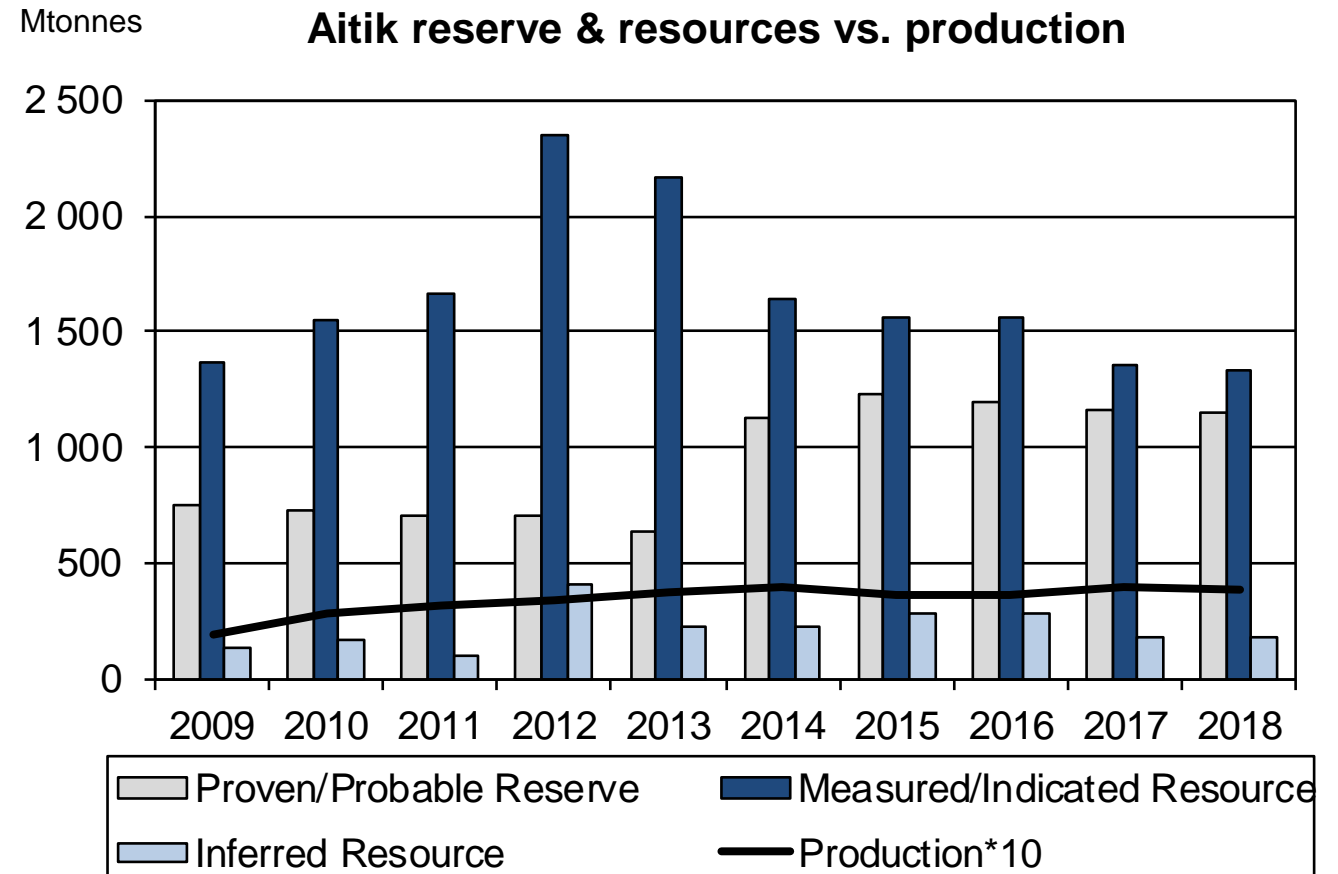


## Plus

- 45 Mtonnes throughput 2020
- New surface crusher
- Electrification
  - Trolley
- Automation
  - Production drilling
- New satellite pits
  - Liikavaara
  - Nautanen
- Reserve life 26 years

## Next key step

- Electrification
- Increased automation





# Kevitsa – status update

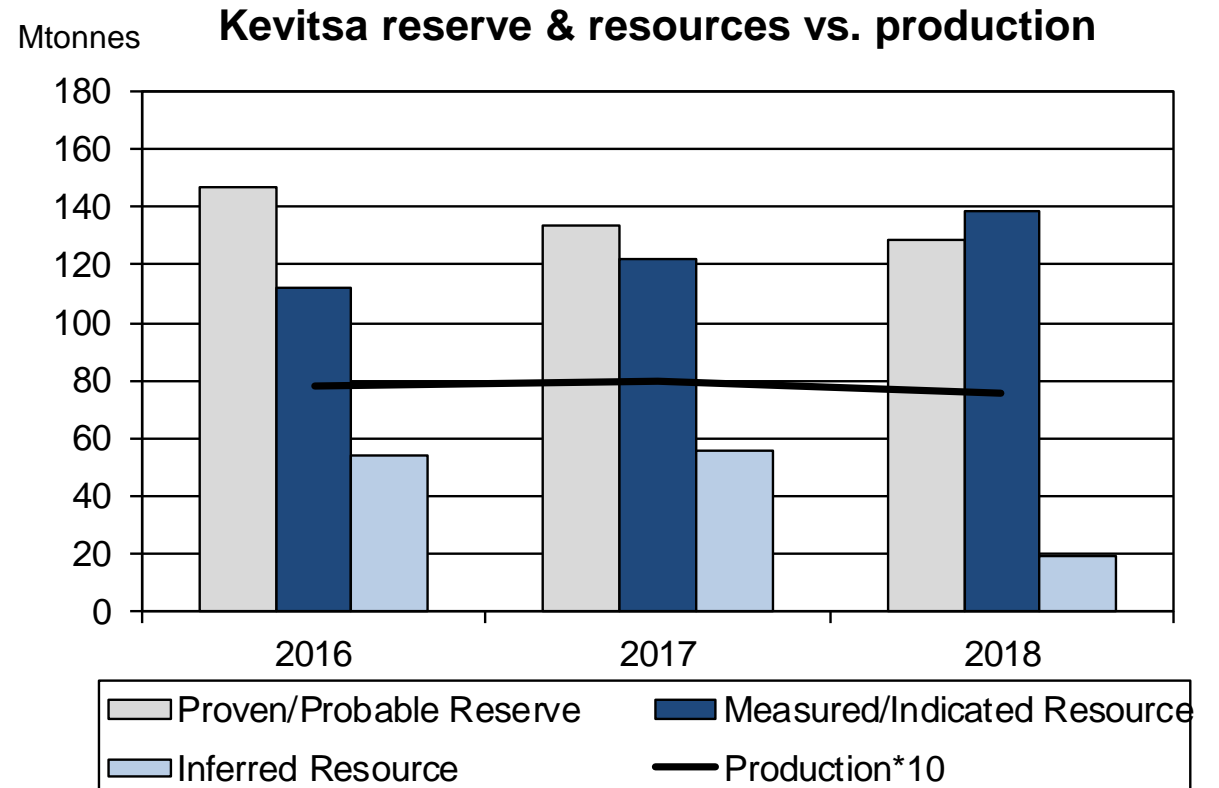


## Plus

- 9.5 Mtonnes milled volume pace in 2020
- Automation
- Increased in-house production
  - 17 Komatsu 830E-5
  - 2 Caterpillar 6060FS
- 13 years reserve life

## Next key step

- Electrification
- Increased automation



# Garpenberg – status update



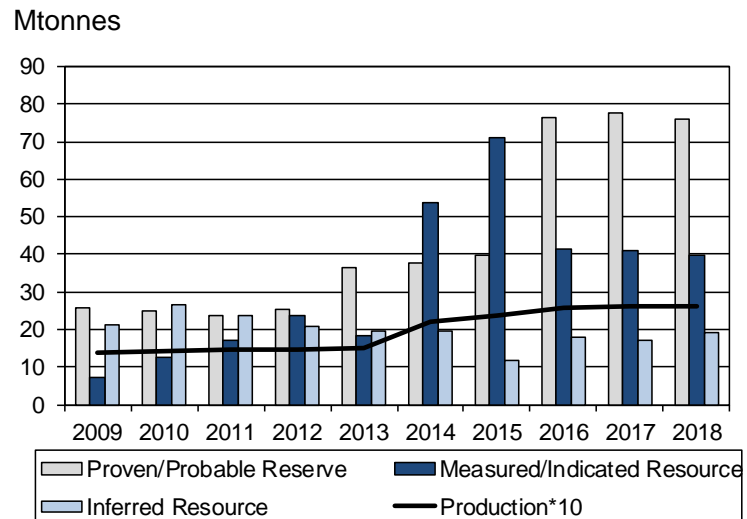
## Plus

- 3.0 Mtonnes throughput 2020
- Automation
  - Drill rigs, trucks
- 25 years reserve life

## Minus

- Mining 2018 at higher grades than mineral reserve average (Zn reserve grade: 3.1%)

## Reserve & resources vs. production



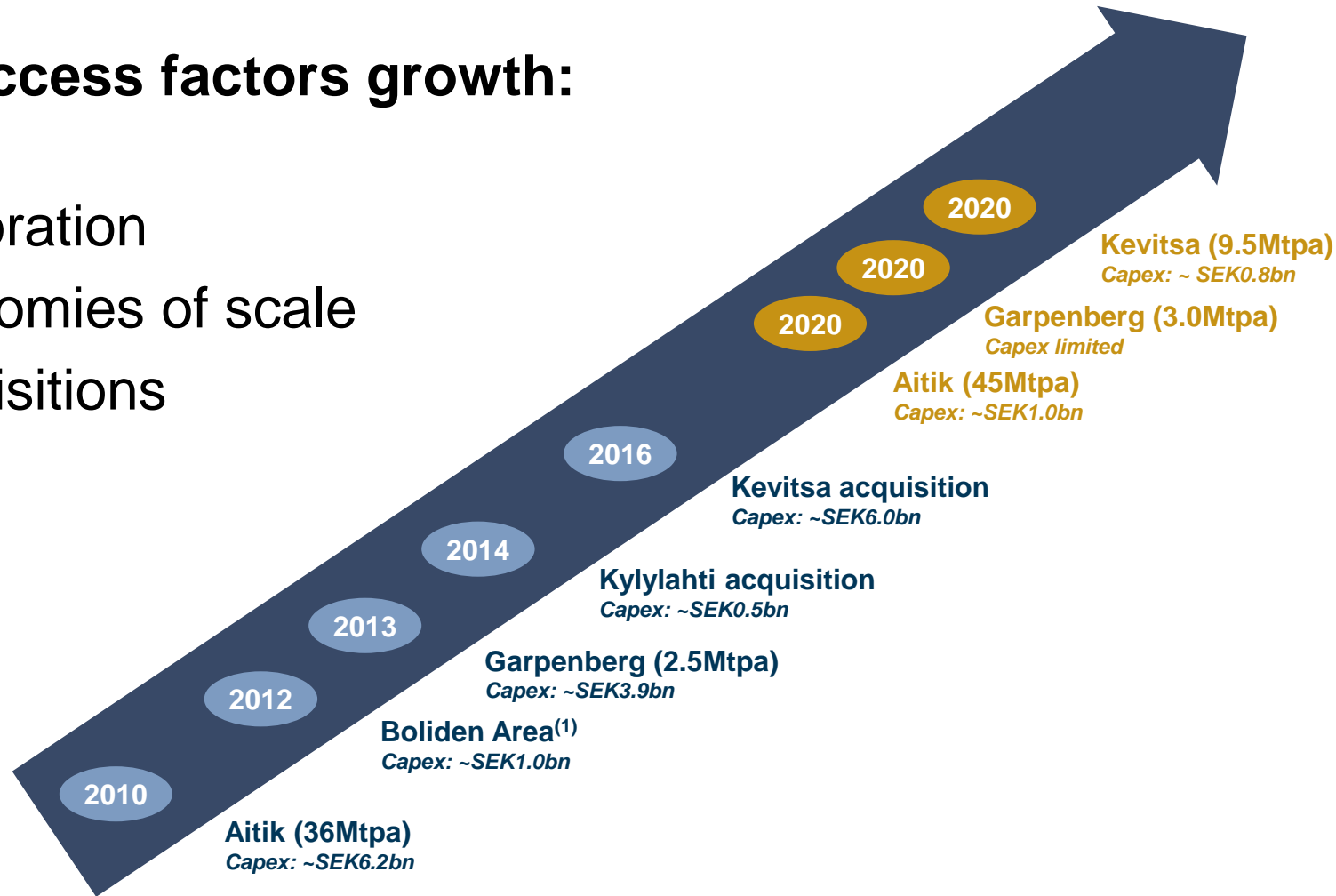
## Next key step

- Increased automation

# Investing for growth

## Key success factors growth:

1. Exploration
2. Economies of scale
3. Acquisitions



● Completed expansions ● On-going Expansion

1) Kankberg mine; Gold/Tellurium expansion