

PYHÄSALMI MINE OY



**8<sup>th</sup> Fennoscandian Exploration & Mining – FEM 2011**  
**Pyhäsalmi Mine – Five Decades of Profitable Mining**

Levi , Finland | November 2, 2011



# Outline

- Production History
- Productivity Chronicle
- How others see us?
- Technology Review
- Success with Inmet
- Corporate Responsibility
- Pyhäsalmi Today
- Summary



# Project Development

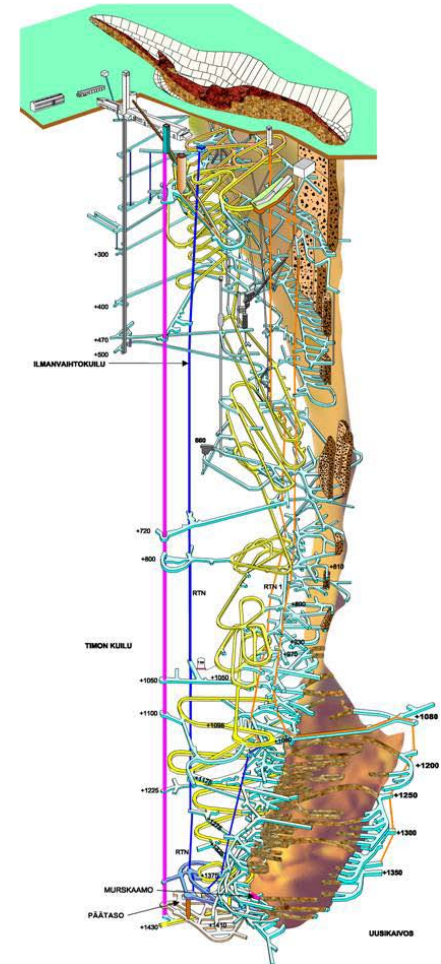
- Orebody was found 22.8.1958
- Outokumpu Exploration received chip sample 25.8.1958
- Agreement on claim reservation with Mr. Evert Ruotoistenmäki
- Geophysical surveys and diamond drilling commenced in September
- First intersection in October
- Mineral resources in March 1959  
17 Mt @0.85% Cu and 2.8% Zn



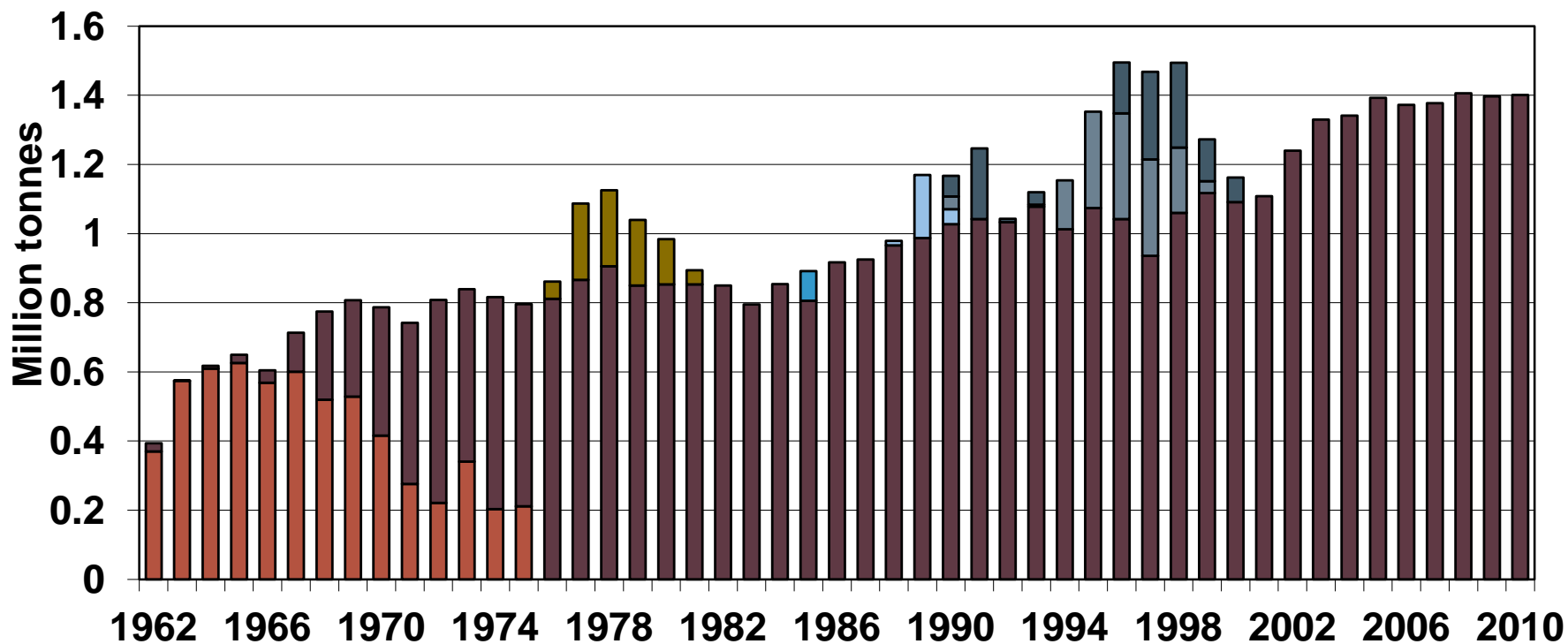
Topping-out ceremony 8.12.1959

# Mine Development History

- Open pit production started in March 1962
- U/G production started in 1966
- 500L was reached in 1970
- Open pit was completed in 1975
- Blind shaft down to 660L in 1985
- Gradual deepening down to 1000L in 1996
- New orebody was found in late 1996
- Production via Timo Shaft started 1.7.2001
- Inmet Mining Corporation 1.1.2002



# Production History



- Open Pit
- Underground
- Oxidized
- Kangasjärvi
- Ruostesuo
- D-pond
- Mullikkoräme

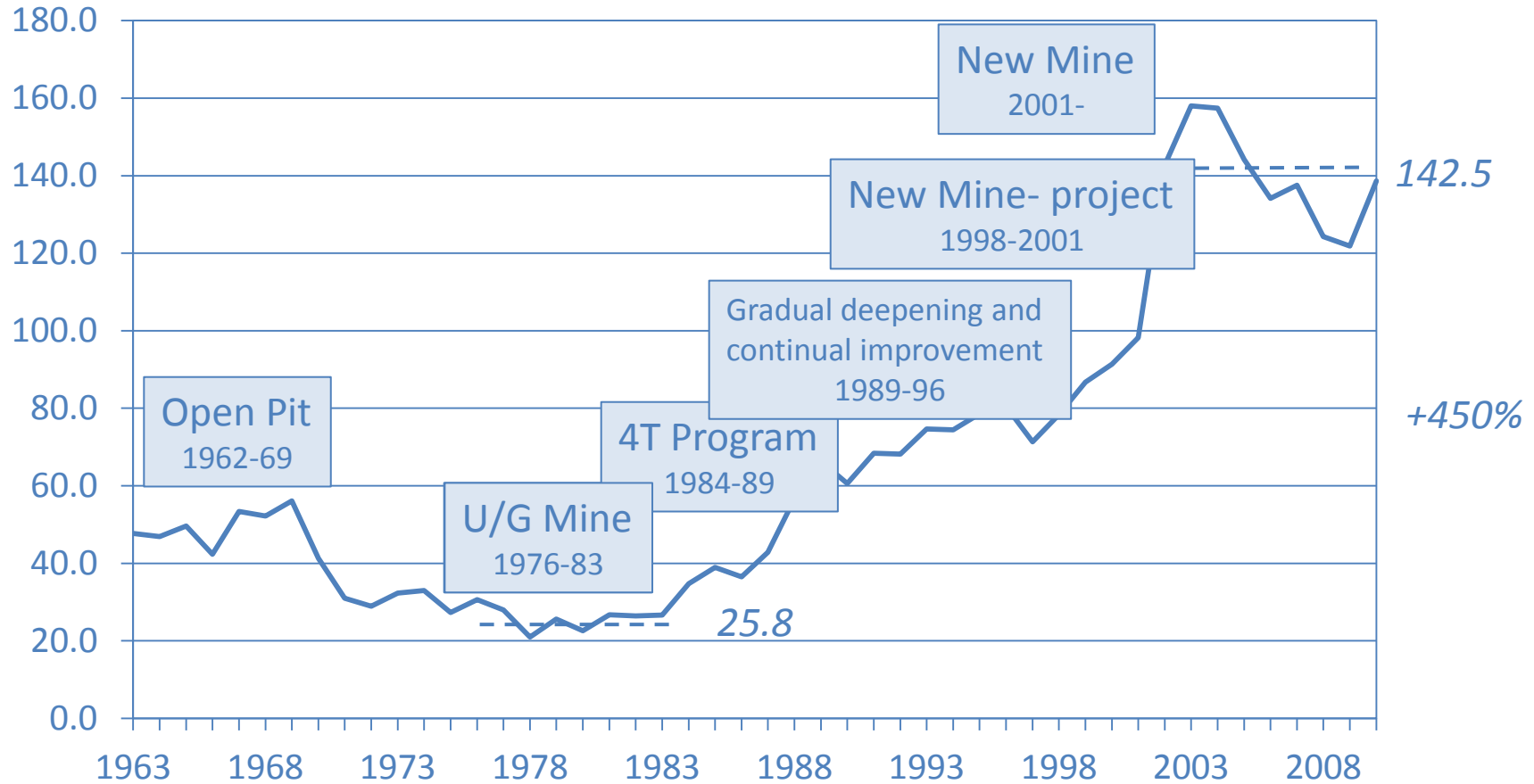
# Production Volumes

- Mill feed 51,4 Mt
- Copper produced 400,000 t
- Zinc produced 1,1 Mt
- Pyrite concentrates 25,5 Mt
- Gold 10,000 kg
- Silver 480,000 kg



# Productivity Chronicle

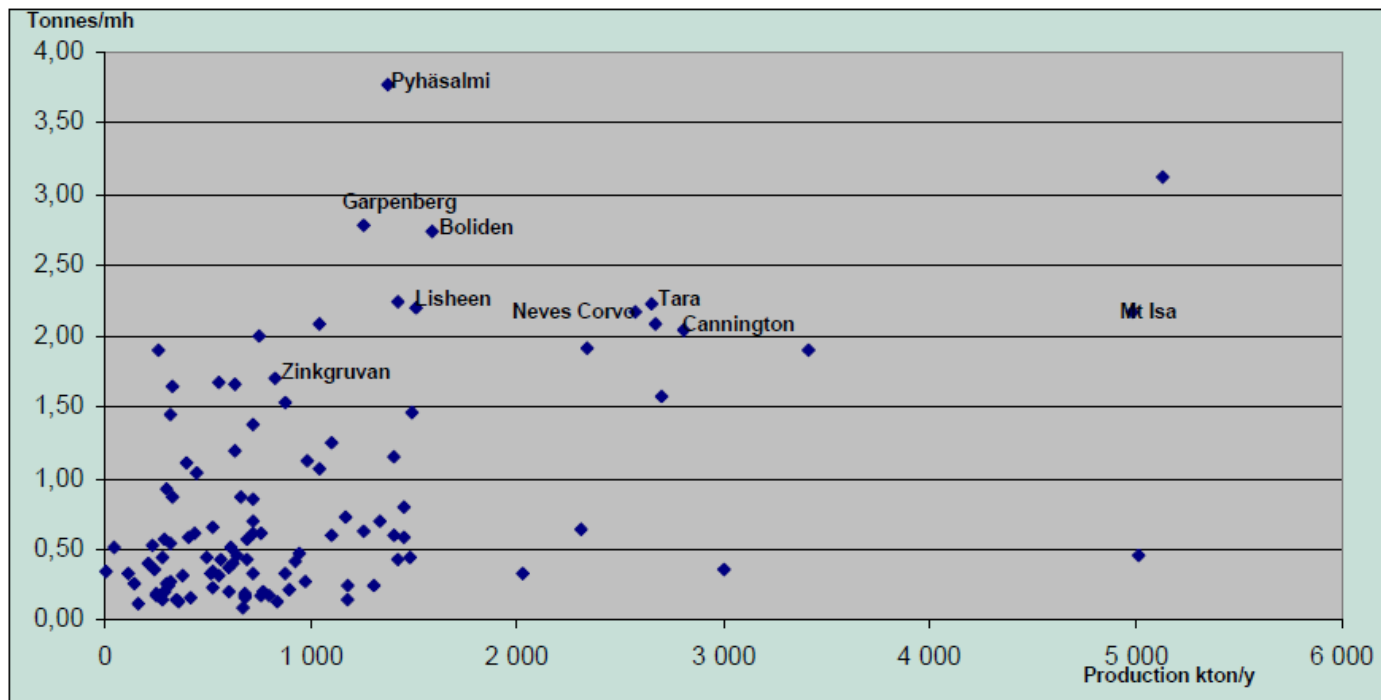
## Copper Equivalent - tonnes per manyear



# How others see us?

## Productivity 2007 World Wide Zinc UG Operations

(mine+mill+GA)



source  **BROOK HUNT**  
A WOOD MACKENZIE COMPANY

**BOLIDEN**

Source: Heeroma P, Supply potential and issues,  
Mineral Resources for Europe, Prague 28-29.4.2009

Pyhäsalmi Mine Oy  
2.11.2011



# Mining Technology Review

- Increase in unit size
- Hydraulics has replaced pneumatics
- Tele-remote operated mucking and longhole drilling
- Emulsion Explosives
- Mechanized Ground Support
- Rock Mechanical Knowledge
- Control and Data Systems
- Efficient Communication Network
  - LAN, WLAN, GSM, leaky feeder



# Processing Technology Review

- On-line X-ray Analyzator 1968
- One of the first process computers in mining industry 1969
- Flotation cell volume has increased from 3 m<sup>3</sup> to 38 m<sup>3</sup>
- Autogenous grinding, later SAG
- Ceramic filters
- Image Analysis in flotation control
- Remote operated u/g crushing
- Automated hoist and man-riding

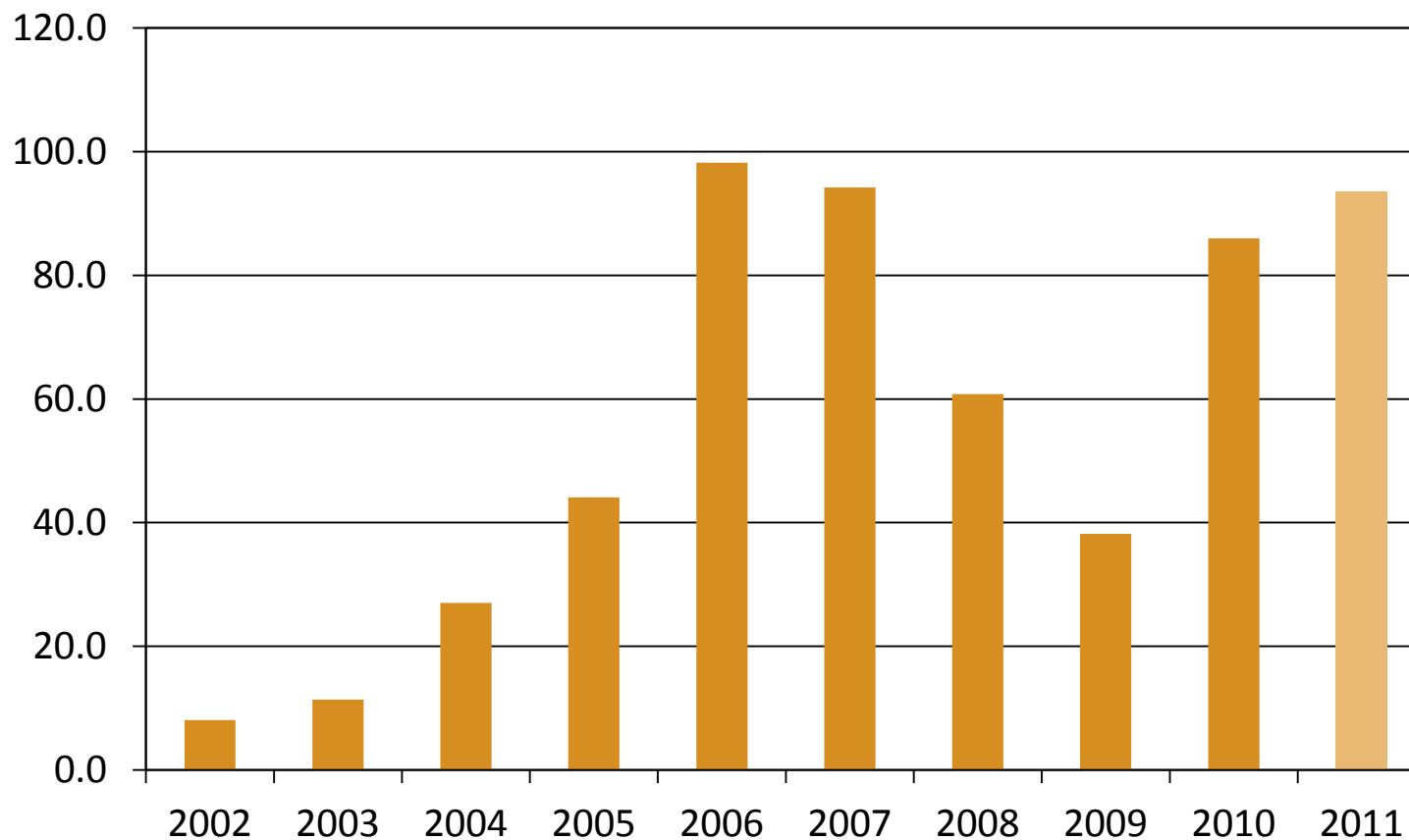


# Five Decades of Profitable Mining

- Fifty years is a long period in cyclical business
- However only in three fiscal years Pyhäsalmi has not made profit
  - 1978, dilution and downturn in pyrite business
  - 1986, metal prices and pyrites
  - 1998, exploration and development costs
- Satellite orebodies mined out and processed at Pyhäsalmi mill have enhanced profitability

# Supporting Inmet's Growth

## Operating Earnings, € million



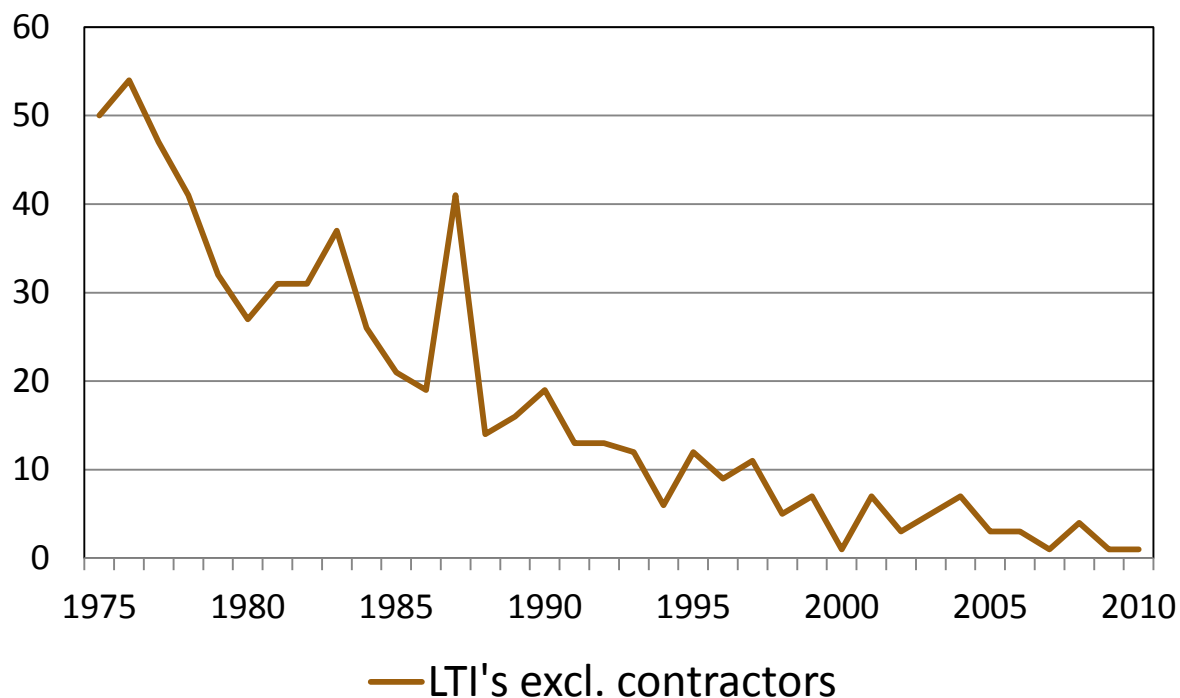
2011 figure represents a revised objective for 2011

# Corporate taxes benefit local community

- We have paid €100M corporate taxes in past seven years
- Government will return in range of 25% of corporate taxes to the place of origin
- Payments are delayed i.e. this year municipalities receive tax returns from fiscal years 2008 and 2009
- Our success has enabled Town of Pyhäjärvi to reduce their debt and even consider to decrease tax rate
- Pyhäjärvi's debt is now less than €700/ capita when some of our neighbours have in 6-7 fold
- Pyhäjärvi's equity ratio has risen up to 77%, when 70% is regarded good and not so often met

# Did we make all that safely?

- Safety record has vastly improved in 35 years
- Pyhäsalmi site completed 365 days LTI- free in October



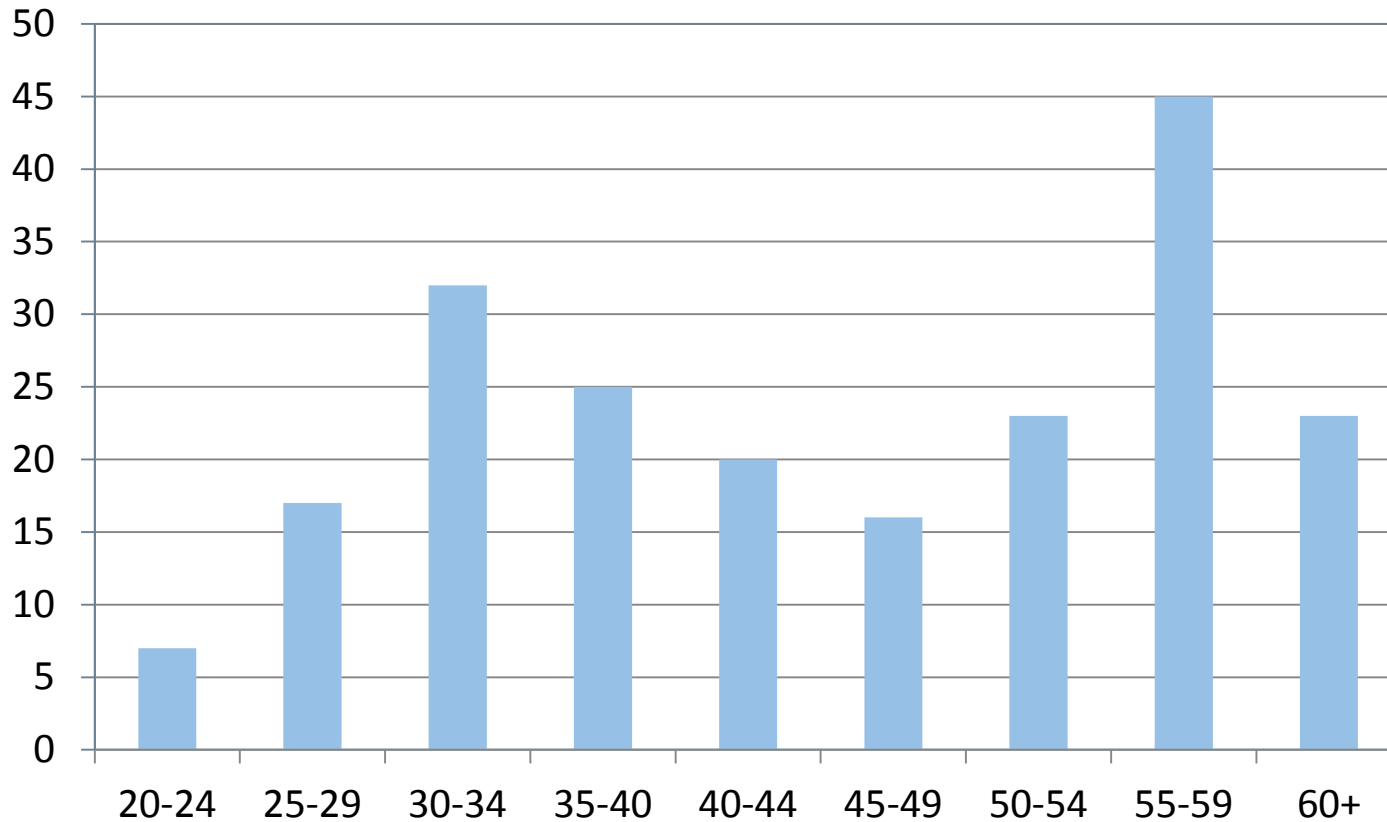
# Environment

- Tailings management facility has the biggest impact
- Application to renew the Environmental Permit will be lodged in 2016 attached with final Mine Closure Plan
- Mine closure will be carried out in accordance to high international standards and most likely will serve as an industry benchmark in Finland



# Pyhäsalmi Employees' Age Distribution

## Skills and knowledge passed to next generation





# Pyhäsalmi Mine Today

- Exploration at mine site
- Strong focus on rock mechanics and rehab in the now aging New Mine
- Mill still improving metallurgy
- Pyrite market favourable
- Introducing CR Standards
- Recycling water to conserve
- Retention plans



# Summary

- We are one of the most efficient u/g mines
- We apply leading edge technologies developed in co-operation with domestic suppliers
- Our profits have well supported Inmet's growth
- Corporate taxes paid have also benefited community
- More than 250 employees are proud to work in a modern, safe and efficient mine.

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