



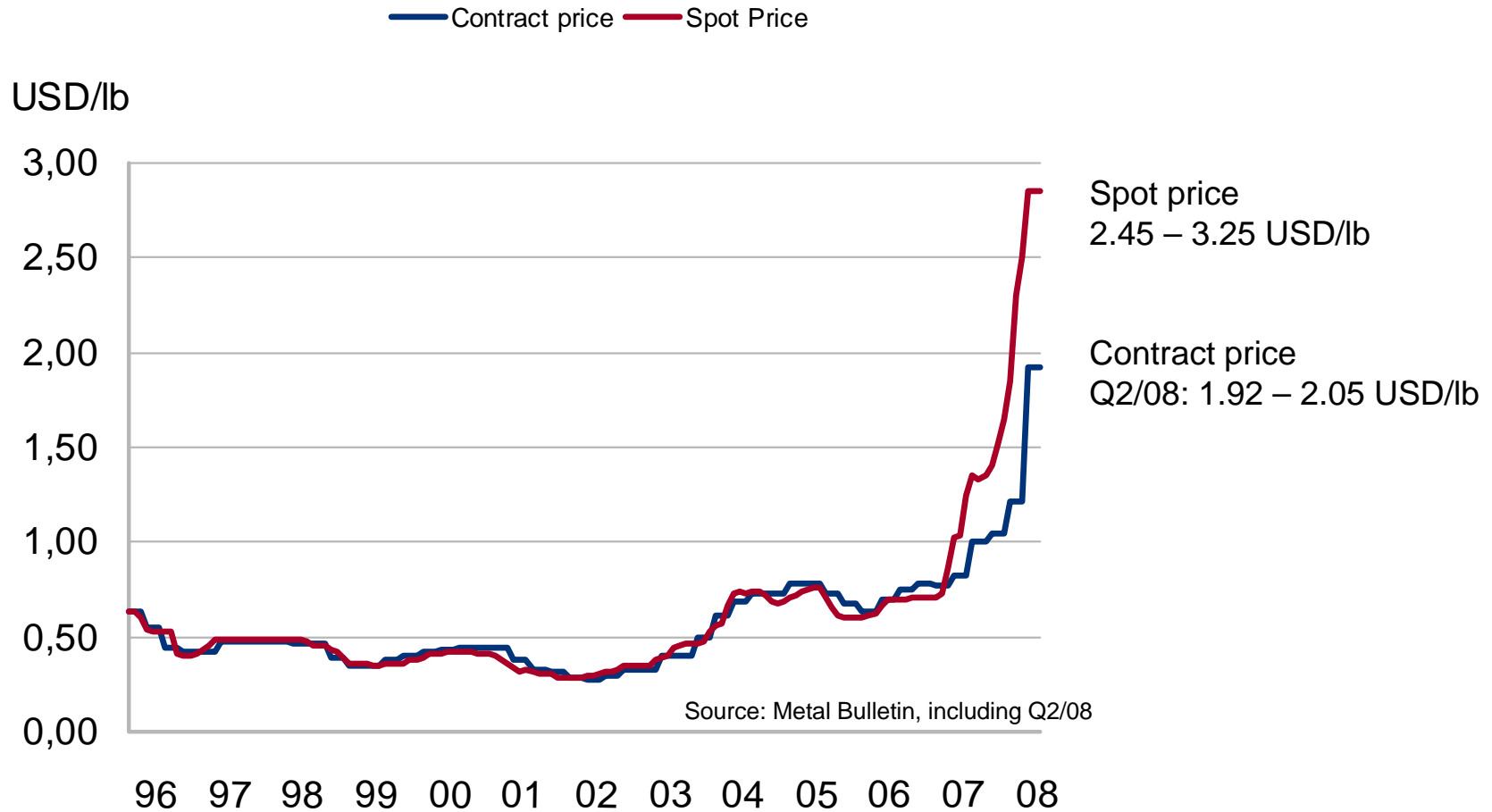
# Ferrochrome capacity expansion in Tornio

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# Ferrochrome demand - key drivers

- Demand of ferrochrome from the stainless steel industry has been increasing lately:
- Overall growth in stainless steel production (chrome makes steel stainless)
  - CAGR 5-7% over last 25 years
- Development of grade series production ratio
  - shift from chrome and nickel-containing austenitic grades to no-nickel, more chrome-containing ferritic grades
- Electricity restrictions in South Africa, and to some extent also in China, is limiting possibilities to expand ferrochrome production in the coming years

# Sharp rise in ferrochrome price in 2008



# Expansion of ferrochrome production capacity

- Double Kemi mine output to 2.7 million tons of chromium ore, chromite concentrates some 1.3 million tons
- Double Tornio ferrochrome production capacity to 530 000 tons
- New capacity in place during Q1/2011
- Will comfortably satisfy all Outokumpu primary ferrochrome needs even after ongoing stainless steel expansion projects

# Financial evaluation

- Capex EUR 420 million during 2008-2011
- The expansion has a solid financial background
  - short payback time
  - profitability clearly >13% Group ROCE target
- Sensitivity with expanded ferrochrome capacity in use:
  - **the positive effect of a 5 USc/lb increase in the ferrochrome contract price will increase from current EUR 10 million to some EUR 20 million on the Group's annual operating profit**
- At current prices, the expansion is estimated to bring additional annual operating profits in the order of EUR 200 million

# Strategic evaluation and risks

- The investment is in line with Outokumpu's strategy to
  - maintain cost leadership
  - secure raw materials and
  - capitalize on own chromium asset
- The investment is based on proven technology
  - in line with Corporate Responsibility targets being EU-rated technology in energy and emissions efficiency
- Main risks relate to electricity cost development in the future and ZAR/USD/EUR exchange rates
  - Outokumpu has a significant stake in the Fennovoima nuclear power plant initiative in Finland, proposed to start in 2018 – 2020
  - in addition to existing long-term electricity contracts and investments in energy supply, Outokumpu is for the interim currently finalizing a ten-year contract (one TWh per annum) electricity supply contract with a major European utility company

# Benefits of own ferrochrome production

- Sourcing the material at cost and pricing the chromium in the final stainless steel product at market price
- Integrated with the stainless steel process in Tornio, ferrochrome can be transferred to the stainless steel melt shop in liquid form
  - an exceptional cost advantage as the material does not need to be re-melted
- Carbon monoxide emanating from the ferrochrome process is used as fuel in the stainless steel mill
  - reducing the need for external energy

# Positive effect to global carbon dioxide emissions

- The ferrochrome expansion will increase Tornio's annual CO<sub>2</sub> emissions by some 270 000 tons to 950 000 tons
    - The main source of CO<sub>2</sub>, the use of coke, cannot be substituted in the ferrochrome process
  - Production of ferrochrome in Tornio with the mainly in-house developed state-of-the-art technology will reduce global emissions significantly
    - In Tornio, electricity mainly sourced from hydro and nuclear power, in South Africa and Kazakhstan mainly from fossil based plants
- **Expanding the capacity in Tornio is estimated to reduce the global CO<sub>2</sub> emission by some one million tons as opposed to sourcing the material from South Africa or Kazakhstan**

# Kemi Mine - currently

- Chrome deposit found in 1959
- Decision to exploit the deposit in 1964
- Production started in 1968
- Annual production 1.2 million tons of ore
- Ore reserves 38 million tons, additional mineral resources 85 million tons
- Products: upgraded lumpy ore and fine concentrate

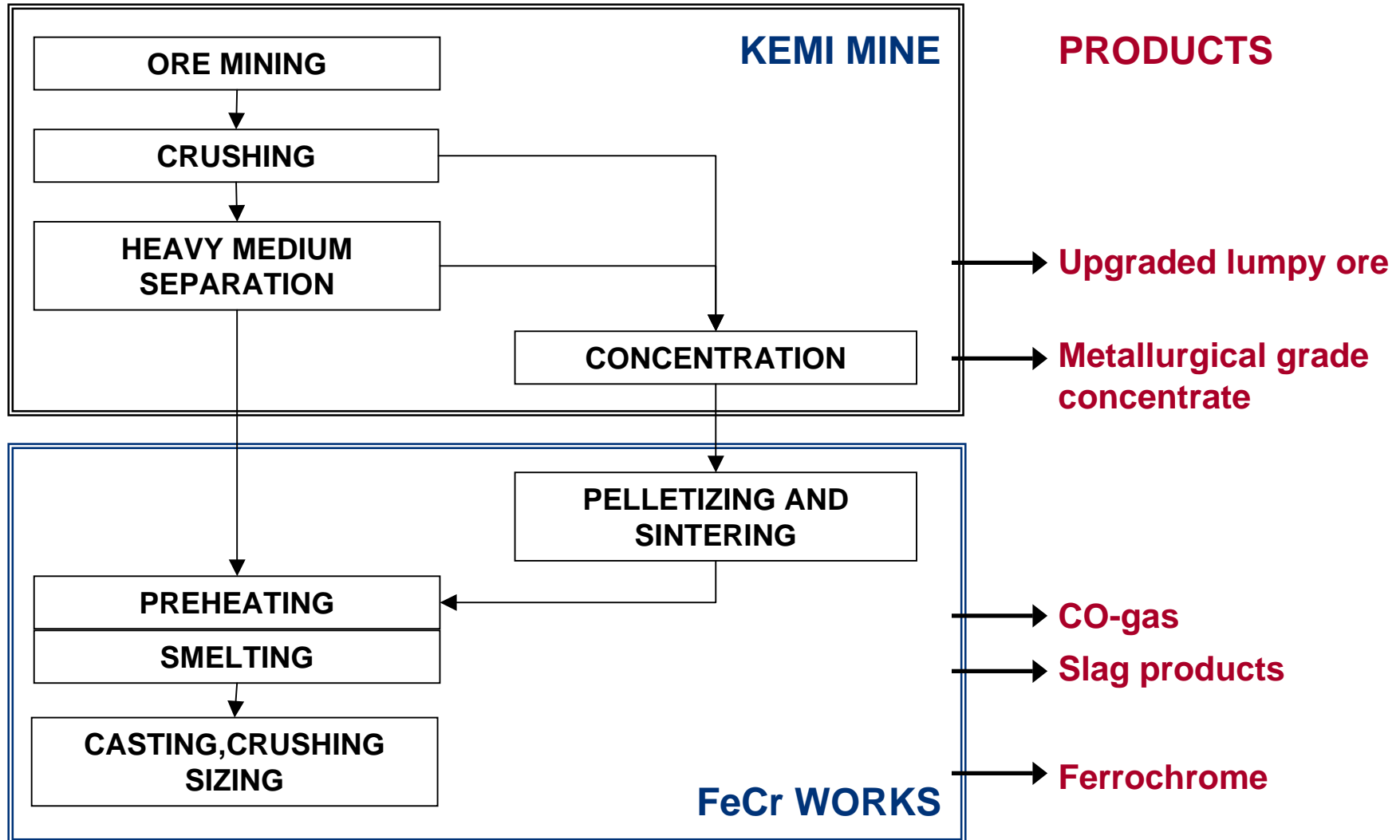


# Tornio ferrochrome smelter - currently

- Production commenced in 1968
- Ferrochrome smelter expanded by second smelting furnace in 1985
- New pelletizing and sintering plant commenced in 1989
- Current capacity 270 000 tpa ferrochrome accounts for some 3% of the ferrochrome capacity in the world



# Ferrochrome production – flow sheet



# Ferrochrome sintering and smelting process

