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INVESTMENT DECISIONS AND IMPLEMENTATION OF COPPER SMELTING PROJECTS IN CHINA
COPPER SMELTING AND REFINING

INVESTMENT DECISIONS AND IMPLEMENTATION OF COPPER SMELTING PROJECTS IN CHINA

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1. INTRODUCTION OF CHINA COPPER INDUSTRY

× 10kt

Copper production and consumption in China

Production Percentage

Consumption Percentage (2017)

China 51.8%
Others 48.2%

China 34%
Others 66%

Copper production and consumption in China
1. INTRODUCTION OF CHINA COPPER INDUSTRY

- ISA smelting technology
- Ausmelt smelting technology
- Flash smelting technology
- Side blowing technology
- SKS technology
- Others

Concentrate Processing capability Ratio (2017 in China)

- SKS: 40%
- Others: 60%

Key benefits of SKS technology:
1. Good Safety and environmental performance
2. High Flexibility to Raw Material
3. Low CAPEX
4. Low energy consumption
2. THE SURVIVAL ENVIRONMENT OF CHINESE COPPER SMELTERS

China Copper Consumption

China Copper Resource (2017)

- Domestic concentrate: 56%
- Imported concentrate: 18%
- Imported anode plate: 9.40%
- Imported scrap copper: 16.30%
2. THE SURVIVAL ENVIRONMENT OF CHINESE COPPER SMELTERS

**Emission Control**

- SO2 (mg/m³)
- As (μg/m³)
- Dust particles

**TC/RC**

- TC (USD)
- RC (US CENT)

- Chile
- China
- Specific provinces in China
- Specific areas in China

![Graph showing emission control and TC/RC over years](image-url)
2. THE SURVIVAL ENVIRONMENT OF CHINESE COPPER SMELTERS

Market Access Condition for Copper Smelting and Refining

- Water recycling ratio (%)
- S fixed ratio (%)
- Energy Consumption (Electrorefining, kgce/t)
- Energy Consumption (from concentrate to anode copper, kgce/t)

*1kwh=0.0129kgce

Chinese copper smelters need to update every 10-15 years
3. INVESTMENT DECISIONS AND IMPLEMENTATION OF COPPER SMELTING PROJECTS IN CHINA

Prefeasibility/Feasibility Study
4 months

Environmental impact assessment/project approval
12 months

Basic Engineering Design
8-10 months

Detailed Engineering Design
12 months

Procurement/Construction
20 months
(8 months after the completion of detailed design)

Commissioning/Start up
3 months

Less than 4 years

Project Implementation Period

Important factors

- Process
- Sulfuric acid
- Arsenic
- Slag tailing

The responsibility of local government

- Water supply
- Power supply
- Gas supply
- Site preparation
4. TYPICAL COPPER SMELTING PROJECTS IMPLEMENTATION (Designed by ENFI)

**Zhongyuan Smelter**
- Designed capacity: 1500k t/a concentrate
- SKS+Flash converting process
- (2013 feasibility study, 2015 put into operation)
- CAPEX 880 million USD

**Fangchenggang Smelter**
- Designed capacity: 1600k t/a concentrate
- Flash smelting + Flash converting process
- (2011 feasibility study, 2013 put into operation)
- CAPEX 1400 million USD

The largest flash copper smelter project in China

The largest copper smelter project with SKS
HISTORICAL PERSPECTIVE OF CHINA COPPER SMELTING

4. TYPICAL COPPER SMELTING PROJECTS IMPLEMENTATION (Designed by ENFI)

- **Cu Smelter of Yuguang Au&Cu Corporation**
  - Designed capacity: 80,000 t/a cathode copper
  - SKS+BCC process
  - (2010 feasibility study, 2014 put into operation)
  - CAPEX 300 million USD

- **Lingbao Copper Smelter**
  - Designed capacity: 660kta copper concentrate
  - SKS+BCC process
  - (2013 feasibility, will be put into operation at the end of 2018)
  - CAPEX 400 million USD
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