

An aerial photograph of an iron ore mine. The landscape is a vast, flat expanse of reddish-brown earth, heavily marked with the tracks of heavy machinery. A prominent yellow conveyor system, consisting of a long, elevated metal structure supported by pillars, stretches across the middle of the frame. The lighting is bright, casting long, dark shadows from the conveyor and other structures. The overall scene depicts a large-scale industrial mining operation.

Northwest steel and iron ore market research

Northwest steel and iron ore market research

SMM bases on primary research, internal database and modelling, successfully help our client deeply understand northwest steel and iron ore market and make a prediction of future iron ore usage changes

Project Background

Clients wishes to conduct a study to understand the steel, iron ore concentrate, pellets supply, demand and flows in northwest China. The focus area is the northwest China which includes Xinjiang, Gansu, Qinghai, Ningxia, Shaanxi provinces.

Additionally, the analysis should also include the logistics analysis, concentrate production costs and price mechanism of iron ore, as well the key iron ore cost performance analysis including quality, sales prices, etc.

Clients would like to focus on the yearly prediction and monthly update for each provinces and key plants sample.

Key Output

Strategic market research

Yearly steel S&D by provinces in 2022-2030

Yearly raw material (iron ore) flow by provinces in 2022-2030

Iron ore quality analysis

Iron ore price mechanism

Monthly market research

Monthly steel S&D by provinces and key plants sample

Monthly iron ore S&D by provinces and key plants sample

Steel price and steel mills' profit

Iron ore price and mines' profit

SMM Methodology

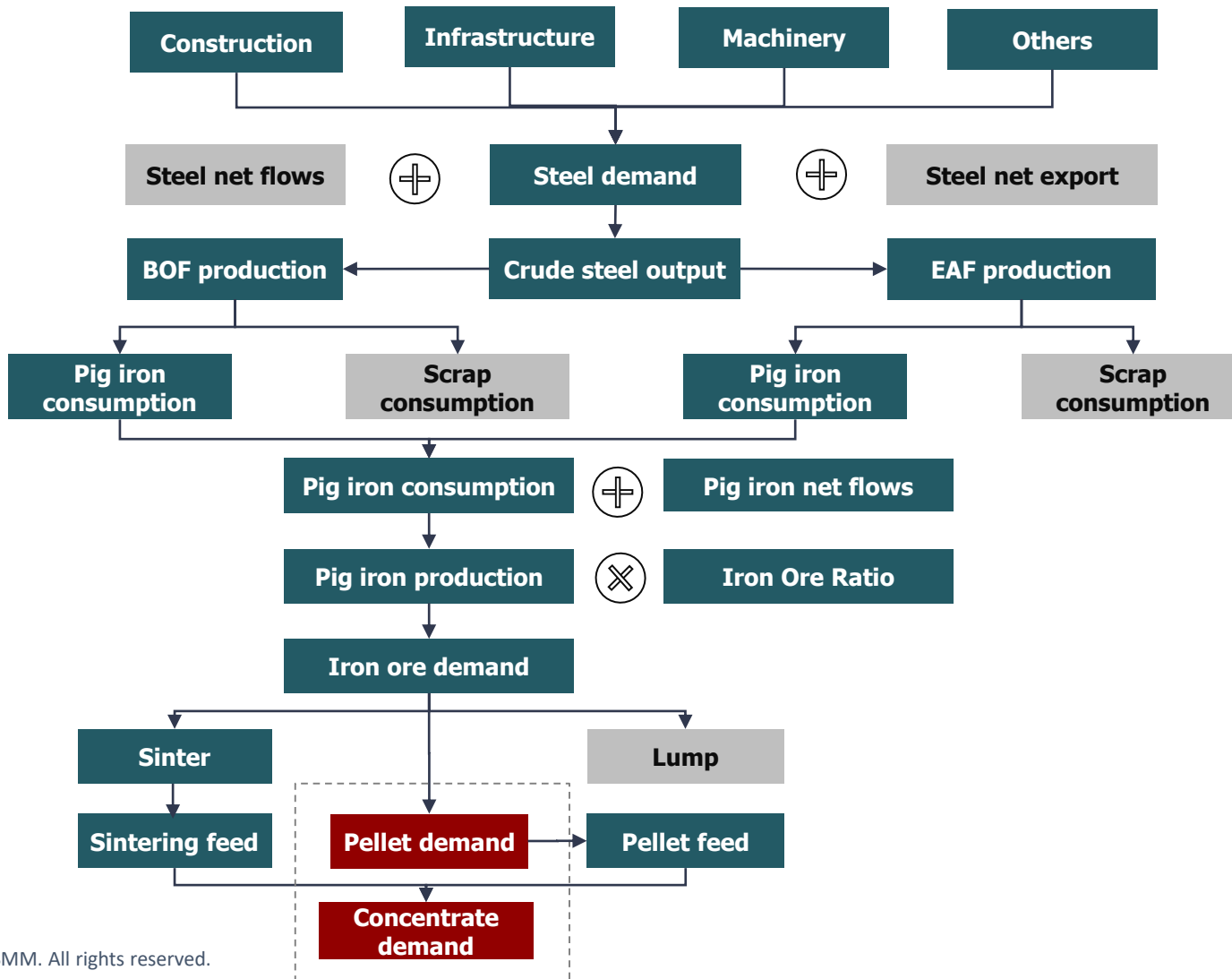
Based on client's request, SMM has scoped the project into 2 modules:

1. Northeast steel and iron ore market overview, yearly prediction
2. Northwest steel and iron ore market research, monthly update

Main Research Methodology:

- **Desktop Research:** SMM databases, industry public reports, etc. to comprehensively understand northwest steel and iron ore market
- **Primary Research:**
 - Industry level: conduct in-depth interviews with industry experts such as regional steel association (3 samples) steel and iron ore traders (5 samples)
 - Company level: conduct in-depth interviews with different departments of key benchmarking company, incl. procurement dept., sales dept., cost monitoring dept., etc. (17 steel mills sample, 14 pelletizing plants sample, 21 iron ore mines sample and 10 downstream steel consumption companies)

SMM methodology of value chain from downstream steel consumption industries to the raw materials

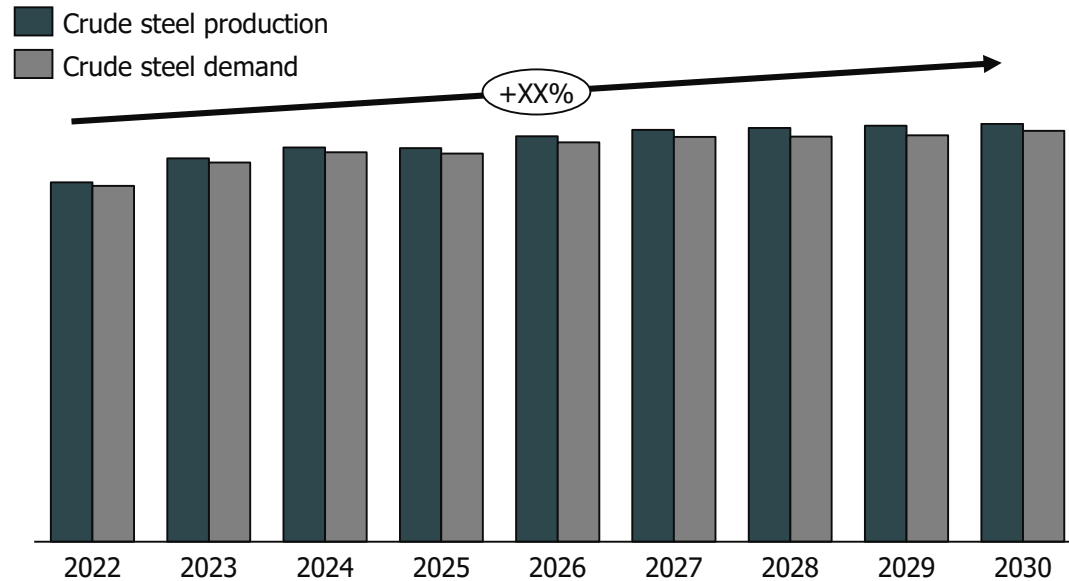


SMM applies for top-down methodology to forecast iron ore demand including IOC and pellet for each provinces in northwest region across the period.

- SMM provides northwest steel demand by downstream sectors and provinces.
- SMM considers the different downstream industries' steel demand and considering each factors may affecting the downstream industry steel demand via factors analysis method. Then combined with regional crude steel production capacity changes and structural changes, the crude steel output is predicted. According to BF-BOF and EAF capacity proportion and industry policy, pig iron production is forecasted.
- Also, SMM conducts the northwest steel production forecast model on the basis of the historical data. On the one hand, SMM establishes an indicator, that is, the contribution of each ton of steel to GDP. According to the historical trend, the indicator is regressed. Among it, GDP growth rate forecasts and population growth forecasts are sourced from industry experts or public authorities.
- Based on survey the burden mix in BF, iron ore including concentrate and pellet demand is forecasted. Pellet demand is calculated by considering the pig iron production and burden mix. Concentrate in sinter and pellet also be considered.

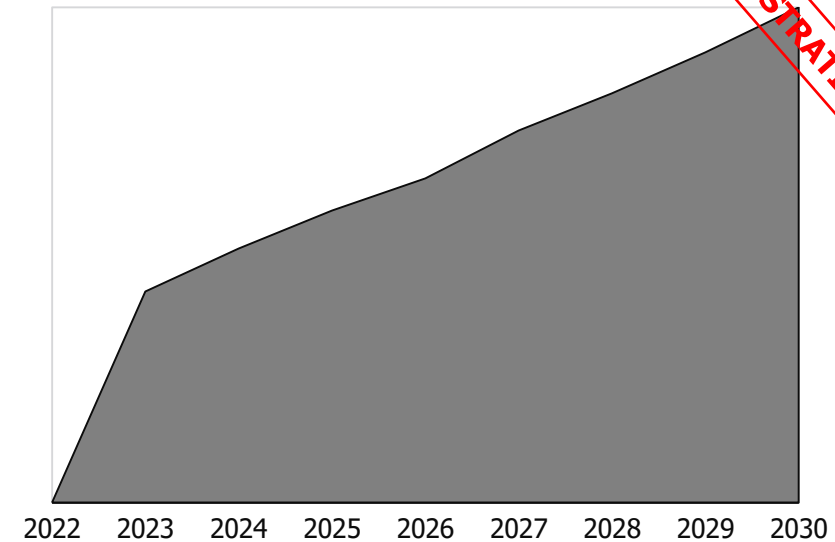
Crude steel demand in northwest will be expected to increase that driven by encouragement policy and economic development in northwest

➤ Overall northwest crude steel prediction



Data source: NBS; SMM

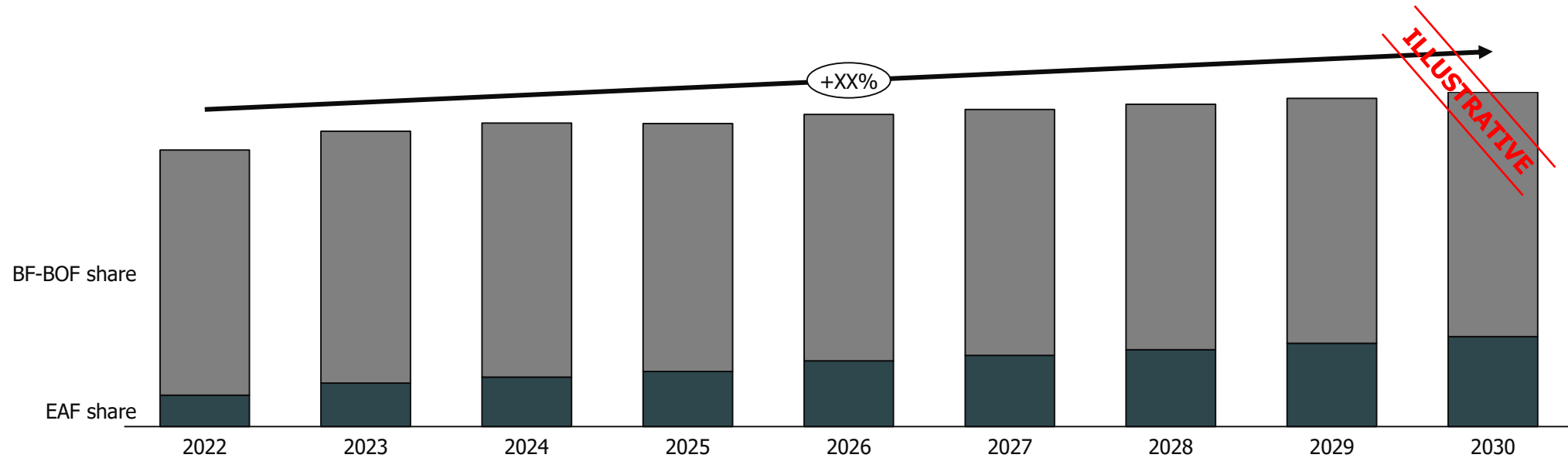
➤ Crude steel net export prediction



- Crude steel demand applies for factor analysis methodology, GDP growth, population, urbanization rate, FAI are considered in the forecast model. Encouragement policy on northwest infrastructure, expressway and other downstream steel industry still worth being expected. Especially, it is mentioned in the 14th-five and 2035 far-seeing plan that the automobile, machinery and chemical equipment manufacturer industry still a key development target in some regions northwest. Additionally, SMM also cross check with local end-users.
- SMM expects that the crude steel demand will increase by CAGR XX% to XX Mt in 2030. Current low urbanization rate and less development on infrastructure in northwest, it still expects that the future development provide support to the steel demand.
- The crude steel export expects to increase due to convenient transportation via China-Europe Railway Express connecting northwest region to the countries in Europe. Crude steel import almost maintain the XX Mt per year.
- Crude steel production = crude steel demand - steel import + steel export. Crude steel production will reach around XX Mt in 2030 based on the demand model.

EAF share of crude steel production will see an increase in the next 10 years, while BF-BOF still account for the largest proportion

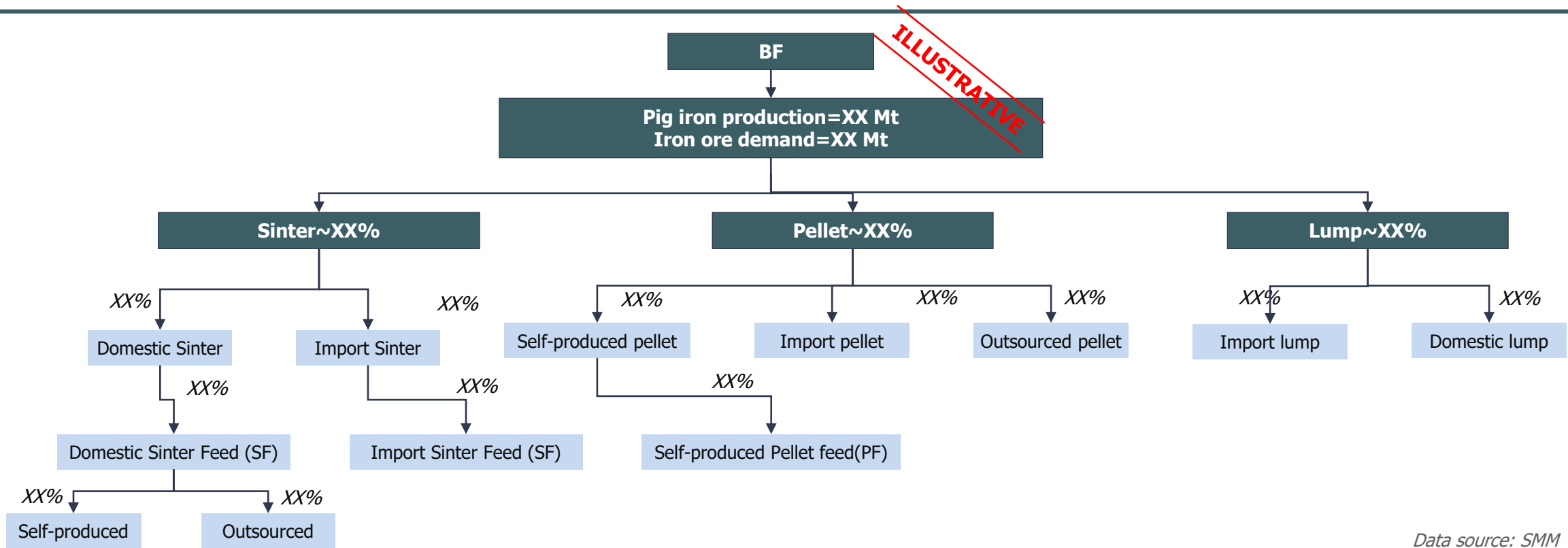
Northwest crude steel production prediction by technology



Data source: NBS; SMM

- Crude steel production in the next 10 years will see an increase, of which EAF contribution will increase obviously, but the BF-BOF contribution still the main largest contribution on the overall crude steel supply in northwest China. It expects that the newly-built EAF capacity will increase from 2025, simulated by national support policy while BOF capacity will not see an obvious increase in the future.
- Due to shortage of scrap steel in northwest region, pig iron still the leading raw materials for BOF and EAF, which resulted in the increasing iron ore demand in the future. But driven by national encouragement policy, scrap ratio will be expected to reach around XX % by the end of 2030.

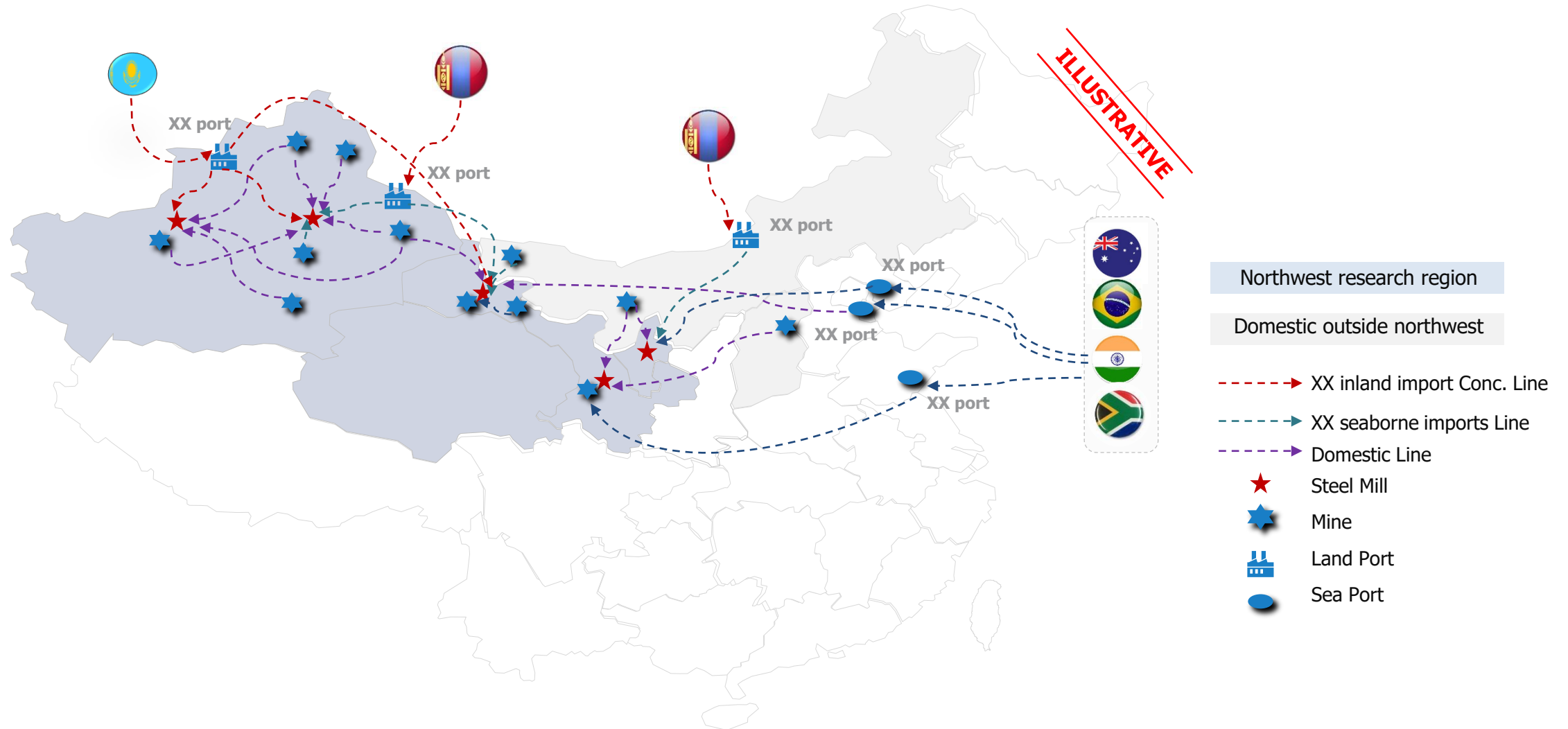
Bill of material for XX plant sample in northwest region



Data source: SMM

- The sinter ore are produced by many sintering concentrate and few fine, which is different from steel mills in other provinces in China. Concentrate resources are quite abundant in individual province, compared to other provinces in northwest.
- After the pandemic control, it expects that the import iron ore including concentrate and pellet would increase in the future.
- SMM will monthly update the steel mills sample to know their BF burden mix and scrap demand.

Northwest iron ore concentrate material flow

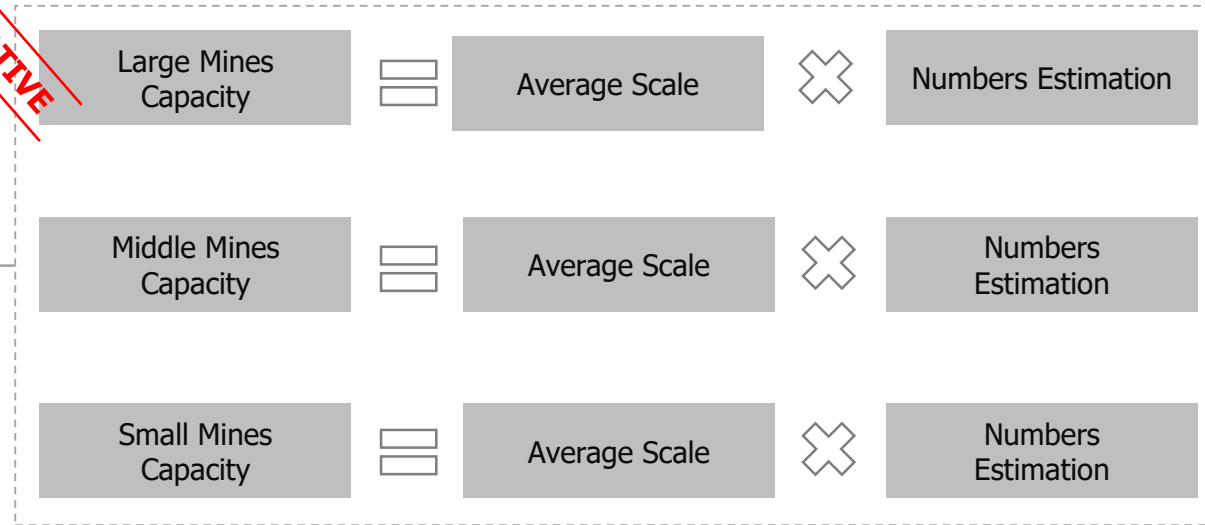


Bottom-up approach to analysis of northwest iron ore capacity

Northwest iron ore capacity estimation model

Regions	Concentrate capacity	Proportion
XX 1	×Million mt	×%
XX 2	×Million mt	×%
XX 3	×Million mt	×%
XX 4	×Million mt	×%
...	×Million mt	×%

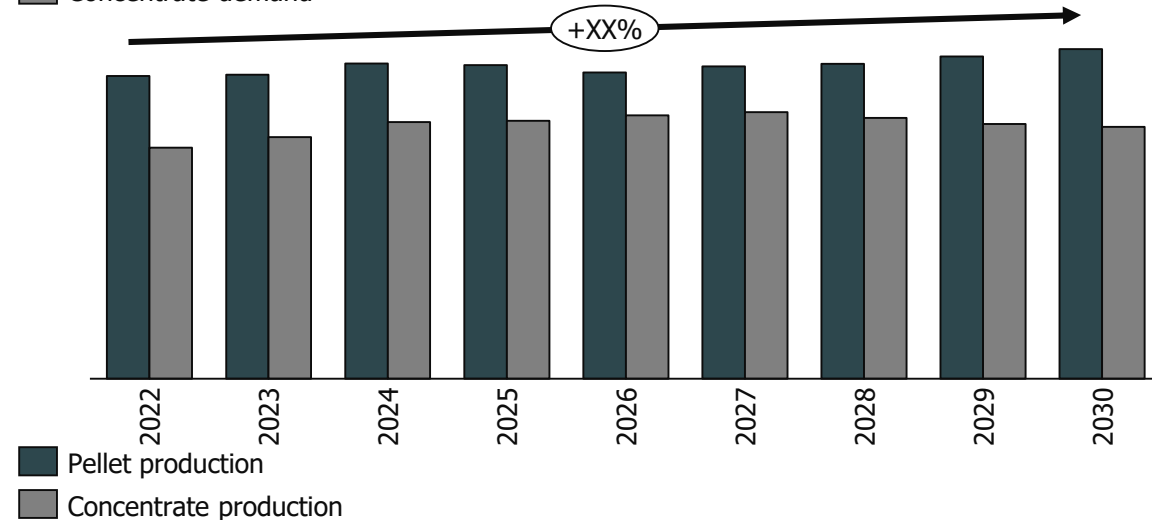
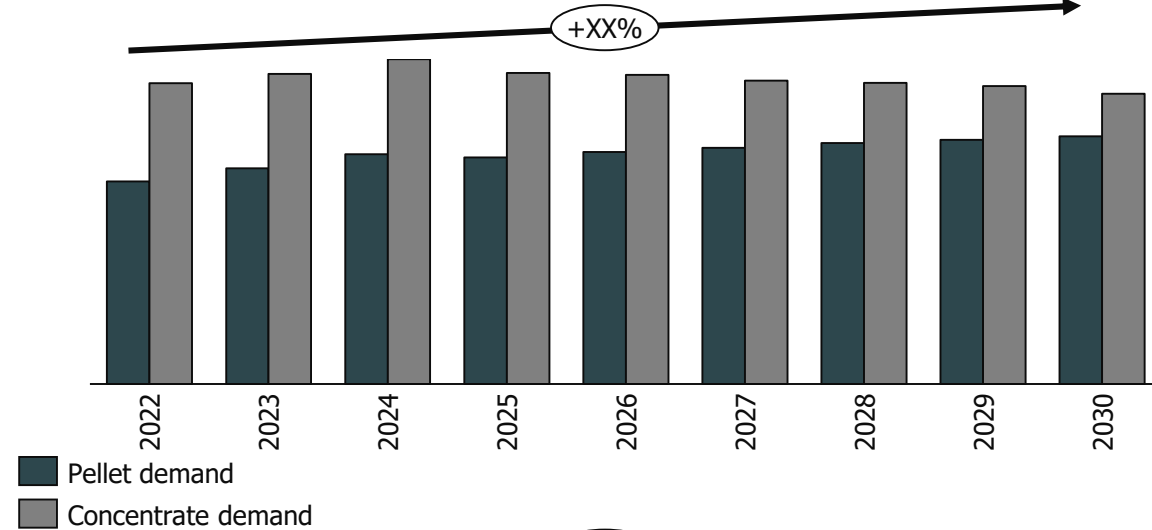
ILLUSTRATIVE



- Based on the average scale, numbers estimation of local mines by different capacity classification, SMM concludes the conc. capacity of mining zones in three provinces.
- Since 2007, SMM has been focusing on the research of domestic iron ore mines. Currently, SMM surveys 800+ domestic iron ore mines every month, covering 86% of total iron ore capacity. Among it, SMM has kept a regular research with more than 80+ iron ore mines in northwest region.

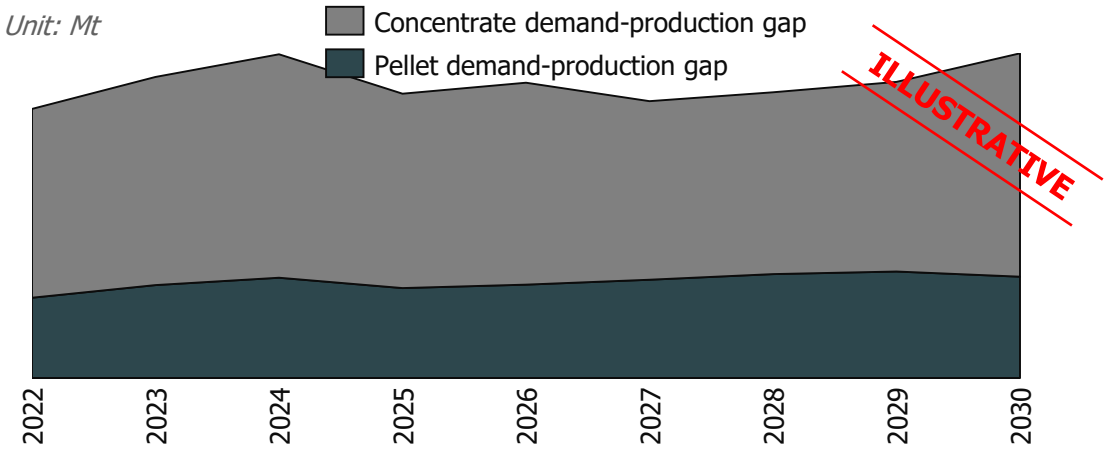
Northwest concentrate and pellet demand and supply changes forecast

Northwest concentrate and pellet demand and supply forecast



Northwest concentrate and pellet demand-production gap

Unit: Mt



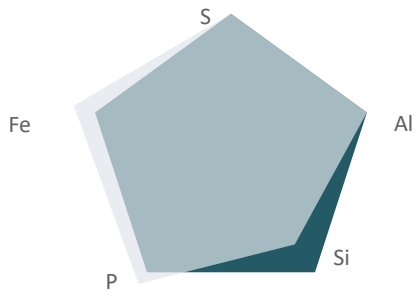
- Generally, concentrate and pellet always belong to net-inflow trend in northwest region, which resulted in the import and purchasing from domestic mines in other regions outside northwest.
- Concentrate demand and production gap in the future will be expected to be larger than pellet gap, with the decreasing iron ore price, the capacity utilization rate of mines will decline, which resulted in the low growth rate for concentrate production. In addition, green mine construction in some areas must partly finish by 2025, in order to achieve construction standards, mine production may also be greatly affected. Also, safety inspection becomes severe in individual province, which also have an impact on the concentrate supply.
- In terms of pellets, due to the large-scale blast furnace and environmental protection requirements, the pellet output will steadily increase with the commissioning of new production capacity.

Import iron ore quality comparison with domestic iron ore

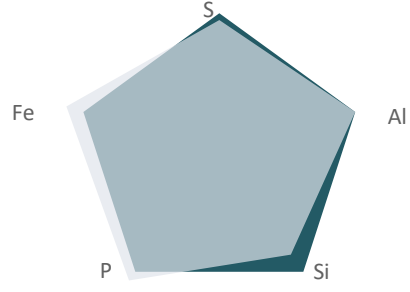
➤ Import iron ore quality comparison with domestic iron ore

➤ Steel mills' requirement or quality deduction example

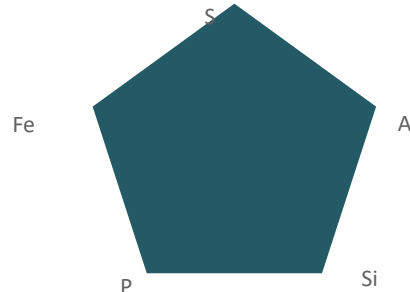
Domestic concentrate



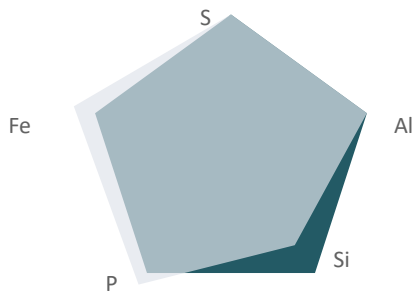
Import concentrate



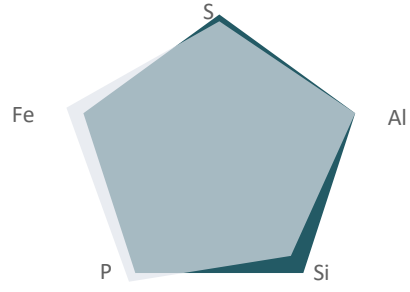
Benchmark concentrate



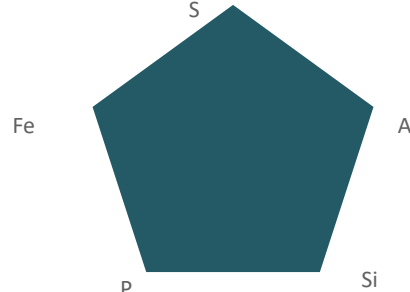
Domestic pellet



Import pellet



Benchmark pellet



Plants	Products	Fe	Si	Al	S	P	Particle size	Compressive strength	Tumble index
Mine 1	IOC	***	***	***	***	***	***	***	***
Mine 2	IOC	***	***	***	***	***	***	***	***
Mine 3	IOC	***	***	***	***	***	***	***	***
Plant 4	Pellet	***	***	***	***	***	***	***	***
Plant 5	Pellet	***	***	***	***	***	***	***	***
XX...		***	***	***	***	***	***	***	***

Pellet premium and deduction model illustrative

ILLUSTRATIVE

Fe content	Requirement	Model
Fe ≥ 62%	RMB XX/dmt premium for each 1% Fe more	
61% ≤ Fe < 62%	RMB XX/dmt deduction for each 1% Fe less	
60% ≤ Fe < 61%	RMB XX/dmt deduction for each 1% Fe less	
Fe < 60%	Negotiation or refuse	

SiO2 content	Requirement	Model
7.5% < SiO2 ≤ 8%	RMB XX/dmt deduction for each 0.1% Si more	
8% < SiO2 < 9%	RMB XX/dmt deduction for each 0.1% Si more	
SiO2 ≥ 9%	Negotiation or refuse	

AIO2 content	Requirement	Model
1.6% < AIO2 ≤ 1.7%	RMB XX/dmt deduction for each 0.1% Al more	
1.7% < AIO2 ≤ 1.9%	RMB XX/dmt deduction for each 0.1% Al more	
1.9% < AIO2 < 2%	RMB XX/dmt deduction for each 0.1% Al more	
AIO2 ≥ 2%	Negotiation or refuse	

S content	Requirement	Model
0.06% < SO2 ≤ 0.07%	RMB XX/dmt deduction for each 0.01% S more	
0.07% < SO2 ≤ 0.08%	RMB XX/dmt deduction for each 0.01% S more	
0.08% < AIO2 < 0.1%	RMB XX/dmt deduction for each 0.01% S more	
SiO2 ≥ 0.1%	Negotiation or refuse	