



**International conference “Strategy for railway
infrastructure development of Mongolia”**
Presentation materials from BCG

Ulaanbaatar, October 15th, 2009

THE BOSTON CONSULTING GROUP

Agenda for BCG presentations

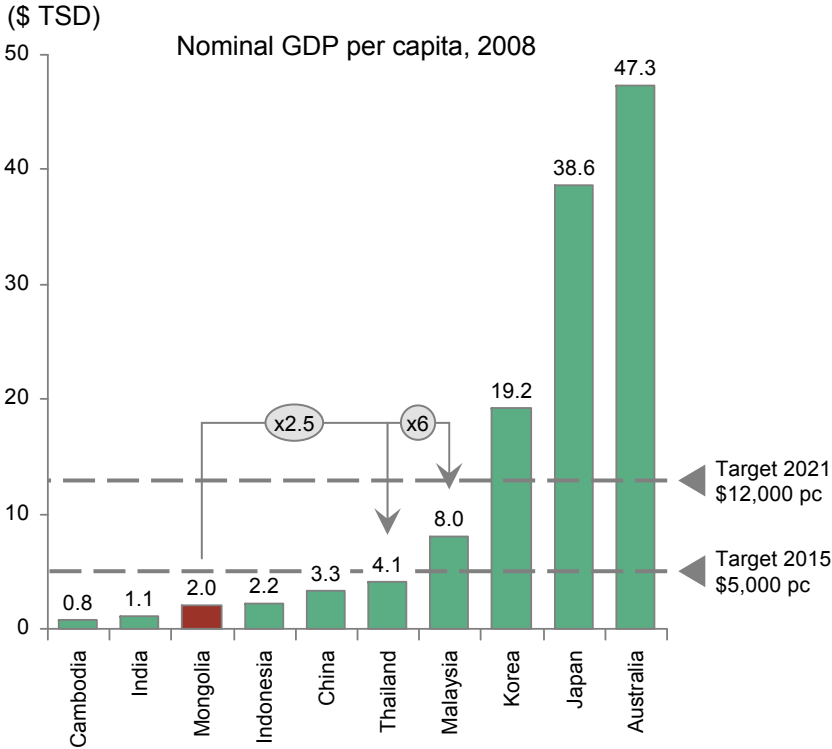
- 1. Capitalizing on Mongolia's mineral resource base as key engine of growth**
2. Taking a long-term view for Mongolia's railway infrastructure
3. Reaping the benefits of an integrated mining-rail strategy

Mongolia needs to capitalize on its mining resources as key engine of growth

- *Mongolia has bold macro-economic development ambitions*
- *Mining and associated processing are key to meeting growth goals*
- *Copper and coal reserves are among the most promising in the world, provide building block*
- *Export markets identified to absorb profitably Mongolian production*
- *Case study: Chile shows best practice of how to leverage mining resources for broader based economic development*
- *Long term route to success for Mongolia is downstream integration and domestic value creation*
- *Industrial cluster will be key lever for development*

Mongolia has set ambitious macroeconomic targets for the next decade

GDP is projected to grow very fast ...



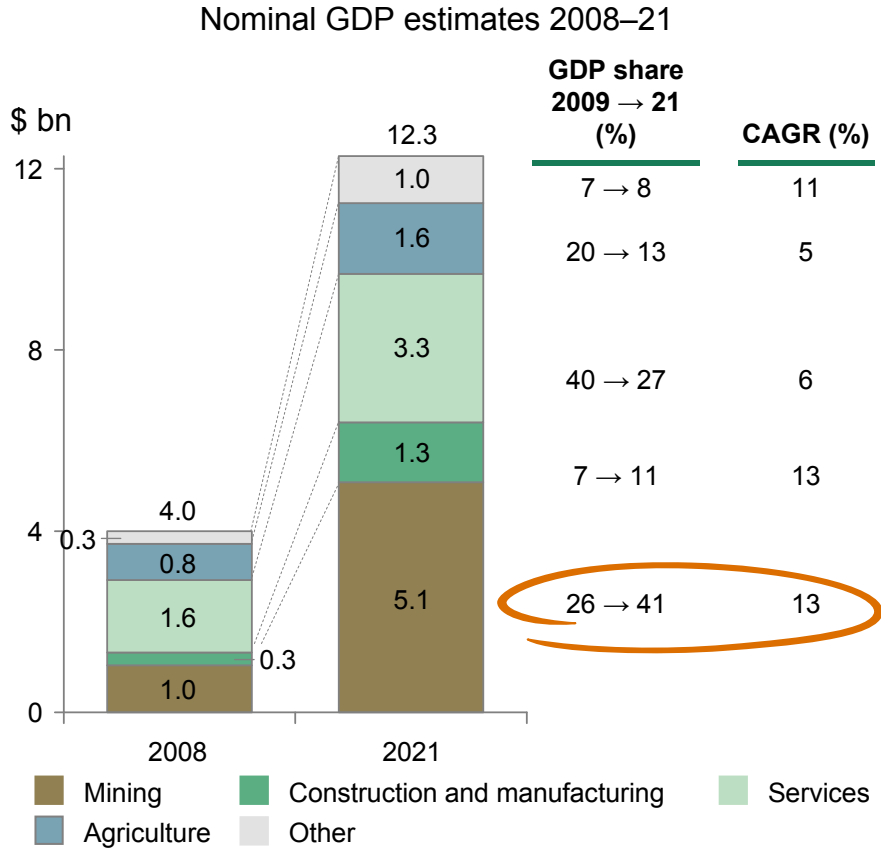
... together with other economic targets

		Now	2021 target
GDP	GDP growth rate (%)	5.7	12–14%
	Processing production in GDP (%)	7	x4
Employment & population	Unemployed (%)	12	Considerable reduction
	Population of South Gobi	Scarcely populated towns	Regional centres with pop ~100 TSD inhabitants
Infrastructure	Technoparks and technol. dev-t	no industrial & technology parks	industrial & technology parks are established
	Roads and railway density	low	increasing
	Power generation per worker, MWt per K	0.7	Internal electricity and heating demand satisfied
	Construction of railroads	Single track TMR	Electrified double track TMR Gobi, Eastern and second railway in use

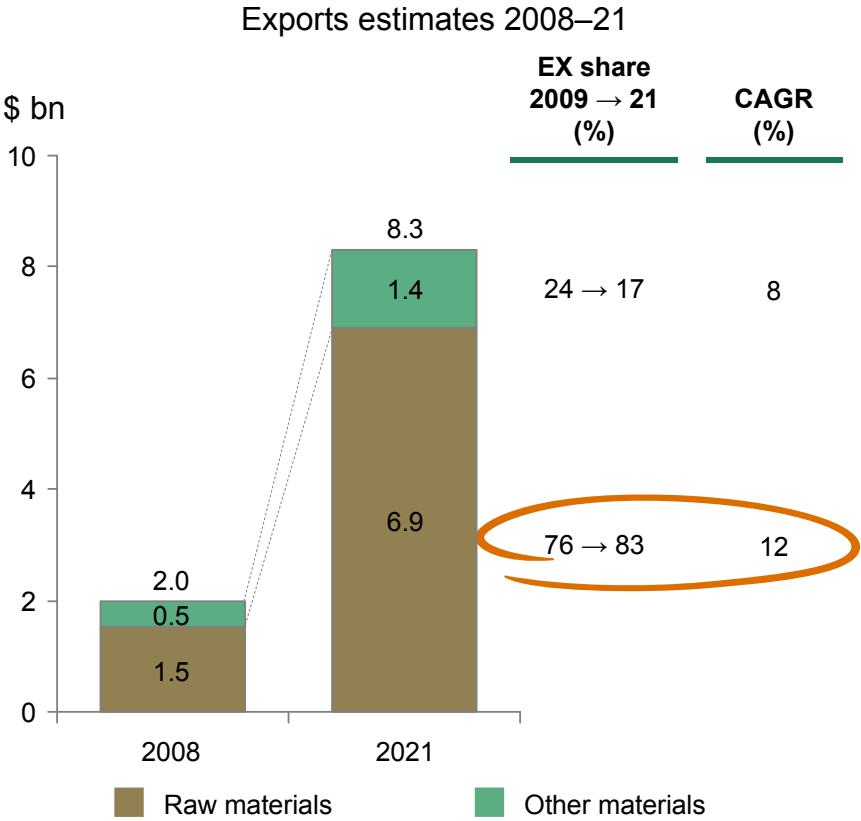
Source: National development strategy; EIU
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Mongolia's mining resources are the major lever to lift the economy to a high growth path

Mining will be the key growth lever of Mongolian wealth ...



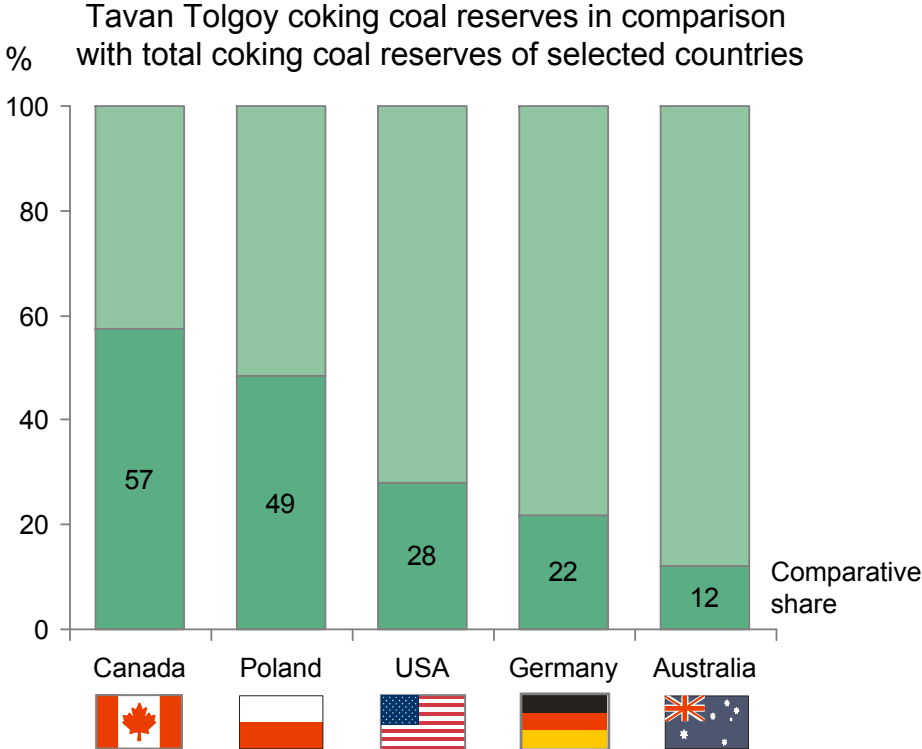
... and exports in the foreseeable future



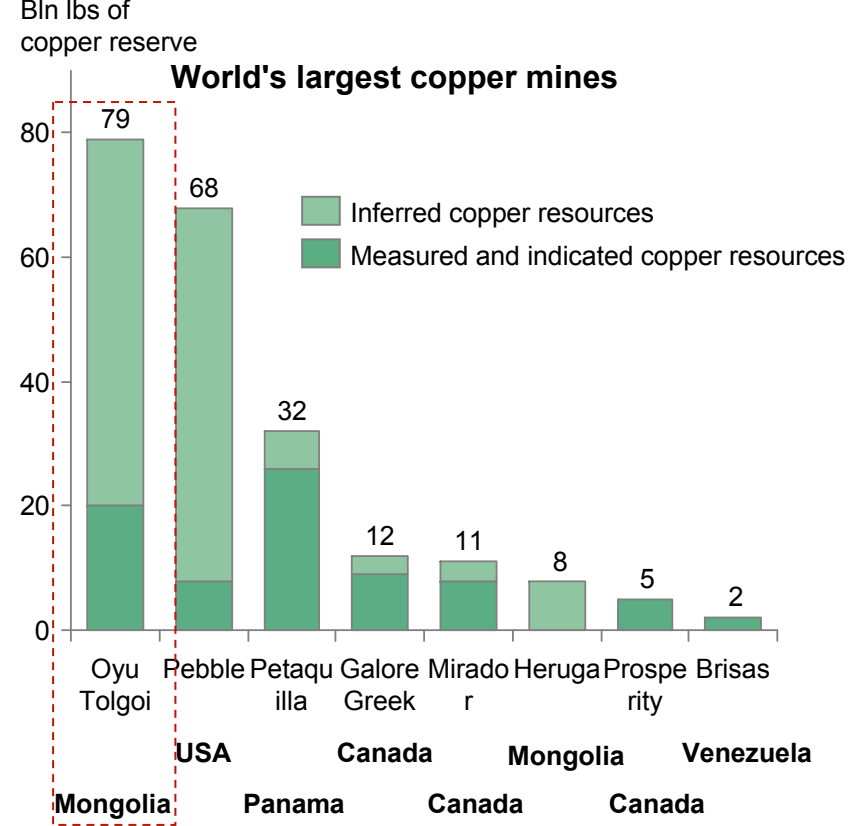
Source: WB, Government of Mongolia; BCG estimates
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Tavan Tolgoy and Oyu Tolgoy are largest undeveloped fields in the world – source of long-term growth

Tavan Tolgoy is the largest coal reserve in the world



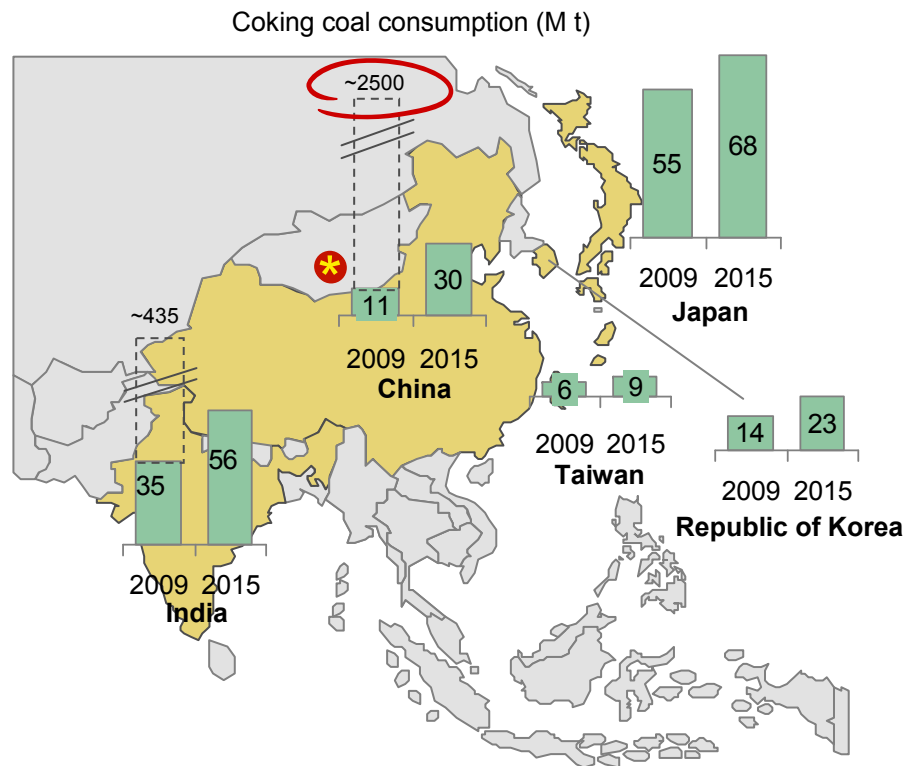
Oyu Tolgoy is the largest by inferred copper and gold resources



Source: Anglo Coal Investors Seminar, Ivanhoe mines
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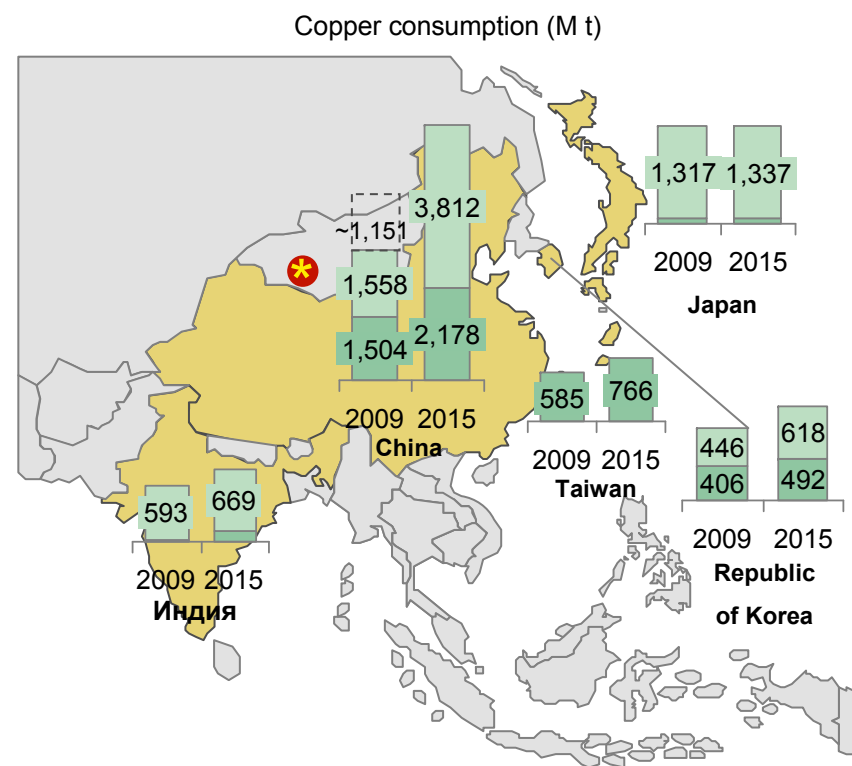
Asian countries, first and foremost China, have rapidly growing demand for coal and copper

Coal imports into Asian countries will grow ~9% a year between 2009-2015



 Domestic consumption supplied by domestic production
 Coking coal imports

China is the biggest Asian market for copper, concentrate makes the bulk of imports

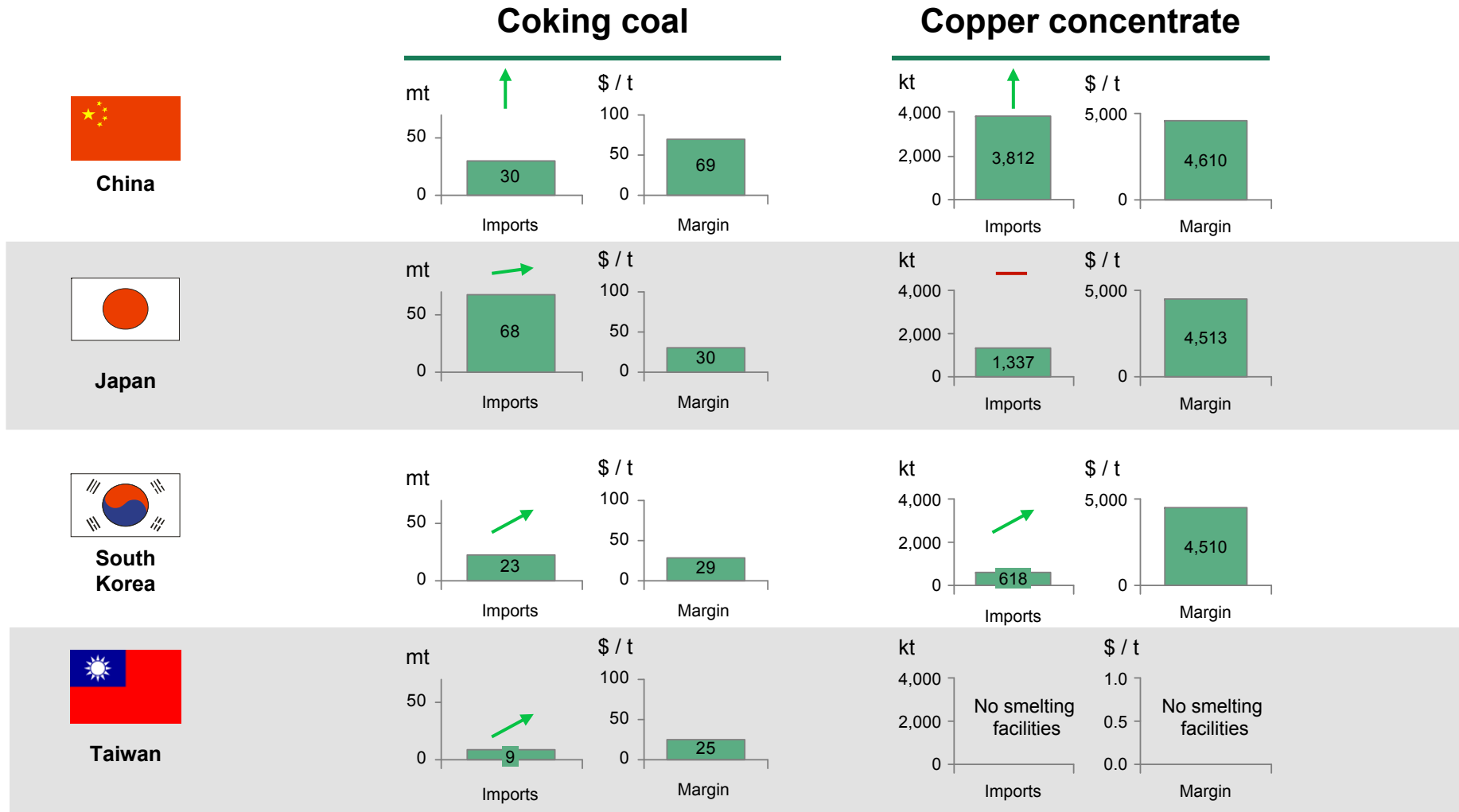


 Copper concentrate imports
 Copper cathode imports
 Domestic consumption supplied by domestic production

Source: Wood Mackenzie, Brook Hunt, ICSG, Morgan Stanley, Macquarie Research, BCG analysis

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Mongolia has several profitable potential markets ...diversification of exports desirable

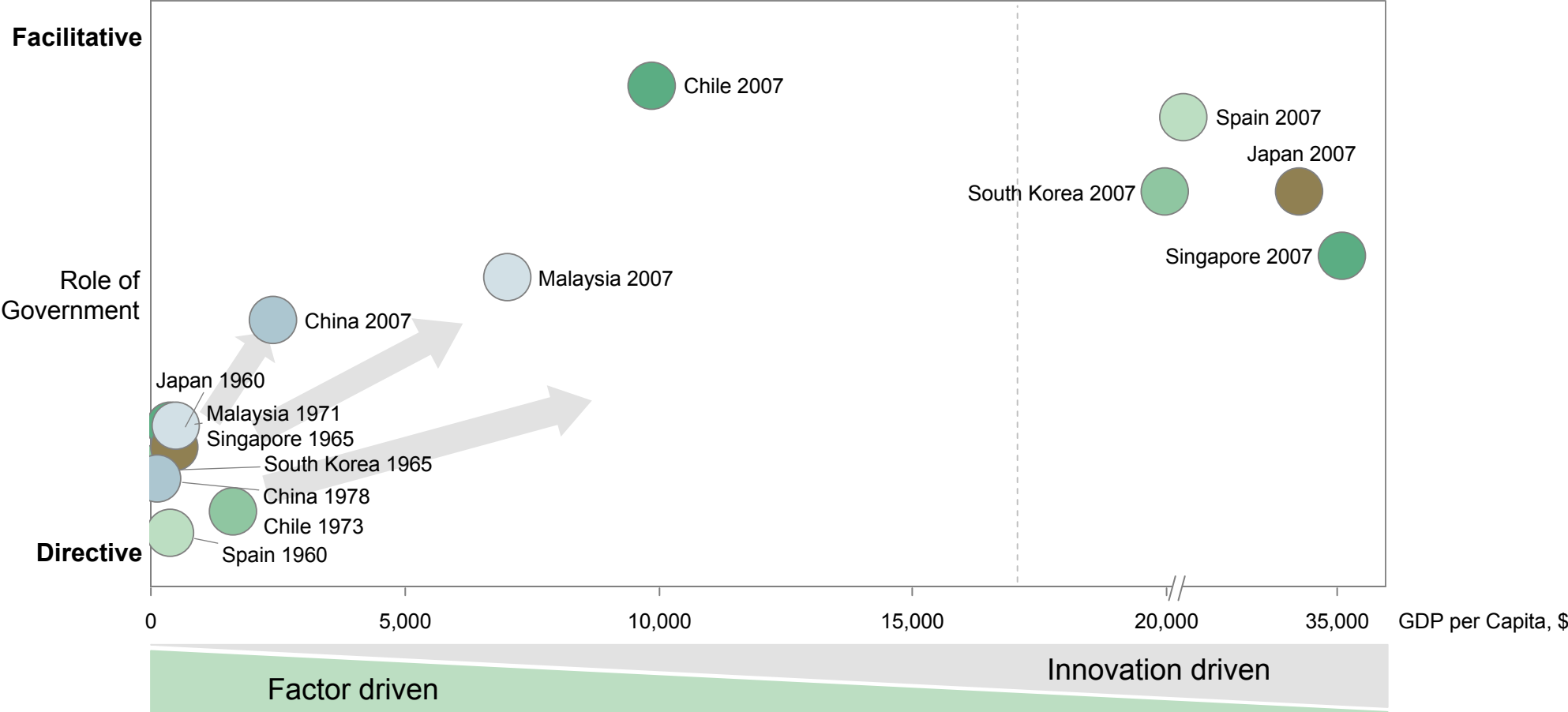


↑ Trend over 2009-2015

Note: Projected data as of 2015. Margin = Implied margin (not potential)
 Source: JV concept, Wood Mackenzie, Brook Hunt, World Bank, ICGS, Morgan Stanley, Macquarie Research, BCG analysis
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What can be learned from successful development paths?

Comparison of GDP per capita development and the role of government over time



Source: World bank, WEF global competitive report
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Chile represents best practice in gaining maximum benefit out of resource-based growth



Sound macro-economic management

- Actively managing exchange rate , tight fiscal policy, set up of a stabilization/sovereign wealth fund to capture surpluses from mining when copper prices are high.

Enable multiple export destinations

- Largest export partner no more than 15% of total exports (US), second — 10% (Japan)
- Chile leader in signing free trade agreements -, European Union, USA, China, South Korea etc

Leading role of public sector in regulation, private in operations

- Favorable taxation regime for profits reinvestment
- Driving role of private sector in ensuring exploration and production with maximum efficiency, maximisation of value adding activities, focusing on the most productive technology

Build in-country downstream industry

- Integration of upstream and downstream industries (eg, Spence Copper mine + cathode prod, Minera Escondida – concentrator + cathode prod)
- Formation of regional clusters which subsequent scale benefits from transport, power supply,

Gain long-term technological advantage

- Opening copper reserves for exploration by the major international players (e.g., BHP Billiton, Anglo American, Rio Tinto) and enabling use of latest technologies, development and training of local staff

Develop efficient rail infrastructure

- Critical role of rail infrastructure development to connect mining and industry clusters and establish link to ports.

Example: Central region of Chile – economic development based on creating industry clusters around railways



— Railroad, operator Fepasa SA

Extracting industry

- Copper (Los Andes, La Calera)

Manufacturing

- Codelco Smelting Plant

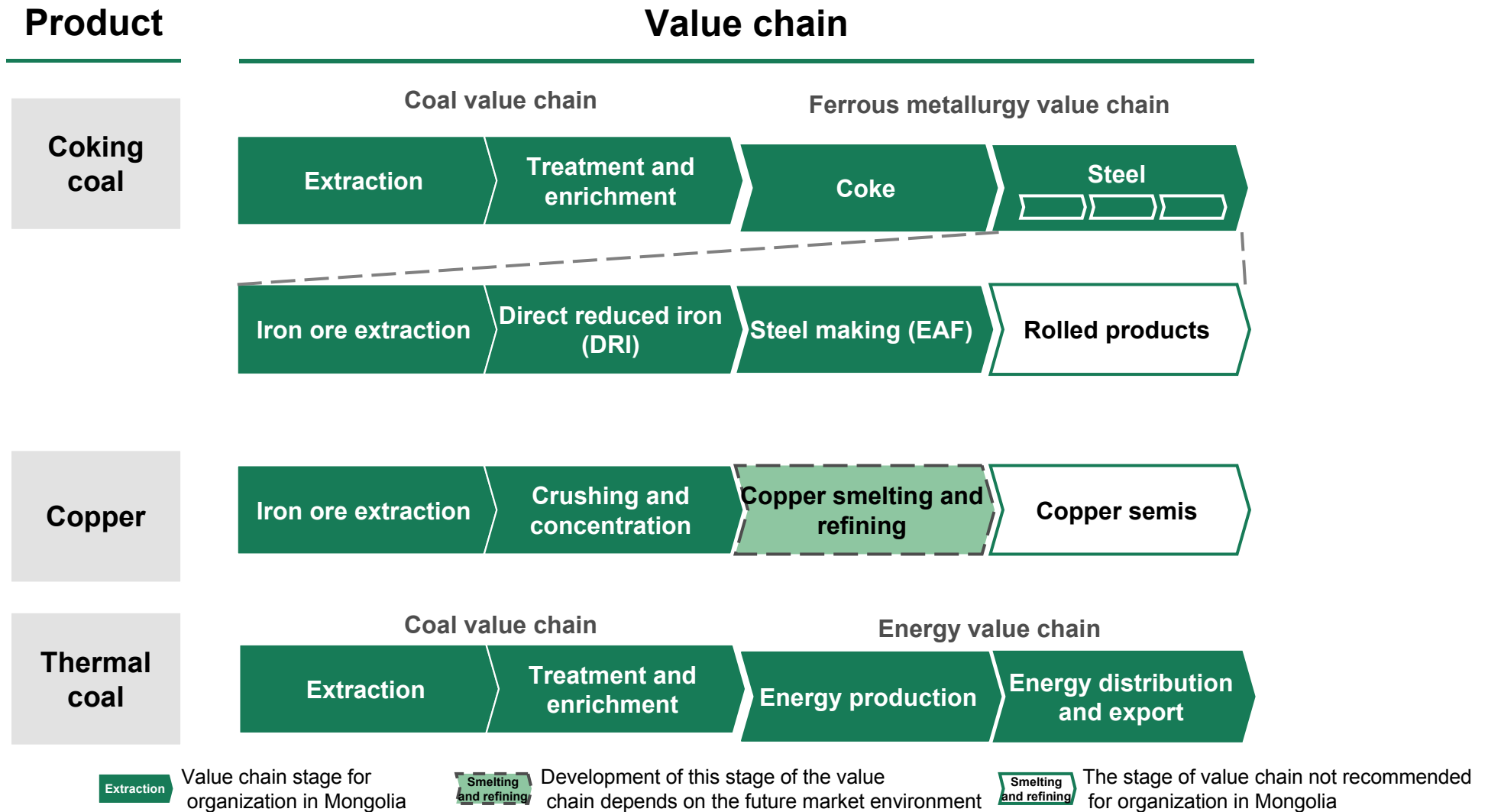
Agriculture

- Fruit and vegetable production development, wine industries with internal and external supplies (export to over 50 countries)

Chemical industry

- Chemical plant in Quintero

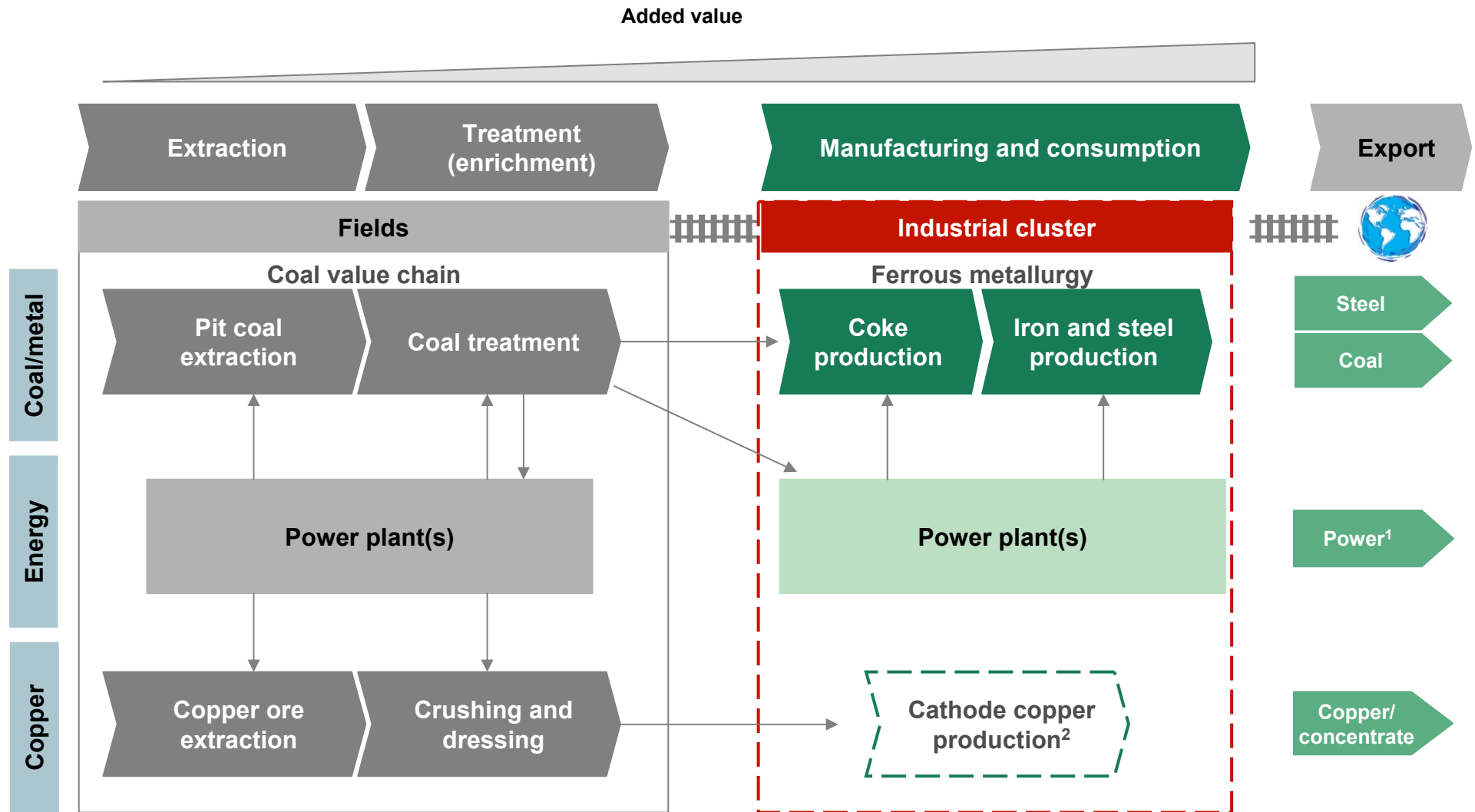
Mongolia must define its level of integration along value chain



Source: BCG analysis

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Industrialization at Sainshand: key growth lever for Mongolia



1. Power export depends on thermal coal surplus and requires individual feasibility study.
 2. Currently is not economically justified but additional research is required for future feasibility assessment.
 Source: BCG analysis