Coal Market Study

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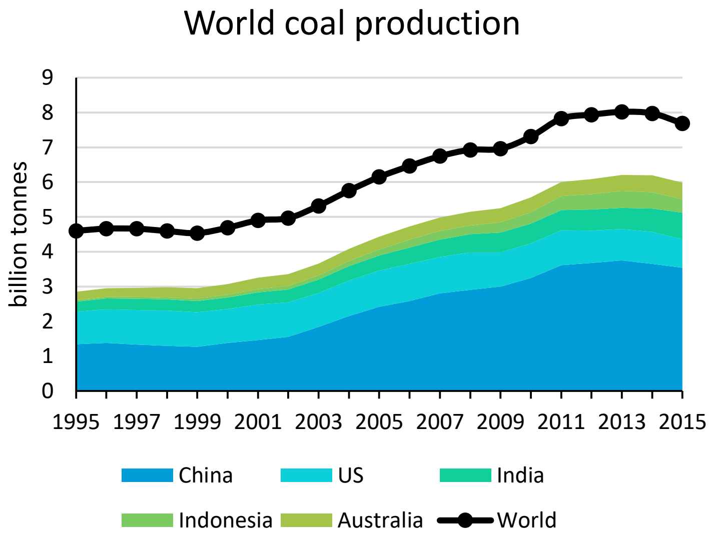
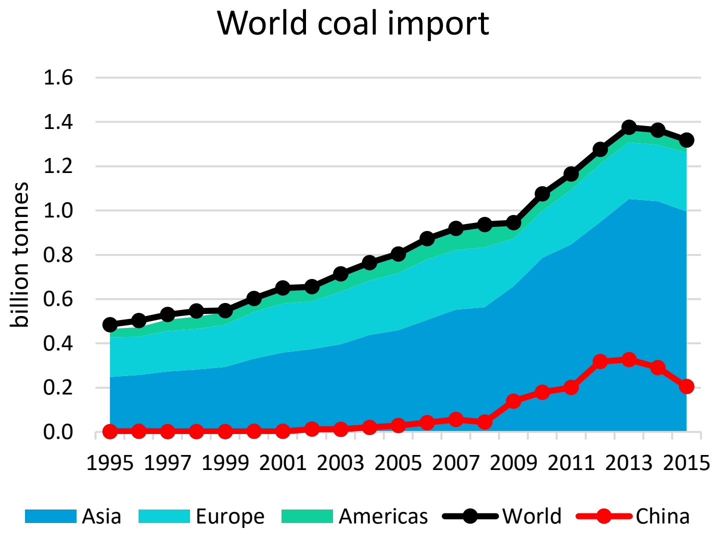
Contents

Background

- Coal trade – coking coal and thermal coal
  - Coking coal – steel manufacturing as a raw material
  - Thermal coal – electricity generation (2nd), heat and steam

- 5 countries produce more than 70 percent





Source: Enerdata Intelligence Consulting

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Background: Mongolia

- Mining sector (3,724 licenses-2154 companies)
  - Of which: Coal-242 licenses; 82 companies

- Coal is main commodity
  - The relationship between its production and economic growth
    Coal (+72.4%) in 2010, GDP (+17.3%) in 2011;
    Coal (-16%) in 2014, GDP (-2.4%) in 2015;
  - Budget revenue (in 2015,)
  - Coal as a share of exports (in 2015, Minerals-78.8%, of which: copper-48.8%; coal-11.91%)

- Its production-23.9 million tonnes

Demand side: Domestic

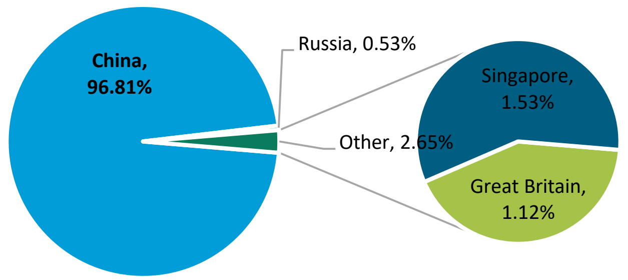
№	Name	Public or Private	Mine-1	Mine-2
1	Darkhan TPP	Pub	Sharyn Gol	Baganuur
2	Erdenet TPP	Pub	Sharyn Gol	Baganuur
3	IV TPP	Pub	Baganuur	Shivee-Ovoo
4	Amgalan TP	Pub	Shivee-Ovoo	Baganuur
5	III TPP	Pub	Baganuur	-
6	II TPP	Pub	Baganuur	-
7	Choibalsan TPP	Pub	Aduun Chuluu	-
8	Dalanzadgad TPP	Pub	-	-
9	Uvs TP	Priv	Khartarvagatai	-
10	Bayan-Ulgii TP	Priv	Nuurst Khotgor	-
11	Khovd TP	Priv	Khartarvagatai	-
12	Selenge TP	Priv	Sharyn Gol	Ulaan-Ovoo
13	Sharyn Gol TP	Pub	Sharyn Gol	-
14	Dornogovi TP	Priv	Shivee-Ovoo	-
15	Sukhbaatar TP	Priv	Talbulan	-
16	Khuvsgul TP	Pub	Mogoin Gol	-
17	Baganuur TP	Pub	Baganuur	-

Source: Ministry of Energy, Mongolia

- In 2015, mln tonnes
  - TPPs-6.7
    - Central sys-5.2
  - W/palnts-2.6
  - Households-0.5
  - Enterprises-0.6
- TOTAL-10.4

Demand side: Foreign

Coal Exports in 2015



Source: http://www.customs.gov.mn, Nov 2016

- In 2015 bln tonne (in 2014):
  - China- 3.6 (3.7)
  - India- 0.9 (0.86)
  - US- 0.7 (0.84)
    - **WORLD – 7.63**

      (7.86 in 2014)

- Prior to 2015, China-99%
  - In 2015, Exports-13.3 (14.3)
    - China-12.88

- Bloomberg and China Customs Statistics (mln t)
  - China coal imports-204.1
    - Coking coal- 48.0
      - **Of which, Mongolia- 10.9** (85%)

        In May 2012, it was 91% (MB)
    - Thermal coal- 156.1

Outlook: Demand

- World coal consumption will slightly grow in 2017
  - Asia-coal (thermal+coking) market is shifting to it
    - India, Vietnam, Indonesia and other emerging countries
    - China's consumption (also the USA) will decrease due to CPP
      - In the first half of 2016, 114 gigawatts
      - In the third quarter, China has over 200 gigawatts under construction (SOME CANCELLED BUT)
    - Japan is shifting from nuclear to safety one (but Long term energy strategy* on April 11, 2014)

	2015	2016*	2017*	2018*
China	3,625	3,596	3,542	3,460
India	906	960	1,008	1,056
United States	730	666	676	679
Russia	230	234	240	247
Germany	225	220	217	215
Japan	202	203	202	201
Others	1,141	1,149	1,177	1,208
World total	7,631	7,608	7,656	7,670
% change	-2.9	-0.3	0.6	0.2

Source: IEA and EIU

* Fukishima accident experienced on 11 March 2011. But environment, according to the strategy, is important as well

Outlook: Demand (cont)

- Europe
  - UK-phasing out coal-fired plants by 2025
  - Germany-even in longer term
    (nuclear is phasing out now)
- Coking coal is used as a raw material of steel production
  - China is main player of this market because of its share (over 50 percent)
  - 13th Five-Year Plan-On April 29, 2016 ➔ Infrastructure projects
    - Constructing 3000 kilometres of new urban rail lines
    - Investing over 800 billion yuan in railway construction etc.,
  - One belt, One road
    - Moscow-Kazan high-speed railway
    - Khorgos-Aktau railway
    - China-Kyrgyzstan-Uzbekistan railway etc.,
- The USA will use more steel due to Donald Trump's victory

	2016*	2017*	2018*
China	3,596	3,542	3,460
India	960	1,008	1,056
United States	666	676	679
Russia	234	240	247
Germany	220	217	215
Japan	203	202	201
South Africa	185	192	199
South Korea	135	139	142
Poland	135	135	135
Australia	127	128	128
Others	1,149	1,177	1,208
World total	7,608	7,656	7,670
% change	-0.3	0.6	0.2

Source: IEA and EIU

Outlook: Demand (cont)

№	Name	Planned location	Mine-1	Mine-2	Capacity, thous.t
	Public investment-Only Thermal Plants				
1	Thermal plant	Bayankhongor soum, Bayankhongor	Uvurchuluun	Bayanteeg	28.0
2	Thermal plant	Arvaikheer soum, Uvurkhangai	Bayanteeg	-	21.0
3	Thermal plant	Undurkhaan soum, Khentii	Chandgana Tal	-	27.6
4	Thermal plant	Uliastai soum, Zavkhan	Mogoin Gol	-	21.0
5	Thermal plant	Tsetserleg soum, Arkhangai	Bayanteeg	Ereen	24.0
6	Thermal plant	Mandalgovi soum, Dundgovi	Tevshiin Govi	-	32.2
7	Thermal plant	Zuunmod soum, Tuv	Baganuur	Nalaikh	28.0
8	Thermal plant	Altai soum, Govi-Altai	Zeegt	Maanitiin	29.8
				TOTAL	211.6
	Private investment-Only Power Plants				
9	Telmen	Telmen soum, Zavkhan	Mogoin Gol	-	270.0
10	Tavantolgoi	Tsogttsetsii soum, Umnugovi	Tavantolgoi	-	1420.0
11	Tsaidam	Bayan soum, Tuv	Tsaidam Nuur	-	1530.0
12	Buuruljuut	Bayan soum, Tuv	Tugrug Nuur	-	2490.0
13	Chandgana	Murun soum, Khentii	Chandgana Tal	-	3160
14	Erdentsogt	Altanshiree soum, Dornogovi	Chandgana Tal	-	2970
15	Shivee-Ovoo	Shiveegovi soum, Govisumber	Shivee-Ovoo	-	700
16	Erdentsagaan	Erdenetsagaan soum, Sukhbaatar	Erdenetsagaan	-	72
				TOTAL	12612.0

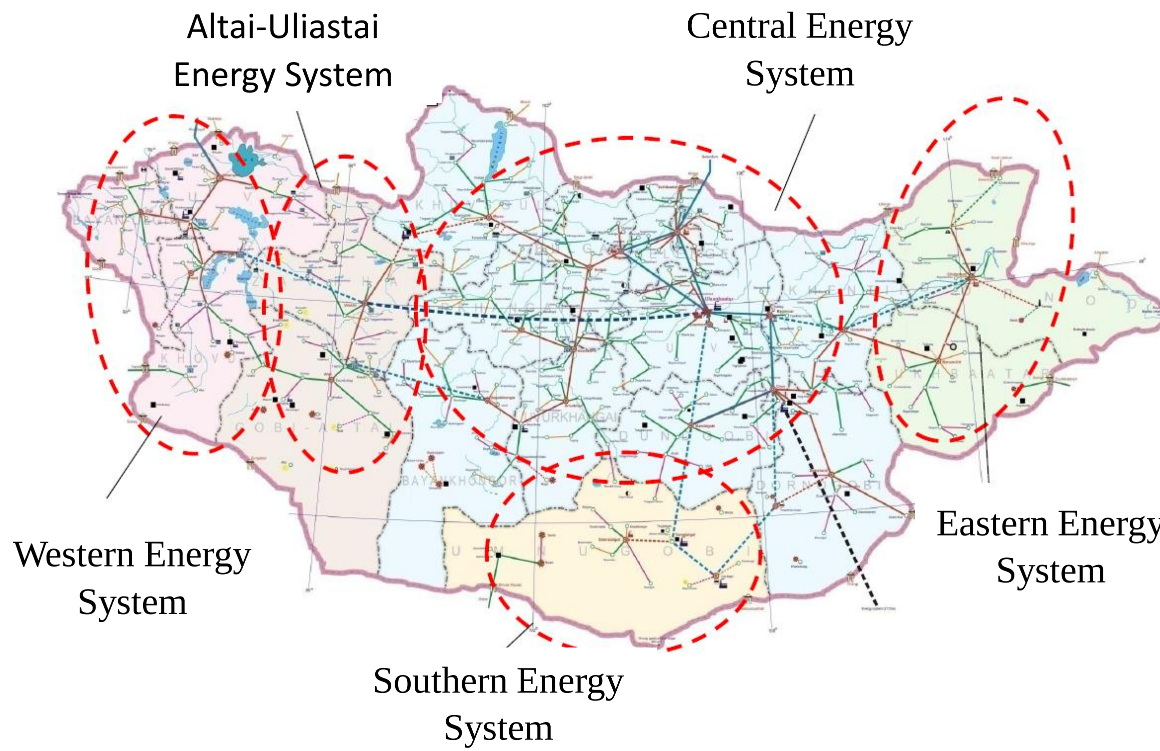
Source: Ministry of Energy, Mongolia

Supply side

- There are 3724 licenses (2154 companies)
  - Of which: coal licenses- 242 (mines-82);
    22 companies-Annual Report 2015
- Coal production was 23.9 million tonnes
  - Of which:
    - 13.3 million for foreign market
    - 10.4 million for domestic market, including washing plant
- The main consumers of domestic market are TPPs and two washing plants.

Supply side: Domestic

- In 2015
  - For TPPs: 6.7 mln
    - Of which, 5.4 mln (Ba, ShO, ShrGo)
  - For washing plants: 2.6 mln (ShrGo, TT-ERes)
- Sum of them as a share of domestic-89.4% (total-10.4 mln)



Source: Overview of Energy/Electricity demand and Renewable energy potential in Mongolia, **Asia Super Grid (ASG) Workshop,** 25-27th May 2016

Supply side: Foreign

- In 2015
  - China's coal production 3.3 bln tonnes (for domestic)
  - These countries as a share of world market – 98.3%
  - Top 7, excluding China, (Stable)
  - N.Korea and Mongolia (Top-12)
  - China policy (-):
    - Import tariff-Oct 2014
      - 3%-anthracite, coking
    - Coal quality regulation*

Country	2006		2015		
	Rank	Mln tonnes	Rank	Export in dollars	Share of world market
Australia	I	255.0	I	$28.4 bln	36%
Indonesia	II	192.2	II	$16.4 bln	20.8%
Russia	III	103.4	III	$9.3 bln	11.7%
United States	VII	51.2	IV	$5.7 bln	7.2%
South Africa	V	75.8	V	$4.3 bln	5.4%
Colombia	VI	68.3	VI	$4.3 bln	5.4%
Netherlands	-		VII	$3 bln	3.8%
Canada	VIII	31.2	VIII	$2.7 bln	3.4%
North Korea	-	-	IX	$1.1 bln	1.4%
Poland	IX	25.4	X	$737.2 mln	0.9%
Mongolia	-	-	XI	$542.6 mln	0.7%
China	IV	85.6	XII	$498.2 mln	0.6%
Czech Republic	-	-	XIII	$327.9 mln	0.4%
Vietnam	X	23.5	XIV	$265.1 mln	0.3%
Belgium	-	-	XV	$232.9 mln	0.3%

Source: www.worldtopexports.com

* For instance, thermal coal-ash content under 30%, sulphur content under 2% and energy greater than 18MJ/kg

Outlook: Supply

- World coal production will slightly grow in 2017
  - China's production will decrease
    - Small mines closed, notably in Inner Mongolia* (in 2016)
    - Coal mining restrictions were cancelled on November 17, 2016
      - after restructuring large mines
  - In the USA, increase of price ➔ the biggest coal producers (+)
  - Mongolia will produce 31.3 mln t in 2017
    - Of which: exports-23.0; domestic-8.3 (MoF, 2016)

	2016*	2017*	2018*
China	3,280	3,257	3,245
India	705	744	778
United States	655	680	691
Australia	476	479	483
Russia	364	367	369
Indonesia	361	351	360
South Africa	253	254	255
Germany	184	184	175
Poland	133	132	131
Kazakhstan	105	107	109
Others	689	694	699
World total	7,204	7,248	7,295
% change	-2.4	0.6	0.6

Source: IEA and EIU

* Mines with 700 mln t capacity will be closed until 2019 (1 mln worker will become unemployed)

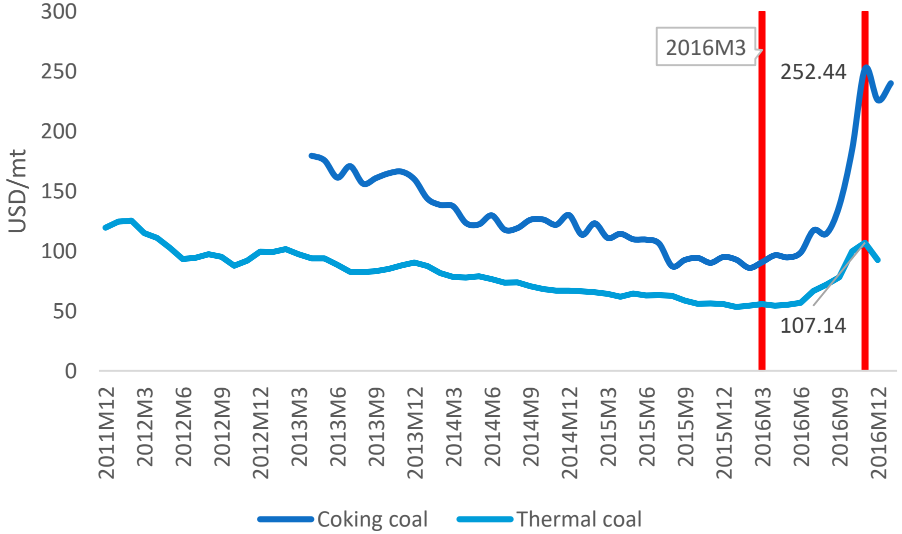
Price side ↓

- Demand ↓ & Supply ↑ ➔ Price ↓
  - (from 2012 until autumn 2016)

- Coking & thermal coal
  - Demand (C) - fall in steel price due to oversupply led by China's exports
    - Steel usage reached at peak
  - Demand (Th) – coal-fired plants closed by Government & the decrease of steel production
  - Supply - coal supply from Australia, Indonesia, Russia, China itself and Mongolia

Price side ↑

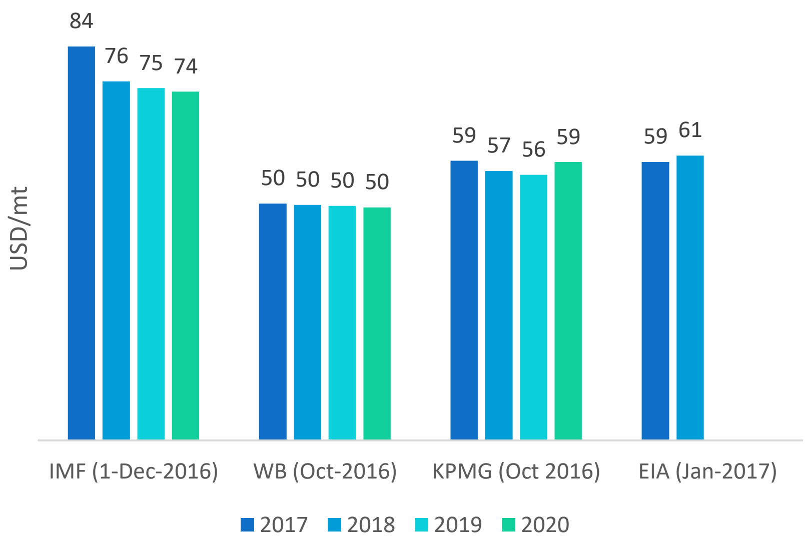
- The increase of coal price (due to supply shock)
  - the fall in prices led to restructuring in industry
  - weaker and costlier suppliers leaving the market
  - deciding not to invest in coal, especially in Africa
  - large world supplier entered bankruptcy (Peabody Energy Corp., Arch Coal Inc., Alpha Natural Resources Inc., Murray Energy Corp., the largest privately in the USA)
  - Chinese government restrictions cutting domestic supply (in March 2016- to 276 days; & small mines in 2016)
  - On November 17, 2016
    - to 330 days due to a cost structure



Source: Bloomberg terminal and China Customs Statistics

Outlook: Price

- Thermal coal price will slightly decrease in 2017 ($92.74 in December 2016) because
  - production days restrictions in China (on November 2016)
  - by 2020, renewables' share – 15 percent of total energy
  - some coal-fired plants (112 gigawatts) closed in 2016, also in 2017 (200 gigawatts-uncertain)
- Overall, CPP's pressures on coking and thermal coal



Source: WB, IMF, EIU, KPMG

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Conclusion

- In Mongolia, coal is export-oriented
  - Coking coal: for foreign market (exports)
  - Thermal coal for domestic market
- CPP’s pressures on coking and thermal coal
  - China’s coal production ↓ (small mines, laws; also, 15% by 2025)
  - the USA’s coal production (the increase of price-bankruptcy)

  - China’s coal demand
    - Thermal coal (coal-fired plants: 120 gigawatts in 16, 200 in 2017)
    - Coking coal (planned infrastructure: 3000 kilometres of new urban rail lines; investing over 800 billion yuan in railway construction etc.,) & USA’s infrastructures

  - PRICE will slightly decrease in 2017 due to the balance of demand and supply