MOL Mitsui O.S.K. Lines

2nd T-LOG/EASTS Logistics IRG Seminar

Recent development of international seaborne transportation of dry bulk commodities and inefficiency due to constraints from export and import infrastructures

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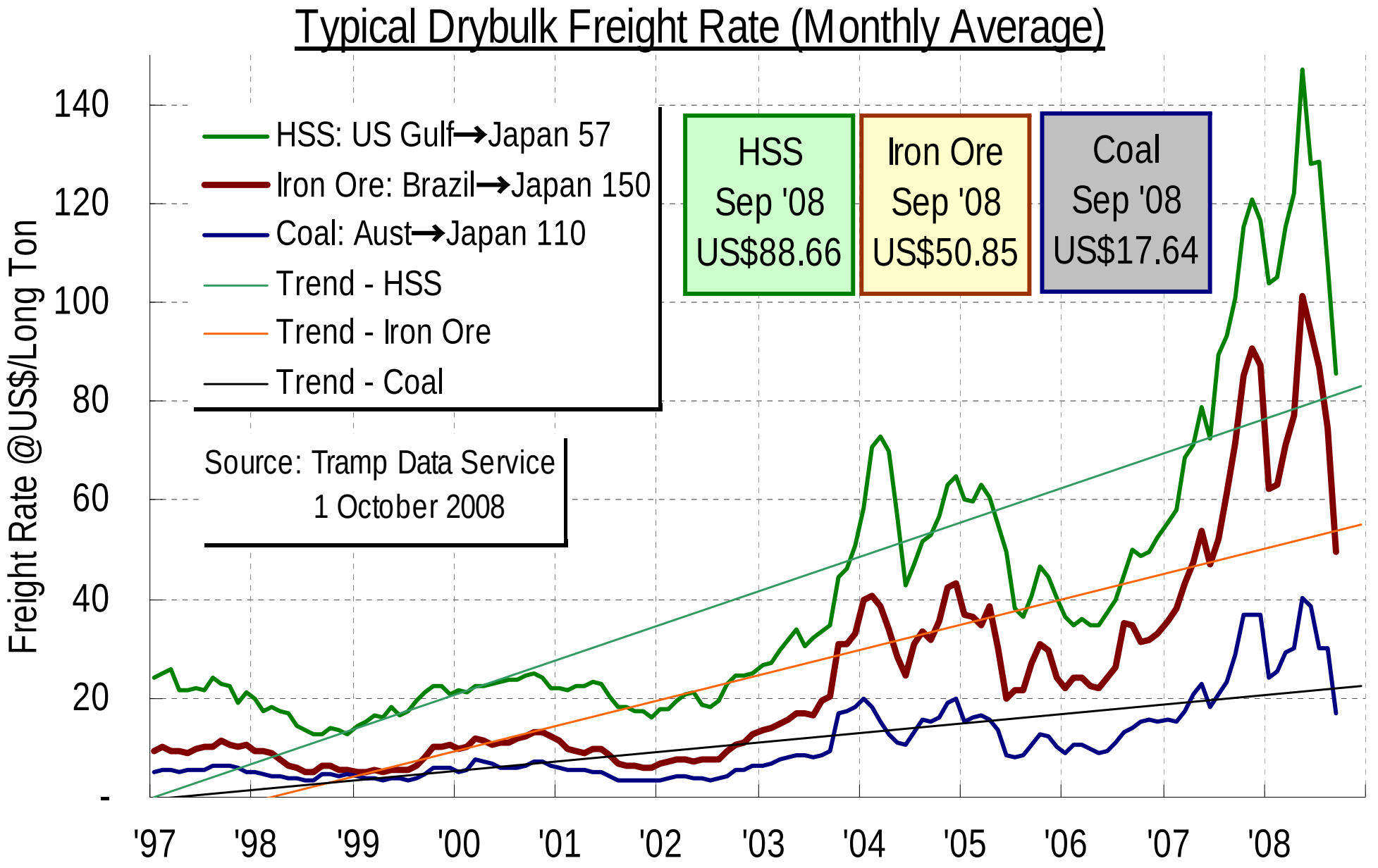
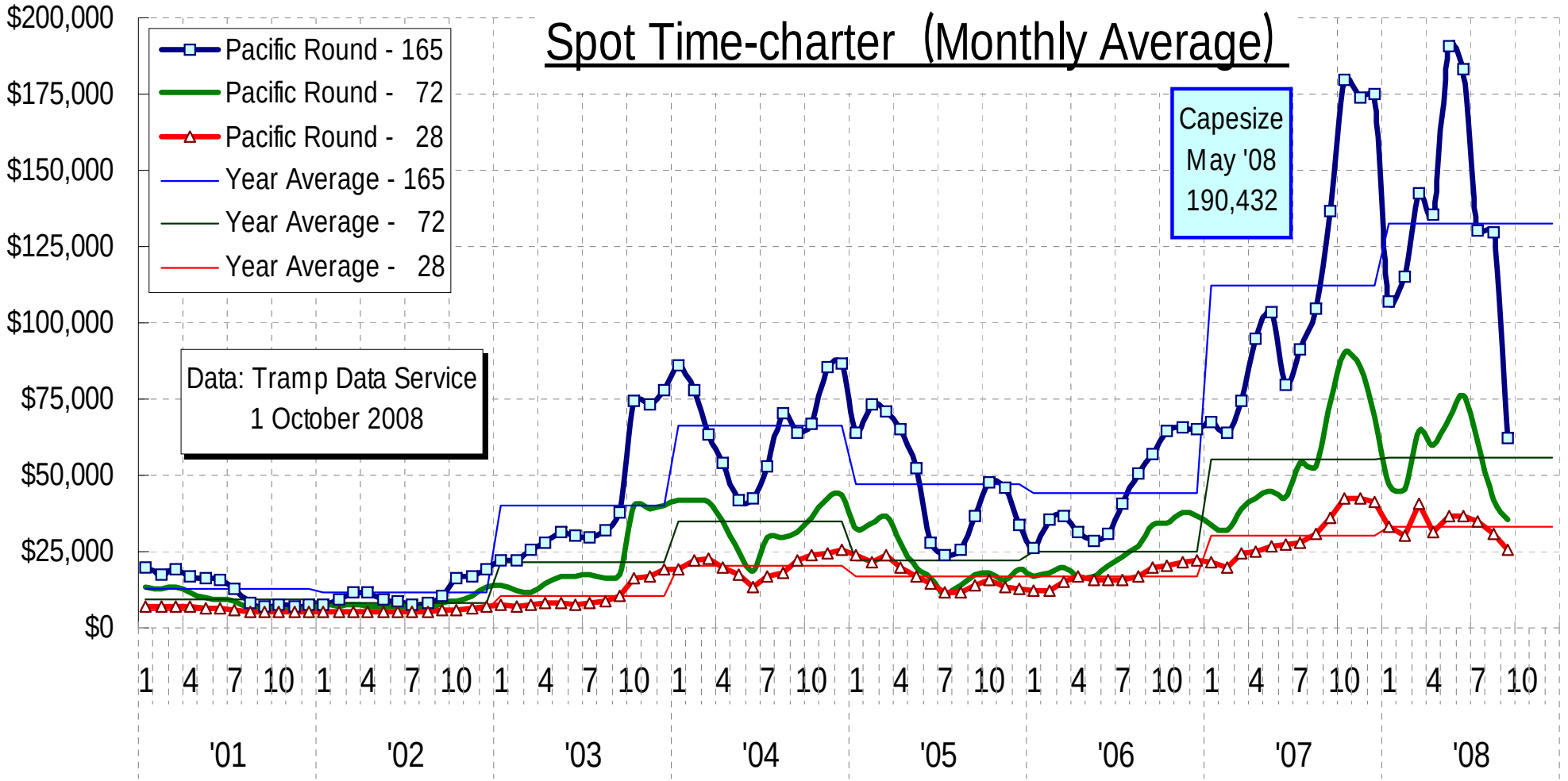
    Hunter Valley, New South Wales, Australia

Recent Drybulk Market History- I



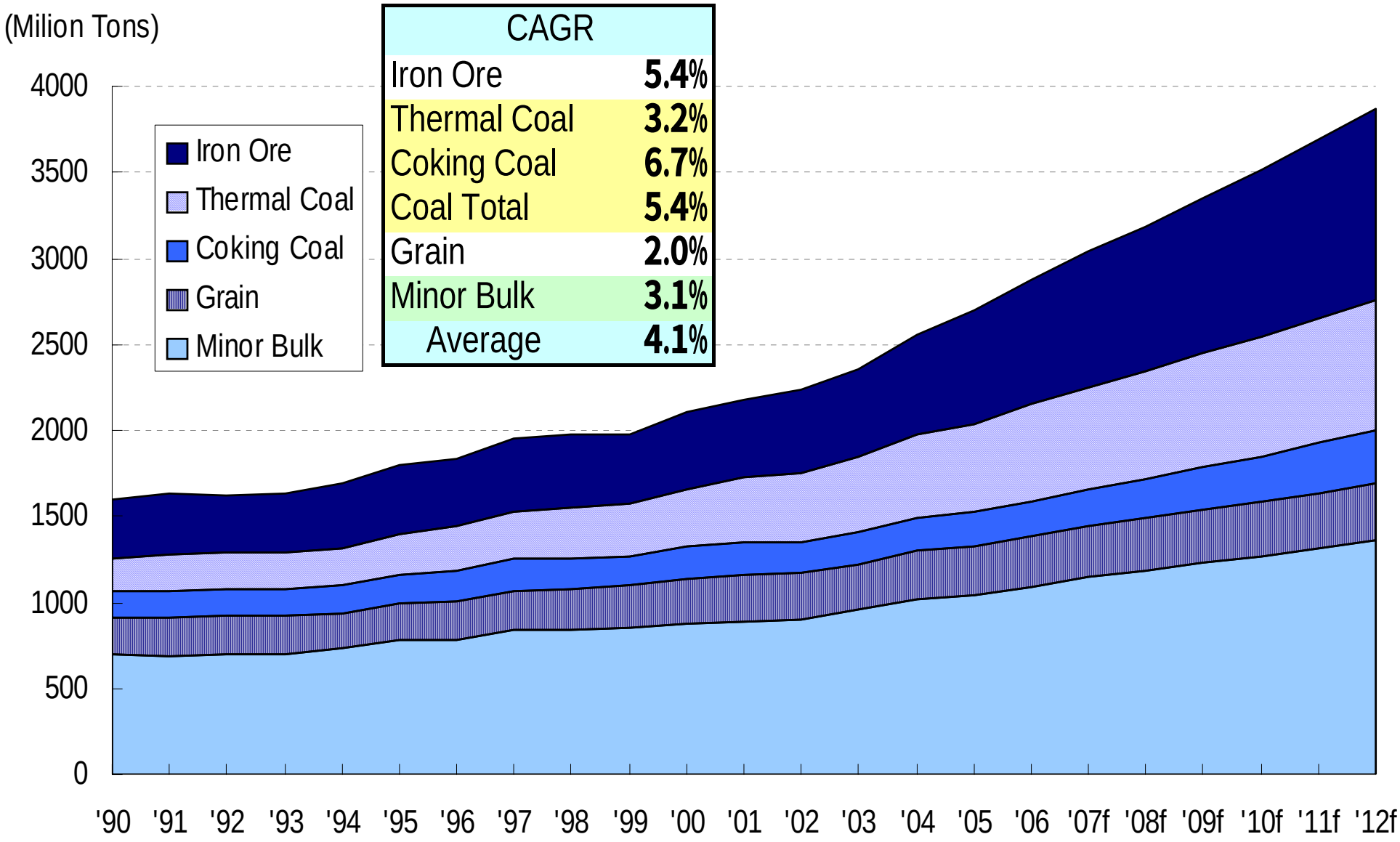
Recent Drybulk Market History- II



Time-charter market also has been keeping high level – with high volatility

Rates picked up across every water and every size, since 4Q of 2002

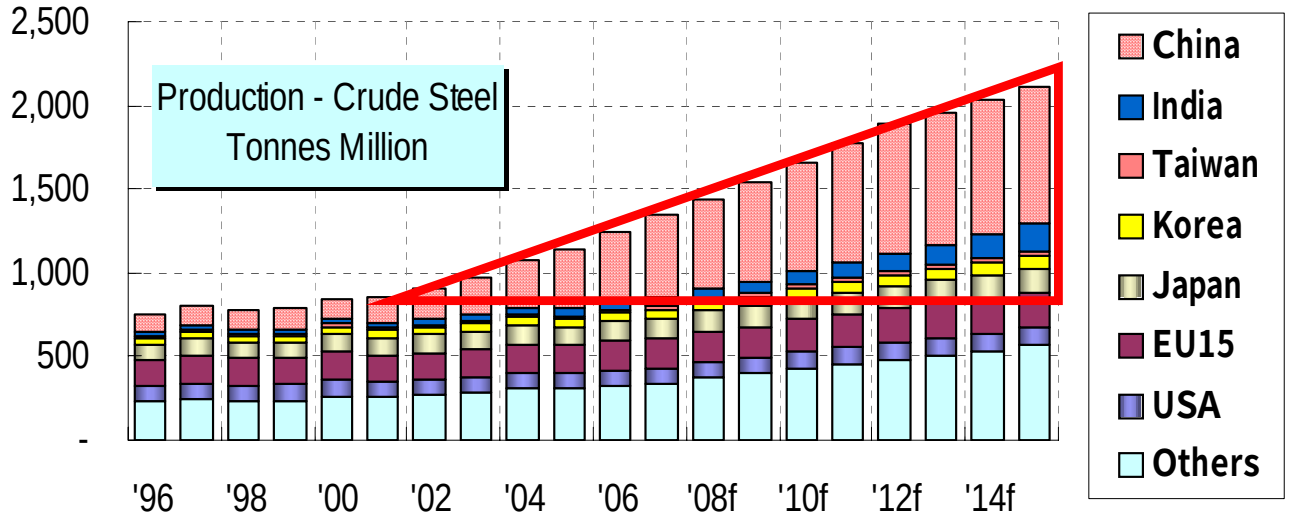
Seaborne Transportation Demand of Major Drybulk Commodities (Tonnes Million)

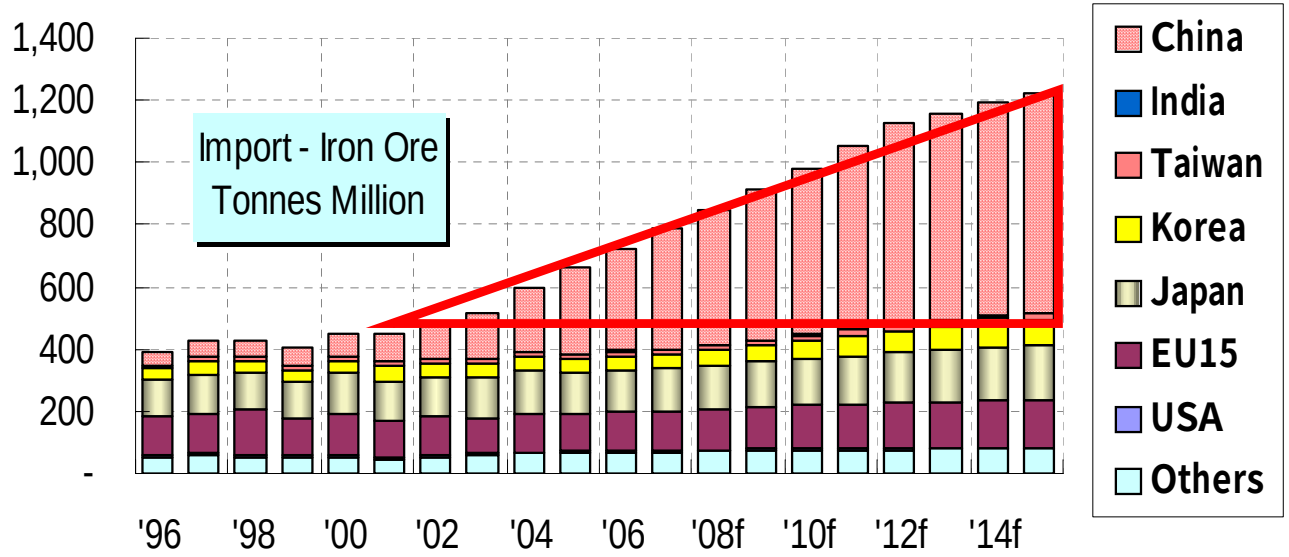


CAGR	
Iron Ore	5.4%
Thermal Coal	3.2%
Coking Coal	6.7%
Coal Total	5.4%
Grain	2.0%
Minor Bulk	3.1%
Average	4.1%

Driven by strong demand – Crude Steel

Trend of Production and Iron Ore Import



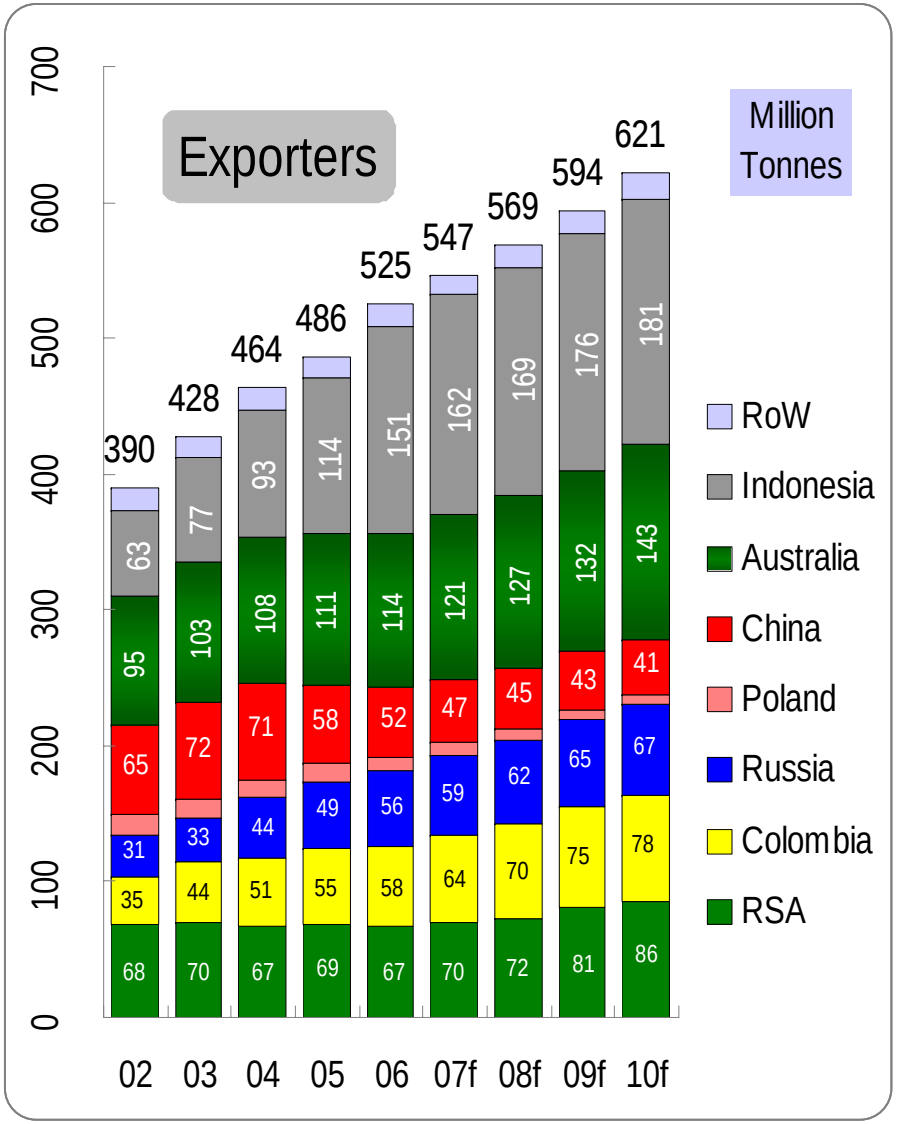


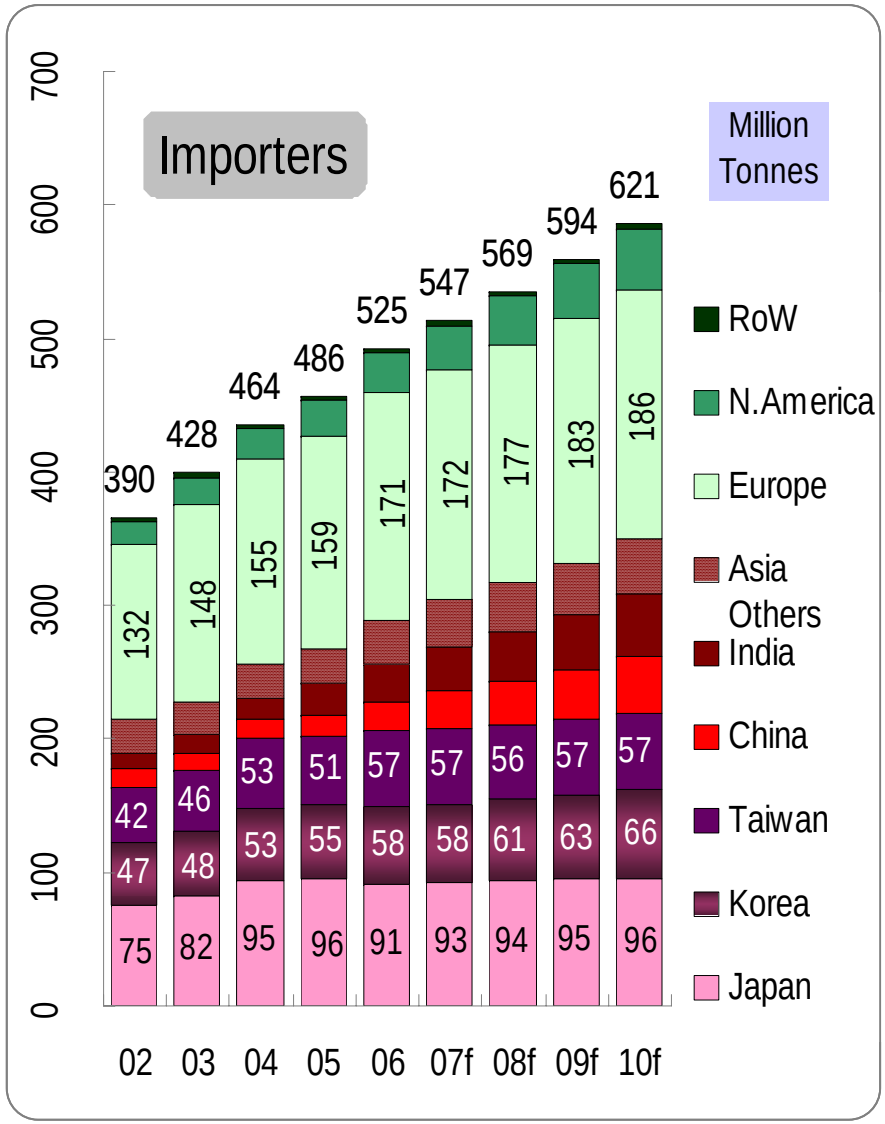
The surge of production of crude steel in China has been supported primarily by imported iron ore as consumption of steel increased mainly in coastal provinces, and resulted in booming market.

Driven by strong demand – Thermal Coal :

"Not Green", but consumption and import continue to increase globally, due to:-

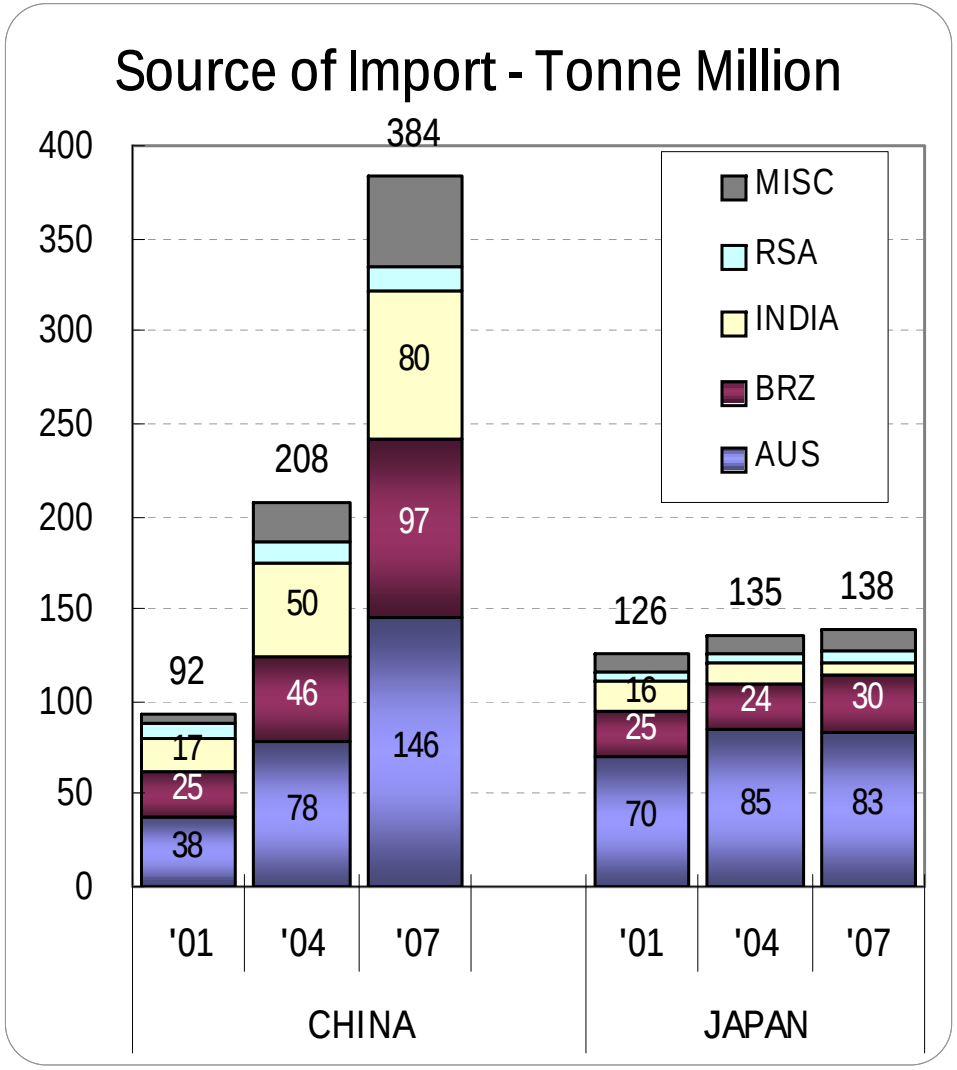
- geo-political situation at the source countries of oil and gas,
- high initial cost of cleaner energies such as nuclear energy and LNG, and,
- the CCS technologies under development may drive the demand further.

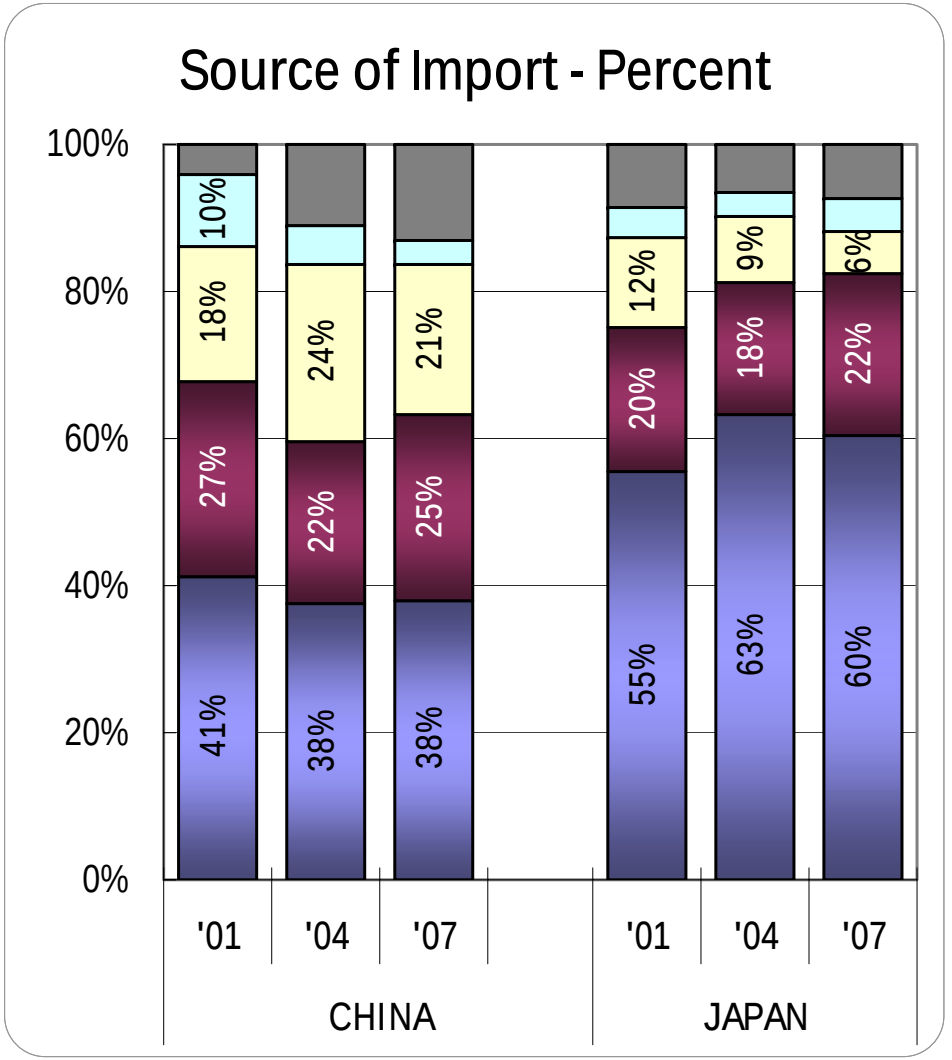




Further, acceleration by long-haul sourcing

Not only trade volume but distance getting longer – typically iron ore - account “China Factor”





From Shanghai: Dampier = 3100NM, Tubarao = 11000NM, Goa = 3600NM

Fleet inefficiency; fewer trips per vessel per year

due to combined effects of long-haul trips and congestion

[data: operation records of MOL's capesize fleet]

CAPESIZE (160K+)	2002		2003		2004		2005		2006		2007		2008 1H	
	Calls	Stay	Calls	Stay	Calls	Stay	Calls	Stay	Calls	Stay	Calls	Stay	Calls	Stay
Japan	289	4.1	256	5.0	308	6.3	336	6.4	324	6.0	355	6.0	183	5.3
China	13	8.8	14	5.3	29	8.4	55	5.8	55	4.0	79	4.4	48	6.0
Australia	188	4.7	192	6.1	206	6.8	241	4.9	219	8.5	247	10.2	129	7.7
Brazil	46	4.8	52	7.4	58	8.7	63	5.4	79	5.2	94	8.1	50	12.0
India	5	8.5	8	6.1	7	13.2	8	15.8	3	18.8	0	0.0	1	19.1
South Africa	19	4.6	11	14.2	28	4.8	22	3.9	12	5.8	12	5.1	2	8.5
The Netherlands	17	5.0	11	2.7	38	7.7	37	6.4	35	5.5	30	5.4	18	7.1
Total Calls / Average Stay	577	4.5	544	5.8	674	6.8	762	5.8	727	6.6	817	7.3	431	7.0
'02 vs '03~'08 1H	0	0.0	-33	1.3	97	2.3	185	1.3	150	2.1	240	2.8	-146	2.5
Congestion Index	0.0%		2.3%		5.4%		5.7%		4.9%		4.7%		3.0%	

Average Trip Duration	40.52 days	41.55 days	45.70 days	44.16 days	45.04 days	49.86 days	52.88 days
(Japan Discharge)	222	199	217	242	223	246	144
Trip Duration Index	basis 2002	2.56%	12.78%	8.98%	11.15%	23.06%	30.51%

- Average turn round basis Japan discharge vessels getting longer and resulting in less and less lifting per vessel per year. 8.9 trips/vessel in 2002, now it is 6.8 trips.
- Major investments in the port facilities and inland transport – but not up to demand.

Another reason to reduce number of trips per year

- The imbalance of eastbound and westbound cargo -

【Major Capesize Cargo Movement (Tonnes Million)】

	2002	2003	2004	2005	2006	2007
Pacific → Atlantic (Iron ore & Coal ex Australia) -A	45.0	46.7	41.2	38.7	37.9	39.9
Pacific → Atlantic (Iron Ore & Coal ex RSA) -B	60.8	67.7	71.2	73.7	68.5	58.5
Atlantic → Pacific (Iron Ore ex Brazil) -C	68.3	81.8	94.0	106.3	135.0	155.3
Cargo Imbalance: C-(A+B)	-37.5	-32.6	-18.4	-6.1	28.6	56.9

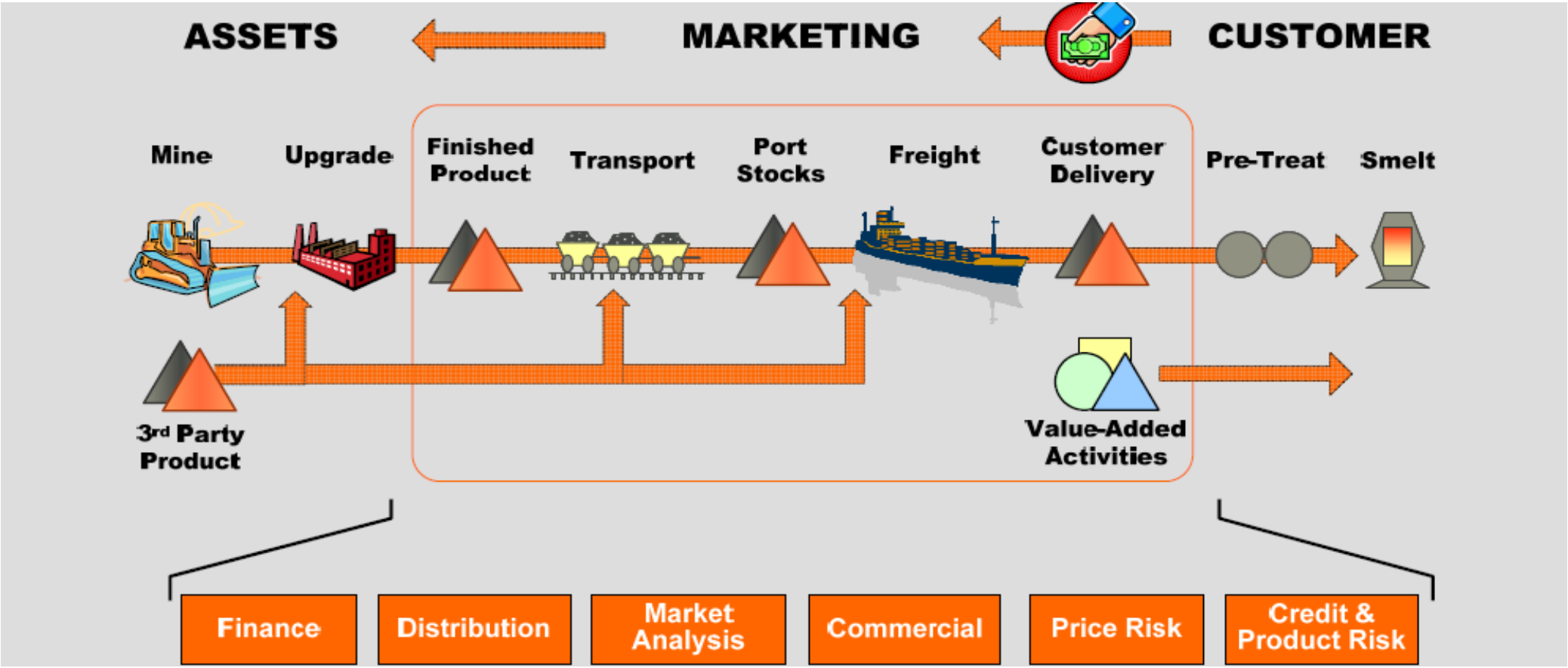
【Theoretical Number of Trips per Standard Capesize Bulker】

	2002	2003	2004	2005	2006	2007
Pacific → Atlantic (Iron ore & Coal ex Australia) -A	250	259	229	215	211	222
Pacific → Atlantic (Iron Ore & Coal ex RSA) -B	338	376	396	409	381	325
Atlantic → Pacific (Iron Ore ex Brazil) -C	379	454	522	591	750	863
Theoretical Trip Imbalance: C-(A+B)	-208	-181	-102	-34	159	316
Theoretical Trip Imbalance - % of Eastbound Trips	0	0	0	0	21%	37%

MOL Research April 2008

- As ore ex Brazil increases, the balance of eastbound and westbound cargoes is changing
- Due to insufficient supply of westbound cargoes – coal ex Australia or RSA, more ships are forced to proceed to Brazil in ballast

Value Chain Model for Coal: BHP Billiton's Energy Coal Operations in NSW

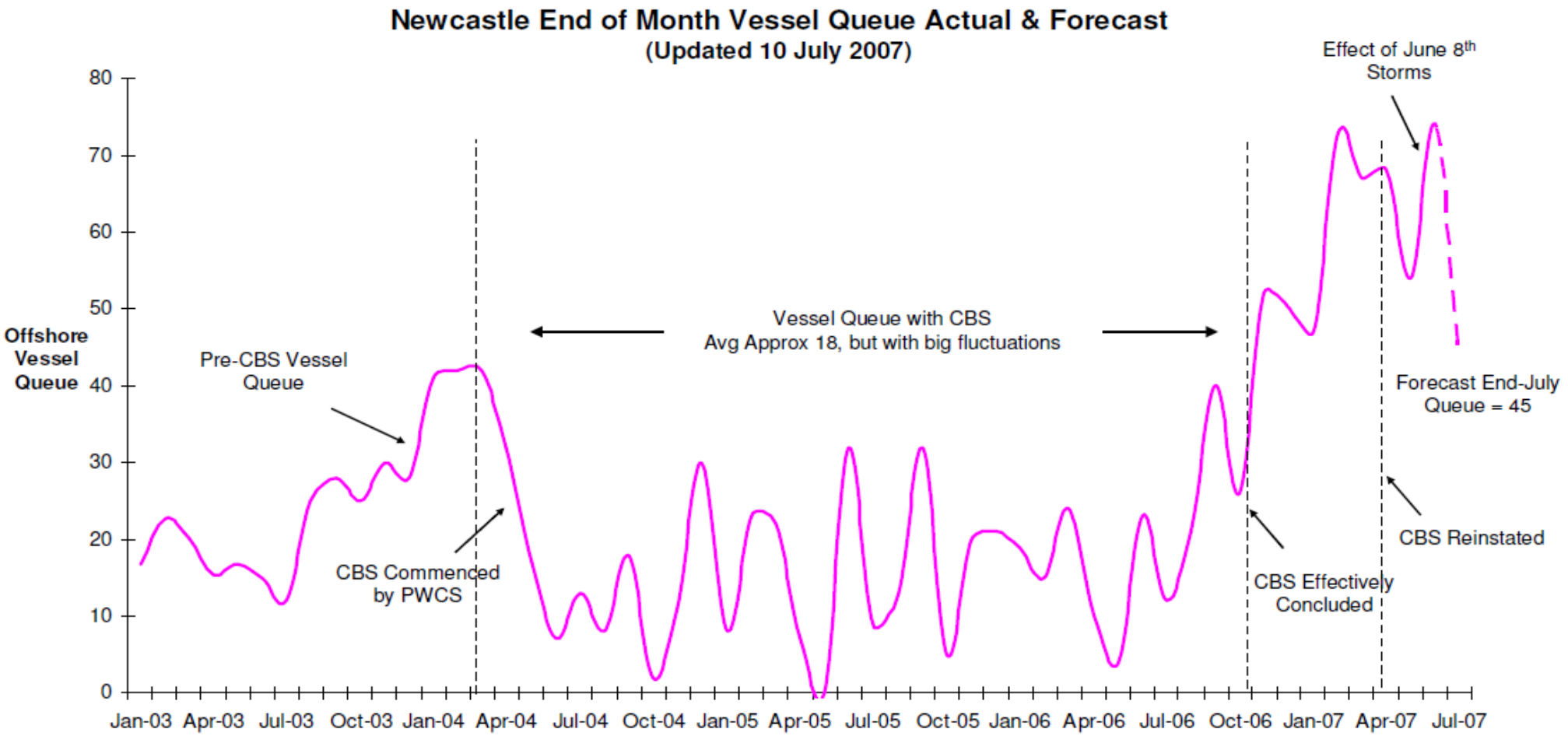


- The key issue is to ensure no bottleneck throughout export process from mines to the ship.
- The capacity of each export stage must be matched and flow from one stage to the other must be well coordinated.

Source: B H Billiton web site

However, congestion in reality…

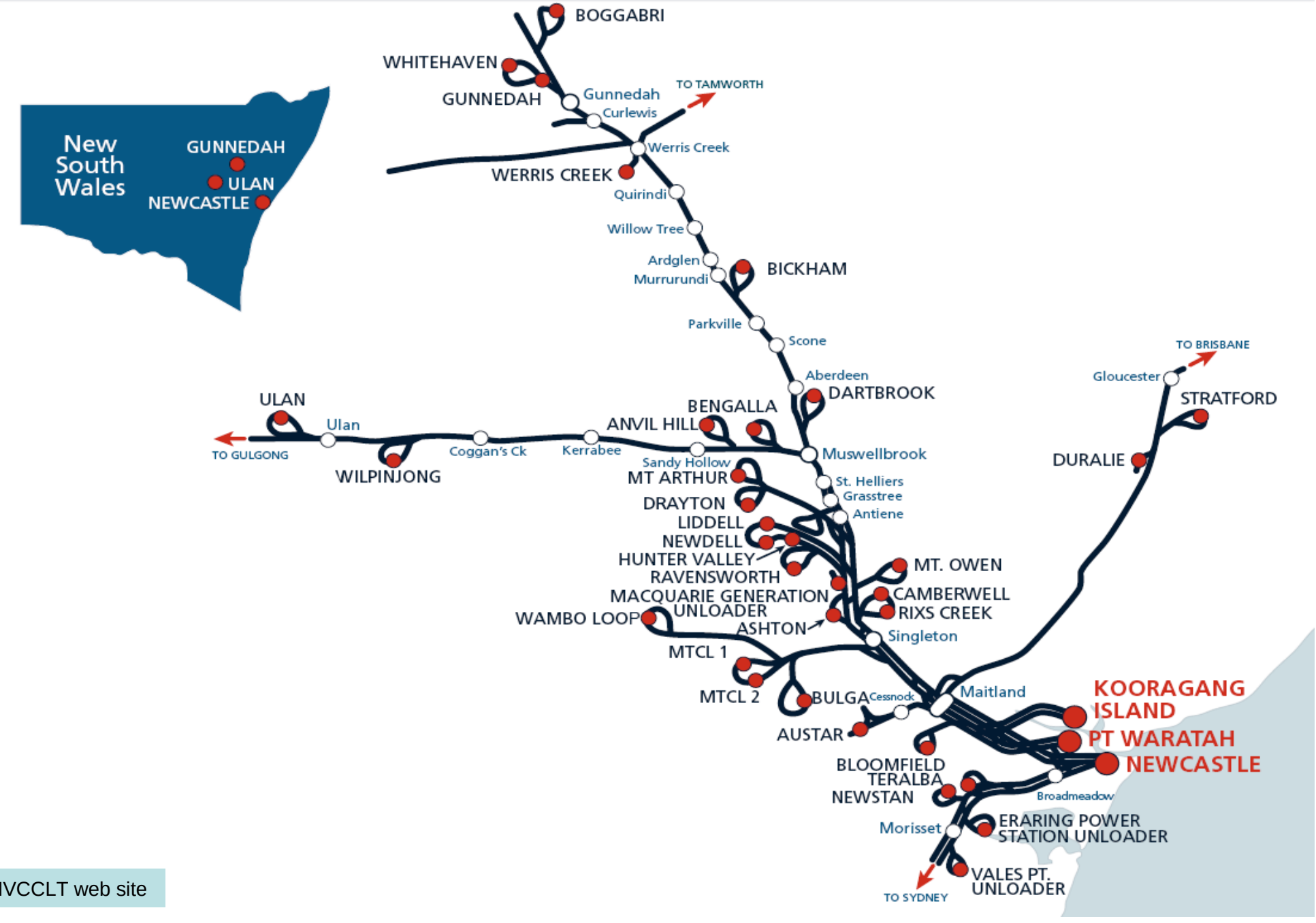
Vessel Queue



- Primarily due to surging export demand, export infrastructures caused delay to vessels arriving New Castle, the majority shipping center.

Source: HVCCLT web site

Hunter Valley, New South Wales



Source: HVCCLT web site

Complicated Operations; many players in each stage of mining, rail, terminal and trading…

Hunter Valley Coal Chain: The Worlds Largest Coal Export Operation

- 40 Coal Mines
- 17 Producers
- 30 Load Points
- > 80 Different Brands of Coal

- 2 Above Rail Operators
- 29 Trains/15,000 trips per year
- 2 Track Owner/Operators
- Haulage distances up to 350km

- 2 Coal Loading Terminals – KCT & CCT
- 5 Dump Stations
- 1.5Mt of Working Stockyard
- 5 Ship Berths and Loaders, "4 Queues"

- Approx. 1000 vessels per year
- Average vessel size is 84kt
- Avg 2 Cargoes per Vessel
- Multiple Components per Cargo
- Tidal constrained river port

- 10% Domestic Consumption
- 90% Export – mostly Thermal coal
- 70% to Japanese Power Stations

- Turn of Arrival loading port
- JIT cargo assembly process
- 16 independent organisations required to move each tonne of coal
- No control over demand – only two weeks visibility and highly variable volumes
- Avg 5 days clean coal on stock at the mines

Q: How to maximise system throughput and drive efficient asset utilisation?

A: Plan and operate the system as though owned by a single shareholder

HUNTER VALLEY COAL CHAIN LOGISTICS TEAM

Source: HVCCLT web site

Effort for higher efficiency through coordinated operation: Hunter Valley Coal Chain Logistics Team

HVCCLT: A Cooperative Planning and Operating Model

PWCS
QRNational
HUNTER VALLEY COAL CHAIN LOGISTICS TEAM
NEWCASTLE PORT
pacificnational
RailCorp
RAILINFRASTRUCTURE CORPORATION
ARTC

- *Joint Venture between the organisations that own the train, track, terminal and port infrastructure*
- *The movement of every tonne of domestic and export coal is planned via the HVCCLT*
- *HVCCLT provides a 'system wide' forum for pursuing operational improvements and making efficient decisions about future investment in infrastructure*

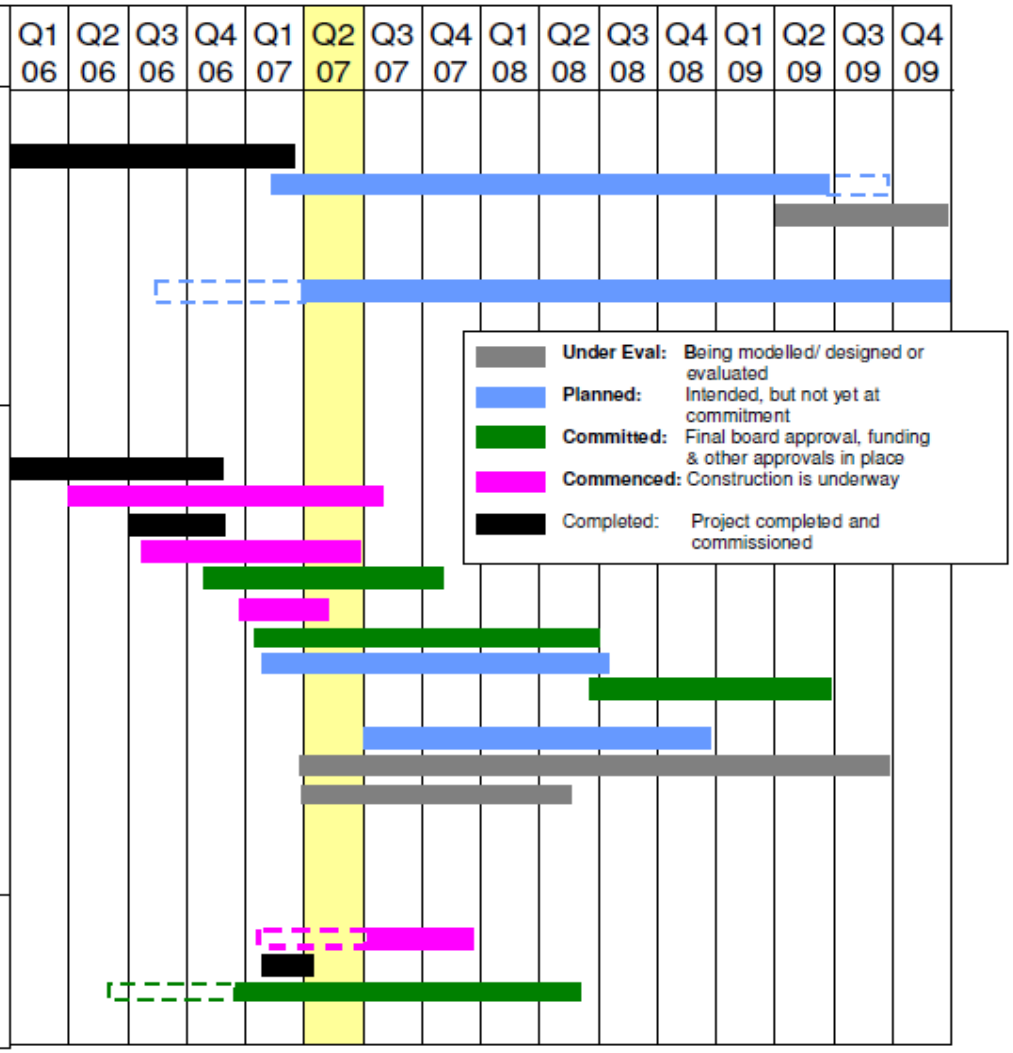
- Provides centralised planning services on behalf of its members:
  1. **Short term objective** – focus on maximising daily capacity and throughput
  2. **Long term objective** – assist members with investment planning
- Established as a trial in 2003 and formalised with governance arrangements under an MoU in July 2005 – operates on a premise of cooperation between the member organisations
- Membership includes all transport asset owners in the Hunter Valley – and the newest operator, NCIG, have expressed intent to participate in the model
- 25 Employees seconded from member organisations
- $5 million investment in state-of-the-art constraint based planning technology and models

Source: HVCCLT web site

Coordinated approach upon investment for appropriate capacity. However, obtaining permit is never easy…

Current Infrastructure Initiatives

Planned Infrastructure Investments, Status and Capacity Benefits		
Port	**Status:**	**Capacity:**
PWCS:		
• **Project 3D**	Completed	102 Mtpa
• Phase 1 Expansion Option	Planned	116 Mtpa
• Phase 2 Expansion Option	Under Eval.	126 Mtpa
NCIG		
• Phase 1	Planned	+30 Mtpa
Track:		
ARTC V5:		
• **Sandgate Grade Separation**	**Complete**	
• Ulan CTC, passing loops	Commenced	
• **5 Gunnedah paths/day**	**Complete**	
• M'Brook Yard Duplication Stage 1	Commenced	102Mtpa
• Part M-A Duplication (Antiene-G'trees)	Committed	112Mtpa
• 7 Gunnedah paths/day		
–Murulla Loop	Commenced	
–Loop x 3	Committed	
–Loop x 7	Planned	
• Full M-A Duplication (St H-M'Brook)	Committed	145Mtpa
• Ulan additional passing loop	Planned	
• 3rd Road Mininbah Bank	Planned	
• Bi-Di Signalling Maitland to Antiene	Planned	
Trains:		
PN: - 330 additional wagons on order	Commenced	~*110Mtpa
QRN: - 4th consists operational	**Complete**	
Eliminate refuelling @ KCT (i.e. 6 Dep. Rds)	Committed	~** 120Mtpa



Note(*): Rolling stock system capacity at end of 2007 is approx 110 Mtpa in a stand alone configuration as modelled by HVCCLT
Note(**): Refuelling at KCT currently constrains throughput at ~95-100 Mtpa

Source: HVCCLT web site

Summary

- While the chartering market is going through highly volatile changes due to downturn in import demand for iron ore from Brazil to China account price conflict, the underlying demand remains strong on the medium term.
- Due to rapid increase of cargo volume, the bulk carrier fleet has been suffering from longer port stay in waiting for loading turn partly due to late arrival of cargo from mines to ports.
- Exporters are endeavoring to squeeze maximum productivity out of existing onshore infrastructure, in addition to investment in additional facilities.
- One typical model effort is going on at Hunter Valley in New South Wales, Australia, where mines, railroad, and export terminals have set up a joint-coordination body, Hunter Valley Coal Chain Logistics Team, to make use of the existing facilities at maximum efficiency.
- The approach to sort out regional operational bottleneck by setting up joint-coordination body is observed at various places. HVCCLT may be unique in expanding the scope to optimize investment program too.

Thank You!