

## **SOK JE LEE'S BIOGRAPHY**

Sokje Lee is a senior analyst of Mirae Asset Securities, Korea. He is an analyst covering Korean shipbuilding sector.

Mr. Lee joined Mirae in 2009 from Citi Global Research where he covered shipbuilding and automotive sectors. In 2007, he ranked as No. 1 among all analysts in Korea in Asian Money. Prior to that, he worked in Credit Suisse, HSBC, and McKinsey.

Mr. Lee holds a Bachelor and Master of Economics degree from Seoul National University.

# Korean Shipbuilding Industries

The biggest wave ever

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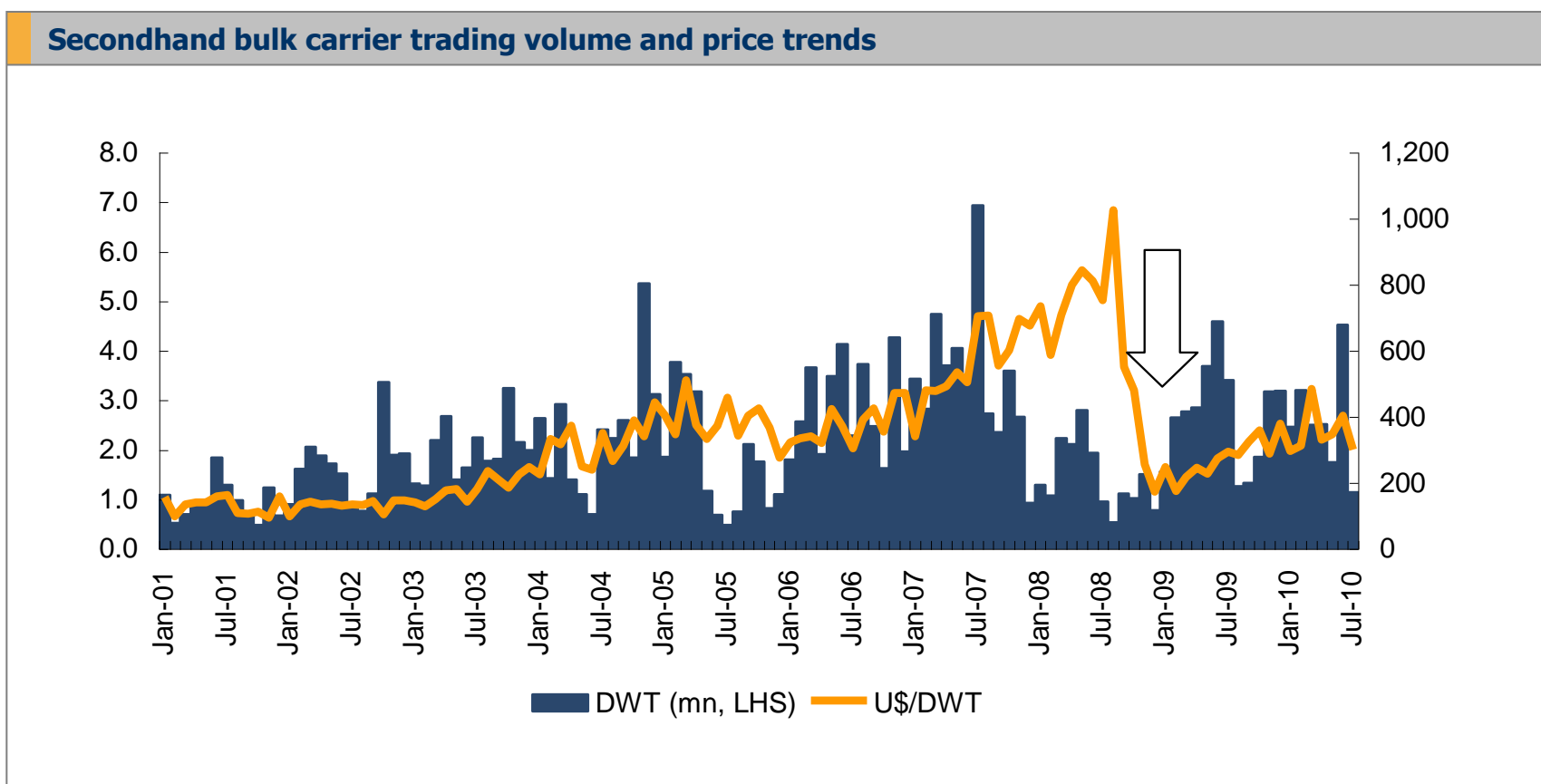
May 2011

## Key points

- ✓ Bottoms were early 2009
- ✓ Fuel efficiency invites huge new and replacement demand
- ✓ Restructuring will continue

## Turnaround began in early 2009 in secondhand market

- Turnaround usually starts from secondhand market
- Ship owners started shopping in new building market from late 2009, for lack of available vessels in the secondhand market.



Source: Clarksons

## Massive restructuring is already on the way

- The number of yards with new building contracts declined from 400 to 130 (2007-2010)
- New orders are highly concentrated with top-tier yards
- Massive restructuring is likely from 2011



Source: Clarksons, Mirae Asset Securities

# Uncertainty of Chinese yards

## Big questions on profitability

- Labor costs account for 25% of contract prices for Korean yards
- Labor cost for Chinese yards are 30% cheaper than Korean yards (1/5 per labor cost x 3 times bigger employee per ship)
- 7.5%pt cost advantage over Korean yards cannot explain 15-20% cheaper shipbuilding contract prices

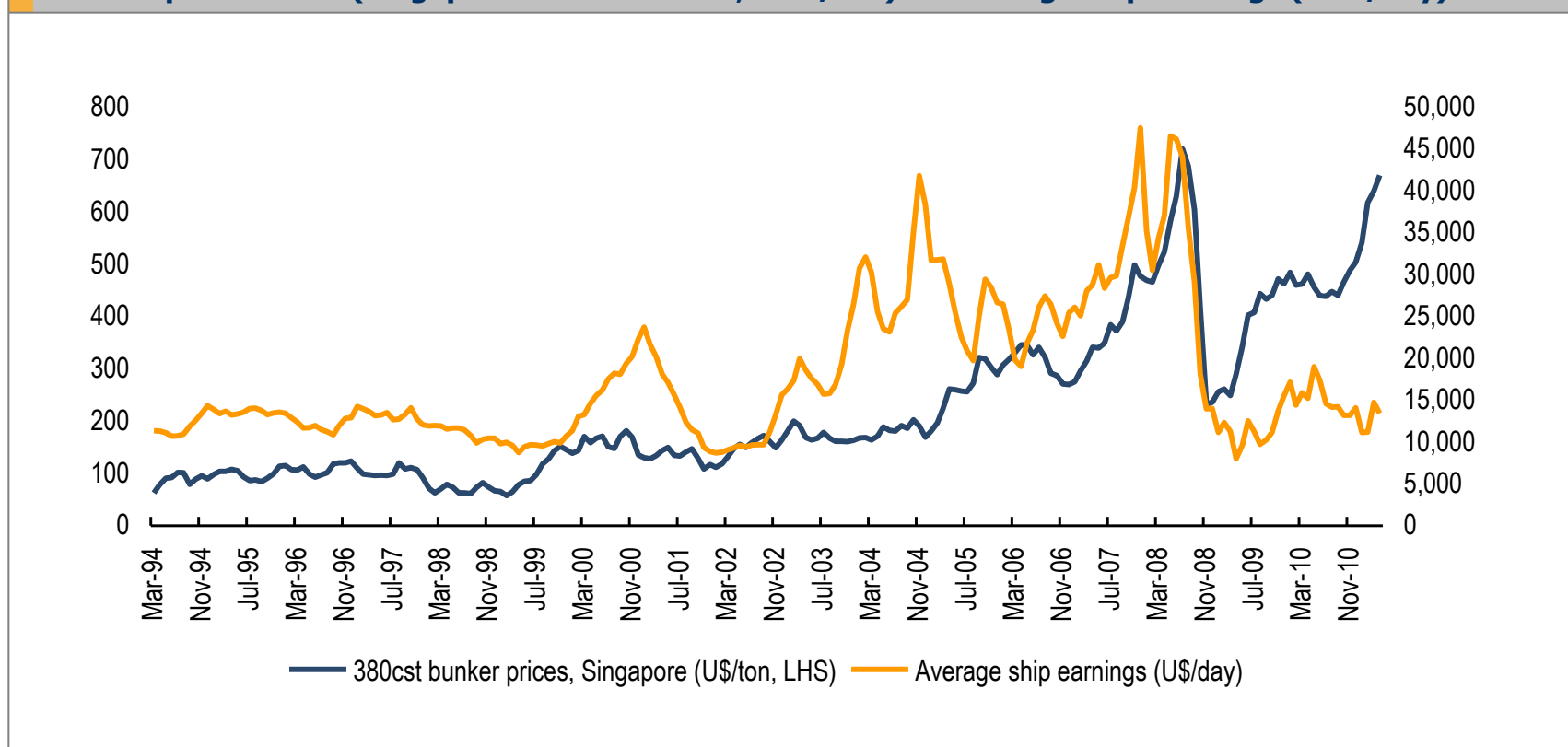
## Disaster comes from the rise of steel prices

- Increasing possibility of rally in steel prices
- Different phase from year 2004-2006 with lower bulk carrier freight rates
- Chinese government cannot support forever

## Fuel efficiency becomes everything

- 1990-2000 avg. bunker price at USD90/ton vs. current price at USD700/ton
- Growing focus on fuel efficiency, as fuel costs amounted to 17-19% of revenue
- In 2011, the cost is expected to reach 30%

**Bunker price trends (Singapore 380CST bulker, USD/ton) vs. average ship earnings (USD/day)**

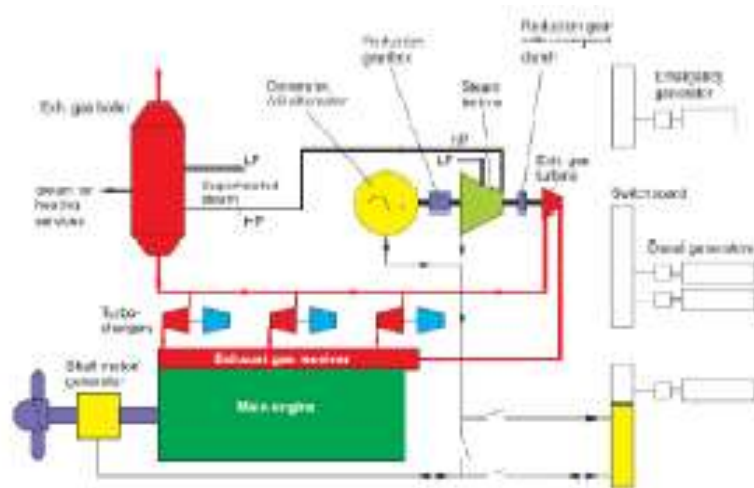


Source: Clarksons

## Savings from lower fuel costs can equal ship prices

- New ship types will have smaller engines, slower top speeds, bigger cargo areas
- Energy-saving devices can save up to 15% in fuel costs
- 13,000 TEU containership priced at USD130mn spends USD1.5bn worth fuel throughout life (25 years)

### Waste heat recovery system (WHRS, Wartsila)



### Fin & pre-swirl stator (HHI, DSME)

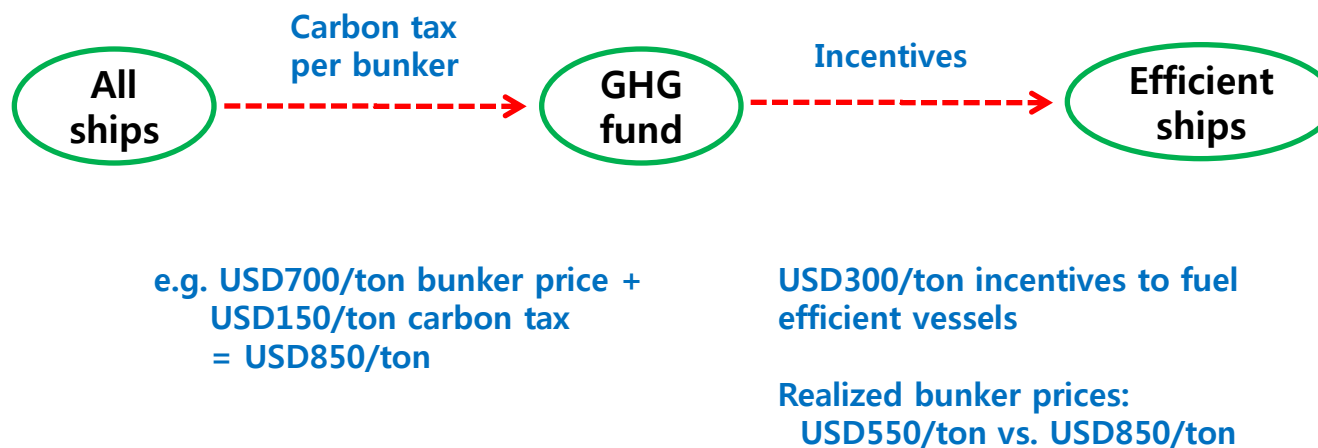


- ✓ Pay-back period of energy saving devices: 3-4 years
- ✓ For remaining 20 years, ship owners' fuel cost savings can amount to 50-100% of ship price

## Market-based measures

- GHG fund emerges as the best candidate to regulate CO2 emissions by IMO
- The system actually invites relative evaluation among shipping companies
- Huge margin gap among shipping companies due to fuel efficiency is expected

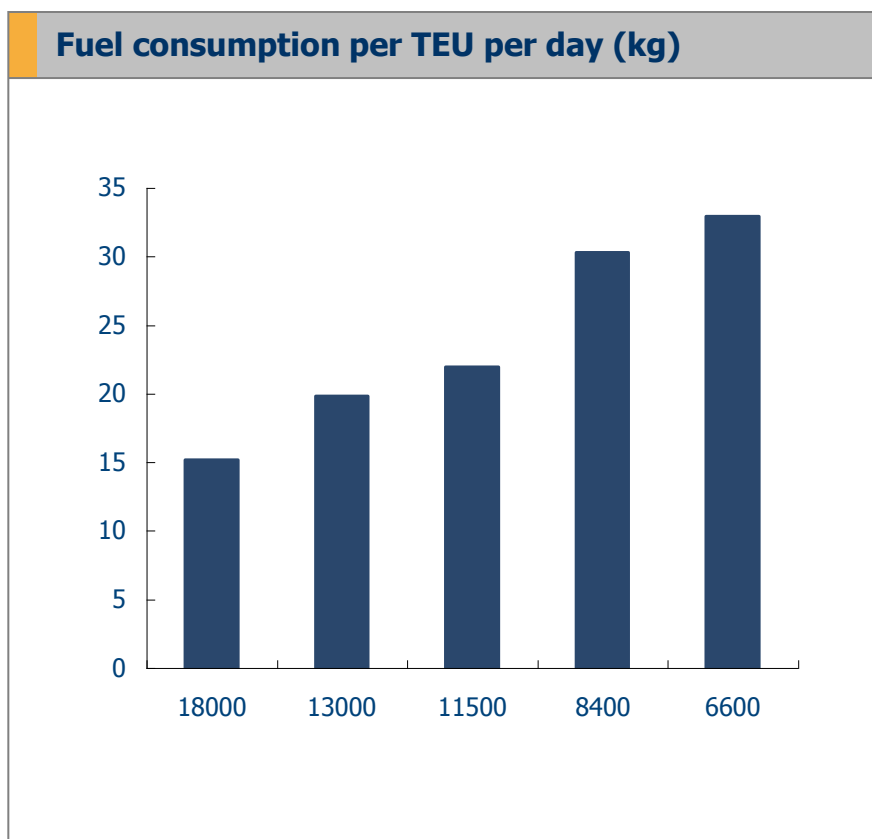
### GHG funds: Market-based measures



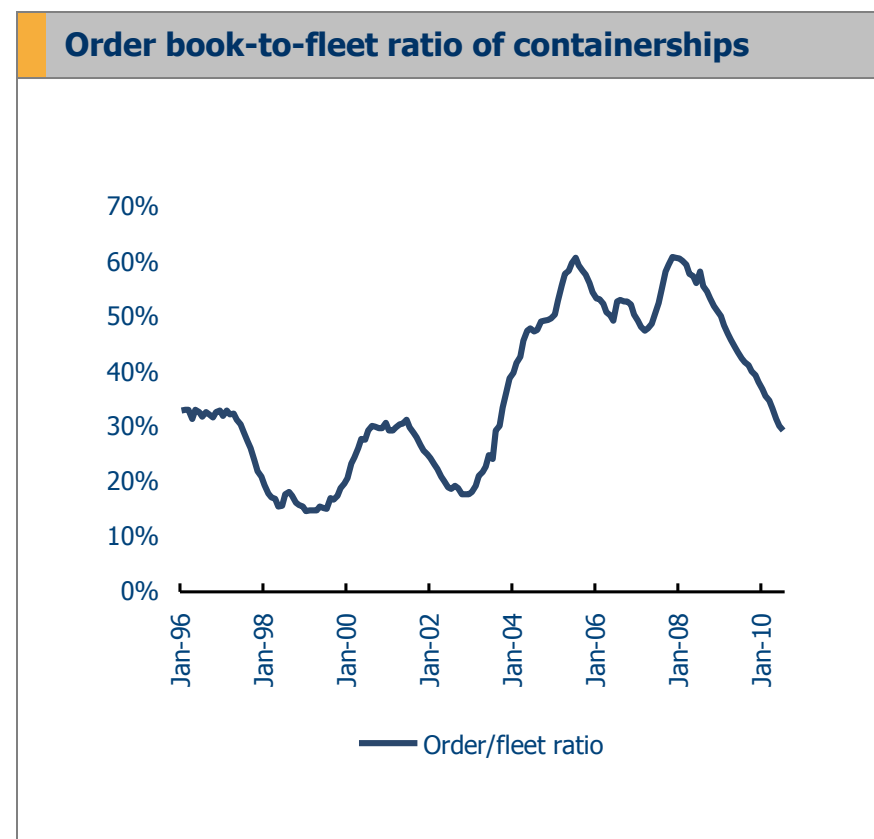
Source: IMO, MEPC 59/INF.10

## Top-tiers are on the move

- They saw the potential supply shortage of containerships
- Maersk is aiming at outstanding fuel cost savings by ordering twenty 18,000 TEU containerships
- The number of ships per route is on the rise due to slow steaming: 8 → 9 → 10



Source: Clarksons

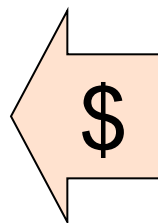


Source: Clarksons

# 'Winners' and 'losers' in the shipping industry


'Winner': Better fuel efficiency

- Lower fuel costs + incentives
- Leader of industry consolidation



'Loser': Poor fuel efficiency

- High fuel costs + carbon credit cost
- Incessant leakage of cash to competitors

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- Price of carbon credits is likely to increase, going forward
  - High oil prices will have same impact

## Precise supply and demand analyses unnecessary, as...

### Contraction of ship supply

- Slow steaming is the first step to reduce CO2
- 10% reduction of ship speed implies **9~10%** contraction of ship supply
- New ship demand comes to transport same amount of cargo



### Scrap of old vessels

- Vessels over 20 years old amount to **30%** of global fleet (**42~43%** for over 15 years)
- Relatively big investment required to improve efficiency of old ships
- Best solution is scrap

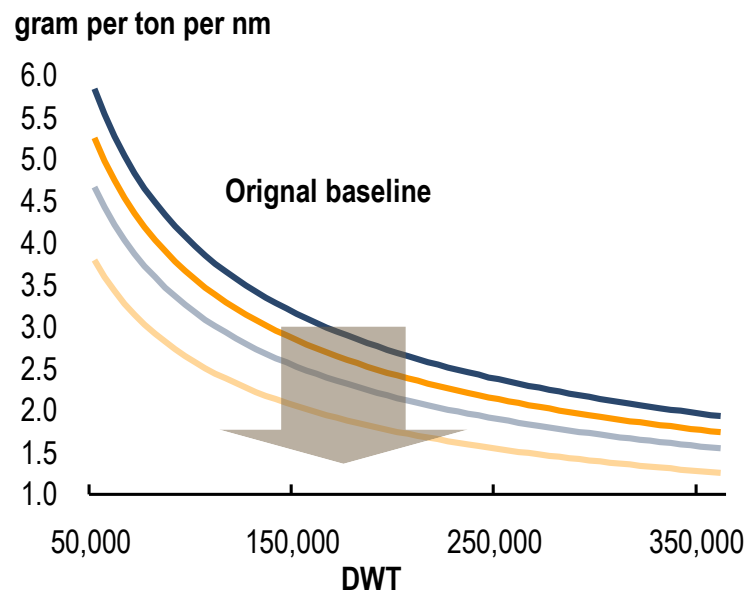
**Heavy replacement demand is coming**

**Global shipbuilding order book is only **36%** of global fleet**

## Energy efficiency design index (EEDI) = Entry barrier

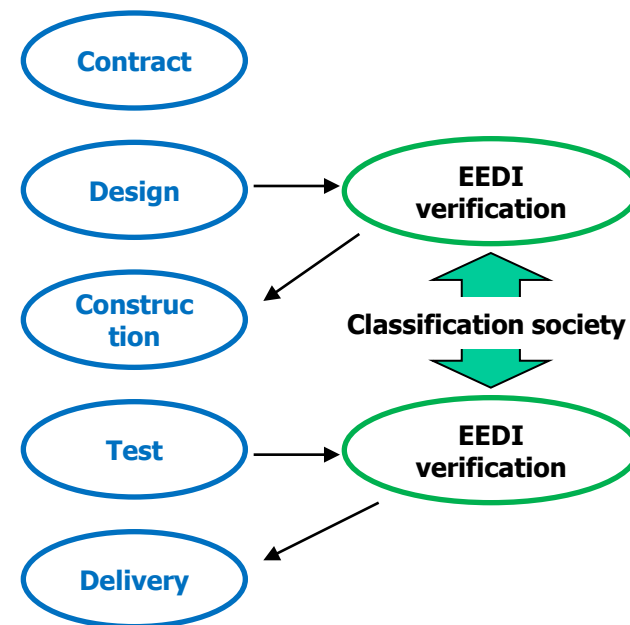
- Starting from 2015, new building contracts are subject to required EEDI (10%, 20% and 35% reductions in 2015, 2020, and 2025)
- Verification of EEDI will be made twice by 3rd party (Classification Society)
- If actual EEDI exceeds required EEDI, the vessel cannot be delivered

### Development of required EEDI



Source: IMO, MEPC 59/INF.10

### New shipbuilding process



Source: IMO, MEPC 59/INF.10

# Key differentiating factors of EEDI

## Not engines !!!

- 50% of ships from China use Korean engines
- MAN Diesel has 80~90% market share in ship engine patents

## 1. Design and R&D

- Ship design will change dramatically, across all vessel types
- Smaller engines, smaller engine rooms and greater cargo space
- New design requires significant R&D efforts and experience
- Significant in-house design resources are required for new designs

## 2. Manufacturing skill

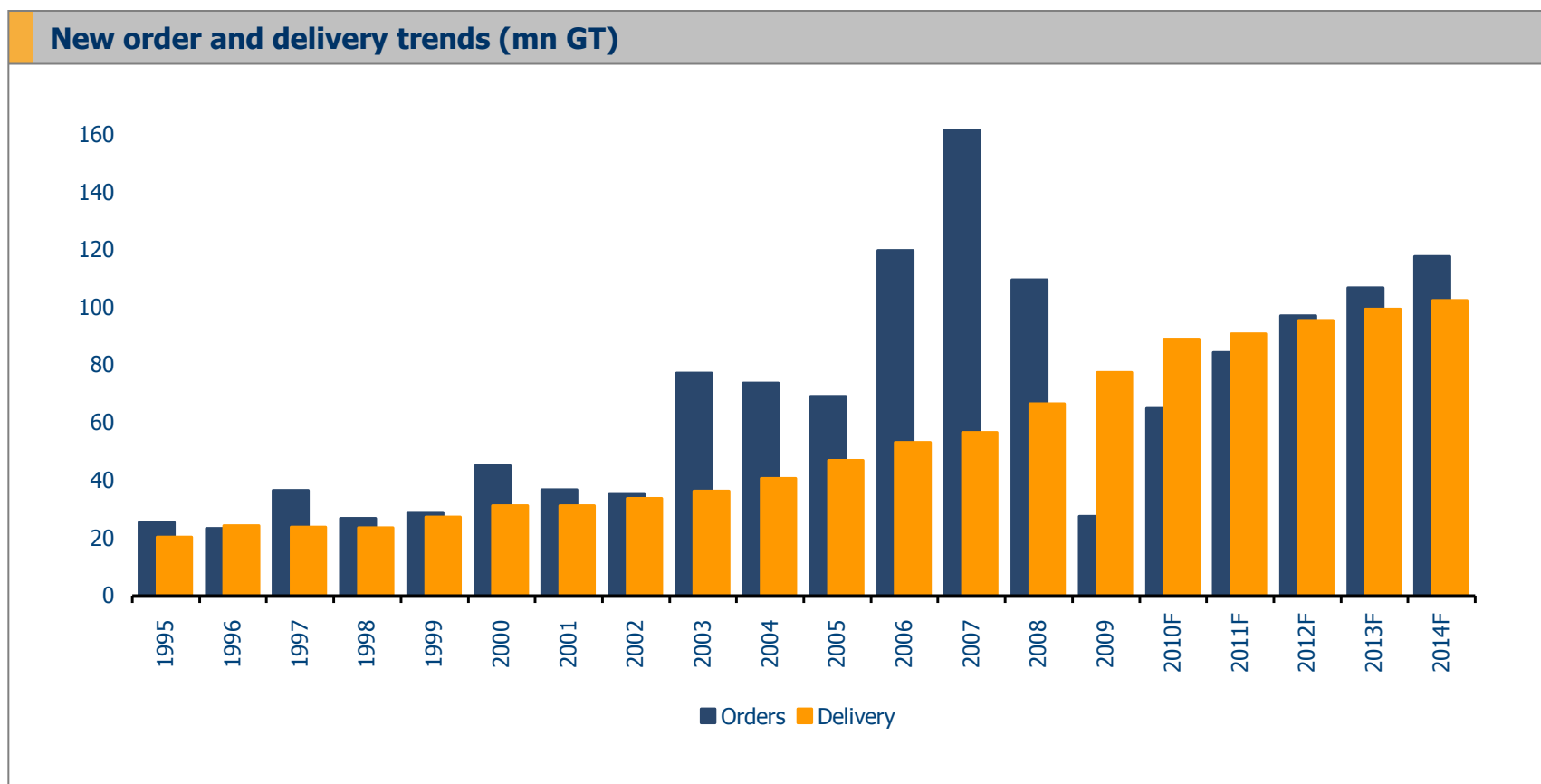
- Fuel efficiency has high correlation with quality of vessels
- Ships are made from 100~200k units of components

## 3. Quality components

- Quality of ship components will be critical to fuel efficiency
- Qualified component players are essential

## 2011E, 20-30% YoY growth in orders

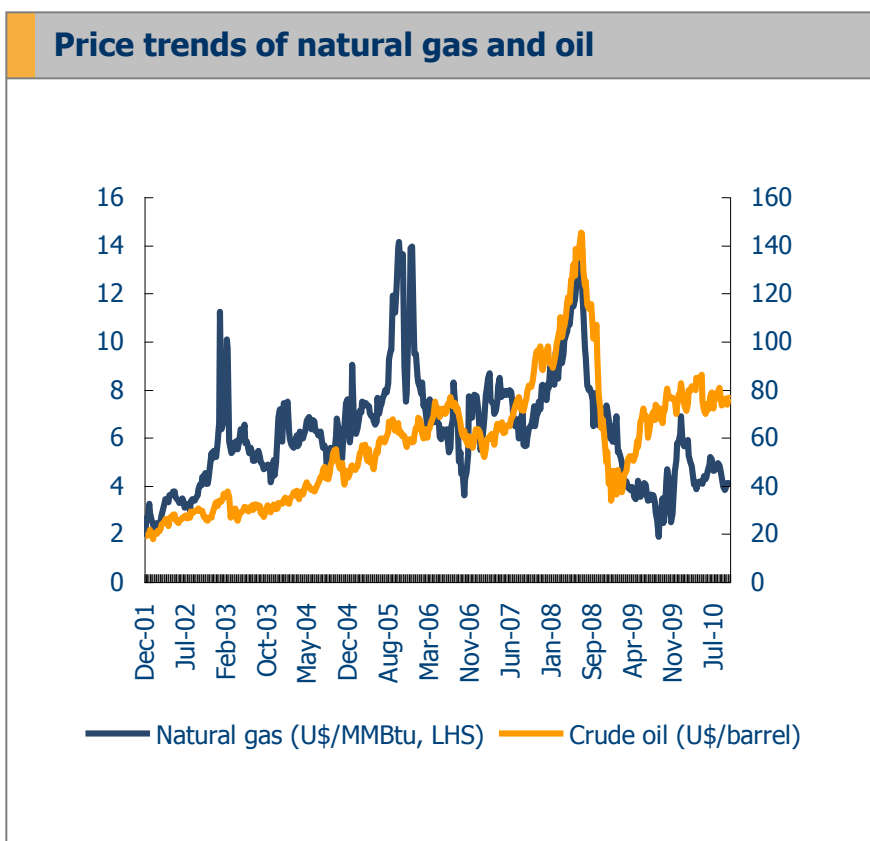
- New orders will be driven by container ships and offshore structures
- Another driver will be normalized ship finance from mid-2011. Typically, ship finance lags the move of shipbuilding prices by one year (bottom price was Mar 2010)



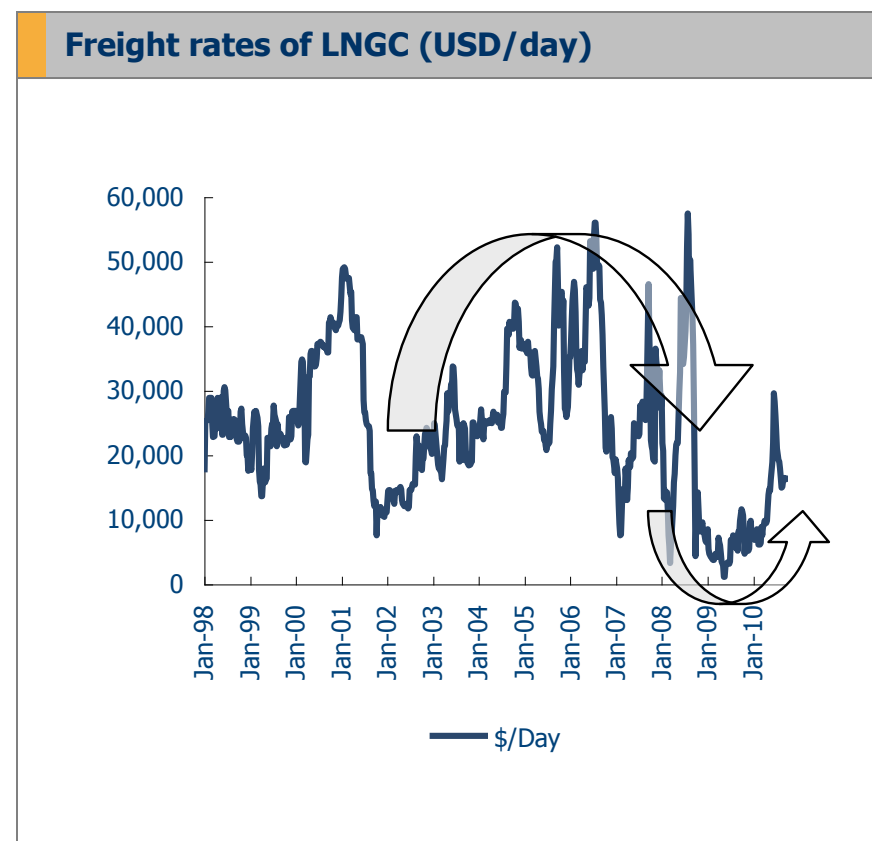
Source: Clarksons, Mirae Asset Securities

## LNGC boom is coming back

- Order book-to-fleet ratio of LNGC fell to 8%; an historical low level
- Accident of Japanese nuclear power plant invited bigger interest in LNG
- Bigger momentum than 2002-2006 (over 220 LNGC orders)



Source: Clarksons



Source: Clarksons

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