Update on the Panama Canal Expansion

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Autoridad del Canal de Panamá
January 19, 2012
FY 2011 Canal Traffic Indicators

Update on the Expansion Program (Video Clip)

Potential Impact/Importance of the Expansion
Transits vs. Panama Canal/UMS Tonnage
FY 1915 – FY 2011

Average PC/UMS Tonnage for Commercial Transits

- AF 1955: 4,832
- AF 1975: 9,931
- AF 1995: 18,940
- AF 2011 (E): 24,538

Transits vs. Panama Canal/UMS Tonnage
FY 1915 – FY 2011

Average PC/UMS Tonnage for Commercial Transits

- AF 1955: 4,832
- AF 1975: 9,931
- AF 1995: 18,940
- AF 2011 (E): 24,538
Main Routes - FY 2011

- **East Coast US -- Asia**: 87.3M
- **West Coast South America -- East Coast US**: 26.2M
- **West Coast South America -- Europe**: 15.2M
- **West Coast US -- Europe**: 9.9M
- **West Coast Central America -- East Coast US**: 11.7M

**Total (long tons)**: 222.4 M
Tonnage by Market Segments FY 2010 – FY 2011

- Container: FY2010 = 104.59, FY2011 (e) = 113.59
- Dry Bulk: FY2010 = 72.59, FY2011 (e) = 79.94
- Vehicle Carrier: FY2010 = 33.05, FY2011 (e) = 34.68
- Tanker: FY2010 = 46.56, FY2011 (e) = 48.99
- Refrigerated: FY2010 = 7.78, FY2011 (e) = 12.83
- Passenger: FY2010 = 10.34, FY2011 (e) = 10.77
- General Cargo: FY2010 = 7.78, FY2011 (e) = 9.19
- Others: FY2010 = 11.30, FY2011 (e) = 11.71

PCUMS (in millions)
Liner Services Through The Panama Canal

<table>
<thead>
<tr>
<th>Trade Route</th>
<th>Number of Services</th>
<th>Yearly Capacity</th>
<th>Number of Vessels</th>
<th>Average Vessel Size</th>
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<tr>
<td>Asia - USEC</td>
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<td>3,008,960</td>
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</table>

Source: Compair Data, January 2011
Port Development in Panama

1996: 235K TEUs
2010: 5.59M TEUs
2011: 6.58M TEUs
2015: 8.4M TEUs(P)

Panama Ports Company – Cristobal
Colon Container Terminal
Manzanillo International Terminal (MIT)
Panama Ports Company - Balboa
Tonnage by Market Segments FY 2010 – FY 2011

- Container: FY2011 (e) 113.59, FY2010 104.59
- Dry Bulk: FY2011 (e) 79.94, FY2010 72.59
- Vehicle Carrier: FY2011 (e) 34.68, FY2010 33.05
- Tanker: FY2011 (e) 48.99, FY2010 46.56
- Refrigerated: FY2011 (e) 12.83, FY2010 14.59
- Passenger: FY2011 (e) 10.77, FY2010 10.34
- General Cargo: FY2011 (e) 9.19, FY2010 7.78
- Others: FY2011 (e) 11.71, FY2010 11.30

PCUMS (in millions)
Mississippi River Watershed
Grain Cargo Tonnage

Source: ACP Data Warehouse

Years are fiscal: October through September
Soybean and corn (Metric Tons)

Source: ACP Data Warehouse
FY 2011 Canal Traffic Indicators

Update on the Expansion Program (Clip)
Panama Canal Expansion
Program Objectives

- Maintain Canal competitiveness as well as the value of the route
- Increase capacity and allow the transit of larger ships
- Reduce water consumption
- Improve safety and efficiency
- Sustain tonnage and profitability growth
Canal Expansion Program Components

- Deepening of Pacific and Atlantic entrance channels
- Deepening and widening of the Gatun Lake navigation channel
- Construction of new access channel for Pacific Locks
- Construction of new Post Panamax Locks and water saving basins in the Atlantic and the Pacific
- Increase the maximum operating level of Gatun Lake
International Congress Panama Canal 2012
Engineering and Infrastructure

April 18-20, 2012 Panama City, Panama

Witness the Panama Canal Expansion firsthand.
FY 2011 Canal Traffic Indicators

Update on the Expansion Program (Clip)

Potential Impact/Importance of the Expansion
The Panama Canal - 2014

GAME CHANGER?
Locks Chamber and Vessel Size

Existing locks' maximum vessel size: 4,400 TEU

New locks' maximum vessel size: 12,600
# Container – Main Dimension Study

## Matrix of Ship's Length & Beam

<table>
<thead>
<tr>
<th>LOA Beam</th>
<th>277m</th>
<th>285m</th>
<th>300m</th>
<th>316m</th>
<th>334m</th>
<th>350m</th>
<th>366m</th>
<th>383m</th>
<th>399m</th>
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<td>8,550 TEU</td>
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Guideline to Expanded Panama Canal (Plan)

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*Images of container ships with dimensions shown in the table.*

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SAMSUNG HEAVY INDUSTRIES
CONTAINER – 13,000 TEU

- **Main Dimension**
  - LOA x B x D: 366.0 x 48.2 x 29.8 m
  - Draft at Td / Ts: 14.0 m / 15.5 m

- **Ship’s Capacity**
  - Deadweight at Ts: 143,500 Ton
  - Container Capacity: 13,200 TEU

- **Main Engine & Speed**
  - Max. Power: 54,200 kW x 77 RPM
  - Service Speed: 23.5 kts

- **Complement**
  - Crew 30P + Suez 6P

- **Navigation & Communication**
  - 1-INS / 2-Radar Plant
  - 2-DGPS
  - 1-Auto Pilot / 2-Gyro compass

SAMSUNG HEAVY INDUSTRIES
MAERSK Line looks set to limit its fleet of 18,000 teu containerships to 20 units, but has more than a month to decide whether to exercise its option to order 10 more.

The deadline on the option for the final tranche expires at the end of February, but Maersk has already said it does not expect to convert the option into an order. The decision is likely to be confirmed when AP Moller-Maersk publishes its full-year results on February 27.

Speculation about Maersk’s intentions was fuelled by comments in the German media that appeared to suggest that it had cancelled the order for the second series of 10, placed last summer.

However, Maersk says it will take delivery of all 20 Triple-E ships ordered last year at a cost of $190m each. Maersk announced its $1.9bn order for 10 ships to be built by Daewoo Shipbuilding and Marine Engineering almost a year ago, along with options for two more series of 10.

At 400 m long and with a beam of 59 m, they will be the largest ships in service. Deliveries will start in 2013.
Main Global Container Transportation Flows

- **Eastbound Route**
- **Westbound Route**
- **Indifference Point**
- **Southeast Asia**
- **South Asia**
- **East Asia**
- **PANAMAX**
- **POSTPANAMAX**
- **Landbridge**
Main Global Container Transportation Flows

- East Asia
- South Asia
- Southeast Asia
- POSTPANAMAX

Westbound Route

Eastbound Route

Landbridge

Panama Route

Indifference Point
2010 World Container Flow

TRANS-ATLANTIC
6 million TEU

ASIA-EUROPE
17 million TEU

TRANS-PACIFIC
21 million TEU

INTRA-ASIA
56 million TEU
(including Australia, Indian Subcontinent and Middle East)

OTHER TRADES
North-South:
24 million TEU

Intra-Regional:
16 million TEU

Worldwide:
140m TEU in 2010
$ vs TT: Key is Time Sensitivity

Value Trade Off ≈ \frac{\text{Incremental Cost}}{\text{Transit Time Diff.}} \approx \frac{[($X_w+$Y_w) - ($X_e+$Y_e)]}{[(TT_{ow}+TT_{i}) - (TT_{oe}+Tt_{i})]}

South China

Long Beach

Norfolk

Memphis

Chicago

Columbus

Atlanta

28 Days, $XXX

12 days, $XXX

2 days $YYY

3 days $YYY

5 days $YYY

7 days $YYY

6 days $YYY

5 days $YYY

2 days $YYY

2 days $YYY

2 days $YYY
Route Cost Elements

Maritime Route Costs

Fuel Cost
- Fuel Cost
- Unit Fuel Cost

Operating Costs
- Operating Costs
- Vessel Total Operating Cost
- Unit Operating Costs

Capital Cost
- Capital Costs
- Unit Capital Costs

Charter Cost (Alternative Operating & Capital)
- Charter Costs
- Unit Charter Costs

Port Costs
- Port Costs
- Total Port Cost
- Unit Port Costs

Handling Costs
- Handling Costs
- Unit Handling Costs

Canal Costs
- Canal Costs
- Unit Canal Costs

Reposition Cost
- Reposition Cost
- Unit Reposition Cost

Costs based on Charter Rates
Consider Reposition Cost? Yes/No

Total Maritime Itinerary Cost
Maritime Unit Costs

Unit Maritime Cost per PCUMS
Unit Maritime Cost per DWT
Unit Route Cost Elements
US Inland transportation costs

11 regions in US
11 centroids
Route port to centroid

Local drayage
Rail
Truck
An expanded generalized cost concept

Generalized cost :=

Direct cost of transportation + Cost of time + Frequency cost + Cost of reliability
Market share computation

| Mid Value of Market Shares | | 
|---------------------------|--|--| 
| Apparel                    | 36.58% | 36.42% | 36.36% | 36.36% | 36.36% | 35.09% | 35.09% | 35.09% | 35.09% | 35.09% | 35.09% |
| Consumer Products          | 37.82% | 37.71% | 37.68% | 37.68% | 37.68% | 36.47% | 36.47% | 36.47% | 36.47% | 36.47% | 36.47% |
| Food                       | 61.04% | 61% | 60.98% | 60.98% | 60.98% | 60.12% | 60.12% | 60.12% | 60.12% | 60.12% | 60.12% |
| Industrial                 | 33.53% | 33.52% | 33.51% | 33.51% | 33.51% | 32.76% | 32.76% | 32.76% | 32.76% | 32.76% | 32.76% |
| Computer                   | 24.85% | 24.82% | 24.81% | 24.81% | 24.81% | 23.6% | 23.6% | 23.6% | 23.6% | 23.6% | 23.6% |
| Construction               | 45.86% | 46.02% | 46.08% | 46.08% | 46.08% | 46.26% | 46.26% | 46.26% | 46.26% | 46.26% | 46.26% |
| Autos                      | 37.82% | 37.72% | 37.68% | 37.68% | 37.68% | 36.47% | 36.47% | 36.47% | 36.47% | 36.47% | 36.47% |
| Auto Parts                 | 33.53% | 33.52% | 33.51% | 33.51% | 33.51% | 32.76% | 32.76% | 32.76% | 32.76% | 32.76% | 32.76% |
| Sporting Goods             | 37.36% | 37.23% | 37.18% | 37.18% | 37.18% | 35.94% | 35.94% | 35.94% | 35.94% | 35.94% | 35.94% |
| Other Agriculture          | 62.56% | 62.54% | 62.52% | 62.52% | 62.52% | 61.64% | 61.64% | 61.64% | 61.64% | 61.64% | 61.64% |
| Other                      | 37.66% | 37.54% | 37.5% | 37.5% | 37.5% | 36.28% | 36.28% | 36.28% | 36.28% | 36.28% | 36.28% |
| Appliances                 | 37.66% | 37.54% | 37.5% | 37.5% | 37.5% | 36.28% | 36.28% | 36.28% | 36.28% | 36.28% | 36.28% |
| Toys                       | 37.36% | 37.23% | 37.18% | 37.18% | 37.18% | 35.94% | 35.94% | 35.94% | 35.94% | 35.94% | 35.94% |
| Bulk                       | 45.81% | 45.96% | 46.04% | 46.04% | 46.04% | 46.22% | 46.22% | 46.22% | 46.22% | 46.22% | 46.22% |
| Textiles                   | 37.56% | 37.43% | 37.39% | 37.39% | 37.39% | 36.16% | 36.16% | 36.16% | 36.16% | 36.16% | 36.16% |
| Manmade                    | 45.96% | 46.12% | 46.17% | 46.17% | 46.17% | 46.35% | 46.35% | 46.35% | 46.35% | 46.35% | 46.35% |
| Furniture                  | 41.91% | 41.83% | 41.8% | 41.8% | 41.8% | 40.66% | 40.66% | 40.66% | 40.66% | 40.66% | 40.66% |
Emerging Global Maritime Freight Transport System

Port Traffic, TEU (2010)

- Less than 2 M
- 2 to 4 M
- 4 to 6 M
- 6 to 12 M
- More than 12 M

Circum Equatorial Route
North-South Pendulum Connector
Transoceanic Pendulum Connector

Main Transshipment Market
2010: 250 successful attacks, 200 failed
Container Fleet Capacity and Vessel Size Composition

2000 (4.79 million TEU)
- 15% Pmax
- 85% Pmax and less

2011 (14.9 million TEU)
- 44.4% Total
- 8.2% Pmax
- 36.2% Pmax and less

2016 (19.4 million TEU)
- 54.6% Total
- 17.6% Pmax
- 37% Pmax and less

Fuente: Clarkson's Research Studies - julio 2011

Panamax: 371 961 1,021
Post Panamax: 134 889 1,325
## Carrier Operating Margins

### 1H/2011: Top-20 Ocean Carrier Operating Profit and Margins

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<tr>
<th>Carrier</th>
<th>Operating Profit</th>
<th>Operating Margin</th>
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<td>APM-Maersk</td>
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<td>MSC</td>
<td>8%</td>
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<tr>
<td>CMA CGM</td>
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<td>COSCON</td>
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<td>Hanjin Shg</td>
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**Financial Health Check**

**Z-score** = \(1.2T1 + 1.4T2 + 3.3T3 + 0.6T4 + 1.0T5\)

- \(T1 = (\text{Cur Assets} - \text{Cur Liabilities}) / \text{Total Assets}\)
- \(T2 = \text{Retained Earnings} / \text{Total Assets}\)
- \(T3 = \text{Annual Earnings B4 Int & Tax} / \text{Total Assets}\)
- \(T4 = \text{Book Value of Equity} / \text{Total Liabilities}\)

**Healthy Zone**
- **OOIL**
- **Maersk**
- **NOL**
- **Wan Hai**
- **Evergreen**
- **CSCL**
- **MOL Grp**
- **K Line Grp**
- **NYK Grp**

**Caution Zone**
- **Hapag-Lloyd**
- **CMA CGM**
- **Zim**
- **CSAV**
- **Cosco**
- **Yang Ming**
- **HMM**
- **Hanjin**

**Distress Zone**
- **Horizon**

**Source:** Drewry FSI, Sept 2011
# Demand/Supply Forecast

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<th>2008</th>
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<td>6.0%</td>
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<td>Clarkson demand – Aug 11</td>
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<td>-9.1%</td>
<td>12.6%</td>
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<td>Morgan Stanley – Jun 11</td>
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<td></td>
<td></td>
<td>8.0%</td>
</tr>
<tr>
<td>Morgan Stanley – Jun 11</td>
<td></td>
<td></td>
<td></td>
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<td>9.3%</td>
</tr>
<tr>
<td>Nomura Equity – Jun 11</td>
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<td></td>
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<td></td>
<td></td>
<td>9.3%</td>
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<tr>
<td>Goldman Sachs Research – Jul 11</td>
<td>12.7%</td>
<td>6.0%</td>
<td>9.6%</td>
<td>10.4%</td>
<td>9.7%</td>
<td>10.4%</td>
</tr>
<tr>
<td><strong>Average Supply</strong></td>
<td><strong>11.5%</strong></td>
<td><strong>5.1%</strong></td>
<td><strong>9.3%</strong></td>
<td><strong>8.6%</strong></td>
<td><strong>8.1%</strong></td>
<td><strong>8.3%</strong></td>
</tr>
</tbody>
</table>
CO₂ emission trading from 2013

2020: SOₓ-limits for fuel apply globally. MGO demands a premium > 50% of Heavy Fuel Oil

Price of Heavy Fuel Oil {HFO} will continue to rise in the long run (2.5% pa)
Why “Slow Steaming”? 

$$ \text{$$$} \quad \text{$$$$} 

$$\text{$$$/TEU} \quad \text{$$$$/TEU} 

Slow Steaming = more ships + boxes = $$$$$$
Dry Bulk Carrier

Panamax Locks

Draft

12 m (39.5 ft)

Maximum cargo capacity: 60,000 MT

225 m (738.2 ft)

304.8 m (1,000 ft)

32.3 m (106 ft)

12.8 m (42 ft)

245 m (803.8 ft)

43 m (141.1 ft)

55 m (180 ft)

427 m (1,400 ft)

Post Panamax Locks

Draft

15.2 m (50 ft)

Maximum cargo capacity: 115,000 MT
U.S. Soybean Production and Exports
2001 – 2011 and Trend to 2021
U.S. Likely to be Producing 3.7 Billion Bushels in 2021, Exports Likely Reach 2.5 Billion Bushels (68%)
The Impact of Canal Expansion on Dry Bulks

1. The USG-Asia grain trade will become more competitive through the use of larger vessels.

2. Potential for increased trade of coal to Asia/China.
## Competitive Analysis for Dry Bulks

### Grain

<table>
<thead>
<tr>
<th>Route</th>
<th>Days</th>
<th>Fuel</th>
<th>Charter rate</th>
<th>Ports</th>
<th>Canal</th>
<th>Cargo Handling</th>
<th>Inland</th>
<th>Total</th>
<th>Indice de Competitividad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Belt - Asia - Panama Canal</td>
<td>43</td>
<td>12.22</td>
<td>12.93</td>
<td>2.89</td>
<td>2.51</td>
<td>8.10</td>
<td>29.91</td>
<td>68.56</td>
<td>1.00</td>
</tr>
<tr>
<td>Grain Belt - Asia - Intermodal (PNW)</td>
<td>31</td>
<td>6.43</td>
<td>8.15</td>
<td>2.68</td>
<td>0.00</td>
<td>24.59</td>
<td>50.11</td>
<td>91.95</td>
<td>1.34</td>
</tr>
<tr>
<td>Grain Belt - Asia - Suez Canal</td>
<td>58</td>
<td>17.13</td>
<td>17.29</td>
<td>2.89</td>
<td>4.42</td>
<td>8.10</td>
<td>29.91</td>
<td>79.73</td>
<td>1.16</td>
</tr>
<tr>
<td>Grain Belt - Asia - C. G. H.</td>
<td>61</td>
<td>20.27</td>
<td>19.53</td>
<td>2.89</td>
<td>0.22</td>
<td>8.10</td>
<td>29.91</td>
<td>80.92</td>
<td>1.18</td>
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<tr>
<td>Grain Belt - Asia - C. H.</td>
<td>64</td>
<td>19.09</td>
<td>18.56</td>
<td>2.89</td>
<td>0.11</td>
<td>8.10</td>
<td>29.91</td>
<td>78.65</td>
<td>1.15</td>
</tr>
</tbody>
</table>

### Coal

<table>
<thead>
<tr>
<th>Route</th>
<th>Days</th>
<th>Fuel</th>
<th>Charter rate</th>
<th>Ports</th>
<th>Canal</th>
<th>Cargo Handling</th>
<th>Total</th>
<th>Indice de Competitividad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norfolk to Nagoya - C. G. H.</td>
<td>47</td>
<td>18.76</td>
<td>11.57</td>
<td>2.27</td>
<td>0.00</td>
<td>8.36</td>
<td>40.97</td>
<td>1.09</td>
</tr>
<tr>
<td>Norfolk to Nagoya - C. H.</td>
<td>50</td>
<td>20.28</td>
<td>12.42</td>
<td>2.27</td>
<td>0.33</td>
<td>8.36</td>
<td>43.66</td>
<td>1.16</td>
</tr>
<tr>
<td>Norfolk to Nagoya - Panama</td>
<td>32</td>
<td>14.33</td>
<td>9.24</td>
<td>2.73</td>
<td>2.99</td>
<td>8.36</td>
<td>37.65</td>
<td>1.00</td>
</tr>
<tr>
<td>Norfolk to Nagoya - Suez</td>
<td>42</td>
<td>16.39</td>
<td>10.51</td>
<td>2.27</td>
<td>4.20</td>
<td>8.36</td>
<td>41.73</td>
<td>1.11</td>
</tr>
</tbody>
</table>

### Additional Routes

- Santa Marta / Tocopilla - C. H.
- Santa Marta / Tocopilla - Panamá
- Vancouver to Rotterdam - C. H.
- Vancouver to Rotterdam - Panama
Dry Bulk Fleet Capacity
(Millions DWT)

### Capacity 2011

<table>
<thead>
<tr>
<th>Size Range</th>
<th>2011</th>
<th>Orders (2011-13)</th>
<th>2015 E*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Panamax (&lt;106) DWT</td>
<td>341.8</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Capesize (&gt;106) DWT</td>
<td>22.3</td>
<td>39%</td>
<td></td>
</tr>
</tbody>
</table>

### New Orders

<table>
<thead>
<tr>
<th>Size Range</th>
<th>2011</th>
<th>Orders (2011-13)</th>
<th>2015 E*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Panamax (&gt;106) DWT</td>
<td>111.2</td>
<td>45%</td>
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</tr>
<tr>
<td>Capesize (&gt;106) DWT</td>
<td>138.2</td>
<td>55%</td>
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</tbody>
</table>

### Capacity 2013

<table>
<thead>
<tr>
<th>Size Range</th>
<th>2011</th>
<th>Orders (2011-13)</th>
<th>2015 E*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Panamax (&lt;106) DWT</td>
<td>480.0</td>
<td>59%</td>
<td></td>
</tr>
<tr>
<td>Capesize (&gt;106) DWT</td>
<td>333.5</td>
<td>41%</td>
<td></td>
</tr>
</tbody>
</table>

* Total 2015 estimated, not including scrapping

Source: Clarksons Research Studies, June 2011
# Competitive Analysis Tankers

## Oil Tankers

<table>
<thead>
<tr>
<th>Route</th>
<th>Days</th>
<th>Fuel</th>
<th>Charter Rate</th>
<th>Ports</th>
<th>Canal</th>
<th>Cargo Handling</th>
<th>Inland</th>
<th>Total</th>
<th>Competitive Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houston / Quintero - C.H.</td>
<td>31</td>
<td>15.40</td>
<td>11.91</td>
<td>2.39</td>
<td>0.00</td>
<td>1.19</td>
<td>0.00</td>
<td>30.90</td>
<td>1.58</td>
</tr>
<tr>
<td>Houston / Quintero - Panama</td>
<td>16</td>
<td>7.09</td>
<td>6.10</td>
<td>2.39</td>
<td>2.76</td>
<td>1.19</td>
<td>0.00</td>
<td>19.53</td>
<td>1.00</td>
</tr>
<tr>
<td>Houston / Quintero - Panama Pipeline</td>
<td>20</td>
<td>7.32</td>
<td>7.40</td>
<td>2.89</td>
<td>0.00</td>
<td>1.19</td>
<td>4.00</td>
<td>22.80</td>
<td>1.17</td>
</tr>
</tbody>
</table>
Tanker Fleet Capacity (Millions DWT)

### Capacity 2011

<table>
<thead>
<tr>
<th>Vessel Size Range</th>
<th>Capacity in Million DWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLCC</td>
<td>172.1</td>
</tr>
<tr>
<td>Aframax</td>
<td>95.7</td>
</tr>
<tr>
<td>Suezmax</td>
<td>67.2</td>
</tr>
</tbody>
</table>

### Orderbook 2012-2014

<table>
<thead>
<tr>
<th>Vessel Size Range</th>
<th>Capacity in Million DWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLCC</td>
<td>53.2</td>
</tr>
<tr>
<td>Aframax</td>
<td>13.6</td>
</tr>
<tr>
<td>Suezmax</td>
<td>22.0</td>
</tr>
</tbody>
</table>

### Capacity 2015

<table>
<thead>
<tr>
<th>Vessel Size Range</th>
<th>Capacity in Million DWT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLCC</td>
<td>225.3</td>
</tr>
<tr>
<td>Aframax</td>
<td>109.3</td>
</tr>
<tr>
<td>Suezmax</td>
<td>89.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vessel Size Range</th>
<th>2011</th>
<th>Orderbook (2012-14)</th>
<th>2015 E *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to Panamax (&lt;106')</td>
<td>145.8</td>
<td>24.5</td>
<td>170.4</td>
</tr>
<tr>
<td>Aframax (106' - 140')</td>
<td>95.7</td>
<td>13.6</td>
<td>109.3</td>
</tr>
<tr>
<td>Suezmax (140' - 160')</td>
<td>67.2</td>
<td>22.0</td>
<td>89.2</td>
</tr>
<tr>
<td>VLCC (&gt; 160')</td>
<td>172.1</td>
<td>53.2</td>
<td>225.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>480.8</strong></td>
<td><strong>113.3</strong></td>
<td><strong>594.2</strong></td>
</tr>
</tbody>
</table>

*Total 2015 estimate does not include demolitions
Source: Clarkson Research Ltd, 2011
CRUDE OIL TANKER – 157,000 DWT

- **Main Dimension**
  - LOA x B x D: 274.0 x 49.0 x 23.3 m
  - Draft at Td / Ts: 16.2 m / 17.2 m

- **Ship's Capacity**
  - Deadweight at Ts: 157,000 ton
  - Cargo Capacity: 175,000 m³

- **Main Engine & Speed**
  - Max. Power: 16,600 kW x 81 RPM
  - Service Speed: 15.9 kts

- **Complement**
  - Crew 26P + Suez 6P

- **Navigation & Communication**
  - 2-Radar Plant, 1-VDR/ECDIS/AIS/BMWS
  - 1-Auto pilot/Gyro compass
  - GMDSS A3
The Impact of Canal Expansion on Liquid Bulks

1. Canal expansion will make Ecuador – USG crude shipments more competitive vs alternative sources (e.g., ex Nigeria).

2. The expanded Canal will be the first route choice for LNG trades between Trinidad-Chile and Peru-USG and for Shale Gas exports coming out of the U.S. destined to Asia.
LNG CARRIER – 170,000 m³

- **Main Dimension**
  - LOA x B x D: 291.0 x 45.0 x 26.0 m
  - Draft at Td / Ts: 11.5 m / 12.5 m

- **Ship’s Capacity**
  - Deadweight at Ts: 81,620 ton
  - Cargo Capacity: 170,720 m³

- **Main Engine & Speed**
  - Max. Power: 25,000 kW x 86 RPM
  - Service Speed: 19.9 kts

- **Complement**
  - 37 persons + 6 workers

- **Navigation & Communication**
  - 2-Radar with ARPA (1 X-band, 1 S-band)
  - 1-Gyro compass
  - 2xGPS
Figure 2: U.S. natural gas production, 1990-2035 (trillion cubic feet per year)

Figure 5: Wet Natural Gas Proved Reserves by Area, 2009

States with a color but no value displayed above are intentionally unlabelled for confidentiality reasons.
Source: U.S. Energy Information Administration
Tonnage by Market Segments FY 2010 – FY 2011

- **Container**: 113.59 (FY2011), 104.59 (FY2010)
- **Dry Bulk**: 79.94 (FY2011), 72.59 (FY2010)
- **Vehicle Carrier**: 48.99 (FY2011), 46.56 (FY2010)
- **Refrigerated**: 12.83 (FY2011), 14.59 (FY2010)
- **Passenger**: 10.77 (FY2011), 10.34 (FY2010)
- **General Cargo**: 9.19 (FY2011), 7.78 (FY2010)
- **Others**: 11.71 (FY2011), 11.30 (FY2010)

**Oasis of the Seas**
The Future of Market Segments – Panama Canal

Container
  Container Break Bulk
Dry Bulk
Vehicle Carriers
  Ro-Ro’s
Tankers
  Chemical Carriers
  LPG
  LNG
Refrigerated Vessels
Cruise
General Cargo
Others
Value-Added Components of Panama’s Transportation and Logistics Cluster
Value Chain Mindset

OUR CLIENT’S VALUE CHAIN

WHERE ELSE CAN WE ADD VALUE?

WHAT ELSE CAN WE DO TO ADD VALUE?

OUR VALUE CHAIN

Copyright 2011: Andreas Schotter (Ph.D.)
Continuing negotiations between GUPC and Labor Unions,
### Average Annual GDP Growth Rates for Latin America 2000-2010 (%chg)

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panama</td>
<td>6.4%</td>
</tr>
<tr>
<td>Surinam</td>
<td>5.2%</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>4.2%</td>
</tr>
<tr>
<td>Peru</td>
<td>4.0%</td>
</tr>
<tr>
<td>R. Dominicana</td>
<td>3.8%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>3.7%</td>
</tr>
<tr>
<td>Ecuador</td>
<td>3.5%</td>
</tr>
<tr>
<td>Argentina</td>
<td>3.3%</td>
</tr>
<tr>
<td>Honduras</td>
<td>3.0%</td>
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<tr>
<td>Colombia</td>
<td>2.8%</td>
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<tr>
<td>Belice</td>
<td>2.7%</td>
</tr>
<tr>
<td>Bolivia</td>
<td>2.3%</td>
</tr>
<tr>
<td>Chile</td>
<td>2.2%</td>
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<tr>
<td>Brazil</td>
<td>2.1%</td>
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<tr>
<td>Paraguay</td>
<td>1.9%</td>
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<tr>
<td>Uruguay</td>
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<td>Guatemala</td>
<td>1.6%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1.5%</td>
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<tr>
<td>Nicaragua</td>
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<td>El Salvador</td>
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<td>Mexico</td>
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<td>Jamaica</td>
<td>1.0%</td>
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<tr>
<td>Haiti</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**Source:** IMF, INDESA
Panama’s Real GDP Growth 2006-2011

- 2006: 8.5%
- 2007: 12.1%
- 2008: 10.1%
- 2009: 3.2%
- 2010: 7.5%
- 2011E: 10.3%

Source: Contraloría General de la República, INDESA
Foreign investment has also been strong

Foreign Direct Investment: 2006-2010
(millions of US$ and % of GDP)

Source: Contraloría General de la República, INDESA
GOVERNMENT INVESTMENT PROGRAM
(2010-2014)
(in millions)

Source: ACP, MEF