Keynote Presentation

Trends in the Movement of Perishable Products

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Kuehne+Nagel Seafreight
K+N reefer logistics

Marc Rooms
Global Reefer Management
For the Global Cold Chain Alliance
The global perishable reefer market

Seaborne transport

- 2016 total 116 mio ton.
- Total 221 mio for all modes of transport.
- Growth with 4.7 mio ton.
- Estimate to grow annually with +- 3% for the next 5 years.

Source: Drewry Maritime Research, Sextant Consultancy
The global seaborne reefer market
Reefer container versus Reefer break bulk

Advantages of container:

• Door to Door is possible
• Full temperature control
• Last minute COD (Change Of Destination)
• Reduced handling of cargo
• No weather exposure
• Regular supply in smaller quantities

Source: Sextant Consultancy
The global perishable reefer market commodities

- Biggest % growth is in the exotics: pineapple, kiwi, avocado...

- Biggest volume growth is for meat: poultry, beef, pork...

- Growing population and GDP

- Possible shift in regions due to climate, harvest and trade regulations.

Source: Drewry Maritime Research, Sextant Consultancy
The global perishable reefer market regions

Totals to approx 4.1 mio reefer teu.

- Biggest % growth is Middle East/Ind/Pak
- Biggest volume are EUR/USA to ASIA SAM to EUR/USA/ASIA CAM to EUR/USA/ASIA
KN Seafreight Reefer: the cargo

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Cargo Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>Pharma Healthcare</td>
<td>Light Weight&lt;br&gt;High value / claim risk&lt;br&gt;Containers often not fully utilized&lt;br&gt;Dangerous when off power.</td>
</tr>
<tr>
<td>40%</td>
<td>Perishable Cargo: Fruits, Vegetables</td>
<td>Transit time Critical&lt;br&gt;No transshipments!&lt;br&gt;Shelf life is Short&lt;br&gt;Each commodity has its own setting. Seasonal cargo!</td>
</tr>
<tr>
<td>7%</td>
<td>Perishable Cargo: Dairy</td>
<td>Medium transit time&lt;br&gt;Limited shelf life&lt;br&gt;Transshipment possible&lt;br&gt;Medium – Heavy weight</td>
</tr>
<tr>
<td>10%</td>
<td>General foodstuffs And various</td>
<td>Flexible transit time&lt;br&gt;Longer shelf life&lt;br&gt;Transshipment possible&lt;br&gt;Medium – Heavy weight</td>
</tr>
<tr>
<td>40%</td>
<td>Frozen Cargo: Meat, Seafood, Industrial</td>
<td>Heavy weight&lt;br&gt;Year around cargo&lt;br&gt;Off power less critical&lt;br&gt;Less transit time sensitive</td>
</tr>
</tbody>
</table>

- **Frozen Cargo**
  - Meats, Seafood, Industrial
  - Characteristics: Flexible transit time, Longer shelf life, Transshipment possible, Medium – Heavy weight
  - Temperature range: +14°C / +18°C

- **Perishable Cargo**
  - Fruits, Vegetables
  - Characteristics: Transit time Critical, No transshipments!, Shelf life is Short, Each commodity has its own setting, Seasonal cargo!
  - Temperature range: -1°C / +13°C

- **General foodstuffs And various**
  - Characteristics: Medium transit time, Limited shelf life, Transshipment possible, Medium – Heavy weight
  - Temperature range: +14°C / +18°C

- **Pharma Healthcare**
  - Characteristics: Light Weight, High value / claim risk, Containers often not fully utilized, Dangerous when off power.
  - Temperature range: +2°C / +8°C, +15°C / +25°C, Below -25°C

- **Perishable Cargo: Dairy**
  - Characteristics: Medium transit time, Limited shelf life, Transshipment possible, Medium – Heavy weight
  - Temperature range: -1°C / +15°C

- **Seasonal Cargo**
  - Perishable Cargo
  - Characteristics: Transit time Critical, No transshipments!, Shelf life is Short, Each commodity has its own setting, Seasonal cargo!
  - Temperature range: -1°C / +13°C

- **Pharma Healthcare**
  - Characteristics: Light Weight, High value / claim risk, Containers often not fully utilized, Dangerous when off power.
  - Temperature range: +2°C / +8°C, +15°C / +25°C, Below -25°C
The global reefer market

carrier consolidation

Unseen changes during the last 24 months

- Carrier industry suffers from overcapacities for past 6 years
- Only 6 big, global ocean carriers left
- Carriers are organized in 3 alliances (vessel sharing agreements)
- Shift of power from shippers back to the carriers
The global reefer market

Big 15 becomes Big 6

2014  2016  2017  2018

Maersk Line
MSC
Hamburg Süd
CMA CGM
APL
HANJIN
MOL
Kawasaki Kisen Kaisha, Ltd.
China Shipping
OOCL
Cosco
Yang Ming
PIL
ZIM
HMM
WAN HAI
UASC
CSAV
The 3 Alliances

- **2M**
  - MAERSK LINE
  - HAMBURG SÜD
  - MSC
  - HMM

- **Ocean Alliance**
  - CMA CGM
  - APL
  - COSCO SHIPPING
  - OOCL
  - EVERGREEN

- **THE Alliance**
  - Hapag-Lloyd
  - ONE
  - YANG MING
Global Supply and demand in container shipping more balanced ...

Demand (Estimate Kuehne + Nagel)

Supply

ULCS (14,000 - 21,000 teu) with delivery scheduled for January 2018:

<table>
<thead>
<tr>
<th>Name</th>
<th>Teu</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>OOCL INDONESIA*</td>
<td>21,413</td>
<td>OOCL</td>
</tr>
<tr>
<td>CMA CGM ANTOINE DE SAINT EXUPERY*</td>
<td>20,776</td>
<td>CMA CGM</td>
</tr>
<tr>
<td>MARSEILLE MAERSK*</td>
<td>20,568</td>
<td>Maersk</td>
</tr>
<tr>
<td>MANCHESTER MAERSK*</td>
<td>20,568</td>
<td>Maersk</td>
</tr>
<tr>
<td>MOL TREASURE*</td>
<td>20,182</td>
<td>MOL</td>
</tr>
<tr>
<td>COSCO SHIPPING Taurus*</td>
<td>20,119</td>
<td>COSCO</td>
</tr>
<tr>
<td>COSCO SHIPPING Aries*</td>
<td>19,273</td>
<td>COSCO</td>
</tr>
<tr>
<td>MAERSK HANOI</td>
<td>15,282</td>
<td>Maersk</td>
</tr>
<tr>
<td>COSCO SHIPPING ALPS</td>
<td>14,568</td>
<td>COSCO</td>
</tr>
<tr>
<td>MILANO BRIDGE</td>
<td>13,870</td>
<td>K Line</td>
</tr>
</tbody>
</table>

*megamax vessel 24 bays / 23 rows
Global Reefer manufacturing capacity: ~ 300,000 RE TEU p.a
2017 approx. 400,000 RE TEU over 15 years old (critical age)
large amount of Reefers should be put out of service (life cycle > 15 year)
Strong recent orders will keep Reefer demand and supply in balance
The global reefer market
world population 2015-2100

- Consumption growth in one of the major consumption markets – Europe – will stagnate as the population will decrease
- Largest growth projected in Africa
- Population and parallelly consumption will grow significantly in Asia and in particular China
- World population 2050: 9.5 - 10 Billion

The global reefer market
World population 2015-2100

• More people means more food.
• This will be grown in the best yielding areas.
• So it will have to be transported to the corners of the earth.
• So staying focused have to tools and the people ready for this business!
76,000 logistics experts

**SEAFREIGHT**

More than 4.4 million TEUs handled

**AIRFRIGHT**

1.6 million tons handled

**CONTRACT LOGISTICS**

Over 10.6 million m² warehousing & logistics space

**OVERLAND**

18.4 million shipments
KN seafreight reefer logistics

**cool facts**

- Almost 250,000 Export Reefer TEU globally
- Average volume growth of 10 to 15% per annum
- Market leadership globally as a freight forwarder
- 350 dedicated Reefer staff globally
- 55 branches with specialized operations / expertise
- Pharma Chain: 29 attested GXP stations
- Access and good relationship to all leading carriers
- Carrier independent temperature monitoring system; most
- Carrier independent schedule system; sea explorer
„Train people well enough so they can leave, treat them well enough so they don‘t want to“ Richard Branson; Entrepreneur
Thank you!

KN Global reefer team