Dimensions of Ocean-going Cruise Vessels

Study on the Development of Cruise Ship Sizes and Capacities with Focus on the Baltic Sea Region

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Authors
Helge H. Grammerstorf
Tina Büchner
Janika Czere

SeaConsult HAM GmbH
House of Cruises
Bergstedter Chaussee 104
22395 Hamburg
Germany
www.SeaConsult.de

commissioned by

Rostock Port GmbH
Ost-West-Str. 32
18147 Rostock
Germany
www.rostock-port.de

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List of Abbreviations

GT    Gross Tonnage
m     Meter
PAX   Passengers
LB    Lower Berths
1 Executive Summary

The cruise fleet in the Baltic Sea is going to grow continuously. There is a trend to larger ships with higher capacity as well as there are increasingly more ships of sizes up to 1,000 PAX. Both the trends are existing concurrently.

The Baltic-max dimensions are defined by the four access routes into the Baltic Sea.

It is expected that cruise lines will deploy more of its up to 3,000+ PAX accommodating cruise vessels – as well as the smaller sizes – in the Baltic in the near future, but the 5,000+ PAX class will only be seen very rarely.

The smaller cruise vessel newbuilds will show extended dimensions compared with older vessels of similar capacity.

Environmental aspects will require increased attention in the future. Obligations to discharge waste water and solid waste in ports – causing increasing volumes due to more passengers - will require investments by the ports.
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2 Introduction

Cruise vacation enjoys an increase in popularity over more than two decades. The global cruise lines’ association, CLIA, predicts a new record number of more than 27 million cruise holiday-makers, globally. Also, the German source market shows a stable growth resulting in 2.2 million cruise passengers in the year 2017. The Baltic as a seasonal region is benefitting from this development.

The cruise sector in the Baltic Sea region experiences a significant growth. In 2017, approximately 5 million cruise passengers visited Baltic cruise ports. This growth in passenger volume is equivalent to a 16.6 percent increase compared to 2016. A slight growth is recognisable within calls and turnarounds, where the total amount of calls was increased by 15.4 percent and the number of turnarounds was 3.9 percent higher in 2017. (Bond, 2018)

In some ports a disproportion between the increase in passenger numbers and the increase in number of port calls could be observed. This development was caused by an increase in ship sizes and passenger capacities. The building of ever larger cruise ships will continue, based on the figures from last years’ deliveries of newbuilds and the present order book.

For Baltic Sea ports, this expected growth implies a considerable attention on the adjustment of terminal facilities and space as well as on nautical restrictions.

But since about two years also smaller – predominantly more luxurious and in many cases upscale expedition vessels – have been ordered. Interestingly a number of this vessels are being built at Baltic close shipyards in Norway, which have not been on the newbuilding map in previous years. These vessels of smaller sizes are also expected to show up in the Baltic in the near future.

Therefore, this study aims at providing an overview of nautical parameters of the current and deducing a trend in the expected growth of cruise ship sizes in the Baltic sea region.
3 Methodology

In order to collect and analyse the above-named data, a quantitative research approach was necessary. The research process was divided into two phases which were conducted in parallel. Firstly, with the help of the contractor’s database containing data on the global ocean-going cruise fleet and a comprehensive orderbook, cruise ship tonnage operating globally and specifically in the Baltic sea was primarily analysed. Additional data were extracted from classification societies’ websites. Another source used was *Berlitz Cruising & Cruise Ships* (Ward, 2013, 2016, 2018).

Cruise Vessels were classified into the following five size categories:

- ≤500 PAX
- 501 - 1.500 PAX
- 1.501 - 3.000 PAX
- 3.001 - 5.000 PAX
- ≥ 5.001 PAX

Furthermore, four periods of evaluation were set:

- Vessels delivered until 12/2013
- Vessels delivered 01/2014 - 10/2018
- Vessels to be delivered 11/2018-2027 (Orderbook)
- Expected composition of fleet 12/2027

The global fleet as well as the Baltic fleet were analysed under following parameters:

- Number of Vessels
- PAX Capacity based on Lower Berth
- Length of Vessels
- Beam of Vessels
- Draft of Vessels
- Gross Tonnage
- Significant aberrations

During the concurrent second phase, operational and nautical capacities and restrictions in Baltic cruise ports were collected by means of questionnaires. A respective questionnaire was designed and distributed to representatives of Baltic cruise ports. Specifically, the questionnaire asked for four different fields of information:

- Parameters of existing cruise berths
- Plans of future expansion in cruise capacity
- Fairway dimensions/restrictions till berth
- Lists of cruise calls (2013, 2018, 2019)

This empirical analysis enabled to figure out port-specific data and served for underpinning data already collected during the first phase. Findings of the two phases allow comparison with the dimensions of a Baltic-max vessel.
4 Data Analysis

4.1 Analysis of Growth in Cruise Ship Tonnage

In this section “key figures” such as number of vessels, average passenger capacity, average length, average berth, average draft and average tonnage of vessels will be examined. Hereby, the global fleet as well as the Baltic deployed part of the fleet have been analysed.

4.1.1 Global Ocean-going Cruise Vessels

Subsequently, the global ocean fleet has been researched. Therefore, a status quo was set at the end of 2013. Furthermore, vessels which joined the global fleet between 01/2014 and 11/2018 as well as new buildings which are currently under construction and in the orderbook of worldwide ship yards were looked at, separately.

<table>
<thead>
<tr>
<th>Global Fleet - Number of Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Vessels delivered until 12/2013</td>
</tr>
<tr>
<td>Percentage Share</td>
</tr>
<tr>
<td>Vessels delivered 01/2014 - 10/2018</td>
</tr>
<tr>
<td>Percentage Share</td>
</tr>
<tr>
<td>Vessels to be delivered 11/2018 - 12/2027 (Orderbook)*</td>
</tr>
<tr>
<td>Percentage Share</td>
</tr>
<tr>
<td>Expected composition of fleet as of 12/2027*</td>
</tr>
<tr>
<td>Percentage Share</td>
</tr>
</tbody>
</table>

* based on information up to 31 October 2018

Figure 1: Global Fleet – Number of Vessels

a. Vessels delivered until 12/2013
   - Biggest shares within the global fleet are vessels with the size class ≤500 PAX (38%) and 1.501-3.000 PAX (32%)
   - Vessels with more than 5.000 passengers represent a share of only 1%

b. Vessels delivered 01/2014 - 10/2018
   - Vessels which accommodate between 3.001 and 5.000 passenger represent almost half (47%) of the vessels delivered between 01/2014 and 10/2018

c. Vessels to be delivered 11/2018 - 2027 (Orderbook):
   - Biggest stake is represented by vessels of the size class ≤500 PAX (31%) and 3.001-5.000 PAX (31%)

d. Expected composition of fleet 12/2027:
   - More than half of the new buildings (55%) are smaller than 1.500 PAX. This finding is contrary to the general opinion that only big vessels are to be delivered.
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Figure 2: Global Fleet – Average PAX Capacity based on Lower Berth

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
   - No remarkable difference in size class 501-1,500 PAX and ≥ 5,001 PAX
   - Remaining three size classes similarly grew by roughly 35%

b. Comparison: Vessels delivered between 01/2014 - 10/2018 and vessels to be delivered 11/2018 - 2027 (Orderbook)
   - In all size categories a decrease in average capacity can be registered
   - The highest decrease in average capacity (-30%) is identified within the category of vessels with maximum 500 passengers

Figure 3: Global Fleet – Average Length of Vessels

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2018 - 10/2018
   - No variance recorded at vessels with ≥ 5,001 PAX
   - Similar growth in the size classes ≤500 PAX and 501 - 1,500 PAX as well as in the categories 1,501 - 3,000 PAX and 3,001 - 5,000 PAX

b. Comparison: Vessels delivered 01/2018 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - The smallest size class increases by 15%, while the remaining categories decline in the average length up to 8%
Figure 4: Global Fleet – Average Beam of Vessels

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2018 - 10/2018
   - Average Beam of vessels ≥ 5.001 PAX decreased by 13 meters during 01/2014 – 10/2018
   - The remaining size classes deviate minimal

b. Comparison: Vessels delivered 01/2018 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - All size classes display a negative development in average beam while vessels ≤500 PAX shows an increase by almost two meters

Figure 5: Global Fleet – Average Draft of Vessels

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2018 - 10/2018
   - Minor deviations which are not considerable

b. Comparison: Vessels delivered 01/2018 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - Vessels with 501 - 1.500 PAX show the evident decline in average draft by more than one meter.
   - Draft of vessels ≤500 PAX has increased by roughly 0,7 meter
### Dimensions of Ocean-going Cruise Vessels
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**Figure 6: Global Fleet – Average Gross Tonnage**

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
   - Biggest growth in average tonnage in size class 501 - 1.500 PAX (34%)
   - No variance recorded at vessels with ≤500 PAX and ≥ 5.001 PAX

b. Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - A striking development in average tonnage recorded in size class ≤500 PAX (73%) which will almost double from 7.689 GT to 13.315 GT

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**Figure 7: Global Fleet – Significant Aberrations**

Figure 7 illustrates significant aberrations among vessels of the global ocean-going fleet. Hereby, max. length over all (m), max. beam (m) and max. draft/draught (m) are considered.

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### 4.1.2 Cruise Vessels in the Baltic Sea Region

In the following subchapter the focus is set on ocean-going cruise vessels deployed (or planned to be deployed) in the Baltic Sea region. A selection was made regarding the seasons 2013 as well as 2018/19 including vessels which have not yet been delivered, but information about their deployment is available.
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![Green Cruise Port Logo]

**Baltic Fleet - Number of Vessels**

<table>
<thead>
<tr>
<th>Vessels delivered until 12/2013</th>
<th>≤500 PAX</th>
<th>501 - 1,500 PAX</th>
<th>1,501 - 3,000 PAX</th>
<th>3,001 - 5,000 PAX</th>
<th>≥5,001 PAX</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Share</td>
<td>21%</td>
<td>38%</td>
<td>35%</td>
<td>6%</td>
<td>N/A</td>
<td>100%</td>
</tr>
<tr>
<td>Vessels delivered 01/2014 - 10/2018</td>
<td>12%</td>
<td>35%</td>
<td>24%</td>
<td>29%</td>
<td>N/A</td>
<td>100%</td>
</tr>
<tr>
<td>Percentage Share</td>
<td>12%</td>
<td>6%</td>
<td>5%</td>
<td>N/A</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Vessels to be delivered 11/2018 - 12/2027 (Orderbook)*</td>
<td>20%</td>
<td>35%</td>
<td>24%</td>
<td>29%</td>
<td>N/A</td>
<td>100%</td>
</tr>
<tr>
<td>Percentage Share</td>
<td>20%</td>
<td>35%</td>
<td>24%</td>
<td>29%</td>
<td>N/A</td>
<td>100%</td>
</tr>
<tr>
<td>Expected composition of fleet as per 12/2027*</td>
<td>19%</td>
<td>35%</td>
<td>32%</td>
<td>10%</td>
<td>N/A</td>
<td>100%</td>
</tr>
</tbody>
</table>

*a based on latest information as of 31 October 2016

**Figure 8: Baltic Fleet – Number of Vessels**

a. Key finding:
   - Neither in the 2013 season nor in the 2018/19 season vessels with a capacity of ≥5,001 PAX have been deployed in the Baltic Sea
   - Today’s orderbook does not contain any information about intentions by national or international cruise lines planning to deploy vessels of the largest size class in the Baltic region

b. Vessels delivered until 12/2013
   - Almost three quarter of the baltic fleet are midsize vessels with 501 - 1,500 PAX (38%) and 1,501 - 3,000 PAX (35%)

c. Vessels delivered 01/2014 - 10/2018
   - The proportion of vessels 3,001 - 5,000 PAX is significantly higher (29%) than in the existing fleet as per 12/2013
   - The share of vessels among the smallest size class nearly halved (12%) compared to its share in 2013 (21%)

d. Vessels to be delivered 11/2018 - 2027 (Orderbook):
   - Vessels of size class 501 - 1,500 PAX still dominate the orderbook
   - All in all, new buildings for the Baltic will not exceed a capacity of 3,000 PAX (LB)

e. Expected composition of fleet 12/2027:
   - Assuming that cruise lines will deploy vessels with similar capacity, the distribution of the of the different size classes will be similar to the fleet as per the end of 2013

**Baltic Fleet - Average Pax Capacity based on Lower Berth**

<table>
<thead>
<tr>
<th>Vessels delivered until 12/2013</th>
<th>≤500 Pax</th>
<th>501 - 1,500 Pax</th>
<th>1,501 - 3,000 Pax</th>
<th>3,001 - 5,000 Pax</th>
<th>≥5,001 Pax</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels delivered 01/2014 - 10/2018</td>
<td>20%</td>
<td>35%</td>
<td>24%</td>
<td>29%</td>
<td>N/A</td>
<td>100%</td>
</tr>
<tr>
<td>Percentage Deviation</td>
<td>-46%</td>
<td>-3%</td>
<td>23%</td>
<td>19%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vessels to be delivered 11/2018 - 12/2027 (Orderbook)*</td>
<td>17%</td>
<td>70%</td>
<td>2,666</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Percentage Deviation</td>
<td>-3%</td>
<td>-17%</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a based on latest information as of 31 October 2016

**Figure 9: Baltic Fleet – Average PAX Capacity based on Lower Berth**
a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
   - Controversial development: the small size classes decrease in passenger capacity, while vessels of size classes between 1.501 – 5.000 PAX and above record a growth in passenger capacity

b. Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - New buildings which are going to be deployed in the Baltic Sea in general tend to decrease in passenger capacity

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**Figure 10: Baltic Fleet – Average Length of Vessels**

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
   - Only vessels of the smallest size class reduce their length (-20m), while in the remaining categories an increase between 17m and 28m is shown

b. Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   - Similar development as before, but in smaller steps

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**Figure 11: Baltic Fleet – Average Beam of Vessels**

a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
   - The biggest increase in beam is recorded among vessels of the size class 1.501 - 3.000 PAX
- Exclusively vessels ≤500 PAX registered a decrease in beam
  - Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
  - Controversial development: vessels of the smallest size class will have a higher beam while vessels 501 - 1.500 PAX will be trimmed in beam by 3m

<table>
<thead>
<tr>
<th>Baltic Fleet - Average Draft of Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤500 PAX</td>
</tr>
<tr>
<td>Vessels delivered until 12/2013</td>
</tr>
<tr>
<td>Vessels delivered 01/2014 - 10/2018</td>
</tr>
<tr>
<td>Difference (m)</td>
</tr>
<tr>
<td>Percentage Deviation</td>
</tr>
<tr>
<td>Vessels to be delivered 11/2018-2027 (Orderbook)*</td>
</tr>
<tr>
<td>Difference (m)</td>
</tr>
<tr>
<td>Percentage Deviation</td>
</tr>
</tbody>
</table>

*Based on level of information as per 31 October 2018

**Figure 12: Baltic Fleet – Average Draft of Vessels**

  a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
     - A significant reduction of draft by 1,2m in the smallest size class
     - Development in the remaining categories varies by ±0,2m
  b. Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
     - No change in draft for new buildings smaller than 500 passengers
     - Reduction of draft by around 1,3m in the size class 501 - 1.500 PAX

<table>
<thead>
<tr>
<th>Baltic Fleet - Average Gross Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤500 PAX</td>
</tr>
<tr>
<td>Vessels delivered until 12/2013</td>
</tr>
<tr>
<td>Vessels delivered 01/2014 - 10/2018</td>
</tr>
<tr>
<td>Difference (GT)</td>
</tr>
<tr>
<td>Percentage Deviation</td>
</tr>
<tr>
<td>Vessels to be delivered 11/2018-12/2027 (Orderbook)*</td>
</tr>
<tr>
<td>Difference (GT)</td>
</tr>
<tr>
<td>Percentage Deviation</td>
</tr>
</tbody>
</table>

*Based on level of information as per 31 October 2018

**Figure 13: Baltic Fleet – Average Gross Tonnage**

  a. Comparison: Vessels delivered until 12/2013 and vessels delivered 01/2014 - 10/2018
     - Obvious development in gross tonnage
      - Vessels ≤500 PAX that joined the Baltic fleet between 01/2014 and 10/2018 had a smaller tonnage (-5.535 GT)
      - The remaining size classes have grown by round 25% in average
b. Comparison: Vessels delivered 01/2014 - 10/2018 and vessels to be delivered 11/2018-2027 (Orderbook)
   ▪ Vessels of all three size classes will be reduced in their tonnage
   ▪ The highest reduction can be found at vessels 501 - 1.500 PAX (9.300 GT)

<table>
<thead>
<tr>
<th>Baltic Fleet - Significant Aberrations</th>
<th>Max. Length over all (m)</th>
<th>Max. Beam/Breast (m)</th>
<th>Max. Draft/ Draught (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤500 PAX</td>
<td>Europa</td>
<td>198,52</td>
<td>26,90</td>
</tr>
<tr>
<td>501 - 1.500 PAX</td>
<td>Spirit of Discovery</td>
<td>236,00</td>
<td>32,30</td>
</tr>
<tr>
<td>1.501 - 3.000 PAX</td>
<td>Queen Mary 2</td>
<td>345,03</td>
<td>42,30</td>
</tr>
<tr>
<td>3.001 - 5.000 PAX</td>
<td>Independence of the Seas</td>
<td>338,72</td>
<td>47,40</td>
</tr>
<tr>
<td>≥ 5.001 PAX</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 14: Baltic Fleet – Significant Aberrations

Figure 14 illustrates significant aberrations among vessels of the Baltic fleet. Hereby, max. length over all (m), max. beam/breast (m) and max. draft/draught (m) are considered.

4.1.3 Comparison – Global vs. Baltic Fleet
a. Number of Vessels – Global vs. Baltic Fleet
   ▪ 2013 fleet: Both, in the global fleet and in the Baltic fleet, vessels with a capacity up to 3.000 PAX represent more than 90%
   ▪ 2018/19 season: 80% of the global cruise fleet represent vessels with a capacity of 501 – 5.000 PAX. Similar distribution regarding vessels cruising the Baltic Sea (88%)
   ▪ Vessels to be delivered 11/2018-2027 (Orderbook): 61% of the global orderbook are sized up to 3.000 PAX. Regarding vessels to be delivered for the Baltic, 100% of the vessels range between the size classes ≤500 PAX and 1.501 - 3.000 PAX

b. Average PAX Capacity (LB) - Global vs. Baltic Fleet
   ▪ In all size classes and during all observation periods the capacity of vessels deployed and ordered in the Baltic Sea region is below the capacity of the global fleet
   ▪ Just a single value is in contrast to the general consistency. In the fleet comprising vessels delivered until 12/2013, the global capacity of vessels ≤500 PAX (195) is significantly smaller than the capacity of the Baltic fleet (335 PAX).

c. Average Length of Vessels - Global vs. Baltic Fleet
d. Average Beam of Vessels - Global vs. Baltic Fleet
e. Average Draft of Vessels - Global vs. Baltic Fleet
f. Average Gross Tonnage - Global vs. Baltic Fleet
4.2 Examination of Operational and Nautical Restrictions

<table>
<thead>
<tr>
<th>Port</th>
<th>Country</th>
<th>Length (m)</th>
<th>Breadth (m)</th>
<th>Draft (m)</th>
<th>Airstaff (m)</th>
<th>Limiting Structures</th>
<th>Pilot Compulsory</th>
<th>Restrictions/Special Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aalborg</td>
<td>Denmark</td>
<td>9,899.20</td>
<td>240.76</td>
<td>14.00</td>
<td>N/A</td>
<td>None</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Aarhus*</td>
<td>Denmark</td>
<td>1,000.00</td>
<td>300.00</td>
<td>10.80</td>
<td>N/A</td>
<td>No restrictions</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Alicante</td>
<td>Spain</td>
<td>1,000.00</td>
<td>300.00</td>
<td>10.80</td>
<td>N/A</td>
<td>No restrictions</td>
<td>No</td>
<td>None</td>
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<tr>
<td>Amsterdam</td>
<td>Netherlands</td>
<td>1,000.00</td>
<td>300.00</td>
<td>10.80</td>
<td>N/A</td>
<td>No restrictions</td>
<td>No</td>
<td>None</td>
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<tr>
<td>Antwerp</td>
<td>Belgium</td>
<td>1,000.00</td>
<td>300.00</td>
<td>10.80</td>
<td>N/A</td>
<td>No restrictions</td>
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<td>None</td>
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<td>14.00</td>
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<td>None</td>
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<td>240.76</td>
<td>14.00</td>
<td>N/A</td>
<td>None</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Amsterdam</td>
<td>Netherlands</td>
<td>1,000.00</td>
<td>300.00</td>
<td>10.80</td>
<td>N/A</td>
<td>No restrictions</td>
<td>No</td>
<td>None</td>
</tr>
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* Cruise Baltic Member

Figure 15: Fairway till Berth

- Access to Baltic Sea ports in most of the locations is easy and fast. Only two ports report 1,000+ meters.
- Limitations are reported in view of maximum draft and – rarely – maximum beam.
- Base on the ports’ responses, ten out of 35 ports require mandatory use of pilots.
Nine out of 35 ports are planning modifications of its cruise related port facilities between 2019 to 2028.

A number of ports will have to expand its reception facilities (waste, waste water, etc.) but have not reported that.
4.3 Baltic-max Cruise Ship

The Baltic is a continental sea with relatively small access on its western end. The access to the Baltic Sea is provided by

- the Great Belt, Denmark
- the Little Belt, Denmark
- the Öresund, separating Sweden from Denmark and
- the Kiel Canal, shortcut from North Sea to Baltic, crossing the State of Schleswig-Holstein in Northern Germany.

Due to the limited water exchange with the global ocean system and its limited depths the Baltic Sea is ecologically sensitive. So, cruise ships in the Baltic are not only obliged to limited dimensions, but also have to comply with strict environment regulations; IMO and Helcom being only two of those.

Draft and air-draft are the most critical constrains when entering the Baltic Sea. Whilst the Great Belt allows for a maximum of 15,4 meters draft and 65 meters air-draft (due to clearance regulations of the eastern part of Great Belt bridge) (Wikipedia, 2018).

The Little Belt allows for max. 11,8 meter and an air-draft of max. 33 meter (Jahn, 2018).

The Öresund is restricted to a draft of 7,1 to 7,7 meters (Wasserstraßen- und Schifffahrtsamt Kiel-Holtenau, 2018).

The Kiel Canal is navigable for ships up to 7,0 to 9,5 meters draft and an air-draft of max. 40 meters.

Consequentially, the BALTIMAX vessel as the vessel with the maximum dimensions must not exceed

- 400 meters in length
- 68 meters beam
- 15,4 meters draft
- 65 meters air-draft

Cruise vessels typically have less draft than cargo ships of similar tonnage. Hence, mega cruise vessels as expected for the upcoming years likely will not exceed the restrictions as above.
5 Conclusion

There is no evidence for a clear and exclusive trend towards mega ships. What can be observed is a split trend to bigger ships with larger PAX capacities and a rather young trend towards ships with a PAX capacity of less than 1,000 PAX. Nearly half of the newbuilds on order are of that size. However, this examination shows, that smaller vessels with <500 PAX tend to have larger dimensions when inaugurated recently or on order than those being in service for longer. This can be seen as an indicator for a higher, more luxurious standard, which provides more comfort for passengers.

As explained earlier in this study, maximum dimensions for a Baltic-max vessel are defined by geographical or hydrographical limitations due to the special access situation of the Baltic Sea. Vessels listed in the current orderbooks and to be delivered until 2027 of size class 501 - 1,500 PAX still dominate the listings.

Neither in 2013 nor in the 2018/19 vessels with a capacity of ≥ 5,001 PAX have been deployed in the Baltic Sea. All in all, new buildings for the Baltic until 2027 are not expected to exceed a capacity of 3,000 PAX (LB) and will cope with the Baltic-max limitations.

Also, the current announcements of cruise lines do not suggest intentions by national or international cruise lines planning to deploy vessels of the largest size class in the Baltic Sea region in the near future. Admittedly, some small ports will not be capable to cope with the existing largest cruise ships due to lack of space and handling capacities. Other ports at the Baltic Sea have announced plans to extend berthing facilities.

This includes investments into environment protection facilities, such as waste water and waste reception facilities in particular. A specific of the Baltic Sea are the regulations from the HELCOM regime, which makes it mandatory for passenger ships to dispose all waste water ashore from 2019 for new ships and from 2021 for all ships – except the ship is equipped with an advanced waste water treatment pant of the newest generation.

The findings of the study suggest that the Baltic cruise ship fleet will continue to grow and passenger numbers will increase as a result of that growths. But on the long run, the growth is expected to result from an increased number of vessels of the 1,500 to 3,000+ PAX category rather than larger vessels of >5,000 PAX.
6 References


7 Acknowledgements

The authors wish to express sincere thanks to the Baltic sea ports for the spontaneous support and cooperativeness during the elaboration of this study.