



CONTAINER THROUGHPUT & TERMINAL CAPACITY in North Europe II

April 2015
Including April-August 2015 news updates



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Contents

CONTENTS	4
Index of tables	10
List of Pictures	12
PREFACE	13
CONTAINER VOLUMES AND TERMINAL CAPACITY IN NORTH EUROPE II	13
KEY TO TABLES AND OVERVIEWS	18
PORTS AND TERMINALS SELECTION	18
Notes on Terminal Capacity.....	19
Notes on Container Volume Forecasts	19
PostPanamax STS gantry cranes - outreach definitions	20
Other STS gantry crane-related definitions	21
Ports served	21
EXECUTIVE SUMMARY	23
CURRENT AND PROJECTED NORTH EUROPE CONTAINER TERMINAL CAPACITY	23
Terminals in ports handling Far East and North America services	23
EQUIPMENT	24
Terminals in other ports NOT handling Far East and North America services	25
THROUGHPUT (ALL TEU)	26
CAPACITY	28
Throughput versus 100% capacity.....	29
Throughput versus 75% capacity.....	30
CARRYINGS (FULL TEU)	31
North Europe - Far East trade.....	31
Transatlantic trade.....	32
CONCLUSIONS	33
Important note	33
THE BIG SHIPS FILES	34
The ULCS phenomenon and its impact on ports	34
Occupancies of terminals in North Europe handling ULCS.....	35
Carriers operating ULCS.....	37
Carriers' NP and NPP distribution.....	37
ULCS by size categories.....	38
ULCS in the North Europe-Far East trade	38
BALTIC/SCANDINAVIA	40
RUSSIA	41
ST PETERSBURG	41
Container Terminal Saint-Petersburg (CTSP).....	42
First Container Terminal (FCT)	43
Moby Dik Container Terminal.....	43
Petrolesport (PLP).....	43
Severstal Neva-Metal Terminal	44
Rusmarine Terminal.....	44
Sea Fishing Port of Saint-Petersburg (SFP)	44
Projects St Petersburg	45
MMPK Bronka Terminal.....	45
UST LUGA	46
Ust-Luga Container Terminal (ULCT)	47
KALININGRAD	47

Baltiysk Container Terminal.....	48
KCSP Container Terminal	48
Kaliningrad projects	49
LITHUANIA	50
KLAIPEDA	50
Klaipedos Smelte Terminal	50
Klaipeda Container Terminal (KCT).....	51
Projects Klaipeda	51
POLAND	52
GDANSK - FE.....	52
Deepwater Container Terminal Gdansk (DCT Gdansk).....	53
Gdansk Container Terminal (GTK)	53
Gdansk Projects	54
Deepwater Container Terminal 2 Gdansk (DCT2 Gdansk).....	54
GDYNIA	55
Baltic Container Terminal Gdynia (BCT).....	56
Gdynia Container Terminal (GCT).....	56
SWEDEN	57
GOTHENBURG - FE/TA	57
APM Terminals Gothenburg	58
DENMARK	59
AARHUS - FE.....	59
Container Terminal Aarhus.....	59
Project Denmark.....	60
UK/EIRE.....	61
UNITED KINGDOM	61
FELIXSTOWE - FE/TA	62
Trinity Terminal.....	63
Berths 8&9 Terminal.....	64
Felixstowe projects.....	65
Harwich International Port Container Terminal	65
THAMESPORT	65
London Thamesport.....	66
LONDON - TA	67
London Container Terminal (LCT) (Tilbury).....	68
London Gateway.....	70
SOUTHAMPTON - FE/TA	71
DP World Southampton.....	71
Southampton project.....	72
LIVERPOOL - TA.....	73
Royal Seaforth Container Terminal.....	74
Liverpool Project.....	74
Liverpool2 Container Terminal	75
PROJECTS UK	75
TEESPORT.....	75
Teesport Container Terminal 1 (TCT1).....	76
Teesport Container Terminal 2 (TCT2).....	76
Teesport Project	76
Northern Gateway Container Terminal (NGCT).....	76
BRISTOL.....	77
Existing Bristol terminals	78
Avonmouth Container Terminal	78
Portbury Container Terminal.....	78
Bristol Project	79

Avonmouth Deep Sea Container Terminal	79
NORTH WEST EUROPE	80
GERMANY	80
HAMBURG - FE/TA	81
EUROGATE Container Terminal Hamburg (CTH).....	83
HHLA Container Terminal Altenwerder (CTA)	83
HHLA Container Terminal Burchardkai (CTB)	84
HHLA Container Terminal Tollerort (CTT)	84
Buss Hansa Terminal.....	84
HHLA Frucht- und Kühl-Zentrum	85
Unikai	85
Projects Hamburg	85
Container Terminal Moorburg (CTM)	86
BREMERHAVEN - FE/TA	86
EUROGATE Container Terminal Bremerhaven (CTB).....	88
MSC Gate	88
North Sea Terminal Bremerhaven (NTB)	88
Projects Bremerhaven	89
WILHELMSHAVEN (JADEWESERPORT) - FE.....	89
EUROGATE Container Terminal Wilhelmshaven (CTW).....	91
THE NETHERLANDS	93
AMSTERDAM	93
Holland Container Terminal (HCT).....	94
Amsterdam Multipurpose Terminal USA.....	95
ROTTERDAM - FE/TA.....	96
Existing Rotterdam terminals	98
APM Terminals Rotterdam 1 (APMTR1)	98
Delta MSC Terminal (DMT)	99
ECT Delta Terminal	99
ECT Delta Barge Feeder Terminal (DBFT).....	100
EuroMax Terminal Rotterdam (EuroMax)	100
ECT City Terminal (ECT).....	100
SCA Logistics Terminal Rotterdam (SLT)	101
Delta Container Services (DCS)	101
Rotterdam Container Terminal (RCT)	102
Rotterdam Shortsea Terminals (RST).....	102
Uniport Multipurpose Terminals (UMT)	102
Waalhaven Terminal (WT)	102
Waalhaven Botlek Terminal (WBT).....	103
Rotterdam Projects.....	103
APM Terminal Rotterdam II (APMT MVII)	104
APM Terminal Rotterdam II (APMT MVII) - Expansion	105
Rotterdam World Gateway (RWG)	105
Rotterdam World Gateway (RWG) - Expansion.....	106
Euromax Terminal II.....	106
Maasvlakte II - Phase II	107
FLUSHING (Vlissingen)	108
Existing Flushing terminals	109
Projects Flushing.....	109
Westerscheldt Container Terminal (WCT)	109
BELGIUM	110
ANTWERP - FE/TA	110
Existing left bank Antwerp terminals tidal Deurganckdok	112
Antwerp Gateway	112
PSA Antwerp Deurganck Terminal, Antwerp International Terminal.....	113

Existing left bank Antwerp terminals non-tidal Verrebroekdok (behind locks)	113
Katoen Natie	113
Existing right bank Antwerp terminals, Scheldt-right bank, outside the locks.....	114
PSA Antwerp Europa Terminal	114
PSA Antwerp Noordzee Terminal	114
Existing right bank Antwerp Scheldt-right bank terminals (behind locks)	115
Churchill Terminal (multipurpose).....	115
Independent Maritime Terminal (IMT).....	115
MSC PSA European Terminal (MPET) Delwaidedok.....	115
Projects Antwerp	116
Antwerp Euroterminal (AET).....	116
MSC PSA European Terminal (MPET) Deurganckdok	116
Saeftinghedok.....	117
ZEEBRUGGE - FE.....	117
Existing Zeebrugge terminals.....	119
APM Terminals Zeebrugge (ATZ)	119
Container Handling Zeebrugge (CHZ)	119
Zeebrugge International Port (ZIP)	120
Zeebrugge Projects	120
FRANCE (ATLANTIC).....	121
DUNKIRK - FE/TA.....	121
Terminal des Flandres.....	122
LE HAVRE - FE/TA	123
Existing Le Havre terminals.....	125
- Port 2000.....	125
Terminal de France	126
Terminal Porte Océane	126
Terminaux de Normandie MSC (TN MSC).....	126
- Nord Terminals.....	127
Quai de l'Atlantique.....	127
Quai des Amériques.....	127
Quai de l'Europe (closed for deepsea container vessels)	128
Terminal de Normandie (closed)	128
Terminal de l'Océan (closed)	128
Projects Le Havre	128
Port 2000 last 2 berths	128
SOUTH WEST EUROPE	129
PORTUGAL	129
LISBON - TA	130
Terminal de Contentores de Alcântara Sul.....	130
Santa Apolónia Container Terminal	131
Lisbon projects.....	131
New Container Terminal Lisbon (intended).....	132
SINES - FE/TA	132
PSA Sines Terminais de Contentores XXI	133
Sines projects.....	133
CONTAINER SHIPPING SERVICES	135
NORTH EUROPE - FAR EAST	135
Details of the 21 individual services	135
Eastbound to Europe-only service (for information only).....	139
Ports of call analysis.....	139
Slow Steaming	140
TRANSATLANTIC.....	141

TRANSATLANTIC SERVICES	141
Details of the 16 individual services	141
SAINT LAWRENCE GATEWAY SERVICES.....	144
MEDITERRANEAN - NORTH AMERICA SERVICES calling Portuguese ports	144
Ports of call analysis.....	145
CARRYINGS	147
5-YEAR NORTH EUROPE-FAR EAST FULL CONTAINER VOLUMES	147
Total TEU (Westbound & Eastbound), including shares per country and per area	147
Westbound TEU (to North Europe), including shares per country and per area	149
Eastbound TEU (to the Far East), including shares per country and per area.....	150
5-YEAR TRANSATLANTIC (NORTH EUROPE-USA AND V.V.) FULL CONTAINER VOLUMES	151
Total TEU (Eastbound & Westbound), including shares per country and per area	151
Eastbound TEU (to North Europe), including shares per country and per area.....	152
Westbound TEU (to the USA), including shares per country and per area	153
PORT THROUGHPUT	154
THROUGHPUTS OF NORTH EUROPEAN PORTS HANDLING FAR EAST AND/OR TRANSATLANTIC SERVICES	154
THROUGHPUTS OF ALL NORTH EUROPEAN PORTS	155
TRANSHIPMENT, FEEDERING, MODAL SPLIT.....	160
NEW NORTH EUROPE CONTAINER TERMINAL PROJECTS	161
INTERNATIONAL AND GLOBAL TERMINAL OPERATORS	162
APM Terminals.....	162
China Shipping Development	162
CMA Terminals	162
Cosco Pacific	162
DP World (including through PortSynergy)	163
Eurogate	163
Hutchison Port Holdings (HPH).....	163
International Container Terminal Services Inc (ICTSI)	164
PSA International	164
Terminal Link	164
TIL Group	164
ECONOMIC GROWTH.....	165
NEWS UPDATES.....	167
ST PETERSBURG	167
MMPK Bronka Terminal.....	167
KLAIPEDA	167
Klaipedos Smelte Terminal	167
GDYNIA	167
Baltic Container Terminal Gdynia (BCT).....	167
Gdynia Container Terminal (GCT).....	167
GDANSK	167
Deepwater Container Terminal Gdansk (DCT Gdansk).....	167
Deepwater Container Terminal 2 Gdansk (DCT2 Gdansk).....	168
LONDON.....	168
London Gateway.....	168
BRISTOL.....	168
Avonmouth Deep Sea Container Terminal (project)	168
BREMERHAVEN, HAMBURG	168
Dredging of the Rivers Weser and Elbe	168

HAMBURG.....	168
HHLA Container Terminal Burchardkai (CTB)	168
HHLA Container Terminal Tollerort (CTT)	168
AMSTERDAM	168
Holland Container Terminal (HCT)	169
ROTTERDAM	169
ECT Delta Terminal	169
ECT City Terminal (ECT).....	169
APM Terminal Rotterdam II (APMT MVII)	169
Rotterdam World Gateway (RWG)	169
ANTWERP.....	170
PSA Antwerp Noordzee Terminal	170
MSC PSA European Terminal (MPET) Deurganckdok	170
Saeftinghedok.....	170
ZEEBRUGGE	170
Zeebrugge International Port (ZIP)	170
SETUBAL.....	170
SOURCES	171



Index of tables

<i>Cellular container ships by breadth and boxes-wide - Table 1</i>	20
<i>Ports in this publication served by Far East and Transatlantic services - Table 2</i>	21
<i>Ports in this publication NOT served by Far East and Transatlantic services - Table 3</i>	21
<i>Existing 2014 North Europe Container Terminal capacity - Table 4</i>	23
<i>Planned additional and new 2015/2024 North Europe Container Terminal capacity - Table 5</i>	23
<i>2024 North Europe Container Terminal capacity - existing and new combined - Table 6</i>	24
<i>North Europe Container Terminal capacity - market share developments per area - Table 7</i>	24
<i>Terminal parameters and quay crane categories (as of end 2014) - Table 8</i>	24
<i>Quay crane density (as of end 2014) - Table 9</i>	24
<i>Existing 2014 North Europe Container Terminal capacity in other ports - Table 10</i>	25
<i>Planned new 2015/2024 North Europe Container Terminal capacity in other ports - Table 11</i>	25
<i>2024 Container Terminal capacity other ports - existing and new combined - Table 12</i>	25
<i>Terminal parameters and quay crane categories - Table 13</i>	25
<i>North Europe container port throughput 2005/2014 - Table 14</i>	26
<i>North Europe container port throughput 2015/2024 - Table 15</i>	26
<i>North Europe container throughput: 2x 10-year CAGR compared - Table 16</i>	27
<i>North Europe container terminal capacity development 2015/2024 - Table 17</i>	28
<i>Box throughput versus 100% container terminal capacity 2015/2024 - Table 18</i>	29
<i>Box throughput versus 75% container terminal capacity 2015/2024 - Table 19</i>	30
<i>North Europe-Far East trade, totals per European area - Table 20</i>	31
<i>North Europe-Far East trade, overall, by trade direction - Table 21</i>	31
<i>Transatlantic trade, total per European area - Table 22</i>	32
<i>Transatlantic trade, overall, by trade direction - Table 23</i>	32
<i>Throughput and Capacity forecast 2015-2024 CAGR - Table 24</i>	33
<i>North European ports (and areas) capable of handling 22-wide and 23+wide ULCS - Table 25</i>	35
<i>Occupancy of terminals handling North Europe-Far East services - Table 26</i>	36
<i>Carriers operating ULCS or having such ships on order - Table 27</i>	37
<i>Carriers with ULCS split for maximum NewPanamax and for NewPostPanamax - Table 28</i>	38
<i>ULCS per size category split for operating and on order - Table 29</i>	38
<i>ULCS per size category currently operating the North Europe-Far East trade - Table 30</i>	39
<i>St. Petersburg - historical throughput (TEU*1,000) 2005-2014 - Table 31</i>	41
<i>St. Petersburg - overview of existing terminals and projects, salient details - Table 32</i>	42
<i>Ust-Luga - historical throughput (TEU*1,000) 2005-2014 - Table 33</i>	46
<i>Ust-Luga - overview of existing terminals and projects, salient details - Table 34</i>	47
<i>Kaliningrad - historical throughput (TEU*1,000) 2005-2014 - Table 35</i>	47
<i>Kaliningrad - overview of existing terminals and projects, salient details - Table 36</i>	48
<i>Klaipeda - historical throughput (TEU*1,000) 2005-2014 - Table 37</i>	50
<i>Klaipeda - overview of existing terminals and projects, salient details - Table 38</i>	50
<i>Poland - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 39</i>	52
<i>Gdansk - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 40</i>	52
<i>Gdansk - overview of existing terminals and projects, salient details - Table 41</i>	53
<i>Gdansk - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 42</i>	55
<i>Gdynia - overview of existing terminals and projects, salient details - Table 43</i>	56
<i>Gdansk - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 44</i>	57
<i>Gothenburg - overview of existing terminals and projects, salient details - Table 45</i>	58
<i>Gothenburg - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 46</i>	58
<i>Aarhus - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 47</i>	59
<i>Aarhus - overview of existing terminals and projects, salient details - Table 48</i>	59
<i>Aarhus - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 49</i>	60
<i>UK - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 50</i>	62
<i>Felixstowe - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 51</i>	62
<i>Felixstowe - overview of existing terminals and projects, salient details - Table 52</i>	63
<i>Felixstowe - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 53</i>	65
<i>Thamesport - historical throughput (TEU*1,000) 2005-2014 - Table 54</i>	65
<i>Thamesport - overview of existing terminals and projects, salient details - Table 55</i>	66

<i>London - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 56</i>	67
<i>London - overview of existing terminals and projects, salient details - Table 57</i>	68
<i>Services lost by London Container Terminal to London Gateway - Table 58</i>	69
<i>London Gateway handled container services as of 1 January 2015 - Table 59</i>	70
<i>London - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 60</i>	70
<i>Southampton - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 61</i>	71
<i>Southampton - overview of existing terminals and projects, salient details - Table 62</i>	71
<i>Southampton - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 63</i> ...	72
<i>Liverpool - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 64</i>	73
<i>Liverpool - overview of existing terminals and projects, salient details - Table 65</i>	73
<i>Liverpool - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 66</i>	75
<i>Teesport - historical throughput (TEU*1,000) 2005-2014 - Table 67</i>	75
<i>Teesport-Hartlepool - overview of existing terminals and projects, salient details - Table 68</i>	76
<i>Bristol - historical throughput (TEU*1,000) 2005-2014 - Table 69</i>	77
<i>Bristol - overview of existing terminals and projects, salient details - Table 70</i>	78
<i>Germany - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 71</i>	80
<i>Hamburg - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 72</i>	81
<i>Hamburg - overview of existing terminals and projects, salient details - Table 73</i>	83
<i>Hamburg - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 74</i>	86
<i>Bremerhaven - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 75</i>	86
<i>Bremerhaven - overview of existing terminals and projects, salient details - Table 76</i>	88
<i>Bremerhaven - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 77</i> ...	89
<i>Wilhelmshaven (JadeWeserPort) - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 78</i>	89
<i>Wilhelmshaven (JadeWeserPort) - overview of existing terminals and projects, salient details - Table 79</i>	91
<i>Wilhelmshaven - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 80</i>	92
<i>Netherlands - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 81</i>	93
<i>Amsterdam - historical throughput (TEU*1,000) 2005-2014 - Table 82</i>	93
<i>Amsterdam - overview of existing terminals and projects, salient details - Table 83</i>	94
<i>Rotterdam - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 84</i>	96
<i>Rotterdam - overview of existing terminals and projects, salient details - Table 85</i>	98
<i>Rotterdam - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 86</i>	108
<i>Flushing - historical throughput (TEU*1,000) 2005-2014 - Table 87</i>	108
<i>Flushing - overview of existing terminals and projects, salient details - Table 88</i>	109
<i>Belgium - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 89</i>	110
<i>Antwerp - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 90</i>	110
<i>Antwerp - overview of existing terminals and projects, salient details - Table 91</i>	112
<i>Antwerp - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 92</i>	117
<i>Zeebrugge - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 93</i>	117
<i>Zeebrugge - overview of existing terminals and projects, salient details - Table 94</i>	118
<i>Zeebrugge - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 95</i>	120
<i>France - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 96</i>	121
<i>Dunkirk - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 97</i>	121
<i>Dunkirk - overview of existing terminals and projects, salient details - Table 98</i>	122
<i>Dunkirk - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 99</i>	123
<i>Le Havre - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 100</i>	123
<i>Le Havre - overview of existing terminals and projects, salient details - Table 101</i>	124
<i>Le Havre - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 102</i>	128
<i>Portugal - Overall capacity, throughput (TEU*1,000) and occupancy forecast 2015-2024 - Table 103</i>	129
<i>Lisbon - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 104</i>	130
<i>Lisbon - overview of existing terminals and projects, salient details - Table 105</i>	130
<i>Lisbon - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 106</i>	132
<i>Sines - historical and forecast throughput (TEU*1,000) 2005-2024 - Table 107</i>	132
<i>Lisbon - overview of existing terminals and projects, salient details - Table 108</i>	133
<i>Sines - existing and projected capacity, throughput (TEU*1,000) and occupancy forecast - Table 109</i>	134
<i>North Europe ports of call analysis of (21) North Europe-Far East links - Table 110</i>	140
<i>North Europe ports per Far East service (all) - Table 111</i>	140
<i>Ships per North Europe-Far East loop - Table 112</i>	140

<i>North Europe ports of call analysis of (18) Transatlantic links - Table 113</i>	146
<i>North Europe ports per Transatlantic service - Table 114</i>	146
<i>Ships per Transatlantic loop - Table 115</i>	146
<i>Transshipment ports, transshipment shares and feeder volumes - Table 116</i>	160
<i>Gateway ports, transshipment shares and inland modal split - Table 117</i>	160
<i>Overview of all new North European terminal projects - Table 118</i>	161
<i>GDP percentage-wise growth 2005/2014 and 2014 population - Table 119</i>	165
<i>GDP percentage-wise growth 2015/2019 - Table 120</i>	166

List of Pictures

<i>Hamburg, Waltershof area container terminals - Picture 1</i>	22
<i>Six of the 11 remote-controlled, 24-boxes wide StS gantries of RWG, Rotterdam - Picture 2</i>	27
<i>MSC Oscar - with 19,224 nominal TEU currently the largest operating container ship - Picture 3</i>	39
<i>St Petersburg - River Neva afternoon - Picture 4</i>	45
<i>Port of Ust Luga - Picture 5</i>	46
<i>KCSP Terminal, Kaliningrad - Picture 6</i>	49
<i>Klaipėdos Smeltė Terminal - Picture 7</i>	51
<i>DCT Gdansk (to the right) and projected DCT Gdansk2 (left) - Picture 8</i>	54
<i>Port of Gdynia - Picture 9</i>	55
<i>Gothenburg - APM Terminals - Picture 10</i>	58
<i>Container Terminal Aarhus - Picture 11</i>	60
<i>Felixstowe - Berths 8&9 Terminal - Picture 12</i>	64
<i>London Container Terminal versus London Gateway - Picture 13</i>	69
<i>Southampton's new berth during its foggy inauguration - Picture 14</i>	72
<i>The brave Liverpool2 plan - Picture 15</i>	74
<i>Teesport's Northern Gateway Container Terminal design - will it be realised? - Picture 16</i>	77
<i>Avonmouth Deep Sea Container Terminal design - Picture 17</i>	78
<i>Hamburg's biggest carrier's largest ship sailing the port's both lifeline and bottleneck - Picture 18</i>	82
<i>A busy part of 5-kilometre container quay length Bremerhaven - Picture 19</i>	87
<i>EUROGATE Container Terminal Wilhelmshaven - still looking so new - Picture 20</i>	90
<i>Amsterdam to revive as a box port with an additional, new and larger IJmuiden lock? - Picture 21</i>	95
<i>Delta terminals and Euromax (on the top left), Rotterdam's Maasvlakte 1 facilities - Picture 22</i>	97
<i>A bird's eye view of Maasvlakte 2 with RWG and APMT MVII in the foreground - Picture 23</i>	103
<i>APM Terminals, Maasvlakte 2 - Picture 24</i>	104
<i>Rotterdam World Gateway, Maasvlakte 2 - Picture 25</i>	106
<i>Westerscheldt Container Terminal to be - Picture 26</i>	109
<i>Deurganckdok, soon to be square full on both sides - Picture 27</i>	114
<i>Zeebrugge seen from the North Sea with the three box facilities to the right - Picture 28</i>	119
<i>Terminal des Flandres, Dunkirk - Picture 29</i>	123
<i>Port 2000 at full length - Picture 30</i>	125
<i>Terminal de Contentores de Alcântara Sul - Picture 31</i>	131
<i>PSA Sines Terminais de Contentores XXI or just Sines Container Terminal - Picture 32</i>	134

PREFACE

Container Volumes and Terminal Capacity in North Europe II

... is Dynamar's latest publication on the volume of the main container trades connecting with North Europe and on the status of existing and planned container terminal capacity there.

The report provides historic (2005-2014) throughput in all North European ports across four main regions that are the subject of calls by container services with the Far East and North America, as well as a 10-year (2015-2024) forecast, per port and per region.

This is compared with the current container terminal capacity in the same ports and regions, and all planned and intended expansions of existing facilities and entirely new projects in those ports, including potential alternative or complementary outlets.

In this way, indicative answers are formulated to questions such as:

- How is container volume, demand, forecast to grow over the next 10 years?
- How is box handling supply expected to develop in the same period?
- Where could space become tight; where will it remain ample?
- And additionally: which ports/terminals are capable of handling ships of 18,000+ TEU?

Main container trades, ports and terminals

North Europe-Far East and Transatlantic are the two major trades connecting with North Europe. The services of the eighteen carriers operating in these two trades are calling at total seventeen ports in the Gothenburg-Sines range (including the UK). In 2014, these seventeen ports had a total throughput of 53 million TEU, an increase of nearly 5% over 2013. This was a much higher year-on-year growth than was seen in 2013 and 2012 with their 2.2% and 0.2%, respectively. As matters are, the prospects for 2015 are looking a bit less rosy.

These seventeen ports comprise 55 different container terminals equipped with ship-to-shore gantry cranes. As of 31 December 2014, they had a combined box handling capacity of 86 million TEU. The resulting occupancy, i.e. throughput divided by capacity, of 62% may seem to run counter to congestion having plagued so many ports, in the 2nd half of 2014 in particular.

Congestion

The main reason for this congestion phenomenon was and is that demand doesn't come in nice regular identical volumes to be discharged and loaded every day. On the contrary, even the largest ships remain prone to the elements, which are sometimes causing havoc to schedule integrity. Early in the year, nearly a third of more than 9,900 vessel arrivals were off schedule! Delayed ships may bunch up in their next North European port, which will work through further in their schedule.

As such, a certain amount of terminal over-capacity may be considered a requirement to prevent congestion. Terminal capacity is a multiple interpretable subject, but the general consensus is that congestion kicks in at 75% utilisation. Therefore, this study provides occupancy analyses (overall, by sub-region, per country and per port) at both 100% and at 75% capacity.

That all said, throughout the 24/7 working week a terminal operator has always been facing and handling peaks and troughs in demand as a standard fact of life. However, things have changed and ships have grown excessively within a relative short period of time.

Growing vessel sizes

At the start of this century the world's largest box ship was Maersk Line's "Cornelius Maersk", measuring 8,200 TEU. In April this year, a vessel with nearly 2.5 times that capacity was delivered: UASC's 19,900 TEU "Barzan". The average capacity of ships deployed in the North Europe-Far East trade then was 12,700 TEU and has meanwhile increased by another 900 to 13,600 TEU.

The aforementioned serves to understand the challenges port authorities and terminal operators are facing. Very few container terminals have been purpose-built for ULCS (Ultra Large Container Ships of over 10,000 TEU), let alone for the 18,000+ TEU monsters. The first one of the latter was only delivered in mid-2013 and including confirmed orders their total number will swell to 100 by 2019. 35 of these will even be larger than 20,000 TEU.

All these ships will invariably be deployed in the North Europe-Far East trade and the amount of ships so big has definitely come as an unpleasant surprise to many of the terminal operators, who generally only hear what hangs over them when the newbuilding order is placed... Yet they realise to have no choice but to quickly invest substantial sums, again, to handle the monsters, without the certainty that carriers will be prepared to pay for the extra effort.

6,000 moves per day, please

The consensus among big ship carriers nowadays is that terminals should handle 6,000 moves a day on a ULCS; the universal consent among stevedores is that a production of 3,500 moves is a more realistic maximum.

The above 2000-built 8,200 TEU ship has a length of 347 metres, counts 21x 40' bays (transverse rows of 40' containers) and can be discharged/loaded with seven ship-to-shore container gantries simultaneously, maximum: such cranes just cannot work adjacent bays; the gantry legs are too wide to allow that.

The 2015-launched 19,900 TEU "Barzan" is 400 metres long and counts 24 bays. Thanks to the "two islands" deck configuration, it can be handled with 9 gantries at the max, just two more than its nearly 2.5 times smaller fifteen years older predecessor. The difference in capacity between the two ships is not so much in length; it is in breadth: 6 deck rows more, and height: extra tiers under and on deck.

With respect to the ship-to-shore gantries, the differences are much more succinct: on the "Barzan", the crane's spreaders have to travel longer, i.e. wider and deeper. Tandem-spreaders will be used whenever possible and the cranes need to be much taller, minimum 50 metres under the spreader. Thus, they are heavier: some 2,000 tons and therefore require stronger quays.

Purpose-built, expanded, retrofit and coping

Until 2014, just three of the 31 container terminals accommodating North Europe-Far East services were purpose-built for the handling of Ultra Large Container Ships, including the current largest afloat:

- EUROGATE Container Terminal Wilhelmshaven/Germany - water depth alongside 18 metres
- Hutchison's Berths 8/9 Terminal in Felixstowe/UK - 16/18 metres
- ECT's Euromax at Maasvlakte 1 in Rotterdam - 19.8 metres

DP World's London Gateway (17 metres) has definitely been developed for the ULCS purpose from scratch, but is not -yet- structurally handling North Europe-Far East services, deploying the relevant ships.

Southampton Container Terminal is an example of a facility expanded with a custom-built ULCS berth. In Hamburg part of the quays of EUROGATE's Container Terminal Hamburg and HHLA Container Terminal Burchardkai have been retrofit as such and so has APM Terminal Gothenburg (Sweden). ECT has re-equipped to ULCS requirements part of its Delta Terminal at Rotterdam's Maasvlakte 1. And at Bremerhaven's Stromkaje, accommodating three terminals, 29 StS gantries have been upgraded to a 23-boxes wide outreach.

And the others? They are coping, one way or the other! The economies of scale carriers aim to achieve by operating increasingly larger ships means that mainline terminals have no choice but to invest substantial sums in their facilities. Invest in deeper water, in longer and stronger quays, in taller ship-to-shore gantries with a longer outreach, in yard space and equipment, in... and so on.

All these investments should, but do not necessarily translate into higher stevedoring prices; shipping lines rather pass their economy of scale savings on to shippers in the form of lower freight rates instead...

New 2015 facilities

In 2015, three more new, tailor-made ULCS facilities are joining the inventory:

- April: APM Terminal Rotterdam II at Rotterdam's reclaimed Maasvlakte 2. Fully automated including the absolute novelty of (eight) remotely controlled ship-to-shore gantry cranes
- Year-end: DP World's Rotterdam World Gateway (RWG) in the same area and fully automated and remotely controlled as well: all 14 quay cranes, i.e. including the three barge gantries
- December: Liverpool2 Container Terminal, semi-automated yard with initially five conventionally operated ship-to-shore gantries

These three terminals alone will increase North Europe's handling capacity by minimum 6 million TEU or 7%. It will probably be more once the almost excessive degree of automation of the two new Rotterdam greenfield terminals has been fine tuned.

Automation, the holy grail

Full StS container gantry crane automation is seen as the only means to achieve the carriers' badly wished quay-side production of 6,000 moves per day of 24 hours. Approximately 90% of the crane cycle is automated with only the final lowering of the container guided by the operator. The latter is not in a cabin on the crane but in a remote control centre. Unlike the traditional human crane-driver, a robot crane doesn't suffer from back/neck stress, fatigue or fading concentration and can easily withstand the required faster acceleration and braking.

With remotely-controlled crane automation, APM Terminals expects to make up to 50% more moves per hour, while DP World/RWG anticipates 40 moves an hour. In both cases, it comes down to some 6,000 moves per day working the ULCS with 6 automated quay cranes. Obviously, the stowage plan must allow for a crane intensity of minimum 6 (or up to 9, if available) quay cranes.

Even without crane automation, impressive throughputs are sometimes achieved. ECT Delta Terminal claims the volume palmares: on Evergreen's 13,800 TEU "Thalassa Hellas" it achieved a production of 11,050 moves, almost 50/50 discharged/loaded, equal to some 18.500 TEU. As the ship, using five cranes, was at berth for 81 hours, this comes down to a production of 28 moves per crane/137 per hour/3,270 moves per 24 hours... still far away from the wanted 6,000.

Gate pressures

3,270 or 6,000 moves per 24 hours: the vast majority of all these containers (5,500 or 10,000 TEU) have to be delivered to the consignee or by the shipper. Apart from expanding yard space and equipment, it will increasingly be required to start the delivery of inbound containers while the vessel is still discharging. A fast quay crane production puts tremendous pressure on the terminal's storage capacity.

The following examples show how immensely the pressure on terminal gates must have increased over a period of ten years: many more containers on much fewer ships sailing at a substantially lower frequency:

- In 2005, 272 ships of 5,700 TEU average operating 32 dedicated weekly North Europe-Far East services carried 6,732,000 full TEU both ways
- In 2014, 235 ships of average 12,700 TEU operating 21 dedicated weekly North Europe-Far East services carried 14,091,000 full TEU both ways

To prevent capacity constraints, ports and terminal operators have to try and stay ahead of demand. And so are they planning to: if all intended expansions and totally new terminals are commissioned as planned, the 2014 overall capacity of 86 million TEU may increase by a Compound Annual Growth Rate (CAGR) of 5.2% to 143 million TEU by 2024.

Regional highlights

The extensive core Ports/Terminals section of Dynamar's "Container Volumes & Terminal Capacity in North Europe II" is split into four areas. For each section, the total number of terminals profiled, their overall surface (hectares), quay length and the full amount of Ship-to-Shore gantry cranes is given. Unavoidably of a somewhat unequal size, highlights of each of these sections include:

Baltic/Scandinavia - total 18 terminals, 777-ha, 13.7-kilometre quay line, 85 quay cranes

Normally, Russia is the most important feeder destination/origin of boxes transhipped in the various North Continental (and one Baltic) hubs. Hence, there is an extensive analysis of container terminal capacity in three Russian Baltic container ports: St Petersburg, Ust-Luga and Kaliningrad, which comprise 10 box facilities. Their combined handling capacity is 4.5 million TEU, of which 80% comes for the account of St Petersburg. The current seven facilities large and small here offer more than 9,900 reefer plugs. An eighth terminal to be capable of accommodating up to 8,100 TEU ships, more than three times the present maximum container vessel size of 2,600 TEU, will open for business in September.

Gdansk (Poland), Aarhus (Denmark) and Gothenburg (Sweden) are the three ports in this section handling direct North Europe-Far East and (the Swedish port) Transatlantic services. Gdansk is the relatively new kid on the block here. DCT Gdansk is on the Maersk Line schedule since early 2010, still handling this carrier's largest, i.e. 18,000 TEU ships, stowing 23 boxes wide across deck, with 18-boxes wide ship-to-shore cranes. That will change when a new terminal opens by late 2016, equipped with mega cranes of 25-boxes across deck outreach.

UK/Eire - total 11 terminals, 575-ha, 11.1-kilometre quay line, 91 quay cranes

The Irish Republic is a pure feeder destination. During the last few years, the dialogue in the UK has been dominated by the development of brownfield London Gateway and more in particular the reaction it has provoked by established terminals, afraid that the new facility would go after their customers. With the dust settled, for now, it appears that Tilbury has lost part of its North-South business while Thamesport got rid of all of its deepsea services. However, Felixstowe and Southampton have fast-tracked the building of brand new ULCS berths through which they have managed, as matters are, to keep their big ship patronage.

A somewhat different animal with high aspirations is Liverpool, determined to gain back its historical 18% share of all UK seaborne imports. Hence it is building a new deepsea terminal capable of accommodating up to 13,500 TEU ships or bigger, anyway, considerably larger than the ones operating in the Transatlantic trade currently calling the Merseyside port. Liverpool2 will be commissioned by the end of this year.

Europe North West - total 43 terminals, 2,716-ha, 51.7-kilometre quay line, 386 quay cranes

This is by far the largest area with a total of eight German, Dutch, Belgian and French main ports accommodating 24 terminals handling North Europe-Far East or Transatlantic services. In addition, 17 other existing container terminals plus 12 projects are being profiled here. The existing terminals are equipped with 82 ship-to-shore cranes capable of handling the 18,000+ TEU monsters requiring an outreach of 23 rows across deck. The projects will add another estimated 125 of such devices.

Deep water in the port directly on the North Sea is Rotterdam's trump card. Antwerp and Hamburg continue to amaze the trade by their apparent cargo generating capability inducing the carriers' very largest ships to sail the windy and winding Westerscheldt or the relatively shallow Elbe. Le Havre may have misjudged vessel size development by opting for 22-wide ship-to-shore container gantries along its massive Port 2000 project, nearing completion. A solution may be to slightly list the 18,000+ TEU ship to reach the 23rd row, or otherwise to turn her from port to starboard (or the other way round).

Europe Atlantic - total 3 terminals, 52-ha, 2.2-kilometre quay line, 16 quay cranes

The Portuguese ports of Lisbon and Sines are both called by Transatlantic services operating out of North Europe *and* the Mediterranean. Sines also serves as an Atlantic transshipment port for MSC and accommodates one of the 2M alliance's North Europe-Far East services, deploying ships of up to 14,000 TEU. Lisbon's current two terminals may -ultimately- be replaced by a new, 2 million TEU facility.

X-X-X-X-X-X

CONTAINER THROUGHPUT & TERMINAL CAPACITY in North Europe is Dynamar's latest publication on the volume of the main container trades connecting with the area and on the status of existing and planned container terminal capacity there.

This publication's features include:

- Identical, compact profiles and overviews of 75 existing terminals, 20 expansions and 20 new projects in 26 different ports across 11 countries in North Europe
- Profiled data: Terminal name - operator - location - surface - quay length - depth alongside - number and outreach of Ship-to-Shore container gantries and mobile harbour cranes - reefer points - TOS - TEU capacity and 2013/2014 TEU handlings - notes - expansion plans, if any
- 2015-2024 status and annual development of terminal capacity
- 10-year TEU throughput of all North Europe ports, which combined handled more than 56 million TEU in 2014!
- 2015-2024 forecast of port handled TEU development
- Overview of all North Europe-Far East and Transatlantic container services
- Full container volumes per North European country to/from the Far East and to/from the USA
- North Europe ports of call analysis for both trades
- Various extra's, including historic and forecast GDP growth per country; transshipment shares of the large hubs, Global Terminal Operators' North European presence, summary of terminal projects and so much more

Any and all information for this publication has been collected, researched and processed in the period October 2014/March 2015. In as much as possible, terminals and associated project data have been checked with those of the relevant companies and authorities. Information on container shipping services and further content stems from a variety of sources, including Dynamar's own databases. As different sources often offer diverging information on the same topics, we have endeavoured to provide the most accurate estimates.

Our website www.dynamar.com provides links to the websites of many ports, to all global terminal operators and to all liner operators mentioned in this report. Extensive information on the largest of the latter can be found in our annual publications "**Top 25 Container Liner Operators - Trading Profiles**" as well as "**East-West Container Trades, the Alliances Routes**".

We trust that the reader will enjoy this report, which has been compiled with the aim to provide a compact, yet comprehensive, assessment of the current status and near future of North Europe container terminal supply and box trade demand.

Alkmaar/The Netherlands, April 2015

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