Port Feeder Barge:
Innovative green waterborne logistics for container ports

PORT FEEDER BARGE GmbH
Hamburg
The "Port Feeder Barge"

Main Data (preliminary):
length: 64 m
beam: 21 m
capacity (3 Layers): 168 TEU
reefer plugs: 14
container crane:
  - height: 17 m
  - outreach: 29 m
  - capacity: 40 t
ruder propeller: 4

$\text{NO}_x$: < 3.0 g/kWh
Soot: < 0.06 g/kWh
The "Port Feeder Barge"

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Technical partners:

NO\textsubscript{x}: < 3.0 g/kWh
Soot: < 0.06 g/kWh
The "Port Feeder Barge"

- Turning device
- Spreader
- Overheight frame
Operation circle

64 m

3 x 28 TEU = 84 TEU

3 x 2 TEU = 6 TEU

quay edge

19.68 m

narrow

crane

rails
Operation circle

- 29.0 m max. outreach
- 17.0 m
- 7.5 m ü. MTNw (Burchardkai)

PORT FEEDER BARGE
Ship-to-ship operation
Business fields

Intra-port
container haulage

Feeder operation

Inland navigation
1st problem: intra-port container haulage

congested roads within seaports
1st problem: intra-port container haulage
1st problem: intra-port container haulage
1st problem: intra-port container haulage

Solution?
Port of Hamburg: Modal-Split 2009

Umfuhr: 5%
ca. 250.000 Container

Schiene: 34%

Straße: 64%
(inkl. Umfuhr)

Binnenschifffahrt: 2%

Quelle: HHM e.V.
1st problem: intra-port container haulage

Port of Hamburg 2009: ca. 250,000 Ctr.

- Off Dock - Off Dock: 13%
- Terminal - Terminal: 33%
- Terminal - Off Dock: 54%
1st problem: intra-port container haulage

Port of Hamburg 2009: ca. 250,000 Ctr.

Off Dock - Off Dock
13%

Terminal - Terminal
33%

Vorlaufzeit < 1 Tag: 20%

Terminal - Terminal (m. CTA)
16.5%

Terminal - Terminal (o. CTA)
16.5%

Terminal - Off Dock
(o. Wasseranschluß)
44%

Terminal - Off Dock
(m. Wasseranschluß)
10%

Potential for PFB:
approx. 21%, i.e. 53,500 ctrs
PFB capacity: 44,000 ctrs/a
(18 hrs/d, 350 operating days)
2nd problem: feeder\-ing

“terminal hopping”
poor handling efficiency
2nd problem: feedering

Feeder connections via Hamburg

- UK / IRELAND / ICELAND: 8/0/1
- NORWAY: 20
- SWEDEN / DENMARK: 40/25
- FINLAND: 28
- RUSSIA: 16
- POLAND: 9
- BALTIC STATES: 2/5/5
2nd problem: feedering

Hamburg container throughput
2009: 7.01 Mill TEU

Source: HHM e.V.
2nd problem: feedering

Hamburg container throughput
2009: 7.01 Mill TEU

Deepsea 83%

17% Feeder

Source: HHM e.V.
2nd problem: feedering

2007: Feeder liftings
per terminal call

- 1 - 10 TEU: 1%
- 11 - 100 TEU: 37%
- 101 - 150 TEU: 20%
- > 150 TEU: 42%
2nd problem: feedering

Central Feeder Coordination Office (FLZ)

**COMMUNICATION IN PORT WITHOUT FLZ**
- Shipowner 1
- Shipowner 2
- Shipowner 3
- Pilots
- HPA
- Line runners

**COMMUNICATION VIA FLZ**
- Shipowner 1
- Shipowner 2
- Shipowner 3
- Pilots
- HPA
- Line runners

Source: FLZ GmbH

TU Delft
Delft University of Technology
Port Infrastructure Seminar 2010
3rd problem: inland barge operation

facilities not suited for inland navigation

“terminal hopping“

poor handling efficiency
Inland barges via Hamburg

Hinterland by barge

www.portofhamburg.com

Port of Hamburg

TU Delft
Delft University of Technology
Port Infrastructure Seminar 2010
3rd problem: inland barge operation

<table>
<thead>
<tr>
<th></th>
<th>Hamburg</th>
<th>Bremerhaven</th>
<th>Rotterdam</th>
<th>Antwerp</th>
<th>Le Havre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total throughput [Mill TEU]</td>
<td>7,0</td>
<td>4,6</td>
<td>9,7</td>
<td>7,3</td>
<td>2,2</td>
</tr>
<tr>
<td>Hinterland [Mill TEU]</td>
<td>4,7</td>
<td>1,8</td>
<td>6,8</td>
<td>7,0</td>
<td>1,7</td>
</tr>
<tr>
<td>Inland navigation [Mill TEU]</td>
<td>0,09</td>
<td>0,06</td>
<td>2,26</td>
<td>2,30</td>
<td>0,15</td>
</tr>
<tr>
<td>Share in hinterland transport</td>
<td>2%</td>
<td>3%</td>
<td>33%</td>
<td>33%</td>
<td>9%</td>
</tr>
</tbody>
</table>
Dedicated berths for barges at the terminals

“Terminal hopping“ remains
Central barge terminal

1 additional transport

plus

2 additional liftings

for each container carried by barge!
Central floating barge terminal?
AMS Barge
AMS Barge

- Poor stability during crane operation!
- Poor visibility (for crane driver)
- Problems at high quays
- Poor stowage flexibility
AMS Barge

- Poor stability!
- Poor visibility
- Problems at high quays
- Poor stowage flexibility
AMS Barge

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PORT FEEDER BARGE
Sufficient stability!
PFB as "central floating terminal"
New Hamburg inland barge terminal

present view
New Hamburg inland barge terminal

- Investment: 0 Mill €
- Required area: 0 ha
- Duration of plan approval: 0 years

after completion
## Handling agreements with:

<table>
<thead>
<tr>
<th>Logo</th>
<th>Company Name</th>
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</thead>
<tbody>
<tr>
<td><img src="image1" alt="HHLA Logo" /></td>
<td>HHLA Container Terminal Burchardkai GmbH</td>
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<tr>
<td><img src="image2" alt="HHLA Logo" /></td>
<td>HHLA Container Terminal Tollerort GmbH</td>
</tr>
<tr>
<td><img src="image3" alt="LZU Logo" /></td>
<td>LZU Leercontainer Zentrum Unikai GmbH (in Vorbereitung)</td>
</tr>
<tr>
<td><img src="image4" alt="EUROGATE Logo" /></td>
<td>EUROGATE Container Terminal Hamburg GmbH</td>
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<tr>
<td><img src="image5" alt="BUSS Logo" /></td>
<td>BUSS Hansa Terminal GmbH</td>
</tr>
<tr>
<td><img src="image6" alt="C. Steinweg Logo" /></td>
<td>C. Steinweg (Süd-West Terminal) GmbH &amp; Co. KG</td>
</tr>
<tr>
<td><img src="image7" alt="Wallmann &amp; Co. Logo" /></td>
<td>Wallmann &amp; Co. (GmbH &amp; Co.)</td>
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</tbody>
</table>

**PORT FEEDER BARGE**

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## Business fields

<table>
<thead>
<tr>
<th>Business field</th>
<th>Customer</th>
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</thead>
<tbody>
<tr>
<td>Internal harbour transfer</td>
<td>Deep sea container lines (or their agents)</td>
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<td></td>
<td>Forwarding agents</td>
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<tr>
<td></td>
<td>Major shippers</td>
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<tr>
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<td>Container terminals</td>
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<td></td>
<td>Stevedores</td>
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<tr>
<td></td>
<td>Train operators</td>
</tr>
<tr>
<td></td>
<td>Container depots/leasing companies</td>
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<td>Road hauliers</td>
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<tr>
<td>Feeder operation</td>
<td>Feeder operators</td>
</tr>
<tr>
<td></td>
<td>Shortsea lines</td>
</tr>
<tr>
<td>Inland navigation</td>
<td>Inland navigation operators</td>
</tr>
<tr>
<td></td>
<td>Container terminals</td>
</tr>
</tbody>
</table>
Emergency response

Sep. 20, 2005: grounded on river Schelde heading for Antwerp
Emergency response

Lightering of container vessels

Panmax-container vessel
Fields of employment

- Container haulage
- Feeder operation
- Inland navigation

emergency response
Extended versions

> 400 TEU
Option: fuelled by LNG

- SO$_x$ $\downarrow$ -100%
- NO$_x$ $\downarrow$ $\sim$ -90%
- CO$_2$ $\downarrow$ $\sim$ -20%
- PM $\downarrow$ -100%
Option: fuelled by LNG

$V_{LNG \ total\ max} \approx 500 \ m^3$
Thank you very much for your attention!
Contact

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