via donau – Österreichische Wasserstraßen-Gesellschaft mbH

Container Development in Constanta and potentials for the Danube Waterway

Smart Rivers 2007 Conference
September 17, 2007
Louisville, Kentucky
Gerhard Gussmagg

A new transport route for Europe-Asia traffic: Constanta and the Danube waterway

Project COLD
Container Liner Service Danube

- Austrian – Romanian initiative
- Provides unbiased and comprehensive information on potentials to all interested stakeholders
- Pre-feasibility study covering:
  - Starting situation
  - Market and peer analysis
  - Inland navigation concept
  - Analysis of supply chain Austria – Shanghai in terms of duration, cost and environmental balance
  - Conclusions and recommendations for action

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Chapter 1 – Starting Situation

- Enormous growth of container volumes
- Capacity bottlenecks at major sea ports and congested hinterland routes
- Success Stories of inland navigation in Western Europe
- Developments in the Black Sea area and in Constanta

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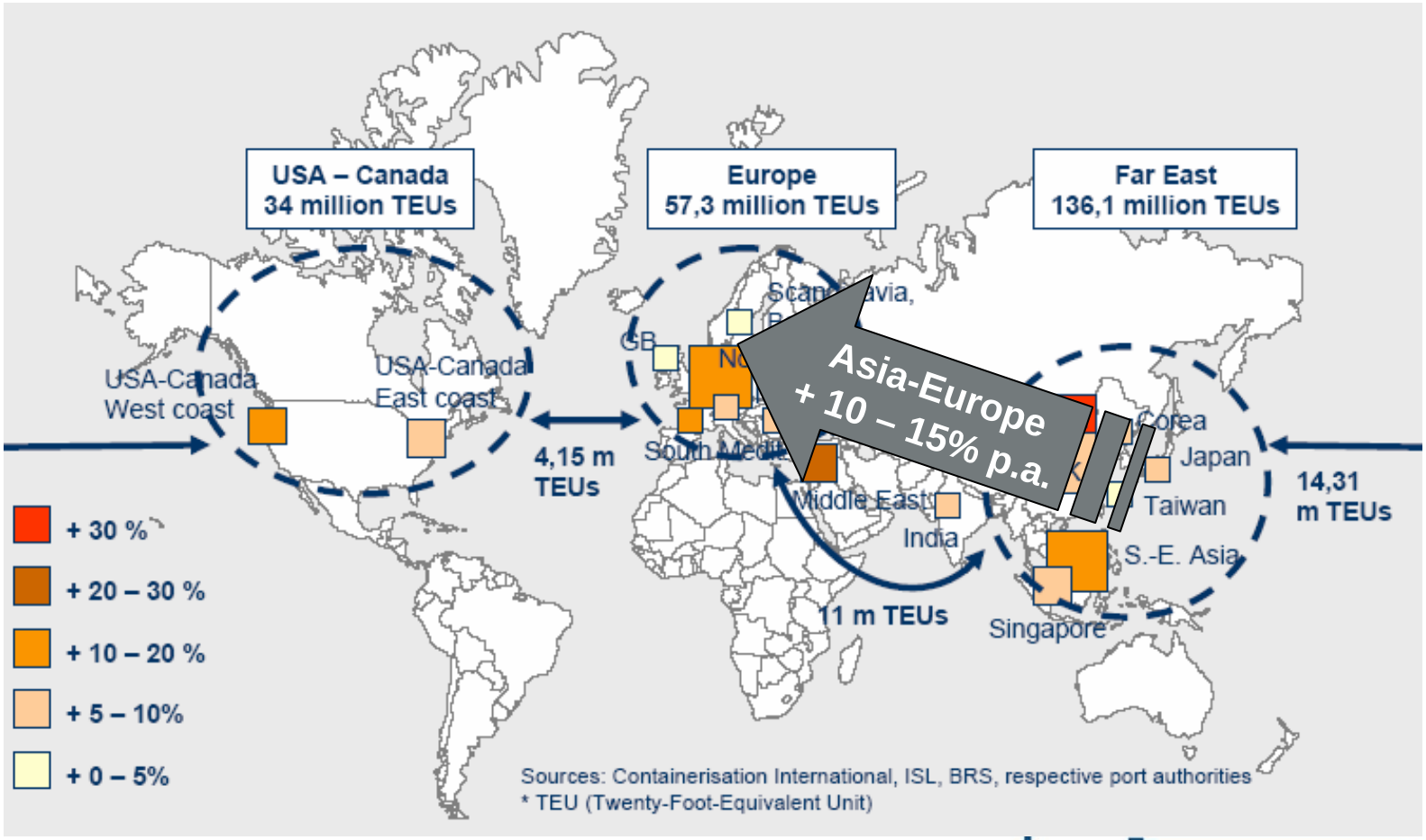
Growing container flows…



Source: Hulocon 2005

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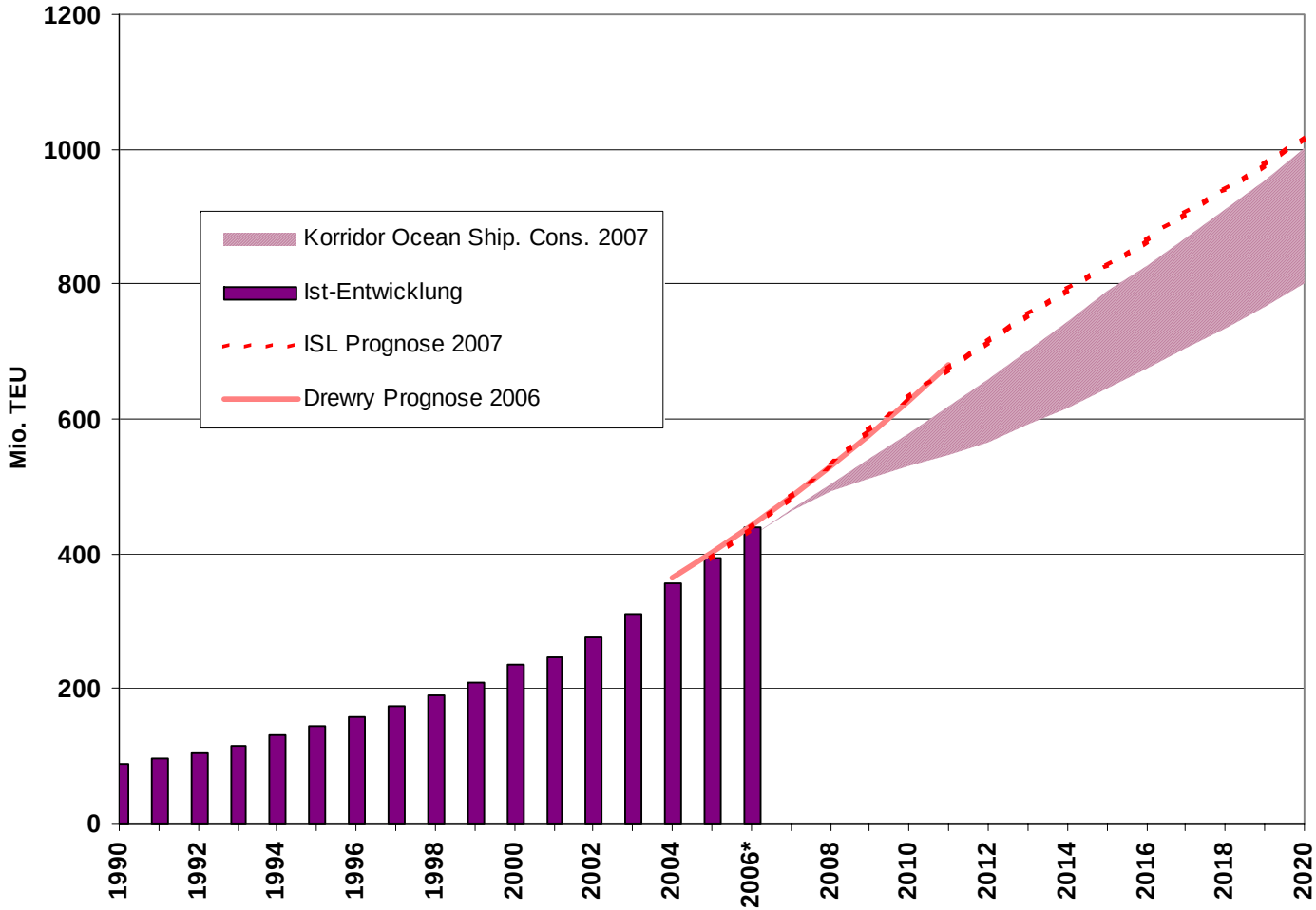
… and port throughput



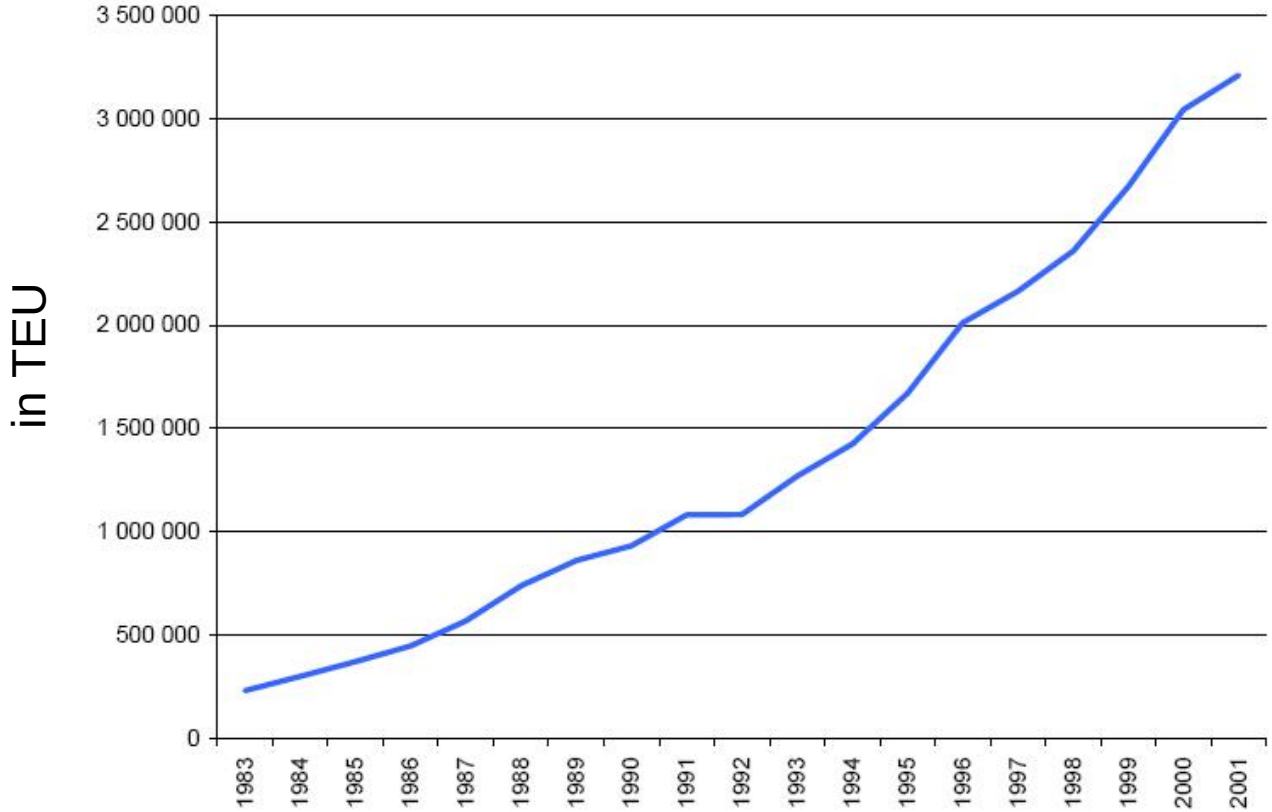
* 2006 vorläufige Schätzung
Quelle: ISL 2007

World Top Container Ports 2006

Container Port	Throughput in million TEU 2006	2005	2001	Growth rate 2001- 2005	Growth rate 2005 - 2006
1. Singapore	24.8	23.2	15.6	+ 49%	+ 7%
2. Hong Kong	23.5	22.5	17.8	+ 26%	+ 5%
3. Shanghai	21.7	18.1	6.3	+ 187%	+ 20%
4. Shenzhen	18.5	16.2	5.1	+ 218 %	+ 14%
5. Busan	11.9	11.8	8.1	+ 46%	+ 1%
6. Kaohsiung	9.7	9.5	7.5	+ 27%	+ 2%
7. Rotterdam	9.6	9.3	6.1	+ 53%	+ 3%
8. Dubai	8.92	7.6	3.5	+ 117 %	+ 17%
9. Hamburg	8.86	8.1	4.7	+ 72%	+ 10%
10. Los Angeles	8.5	7.5	5.2	+ 44 %	+ 13%
85. Constanta	***1.0***	***0.8***	***0.12***	***+ 542%***	***+ 35%***

Source: “Container Management”, August 2007

Container transport on European inland waterways



Source: VNF - CCNR

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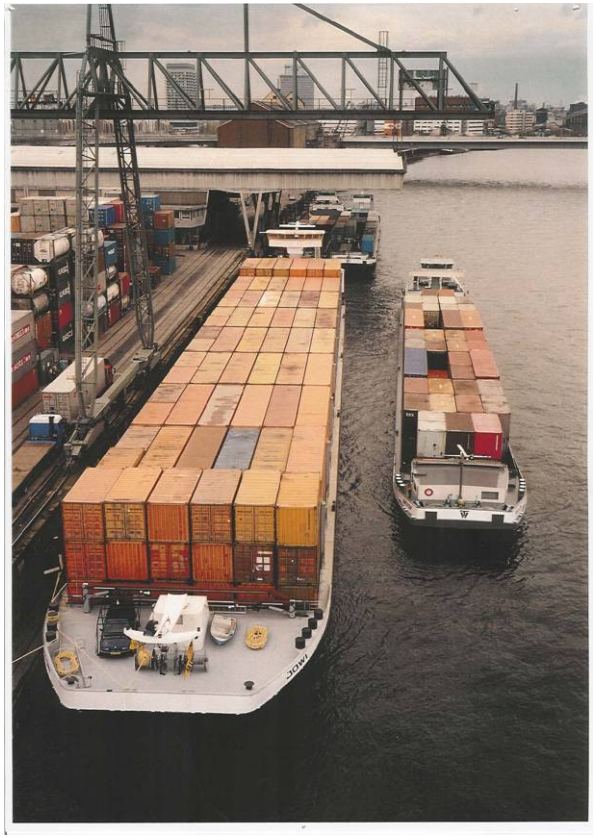
European Success Stories

- **Rhine**
  - Yearly movements of more than 1.8 Mio TEU
  - Daily services between ARA-ports (Amsterdam-Rotterdam-Antwerp) and German Hubs
  - Usage of high-capacity vessels: JOWI etc.



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European Success Stories (2)

- **France: Seine/Rhône**
  - Container market literally booming with an increase of 20% on the Rhône (2005: 55,807 TEU) and 40% on the Seine (2005: 121,584)
  - New services from Marseille up to Lyon etc.
- **Belgian waterways**
  - Container transport average yearly increase of 31 % between 1994 and 2004

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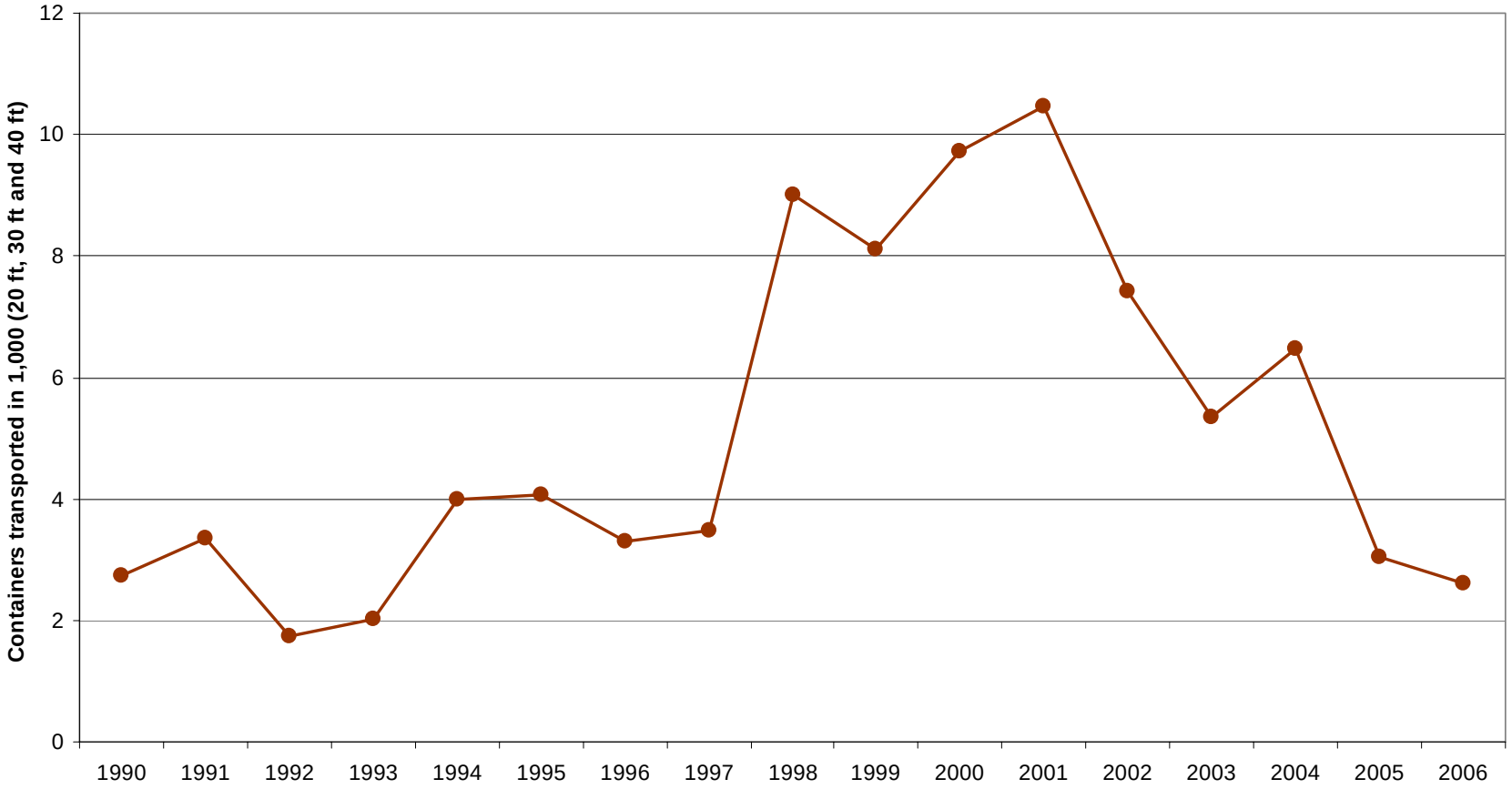
Container transport on the Austrian Danube



Source: Statistik Austria

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Reasons for the underdevelopment

- Massive impediments for Danube navigation by the two crises in former Yugoslavia.
- Nautical and economic difficulties for inland navigation in the western direction (long transport times to ARA passing through more than 60 locks and from the very competitive block train routes).
- In the East, there were no important maritime container hubs in the estuary mouth of the Danube.
- BUT, we have a different situation now…

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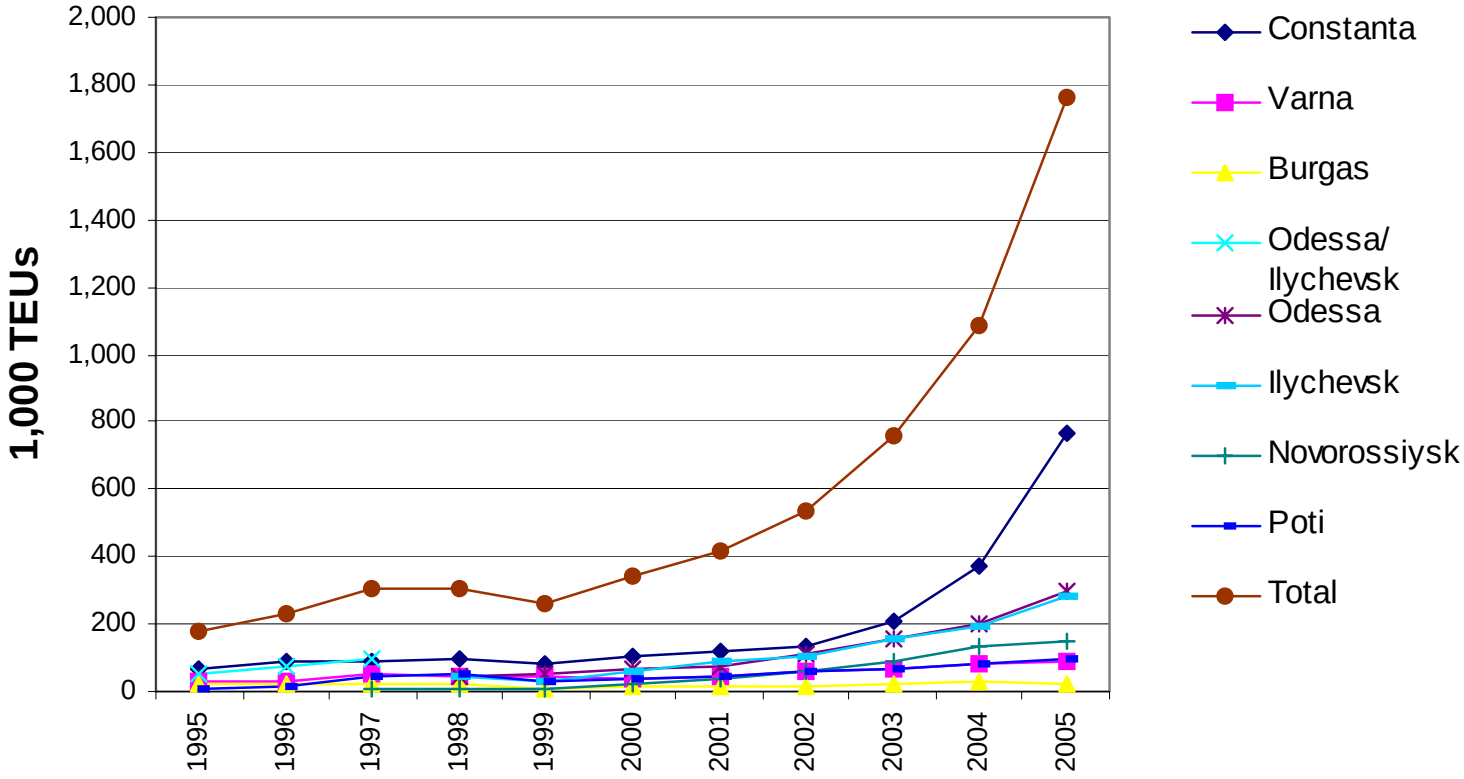
Black Sea: Container throughput by Port, 1995-2005



Source: Ocean Shipping Consultants „The European & Mediterranean Containerport Markets to 2015


MOLDOVA
UKRAINE
ROMANIA
Odessa
Rostov-na-Donu
Sea of Azov
RUSSIA
SERBIA
Sevastapol
Constanta
Yalta
Black Sea
BULGARIA
Varna
MACEDONIA
Burgas
GEORGIA
Batumi
Istanbul
Zonguldak
Sea of Marmara
Samsun
GREECE
Trabzon
TURKEY
Athens
Aegean Sea
NORTH
0 125 250 500
Kilometres
Mediterranean Sea

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Developments in the Black Sea Area (1)

Container throughput at Black Sea ports increased by factor 10 over 1995-2005 to **1.76 Mio TEU**.

Recently, several direct services to/from the Far East have been introduced:

- CMA-CGM: *Bosporus Express*
- China Shipping / ZIM
- Hapag Lloyd / CSAV Norasia: *Asia Black Sea Service – ABS*
- MSC: *Tiger Service*
- Maersk Line: A3 Dartmouth start April 2007

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Developments in the Black Sea Area (2)

Total volumes of all relevant countries (Romania, Bulgaria, Ukraine, Black Sea Russia, Georgia) are forecasted to increase to **3 Mio TEU in 2010** and **5 Mio TEU in 2015**.

Source: Source: Ocean Shipping Consultants „The European & Mediterranean Containerport Markets to 2015

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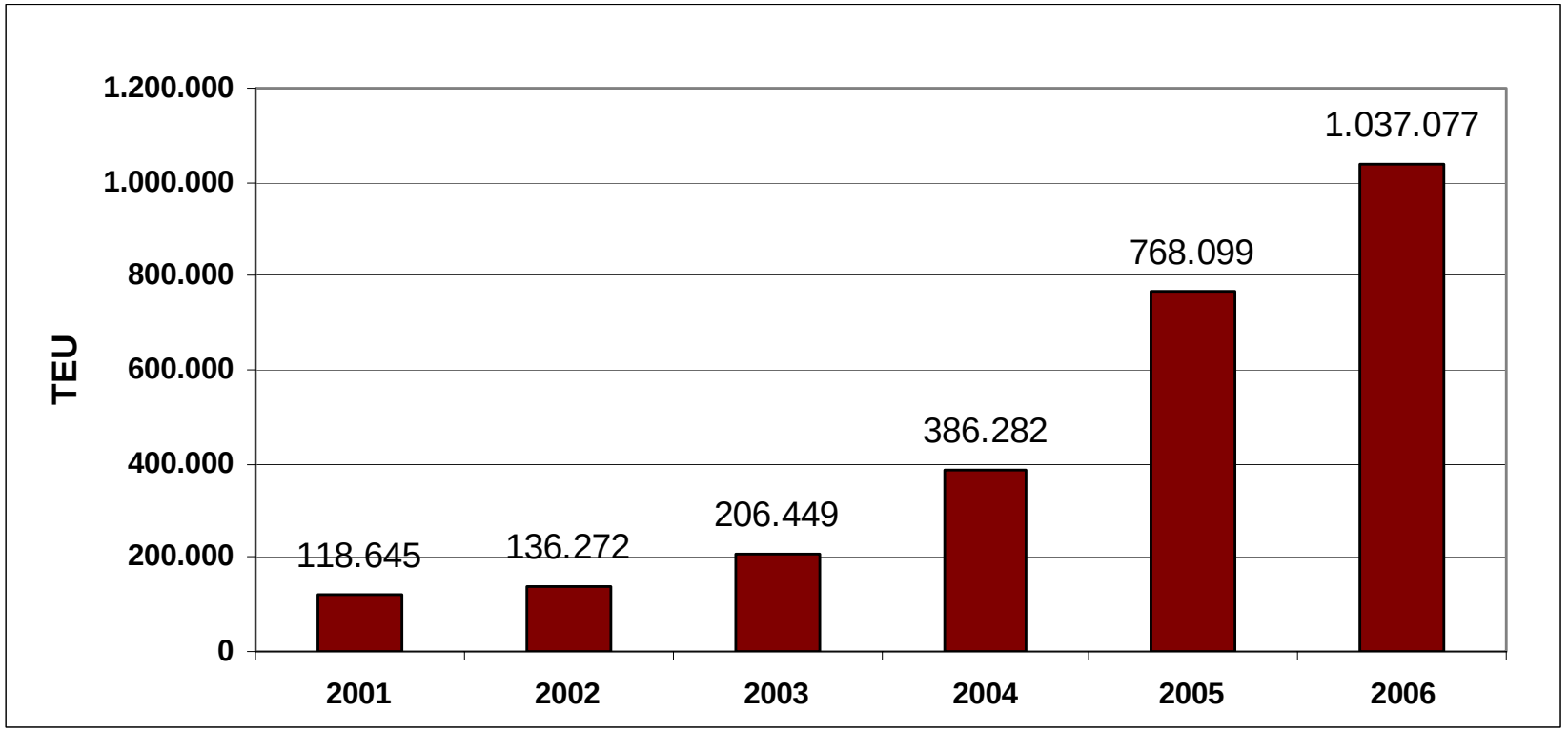
CSCT Constantza South Container Terminal

Operator: DP World
Main berth: 634 m, 5 x Post-Panamax Mitsubishi Gantry Cranes, min. 14.5 m depth

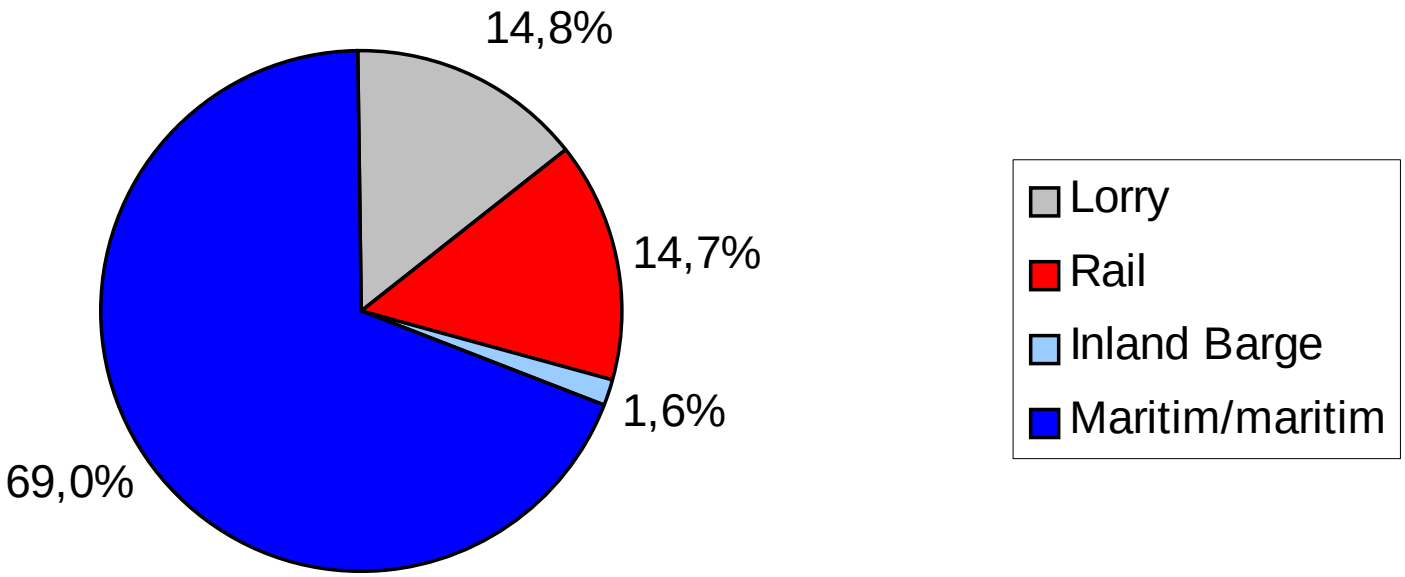
Source: CSCT, Sept. 2007

Container volumes in Constanta
Period 2001 - 2006



Source: Constanta Port

Modal Split Container throughput
Port of Constanta 2006 (total 1.037 Mio TEU)



Share of „Hinterland-Containers“: 31 % (322,000 TEU)

Modal Split: 47% Rail, 48% Truck, 5 % Inland vessel

Source: Port of Constanta

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Development plans CSCT for 2007

- Additional ground slots - Area C will provide 1200 ground slots increasing capacity by approximately 200,000 teu per annum, commencing construction March,
- 2 Super Post-Panamax Quay Cranes commission June/July,
- 1 Mobile Harbour Crane, commission June,
- 20 Internal Terminal Transfer Vehicles (ITVs), commissioning Jan to May ,
- 1 Empty Handler, deliver June,
- Additional feeder berth of 200 meters – on-line July/August subject to final port administration sign-off.

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Chapter 2- Market and Peer analysis

- Existing overseas container volumes of Austria, Hungary and Slovakia
- Railway rates for shuttle-train connections North Range and Adria
- Macro-economic analysis of cargo flows
- Potential container volumes for Danube navigation (2010/2015/2020)

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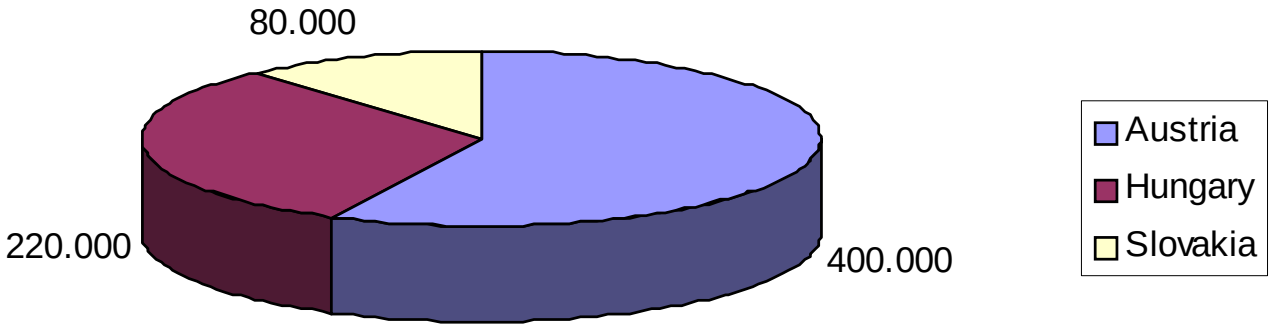
Market and peer analysis

- **Altogether, the current overseas container volume for the region of Austria, Hungary and Slovakia is <u>estimated</u> at around 700,000 TEU per year.**



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Preferred seaports per country

Austria

- Predominance of the North Sea ports (95 %)
- Total volume (incl. bulk): Rotterdam first, followed by Koper
- Container: Hamburg share more than 50 %, followed by Bremen and Rotterdam

Hungary (container)

- 2/3 import, 1/3 export
- North-sea dominance (75%)
- Hamburg share nearly 50 %, followed by Koper and Bremerhaven

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Selected railway rates (container)

		20 ft (8-16.5 t)	**40 ft** (22-34 t)
Vienna Freudenau CCT	Hamburg Waltershof	€ 325	€ 618
Linz Port CCT	Hamburg Süd / Bhav.	€ 308	€ 587
Krems Port CCT	Rotterdam Maasvlakte	€ 340	€ 670
Györ LCH	Rotterdam Pernis	€ 368	€ 649
Budapest BILK	Koper Luka	€ 226	€ 445
Bratislava SPAP	Hamburg Eurokai (via Prague)	€ 413	€ 715

- Railway rates obtained by a small forwarder; including one container handling in the inland terminal;

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Forecast of the flow of goods (OIR)

- Analysis of foreign trade between Austria, Slovakia and Hungary and selected European countries and overseas regions.
- Calculation was based on a theoretical containerization.
- Calculation includes continental shipments in the Danube region as well as short-sea (Maghreb, Levant, Turkey) and overseas shipments (Near East, Southeast and East Asia).

Source: ÖIR, 2006

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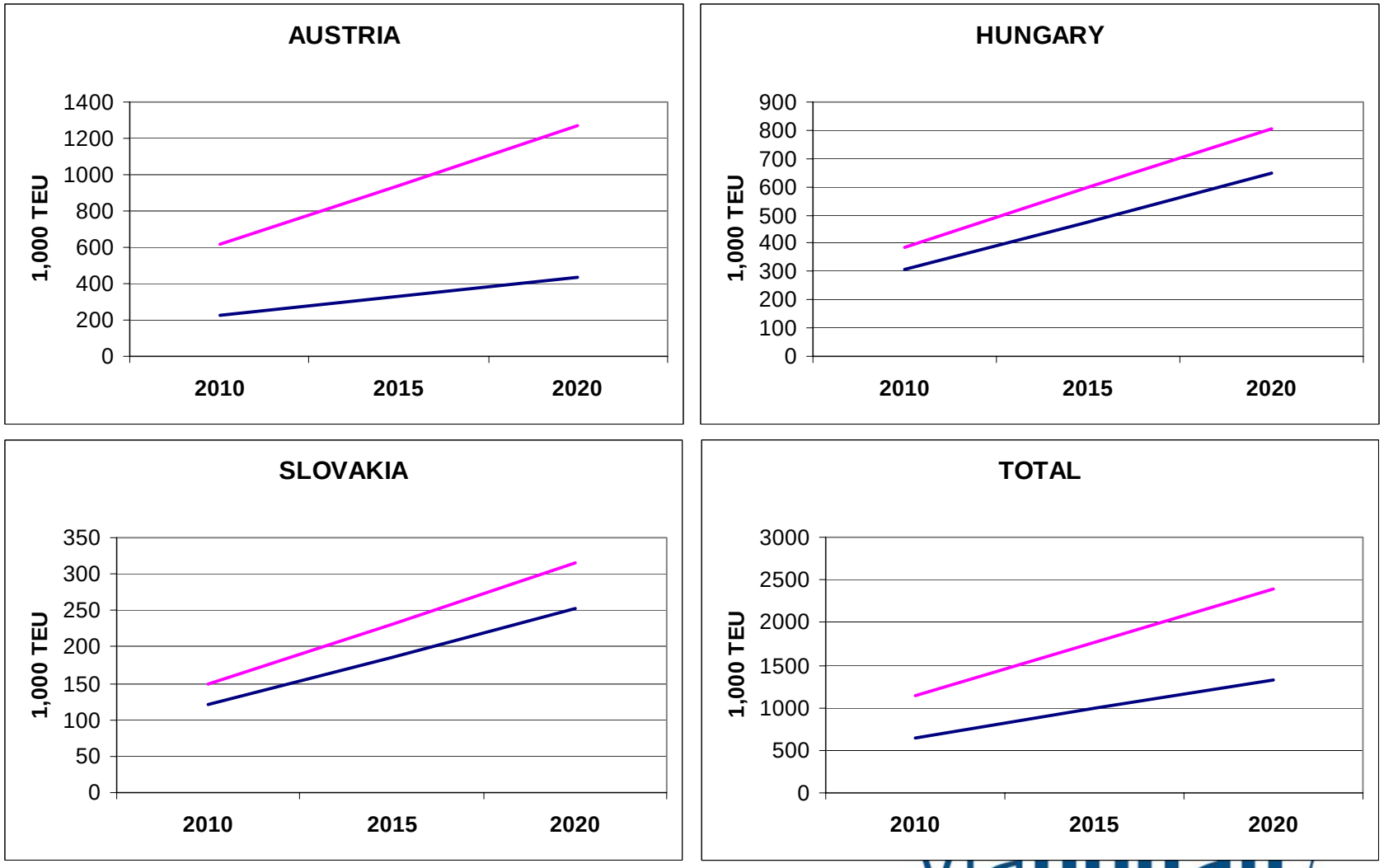
Inland Navigation Potential



Chapter 3 – Inland Navigation Concept

- Detailed description of a container liner service between Krems and Constanta in terms of duration, cost and capacity
- Base scenario (conventional vessels, double stack) vs. optimised scenario (adapted container vessels, triple stack)
- Framework of Danube navigation: Locks, border crossings, inland port and Black Sea Canal fees

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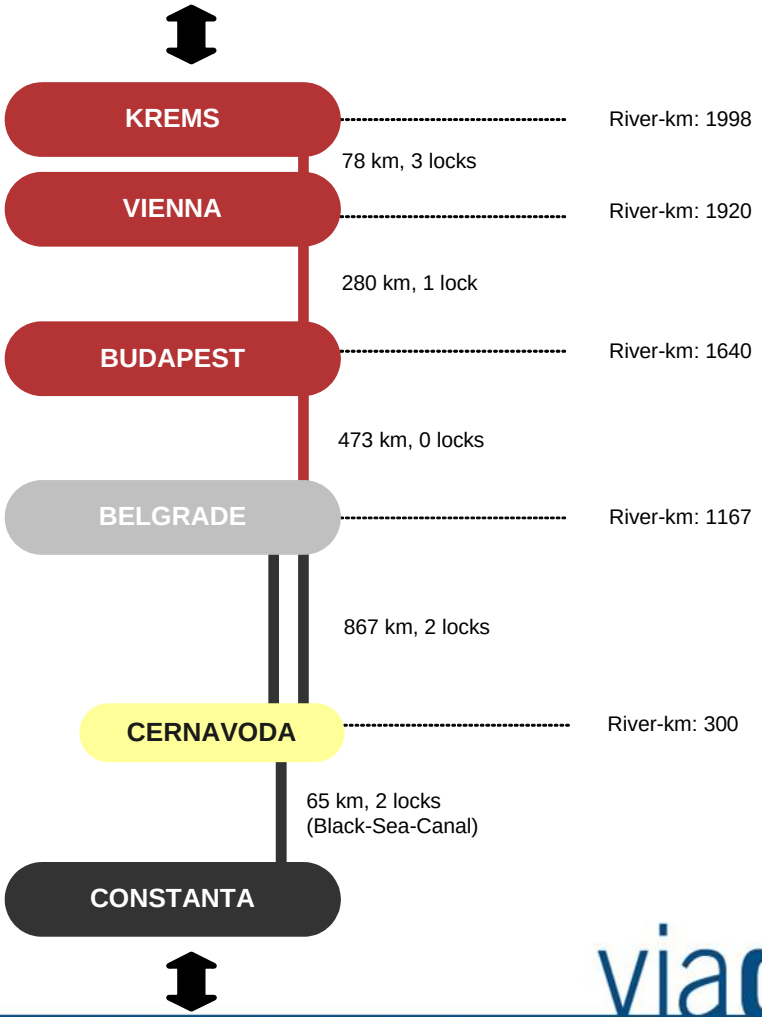
Inland navigation concept
Krems
Wien
Budapest
Belgrad
Giurgiu
Ruse
Konstanza
Wasserstraße Donau
UN/ECE-Klassen
VII
VIa, b, c
Va, b
IV
III
I, II
Sonstige
Häfen
Bedeutend
Sonstige
Schleuse
Hebewerk
Kilometrierung
Städte
Hauptstadt
Sonstige
Staatsgrenze
© via donau 2005

Distances and Main Inland Terminals



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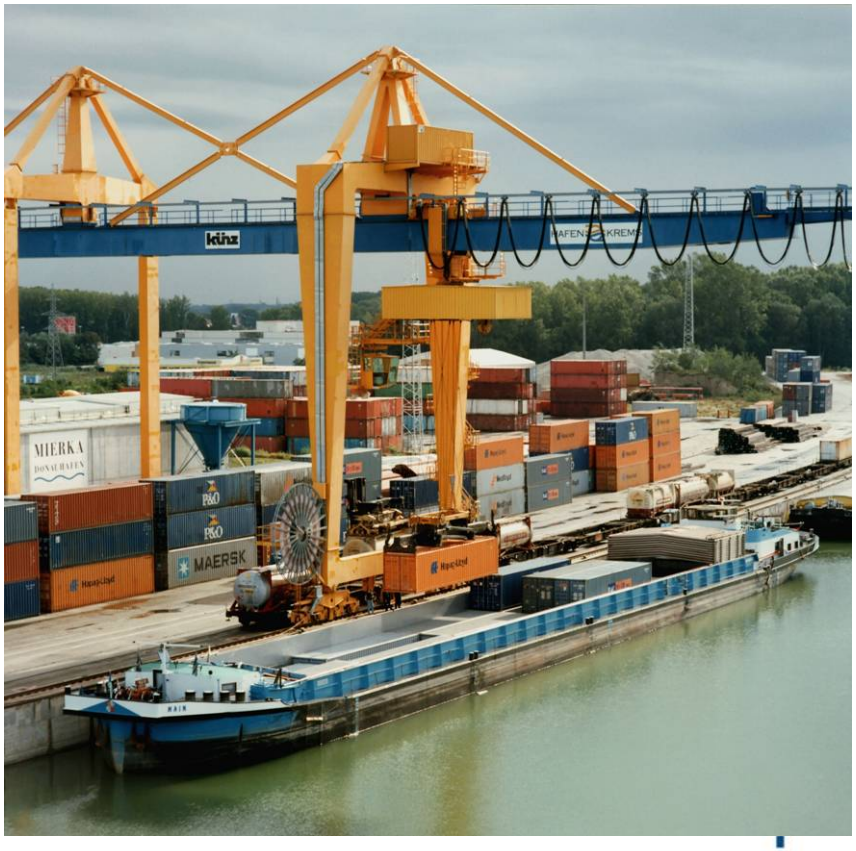
Selected inland port in Lower Austria: Mierka Donauhafen Krems



Source: Mierka Donauhafen Krems

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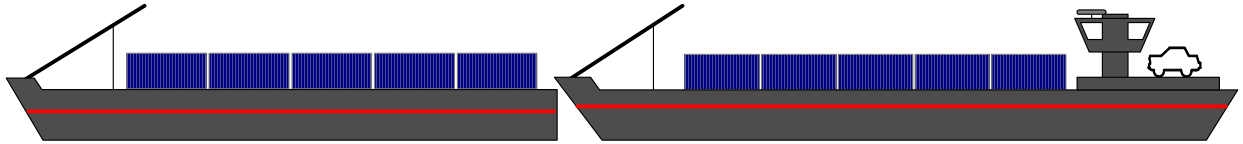
BASE SCENARIO: Danube-Service using available fleet capacity

- Roundtrip **Krems – Constanta – Krems** (3,526 km) in 3 weeks
- Deployment of 3 convoys → Weekly departures from Constanta and Krems
- Structure of convoy: Self propelled vessel + 1 Barge
- Capacity of convoy: 120 TEU (60 TEU per vessel: 10 x 3, double-stack)
- Annual capacity: 4,100 TEU / convoy 12,500 / total



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Cost situation base scenario

Relation:	**Krems - Constanta**	
Typ of vessel:	MCV + PL, capacity per 60 TEU	
Capacity of convoy	120	TEU
round-trip time	21	Days
Lump sum cost per round-trip	**€ 70,000**	

Utilisation	100%	**90%**	75%	50%
TEU per round-trip	240	**216**	180	120
Vessel cost per TEU incl. canal fees	291.67 €	**324.07 €**	388.89 €	583.33 €
Waterside handling fee per container	35.00 €	**35.00 €**	35.00 €	35.00 €
Pierage per TEU	5.00 €	**5.00 €**	5.00 €	5.00 €
Basic cost 20'	331.67 €	**364.07 €**	428.89 €	623.33 €
Basic cost 40'	628.33 €	**693.15 €**	822.78 €	1,211.67 €

Railway rate approx. €340/TEU €670/40‘

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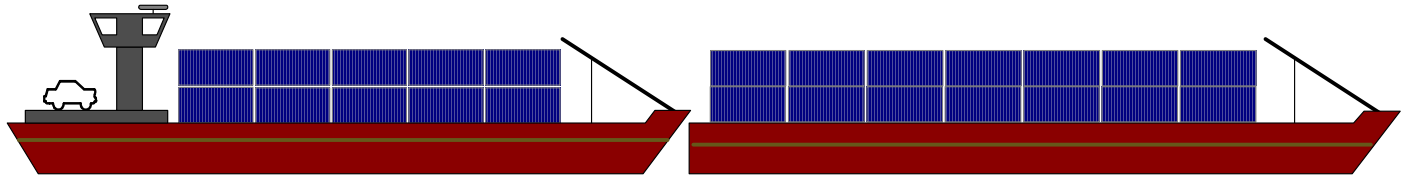
OPTIMISED SCENARIO: using adapted container vessels and 3 layers

- Roundtrip **Krems-Constanta-Krems** in 16 days
- Structure of convoy: Self propelled vessel (DDSG ‘Steinklasse’) + 1 Barge adapted for container transport (4 x 11 x 3)
- Capacity of convoy: 222 TEU (90 + 132 TEU, triple stack!)
- Annual capacity per convoy: 10,000 TEU



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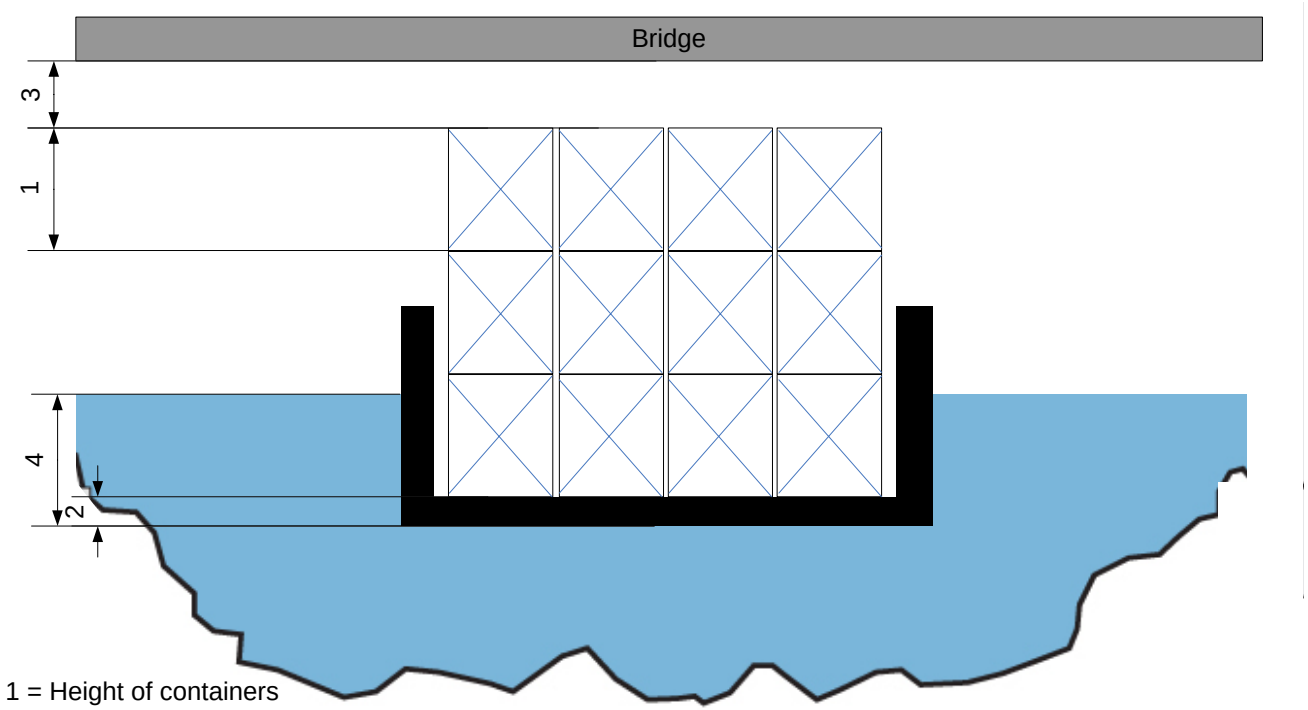
Vertical clearance situation



1 = Height of containers
2 = Double bottom
3 = Safety distance
4 = Draught

Only one critical bridge: Temporary railway bridge Novi Sad at HNWL

Cost situation optimised scenario

Relation:	**Krems - Constanta**		
Typ of vessel:	MCV + PL, capacity 90/132 TEU		
Capacity of convoy	222	TEU	
round-trip time	16	Days	

Utilisation	100%*	**75%**	50%
Cost per round-trip	€ 63,794	**€ 59,727**	€ 55,661
TEU per round-trip	444	**333**	222
Vessel cost per TEU	143.68 €	**179.36 €**	250.72 €
Canal fee per TEU	8.54 €	**11.39 €**	17.08 €
Waterside handling fee per container	35.00 €	**35.00 €**	35.00 €
Pierage per TEU	5.00 €	**5.00 €**	5.00 €
Basic cost 20'	192.22 €	**230.75 €**	307.80 €
Basic cost 40'	349.44 €	**426.50 €**	580.61 €

Railway rate approx. €340/TEU €670/40‘

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Chapter 4 – Analysis of Supply Chain Krems-Shanghai

- Deep-sea voyage to Hamburg plus Hinterland connection via shuttle train vs. Constanta plus Danube navigation
- Assessment in terms of duration, cost and environmental balance
- Target group ocean carriers: Results of interviews in Vienna, Budapest and Belgrade

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Russia
Norway
Estonia
Latvia
Lithuania
Belarus
Ireland
United Kingdom
Den-mark
HAMBURG
Nether-lands
Belgium
Germany
Poland
Ukraine
Luxembourg
Czech Republic
Slovakia
KREMS
Austria
Mol-dova
France
Switzer-land
Hungary
Slove-nia
Croatia
Romania
CONSTANTA
Bosnia and Herzego-vina
Serbia
Monaco
San Marino
Andorra
Portugal
Spain
Italy
Monte-negro
Bulgaria
Vatican City
Al-ba-nia
Mace-donia
Turkey
Greece
Morocco
Algeria
Tunisia
Malta
Cyprus
SUEZ (for Europe – Asia trade)
Israel

Transit time of total supply chain

IMPORT Shanghai -> Krems		Duration in days	EXPORT Krems -> Shanghai	
Hamburg + Rail	Constanta + IWT		Hamburg + Rail	Constanta + IWT
PORT of KREMS				
1,7	8,5	Hinterland connection (transport time rail resp. IWT incl. handling in inland terminals)	2,2	5,5
1,0	1,0	Seaport-time (Hamburg resp. Constanta)	1,0	1,0
27,0	23,0	Deep sea voyage (Direct service)	27,0	23,0
PORT SHANGHAI				
29,7	32,5		30,2	29,5
100%	*109%*		*100%*	*98%*

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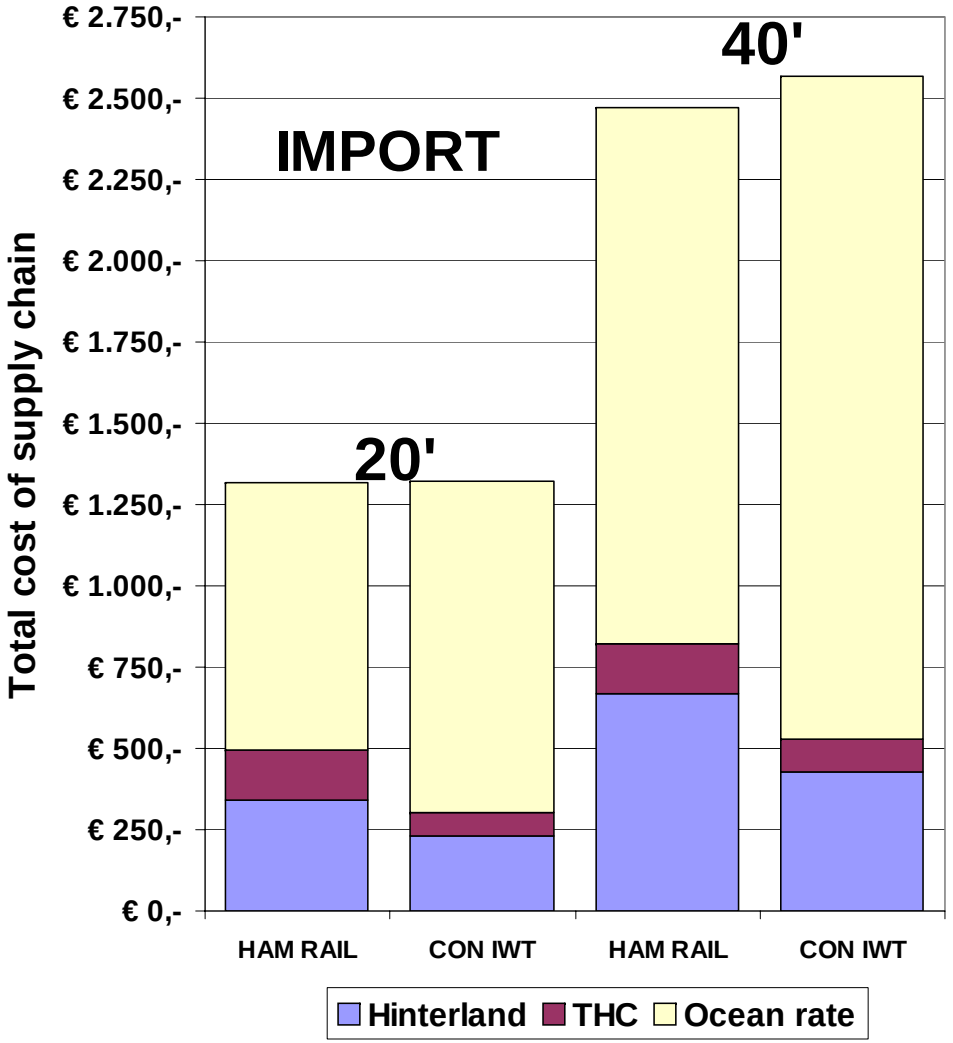
Cost comparison total supply chain (1)



Situation first quarter 2006:

Similar results due to high ocean rates from/to Constanta

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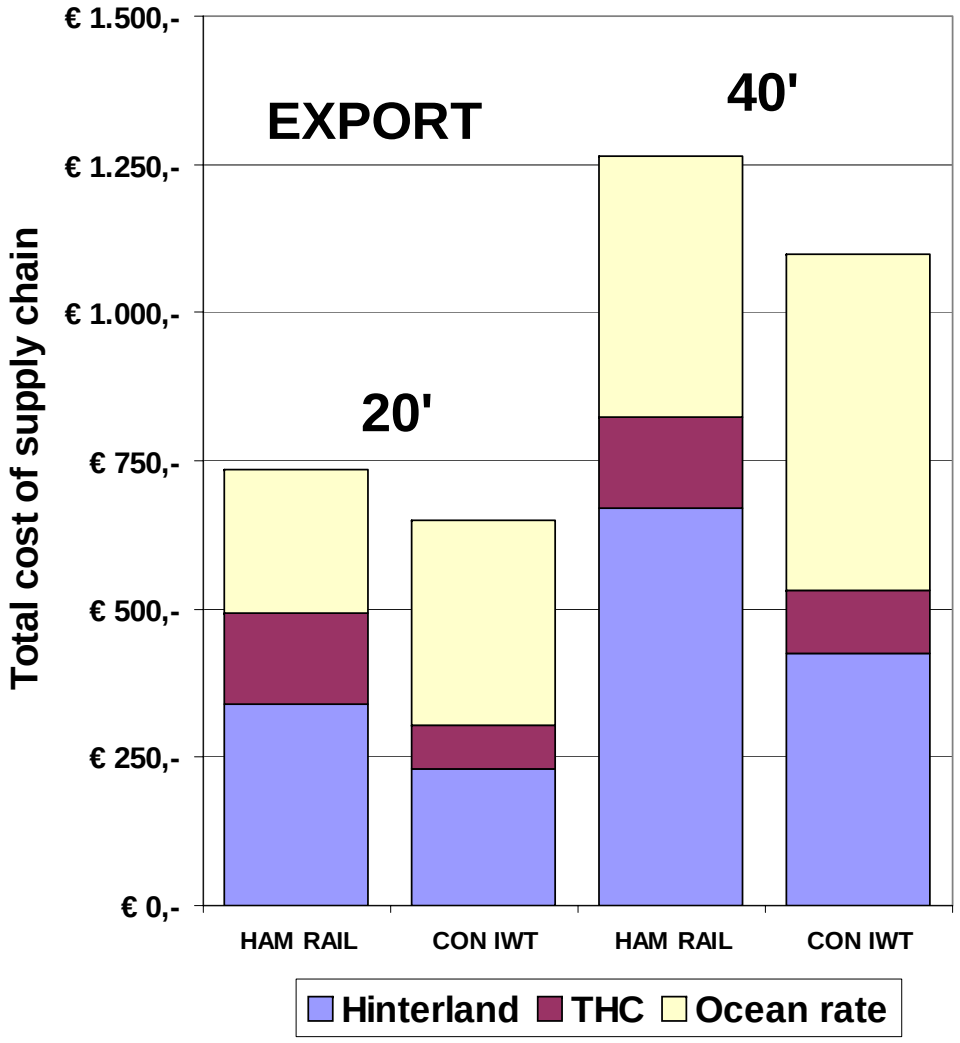
Cost comparison total supply chain (2)



Situation first quarter 2006:

Cost savings via Constanta + Danube 12-13 %

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Cost comparison total supply chain (3)

- **Assumption: convergence of ocean freight rates**
- Rate restoration North Continent, peak season surcharges, congestion problems
- Deletion of Bosphorus surcharge, increased competition within Black Sea, use of bigger deep sea vessels

⇨ significant <u>cost advantage</u> for
Constanta + Danube
Import: 11 to 14 %
Export: 20 to 23 %

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Environmental balance

TOTAL ENVIRONMENTAL BALANCE

CO_2 emission per container [kg]

	Hamburg + Rail	Constanta + IWT
SHANGHAI		
Deep sea	2,276.3	1,843.5
Hinterland	427.4	577.1
KREMS		
Hinterland	427.4	258.0
Deep sea	2,276.3	1,843.5
SHANGHAI		
Total	**5,407.2**	**4,522.1**
	100%	84%

16 % less CO2 per container!

Source: via donau

Conclusions

- **Alternative routing via Constanta and Danube highly attractive for trade between Asia and Central Europe:**
  - ⇨ Significant cost advantages when using specialised inland vessels
  - ⇨ Similar transit time for total supply chain
  - ⇨ Environmental balance very positive

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Next steps

- **Distribution of final report, speeches at national and international events**
- **Involvement of overseas shipping companies and large industrial companies**
- **Verification of inland navigation concept:**
  - Availability of Danube vessels?
  - Substitute transport (high/low water, ice)?
  - Continental cargo (silo and tank containers)?
  - Intermediate ports in Hungary and Serbia?
- **Utilisation of National (Austria, Romania…) and EU-funding (Marco Polo II)?**

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Final Report
available in German and English language

Download at
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resp.
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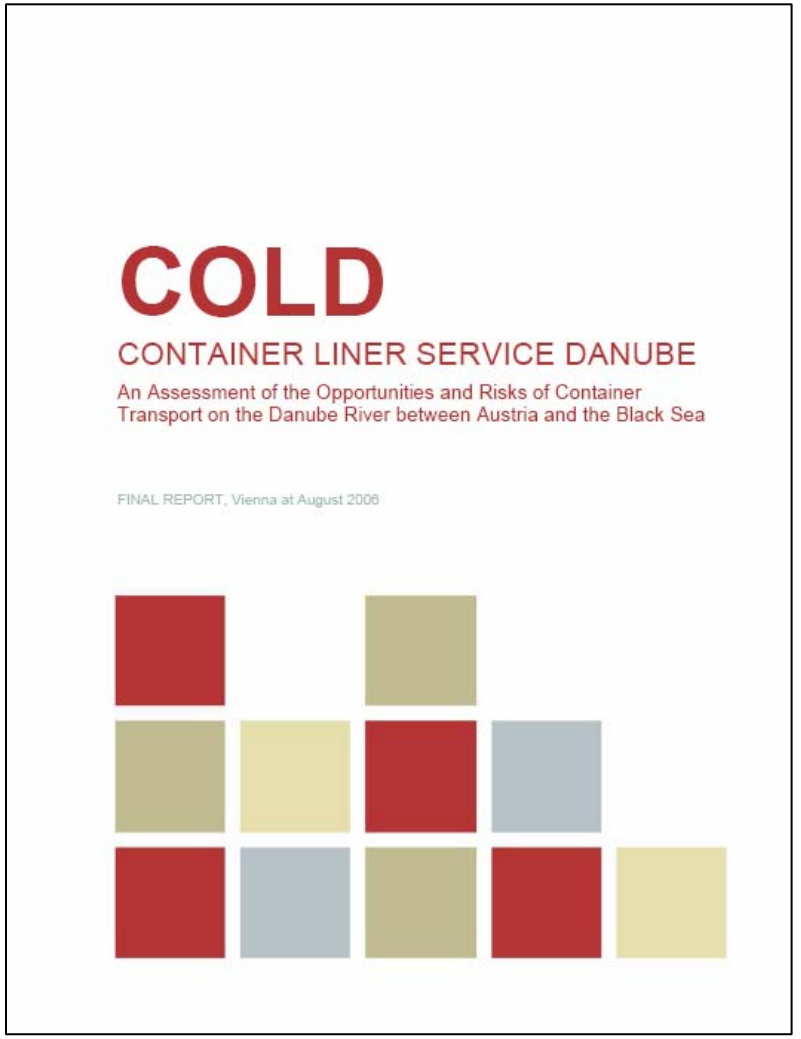

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Soon to come…also on the Danube

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