



Overview of Suez Canal Alternative Routes and Confrontations

الطرق الملاحية البديلة وتحديات قناة السويس

Captain / Mohamed
Essallamy
Maritime Research and
Consultation Centre
messallamy@gmail.com
+201001663580

Prof. D. Alaa Abdelbari
Vice President for
Postgraduate Studies
AASTMT

Prof. D. Tarek Elsayed
College of Engineering
and Technology
AASTMT

Outline

- ▶ Introduction
- ▶ Canal's alternatives and major competitors
 - Cape of Good Hope
 - Panama Canal
 - The Arctic Northern Sea Routes (NSR)
- ▶ Double Acting Ships Innovation
- ▶ Challenges and opportunities
- ▶ Conclusion and Recommendations



Introduction

- ▶ Suez Canal alternatives are mainly:
 - Cape of Good Hope
 - Panama Canal, and
 - Arctic Sea Routes
- ▶ The choice is among the 4 alternatives based on:
 - Distance (trips timing, and fuel consumption)
 - Trading routes (cargo from/to a region).





Cape of Good Hope

Cape of good hope

- ▶ Large draft ships particularly tankers may be operated around the Cape of Good Hope when transiting oil from the gulf region to Europe and North America.



Supertanker routes from the Gulf



Table 6. Crude oil transit via the Cape of Good Hope

million bbl/d	2011	2012	2013
Total flows	4.7	5.3	4.9
Eastbound	2.9	3.7	3.6
Westbound	1.7	1.6	1.3

Note: Estimates may not add up to their totals due to differences in rounding.

Source: U.S. Energy Information Administration analysis based on Lloyd's List Intelligence³⁵

Notes

- Data presented in the text are the most recent available as of November 10, 2014.
- Data are EIA estimates unless otherwise noted.





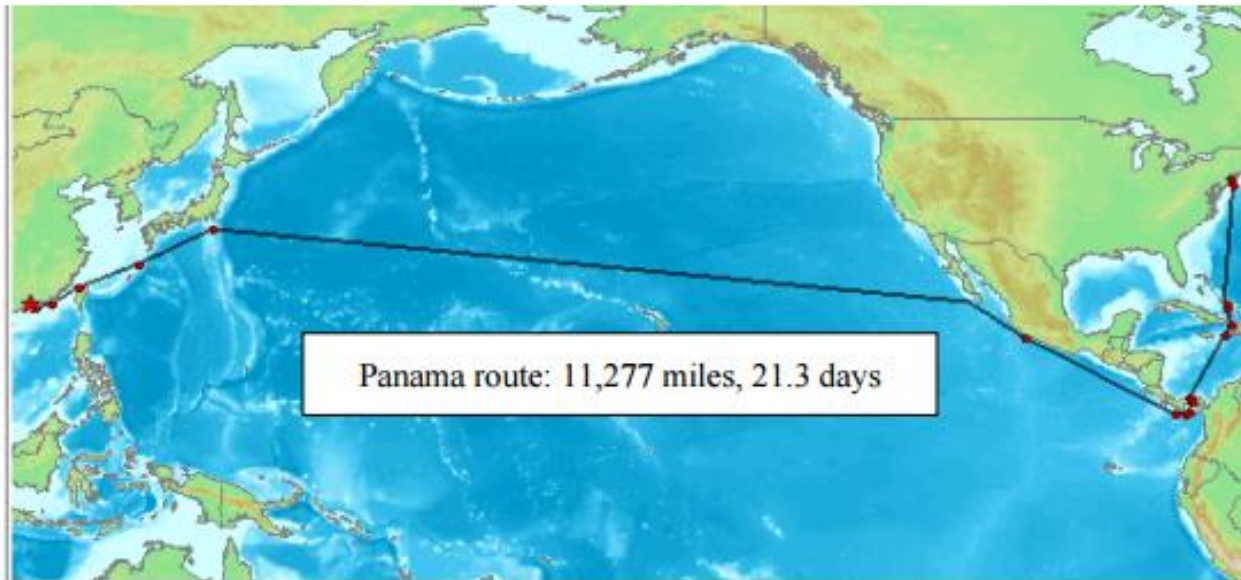
Panama Canal

Panama Canal

- ▶ Ship located east of Singapore may use Panama Canal when trading with the east coast of USA.
- ▶ Shanghai is first port in the world in container trade; a ship trading between china and east coast of the American continents would prefer the panama transits.



Hong Kong to New York Transit Times and Distances (in nautical miles at 22 knots)



THE CANAL CATCHES UP (FOR THE MOST PART)

A great majority of container-ship traffic will be able to use the new Panama Canal. The biggest ships, though, will keep to the other side of the world.

EARLY CONTAINER SHIP

17 meters wide
137 m long
9 m draft
800 containers

MAXIMUM SHIP SIZE, EXISTING LOCKS

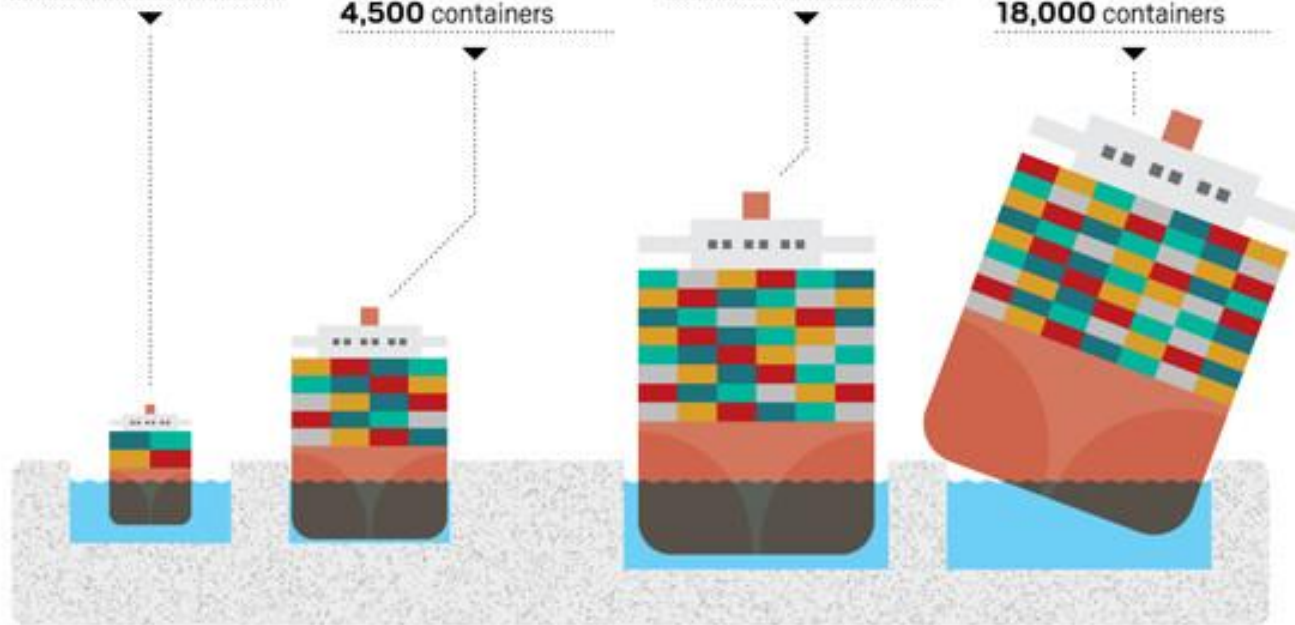
32.3 m wide
294.1 m long
12 m draft
4,500 containers

MAXIMUM SHIP SIZE, NEW LOCKS

49 m wide
366 m long
15.2 m draft
12,500 containers

THE LARGEST CONTAINER SHIP, MAERSK'S TRIPLE E

59 m wide
400 m long
14.5 m draft
18,000 containers



EXISTING LOCKS

33.5 m wide / 12.8 m deep / 304.8 m long

NEW LOCKS

55 m wide / 18.3 m deep / 427 m long

Sources: A.P. Moeller-Maersk, Hofstra University, Panama Canal Authority





Arctic Sea Routes

The Northern Sea Routes, NSR:

- ▶ Relatively new trading lines between:
 - Northern Far East countries and Norway via NSR in the Arctic Sea.
 - Alaska and east coast of the USA and Canada via the West sea passage.
- ▶ Navigation in ice became no more a myth.
- ▶ Double acting ships can navigate for long period of the year along these routes, carrying cargo and breaking a mild ice.





Figure 1-1: Arctic Ocean and coastal Areas.
Source: (Arctic Council, 2004)



Ice cap extent in 1979



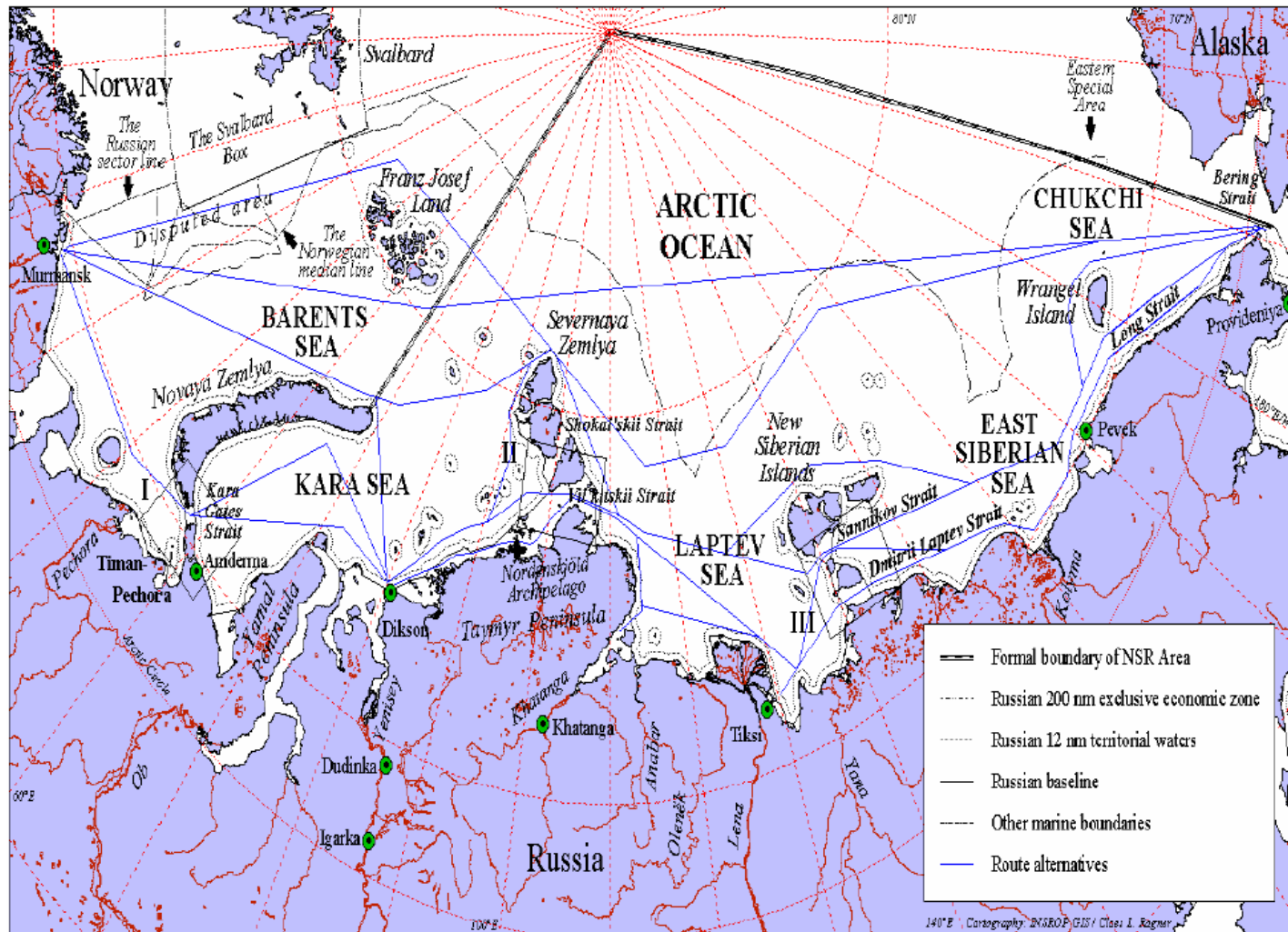


Figure 1-3: The NSR and the 200 Mile Economic Zone of the Russian Federation.
 Source: (Stepanov, Ørebeck, & Brubaker, 2005)



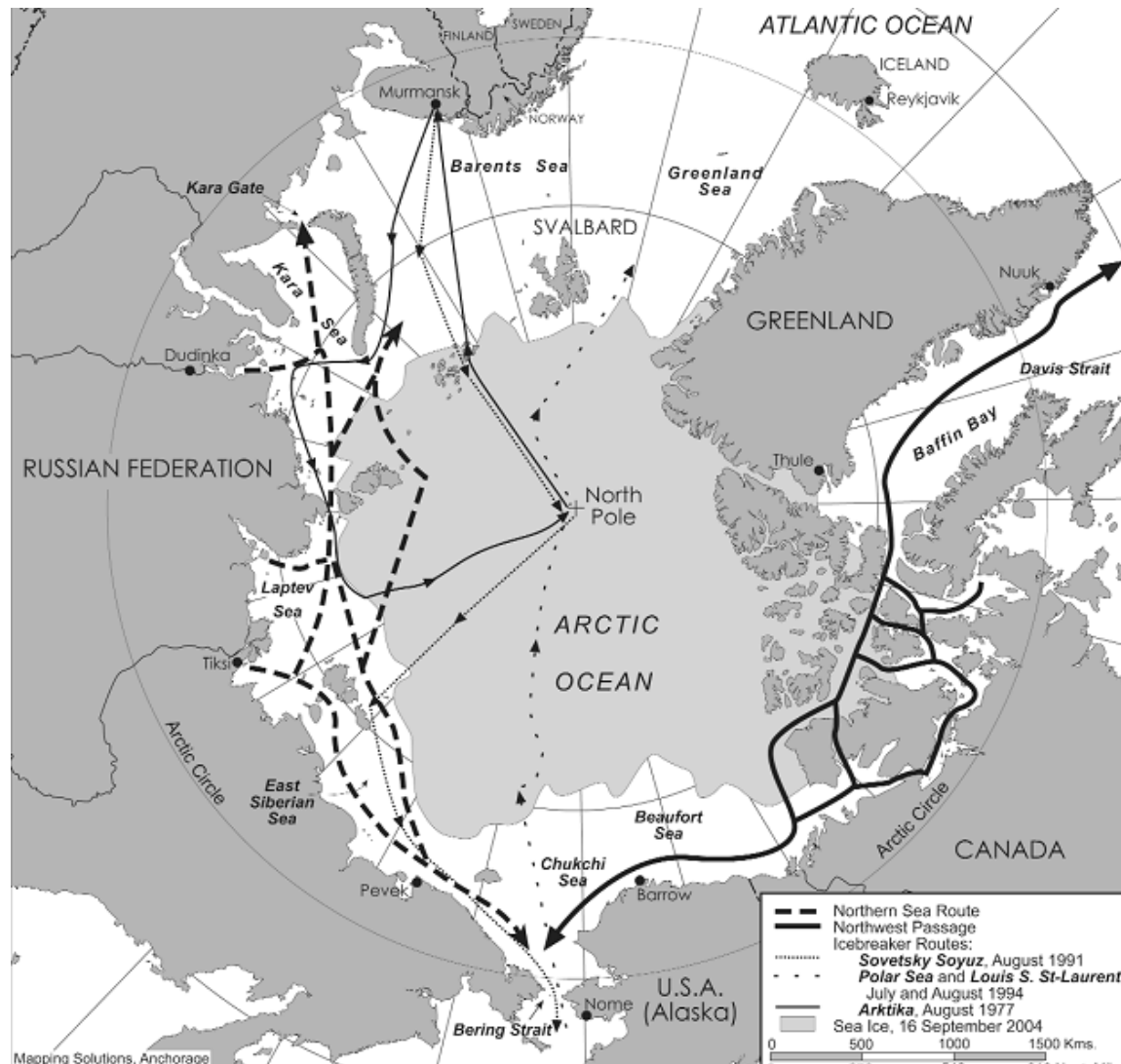
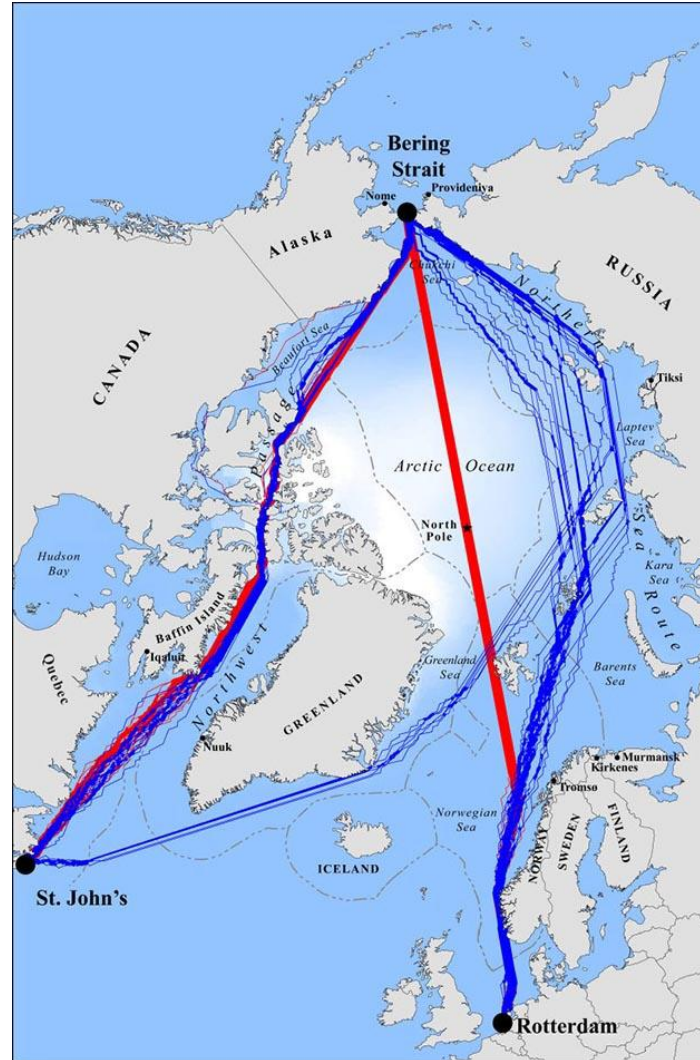


Figure 2-3: The Arctic Northern Sea Route and Northwest Sea Passages with the Ice Extents in 2004.

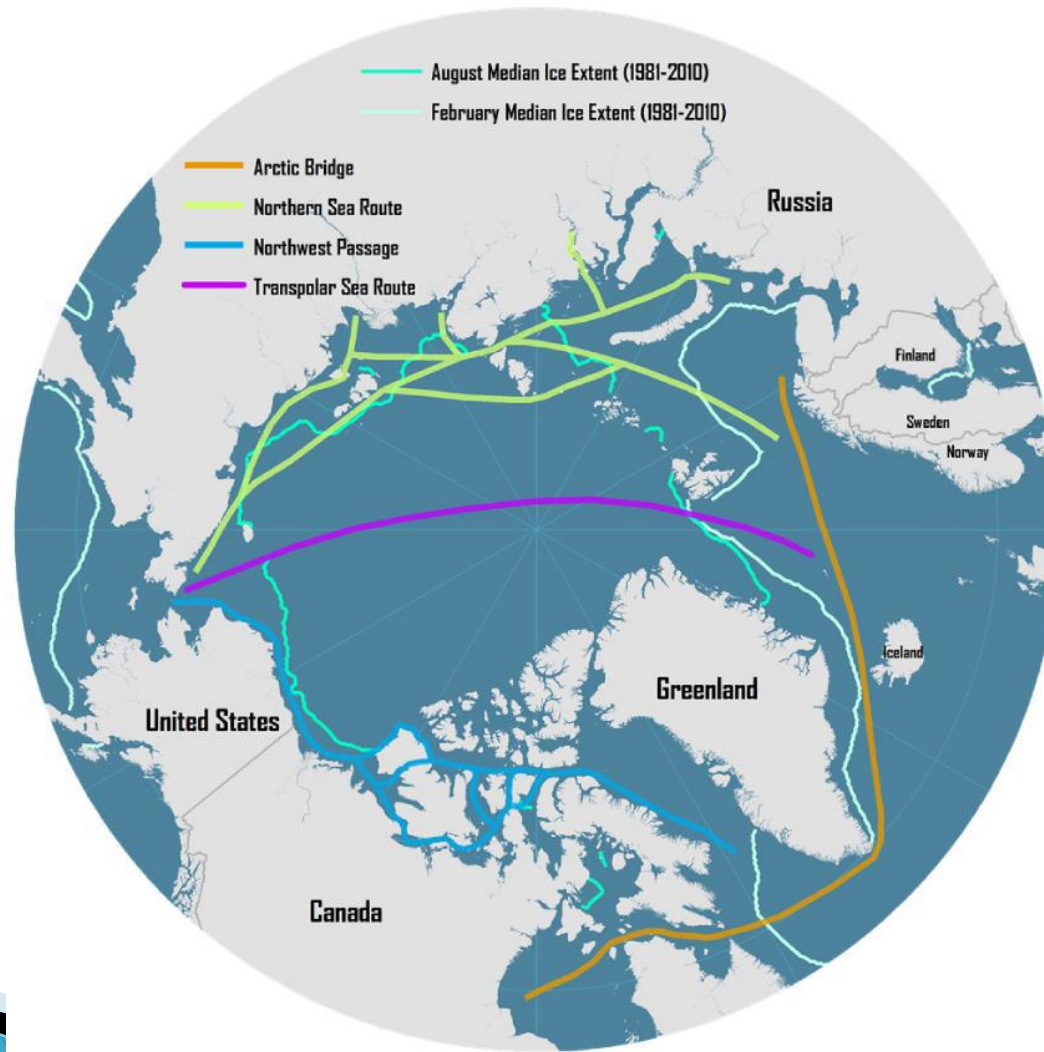
Source: Arctic Marine Transport Workshop 28-30 September 2004



DMI – ICE services



Arctic Routes and Bridge



Arctic Tourism



- Tourism in the Canadian North increased by 28.5% over 3 years.
- Cruise ships are opening up a new travel frontier.



5



Ice Class and On Order

Table 2-2: Ice-class Tankers in Operation and on Order Worldwide Deadweight Tonnage (DWT) in Million Tons in 2006.

	Current fleet		On order	
	No.	dwt	No.	dwt
Class 1A / higher	262	4.2 m	165	11.6 m
Class 1B / lower	735	19.3 m	69	3.9 m
Total ice class fleet <small>Source: ICGE (2006)</small>	997	23.5 m	234	15.5 m
Total tanker fleet	5825	344.0 m	1295	90.9 m



From Arctic to Panama

Arctic Shipping – Montreal 2017



Environmentally Acceptable
Lubricants for Arctic conditions

PANOLIN®
Swiss Oil Technology +



Vessel type*

- Oil tanker: 320K ton
- Container ship: 8,500 TEU, 100K ton

Vessel speed*

- Oil tanker: 16 knot
- Container ship: 26 knot

Fuel consumption*

- Oil tanker: 111 ton MFO/day
- Container ship: 245 ton MFO/day

SSR

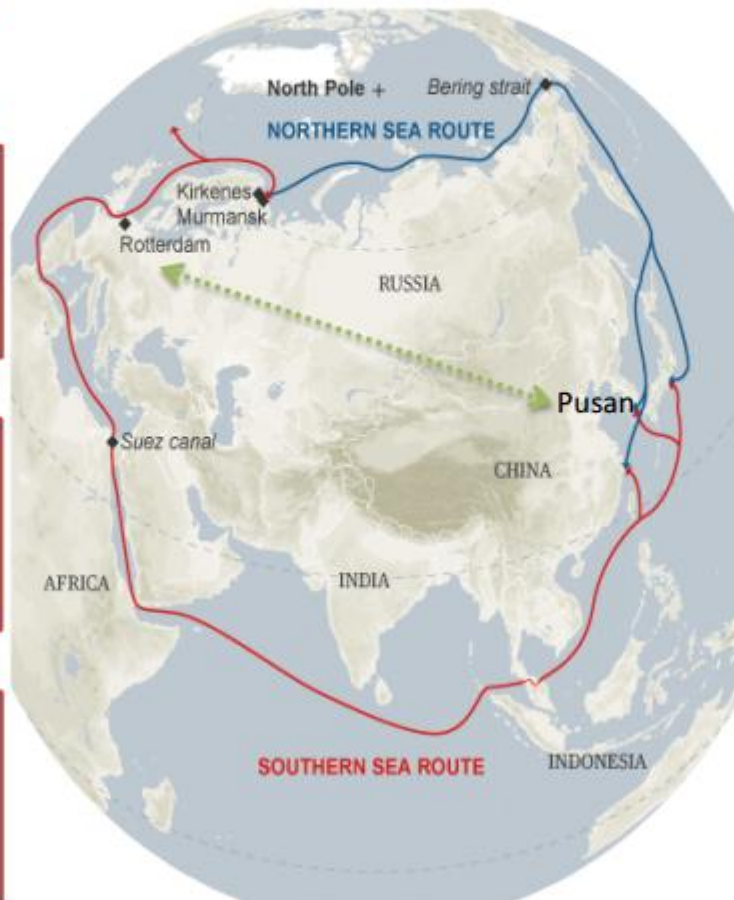
Distance **10,754 nm**

Time

Oil tanker: **28 days**
Container ship: **18 days**

Fuel

Oil tanker: **3,108 ton MFO**
Container ship: **4,410 ton MFO**



NSR

Distance **36.2**

Oil tanker: **18 days**
Container ship: **11 days**

Oil tanker: **1,998 ton MFO**
Container ship: **2,695 ton MFO**



Northern Sea route and current route



Figure 2. Comparison of Northern Sea Route and South way, from [10]

Destination	Via Suez Canal			Through Northern Sea Route			Days Saved
	Distance, Nm	Speed Knots	Days	Distance, Nm	Speed Knots	Days	
Shanghai, China	12050	14.0	37	6500	12.9 ^{xxviii}	21	-16
Busan, Korea	12400	14.0	38	6050	12.9	19.5	-18.5
Yokohama, Japan	12730	14.0	39	5750	12.9	18.5	-20.5

Source: Tschudi Shipping Company A/S

Table 1. Distances and potential days saved for Asian Transport from Kirkenes (Norway) and Murmansk (Russia). From [15] with reference to [13]

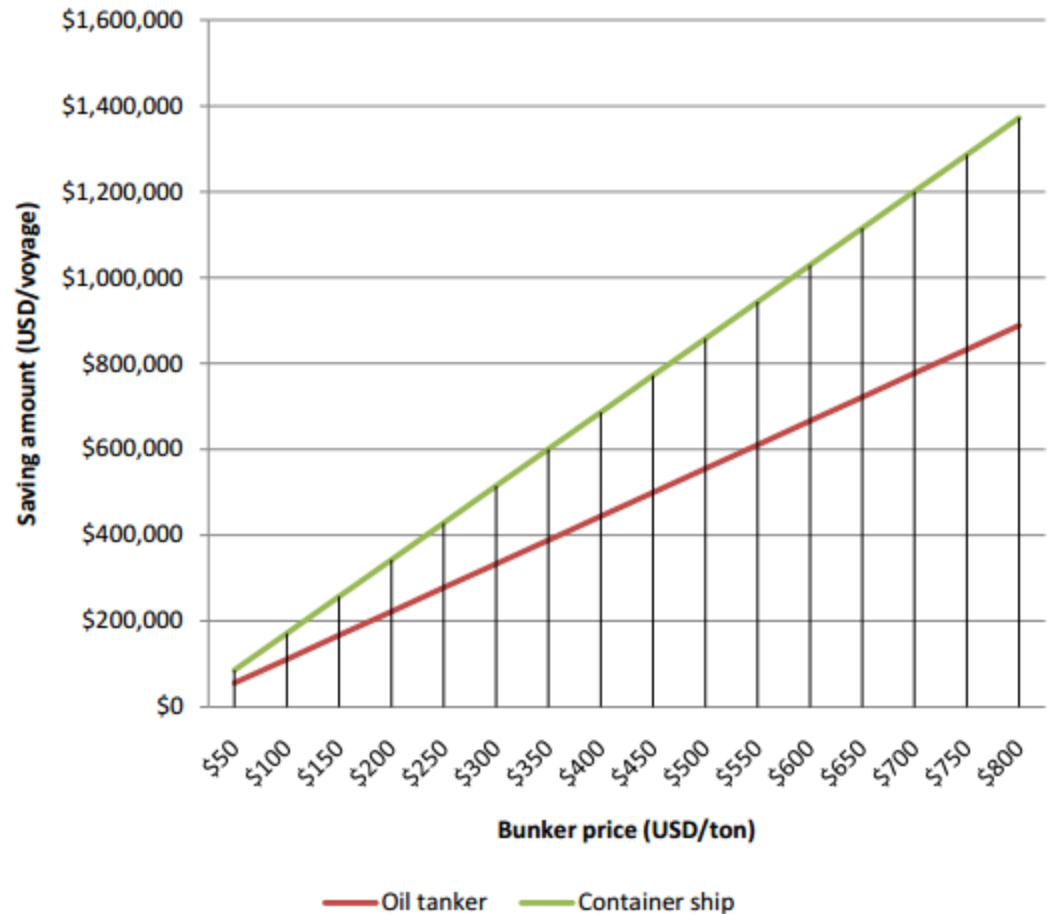


NSR Effects

2) Fuel cost

- In the case of the use of NSR compared with SSR
 - Oil tanker: 36% saving/voyage
 - Container ship: 39% saving/voyage
- If bunker price increases, the amount of saving increases

<http://www.esi.nus.edu.sg/docs/event/jan9-cho.pdf>





Introduction of double acting ships

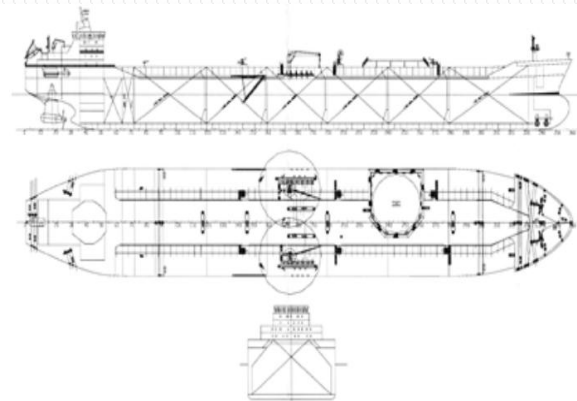
Ships that can break ice and carry cargo

Traditional ice breaker bow



Double Acting Ships Technology

- ▶ Development in navigation, steering and propulsion technologies increased the probability of the use of the ice invested waters in shipping trade.
 - Ordinary merchant vessels designed to navigate through only open or ice free water; they may be fitted with bulbous bow to reduce water resistance, increase speed and decrease fuel consumption and exhaust emission. On the other hand, ice breakers are built with inverted special design bow that can break ice under weight of breakers, but in open water they consume more fuel than traditional ships.



Double acting tanker diagrams and while breaking ice while moving astern
Source: North Meets North, 2006

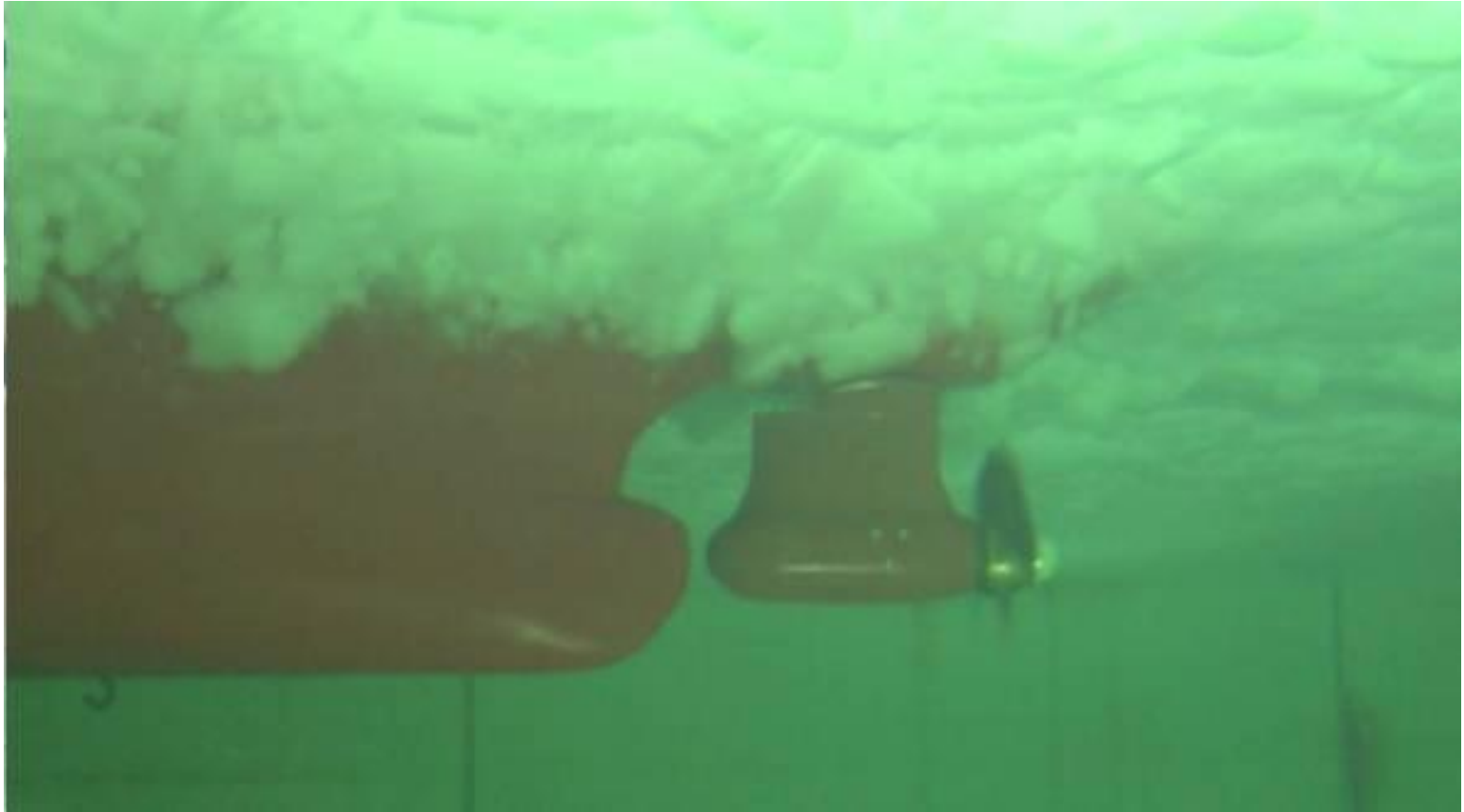
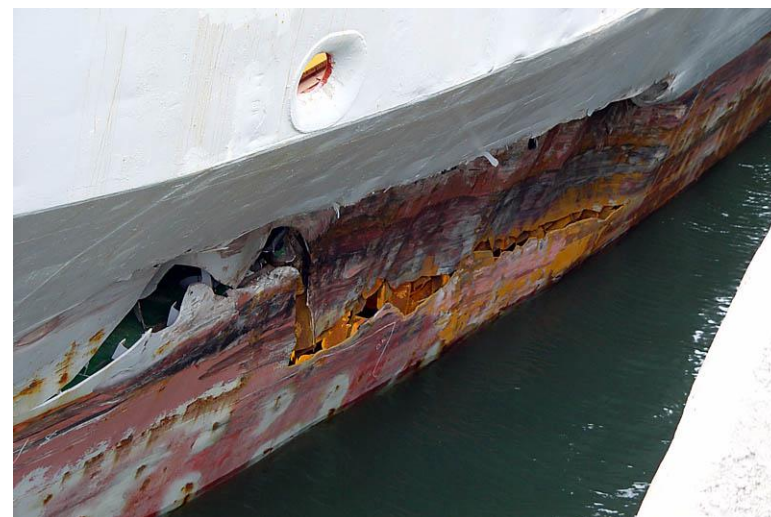


Figure 2-5: DAS Ship With Azipod Moving Astern to Break an Ice Layer.
Source: (Wilkman, n.d.)

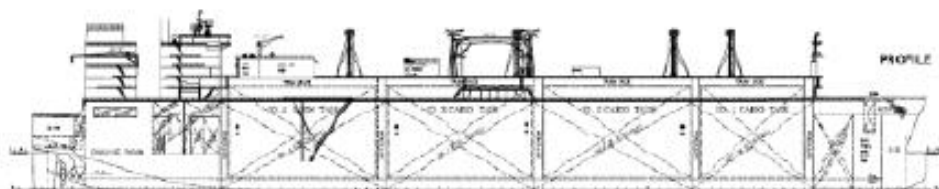




Figure 3-2: A Bilge Keel Rupture and Propeller Damage of Ship Number 100.
Source: (Hänninen, 2003)



Introduction - Concept of Arctic LNG Carrier



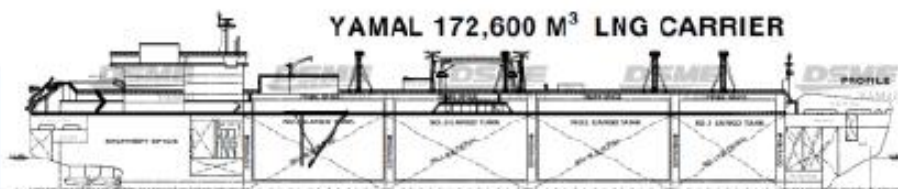
a Conventional LNG Carrier



an Icebreaker

It's an High Ice-Class Double-Acting LNG Carrier

YAMAL 172,600 M³ LNG CARRIER



Astern first in
hard ice condition

Ahead first in
open water and
light ice condition

Economic aspects and region importance

- ▶ Large quantities of cargo are shipped:
 - along the Arctic Routes
 - To other neighboring countries i.e. EU, Canada and USA.
- ▶ Iceland is also undergoing pursuit research to create hub ports for transshipment of cargo.





SCZone Development internal challenges and Opportunities

Bunker prices delivery in Suez Region

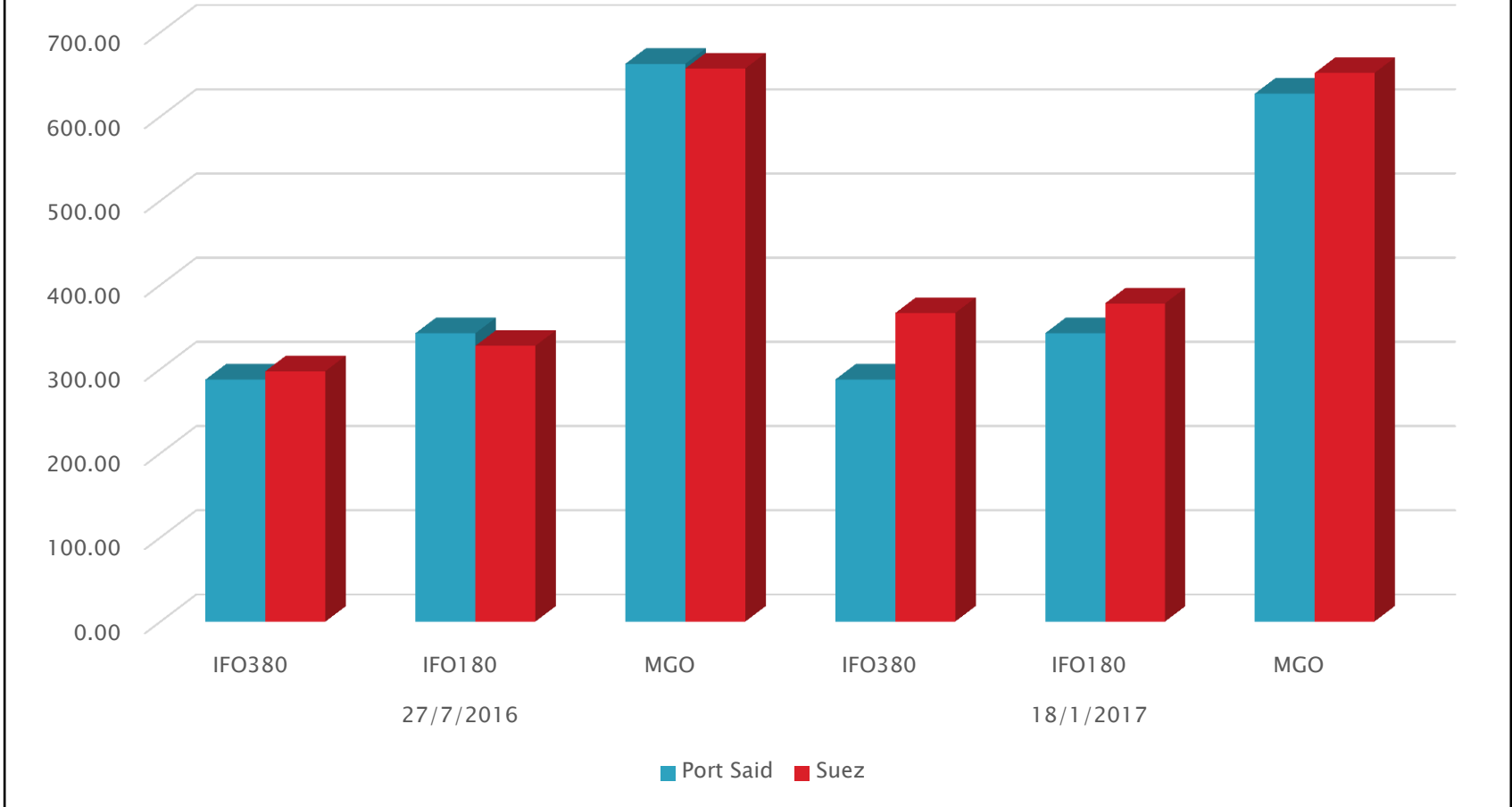


Figure 9: Bunker prices per type delivery in Port Said and Suez

Source: Ship and Bunker - news and intelligence for the marine fuels industry, 27/7/2016 & 18/1/2017

Bunkering prices Suez Region and Int' Average

IFO380 IFO180 MGO

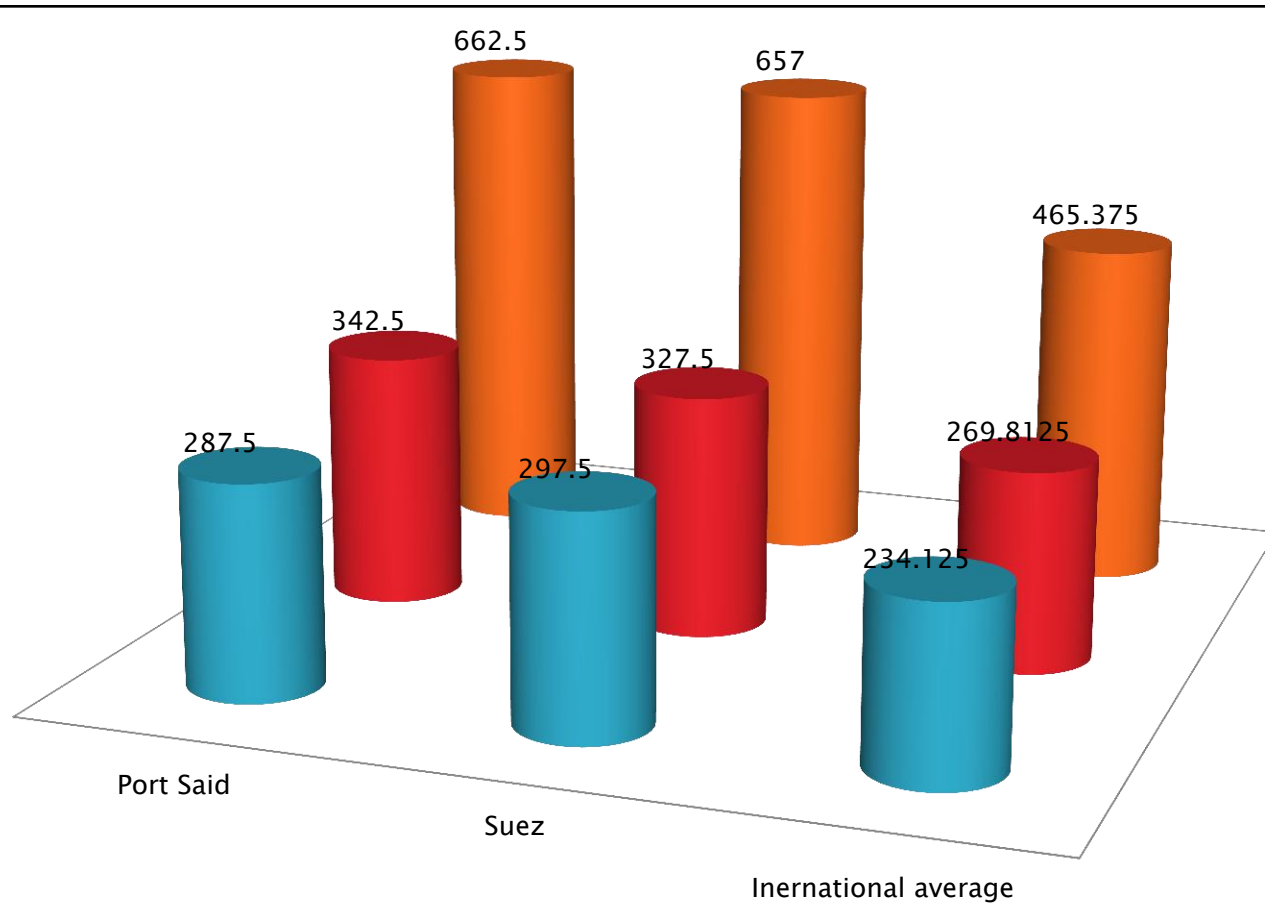


Figure 10: Bunker delivery prices in Suez region compared to the international average

Source: Based on Ship and Bunker - news and intelligence for the marine fuels industry, 27/7/2016

Conclusion and Recommendations

- ▶ Developments in Suez Canal competitors are accelerated significantly and development in ships' design and size are currently much higher than before.
- ▶ Services introduced to ships passing the canal are surely the one solution to be adopted.
 - Bunkering services are one of the solutions to be done and promising solution.



Conclusion and Recommendations

- ▶ Enhancing the infrastructure and management of national companies in many fields of services introduced to ship beside the Canal transit.
 - For example, alike international container shipping companies, bunker national bunker suppliers can merge to survive.



Conclusion and Recommendations

- ▶ **National law** --- **hired ships** to supply and to be operated in Egyptian waters,
- ▶ Petroleum products prices -- open for demand and supply.
- ▶ **Floating storage** product tanker and new small bunker barges.
- ▶ Annex VI of MARPOL.
- ▶ As delivery of bunker will be in foreign currency, taxes and dues should be as well in the same.
- ▶ Free money transfer should be granted.





Questions