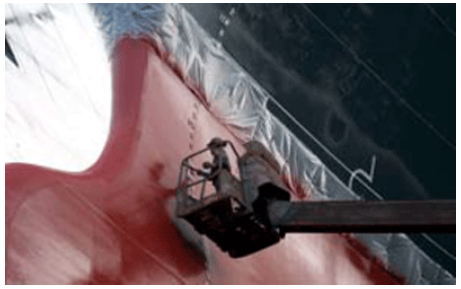
EDPI

Empresa de Docagens Pedra do Ingá

Demand Analysis
A Case Study



BBDC Brasil Basin Drydock Company, SA

BBDC

- *Introduction*
- *Backstory: Brazil & Ship Repair*
- *Empresa de Docagens Pedra do Ingá - EDPI*
- *Demand Analysis Challenge*
- *Remotely-Sensed Information*
- *Summary*

Introduction

McQuilling Partners *is a privately-owned marine services company, providing transportation services to clients in the shipping, commodity and financial services industries. McQuilling Partners is a respected tanker specialist globally and is one of a select few firms that sit on both the International and the Asian Baltic Exchange Tanker Route panels. McQuilling Partners facilitates the physical transportation of liquid and dry bulk commodities annually through the provision of brokerage services and provides coverage in the wet freight derivatives market for all the traded routes. The firm has assisted numerous clients in the sale or purchase of marine assets, and advised them on their directed research and consulting requirements. Today, McQuilling is a privately held firm numbering over 160 people, specializing in the marine transportation of commodities for a global client base. Representing broad commercial experience in the international shipping markets, McQuilling provides professional, reliable and personalized service to clients from offices located in New York, Houston, Caracas, Lima, Mexico City, Rio de Janeiro, Athens, Dubai, Mumbai, New Delhi and Singapore*

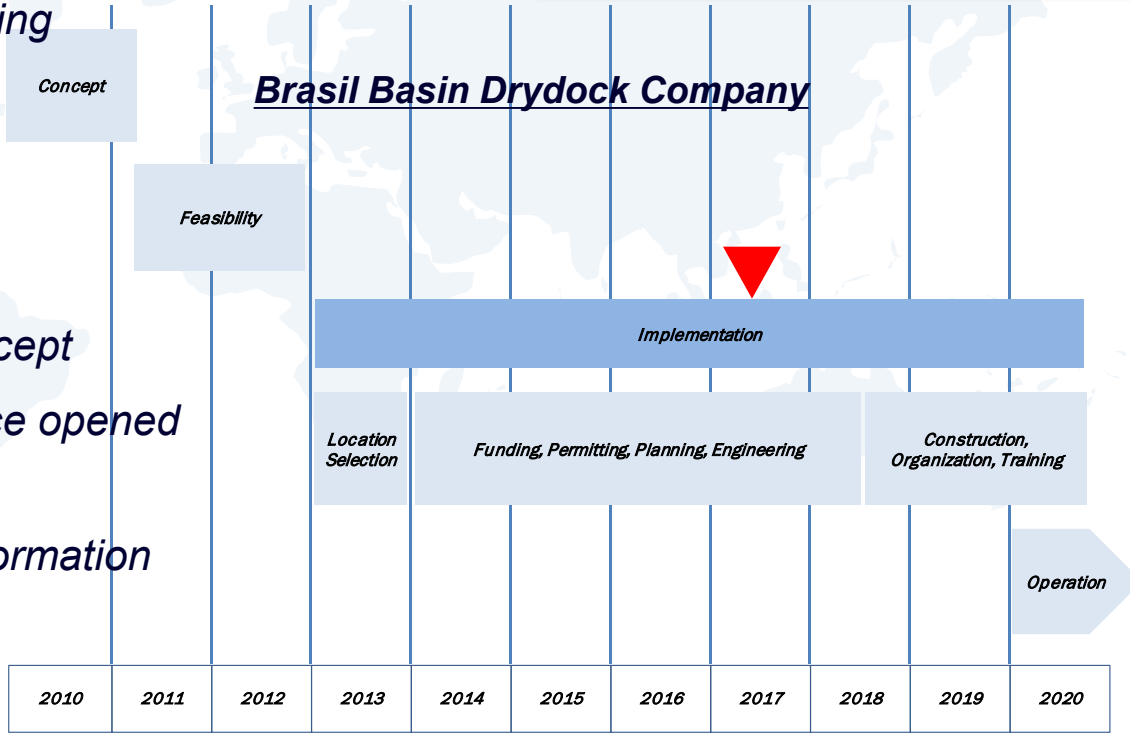
McQuilling Services *is the marine transportation consulting and advisory group of McQuilling Partners, Inc. The primary focus of McQuilling Services is to provide clients commercial consulting services related to global seaborne transportation and related disciplines in the supply chain. The approach of the Company is to develop products and services based on specific client requirements, data, and the systematic employment of quantitative methods, bringing individually crafted solutions to client's needs. The Company employs a collaborative business model combining experienced internal resources with exceptional industry partners to produce a team of directed experts. This model creates a targeted, content-rich knowledge and experience base to serve clients' needs cost effectively.*

Backstory: Brazil & Ship Repair

McQuilling / Brazil:

- **1980's** – Petrobras Account - Chartering
- **1998** – Petrobras Account – S&P & Consulting
- **2000** – Transpetro Consulting
- **2010** – BBDC Project Concept
- **2012** – Rio de Janeiro office opened
- **2016** – BBDC Company Formation

Brasil Basin Drydock Company



Backstory: Brazil & Ship Repair

Ship Repair:

- *The ship repair industry represents a US $20 billion global market; Ship repair is a geographically dispersed activity, in consonance with the importance of location for winning repair business; ordinary repairs tend to be carried out near the ship operating routes*
- *Over 90% of world trade is transported by ships; Growth in world trade is slowing, but the world merchant fleet continues to expand, albeit at a slower pace*
- *Each merchant vessel in the world must be drydocked at least every 5 years and on average every 2-3 years in order to maintain international regulatory compliance; Apart from drydocking, vessels require ship repair yards for fixing collision damage, grounding damage, severe weather damage as well as newbuilding faults and installation of capital items (BWT systems, Scrubbers, etc.)*
- *Ship repair is a capital intensive business with capacity utilization of fixed assets (drydocks) a key success factor*
- *Ship repair yards are generally price-takers, implying a global surplus of the supply of drydocking & repair services; However, trade logistics introduce positioning costs that create regional demand opportunities*
- *The vast majority of ship drydocking and repair contracts are negotiated on a spot basis, making the investment decision dependent on an extremely robust characterization and quantification of drydocking demand*

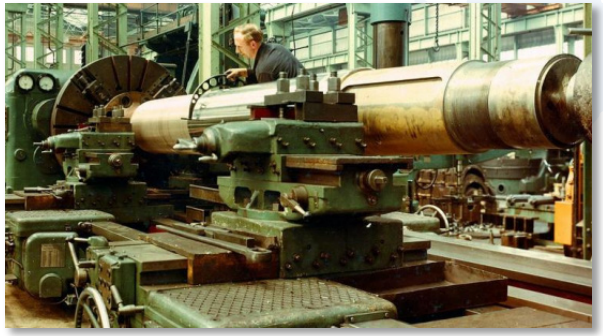
Ship Repair Success Factors

Ship repair can be a labor intensive business, especially for older vessels, pushing work towards low cost regions for these inputs (China, Asia, Middle East).

For routine maintenance & repairs and surveys or repairs involving more complex work, competition is more dispersed.

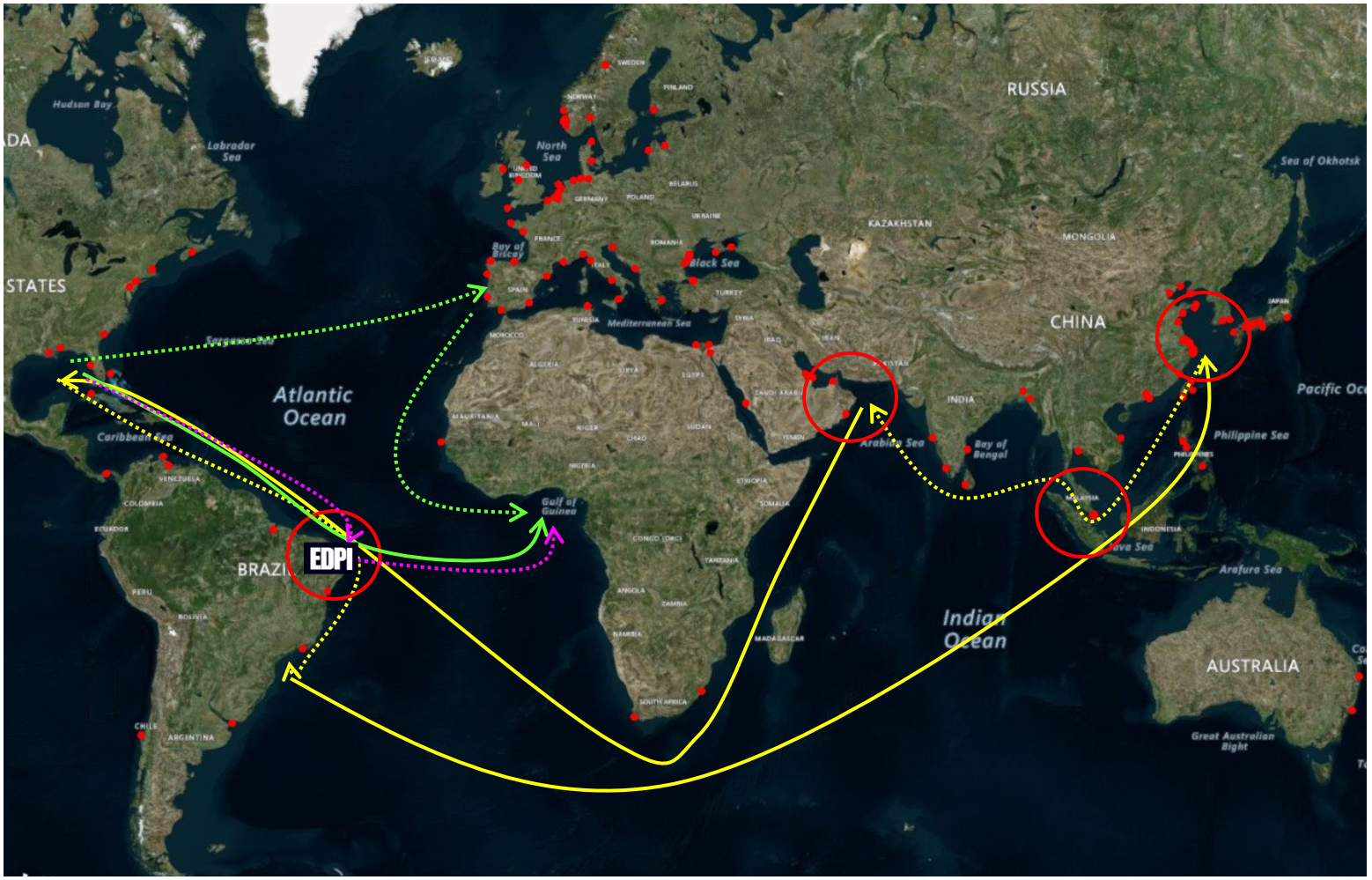
Four factors play a major role in winning the repair contract: proximity, price, promptness and performance.

Proximity	► *Positioning costs diverting ships from their normal routes*
Price	► *The cost of the repair specification work scope quoted*
Promptness	► *The timing & the elapsed time in the shipyard needed to perform the work*
Performance	► *The reputation of the yard in terms of quality & reliability*



Backstory: Brazil & Ship Repair

Key Success Factor - Proximity



BBDC

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Empresa de Docagens Pedra do Ingá - EDPI

- ✓ *Ideal location proximate to global shipping lanes*
- ✓ *Close to major metropolitan areas & industrial centers*
- ✓ *Developed port, protected harbor, deepwater channel*
- ✓ *Existing overland transportation infrastructure*

	Population (2013 Est.)	Distance (km)
Natal	854,000	138
Cabedelo	65,000	0
João Pessoa	770,000	20
Recife	1.6 million	121
Suape	15,000	177

Empresa de Docagens Pedra do Ingá - EDPI

Lucena, Paraíba

- ***Yard Area:*** *~ 600,000+ m² ~ workshops, offices, canteen, changing centers, repair parks*
- ***Docks****: 2 docks, ~ nominal 40 drydockings per dock per year, large dock optimized by nesting*
  - *Dock 1: 450 m x 80 m*
  - *Dock 2: 370 m x 60 m*

- ***Community Center:*** *Training facilities, recreation areas, medical center*
- ***Green Belt:*** *~ 200,000+ m² ~ Native and re-established flora*
- ***Water Treatment:*** *MARPOL Tank Cleaning Station / Shipyard effluent treatment*
- ***Piers****: 2,200 meters quay, 7-8 repair berths*
- ***Ship Lift/Transfer Facility:*** *Offshore & small vessel facility*
  - *180 m x 30 m*
  - *Maximum 7,500 lightship tons*

The objective is to establish a world-class ship repair facility in Brazil capable of drydocking any vessel in the world merchant fleet; EDPI will be the largest facility in the south Atlantic basin purpose-built for ship repair and drydocking

Founding principals McQ International, Inc., New York and Promon Engenharia, Rio de Janeiro, are managing the US$ 872 million (R$ 3.2 billion) project, to be funded by approximately US$ 174 million (R$ 638 million) investor's equity and leveraged with a US$ 698 million (R$ 2.56 billion) local / international financing structure with additional funding from operations

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Demand Analysis Challenge

The EDPI facility is a major marine infrastructure project to be built in Brazil; Both the equity investors and the banks seek comfort from a long term, predicable revenue stream.

- *All spot revenues in ship repair – few contract opportunities*
- *Lack of understanding of the shipping and ship repair industries*
- *Lack of investor confidence in traditional market share development approaches*
- *Perceived global surplus in repair industry, lack of appreciation of regional demand opportunities*

+ *Global drydocking demand is a mathematical calculation*
+ *Good source data from commodity trade statistics*
+ *The emergence of accurate, reliable remotely-sensed vessel position data*

In the absence of contracts, a robust demand assessment is critical

Demand Analysis Challenge

Methodology

HOW MUCH ($) ?

HOW MANY (#) ?

- Global market potential
- Regional market potential
- Regional market share
- Regional Annual estimated throughput – # of vessels

✓ Database of ship repair invoices;
✓ Price points by ship type, size, region

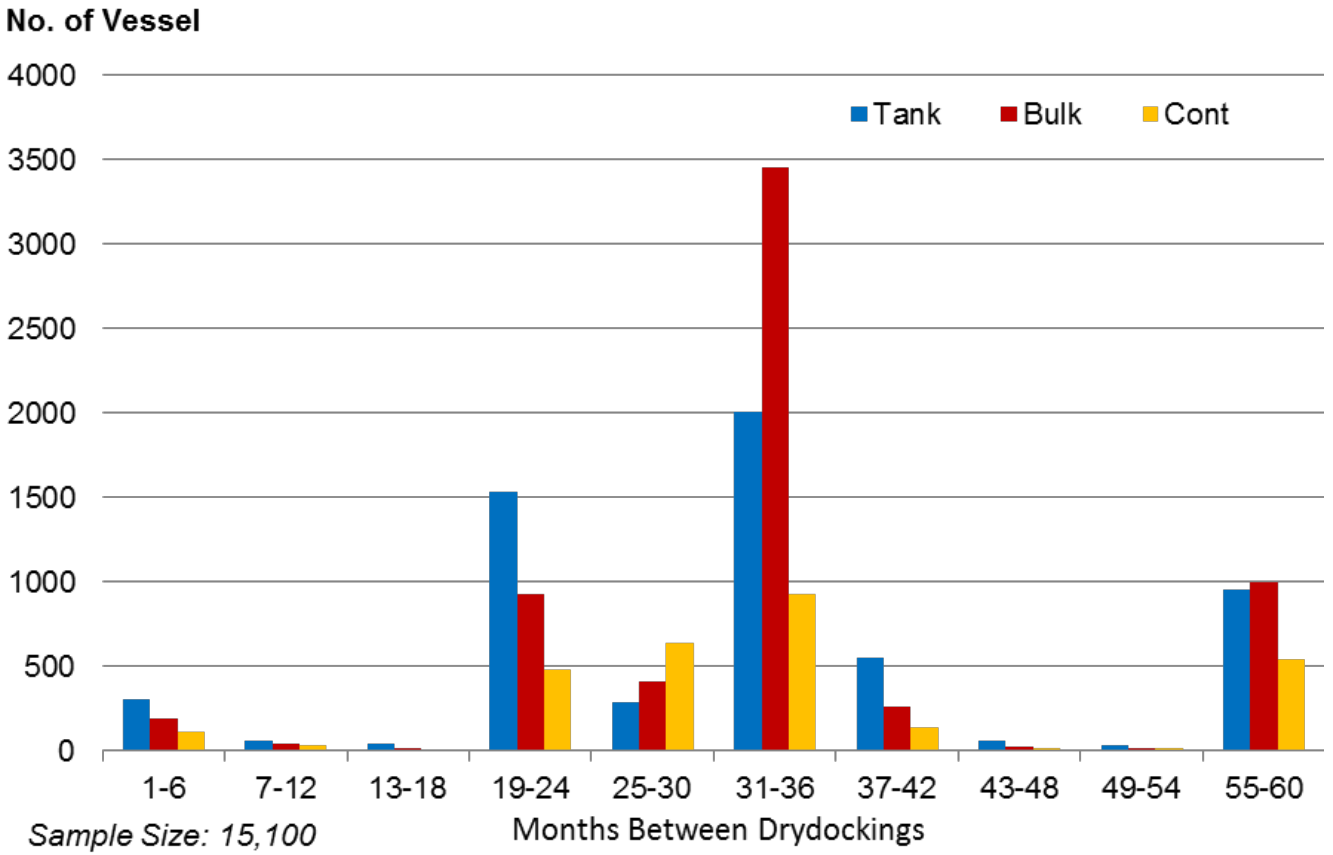
- *Targeted approach rather than top-down: methodology estimates specific major demand components based on identified vessels, or specific marine transportation requirements that require vessels, and sums these individual components together to arrive at an estimate of total demand*
- *Using a targeted approach produces a conservative demand estimate that almost certainly understates actual demand, but represents demand that is highly likely to actually materialize; it is not a collectively exhaustive process but identifies demand minima for the markets evaluated*
- *The importance of classification and grouping is seen when trying to identify segments of demand and how best to analyze them.*

Annual Revenues Estimate

Demand Analysis Challenge

Global Market Potential

Historical drydocking interval data in the world merchant fleet indicates that while regulatory requirements dictate maximum drydocking intervals of 5 years, most vessels drydock every 2-3 years. As vessels get older, the drydocking interval decreases.



Demand Analysis Challenge

Global Market Potential - Demand Analysis - Global Merchant Fleet

2017, 10,000+ Dwt, No. of Vessels,*

	Dwt	TANK	BULK	CONT	OFF SHORE	TOTAL
SMALL	< 27,500	1,562	919	1,589	8,552	12,622
MEDIUM 1	27,500-40,000	656	2,013	636	29	3,334
MEDIUM 2	40,000-55,000	1,609	1,210	650	7	3,476
LARGE	55,000-75,000	392	2,458	564	70	3,484
CAPE-AFRA	75,000-120,000	998	2,083	721	7	3,809
CAPE-SUEZ	120,000-200,000	522	1,068	338	1	1,929
VERY LARGE	> 200,000	691	426	9	0	1,126
TOTAL**		6,430	10,177	4,507	8,666	29,780

In total, the global merchant fleet numbers about 64,000 vessels. All of these vessels must be drydocked at least once every five years.

*Counting **only** tankers, bulk carriers, containerships and offshore supply vessels, the annual drydocking market potential in the south Atlantic basin is about 1,600 vessels*

** Except for offshore sector*

*** Plus 4,201 non-TANK/BULK/CONT vessels, plus 34,162 vessels < 10,000 Dwt, equals 68,000+ vessels*

About 30% of world merchant fleet in south Atlantic trade lanes

Regional Market Potential - Demand Analysis - South Atlantic Basin

for Ship Repair & Drydocking, 2022

		TANK	BULK	CONT	OFF SHORE	TOTAL
Repair Candidates	All	1,811	5,192	539	596	8,138
Drydocking Candidates	All	361	1,038	107	149*	1,655

** 4-year D/D cycle*

South Atlantic Basin

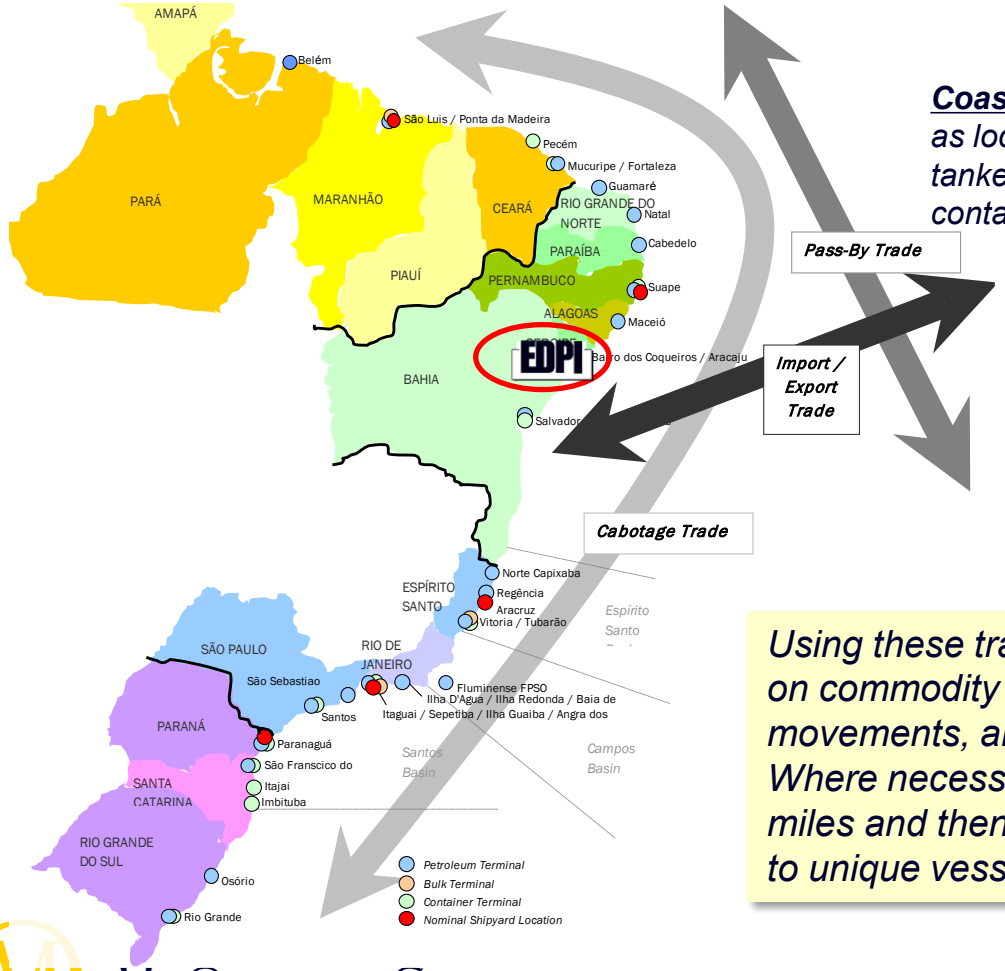
EDPI *Ship Repair Market*

** Demand potential for about 40 drydocks at 8-9 day drydock periods basis 5-year docking cycle*

Demand Analysis Challenge

Regional Market Potential - Development

Historical marine trade data for crude oil and products, vegetable oils, grains, ores & minerals and containers transiting the south Atlantic basin identifies three types of trades existing in the region:



Coastal Brazilian (cabotage) trading *such as local fuel or oilseed deliveries, shuttle tankers, offshore services vessels and container lines*

Import/export trading *to transport crude and/or products, coal iron ore exports and oil seed exports*

Pass-by In-Transit trades *transporting bulk commodities to/from North & South America, Europe and Africa.*

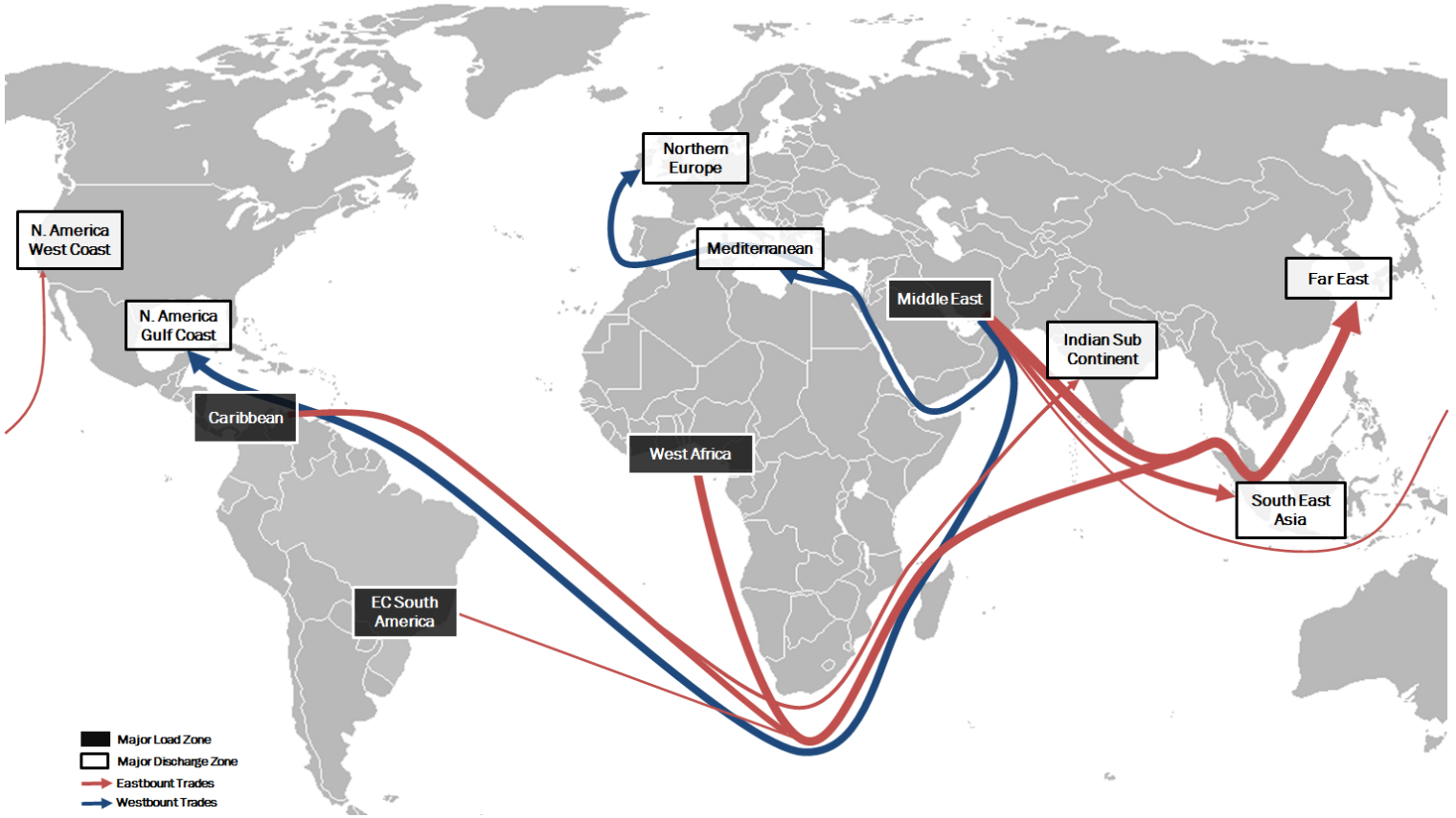
Using these trade classifications, we then took source data on commodity trading to identify and quantify trade movements, and the underlying vessel demand implied. Where necessary, we transformed cargo volumes into ton-miles and then to equivalent vessels, and restated port calls to unique vessels trading in the south Atlantic basin.

Demand Analysis Challenge

Regional Market Potential - Development

Major Trades – Tankers – Global Oil Movements

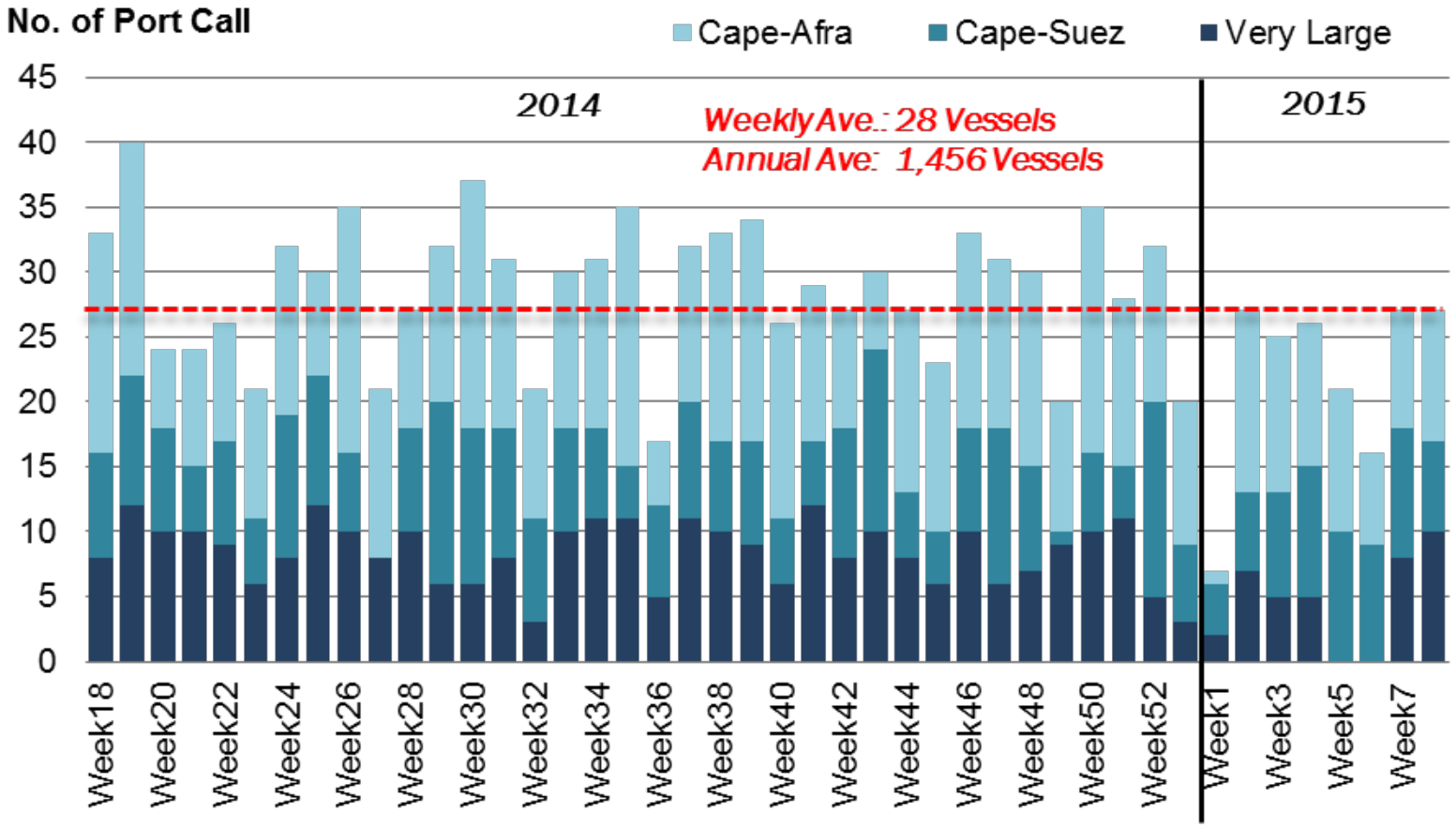
McQuilling uses bi-lateral country trade data to identify and quantify marine trade in crude oil and refined products. We combine transported quantities with distances travelled across 15 global regions yielding 225 different trades. We model demand for tankers based on evaluation of historical and projected volumes transported on these routes. Using this data, we estimated pass-by and import/export demand in the region.



Regional Market Potential - Development

Major Trades – Bulkers – Tubarao Loadings – 2014-2015

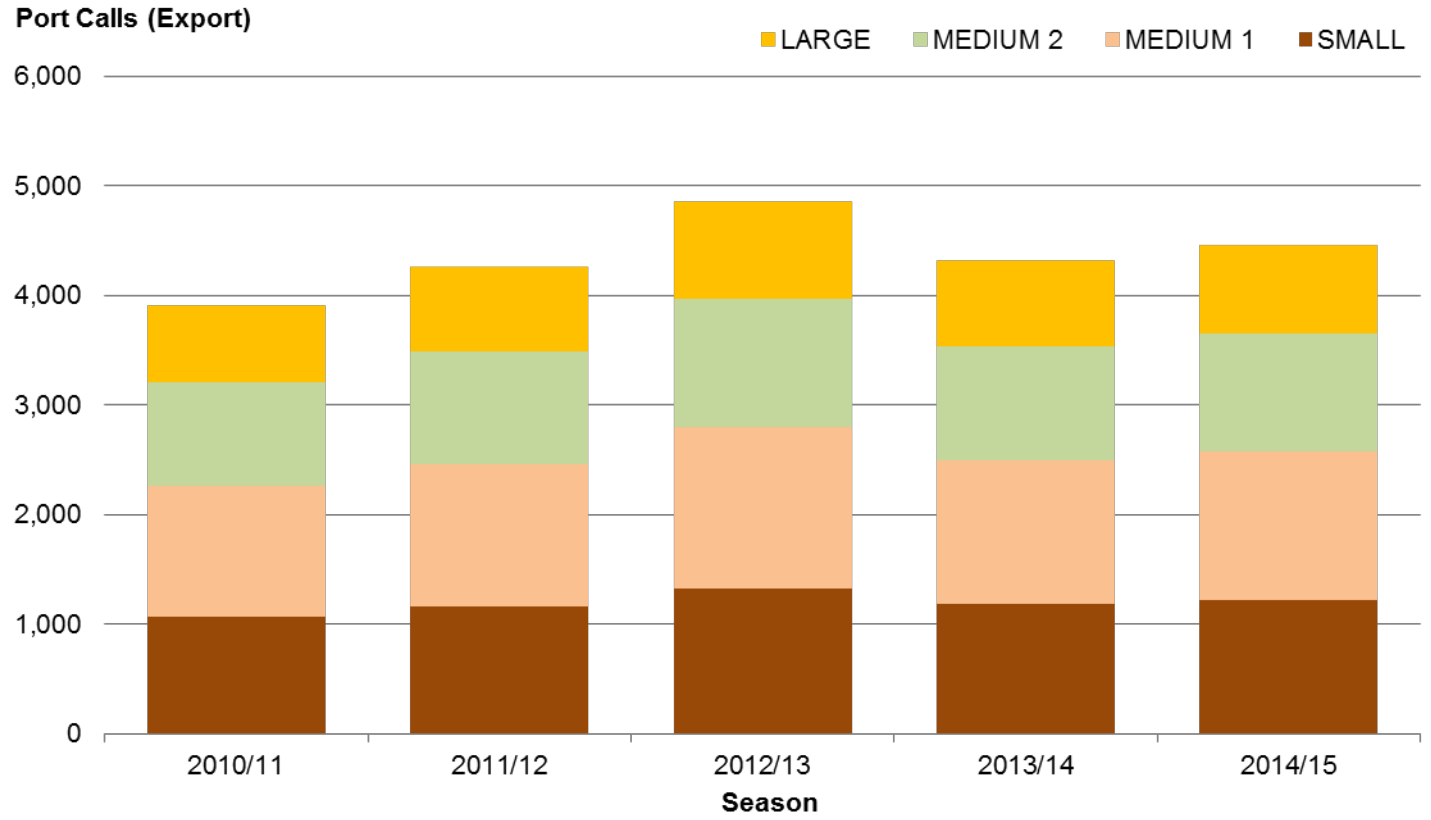
We used port calls at the major Brazilian load ports for iron ore exports and other commodities imports and exports to quantify import/export demand for bulkers.



Regional Market Potential - Development

Major Trades – Bulkers – South American Exports – Grain & Oilseeds – 2010-2015

Exports of grains and oilseeds typically move in vessels up to 75,000 Dwt. Depending on season production, exports from Argentina, Brazil, Paraguay and Uruguay represent between 4,000 and 5,000 port calls annually from the east coast of South America. We used this data for pass-by demand estimation.



Source: USDA Foreign Agricultural Service, McQuilling

Demand Analysis Challenge

Regional Market Potential - Development

Commodity Trade Source Data

1 *MLISA® Fixtures Database, Dirty and Clean Petroleum Products, McQuilling Services, 2015*

2 *"2012 Minerals Yearbooks – Brazil, Argentina, Paraguay & Uruguay", US Geological Survey, June 2014*

3 *MLISA® Vessels Database, Tankers, Bulkers, Containerships, Offshore Vessels, McQuilling Services, 2015*

4 *"www.mercolsul-line.com.br", Mercolsul Line Corporate Website, A.P. Moller-Maersk Group, 2015*

5 *"www.antaq.gov.br", Anuario Estatistico Aquaviario 2013, Merchant Fleet*

6 *"2020 Petrobras Strategic Plan," 19 March 2013*

7 *"www.santosbrasil.com", Port Operations, Tecon Santos, Imbituba and Vila do Conde, 2014-15*

8 *"www.transpetro.com.br", Transpetro Corporate Website, 2015*

9 *"www.vale.com", Vale Corporate Website, Ports and Terminals Descriptions, 2015*

10 *"2012 Minerals Yearbooks – Brazil, Argentina, Paraguay & Uruguay", US Geological Survey, June 2014*

11 *"Slides 8-10 – Largest Independent Logistics Provider in Hidrovia", Navios South American Logistics, Inc. Company Presentation, December 2013*

12 *"US Exports of Petroleum Coke: 2000-2013", US Energy Information Administration, 2014*

13 *"Colombia – Analysis Brief", Coal Exports, US Energy Information Administration, January 2014*

14 *"Oilseeds: World Markets and Trade", US Department of Agriculture, February 2015*

15 *"Grain: World Markets and Trade", US Department of Agriculture, February 2015*

16 *"www.marinetraffic.com", Vessel Tracker – Port Schedules, February 2015*

17 *"www.vesseltracker.com", Expected Vessels, Moored Vessels, Brazilian Ports, February 2015*

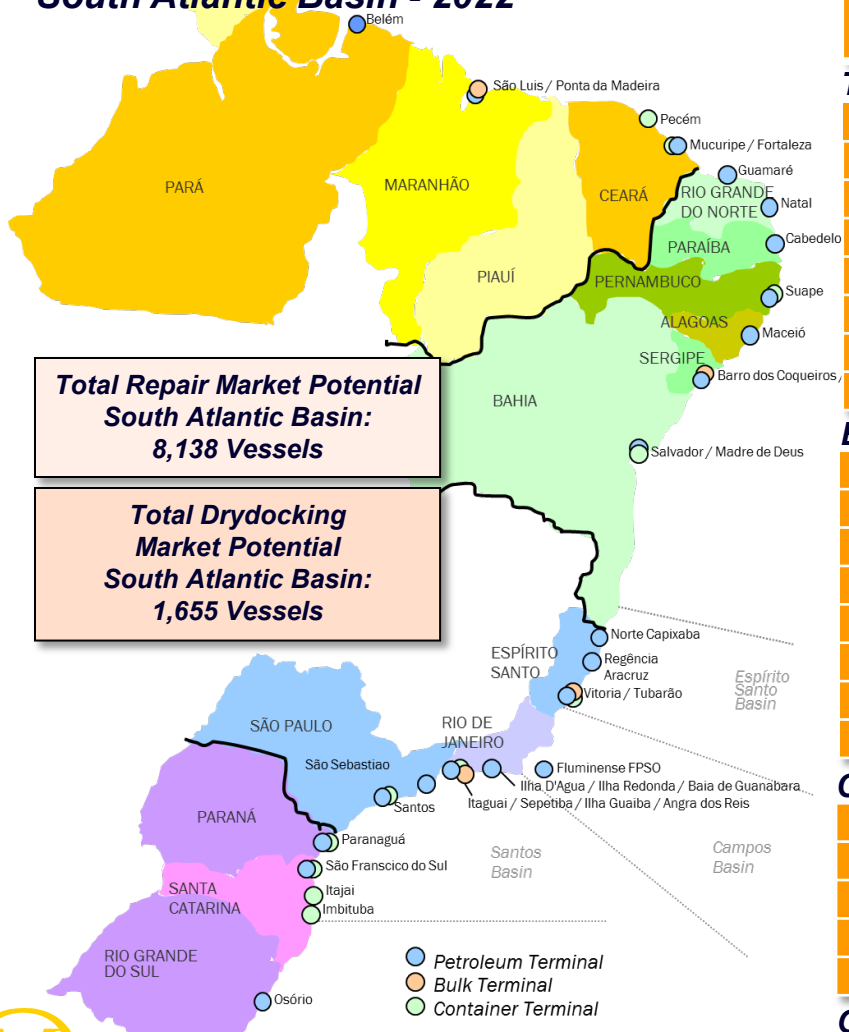
18 *"World & Regional Economic Outlook", International Monetary Fund, January 2015*

19 *"Oil Medium Term Market Report", International Energy Agency, 2014*

Demand Analysis Challenge

Regional Market Potential - Development

South Atlantic Basin - 2022



Total Repair Market Potential South Atlantic Basin: 8,138 Vessels

Total Drydocking Market Potential South Atlantic Basin: 1,655 Vessels

DEMAND CATEGORY	CABOTAGE	IMPORT / EXPORT	PASS-BY	TOTAL VESSELS	TOTAL D/D	
Tankers						
SMALL	63	8	0	71	14	1
MEDIUM 1	35	122	35	192	38	2
MEDIUM 2	16	354	207	577	115	9
LARGE	13	45	5	63	13	2
CAPE-AFRA	27	41	28	96	19	4
CAPE-SUEZ	29	123	273	425	85	5
VERY LARGE	0	25	362	387	77	2
Total	**183**	**718**	**910**	**1811**	**361**	**25**
Bulk Carriers						
SMALL	11	846	0	857	171	7
MEDIUM 1	7	939	91	1037	207	9
MEDIUM 2	8	909	57	974	195	16
LARGE	3	800	13	816	163	21
CAPE-AFRA	3	285	42	330	66	8
CAPE-SUEZ	0	585	33	618	124	10
VERY LARGE	0	562	0	562	112	5
Total	**30**	**4926**	**236**	**5192**	**1038**	**76**
Containerships						
SMALL	9	0	0	9	2	0
MEDIUM 1	17	0	0	17	3	0
MEDIUM 2	1	309	0	310	62	5
LARGE	0	202	0	202	40	3
Total	**28**	**511**	**0**	**539**	**107**	**8**
Offshore						
SMALL	**596**	**0**	**0**	**596**	**149**	**12**

Demand Analysis Challenge

Regional Market Share - EDPI Regional Market Share Assumptions

South Atlantic Basin - 2022

EDPI market share is estimated for each vessel size of each vessel type in each trade category (45 separate assessments) to calculate the total throughput of the EDPI facility on an annual basis .

		TANKER	BULK	CONTAINER	OFFSHORE
CABOTAGE	Small	5%	5%	5%	10%
	Medium 1	10%	10%	10%	
	Medium 2	20%	20%	20%	
	Large	30%	30%		
	Cape-Afra	50%	50%		
	Cape-Suez	50%			
	Very Large				
IMPORT / EXPORT	Small	5%	5%		
	Medium 1	5%	5%		
	Medium 2	10%	10%	10%	
	Large	10%	15%	10%	
	Cape-Afra	10%	15%		
	Cape-Suez	5%	10%		
	Very Large	5%	5%		
IN-TRANSIT / PASS-BY	Small	0%	0%		
	Medium 1	2%	5%		
	Medium 2	2%	5%		
	Large	5%	5%		
	Cape-Afra	5%	5%		
	Cape-Suez	2%	5%		
	Very Large	2%	0%		

Total EDPI Projected Drydocking Market Share: 121 Vessels

BBDC

Introduction

Backstory: Brazil & Ship Repair

Empresa de Docagens Pedra do Ingá - EDPI

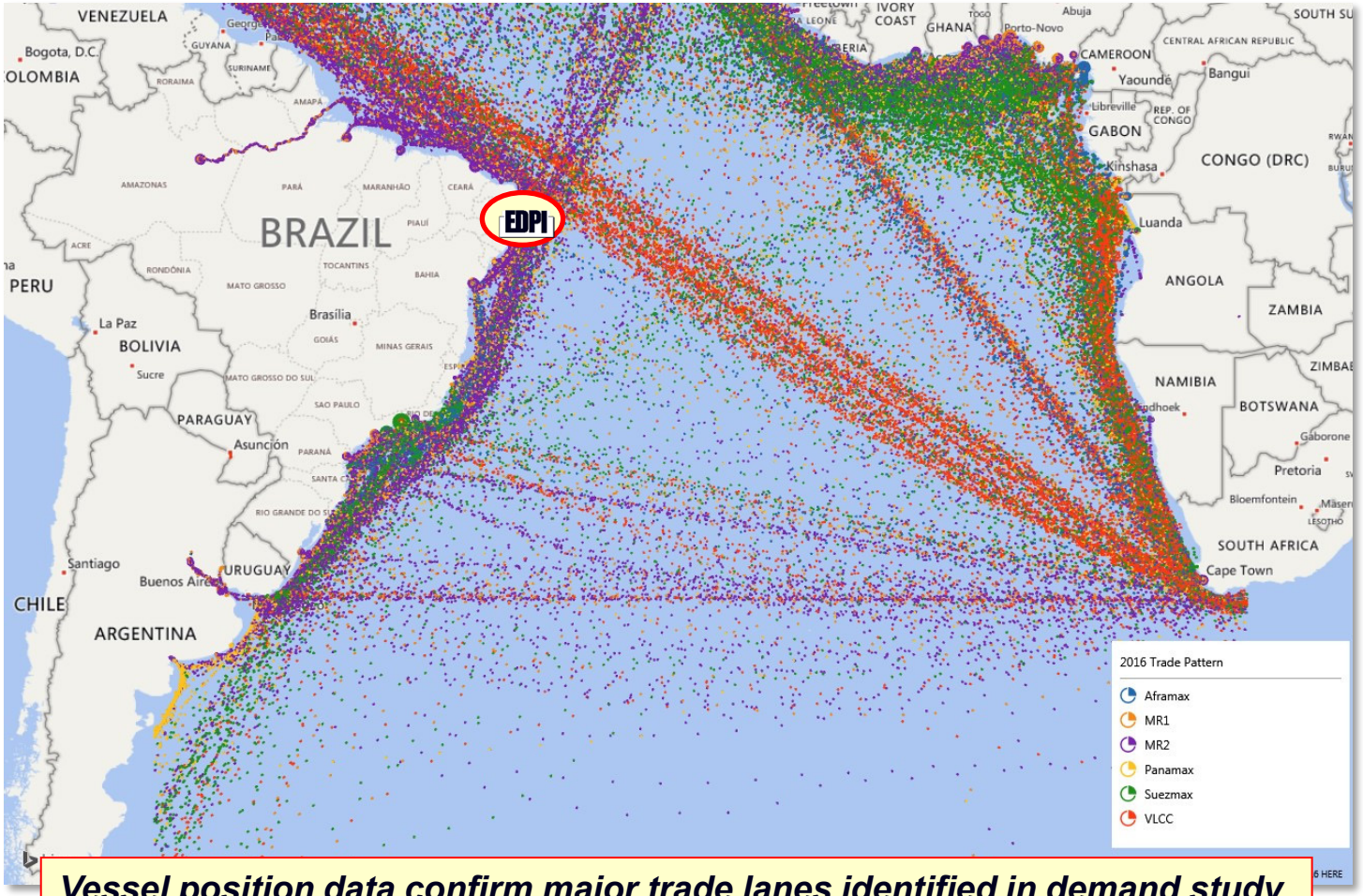
Demand Analysis Challenge

Remotely-Sensed Information

Summary

Major Trades - Remotely-Sensed Vessel Position Data, South Atlantic Basin | 2016 YTD

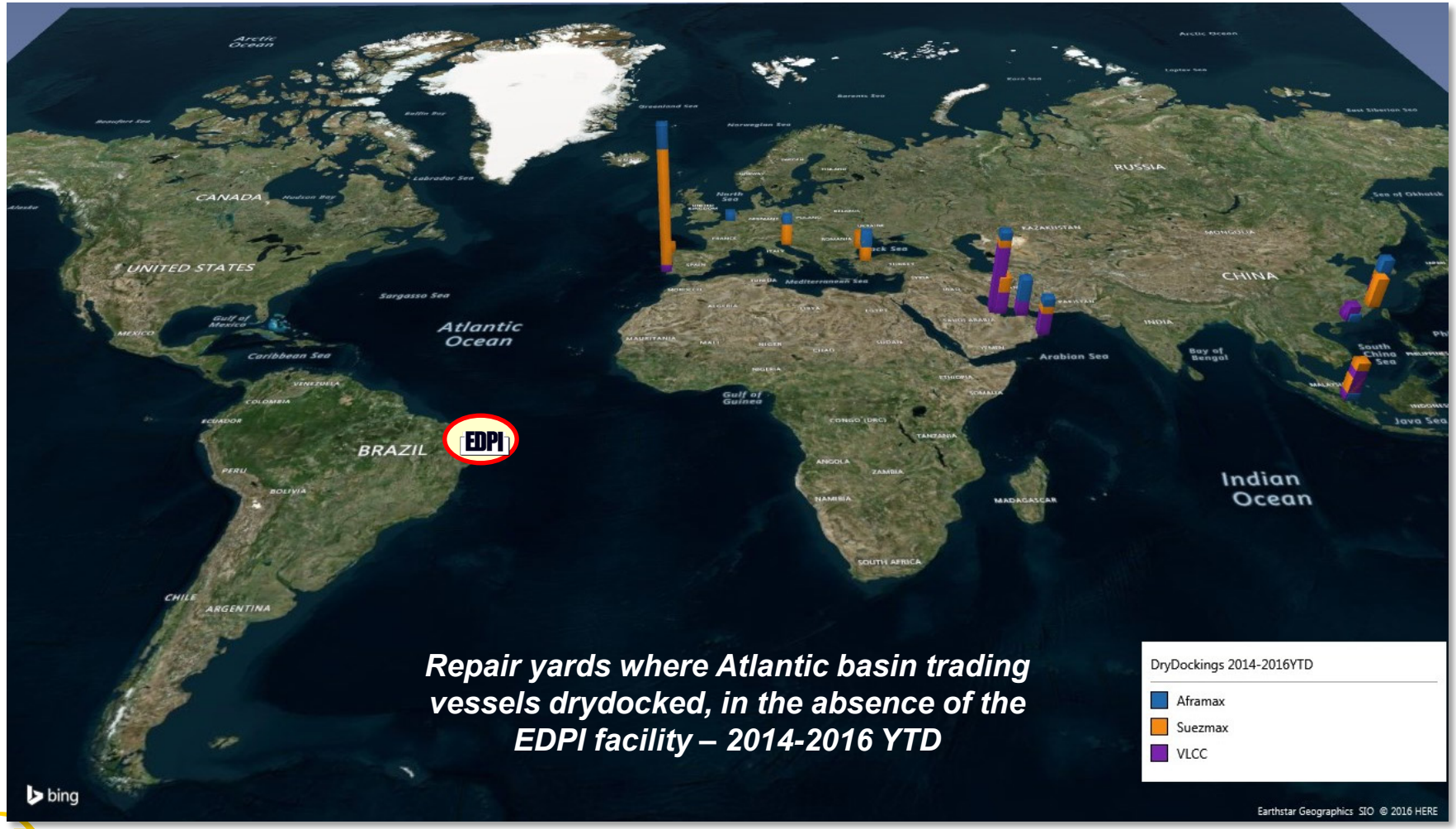
Tankers



Vessel position data confirm major trade lanes identified in demand study

Remotely-Sensed Data

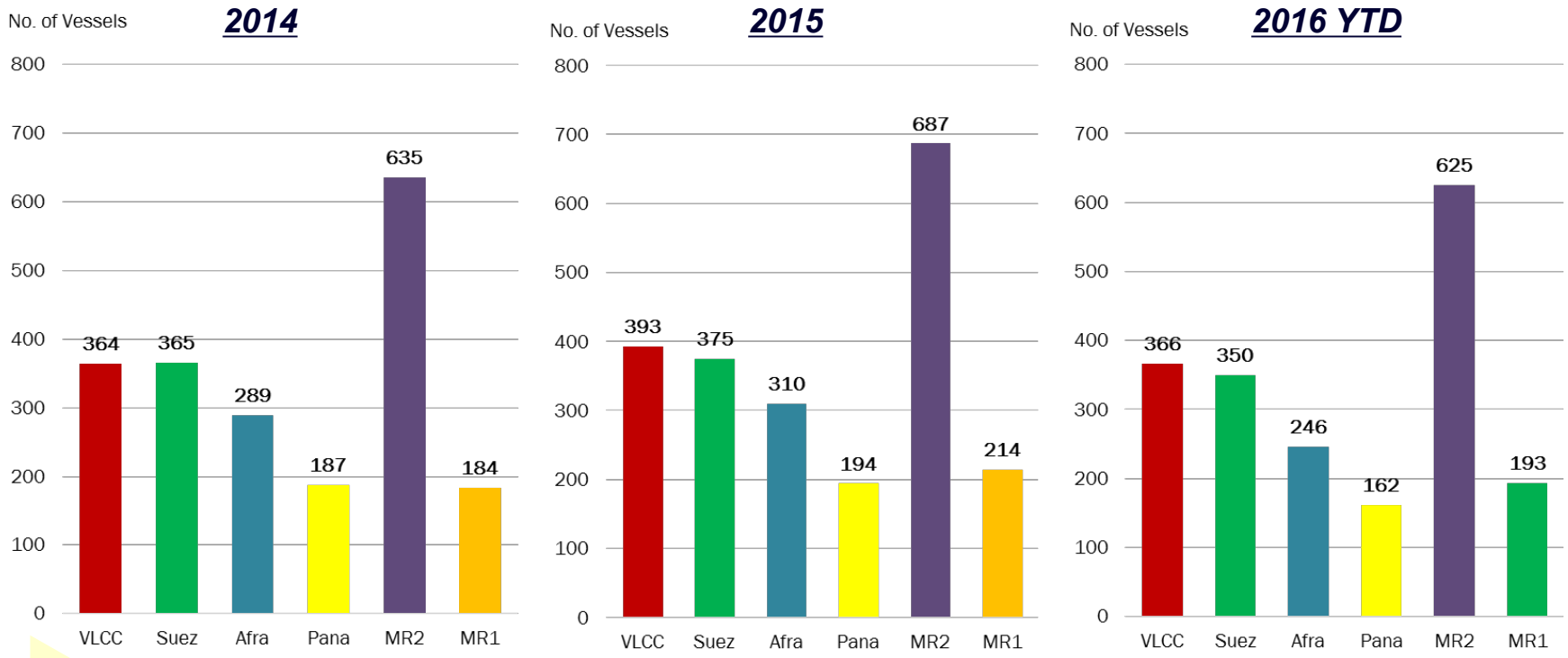
Major Trades – Drydocking for Vessels in Atlantic Basin Trades| 2014 - 2016 YTD



Remotely-Sensed Data

Demand Analysis – Remotely-Sensed Vessel Position Data

South Atlantic Basin Market Potential – Tanker Only



Total Unique Vessels

2,024 | **2,173** | **1,942**

Vessel position data confirm market potential estimates in demand study

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Summary

- *For large infrastructure projects in emerging economies, investors and banks will want to see predictable long-term revenues, preferably fixed by "off-take" agreements or contracts*
- *The vast majority of ship repair contracts are negotiated and performed on a spot basis – long-term contracts are not a feature of the repair business*
- *In the absence of long-term repair contracts, a robust demand assessment methodology is implied, which we pursued using traditional tools for the analysis of demand*
- *A targeted-demand approach, with classification of trade segments allowed for the definition of minimum levels for demand market potential at a global and regional level*
- *Assessments for specific vessel size, type and trade level demand allowed for detailed assessment of market share at a low level, aggregating up to total annual throughput estimates for drydocking in the ship repair yard*
- *An independent analysis using remotely sensed vessel position data not only confirmed the conclusions of the initial study but highlights the possibilities of application of analytics based on remotely-sensed data in the maritime space*

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