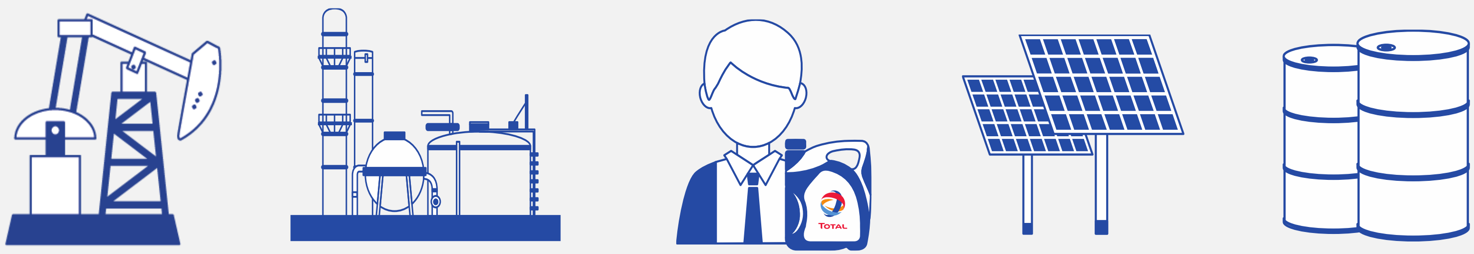
TOTAL

Maritime et fluvial
Quelles réponses aux nouvelles normes d'émission ?

Fondation Tuck, 18 Juin 2018

MarineFuels
Global Solutions

AN INTEGRATED GROUP



Exploration & Production | Refining & Chemicals | Marketing & Services | Gas Renewable & Power | Trading & Shipping

Lubmarine

MarineFuels Global Solutions

Total Marine Fuels Global Solutions is a dedicated M&S business unit:

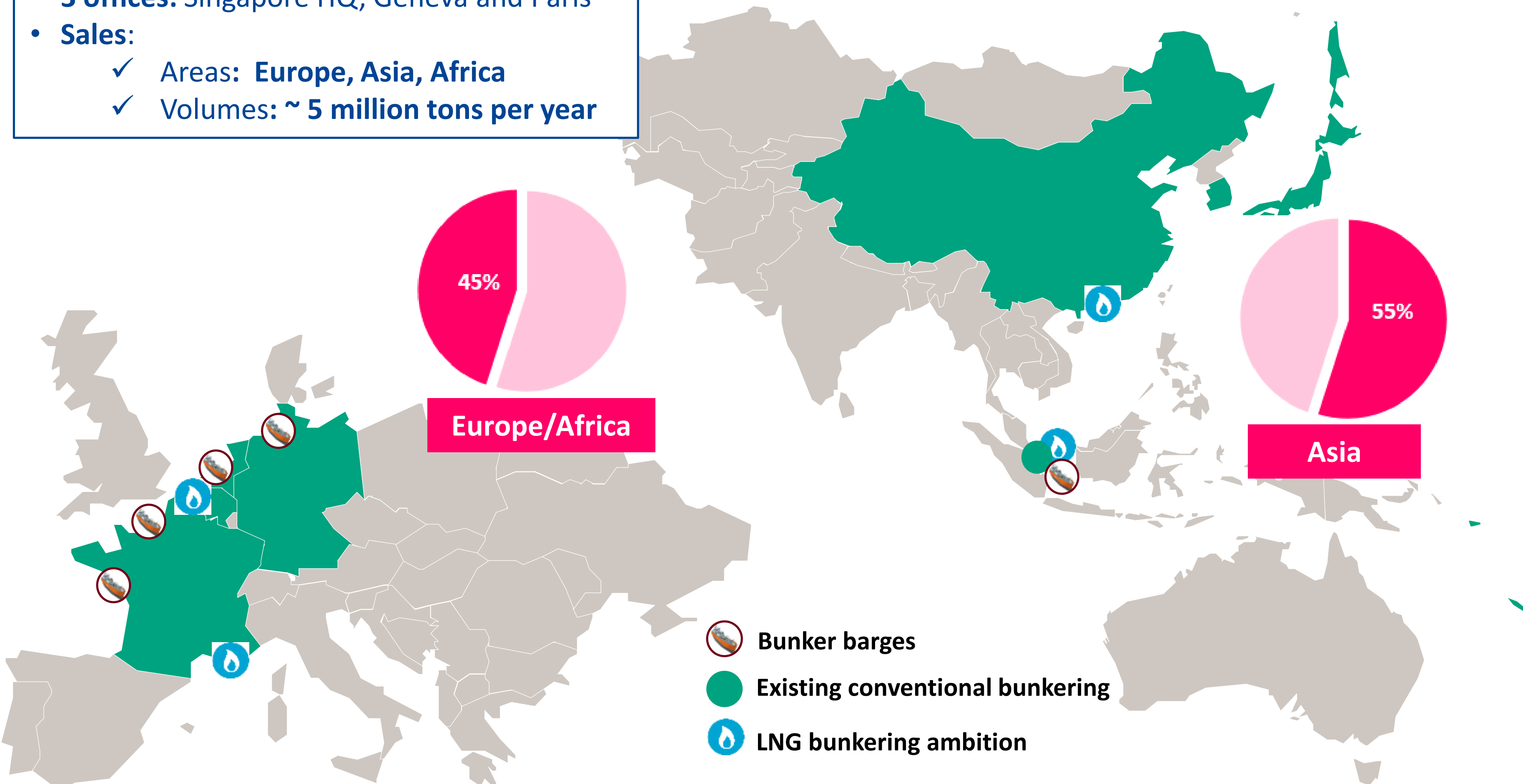
- with decades of **conventional bunker expertise**
- **interacting with all the branches** of the Total group
- with **innovative** and **efficient bunkering services**

→ **A single point of contact for a full spectrum of solutions**

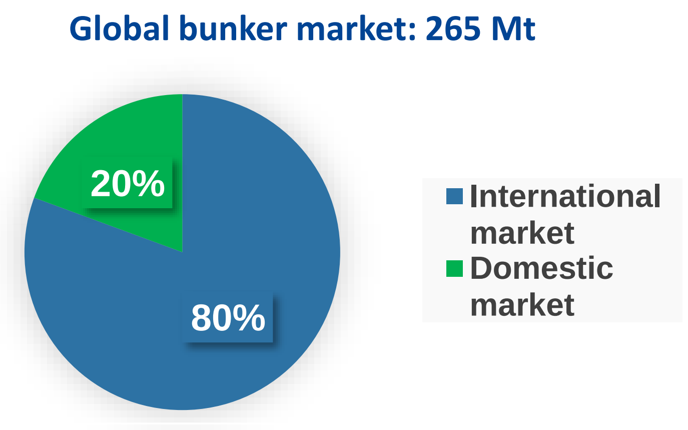
TOTAL MARINE FUELS GLOBAL SOLUTIONS TODAY

MarineFuels Global Solutions

- **40 employees**
- **3 offices:** Singapore HQ, Geneva and Paris
- **Sales**:
  - ✓ Areas: **Europe, Asia, Africa**
  - ✓ Volumes: **~ 5 million tons per year**

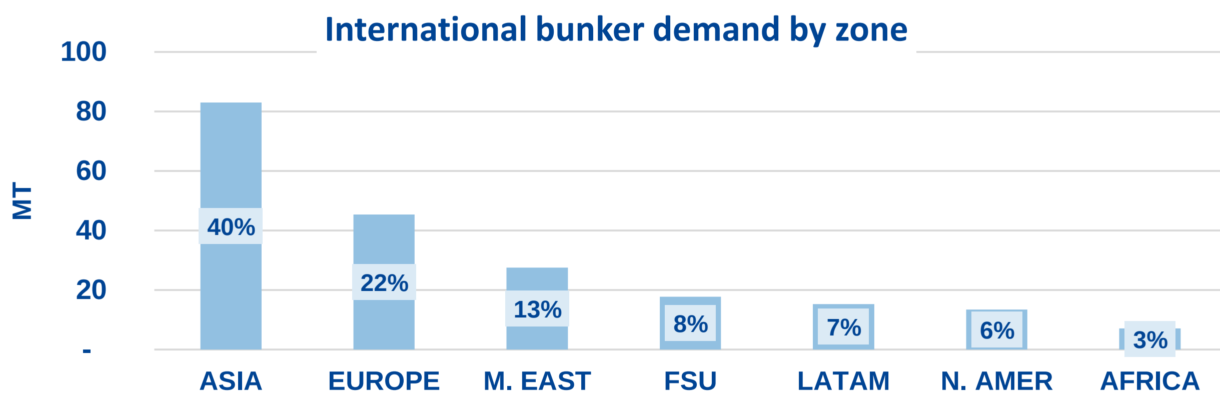


GLOBAL BUNKER DEMAND



A global bunker market of 265 Mt

- 80% for international markets
- 65% made of High Sulphur Residual Fuel Oil



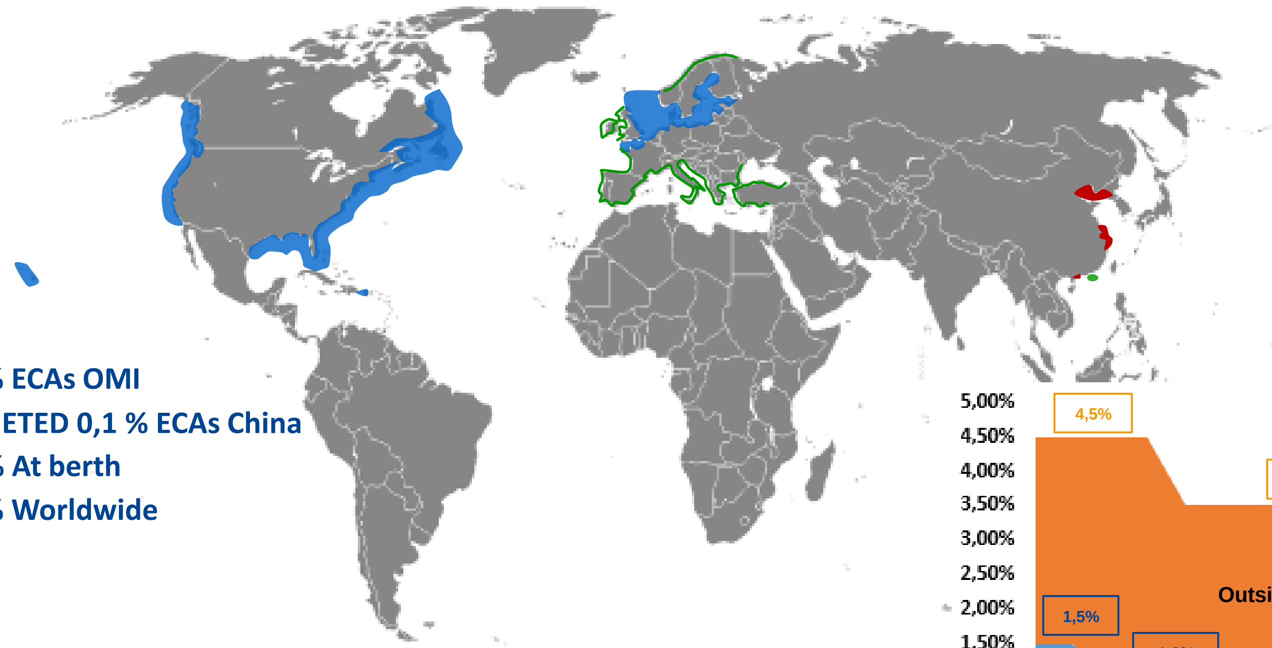
2017 - TOP 10 BUNKERING PORTS (Mt)	
SINGAPORE	51
FUJAIRAH	12
ROTTERDAM	10
HONG-KONG	8
ANTWERP	7
BUSAN	5
GILBRALTAR	5
PANAMA	4
ALGECIRAS	4
LOS ANGELES/LONG BEACH	3

International bunker market is highly concentrated :

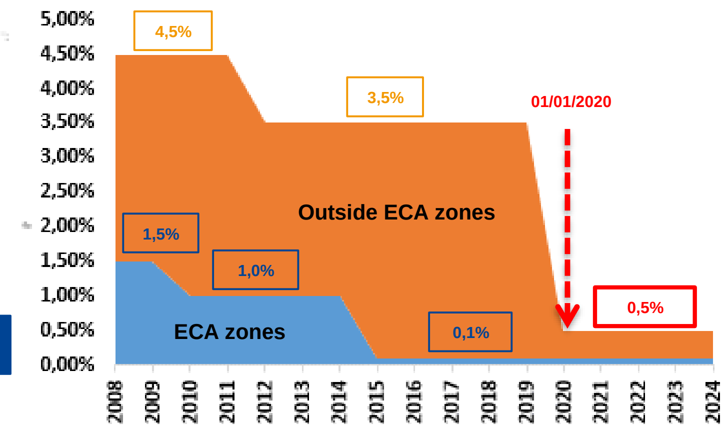
- **10 ports** account for **50% of volumes**
- **3 regions** (Asia, Europe and Middle-East) capture **75% market share**
- **30% of the fleet** (tankers/bulkers/liners) accounts for **70% of bunker demand**

(Sources : 2015 IEA data + internal data)

GLOBAL CAP 2020



0,1 % ECAs OMI
TARGETED 0,1 % ECAs China
0,1 % At berth
0,5 % Worldwide



SULPHUR REGULATION – 2020 IMO GLOBAL CAP

	HSFO	ULSFO / Gasoil	VLSFO / Gasoil
Sulphur content	3,5% max	0,5% max	0,1% max
Today	✓ Worldwide		ECAs + Ports UE
2020	✗ Forbiddden *	✓ Worldwide	ECAs + Ports UE + ECAs Chine

ECAs = The Channel, North Sea, Baltic Sea, North America, US Caribbean

* : Possible use of scrubbers for SOx post-treatment

BEYOND SULPHUR REGULATIONS, IMO IS STUDYING OTHER POTENTIAL EMISSIONS RESTRICTIONS ON **NO_x, CO_2, PARTICULATES …**

SHIPPING INDUSTRY LOW CARBON ROADMAP

GHG Strategy

- **In October 2016,** MEPC 70 approved a **roadmap for the development of a comprehensive IMO strategy on the reduction of GHG emissions from ships**
  - Adoption of initial IMO GHG Strategy in April 2018.
  - Adoption of a revised strategy in 2023

Energy efficiency

- 2011 : New resolution requiring **ships constructed in 2025 to be at least 30% more energy efficient than those constructed in 2014**.
  - Targets are set through Energy Efficiency Design Index (EEDI) reduction factors with milestones at 10% as of 2015, and 20% as of 2020.

Level of ambition (MEPC 72, April 2018) :

- **Reduce GHG emissions by at least 50% by 2050 compared to 2008**
- **Reduce CO2 emissions per transport work by at least 40% by 2030**, pursuing efforts towards 70% by 2050, compared to 2008

SHIPPING INDUSTRY OPTIONS AND CHALLENGES

LSFO & MGO products

THE COMPLIANT

Marine Gasoil and
Very / Ultra Low Sulphur Fuel Oil
(0.5% S & 0.1% S).

Visibility

HSFO & scrubbers

THE ADAPTATION

High Sulfur Fuel Oil
(3.5% S) for scrubber solutions.

Secure scrubber investments

LNG

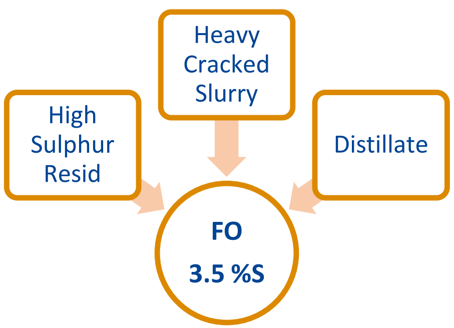
THE LONG-TERM SOLUTION

LNG Fuel delivered by trucks,
ISO-containers or bunkering barges.

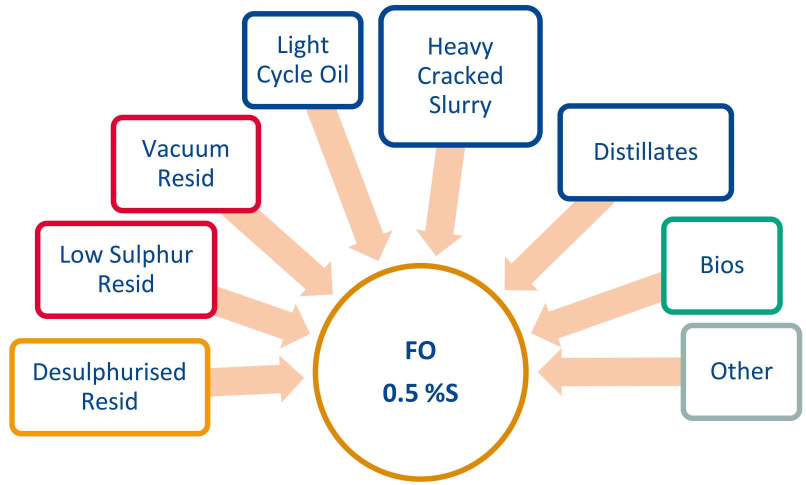
Pioneer

LOW SULPHUR FUEL OIL REQUIRES BLENDING EXPERTISE

From a basic residual blend…

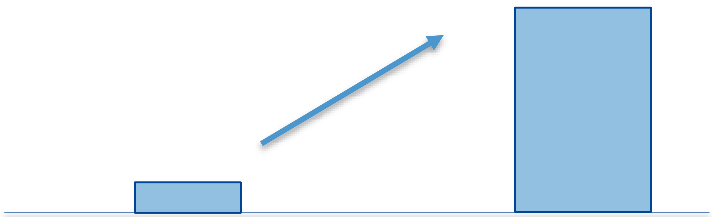


… to a technical product



LNG BUNKERING MARKET TREND

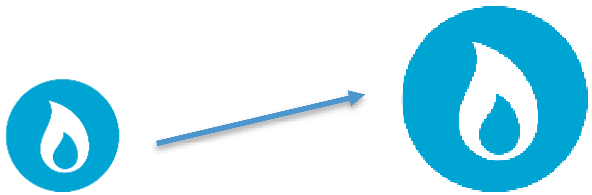
WORLDWIDE DEMAND



2017
0,4 Mt

2025
10 Mt

LOT SIZE



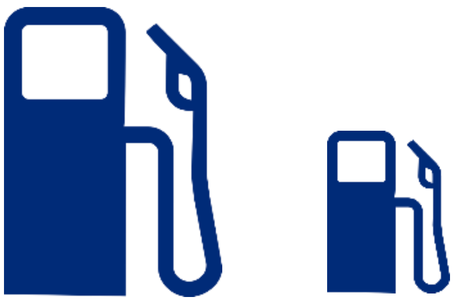
Small stem → **Bigger stem**

FLEET SIZE

By 2026*:

- **250 LNG-fueled** vessels
- **115 LNG-ready** vessels
- Mainly **newbuilds**

DEMAND BY SECTOR



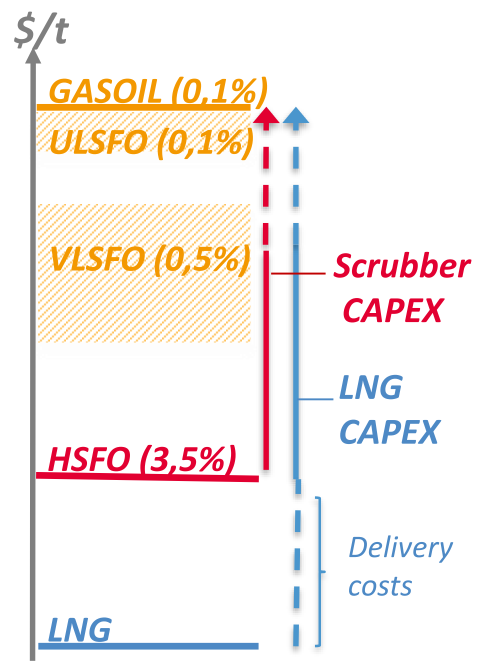
High sea

Short sea

** Source DNV GL*

LNG DRIVERS

ECONOMICS



- **LNG "boosters"**
  - Port cost discounts
  - Subsidies and grants
  - Futures taxes on GHG
  - Green finance opportunities

INFRASTRUCTURES

- **LNG bunker barges / vessels :**
  - Europe is pioneer with 4 existing barges and 5 projects under construction

Engie-Zeebrugge

Cardissa

  - Very few projects in Asia & America

- **Terminals need to ensure:**
  - Small-scale compatibility
  - Competitive access to terminals

OPERATIONS

- **Key operational aspects for shipowners, ship operators and charterers to consider :**

- Build **new industry standards**
- **Train** seafarers and technical staff
- Assess **compatibility with existing/future LNG bunker vessels**
- Set up **gas quality specifications** and involve **engine manufacturers**
- Comply with **port authorities regulations related to LNG**
- **Obtain SIMOPS authorizations**

ISO sgmf

TOTAL

CMA CGM'S LONG TERM DEAL

FAL 1 – French Asia Line

FAL 1 – Focus Northern Europe

9 x 22,000 TEU NEWBUILD VESSELS

- Investment around $1.2 billion US
- Built at Shanghai **Waigaoqiao** Shipbuilding and **Hudong-Zhonghua** Shipbuilding (**CSSC** Group)
- **A 18,000 m³ GTT** membrane tank and **WinGD X-DF** engine

LNG SUPPLY DEAL

- Volume: **300 kt/year**
- Duration: **10 years**
- Start Date: **2020**
- Bunker operations: mainly in **Northern Europe**
- Bunker vessel size: **18,600 m³**

Taylor-made solution with **one large bunker vessel** operating in Europe to minimize:

- **LNG bulk price** (favorable European price)
- **Logistics cost** (loading at terminal + bunkering)
- **Bunkering time**

BRITTANY FERRIES'S INNOVATIVE LOGISTICS SOLUTION

The HONFLEUR

LNG SUPPLY DEAL

- Start Date: **2019**
- Bunker operations**: Iso-containers**
  - ✓ transported by **trucks** from Dunkirk Terminal
  - ✓ **loaded** at Ouistreham **directly into the ferry**
  - ✓ **LNG transfer** from the iso-container to the tank is operated **during the service**

The Caen-Ouistreham/Portsmouth line

REGULAR BUNKERING AT BERTH IS IMPOSSIBLE:

- Short calls
- Cryogenic tanks
- No LNG storage at ports

PARTNERSHIP

Dunkerque LNG
GCA

Set-up a dedicated supply chain with key partners to cope with lack of infrastructures

YOUR PREFERRED WORLDWIDE BUNKER SUPPLIER

www.marinefuels.total.com
marine-fuels@total.com

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