

Innovative Financing Solutions for Emissions Compliance

▪
Pace Ralli, Co-Founder



Introduction

June 11th, 2014

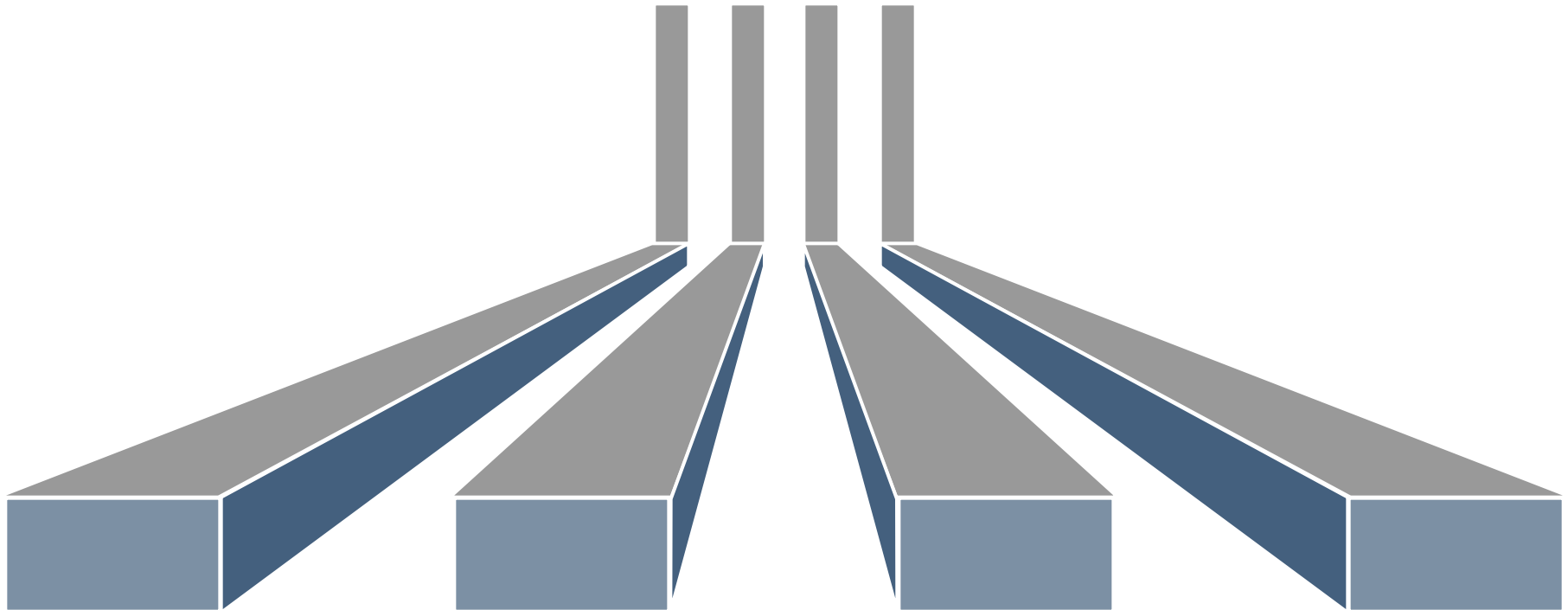
Ship owner reaction to change...



<http://www.youtube.com/watch?v=OdctnPIR5kA>

Ship owner faces several challenges

**Traditional investment
is financially irrational**



Risks of
Payback

Split
Incentive

Debt
Constraints

Capital
Efficiency

General risks of emerging LNG market

Regulatory Risk

- Planning for compliance in an uncertain/early stage regulatory environment
- Regulatory risk of Coast Guard / classification societies
- Extension of the deadline for emissions compliance for ship owners
- Lack of enforcement that leads to widespread non-compliance

Market Risk

- Increasing cost of gas feedstock; decrease of spread commodity spread
- Escalating costs of ship building for bunker barges due to increased demand
- Meeting increasing service level requirements with increased competition
- Bankruptcy of ship owner clients; lower demand due to market downturn

Technological Risk

- Engineering design of bunker barge is flawed; transportation accident
- Ship conversion not feasible due to space requirements on board
- Uncertainty of cost of conversion equipment / engine / storage tanks
- Unforeseen events (e.g. weather/storms) that could impact production of LNG

CME mitigates ship owner risk of payback

Risk of Payback

Technology Risk: mitigate risk that the LNG fueling technology will not work

Risk of LNG Supply: mitigate risk that the LNG supply will not be available in time

Risk of LNG Bunkering: mitigate risk that LNG bunker infrastructure will not be ready

Commodity Risk: mitigate risk that the commodity spread could decrease

Agenda

1. Background

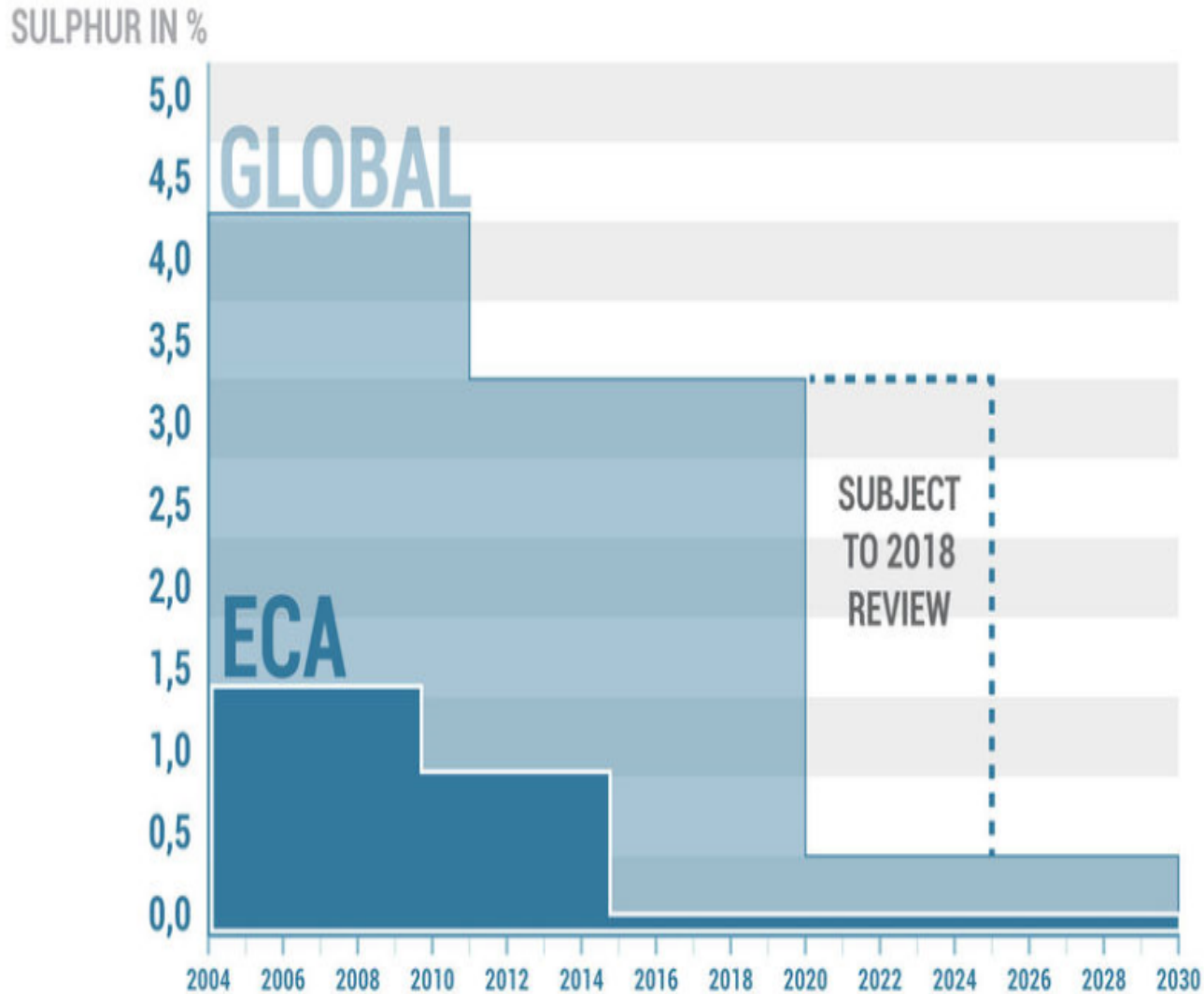
2. Ship Owner Challenge

1. Emissions Compliance Service Agreement

Ships facing increasing global regulation



Ships in ECA need solution by 2015



Three viable options for ECA compliance

1

Low Sulphur fuel (MGO)

- Most ocean-going ships currently use heavy fuel oil (HFO) for propulsion, mainly due to its lower cost. Small amounts of Marine Diesel Oil (MDO) is also used principally by smaller ships such as high-speed vessels and ferries.
- Both HFO and MDO contain high sulphur content, usually above 2% and are not available with <0.1% sulphur content.
- Marine Gas Oil (MGO) is currently the only distillate fuel that can comply with this regulation. MGO (\$1100/mt) currently trades at a premium of ~\$400 per tonne to HFO (\$650/mt), and is project to rise to \$1300-\$1500/mt with increased demand after 2015, due to limited refinery capacity.

2

Scrubber Installation

- Common exhaust cleaning system similar to inert gas systems in tankers.
- Working: Direct contact of HFO exhaust with the “scrubbing liquid” (sea water/ caustic solution of sea water/fresh water) causes sulphur compounds to be absorbed into a solution.
- Allows for the use of HFO and MDO fuel within ECA limits.
- Average cost of scrubber installation is between \$[3m] and \$[10m] per vessel.

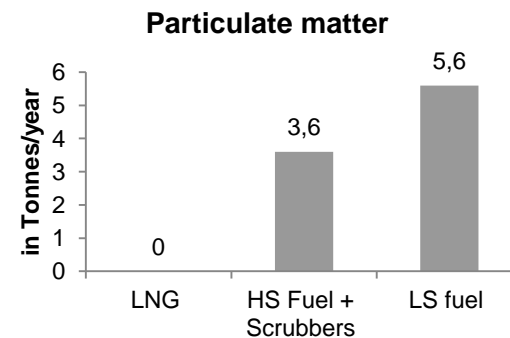
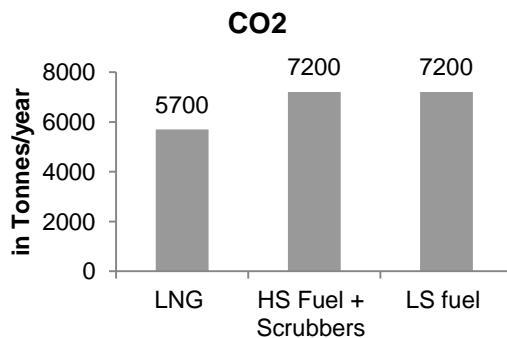
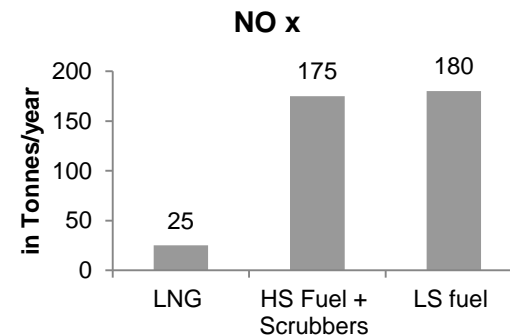
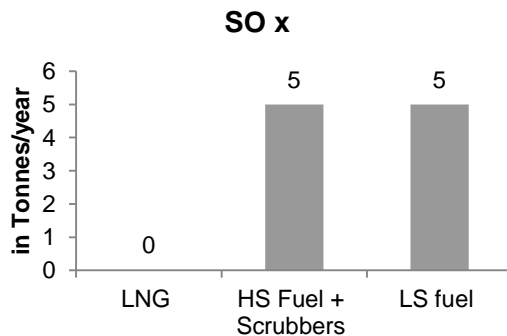
3

LNG propulsion

- Liquefied Natural Gas (LNG) is natural gas converted to liquid form for ease of storage and transport which has no Sulphur content.
- Marine Gas and Dual-fuel engines\ currently available in the market permit use of LNG for marine propulsion.
- Current LNG ship propulsion restricted to short sea shipping in Norway and is not readily available as a European alternative.
- To the extent that it becomes feasible, it is an additional opportunity for CME given our experience in the US market.

Environmental benefits are significant

Exhaust components	SO _x	NO _x	CO ₂	Particulate matter
LNG	0	25	5700	~0
HS Fuel + Scrubbers	5	175	7200	3.6
LS fuel	5	180	7200	5.6

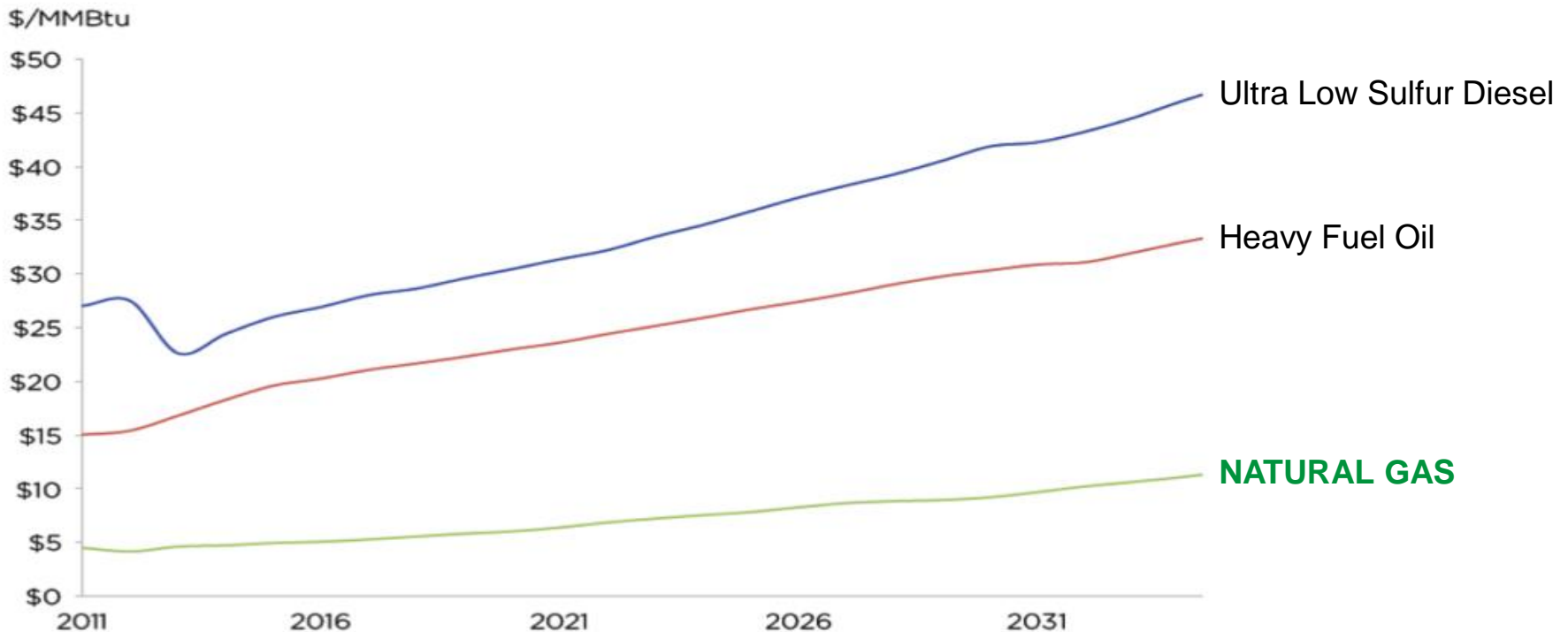


Applicable for a typical general cargo ship 3300 kW installed

Sources: [LNG World](#), [Bunker World](#)

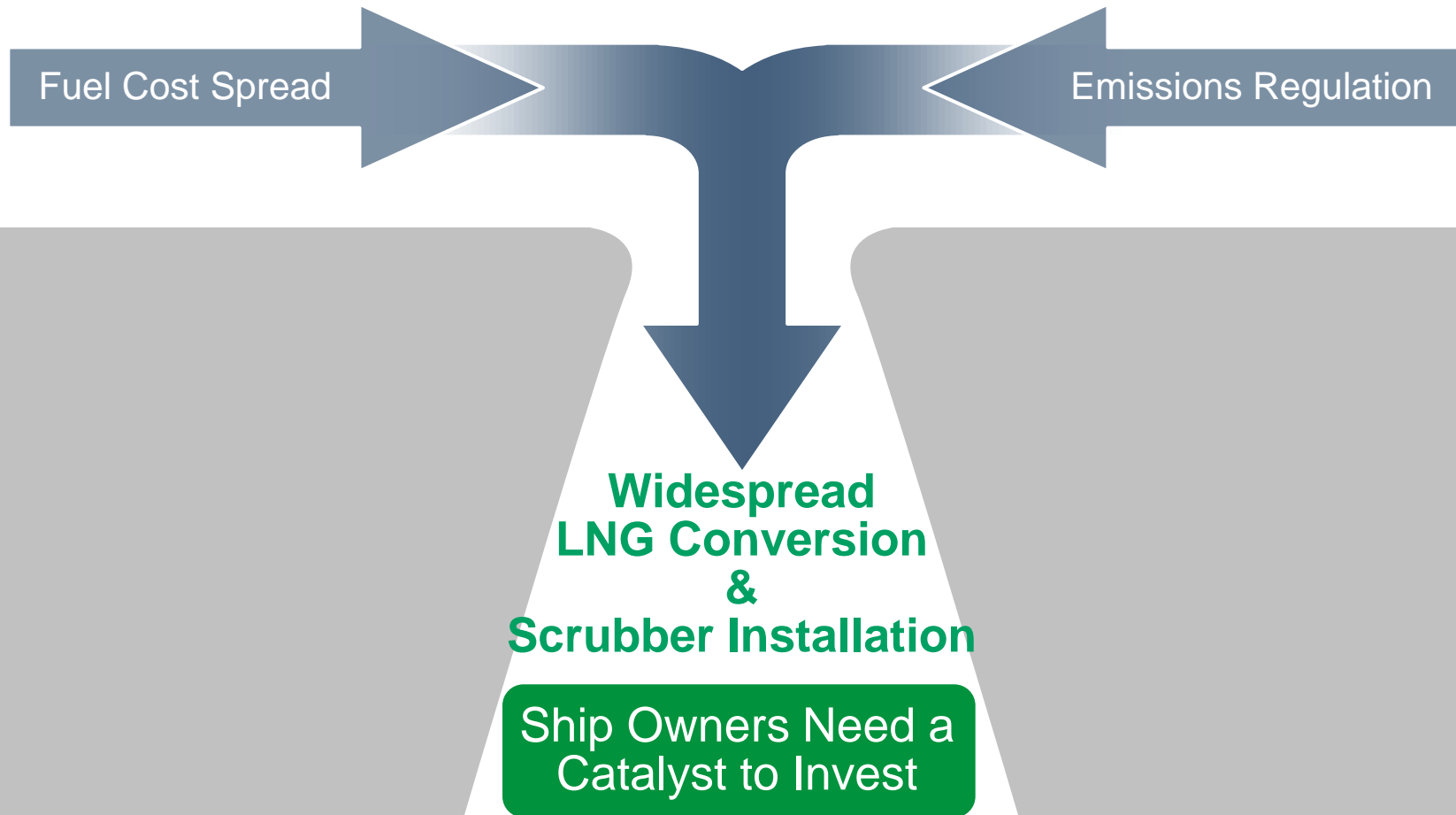
LNG provides 20-40% savings on annual fuel costs...

EIA Projections for Fuel Price Spread

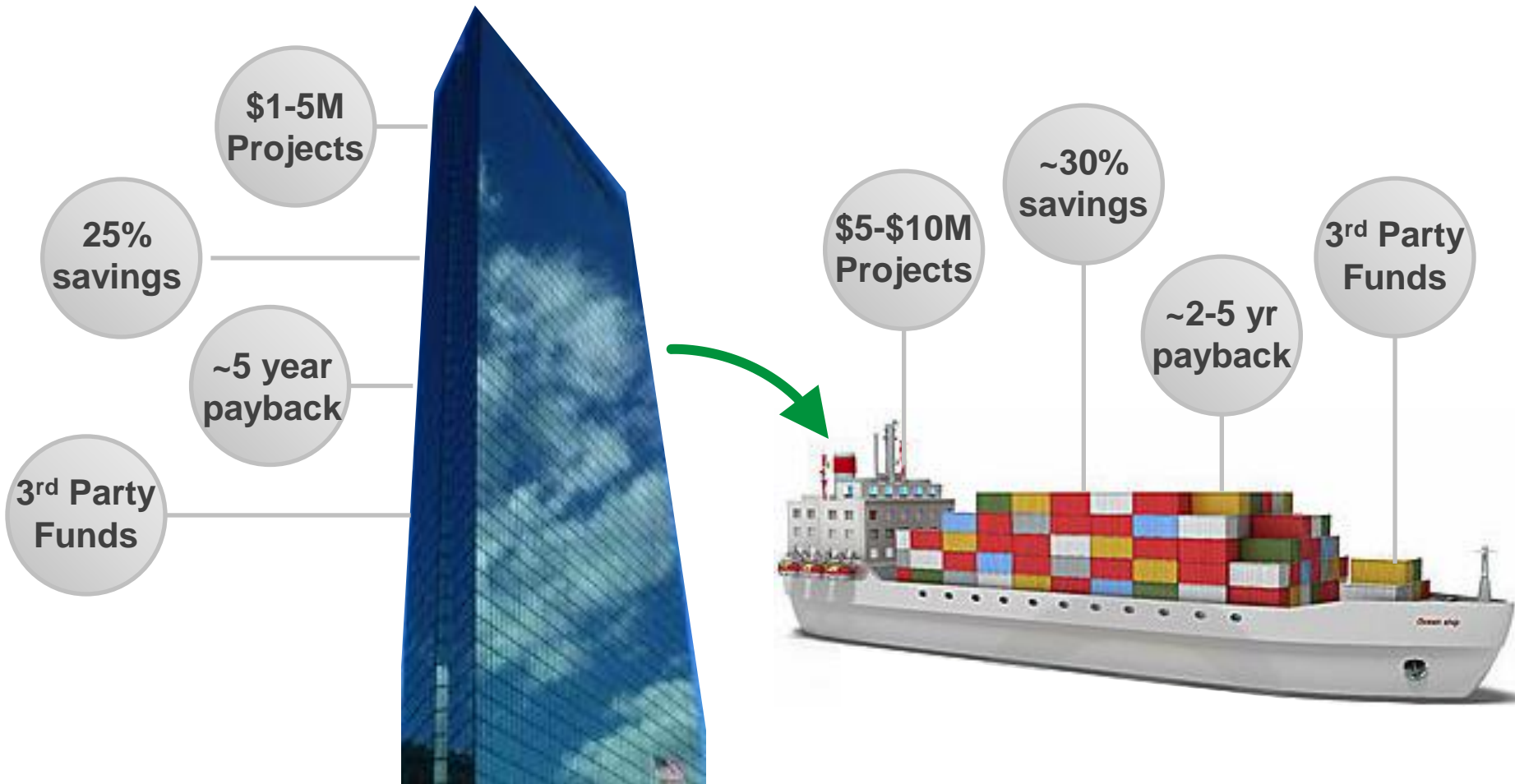


...and the spread is expected to increase after 2015.

Economic & regulatory forces for change



Adapting the building EE financing model



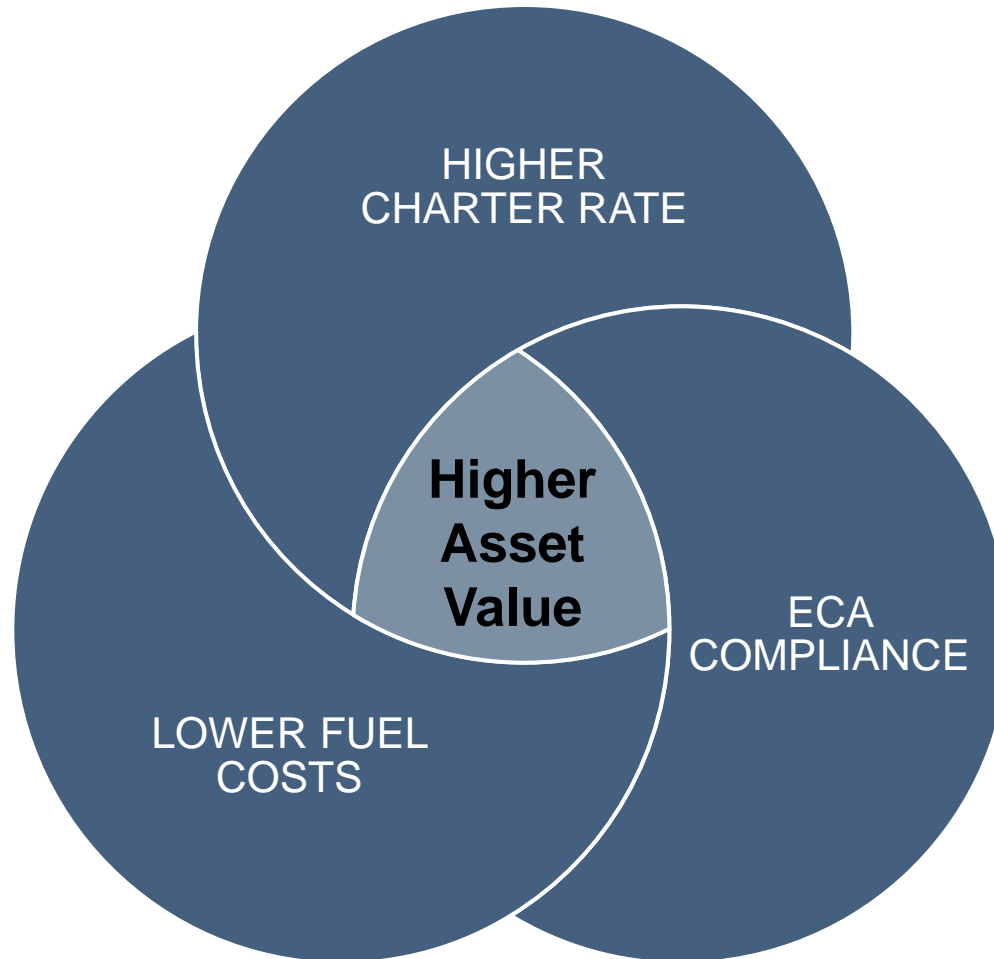
Agenda

1. Background

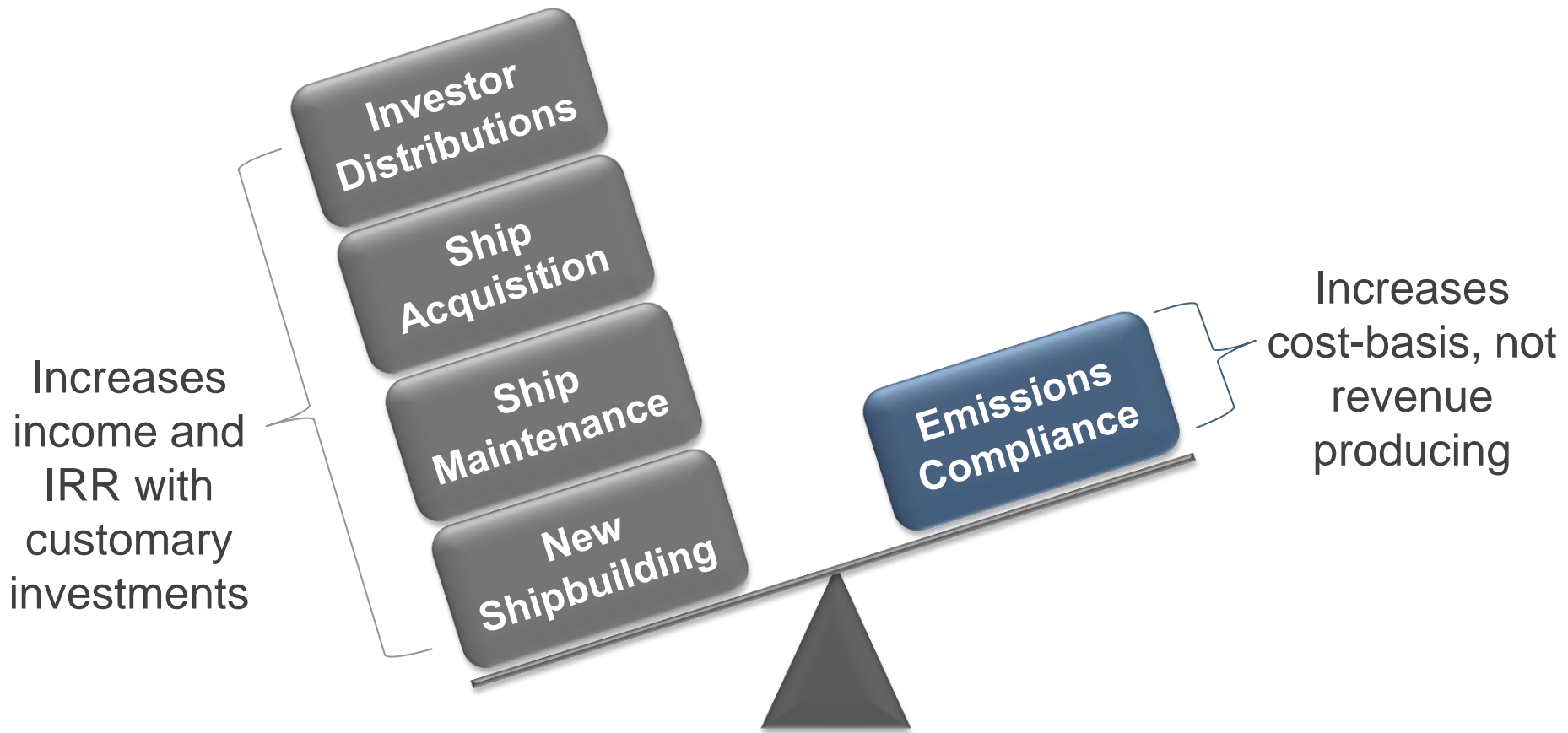
2. Ship Owner Challenge

1. Emissions Compliance Service Agreement

Priorities as a Ship Owner



CFO focus on capital resource efficiency



...capital will always flow to quicker payback projects.

LNG Pilot – Great Lakes Trader

- 40,000 dwt dry bulk carrier
- MDO = \$1050 /mt = \$23 /mmBtu = ~\$8.1m fuel cost
- ULSD = \$1300 /mt = \$29 /mmBtu = ~\$10.3m fuel cost
- LNG = \$650 /mt = \$14 /mmBtu = ~\$5.1m fuel cost
- LNG conversion
 - ~\$10m estimate
 - 2-3 year payback



Outfitted per ABS & USCG guidelines

The Vessel will be outfitted with the following major items:

1. LNG bunkering manifold
2. LNG bunker filling line
3. LNG storage tank (300 cubic meters)
4. LNG vaporization system
5. LNG tank venting system
6. LNG tank pressure and level monitoring system
7. Gas pressure control system
8. Top end engine conversion to accept gas on the intake
9. Gas manifold to each bank of the engine
10. Double wall piping
11. Secondary wall air sweeping system with gas detection
12. Gas ventilation system
13. Engine room gas detection system
14. Exhaust gas rupture disc system
15. Engine load monitoring and control system
16. Lube oil tank batch system
17. Oil sump gas detection system
18. Oil vent gas detection system
19. Upgrade to the IAS system to encompass the additional systems
20. Vent mist separator system for each engine

Options to finance LNG conversion

Option 1: self-finance using ship owner's own capital

Option 2: raise additional debt for conversion cost only

Option 3: refinance entire vessel including conversion

Option 4: utilize third-party funds to cover conversion cost

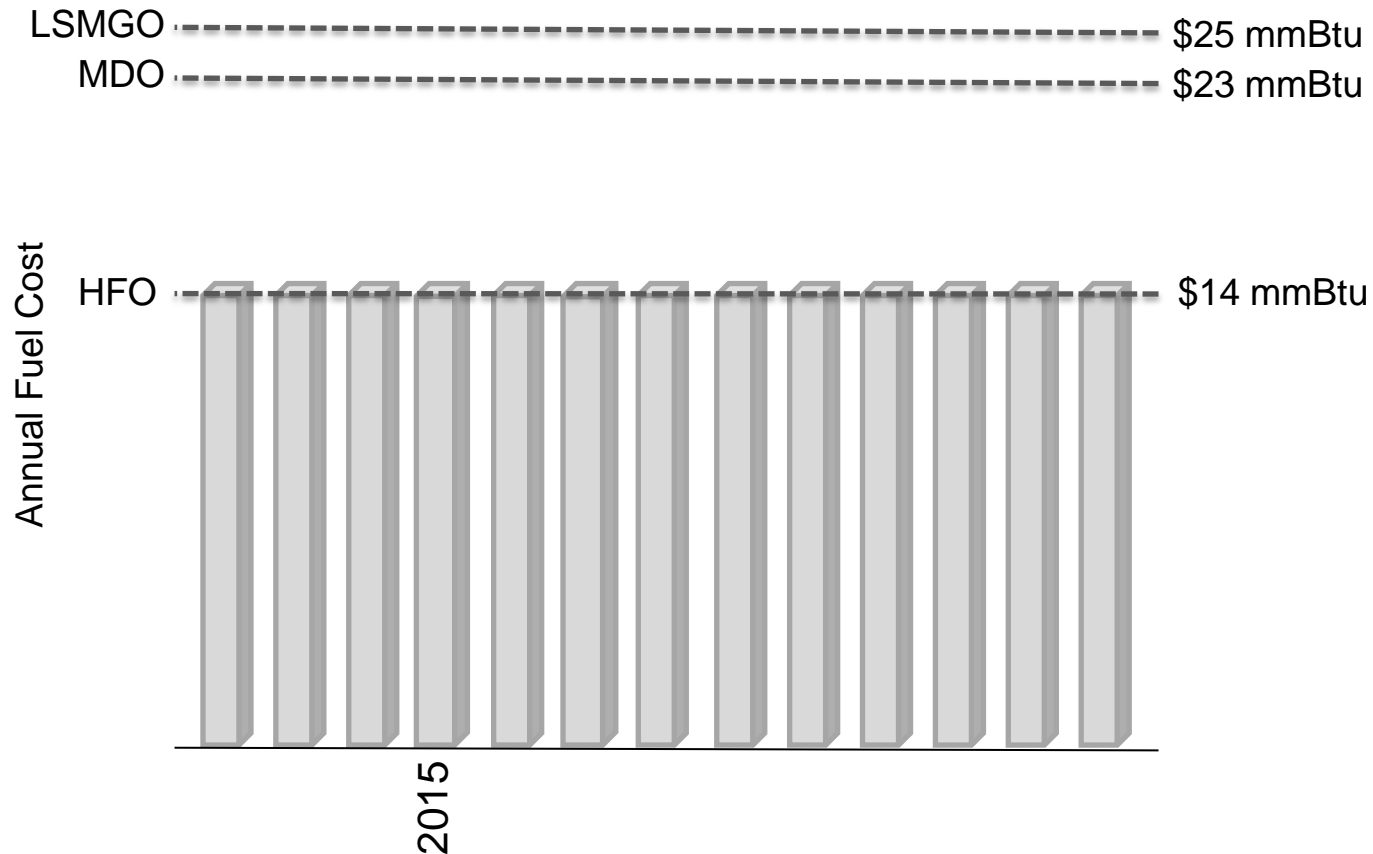
Agenda

1. Background
2. Ship Owner Challenge
3. Emissions Compliance Service Agreement

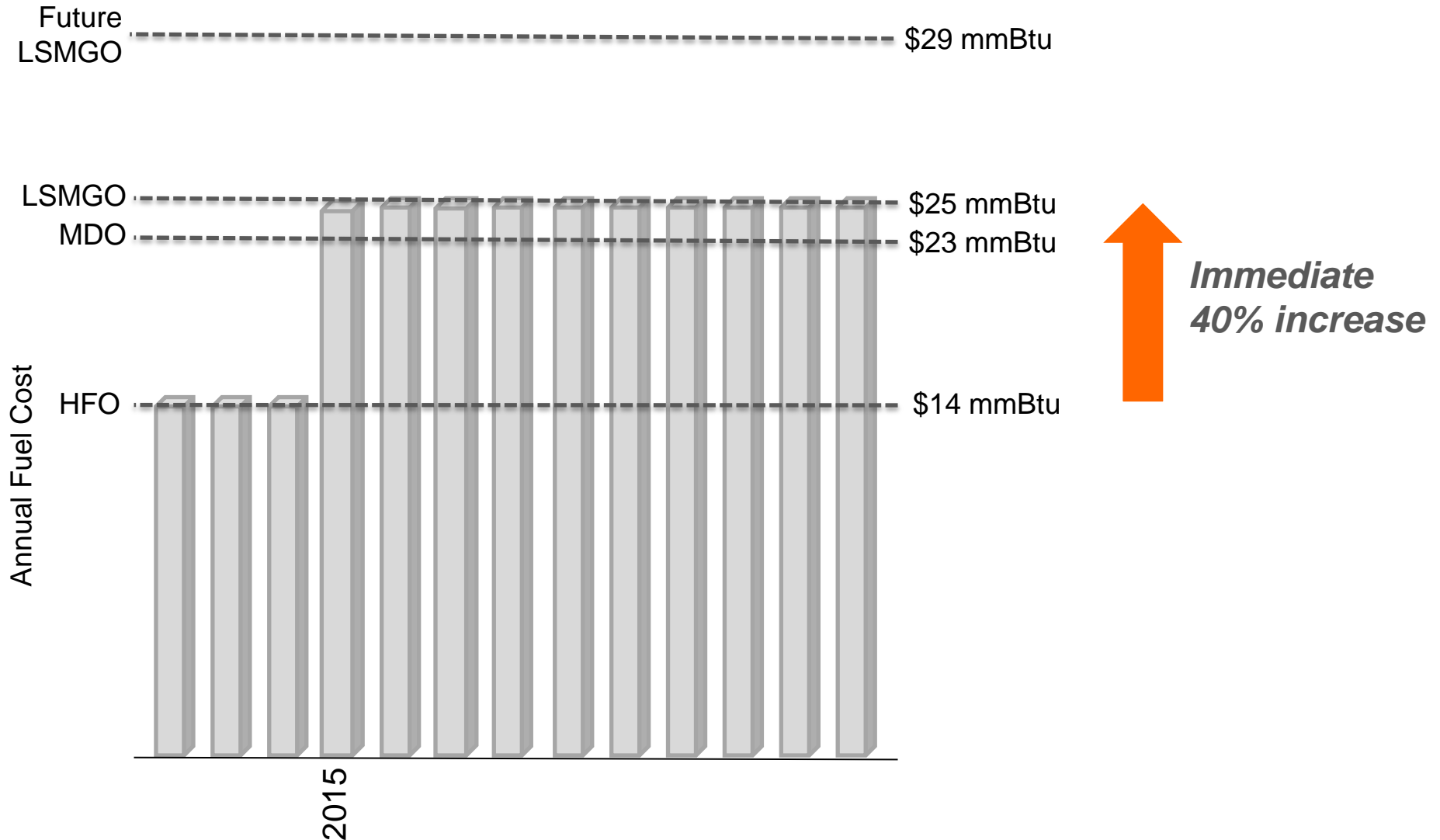
Value Proposition

Clean Marine Energy offers a proprietary financial mechanism called the Emissions Compliance Service Agreement (ECSA) to eliminate the barrier of large upfront capital requirements of LNG conversion or installing scrubber technology on to existing vessels.

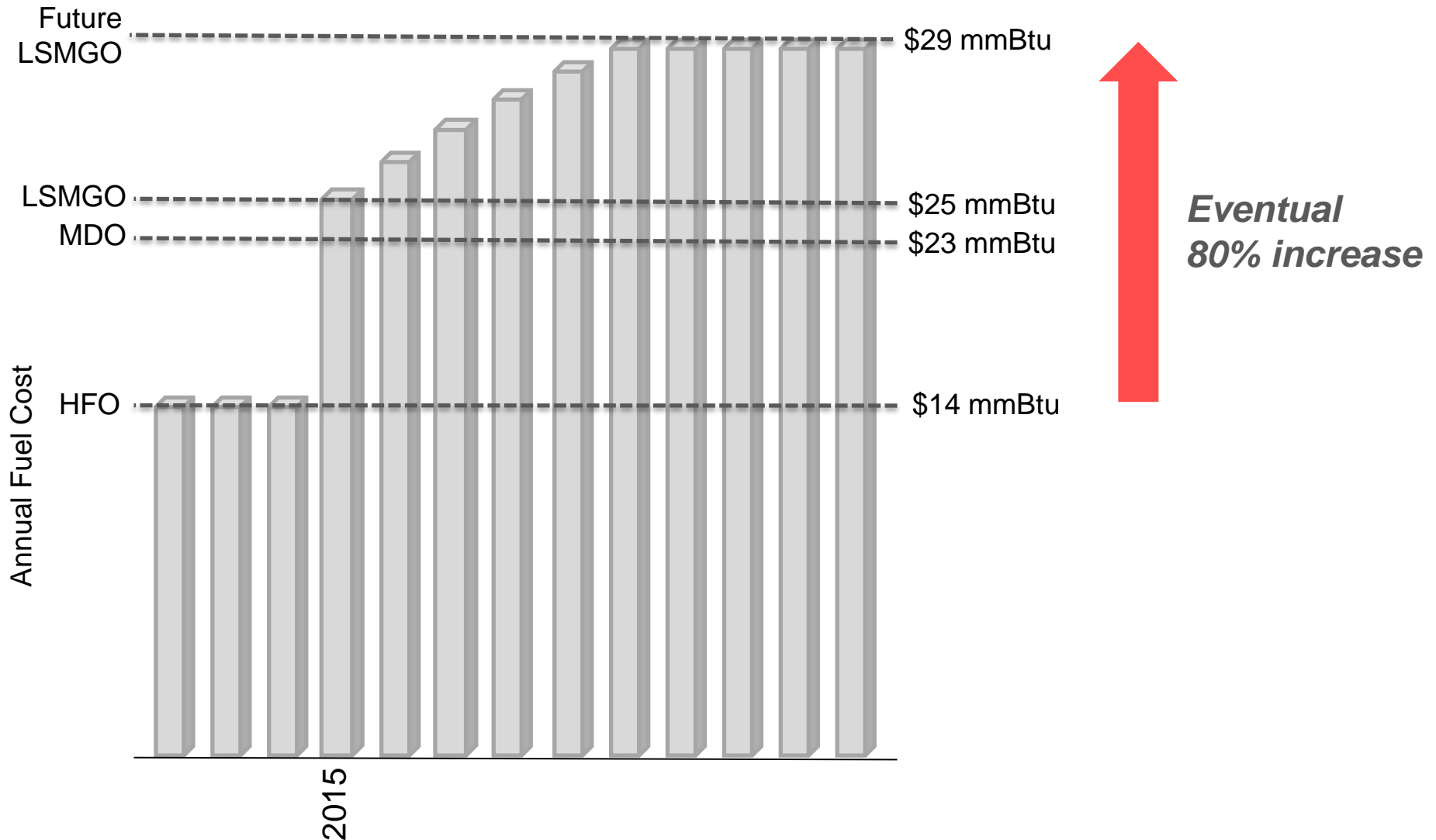
Fuel cost before Jan 1st, 2015



Fuel cost after Jan 1st, 2015

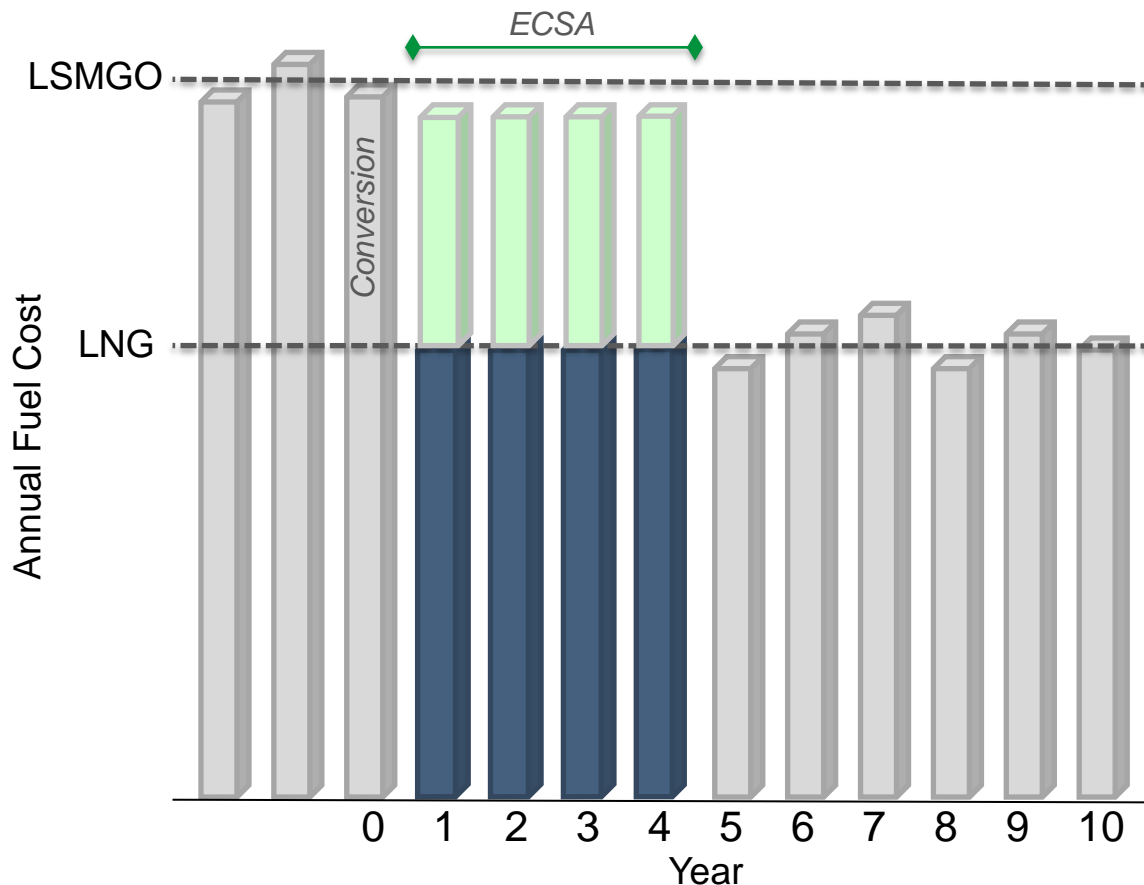


Fuel cost after increase in LSMGO



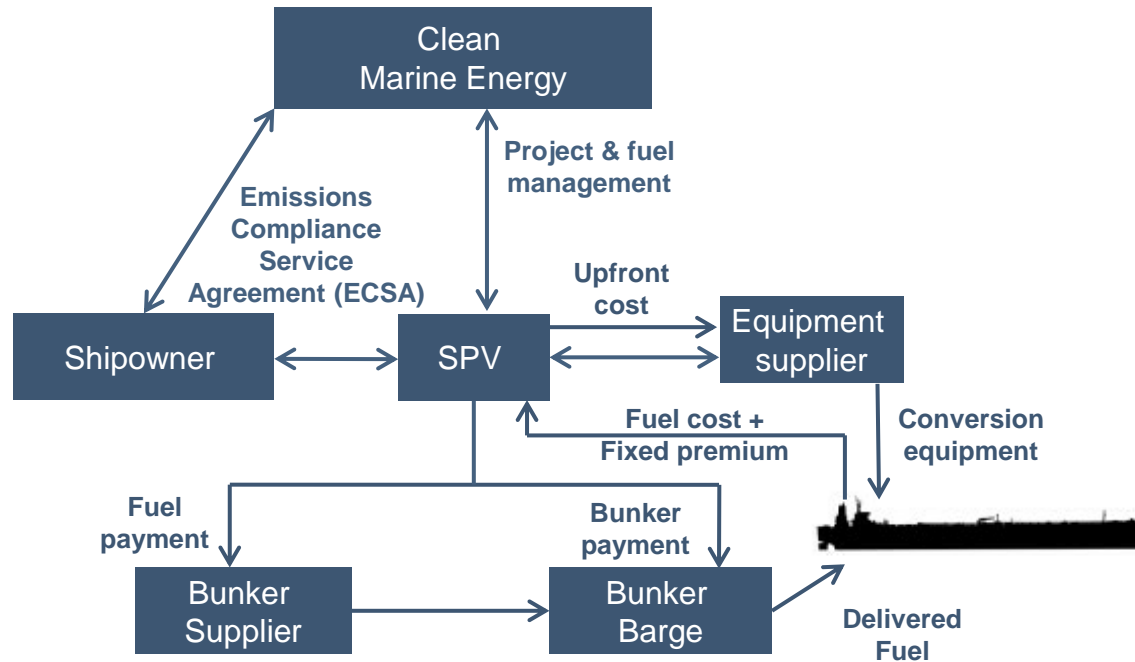
Fuel Cost with ECSA

- ECSA is a capital efficiency solution that leverages 3rd party capital to fund capex investments without adding to the ship owner's cost-basis, by transitioning capex to opex



- Ship owner pays no upfront capital for ECA compliance
- Fuel payer continues to pay what they would have paid anyway, with some immediate shared savings during ECSA
- After the ECSA term, the ship benefits from 100% of the fuel cost savings for the remaining life of the asset
- Compliance becomes a NPV positive activity with no capital requirement... ship owner can use it's capital for other more accretive investments

CME financing mechanism

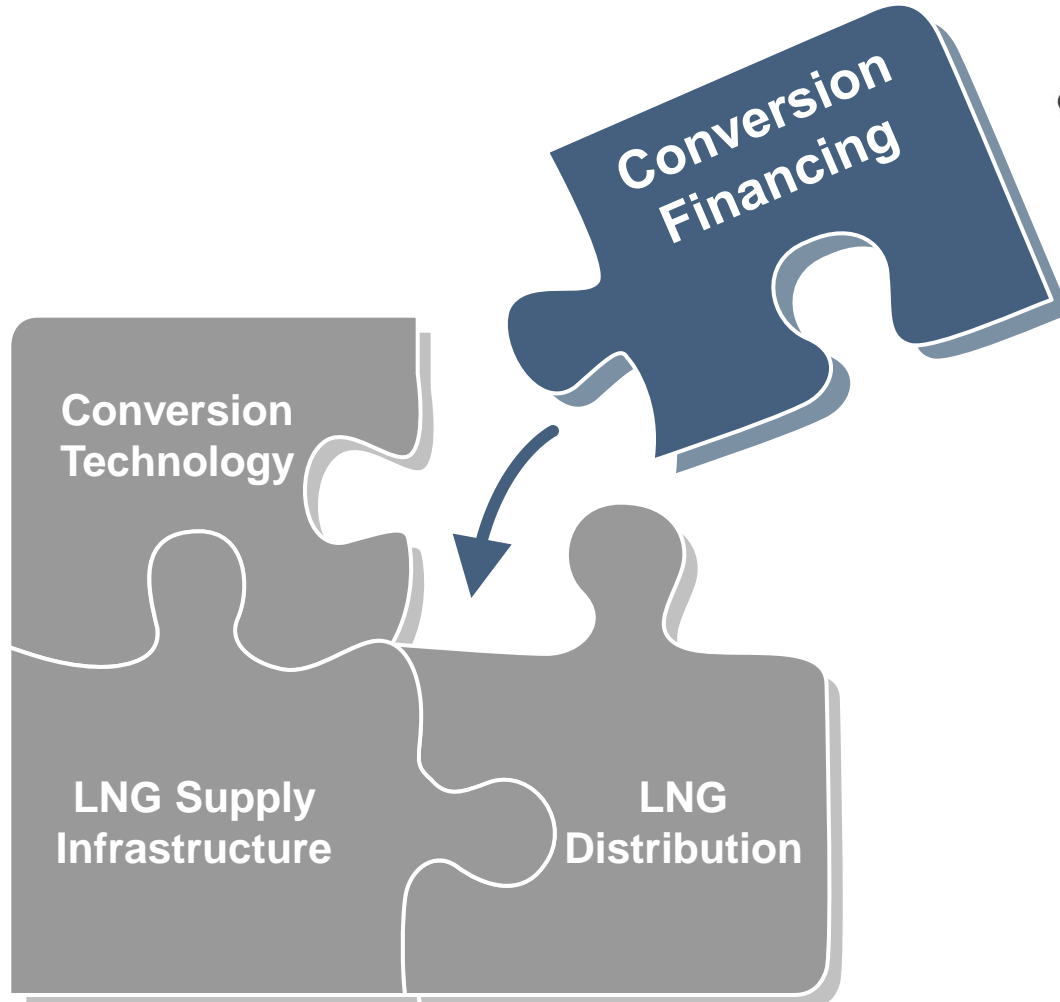


- * Premium is to be fixed at the contract signing being a proportion of the difference between ULSD and actual LNG cost
- * Adapted from a proven model that has been adapted from the real estate sector

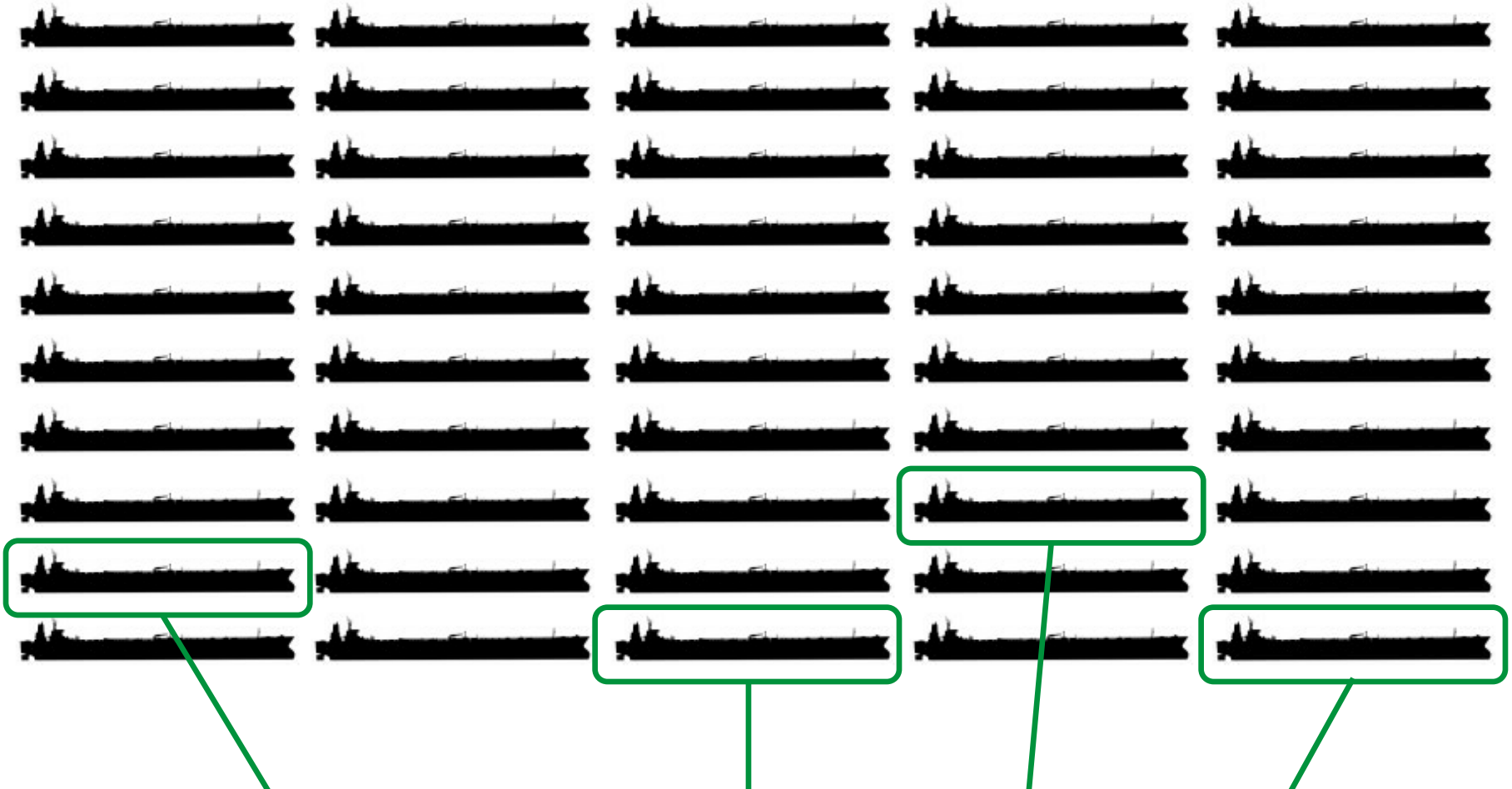
Competitive benefits for ship owners

- 1 A holistic solution for compliance
- 2 A simple and flexible structure with standardised arrangements and documents
- 3 Ships run on low cost fuel. They will therefore either be more competitive or ship owner can take surplus benefit from lower costs
- 4 Provides greater fuel certainty - protecting themselves from future rising costs of low sulphur compared to high sulphur fuel
- 5 No upfront costs to them and therefore no need to find additional finance
- 6 No need to expensively rearrange their current finance arrangements, and could be off balance sheet altogether
- 7 Costs are directly paid from the financial benefit they receive with risks transferred

Eliminate barriers to ship owner action



Mission to fund 50 ships in five years



Start with the 'low-hanging fruit' with technological feasibility & quick payback

THANK YOU

Pace Ralli

pace@cleanmarineenergy.com

Cell: +1 914 844 0840