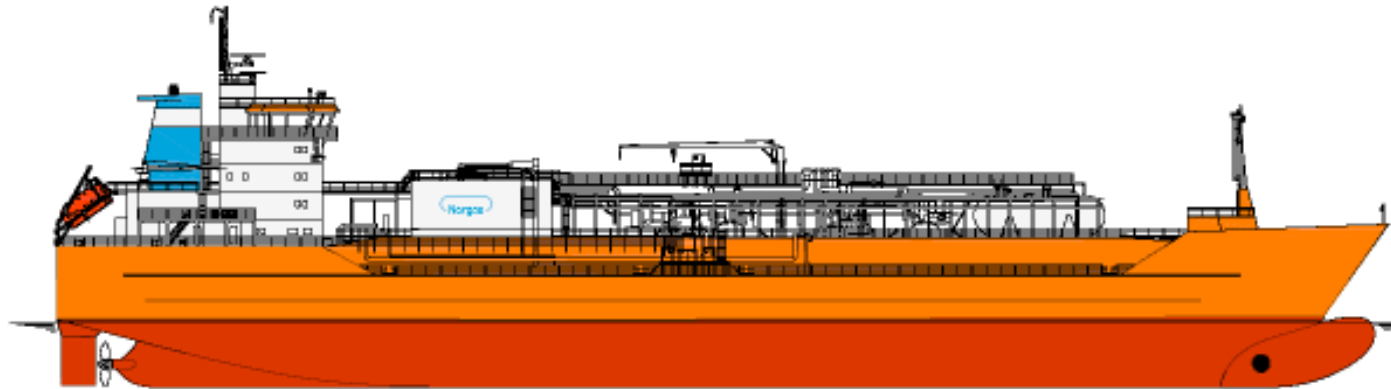




I.M. SKAUGEN ASA
IMS – Innovative Maritime Solutions



The flexible solution – I.M. Skaugen's fleet of Small Scale LNG Carriers

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Business units

Norgas Gas Activities

World-wide transportation of petrochemical gases, LPG and with a focus on Ethylene



Norgas is now moving into LNG by the new vessels we are building in China.

SMC

Skaugen Marine Construction

Management of new building related activities in China



SMC is the only company now constructing semi-ref gas carriers in China

SPT

Skaugen PetroTrans

World-wide ship to ship transfer of crude oil and LNG



SPT is the leading provider of lightering services in the world.





Skaugen Petrotrans - Leading Position in Lightering

- SPT is the largest lightering companies in the world - taking ashore 10% of US' seaborne crude oil imports or around 1 million barrels of oil every day
- SPT is expanding into the European, Russian and African markets through SPT Marine Services
- SPT performed the worlds first two LNG ship-to-ship transfers in August 2006 and February 2007





LOA: 277 m
Beam: 43 m
DWT: 77,288 m t
Built: 2005

LNG Carrier Excelsior



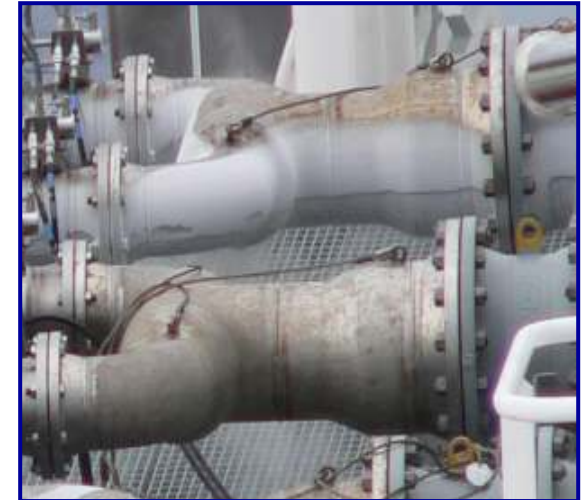
Flag: Belgium
Owner: Exmar Shipping
Draft: 12.3 m
Function: Receiving Ship

LNG Carrier Excalibur



LOA: 277 m
Beam: 43 m
DWT: 76,500 m t
Built: 2002

Flag: Belgium
Owner: Exmar Shipping
Draft: 12.1 m
Function: Ship-to-be-Lightered





I.M. Skaugen Norgas

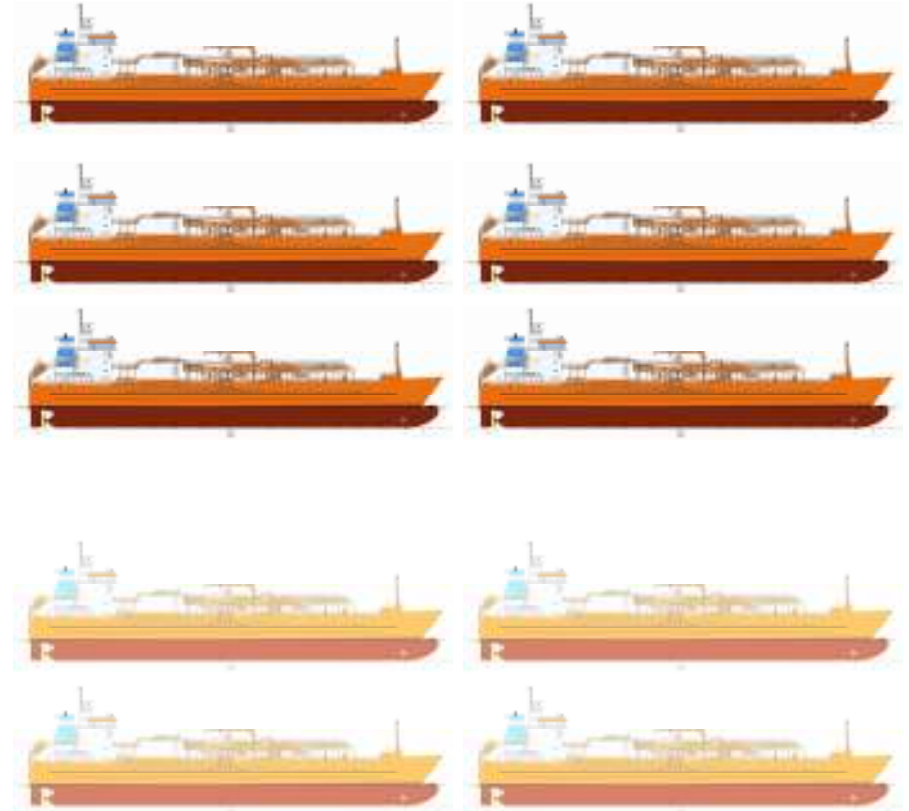
- We are a global leader in the field of cryogenic (mainly ethylene) shipping and have a strong customer base in Asia and Europe
- We are a fully integrated shipping company that designs, builds, owns and operates our own ships.





I.M. Skaugen Norgas

- Our long experience with gas carriers, and handling of cryogenic gasses including handling of LIN, has resulted in a design, called the MultiGas Carrier. Capable of carrying LNG /LEG/LPG/VCM/NH₃.
- Firm orders for six MG carries of 10.000cbm capacity in a series of ten have been placed. The first ship will be delivered Q1 2009.





10.000 m³ Multigas LNG carrier

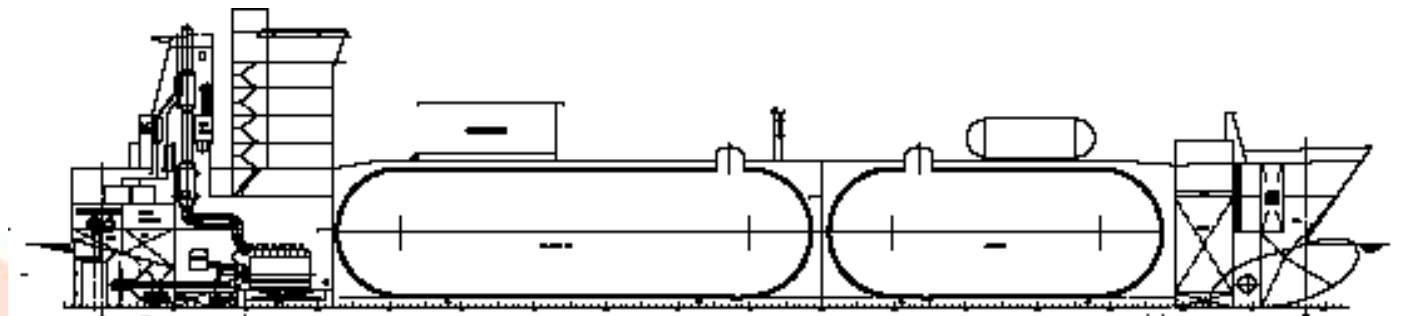
- The Multigas Carriers are designed as semi pressurized gas carriers.
- Semi pressurized vessel gives good flexibility in the carriage of LNG, LEG as well as LPG.
- Designed for quick and efficient change of grade in cargo tanks.
- The vessels are designed for carriage of two cooled and segregated grades simultaneously.





10.000 m³ Multigas LNG carrier

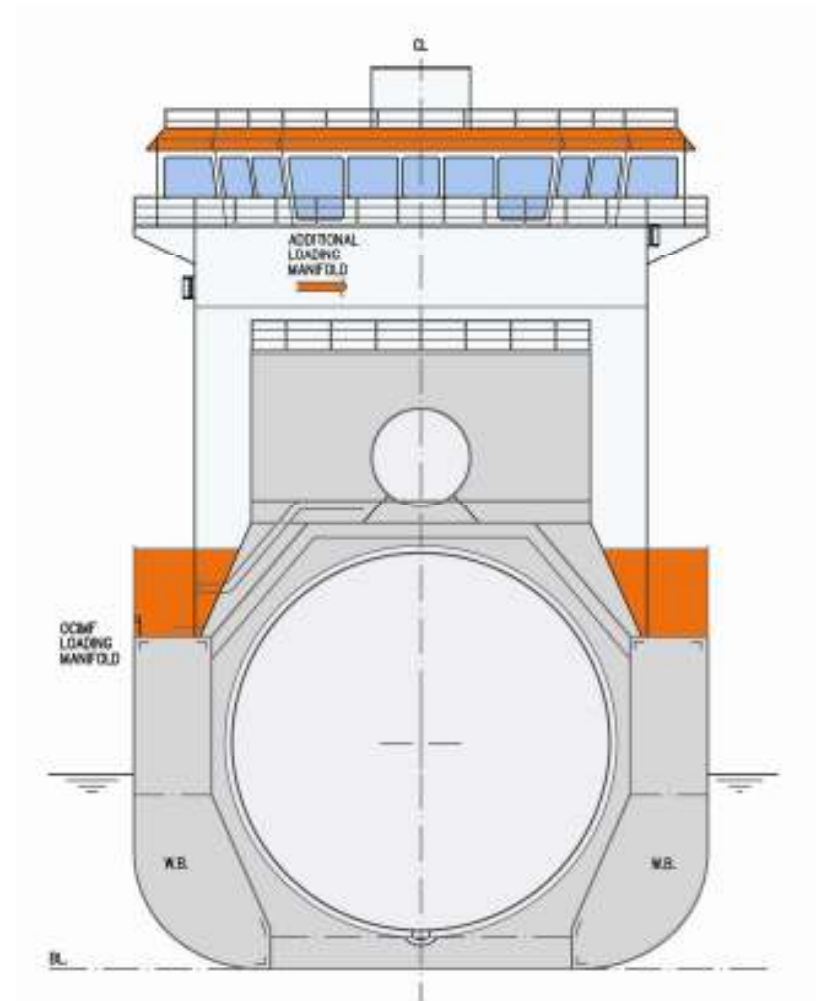
- The cargo tank containment system consists of two (2) cylindrical stainless steel cargo tanks of the independent type 2G of 4,000 m³ and 6,000 m³ respectively.
- Temperature range is from -163° C, and up to ambient conditions.
- Max tank pressure is set to 5.2 bar gauge IMO Setting.
- Each vessel will have a 110 cbm deck tank for LNG /LEG/LPG service. Max pressure 18 bar gauge.





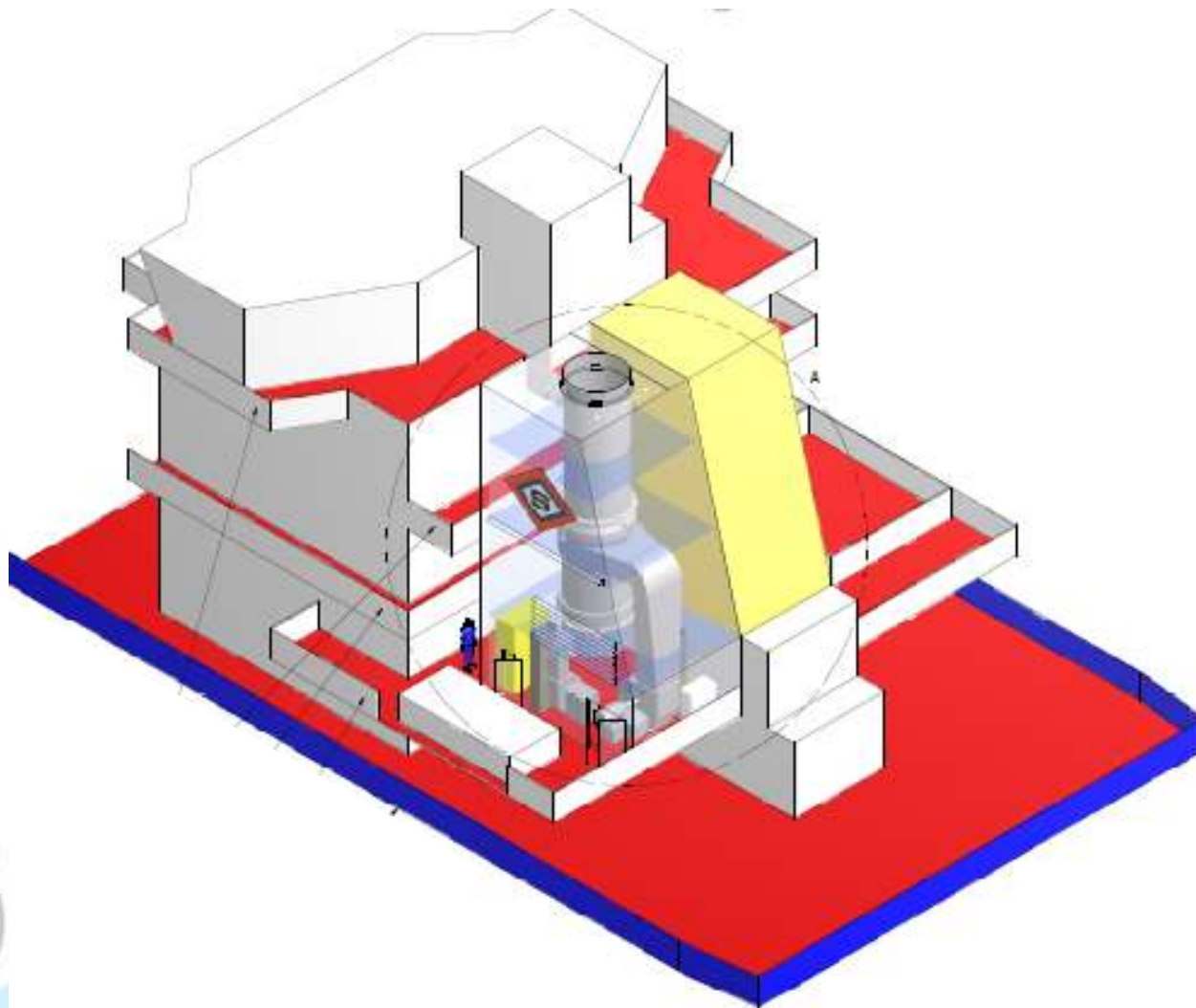
10.000 m³ Multigas LNG carrier

- The re-liquefaction plant has the capacity to re liquefy boil-off from LNG, LEG as well as LPG.
- LNG boil-off will be handled in a newly developed Mini LNG plant.
- LEG and LPG boil off is liquefied in a newly developed cascade plant.
- All vessels will be equipped with a Gas Combustion Unit designed for burning LNG as well as LEG and LPG.





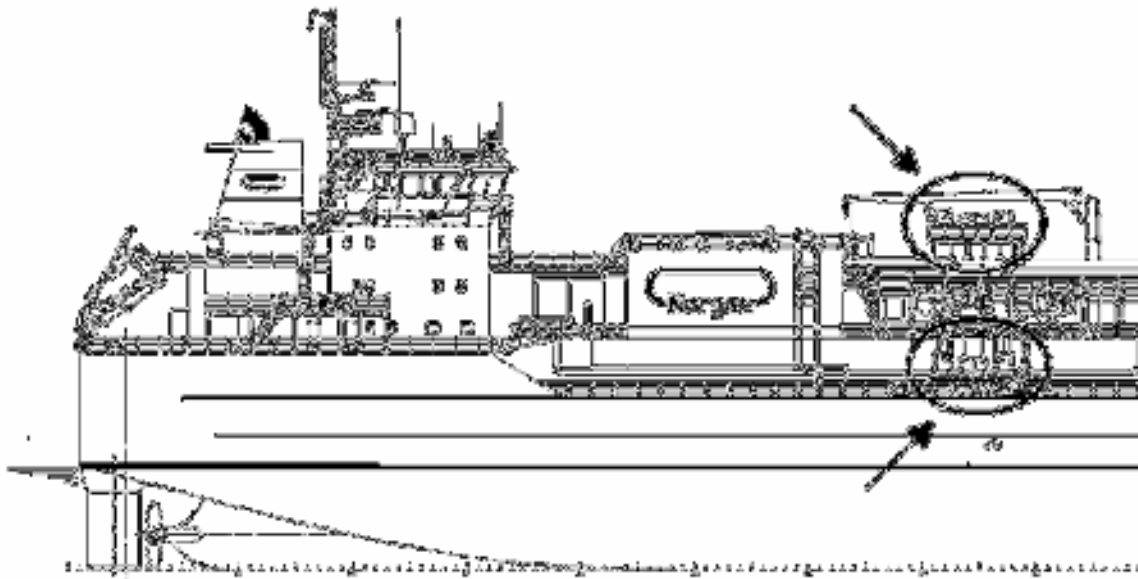
GCU – Gas Combustion Unit





10.000 m³ Multigas LNG carrier– Can load at large terminals

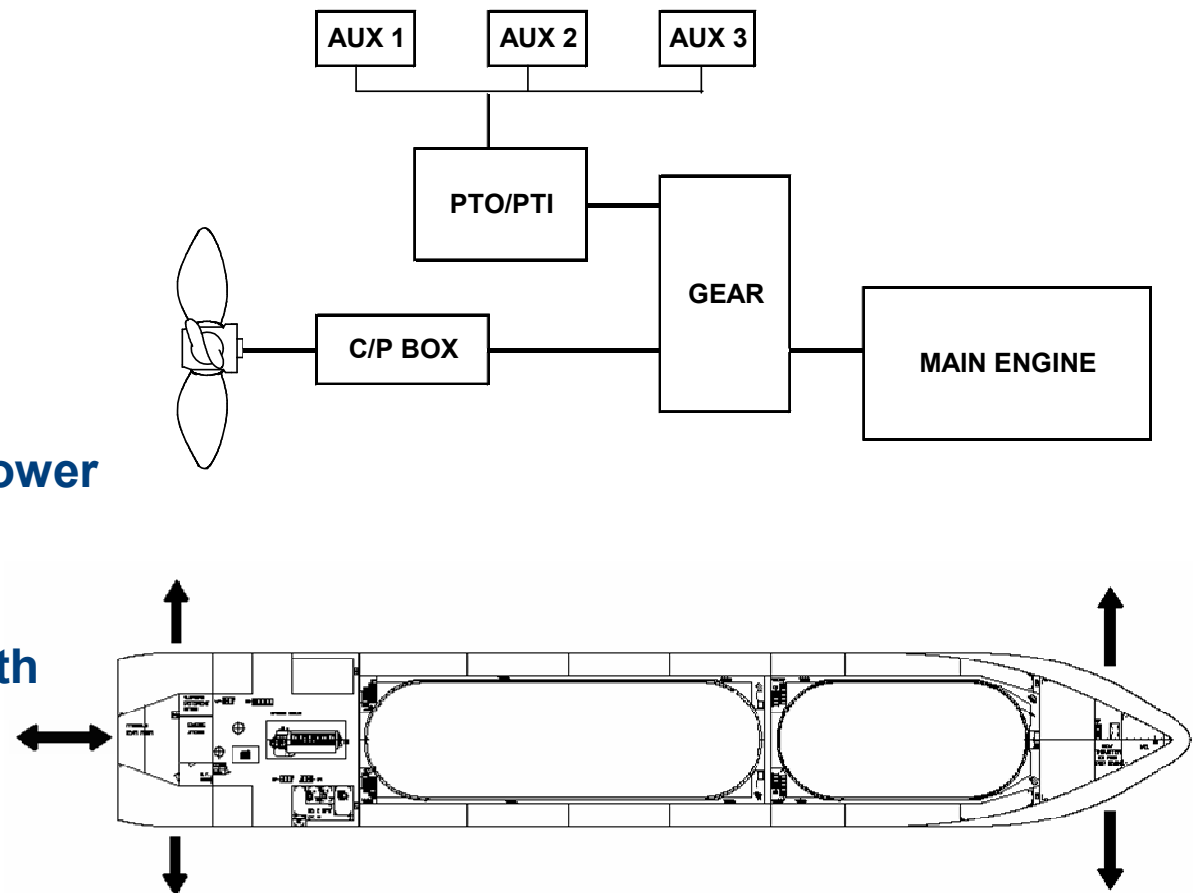
- The vessels are equipped with dual manifolds making it possible to fit the operating envelope of loading arms at both large traditional LNG terminals as well as terminals made for the Small Scale LNG trade.





10.000 m³ Multigas LNG carrier - Propulsion & Maneuverability

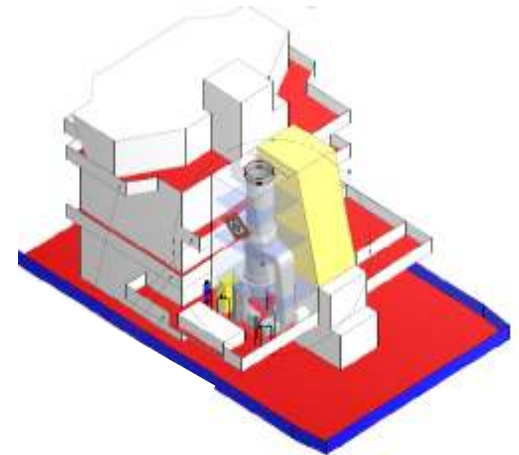
- The propulsion system consists of one medium speed, 4-stroke diesel engine
- A controllable pitch propeller through a reduction gearbox.
- Three (3) auxiliary engines
- The shaft generator has a PTI mode
- A “take-me-home” engine
- Main engine can be used as power plant
- Bow thruster of 800kW
- High efficient spade rudder with flap





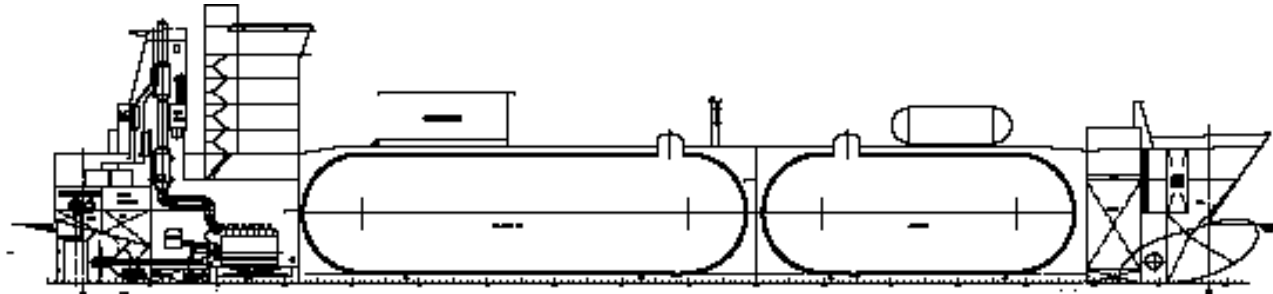
10.000 m³ Multigas LNG carrier - Environment

- Cargo system
 - Vapor recovery through re-liquefaction plant
 - Vapor incineration through GCU
- Vessel
 - Designed for global and multi gas trade, thus dual fuel operation not feasible
 - NO_x abatement through systems like HAM





10.000 m³ Multigas LNG carrier – Key Data (1)

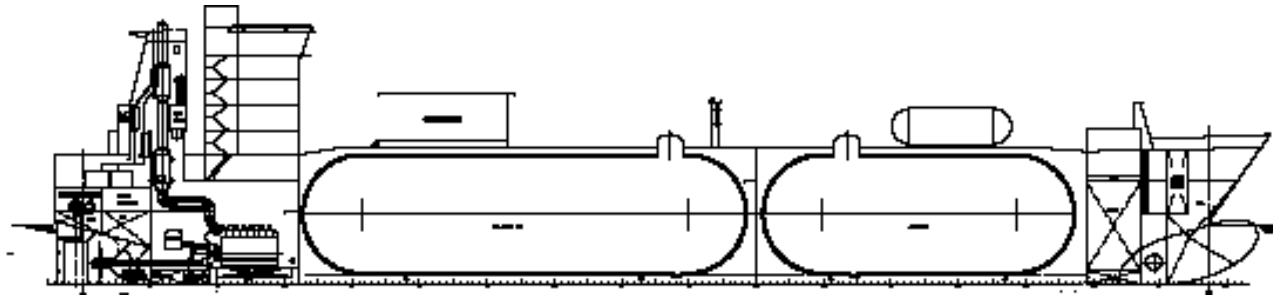


Main Dimensions	
Loa	137.1 m
Lpp	127.2 m
Breadth	19.8 m
Depth	11.5 m
Design Draught	6.7 m
Scantling Draught	8.3 m
Speed & Range	
Service Speed	16.5 knots
Range	12,800 nm

Machinery	
Main engines	7,200 kW
Shaft generator	1,900 kW _e
Auxiliary generators	3 x 910 kW _e
Consumption	
Main Engines (IFO 380)	27 ton/day
Auxiliaries (MDO)	1.5-10 ton/day
Tonnage	
DWT	10 600
GRT	10 060
NRT	3 020



10.000 m3 Multigas LNG carrier – Key Data (2)



Cargo Tanks	
Volume Cargo Tank 1	6000 m3
Volume Cargo Tank 2	4000 m3
Max pressure (IMO/USCG)	5.2 / 3.8 bar g
Max gravity	0.97 ton/m3
Min temperature	-163°C
Cargo Pumps	
Cargo pumps	640 / 380 m3/h
Total head C2	120 mlc
Total head LNG	220 mlc

Deck Tank	
Deck Tank Volume	110 m3
Max pressure (USCG)	18 bar g
Max gravity	0.65 ton/m3
Min temperature	-163°C
Other Tank Capacities	
Heavy Fuel Oil Tanks	1,050 m3
Marine Diesel & Gas Oil Tanks	175 m3
Lubrication Oils	60 m3
Fresh Water Tanks	180 m3
Ballast Tanks	5,800 m3

Auxilliary sytems	
PSA plant	99,9 %
Gas Combustion Unit	20 ton/day
Reliquefaction plant	20 ton/day





What can it do for a LNG operator?

- **Markets**
 - **Size adopted for supplies directly to large end-users or clusters of end-users.**
 - **Will make cost effective transport possible to users too small for traditional large scale LNG or too far from existing pipe line infrastructure**

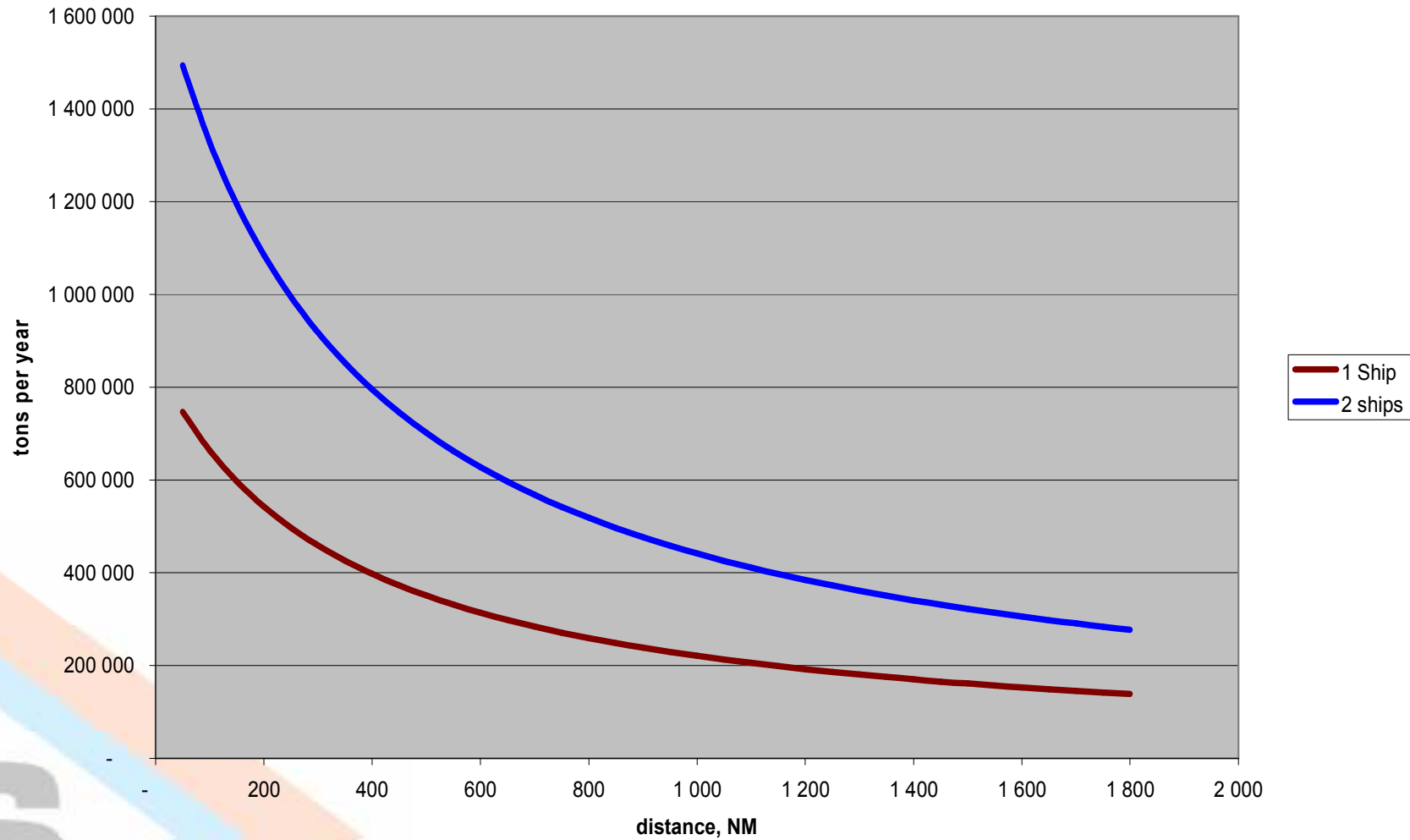


What can it do for a LNG operator?



I.M. SKAUGEN ASA
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Yearly capacity, 10.000 cbm vessels





Small Scale LNG concept – Storage and re-gas facilities

- Size of storage is driven by the size of ships. It should be big enough to always receive one full ship to minimise logistics costs.
- For a normal large scale carrier of 135.000 cbm, the storage needed is therefore 200-300.000 cbm.
- For a ship of the size 10.000 cbm, the storage needed would only be 30.000 cbm.



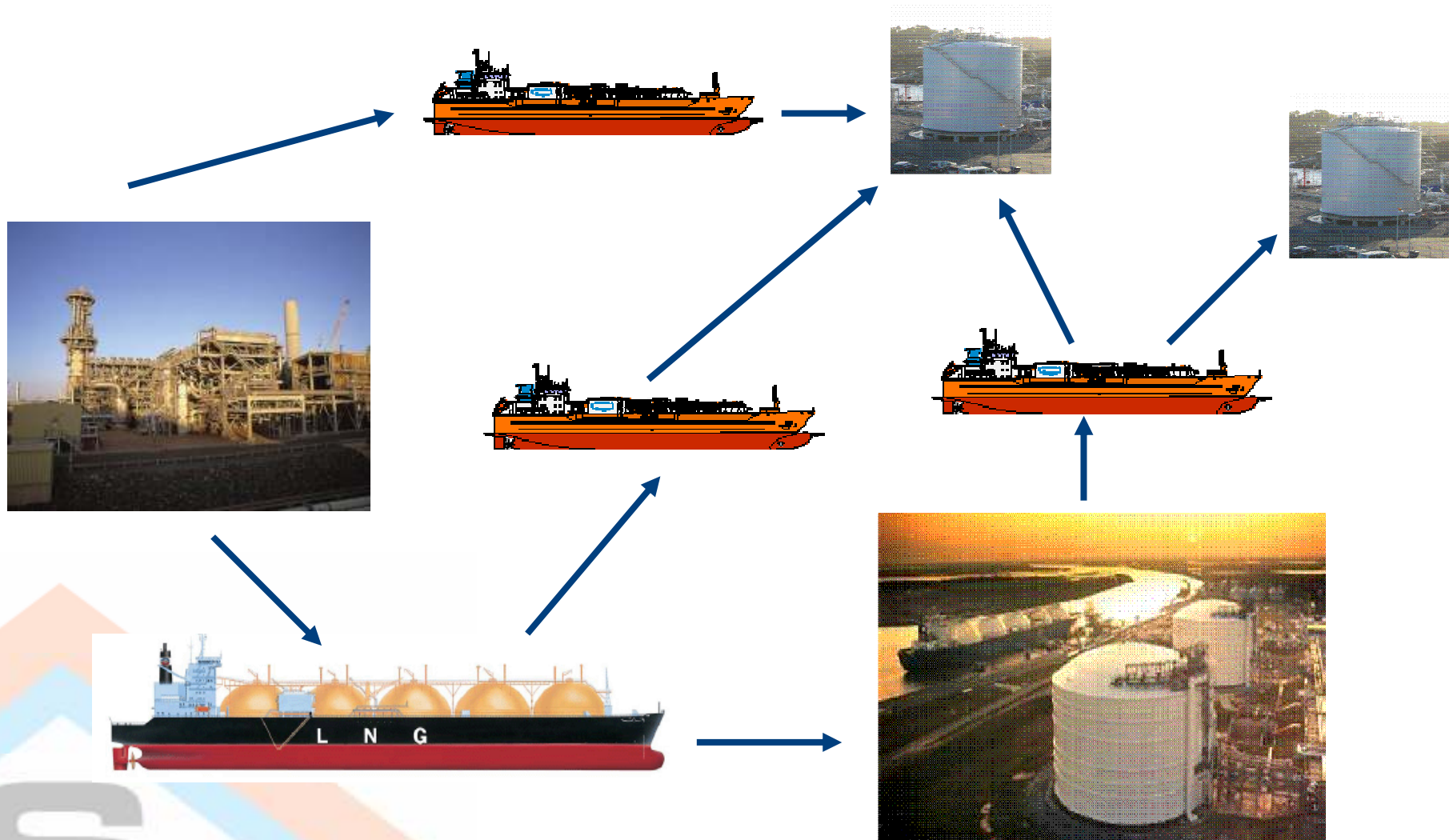
30.000 cbm x \$1500/cbm = \$45M



2 x 140.000 cbm x \$1500/cbm = \$420M



LNG can either be collected from a LNG plant, be re-distributed from a large LNG import terminal or be transferred through STS







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2009

