



LNG for 2020: Fueling Tomorrow's Shipping  
**LNG as a fuel - Regulatory Framework & SGMF's Guidelines**

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# Society for Gas as a Marine Fuel

## Who We Are...

### Our Mission:

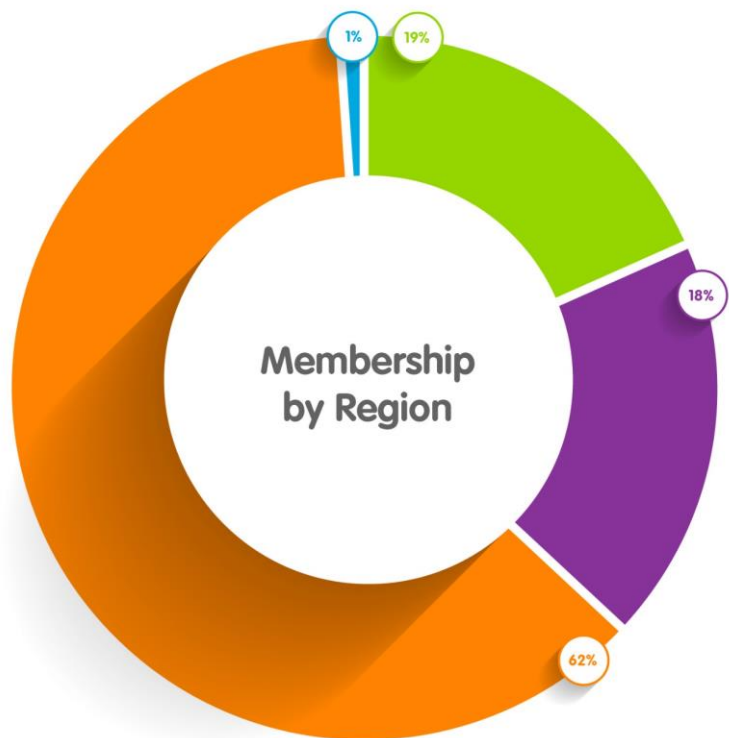
Leading the industry using our **collective knowledge and experience** to help and provide insightful guidance for the **safe and responsible use of gas as a sustainable marine fuel**.

### Key Facts:

- Formed in 2013
- 149 members – growing steadily (at Jan 2020)
- Governed by Board representing almost all industry sectors and geographies
- Two Committees: Technical & Environmental



# Who We Are...



- Americas
- Asia
- Europe
- Australasia



- Ship-owner / manager / operator
- Marine Fuel & Bunkering Supplier
- Port Authority / Terminal
- Shipyard
- Equipment Manufacturer
- Classification Society
- Training Organisation
- Consultancy, Engineering and EPC

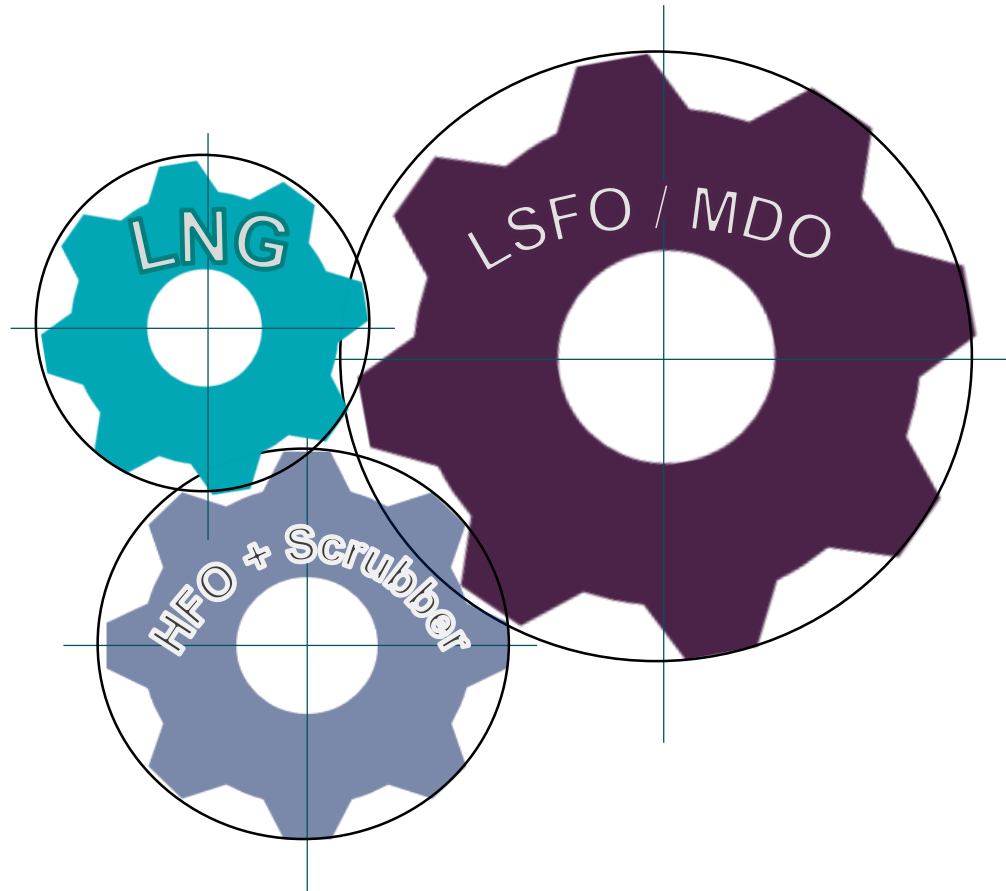


Who we work with.....



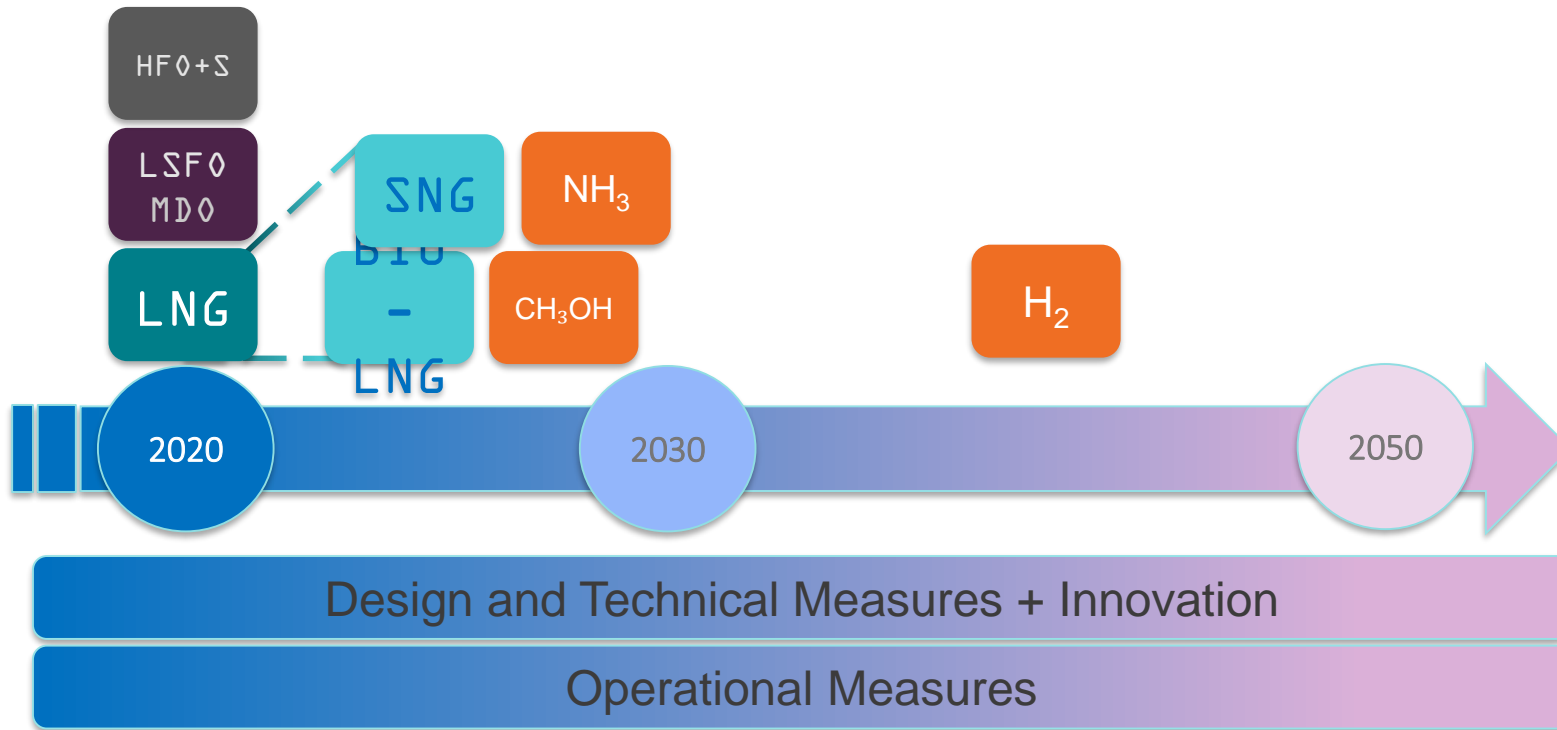
# Compliant Fuel Choices - Today... and Tomorrow

Use of LNG as a Marine Fuel to comply with IMO 2020?



# Compliant Fuel Choices - Today... and Tomorrow

## Use of LNG as a Marine Fuel to comply with IMO 2050?





# Industry by Numbers



177

LNG-fuelled ships in operation

0.2% of world fleet



208

LNG-fuelled ships on order

0.4% of world fleet



10

Vessels supplying LNG as fuel

180 m<sup>-3</sup> to 38,000 m<sup>-3</sup>



19

Vessels on order to supply LNG as fuel

Further 66,000 m<sup>-3</sup>



79

Ports/Terminals supplying LNG fuel

Estimate 6000+ Bunker transfers so far

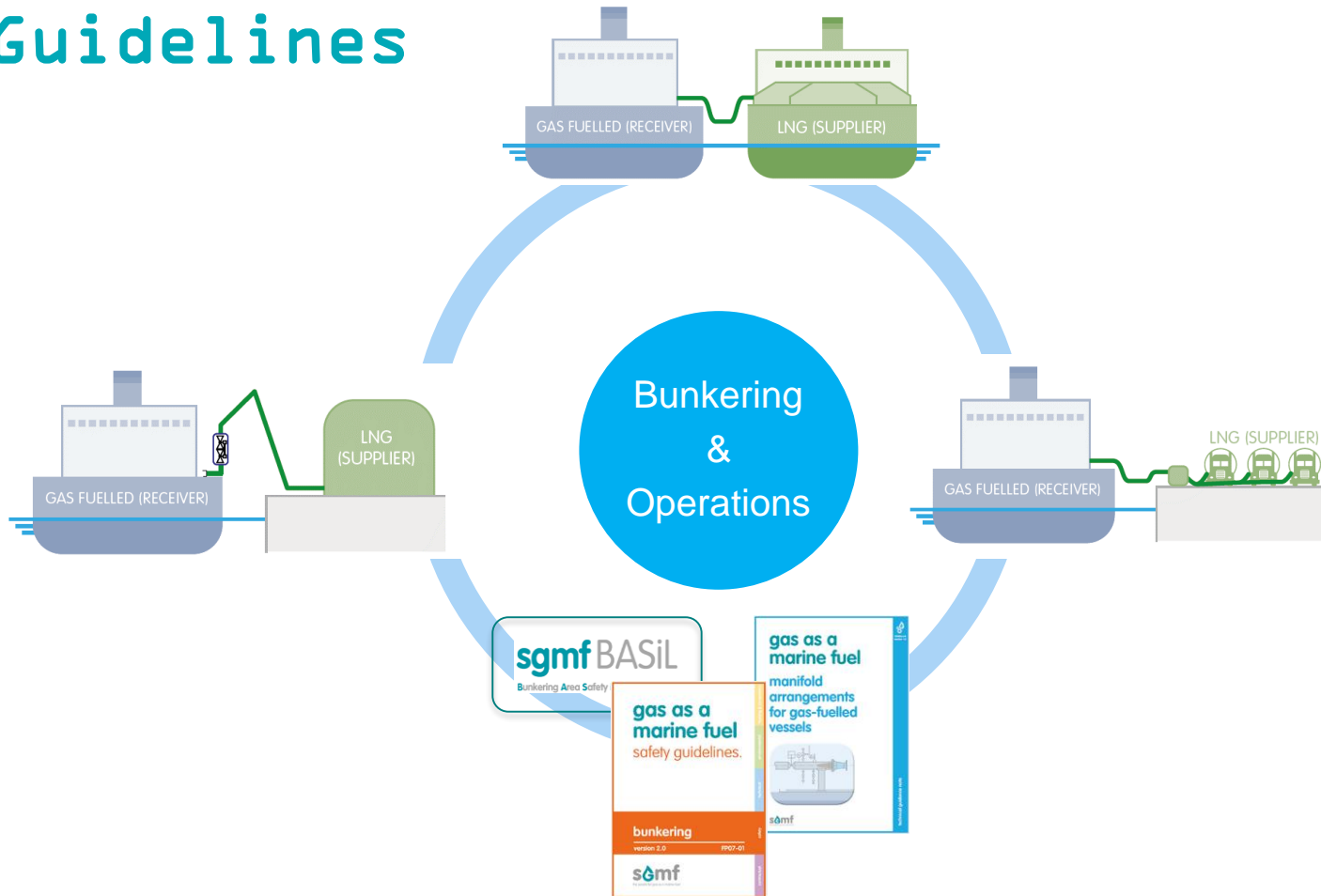


# LNG Bunker Vessels Fleet

SHIP	Operator	IMO	Delivery	Cont	Capacity [m <sup>3</sup> ]	Region
Seagas	Sirius	7382691	2013	Type C	187	Baltic
Engie Zeebrugge	Engie NYK Fluxys	9750024	2017	Type C	5000	N EU
Cardissa	Shell	9765079	2017	Type C	6500	EU
Coralius	Gasum		2017	Type C	5800	Baltic
Oizmendi		9494981	2018	Type C	600	EU
Coral Methane	Anthony Veder	9404584	2018 (Conv)	Type C	7500	EU
Kairos	BSM	9819882	2019	Type C	7500	EU
Clean Jacksonville	TOTE	\	2018	Membrane	2200	USA
FlexFueled 1	Titan LNG	\	2019	Type C	1480	EU
LNG London	Victrol / CFT	ENI 0610562 1	2019	Type C	3000	EU
10 In operation					39,767	
19 on order					+66,600	



# Regulatory Framework & SGMF Guidelines



# Regulatory Framework & SGMF

Already available.

## Guidelines

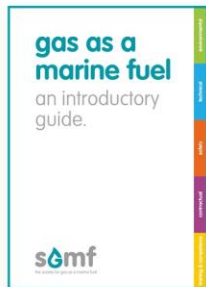
- Gas as Fuel an introductory guide
- Quality & Quantity Contractual Guidelines
- Bunkering Operational Guidelines
- Bunkering Competency Guidelines
- Recommendations of Controlled Zone for LNG Bunkering
- Simultaneous Operations for LNG Bunkering
- BASiL Safe Working Distances for LNG Bunkering
- Manifold Arrangements for IGF Vessels
- Bunkering Safety Link - ESD arrangements
- LNG bunkering with hose bunker systems
- Quick Connect /Disconnect Couplings → ISO21593
- LCA study for LNG as marine fuel

Soon to come...

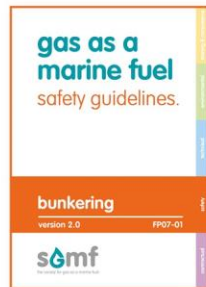
- Gas Quality vs Engine Performance
- Dry Docking and Maintenance for IGF vessels



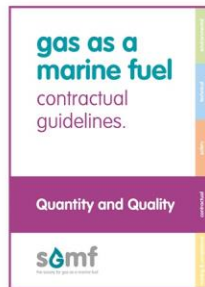
# SGMF Publications



An Introductory guide  
ISBN 978-0-9933164-6-3



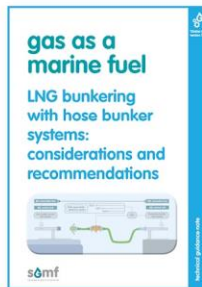
Safety Guidelines –  
Bunkering  
ISBN 978-0-9933164-4-9



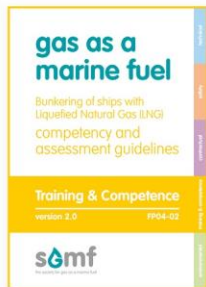
Contractual Guidelines –  
Quantity and Quality  
ISBN 978-0-9933164-1-8



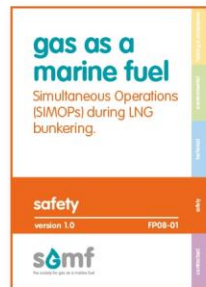
Manifold arrangements  
for gas-fuelled vessels  
ISBN 978-1-9996669-0-3



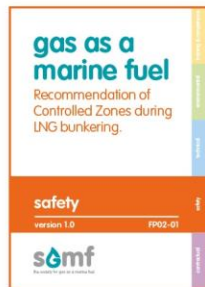
LNG bunkering with hose  
bunker systems:  
considerations and  
recommendations  
ISBN 978-1-9996669-2-7



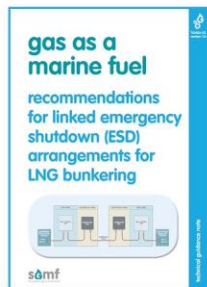
Training & Competence  
ISBN 978-0-9933164-5-6



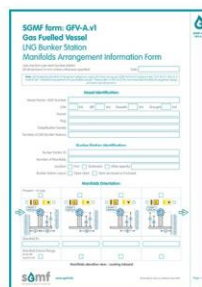
Simultaneous Operations  
(SIMOPs) during LNG  
Bunkering  
ISBN 978-0-9933164-5-6



Recommendation of  
Controlled Zones during  
LNG bunkering  
ISBN 978-0-9933164-8-7



Recommendations for  
linked emergency shutdown  
(ESD) arrangements for  
LNG bunkering  
ISBN 978-1-9996669-1-0

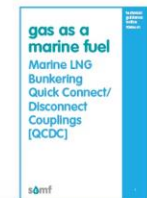
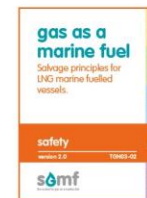


SGMF form: GFV-A.v1  
LNG Bunker Station  
Manifolds Arrangement  
Information Form  
Free download from  
[www.sgmf.info/shop](http://www.sgmf.info/shop)



## Technical Guidance Notices

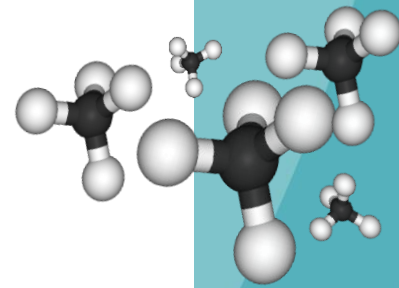
(available to Members only)





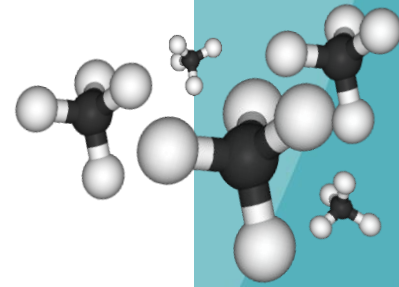
# Conclusions...

- LNG is a fully compliant IMO 2020 fuel
  - Reduction: 100% SO<sub>x</sub>, 95% NO<sub>x</sub>, 99% PMs, GHG:21% wtw to 28% ttw
- Upstream CH<sub>4</sub> losses can be reduced
- Further on board CH<sub>4</sub> slip improvement is needed
- Use of Bio-LNG and Synthetic LNG would further improve emission



# Conclusions...

- LNG is Safe to Use and becoming readily available
- Marine Propulsion Engines can readily burn Methane
- Most ship types now have a Gas Fueled variant in service or on order
- We have a good but still developing regulatory framework





**KEEP  
COOL  
AND  
CARRY  
ON**



**GAS  
FEST** 1 – 2 July  
**2020**  
Barcelona, Spain

**we sea change, do you?**

**sgmf**  
2020 sea change.