



MARINE & OFFSHORE



LNG Ready[®]
The stakeholders engagement
NAPOLI 24 - 29 SETTEMBRE 2018

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Development Manager*

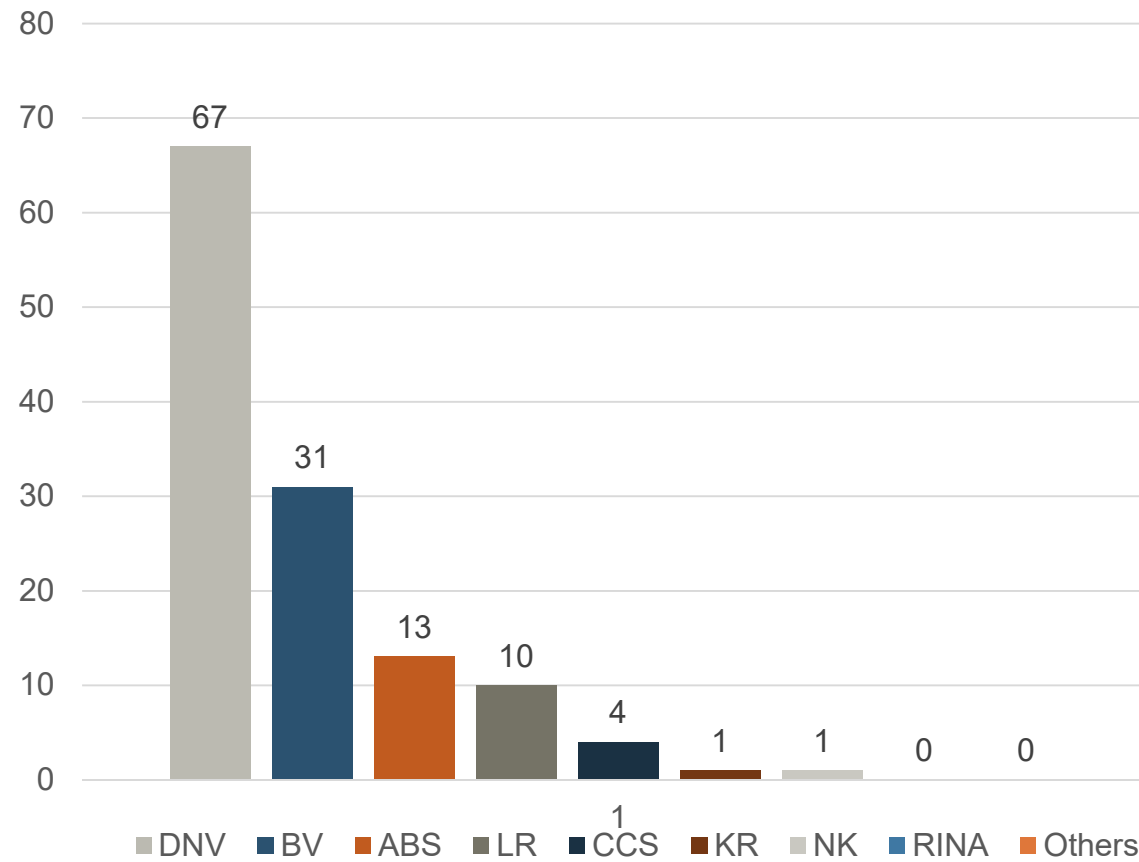
LNG READY[®] From the IGF Code to date **Global LNG fueled ships worldwide** (ocean going excl. LNG carriers)



LNG fuelled ships in operation – update May 2017 by AIS

LNG READY[®] From the IGF Code to date

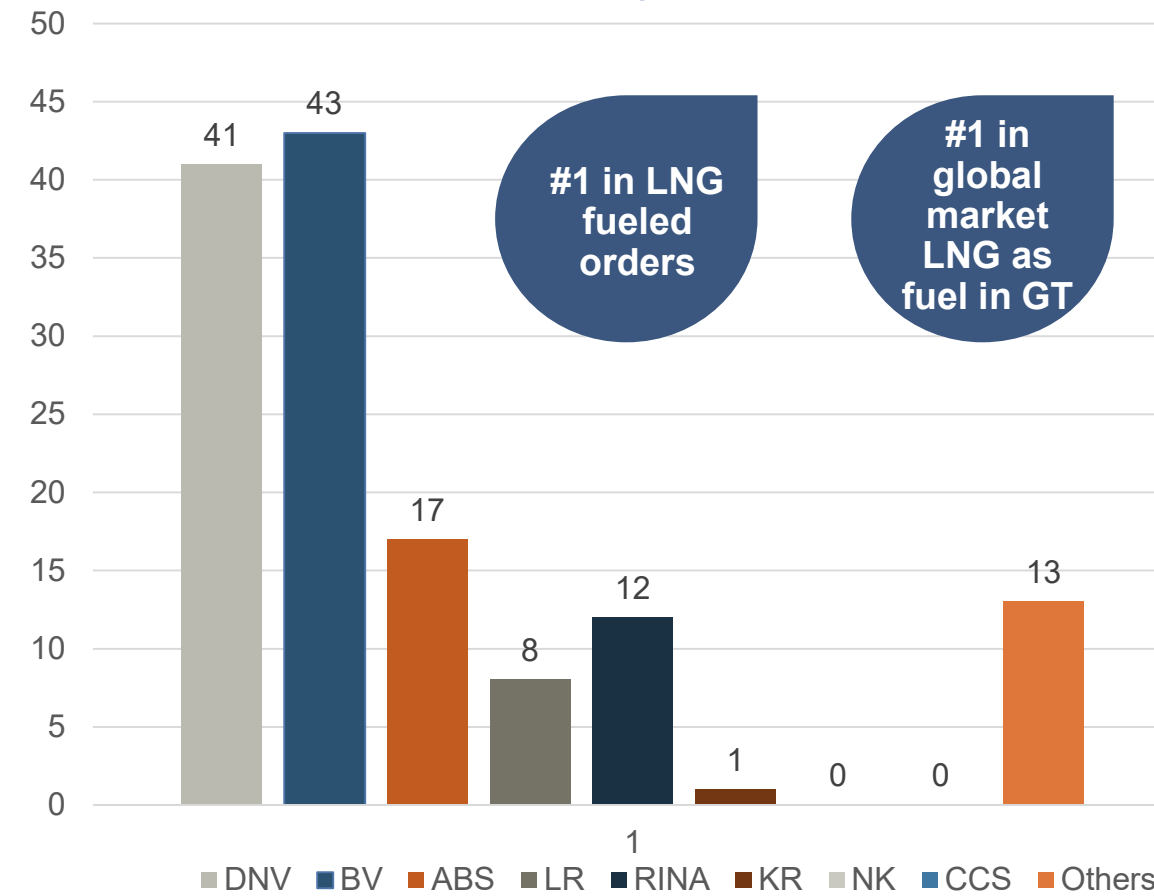
127 Ships in operation



DNV	BV	ABS	LR	CCS	KR	NK	RINA	Others
67	31	13	10	4	1	1	0	0

Global LNG fueled ships worldwide (ocean going excl. LNG carriers)

135 Ships on order



DNV	BV	ABS	LR	RINA	KR	NK	CCS	Others
41	43	17	8	12	1	0	0	13



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Gas fueled ships under BV class



31 LNG fuelled ships are in operation BV class among 127

24% Market Share

43 LNG fuelled ships confirmed NEW Order BV class among 135

32% Market Share



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Gas fueled ships under BV class



Seatrade, 31st May 2017

MSC Cruises reveals novel look of its LNG World-class newbuilds



One year after they were **first announced**, MSC Cruises confirmed the order for up to four LNG-powered cruise ships of 200,000gt at STX France and released the first rendering of their novel design.

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The tipping point



CMA CGM News, 7th November 2017

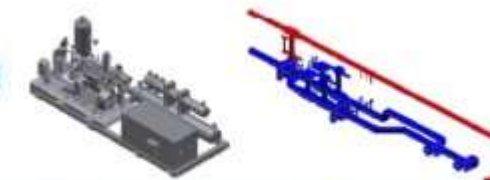


World Innovation: CMA CGM is the first shipping company to choose liquefied natural gas for its biggest ships

On the occasion of the COP23 in Bonn (Germany), the CMA CGM Group, a world leader in maritime transport, is pleased to announce its decision to equip its 9 future ships of 22,000 TEUs (Twenty-foot Equivalent Unit), delivered in 2020, with engines using liquefied natural gas.

CMA CGM is becoming the first shipping company in the world to equip giant containerships with this type of motorization, thus pursuing its firm commitment to the protection of the environment and to ocean conservation.

- ▶ Engineering for **optimized** Fuel Gas Handling System and Bunker Station



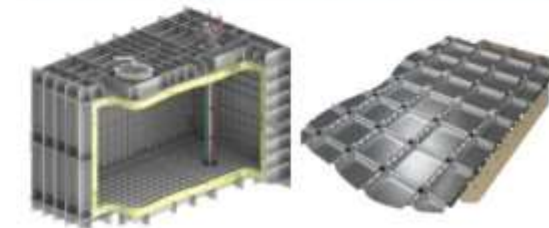
Fuel Gas Handling System and Bunker Station



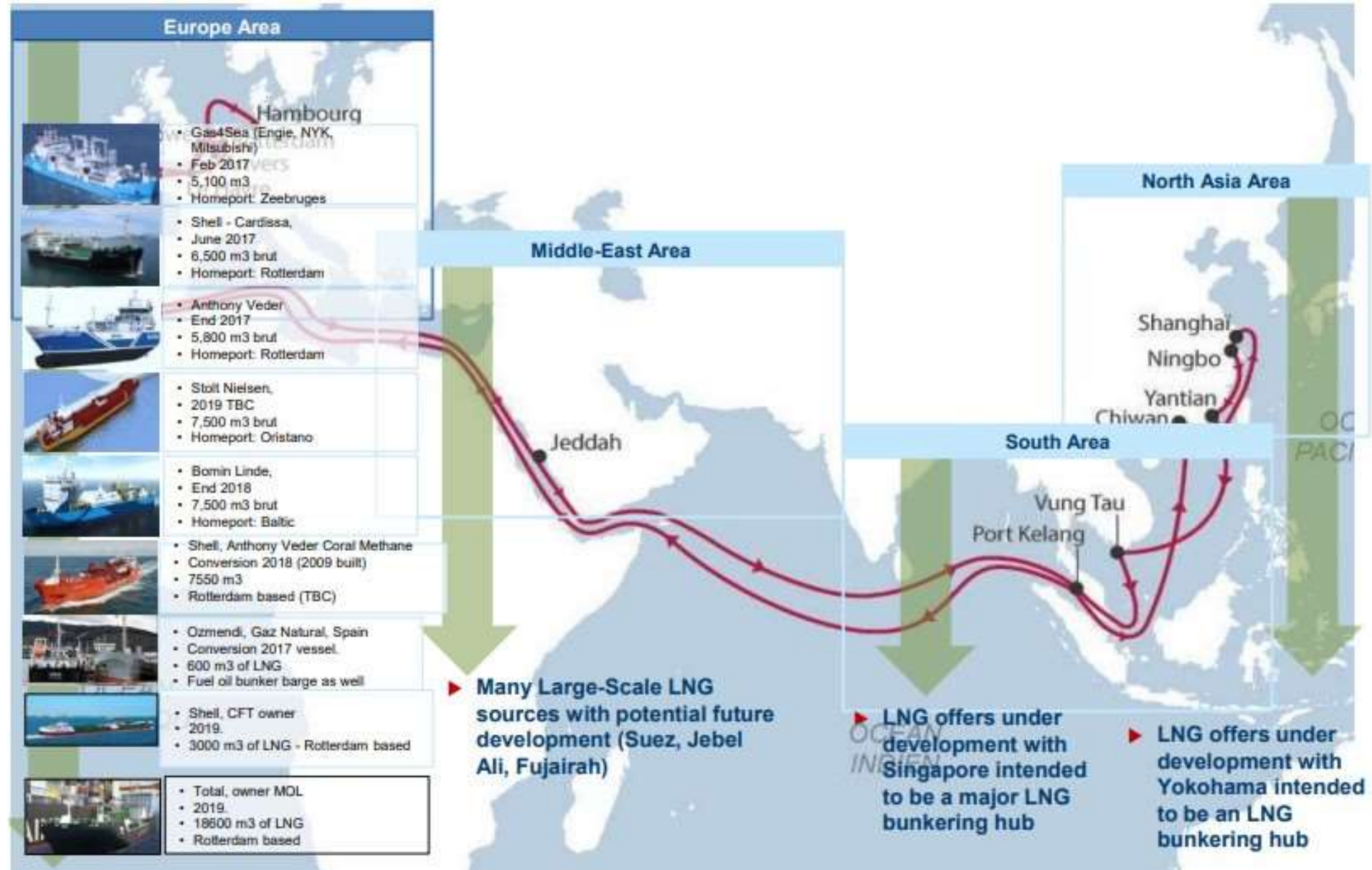
- ▶ **Compact** System thanks to **hull-fitted** Fuel Gas Tank

Fully Integrated and Compact LNG Fuel Tank

- ▶ 18 600 m³ LNG

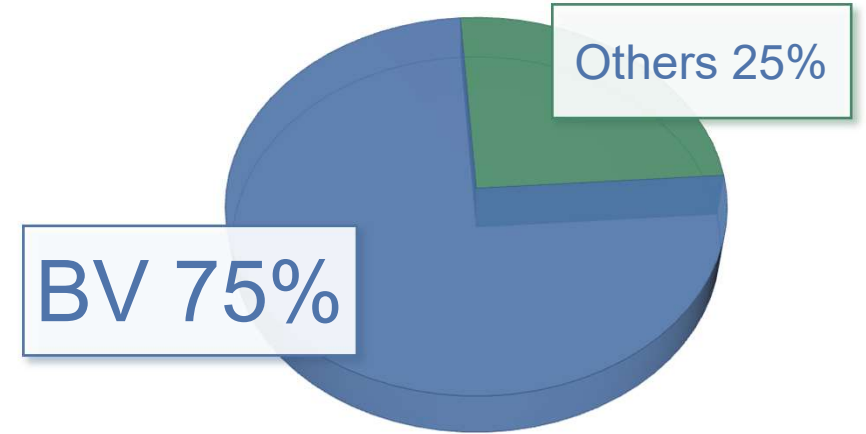


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LNG Bunker vessels classed by BV



75 % of LNG bunkerships in service + to be delivered are classed by BV



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LNG bunkering BV checks safe and efficient operations



General principle of safety zone

USCG policy Letter & field notice on SIMOPS

SIMOPS

The main risk assessment is to be developed for the LNG operation *with* SIMOPS (commercial operation during bunkering).

LFL contour
Full bore release, Jet -X, Wind -Y

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European Maritime Safety Agency



Guidance on LNG Bunkering
to Port Authorities and Administrations

Date: 31-01-2018



The cover of the guidance document features a photograph of two workers in high-visibility yellow and green safety gear working on a ship's deck. They are handling a large, complex piece of machinery, likely related to LNG bunkering. The deck has 'LNG' written on it in large letters. The background shows the ship's structure and a clear sky.

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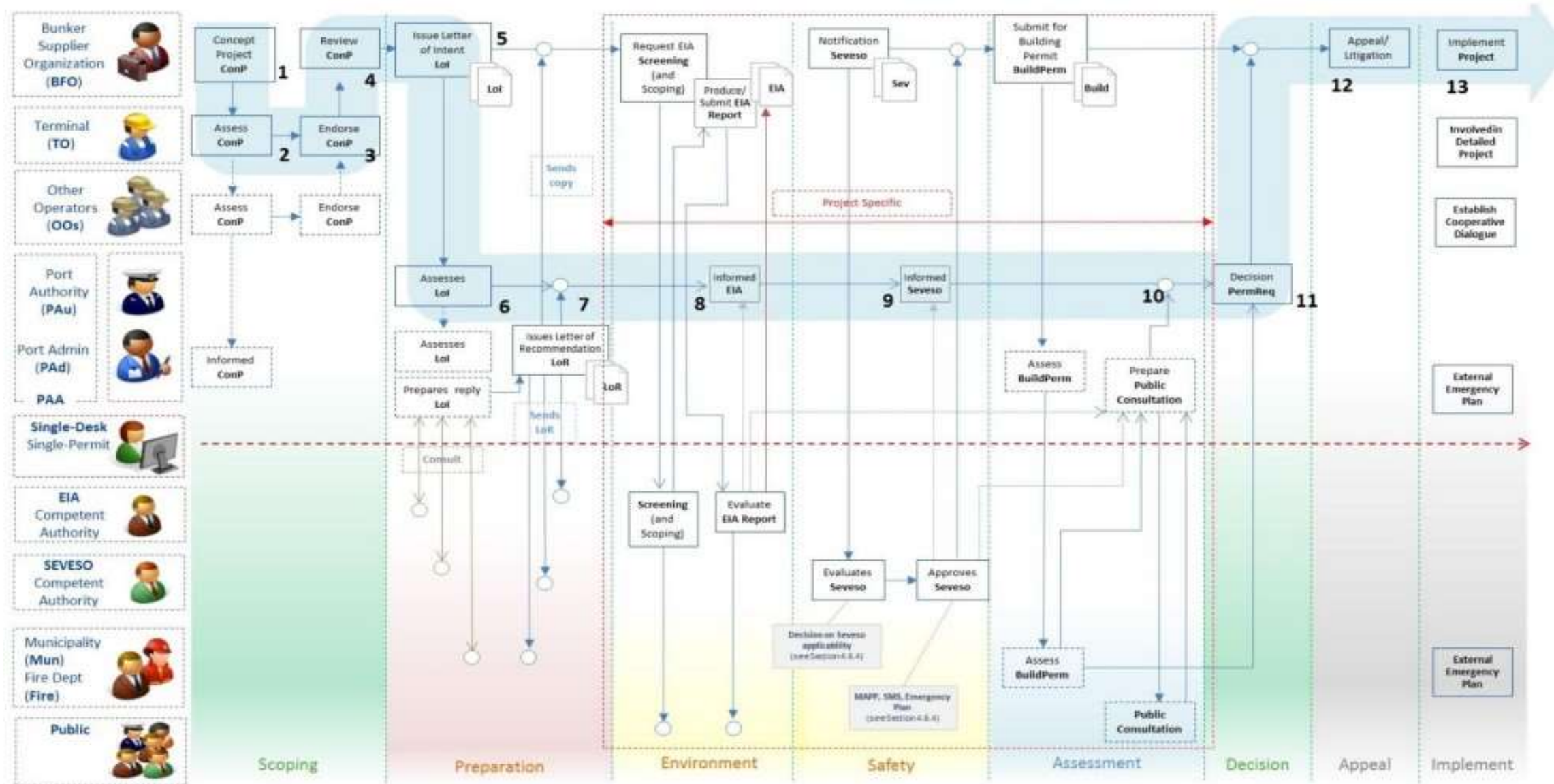
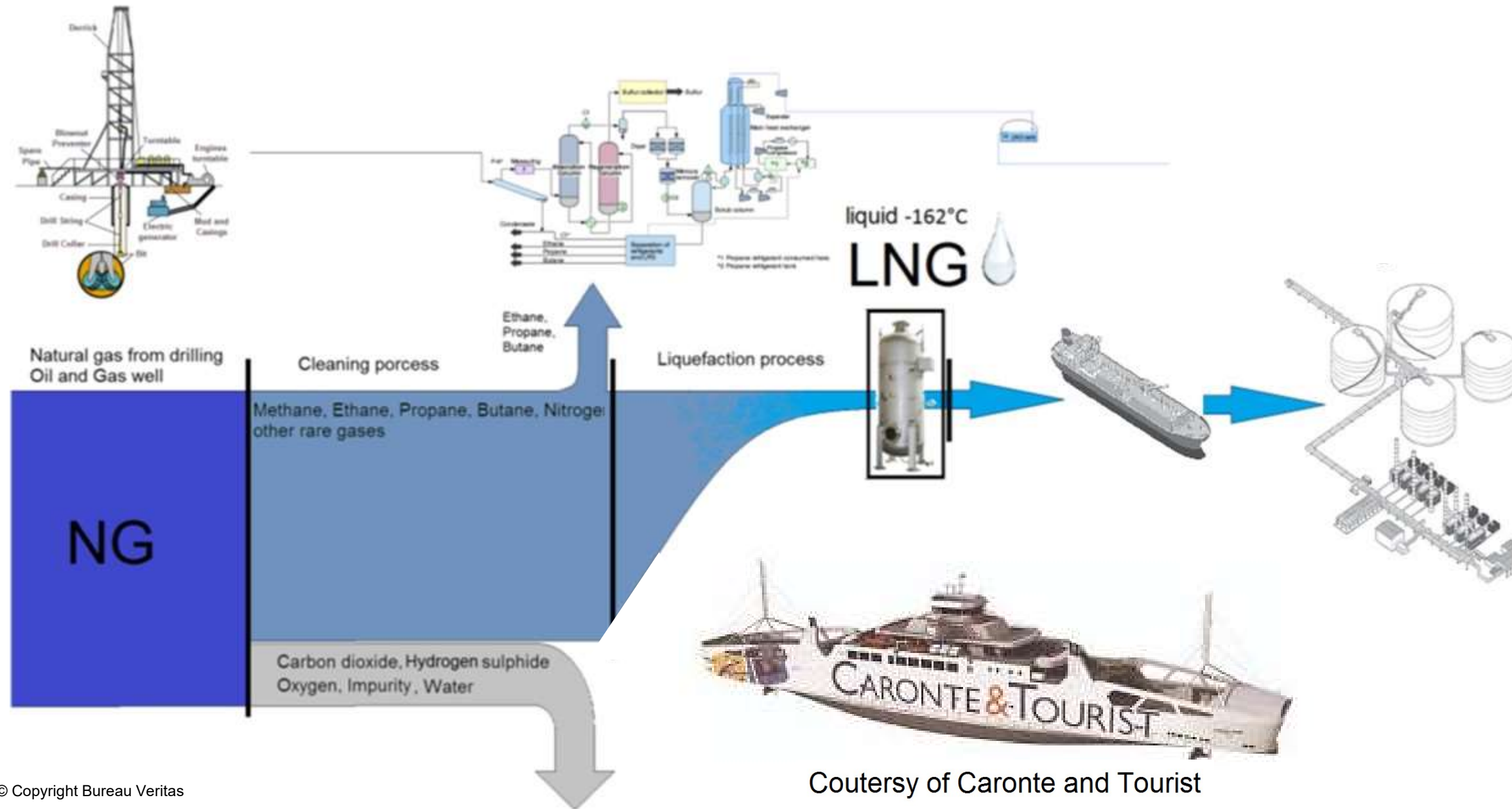
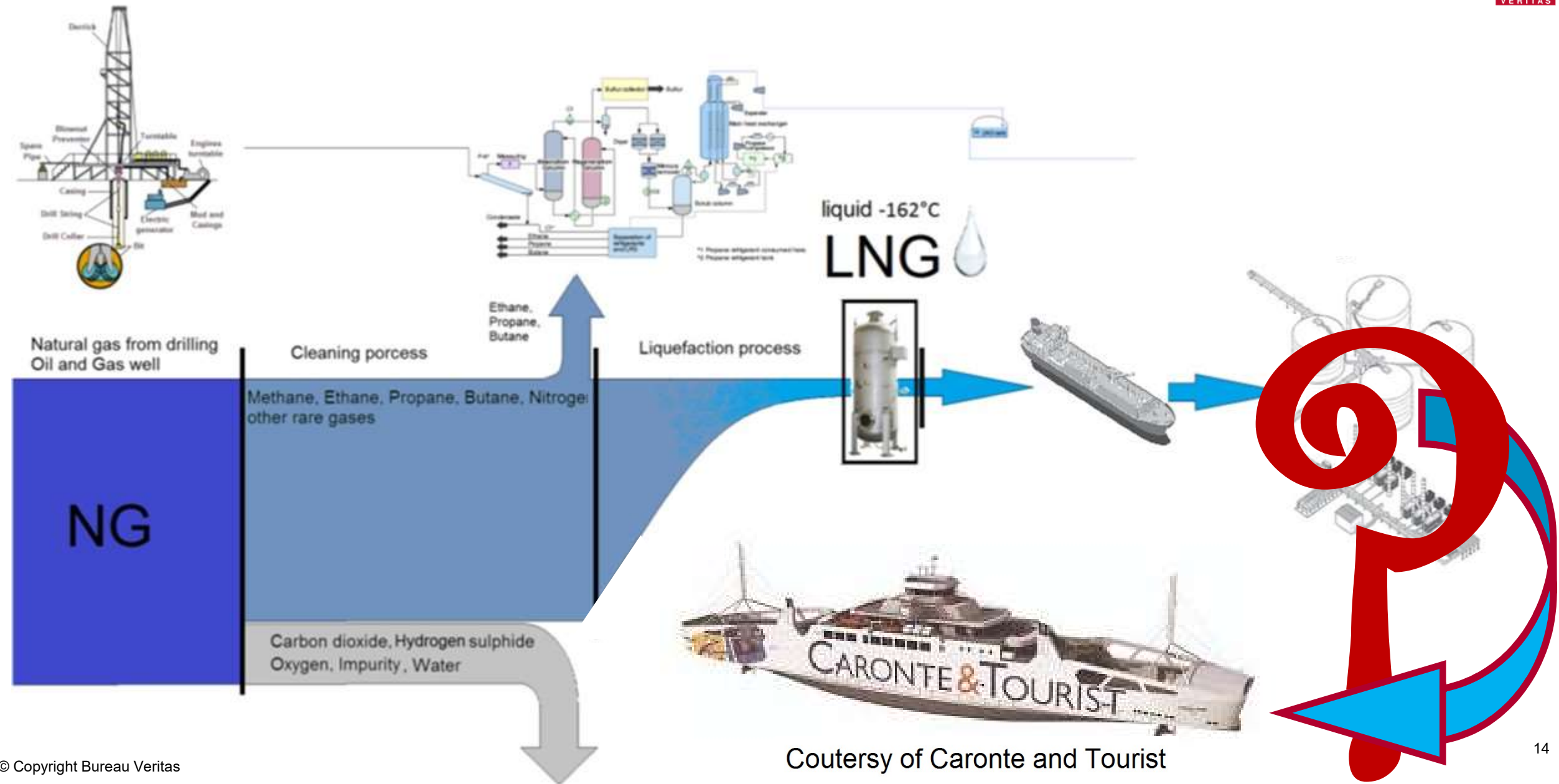


Figure 7.2 – LNG Bunkering – General Permitting Process

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LNG Bunkering must be possible **NOW!**



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