Decarbonisation in the shipping business: future fuel options and their implications for the storage sector

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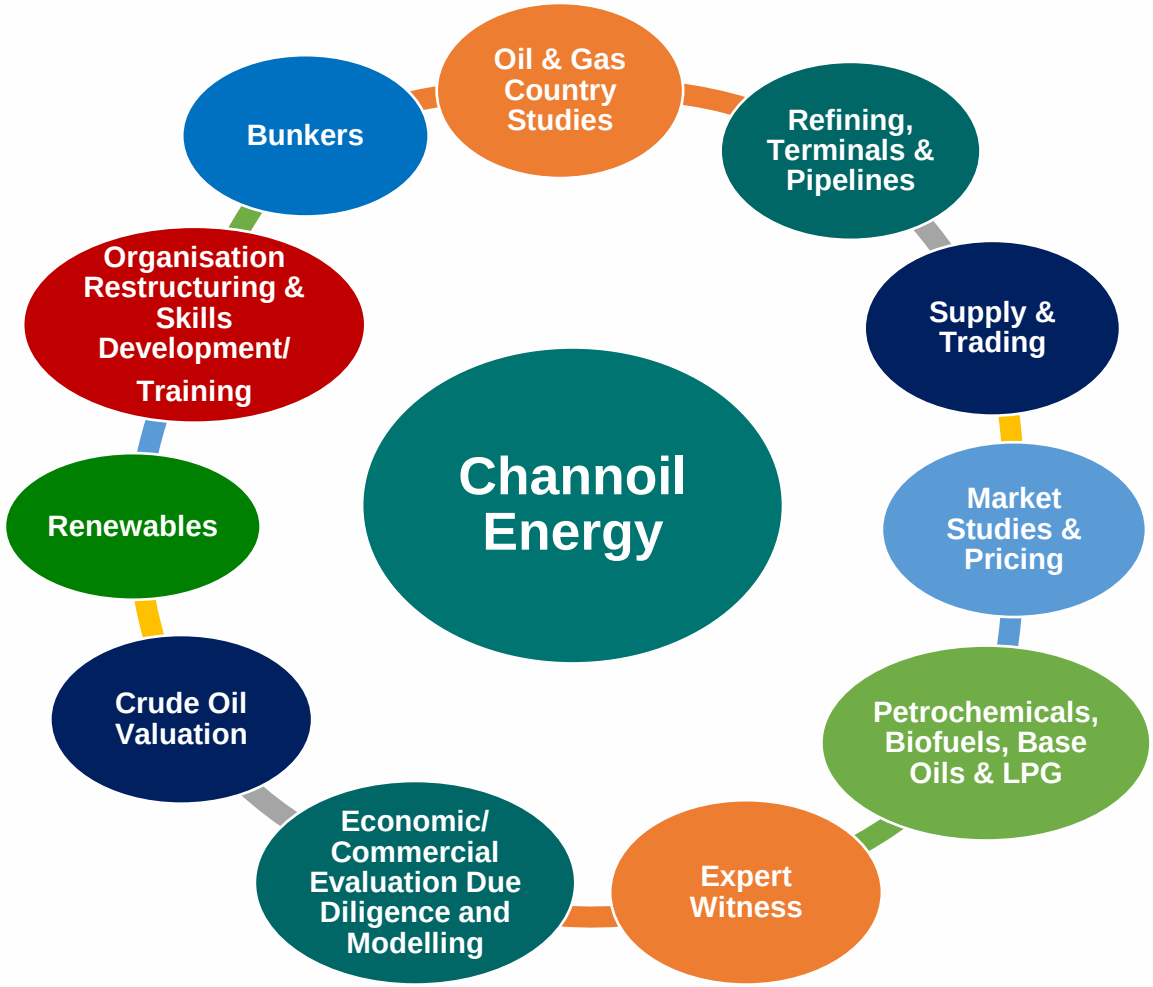
About Channoil Energy

At the forefront of the global oil and gas advisory industry for over 20 years. Extensive coverage of Europe, Middle East and Africa.

About us:

- We consult for countries, governments, institutions and companies.
- All aspects of mid and downstream oil and gas.
- Emerging renewables practice.
- Established industry relationships and strong market contacts.
- Up-to-date knowledge of international and domestic oil and gas markets.
- Senior team members have more than 30 years experience in the downstream oil business.
- Supported by a highly-skilled team of associate consultants.



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Today's discussion

Bunker supply in transition.

- IMO 2020 – what happened?
- Bunker supply today
- The IMO 2050 agenda
- Stricter rules in Europe?
- Alternative fuel options
- Vessel and fuel economics
- Carbon pricing impacts
- Implications for the storage sector
- Conclusions

IMO 2020 – what happened?

The expected tightness failed to materialise.

- Shortages of VLSFO and dependence on Marine gasoil was widely expected.
- This did not happen because:
  - Refiners did a good job on producing VLSFO.
  - Traders built stocks which supported demand for Q1.
- Covid-19 impacts
  - The collapse in demand for transport fuels reduced refining pressures.
  - This eased the supply – and pricing – of VLSFO.
  - HSFO remained relatively tight, as supply was reduced by refinery run cuts.
  - Many small or simple refineries have announced closure or conversion to bio-refining.
  - The LS/HS differential was depressed throughout 2020.

Bunker supply today

Adequate supply thanks to subdued global demand.

- Demand recovery is strongest in Southeast Asia.
- Europe and North America are still recovering and transport fuel demand remains subdued.
- Continued lack of pressure in the refining system.
- VLSFO demand is supporting smaller straight-run refineries with good access to sweet crudes.
- Closure of small inefficient refineries will be compensated by new sophisticated refineries in the Middle East and Asia.
- Scrubber economics are currently poor.
- We do not expect the LS/HS spread to widen significantly until demand recovers globally.

The IMO 2050 agenda

Decarbonisation of the maritime sector by 50% by 2050.

- The next stage for the sector is to decarbonise:
  - 50% reduction in GHG emissions in the global shipping fleet by 2050.
  - 70% reduction in "carbon intensity" (CO_2 emissions per shipment) by the same time.
  - Against a 2008 baseline.
- A complex set of mandates, targets and guidelines is being developed by the IMO.
- Efficiency targets will drive changes in shipping practice.
- The 50% GHG reduction will not be met by efficiency savings alone: lower carbon fuels will be needed.

Stricter rules in Europe?

EU planned mandates are faster and deeper than IMO 2050.

- The EU intends to include the maritime sector in its emissions trading scheme from 2022.
- This is essentially a CO_2 tax on shipping in EU waters from that date.
- EU target is for a 55% reduction in GHG emissions by 2030.
- The target will be either a regulation when sailing in EU waters, or for any journey with an EU destination.
- The conflict in targets could lead to:
  - Regulatory arbitrage.
  - A change in stance from either IMO or the EU.
  - Other jurisdictions following the EU lead.
  - The EU leading alone.

Alternative fuel options

LNG and possibly biofuels are the most developed short-term options.

LNG	• Less carbon intensive than fuel oils and supply infrastructure growing.
Biofuels	• Potential drop-in replacement, but problematic in wet systems - and expensive.
LPG	• Already in use as a fuel for LPG carriers, but bunkering infrastructure is limited.
Methanol	• Already in use for methanol carriers, but green methanol production does not yet exist.
Ammonia and hydrogen	• Both fuels are chemically zero carbon options, but expensive and not yet commercially viable.
Electric	• Only really feasible just for local shipments, not for global supply routes.

Vessel and fuel economics

Dual fuel vessel investment has definite potential

				Scenario	1	2	3
				Brent $/barrel	$ 67.50	$ 67.50	$ 67.50
				Carbon price €/tonne	€ -	€ 30.00	€ 250.00
Product	Comment	Price $/tonne		Tonnes fuel per day	Benefit vs VLSFO	Benefit vs VLSFO	Benefit vs VLSFO
VLSFO	100% GHG	$	505	55	$ -	$ -	$ -
MGO	100% GHG	$	535	51	$ 550	$ 1,000	$ 4,200
LNG	80% GHG	$	362	47	$ 10,700	$ 12,700	$ 27,500
HVO	from UCO	$	1,335	45	$ -32,000	$ -27,000	$ 12,700
FAME	from UCO	$	1,220	50	$ -33,500	$ -27,000	$ 11,600

- **LNG is the lowest cost refuelling option available today.**
- **Current pricing is well above what is needed to remunerate investment in a dual fuel vessel.**
- **HVO and FAME economics are far worse.**
- **A high carbon price will be needed to justify HVO or FAME on a standalone basis.**

[1] Based on prices from Friday 5th March 2021

Implications for bunker fuels

Proliferation of grades

- Bunker demand will continue to grow with world trade growth.
- This will be balanced by increases in vessel efficiency.
- There will be more bunker fuel grades in future.
- HVO and FAME are expensive niche demand grades.
- LNG is increasingly popular as a lower carbon (not zero carbon) option
- Ship-owners are ordering more dual fuel tonnage.
- Transition options need to last as long as the ship.
- Other options (e.g. green ammonia, hydrogen or methanol) are not expected to be economic for 10+ years.

Implications for the storage sector

Complexity and reduced unit throughput

- More grades means more complex storage requirements.
- FAME and HVO may need to be added to the list of liquid fuel options.
- More grades means reduced unit throughput for each grade.
- LNG demand will increase and requires completely new infrastructure.
- None of these grades are the long-term solution.
- But, they will help with the transition
- In 10-15 years, greener fuels should start to be competitive.
- Dual fuel vessels will then look to convert.
- Some new grades have tough HSSE requirements.

Conclusions

Managing complexity and economies of scale

- This is no longer a world where a bunker supplier can simply operate a few tanks.
- Small terminals will be challenged by the complexity of grades.
- Especially so where they rely on import economics for supplying the grades.
- Larger terminals will be able to compete more effectively.
- The EU may well push through their ETS agenda.

Contact us for advice on supply chain optimisation or storage investment options.

THANK YOU!

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