LPG

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WLPGA
LPG - THE ALTERNATIVE MARINE FUEL

Webinar Q&A summary:

PB | Pontus Kristofer Berg, BW LPG
PK | Peter H. Kirkeby, MAN Energy Solutions Copenhagen
NX | Nikos Xydas, World LPG Association (WLPGA)

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Can you comment on bunker/sample testing of gas fuels, and can we expect similar levels of non-compliant fuel as VLHFO?

PB | I would expect no issues with the LPG at all. At times we see small amounts of sand or hydrates, both of which can easily be filtered out.

PK | We do not foresee these issues to the same extent at all.

Is LPG fuel concentrating on Butane or Propane and what would be advantages of both.

PB | Mainly Propane, as this is the cheaper and a more available option. Both can be used, or in a mix, with same or very similar efficiency.

Is LPG being used as fuel only in LPG gas carriers or is it being applied to other ship types in conversions or newbuilds?

PK | Yes, but is rapidly gaining traction in other segments.

Concerning quality, are there concerns about the possible quality differences depending on the region in the world? for example Bio-LPG

PB | see 1.

PK | See 1.

How competitive is LPG vs LNG?

PB | In terms of availability and ease of handling LPG is far superior. LNG has a slightly higher energy content but is not as readily available and has rather high CAPEX & OPEX costs in comparison. I'm unsure of the price for LNG.

How will LPG-fuelled shipping be protected from sudden LPG price changes. How does one ensure reliable and sufficient supply in every port worldwide?

PB | LPG is available everywhere and is actually a by-product of oil production and flared off at many locations. As far as price fluctuations, it is up to each company but there is of course the option of hedging; otherwise the risk is there as it always has been for our normal bunker fuel.

Will new engines require additional training for crew?

PK | As always with the latest technology, training is certainly recommended, but no certification is needed from an engine operation point of view.

There will be challenges when installing LPG (or other new fule types) in dry/bulk sector. Can you comment?

PB | Indeed, why LPG is a good and easy to handle option based on proven technology.

Great sound bite ... a greener cleaner fuel ... and reflected in the condition of the inside of the engine. "all the engine internal parts are subject to less maintenance"

PK | I do not believe this is the correct quote.

Is there enough LPG to supply shipping? It is mainly used as cooking fuel so can we rely on supply reliability?

PB | yes, see 12.

What are the safety issues associated with LPG? What changes in ship design will be needed?

PB | We have done a full HAZID & HAZOP with class, engine and gas fuel system supplier. Flag has approved the installation. We have no heightened risk compared to running on current fuel.

What changes in specifications in marine engine oils will be needed?

PK | Cylinder lube oils are continously developed to fit the requirements of modern engines, including dual fuel.

Will it cause any issues in storage capacity of ships? Will ships have to carry less goods, reducing profitability?

PB | We have choosen a retrofit design where we are adding deck tanks to ensure no loss of cargo carrying capacity. In the case of a newbuild this could be catered to easily in its design.

Do you see LPG as a long term fuel option or as a bridge to zero carbon fuels?

PB | We see this as a medium to long term fuel, especially with Bio-LPG on the horizon

Any comparison between LNG and LPG as marine fules with regard to emissions (SOx, NOx, CO2, greenhouse gas emissions)?

PB | See slide 5 for a small comparison: https://www.bwlpg.com/docs/default-source/investor-centre/bwlpg-lpg-as-marine-fuel-from-an-owner-s-perspective_1.pdf

LPG vapour has higher density than air; does this present a safety risk as compared to LNG?

PB | See 21.

PK | Rules regulations and procedures are in place to handle this.

What are the reasons that there more LNG fuelled vessels than LPG fuelled vessels?

PB | Available technical solutions and a quite stronger market drive on the LNG side.

PK | The roads were paved earlier for LNG, with the DFDE carriers. Now the tech for LPG is here.

In the MEGI engine there is the methane slip, but no similar issue with the LGIP engine. Any explanation?

PB | LPG does naturally not contain methane and can thus not have any such slip.

PK | ME-GI HP offers methane slip at a neglible level, 10-15 times lower than any engine available today. LPG does not contain methane.

Do you still need a catelizer with LPG?

PK | For Tier III NOx compliance, yes, either an SCR or EGR is needed.

Can MC engines be converted run on LPG?

PK | No, it is not feasible.

LPG and ammonia will not share same infrastructure; NH3 will be cryogenic!

PB | Ammonia is transported as liquid at -33C. This is why it isn't a cryogenic gas.

Is it possible to use liquid fuel, LPG & LNG in a trifuel engine system?

PB | The LPG is injected as a liquid while the LNG is injected as a gas, hence not exactly the same sollution in our case at least

PK | From a combustion technology standpoint, yes, but the supply systems and bunker tanks are likely to make it impratical.

Any comments on fuel efficiency of LPG vs LNG ? May be in terms of $/Km or Km/$?

PK | The thermal efficiency of the two engine types (ME-GI v. LGIP) is similar, it will come down to fuel price and efficiency of fuel storage (more cargo).

Have you evaluated operational expenses differences between conventional diesel engines and LGIP engines? What are the expected spare parts differences and maintenance cost differences?

PB | The OPEX should reduce slightly as you have less auxiliary equipment in operation and have no or very little need to heat and treat (clean) any residual fuel. However, the gas injectors are quite costly, which is why we estimate it will equal out. LPG is also a much cleaner fuel that hopefully will contribute to far less wear on the engine and associated equipment.

PK | There are additional equipment costs money. There is no way around it. But using a much cleaner fuel than HFO we also see parts (Liners and piston rings) where the TBOs are increasing.