BIOMETHANE IN FREIGHT AND LOGISTICS: STAKEHOLDER PERSPECTIVES

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Background and Purpose
The growing awareness of climate impact from combustion has triggered massive development efforts towards fossil fuel alternatives. The main future alternative appears to be electrification, which directly reduces tailpipe emissions. However, for freight and logistics - in particular heavy and long-haul transportation - electrification will be slower than for passenger transport. At the same time, we need to act fast and promptly to reduce emissions from fossil fuels. In this context, the alternative of biomethane (vehicle gas produced from anaerobic digestion of biowaste) surfaces as a climate-wise very interesting option. Proponents even suggest that biomethane can entail a positive climate impact, depending on its origin. Albeit, the transformation from traditional combustion technology to gas technology comes with a range of challenges as well as opportunities for actors in the supply chain. This paper aims to explore these challenges and opportunities through a stakeholder perspective.

Literature
Research into green logistics and sustainable freight often mentions the fuel aspect as important in greening the operations. As a more detailed picture is lacking with respect to particular fuels, the literature is complemented by research into biomethane, and its various business aspects.

Methodology
Literature was collected through a systematic literature review supplemented by peer advice. The empirical findings are based on interviews with purposefully selected respondents representing stakeholder groups in the supply chain: shippers (buying logistics services); forwarders (transforming customer requests into logistics services); hauliers (performing the transport part of the logistics service also making investments in the novel technology); and fuel providers (producing and distributing the biomethane). The research mainly addresses the Swedish market. The empirical findings are analysed in relation to literature, and important challenges as well as opportunities are explained.

Findings
As literature in total offers few details on stakeholder perspectives of using biomethane in a logistics/freight context, the research took an explorative direction. This is also supported by the relative novelty of the biomethane solution among logistics actors. The various stakeholders present different, and sometimes consistent experiences from using biomethane.

- Shippers require a green fuel solution. Many shippers want the forwarder to dedicate the biomethane truck to their transports, although it may be better used for other transports. Some shippers are interested in sharing the investment in gas vehicles.

- Forwarders - as orchestrators of the shippers needs vs. the available resources - find that biomethane solutions work best in long-haul traffic. Their role as mediators become even more central as they may need to support the hauliers in investing in new technology. Forwarders recognize a conflict between the “best use” of the biomethane truck and specific customer requirements.
- Hauliers can clearly see a business opportunity in biomethane and gas technology. Although the price for the vehicle is higher, the operating costs are comparable, and improved environmental performance is increasing as a competitive argument. However the investment is a challenge, particularly in light of short term customer contracts. Another important challenge is to plan the operations of the gas vehicles to make full use of the fuel. Yet another challenge is the relatively restricted infrastructure for fuel supply, which requires careful planning.
- Fuel providers consider the logistics market as still quite small but growing. Unlike most providers of e.g. biodiesel, one of the interviewed providers presents a market offer with a set price based on production cost, and not relating to fluctuating market prices for fossil fuels. The infrastructure is still underdeveloped compared to that for fossil fuels, however it requires less efforts than developing infrastructure for e.g. electrified transportation.

Conclusions

The use of biomethane in logistics and freight is still in an early phase. However, the biomethane alternative presents a range of opportunities. The transformation for hauliers from traditional fuels to biomethane is relatively fast, and the infrastructure is comparably easy to develop. Although in an early phase, there appears to be an agreement among the stakeholders that biomethane is a viable alternative for long-haul traffic, although not as evident a solution for last-mile deliveries. The main obstacle is the investment, which often require close relationships among the stakeholders including longer-term contracts and shared investments. Using biomethane for logistics and freight is growing in Sweden, but continued development requires a wider contextual approach both for research and for technology development.