

MOBILE REFUELLING STATION. FIRST SUCH STATION IN THE WORLD

Mobile refueling station for biomethane liquefied natural gas (bio-LNG) or liquefied natural gas (LNG) with just 3.5 tons of gross vehicle weight is being built in Tri-City to the order of Maritime Institute Gdynia Maritime University; the leader of the European Union project Liquid Energy. Thanks to it, it will be possible to use LNG and bio-LNG in the public transport, production plants and office buildings.

- There are no such stations in the world yet - says **dr hab. prof. UMG Grażyna Pazikowska-Sapota** from Maritime Institute Gdynia Maritime University; project coordinator. - Our prototype mobile LNG fuel station is to be built by the end of June 2022. Its construction is to change the LNG distribution system. The idea is that bio-LNG and LNG could be delivered to smaller recipients who so far had no chance to use this alternative energy source.





Source: A car on the basis of which a second-generation mobile station and cryogenic container will be built © Baltic Engineering Flare GmbH, 2021





Currently LNG and bio-LNG is transported by LNG tankers, by sea, or in designated trailers with pressurized tanks, by land. The mobile station is designed to be more versatile. In that, small amounts of liquefied bio-LNG or LNG (up to several hundred liters) will be able to be transported from the producer – directly from the biogas plant with a liquefaction plant or from the refueling station – to the local recipient.

This is an absolute novelty on the market of liquid methane distribution as an alternative energy source. A new generation cryogenic container (non-vacuuming) will be used in a vehicle with a gross vehicle weight of 3.5 tons. A mobile refueling station for liquefied methane with a temperature of -163 ° C produced from natural gas (LNG) or biogas (bio-LNG) will be built.

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Paweł Warszycki

HIE-RO AT THE UNIVERSITY OF ROSTOCK, ONE OF THE GERMAN PARTNERS OF THE LIQUID ENERGY PROJECT

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The mobile station will be able to deliver fuel up to 100 - 150 km. The tender for the creation of the station was won by a consortium of two companies - **Baltic Engineering Flare GmbH** and **Ferdinand Schultz Nachfolger Fahrzeugbau GmbH**.





The owner of the station will be the Maritime Institute Gdynia Maritime University, however, it will be widely used as a prototype to demonstrate the technical capabilities.

METROPOLITAN AREA GDAŃSK-GDYNIA-SOPOT AND LIQUID ENERGY

MAGGS is working on analyzes aimed at examining the possibilities of using LNG and bio-LNG: as a backup source of energy supplying trolleybus station power network (for the needs of the Trolleybus Transport Company in Gdynia), as an ecological fuel for water trams (for the needs of Gdańsk Shipping Ltd) and as a source of using waste for fuel production (for the needs of Waste Treatment Utility in Gdańsk).

MAGGS experts have selected the study directions for each of these institutions.

The first proposal for **Przedsiębiorstwo Komunikacji Trolejbusowej (Trolleybus Transport Company) in Gdynia** is to use a unit powered by bio-LNG fuel as an additional source of power. The second proposal is to use a generator powered by bioLNG fuel to power a separate network or a backup network. This solution is possible with the continuous supply of bio-LNG to the feed station.



Source: Trolleybus Transport Company in Gdynia





- With the current increase in electricity prices, the use of bio-LNG fuel to power the overhead contact line may bring economic benefits for the Company - says **dr inż. Alicja Lenarczyk,** MAGGS expert, - Powering the traction network using bio-LNG cogeneration units has a positive environmental effect due to the lack of greenhouse gas emissions to the atmosphere during combustion. The use of bio-LNG fuel will not cause any inconvenience to the inhabitants, as the liquefaction process of bio-LNG removes the gas from oxygen, carbon dioxide, water and sulfur compounds, therefore it is considered a clean fuel.

For **Zakład Utylizacyjny in Gdańsk** (Waste Treatment Utility) the experts proposed the construction of an LNG station to power the car base, garbage trucks, loaders and excavators, and to supplement the current installation with a bio-LNG tank and regasification stations.



Surce: The visit to Waste Treatment Utility in Gdańsk © MAGGS



Source: The visit to Waste Treatment Utility in Gdańsk © MAGGS





- Bio-LNG is an ecologically justified proposition to power engines compared to the previously used diesel drive, because it reduces greenhouse gas emissions - says **dr inż. Alicja Lenarczyk.** - Alternative use of the recovered gas in the form of bio-LNG fuel, without the need to dispose of surpluses, will bring economic benefits to Zakład Utylizacyjny. An additional effect will be the production of own fuel to power technical vehicles. Bio-LNG fuel is characterized by a high refueling speed and the ability of vehicles to achieve long ranges (1500-1600 km) on one refueling. Surpluses not used by Zakład Utylizacyjny may be resold on the market, which may turn out to be economically profitable, taking into account the increase in gas prices.

As a result of consultations with **Żegluga Gdańska (Gdańsk Shipping Ltd),** the Opal vessel was pre-selected from among the two proposed units in order to adapt it to the combustion of LNG / bio-LNG fuel.



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Due to the experience of the Martime University of Szczecin, the general condition of the entire vessel should be taken into consideration. First of all, the modernization has to maintain a ship's commercial services ability, in addition - became a stimulator for development in future key-components of the Liquid Energy Project. It cannot become a single, overpriced curiosity. Modernization of the existing unit should be compared to introducing a brand new one. As an advantage of the second option, we receive a highly efficient vessel which fulfills all of the newest requirements and market needs.

mgr inż. Jakub Ziarnik, MAGGS expert





In search of good practices and inspiration for the Liquid Energy project MAGGS representatives visited **BISEK-LNG Sp. z o.o. in Kostomłoty** specializing in the sale of LNG fuel. The company has a fleet of LNG-powered vehicles. It also implements innovative technologies in the use of this type of fuel. The meeting was attended by **mgr inż. Mariusz Sadłowski**, MAGGS energy and environmental coordinator and **dr inż. Alicja Lenarczyk**, MAGGS expert responsible for developing a concept with elements of a feasibility study for Zakład Utylizacyjny (Waste Treatment Utility) in Gdańsk and Przedsiębiorstwo Komunikacji Trolejbusowej (Trolleybus Transport Company) in Gdynia. With the president and experts of BISEK-LNG, they discussed the possibilities and technical conditions for implementing the technology for the purposes of studies for the partners of the Liquid Energy project. At the meeting, the machinery park, LNG refueling stations and technologies used in the company were presented.

The meeting was announced by the partner of the Liquid Energy project, **Polskie Górnictwo Naftowe** i **Gazownictwo (PGNiG Retail Branch)**.



Source: LNG refueling station at BISEK-LNG Sp. z o.o. in Kostomłoty © MAGGS





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MERRY CHRISTMAS AND HAPPY NEW YEAR



