***Lucas De La Fuente and Professor Dominik Möst***

**CHANGES IN GERMAN PIPELINE RETROFITTING POTENTIAL AFTER THE RUSSIAN INVASION OF UKRAINE**

Lucas De La Fuente, Technische Universität Dresden,

Faculty of Business and Economics

Chair of Business Administration, esp. Energy Economics

Münchner Platz 3, 01069 Dresden, Germany

Phone: + 49 351 463 39766

Email: lucas.delafuente@tu-dresden.de

Professor Domink Möst, Technische Universität Dresden,

Faculty of Business and Economics

Chair of Business Administration, esp. Energy Economics

Münchner Platz 3, 01069 Dresden, Germany

Phone: + 49 351 463 39770

Email: dominik.moest@tu-dresden.de

**Overview**

It is impossible to underestimate the impact that the Russian invasion of Ukraine had on the German Gas Sector. In the matter of a couple of weeks the complete import regime of Germany was changed by an external, unforeseeable factor. This presents a unique opportunity to analyze not only the resiliency of the Germany Gas Sector but also to prepare for the changes that it will go through in the coming decades.

As the German government focuses on Hydrogen as one of the key energy carriers for a carbon-neutral energy sector, questions arise on its viability due to, among others, the high costs of developing a new transmission network.

In this Study we will focus on the changes that the German gas grid has suffered in 2022 and how will this affect the implementation of a hydrogen grid using the existing pipelines.

**Methods**

Our study uses GAMAMOD (Hauser, 2019), an optimal gas transmission flow model, to simulate the changing dynamics of gas import and transport during 2022. Using publicly available data on gas imports we will be able to simulate the gas flows and storage level on every major pipeline in Germany for a variety of scenarios. The reference scenario will be provided by the first part of the year, while the latter will point to new trends.

Key variables of the pipelines to be compared will be import, gas flows and relative flow capacity. With these values we will be able to propose pipeline candidates available for retrofitting. Repeated simulations will allow us to accurately measure which pipelines had retrofitting potential before and after the changing regime in gas import.

**Results**

Preliminary results point to a small increase in relative use of the pipelines in regions Lower Saxony and North Rhine-Westphalia, while a stronger decrease of pipeline use in the eastern regions of Mecklenburg-Vorpommern and Brandenburg. This would imply a regionally uneven increase in retrofitting potential.

Additionally, scenarios for different weather-dependent gas consumption, will allow us to investigate the impact of the retrofitting on transmission reliability under stress. Other scenarios will simulate an accelerated implementation of LNG-Ports and measure its impact. Results regarding these scenarios will be presented at the conference.

**Conclusions**

Retrofitting potential will be key factor in deciding the viability of a hydrogen. A good assessment of the future dynamics of the German gas grid could expedite the transformation of the existing pipelines and facilitate the calculation of infrastructure costs. This study aims to be the first to such type of analysis.

**References**

Hauser, P., 2019. A modelling approach for the German gas grid using highly resolved spatial, temporal and sectoral data (GAMAMOD-DE), *ZBW - Leibniz Information Centre for Economics*, Kiel, Hamburg, Mai 2019