EU Methane Regulation: Potential impacts of a 0.2% Intensity Standard on Natural Gas

In 2024, the European Union became the first jurisdiction to regulate methane emissions from both domestic fossil fuel operations as well as fossil fuel imports when it adopted the EU Methane Regulation (EUMR). This regulation introduces an intensity standard for methane emissions from crude oil, natural gas and coal production which takes effect in 2030. Under this intensity standard, fossil fuels produced in or imported to the EU under contracts concluded or renewed after August 5, 2030, must comply with so-called maximum methane intensity values. These maximum intensity values – which are still to be defined by the European Commission – will set a maximum intensity threshold for methane emissions from the production stage of the fossil fuel supply chain.

In recent research, economists at Environmental Defense Fund (EDF) and SINTEF have assessed the impacts of such a methane intensity standard[1] for natural gas using a partial equilibrium model representing the global gas market. Specifically, this study assesses the impact of an intensity standard for natural gas based on a maximum intensity value of 0.2%. Excess emissions are assumed to be subject to penalties of €2000 per tonne of methane above 0.2% (in 2020€). The findings suggest that a 0.2% methane intensity standard for natural gas would reduce upstream methane emissions embedded in EU gas production and imports by approximately 40%. This in turn corresponds to a 1.4% reduction in global methane emissions from natural gas production. **Associated impacts on EU wholesale gas prices are estimated to be minimal with no significant changes to EU gas supply and modest changes to the gas supply mix, which suggests that concerns about energy security are overstated.**

Main findings

Emission impacts: Modeling indicates that the EU intensity standard can lead to approximately 400kt or 40% reduction in upstream methane emissions embedded in EU gas production and imports. Globally, the EU intensity standard of 0.2% would lead to a 1.4% decrease in global methane emissions from natural gas production.

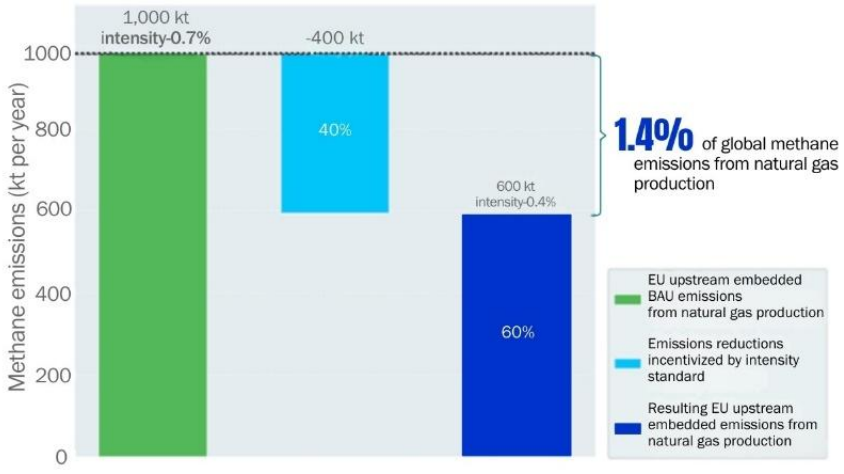

Figure 1: Methane emission reduction from the EU intensity standard. Results for model year 2035.

[1] In this modelling exercise, the EUMR MRV requirements enabling the intensity standard are implicitly assumed to be met for all potential exports to the EU.

Price impacts: The results show that the EU intensity standard of 0.2% would have minimal impacts on the wholesale gas price in EU member states (Figure 2). Romania and Hungary experience relatively higher price impacts. This is because Romania's methane intensity under the business-as-usual (BAU) scenario is 1.6%, twice the EU average. Even after abatement, it is estimated at 0.5%, leading to an estimated wholesale gas price increase of 0.75% due to penalties and supply mix changes. Hungary sees a slight shift in its supply mix, sourcing more gas from suppliers with lower methane intensities, leading toan estimated average wholesale gas price increase of 0.5%. Notably, the relative increases in wholesale gas prices are all less than 1% and would be even lower if compared to end-user gas prices, which include additional taxes and charges.

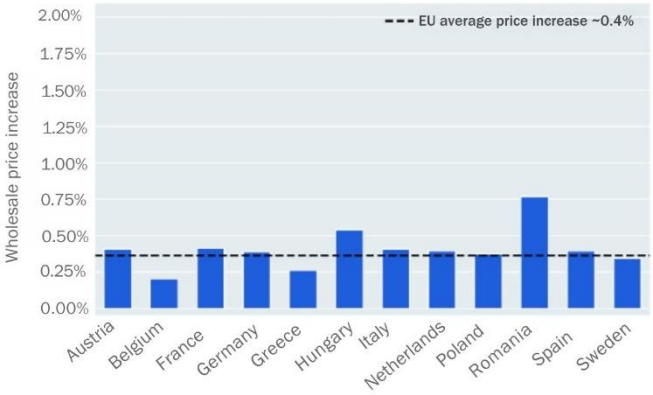

Figure 2: Impacts on wholesale gas prices. Results for model year 2035. Percentages represent changes in wholesale gas prices relative to the BAU scenario. Average BAU projection for 2035 EU wholesale gas price is about €25/MWh.

Gas supply mix to the EU: Total EU imports of natural gas are hardly affected by the intensity standard. The EU is still estimated to import 240 bcm in 2035, as in the BAU, with limited reshuffling among its suppliers, as can be seen in Figure 3.

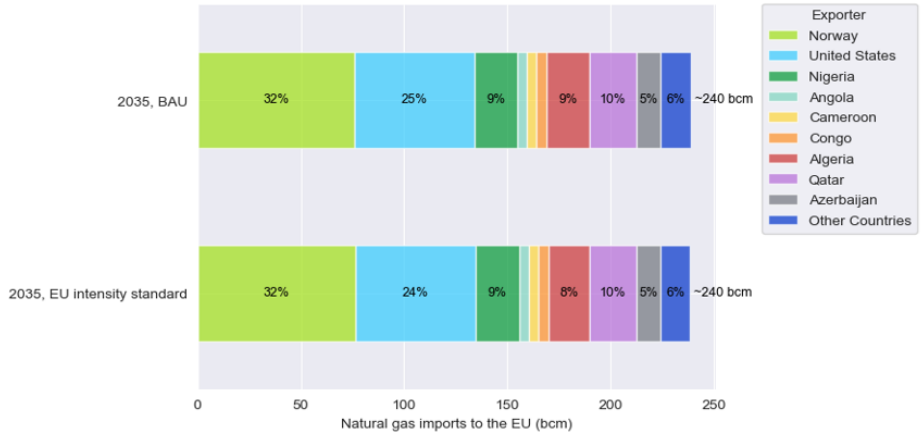

Figure 3: Breakdown of gas supply to the EU. Results for model year 2035. Percentages represent share of the EU's total import volume.

Data and Methodology

The Global Gas Model (GGM) is a multi-period partial equilibrium model for analyzing the global natural gas market. It has a country-level representation of more than 100 countries and thereby essentially covers all global natural gas production and consumption[2]. Methane emissions are represented through country-level upstream methane emission intensities from natural gas production from the International Energy Agency's Global Methane Tracker. The current version of the model covers the natural gas market and cannot be used to assess impacts on the crude oil market and associated emissions. In future research, we plan to expand the model to also cover the crude oil market. This will enable analysis of different methane intensity metrics, maximum methane intensity values, and also make it possible to account for selection effects related to the existence of already low intensity gas production in key gas-exporting countries.

[2] Egging, R., & Holz, F. (2019). Global Gas Model: Model and Data Documentation v3. 0 (2019). DIW Berlin, German Institute for Economic Research.

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