Report 10/2021

Pricing methane

Implementing a methane pricing model for the EU gas market

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October 2021

Forum Ökologisch-Soziale Marktwirtschaft

On behalf of

Deutsche Umwelthilfe

Summary

The reduction of methane emissions from oil and gas is one of the **most cost-effective ways** to slow down global warming. To meet the goals of the Paris Agreement, the reduction is an indispensable requirement. In this study, we propose to implement a set of instruments to incentivize necessary measures to abate methane emissions arising from natural gas production in the EU and gas imports into the EU – **a methane pricing model in combination with a performance standard**. We discuss how such a pricing model should be designed – taking into account relevant aspects like the legal and political feasibility, an appropriate price level, the geographic scope, covered emissions as well as the use of revenues. In order to enhance its climate impact, we propose to combine the methane pricing model with a methane performance standard on all natural gas traded in the EU.

Publication: October 2021

Imprint

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Forum Ökologisch-Soziale Marktwirtschaft (FÖS) has been researching and disseminating information about the potential and benefits of environmental fiscal reform (EFR), the application of market-based instruments (MBI) and the removal of environmentally harmful subsidies for more than twenty years. FÖS is widely recognized among policymakers, NGOs, companies, and trade unions for its expertise in fiscal instruments, environmental and climate policy and foremost for its capacity to evaluate and develop policy proposals in the field of EFR. Over the last years FÖS has led and participated in numerous research projects and has a proven track record in the development, analysis, and evaluation of environmental policies.

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Forum Ökologisch-Soziale Marktwirtschaft

Implementing a methane pricing model for the EU gas market

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Executive Summary

According to the newest report by the Intergovernmental Panel on Climate Change (IPCC), methane has already contributed an increase of **0,5 degrees Celsius to global climate change**. The contribution of carbon dioxide is estimated at 0,8 degrees. According to the IPCC AR6 one ton of methane has an **83 times higher climate impact than CO_2** over 20 years and still a 30 times higher impact over 100 years. So, despite the relative decline of methane's climate impact over time, it is a way more potent greenhouse gas than CO_2.

The reduction of methane emissions is one of the **most cost-effective ways** to slow down global warming. To meet the goals of the Paris Agreement, the reduction is an indispensable requirement. The most cost-effective reductions of methane emissions can be achieved **in the oil and gas industry.**

The EU´s share of the global natural gas demand is currently around **10%.** More than **85%** of the natural gas consumed in the EU is imported from countries outside the European Union. Only 15% is produced inside the EU.

The methane intensities of traded natural gas in the EU differ greatly depending on where the natural gas was extracted. Furthermore, due to a lack of data there is still high uncertainty in defining appropriate methane leakage rates.

With the **EU Methane Strategy** released in October 2020 as part of the new European Green Deal, the European Commission took an important step to raise political attention for methane emissions. The European Commission seeks to improve detection and repair of leaks in gas infrastructure and to prohibit flaring and venting practices in the EU. Furthermore, within the EU Methane Strategy, the exploration of standards and targets for methane intensities for energy imports to the EU are considered.

This study outlines a complementary set of instruments to incentivize necessary measures to abate methane emissions arising from natural gas production in the EU and gas imports into the EU – **a methane pricing model in combination with a performance standard**. As the majority of methane emissions arising from traded natural gas in the EU goes back to gas imports from countries outside the EU, the primary focus thereby lies on the implementation of a **methane border levy.**

There are several options to implement a methane border levy for natural gas imports into the EU: **A replication of the EU-ETS on imports** (including natural gas imports) into the EU (like the CBAM proposal by the European Commission), a **consumption duty** or **an import tax.** Taking the criteria of:

1. **legal feasibility,**
2. **administrative and political feasibility and**
3. **climate impact**

into account, we propose to introduce a methane import tax for natural gas imports into the EU. However, this option also comes with its difficulties and open questions.

To introduce a methane import tax in the EU, first a **methane price must be implemented within the EU**. Otherwise, the import tax would not be in line with WTO law as the exporters of gas from countries outside the EU would be discriminated against traders of gas inside the EU.

The methane emissions footprint of the natural gas imported into the EU could either be calculated on a **product level** or estimated referring to a **default value**. We propose to refer to a **default value during the first implementation phase** of the methane import tax. The MRV framework must be established effectively within a certain timeframe – e.g., three years after the implementation of the import tax – so that the use of the default value is no longer necessary. The proposed default value **is based on average EU methane intensities**. However, importers should have the **opportunity to prove that their product is less methane intensive** than the average.

The methane price needs to be **higher than the abatement costs** to incentivize actual abatement. Though there is high uncertainty on how high the abatement costs really are, the literature shows that with a price between around **500 and 700 €/t CH_4**, which is the equivalent to a relatively low price between around **17 and 23 €/t CO_{2eq}** assuming a GWP_{100} (30) for methane, there is high probability that already at this price levels there would be an incentive to reduce methane emission. We therefore propose to start with a methane import tax between **500 and 700 €/t CH_4.** To ensure that the entire damage of methane emissions is internalized, the import tax should increase to the full climate damage costs of methane emissions. UBA recommends an average value of climate damage costs of **195 $€_{2020}$/t CO_{2eq}**, which increases over time - up to **250 $€_{2050}$/t CO_{2eq}** in 2050.

We propose to **cover only upstream methane emissions during the first implementation phase** of the methane import tax and to **broaden the emissions scope in a second phase** when measurements are improved and more widespread. Furthermore, all countries would be included as this is the legally **most feasible option.**

How the revenues from this tax are used must be in line with the expectations of Member States and trading partners at the same time and be compliant with WTO law. To ensure **WTO conformity**, the total use of revenues should be tied to the purpose of financing climate policy within the EU and outside the EU. To ensure the cooperation and consent of all EU Member States at least a small share of revenues should fund the **EU budget** - and could be used for an EU **GHG- (or methane)-reduction fund.** The rest of revenues should be **returned to countries outside the EU**. Therefore, a share of revenues could be invested in existing climate funds that support climate transition in low- and middle-income countries or new investment funds could be created that focus on support for methane reductions in partner countries, which are directly impacted by the methane import tax.

A study (Enervis 2021) analyzes the impact of a price on upstream methane emissions on methane emissions and EU natural gas prices. The results indicate that the global oil and gas methane emissions would decline by **1-3%** at 25 €/t CO_{2eq} to 100 €/t CO_{2eq} only taking possible methane abatement measures by producers of natural gas inside the EU into account. Assuming that also in countries outside the EU, producers would abate 75% of their methane emissions, global oil and gas supply chain methane emissions would even decrease by around **15-25%.**

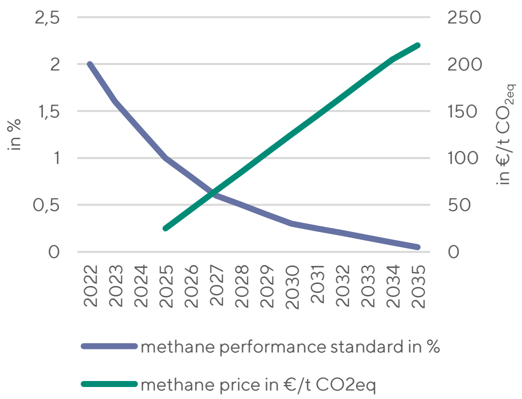
The results further indicate that **the increase in natural gas prices stays limited** (between 0,3% and 8,4%) – even under a relatively high price at 100 €/t CO_{2eq}.

In addition to the pricing of methane emissions arising from the natural gas production in the EU and gas imports into the EU, **a performance standard** should be implemented for all natural gas sold in the EU market. If the methane intensity of natural gas would be above the performance standard, importers would not be able to import this type of natural gas into the EU.

The combination of a regulatory instrument of a performance standard with methane pricing instruments would therefore establish a safeguard to exclude gas with extraordinarily high methane intensities and **set incentives to adapt further measures** to reduce methane emissions at the same time.

Figure 1 shows how the methane performance standard and the methane price could develop over time if the methane performance standard would be implemented already in 2022 and a methane price – within the EU and also in form of the proposed methane import tax – in 2025. Whereas the methane performance standard would decrease from a methane intensity of **2% in 2022 to 0,05% in 2035,** the methane price would increase from **25 €/t CO_{2eq} in 2025** up to the amount of the total climate damage costs of around **220 €/ t CO_{2eq} in 2035.**

Figure 1: The development of the methane performance standard and the methane price over time



Source: own depiction

Implementing both instruments, the EU could take on a global pioneering role, as one of the world's largest gas markets, and inspire other markets to take ambitious action to reduce methane emissions.

1 Time to act

Natural gas consists to a large extent of methane, an extremely climate-damaging gas whose harmfulness to the climate is often underestimated. Methane is the second largest driver of climate change after CO_2 and is responsible for almost a quarter of the greenhouse effect (Environmental Defense Fund 2019). According to the newest report by the Intergovernmental Panel on Climate Change (IPCC), **methane has already contributed 0,5 degrees to global warming**. The contribution of carbon dioxide, is estimated at 0,8 degrees (IPCC 2021). Methane emissions thus play a decisive role in mitigating greenhouse gases.

According to recent reports, **the reduction of methane emissions is one of the most cost-effective ways to slow down global warming** and to meet the goals of the Paris Agreement (United Nations Environment Programme/Climate & Clean Air Coalition 2021). The most cost-effective reductions of methane emissions can be achieved **in the energy sector**, or more specifically: in the oil and gas industry (IEA 2020a).

The **EU Methane Strategy** released in October 2020 as part of the new European Green Deal, gave the subject of methane emissions necessary political attention. The European Commission seeks to improve detection and repair of leaks in gas infrastructure and to prohibit flaring and venting practice in the EU. Furthermore, the EU Methane Strategy explores the idea of standards and targets for methane intensities for energy imports to the EU (European Commission 2020).

In this study, we propose a complementary set of instruments to incentivize necessary measures to abate methane emissions arising from natural gas production in the EU and gas imports into the EU – **a methane pricing model in combination with a performance standard**.

Internationally, there already exist distinct methane pricing models – e.g., in Norway, Russia, New Zealand and various states in the USA, e.g., Alaska. **Norway's** combination of a mandatory greenhouse gas tax that applies to gas flares with a regulatory strategy presents a **best practice example** of how methane emissions arising from the gas sector can be reduced. The flaring-related methane releases dropped by 36% in the first years following the tax implementation. The methane intensity of Norway's gas production remains far below global averages (Rabe et al. 2020).

The majority of methane emissions arising from traded natural gas in the EU goes back to gas imports from countries outside the EU. Therefore, the primary focus lies on the implementation of a **methane border levy.** Though legal feasibility is taken into account in this proposal, it is beyond the scope of this study to carry out a legal analysis.

2 Methane emissions from the gas industry

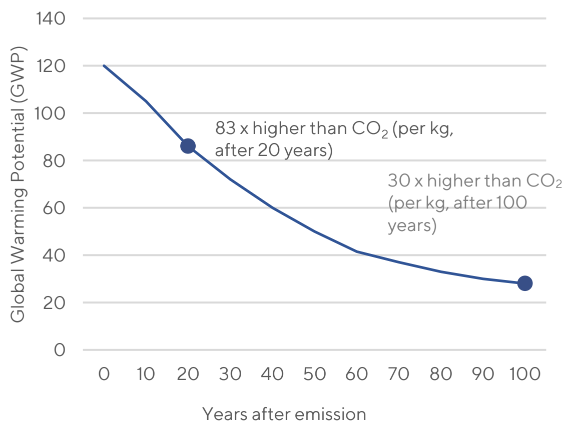
In 2019, around a quarter of the EU's energy mix consisted of natural gas (22%). Behind petroleum products, natural gas is the **EU´s second most used fossil energy source** (Eurostat 2020a). The second chapter of the study will serve as an overview of the most important facts and numbers of the natural gas use in the EU and the resulting methane emissions.

2.1 Climate impact of methane emissions

Natural gas is often seen as a transition technology in the energy transition and as a less environmentally harmful alternative to coal combustion (Safari u. a. 2019). What is often overlooked are the **extremely damaging climate effects of methane emissions** from the production, transportation, processing, and consumption of natural gas.

Figure 2 belows shows methane's global warming potential over time. The **Global Warming Potential (GWP)** is measured relative to the potential of CO_2. Therefore, one ton of methane has an 83 times higher impact than CO_2 after 20 years and still a 30 times higher impact after 100 years. So, despite the relative decline of methane's climate impact over time, it is a way more potent greenhouse gas than CO_2 (IPCC 2021).

Figure 2: Climate impact of methane emissions per kg over time



Source: own depiction based on (IPCC 2021)

The next decade will be crucial in the fight against climate change. Therefore, methane must be evaluated in terms of its **short-term climate impact**.
Altogether, methane is responsible for one fourth of the greenhouse effect and the **second biggest contributor to global warming** (Environmental Defense

Fund 2019). Newest data shows that some forms of natural gas, e.g., fracking gas, have an **even higher climate impact** than lignite coal (Howarth 2019; EnergyWatchGroup 2019).

2.2 Natural gas consumption and imports in the EU

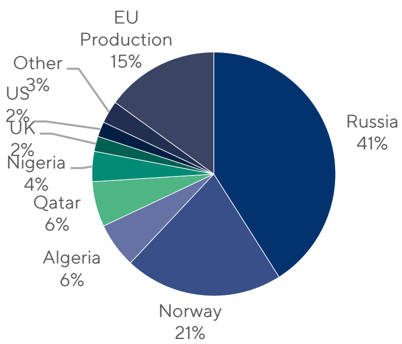
The global gas demand in 2019 was **4.000 billion cubic metres** (bcm) and is expected to increase to 4.300 bcm in 2025 (Enervis 2021). Every year, countries in the European Union consume around 400 billion cubic metres of natural gas (DIW 2020). Germany (86.5 bcm), Italy (67.7 bcm) and France (40.7 bcm) had the highest natural gas consumption in 2020 (BP 2021). Until 2025, the consumption of natural gas in the EU is forecasted to decrease by 3%. By then, the EU´s share of the global natural gas demand will be at **9%** (Enervis 2021).

More than **85%** of the natural gas consumed in the EU are imported from countries outside the European Union. Only 15% are produced inside the EU (Eurostat 2020b; Eurostat 2020c).

The share of natural gas imports will **increase in the coming years**. European gas production is **likely to decrease**. The Netherlands terminated gas production on the Groningen gas field and will decrease small field production by 90% until 2040. Additionally, one of the European gas suppliers, the UK, left the EU. Some European countries like France and Spain are in a **regasification process** and will therefore be even more dependent on LNG imports, despite the expected general decrease in natural gas consumption (Enervis 2021).

Russia and Norway are the most important natural gas suppliers of the EU. They produce more than half of the EU´s natural gas imports (see Figure 3). Russia accounts for **41%** of the EU´s natural gas supply, while Norway accounts for **21%**. Other notable exporters into the EU are Qatar and Algeria with **6%** each and Nigeria with **4%** (Eurostat 2020b; Eurostat 2020c).

Figure 3: EU natural gas import structure 2019

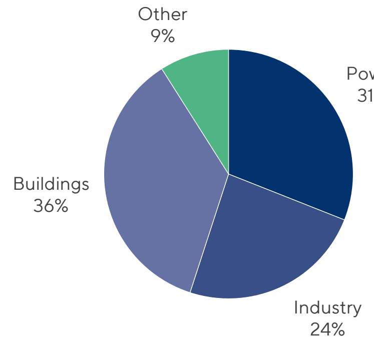


Source: Own depiction based on (Enervis 2021; Eurostat 2020c; Eurostat 2020b)

The countries from which gas is supplied to individual EU Member States vary. Germany is supplied mostly with gas from Norway, Russia and the Netherlands (BDEW 2020; BDEW 2021; BMWi 2021a). Southern European countries like Spain, Italy and France similarly receive a high share of pipeline gas from Norway and Russia, but are also dependent on **LNG imports from Africa and the Middle East**. LNG imports from Russia and the USA into the EU increased heavily in the last five years as well (BP 2021).
81.4 bcm of natural gas was imported into the EU in the form of LNG in 2020. The largest recipients were Spain (20.9 bcm), France (19.6 bcm) and Italy (12.1 bcm) (BP 2021).

As indicated in Figure 4, **the power and building sector as well as the industrial heating sector** are the most common sectors where natural gas is used in the EU. Buildings and power are both responsible for about one third of the EU natural gas consumption each. Industrial heating and other applications make up the last third. The respective shares of the sectors are expected to remain almost the same until 2025 (Enervis 2021).

Figure 4: EU natural gas uses in 2019



Source : Own depiction based on (Enervis 2021; IEA 2020b)

2.3 Countries of origin and methane intensities

Methane leaks and methane slip in any form are a major problem for the climate. Methane leaks describe the escape of methane along the supply chain of natural gas, methane slip refers to the escape of methane during the combustion process (FÖS 2021; IEA 2021).
Methane emissions occur during the extraction, production and processing, transport, distribution, and storage, as well as the combustion of natural gas (Deutsche Umwelthilfe 2020). It escapes from pipelines or drill holes. It also enters the atmosphere during the process of combustion or is discharged, for example during repairs to long-distance gas pipelines (DVGW-Forschungsstelle am Engler-Bunte-Institut des KIT/Fraunhofer ISI 2018).

Country specific methane intensity of natural gas is **very uncertain in the majority of countries**, especially in China, Russia and countries from the Middle East and Africa (IASS 2016). Most of the time, methane intensity data rely on simple estimates and not on actual measurements.

Furthermore, information from national authorities on methane emissions cannot always be relied upon. Independent measurement in the USA corrected the data of the Environmental Protection Agency upwards by 60% (Alvarez u. a. 2018; Howarth 2015).

Table 1 shows estimates for the upstream methane intensity ranges for gas in the seven major supply countries for the EU. Due to low data quality of methane emission levels, there is high uncertainty about the presented methane intensity ranges.

Table 1: Assumed upstream methan intensity ranges for gas

Country of origin	Central Estimate	Lower Bound Estimate	Upper Bound Estimate
Russia	1.3 %	0.0 %	2.5 %
Norway	0.01 %	0.01 %	0.01 %
Algeria	1.6 %	0.0 %	3.2 %
Qatar	0.3 %	0.0 %	0.6 %
Nigeria	1.2 %	0.0 %	2.5 %
UK	0.2 %	0.1 %	0.3 %
USA	2.2 %	1.8 %	2.5 %

Source: Own depiction based on (Alvarez u. a. 2018; Enervis 2021; IEA 2020c)

The assumed upstream methane intensity ranges for gas in Table 1 are based on expert judgment provided by EDF for a study by (Enervis 2021). They developed the distinct methane emissions intensity ranges to reflect data quality and existing uncertainties. The central baseline methane emission intensities are based on the IEA Methane Tracker database for upstream emissions attributed to gas production in each country (IEA 2020c) – except for the USA. Here, the presented data are based on estimates from (Alvarez u. a. 2018). The presented data for upstream emissions does not include methane emissions arising during processing and transportation. The upper and lower bound emission intensities represent the uncertainty in emission intensities (Enervis 2021).

Algeria, Nigeria, USA and Russia, are estimated to have **a high methane intensity** (Enervis 2021; IEA 2020c). Especially those high estimates need to be viewed with caution, because the upper and lower bounds show a high uncertainty. The United Kingdom, Norway, and Qatar are characterized by **very low methane intensities with lower uncertainties** (Enervis 2021; IEA 2020c).

Other sources provide similar results and reinforce the uncertainty in defining methane leakage rates – especially if methane emissions are considered that occur during the processing and gas transportation. Estimates on the methane loss rate of natural gas originating from Russia differ by a factor of 10 for the year 2012. In detail, the estimates for leakage rates from pipelines in Russia range between **0.39% and 3.08%** (BGR 2020; DBI 2016), while for pipelines in Norway, they range between **0.00% and 0.07%** (BGR 2020).

According to satellite data, the **methane leakages in Russia increased by 40% in 2020** (European Space Agency 2021). One reason for the increase could be cutbacks in repairs and inspections due to reduced demand and cost pressure caused by the Covid-19 pandemic (Climate Home News 2021). Those increases are another reason to consider the presented assumed methane intensity ranges for gas (Table 1) as conservative.

For a specific assessment of the climate impact of methane, knowledge about the actual number of emissions is decisive.

It is highly necessary to **improve the accuracy of measuring methane emissions** to ensure better estimations of methane leakage rates. The EU Methane Strategy includes legislation for mandatory measurement, reporting and verification of energy-related methane emissions (European Commission 2020). Improving those measurements is a first step in effectively reducing methane emissions – though there exist other measurements, which are even more cost efficient (see chapter 4.2.1).

Additionally, incentives to reduce methane emissions in the countries of origin of natural gas are needed. Natural gas in the EU is almost entirely imported (85%) and therefore extracted and processed ouside the EU. Therefore, a serious effort to address methane emissions from natural gas requires regulation of gas that comes from ouside the EU's borders. We therefore propose to implement a methane border levy for natural gas imports into the EU.

3 Design of a methane border levy for natural gas imports into the EU

The methane border levy for natural gas imports into the EU sets incentives for producers and traders of gas to implement measures to reduce the loss of natural gas over the whole supply chain and avoid methane leaks. The EU, as one of the world's largest gas markets, could thus take on a global pioneering role and inspire other markets to take ambitious action. Further, a methane border levy would be an important step for **the internalization of the climate damage costs** of natural gas production and transmission.

There are several options to implement a methane border levy for natural gas imports to the EU. The three main options are discussed in the following section: a **replication of the European Emissions Trading System (EU-ETS) for imports** including natural gas imports (like the Carbon Border Adjustment Mechanism (CBAM) proposal by the European Commission), a **consumption duty** and **an import tax.**

Each option has its strengths and weaknesses. We will discuss their relative implications along the criteria of:

1. **legal feasibility,**
2. **administrative and political feasibility, and**
3. **climate impact.**

3.1 Replication of the EU-ETS for imports: CBAM Proposal

The European Commission proposes a replication of the EU-ETS for imports by introducing CBAM-allowances that **mirror the price of the EU-ETS** (European Comission 2021).

Importers would have to purchase a quantity of **CBAM allowances** sufficient to cover the embodied emissions in the goods they import. The CBAM would start with an **implementation phase from 2023 to 2025**. It would be fully operational from **2026** (European Comission 2021).

During the implementation phase, the European Commission proposes to include **a limited number of emission-intensive sectors**, i.e. cement, iron and steel, aluminium, fertilizers and electricity, and **only CO_2, N_2O und PFC-emissions** (European Comission 2021). However, the gas sector and methane emissions could still be integrated in the actual proposal or added in a second step.

To do so, **methane emissions would first need to be included in the EU-ETS,** as the Commission proposes that emissions that are covered by the CBAM should correspond to those covered by the EU-ETS (European Comission 2021).

The Commission selected this option of reproducing the EU-ETS for imports as most promising option for a carbon border mechanism. The advantage of this option is that it builds on the **framework of the EU-ETS**. Furthermore, it is easier to implement under EU law than a tax and more feasible to administer (ERCST 2021).

However, the current CBAM proposal may need to be adapted to be in compliance with the **World Trade Organization (WTO) law**.

Two aspects might make it difficult to **include methane emissions of the gas industry** in the proposed CBAM.

1. First, the **political feasibility** of including methane in the EU-ETS, which is prerequisite to including it in the CBAM, might be complex. Until today, the inclusion of methane emissions arising from the gas industry in the EU-ETS has not been considered seriously.
2. Second, the **main objective of the CBAM proposal** differs from the main objective of a methane border levy for natural gas imports into the EU. The main goal of the proposed CBAM is to ensure that ambitious climate policy in the EU does not lead to carbon leakage (European Comission 2021, p.2). The main goal of a methane boarder levy would not be to avoid relocation of oil and gas production and its associated methane emissions outside the EU, but to **incentivize foreign trade partners and importers to adopt measures to reduce methane emissions** in the countries of origin of natural gas. The danger of resettlement of industry due to methane regulation concerning natural gas is less obvious than it is the case for carbon leakage and different from manufacturing industry's leakage concerns.

Therefore, it might be legally difficult to include methane emissions into the current CBAM proposal.

Table 2: Evaluation of replication of EU-ETS

Legal feasibility	Administrative and political feasibility	Climate impact
▪ WTO compliance to be discussed ▪ Less obvious danger of methane emissions being shifted outside the EU might make methane not suitable for CBAM proposal	▪ Relatively easy to implement ▪ Current window of opportunity ▪ The inclusion into EU-ETS might be complex	▪ The inclusion of methane would create a relevant price signal for importers of natural gas

Source: own depiction

3.2 Excise duty

A second option would be a duty levied on the consumption of natural gas in the EU, regardless of whether it is extracted inside the EU or abroad. The duty would be **based on the quantity of the natural gas produced or imported multiplied by a methane intensity factor**. The methane intensity factor could be a default value for natural gas in the initial phase.

It should be administratively **easy to implement** a consumption duty as it could be built on existing tax infrastructure. Regarding legal feasibility, the adoption of tax provisions would require **unanimity in the Council**.

A second option would be a duty levied on the consumption of natural gas in the EU, regardless of whether it is extracted inside the EU or abroad. The duty would be **based on the quantity of the natural gas produced or imported multiplied by a methane intensity factor**. The methane intensity factor could be a default value for natural gas in the initial phase.

According to ERCST (2020) it may be **easy to implement** a border levy as consumption duty as it could be built on existing customs infrastructure. Furthermore, it may be adopted with a qualified majority voting under Article 192 of the Treaty on the Functioning of the European Union (ERCST 2020). Otherwise, an unanimouse vote in the Council would be necessary.

A consumption duty **would not actually represent a "border adjustment"**, but would be levied on the consumer – similar to the excise duty on alcohol and energy sources (FÖS 2020). On the one hand, this might **reduce the risk of conflicts with WTO law** (SWP 2020). On the other hand, **the price signal reaches the consumer** and not the producer or importers of natural gas.

As the main objective of the methane border levy for natural gas imports into the EU is to incentivize foreign trade partners and importers to adopt measures to reduce methane emissions, it is important that the **price signal reaches the actors that can actually avoid methane emissions**.

Table 3: Evaluation of an excise duty

Legal feasibility	Administrative and political feasibility	Climate impact
▪ Low risk of conflicts with WTO law ▪ Unanimous vote required	▪ Easy to implement ▪ Politically feasible	▪ Price signal does not reach importers of natural gas

Source: own depiction

3.3 Import tax

A third option would be a methane tax on imported natural gas, which is paid by the importer when natural gas enters the EU. To introduce an import tax would very likely **require unanimous vote in the Council**. If the Council would first unanimously exercise the so-called passerelle clause, a majority vote in the legislative procedure would be sufficient (ERCST 2020; Stiftung Umweltenergierecht 2021a). The unanimous vote might, however, be quite possible because mainly imports would be affected. Potential **conflicts with WTO law can be avoided** if the import tax is designed judiciously, as elaborated in chapter 4.

In order to implement an import tax on natural gas imports into the EU, **an internal EU methane pricing must be created** as well in order to ensure equal treatment under WTO law .

The import tax would reflect the price of methane in the EU combined with a methane intensity factor, which could be a default value for natural gas.

Like the replication of the EU-ETS, this option has the advantage that the **price signal reaches the natural gas importers** directly.

Table 4: Evaluation of import tax

Legal feasibility	Administrative and political feasibility	Climate impact
▪ Unanimous vote required, but achievable ▪ Conflicts with WTO law can be avoided	▪ The implementation of an EU methane price is necessary	▪ Price signal reaches the natural gas importers directly

Source: own depiction

Taking into account the strengths and weaknesses outlined above, we propose to introduce a **methane import tax**. This option ensures that the price signal reaches the importers of natural gas, who can decide to import natural gas from those countries where the natural gas has lower methane intensities. As this would be a new instrument, it can be created in line with WTO law.

However, this option also comes with its own difficulties and open questions. The next chapter tries to find answers to these questions and presents how the import tax could be implemented in practice.

4 Implementation of an EU import tax for natural gas imports

4.1 Practical concerns

4.1.1 Implementation of a methane price for natural gas inside the EU

To introduce a methane import tax in the EU, a **methane price must also be implemented within the EU**. Otherwise, the import tax would not be in line with WTO law as the exporters of gas from countries outside the EU would be discriminated against traders of gas inside the EU. It is important that the price level of the methane price within the EU and the price level of the methane import tax **are equal** (regarding the same amount of emissions).

The methane price within the EU could be paid by the distributor of gas, parallel to those actors who pay energy taxes. It would be important that methane emissions arising **during the whole supply chain** of production, transport and consumption are considered. Imports must be excluded as methane emissions arising from imports are covered by the import tax.

The question remains how the separation between gas produced within the EU and imported gas is possible at the point of distribution. A possibility might be to use Guarantees of Origin, which are standardized through the European Energy Certificate System. If a separation proves to be infeasible in practice, the methane price within the EU could include imports – which would mean that gas produced within the EU and imported gas are taxed at the same point (similar to energy taxes). In this case, the instrument would be similar in design to a consumption tax (e.g as an excise duty). Thereby it would be crucial that the distributor has an obligation to **prove evidence of the origin of gas** to enable a differentiation between the methane intensities of gas imported from distinct countries.

4.1.2 Determination of covered methane emissions

The methane emissions footprint of the natural gas imported into the EU could either be calculated on a **product level** or estimated referring to a **default value**.

Calculating the methane intensity of imported natural gas on a product level would require **disclosure of all imported gas quantities**, preferably with third-party verification. The specific determination of imported methane emissions would offer incentives for abatement measures where they are needed the most. This would make this approach **very effective environmentally,** but it would involve **significant administrative efforts** (ERCST 2020).

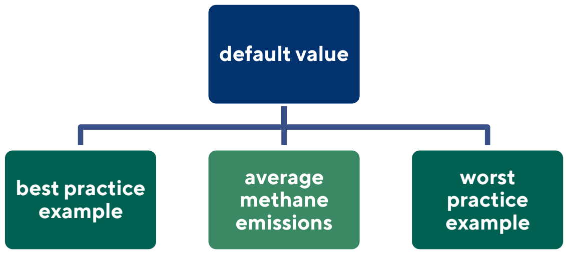
The precondition for adequate measurement of methane intensities along the entire supply chain would be an established methane measurement, reporting and verification **(MRV) framework** in all countries exporting to the EU.

Therefore, we propose to refer to a **default value during the implementation phase** of the methane import tax. It should be proposed that the MRV framework must be effectively established within a certain timeframe – e.g., three years after the implementation of the import tax – so that the use of the default value is no longer necessary.

The **default value** could be based on:

- **average** methane emissions,
- methane emissions in **best practice examples** or
- methane emissions in **worst practice examples**.

Figure 5: Possible default values for methane intensities



Source: own depiction

The default value is **more or less stringent** depending on the point of reference (ERCST 2020):

- Referring to methane emissions in **best practice** examples would put the default value on a low level and would be **less stringent**. Importers would in most cases pay for lower methane emissions than their imported gas actually produces. This would mean that they have less incentives to lower methane intensities.
- Referring to methane emissions of **worst practice examples**, by contrast, would be **highly effective** in incentivizing measures for the abatement of methane emissions. However, this option would be potentially WTO-illegal as the assumption of worst performance would not represent real methane intensities of the included gas imports and could create a significant trade barrier for natural gas from some countries (ERCST 2020).

We suggest using a **default value based on average methane emissions** – in order to avoid the extremes between most and least stringency. However, importers should have the **opportunity to prove that their natural gas imports are less methane intensive** than the average.

Another question is whether the default value refers to:

- the **EU average** methane emissions,
- the **average outside the EU,** or
- the **average in certain gas exporting countries**.

Also in this case, the default value is more or less stringent depending on the chosen option:

- As the average methane intensities in countries outside the EU are generally higher than those inside the EU (see IEA 2020c), **referring to EU average methane emissions would be less stringent** than referring to average emissions outside the EU. In general, importers would pay for less methane emissions than their imported gas actually causes.
- Referring to the average methane emissions outside the EU would therefore represent the more stringent default value and the environmentally more effective option. However, like the option referring to methane emissions of worst practice examples, this could lead to difficulties with the WTO law.

To realize a **smooth implementation** of the methane tax in line with WTO law, we therefore propose to choose the default value referring to EU average methane emissions.

4.1.3 Data/ measurement

The availability of reliable data is a key factor in establishing reasonable methane prices. During the implementation phase, the possibility of verifying lower methane intensities than the EU average provides **incentives to expand and improve data collection**.

The EU Commission is planning to propose corresponding legislation for the quantification and reporting standards of methane emissions. They will be based on the **OMGP 2.0 standard**, which was developed by the voluntary initiative Oil and Gas Methane Partnership (OGMP). This standard requires companies to incorporate emission estimates, which are based on measurement – instead of using emission factors for simplification (European Commission 2020; Enervis 2021).

The default value of methane emissions in the EU should be in line with the OMGP 2.0 standard as well and should capture all sources of methane emissions (leaks, venting, flaring, etc.). For comparison reasons, it would make sense to use methane emissions per unit of gas imported as metric (Environmental Defense Fund/Florence School of Regulation 2021).

After the implementation phase where the default value is used, the **MRV framework required of importers should be in line with the established EU framework**. The EU measurements should be expanded also to countries outside the EU, requiring gas companies importing to the EU to use the OGMP 2.0 reporting and measurement to reduce uncertainties about methane intensities.The recently founded International Methane Emissions Observatory (IMEO), a collaboration of UNEP and the European Commission, might serve as a facilitator. However, it must be considered carefully which requirements are politically and legally adequate for countries outside the EU. For gas companies outside the EU, the EU measurements could present a high administrative and economic burden.

4.1.4 Legal and political feasibility

The presented design of a methane import tax for natural gas imports into the EU takes the current WTO law into account. Proposing to implement also a methane price for natural gas inside the EU assures that exporters of gas from countries outside the EU are not discriminated against (ERCST 2020). Exporters from outside the EU are even better off than EU producers due to the default value being based on average EU methane emissions, as gas sector methane intensities are likely higher in countries outside the EU according to the IEA methane tracker . Furthermore, it gives non-EU gas exporters the possibility to prove lower methane intensities. Therefore, we conclude that the implementation of the proposed methane import tax **is probably compliant with** WTO rules. However, a final review would have to be carried out by a legal expert.

The **political feasibility of introducing a methane price for natural gas inside the EU** is difficult to estimate. It would require a unanimous vote in the European Council. But as in many European countries the extraction of natural gas plays no significant role, the unanimous vote could be achievable. Some European countries already have an extraction fee on natural gas – for example several federal states in Germany[1] (see Bundesverband Erdgas, Erdöl und Geoenergie e.V. 2020).

The **unanimous vote concerning the methane import tax** probably would be relatively easy to achieve, because mainly imports would be affected.

To ensure WTO-compatibility, **exemptions** for gas imports from countries with **equivalent methane pricing systems** are also crucial. If importers provide proof for any methane price paid abroad, this should be priced in the methane import tax levied (BMWi 2021b).

[1] Though in ints current form the extraction fee In Germany does not have an environmental incentive effect.

4.2 Price level

To determine an appropriate price level for the proposed methane price inside the EU and the proposed methane import tax, the approach of **abatement costs** and the approach of the **climate damage costs** represent useful frameworks. The abatement costs are the costs incurred to reduce a given amount of methane compared to a reference scenario. The climate damage costs, by contrast, represent the estimated costs for society caused by methane emissions and the resulting climate change.

4.2.1 Abatement costs

The methane price needs to be higher than the abatement costs to incentivize actual abatement (Enervis 2021). According to (IEA 2020b) **40%** of the methane emissions from gas production (i.e. upstream emissions) could be reduced **without any net costs**.

A literature review by the United Nations Environment Programme/Climate & Clean Air Coalition (2021) shows that there is great divergence in the estimated average abatement costs in existing studies. They differ from around **1.950 €/t CH_4** (for the mitigation of 85% of the total abatement potential) (United States Environmental Protection Agency 2019) over 850 €/t CH_4 (Harmsen et al. 2019) to a **negative net cost of around 595 €/t CH_4** (Höglund-Isaksson et al. 2020).

Focusing on the abatement potential of low-cost measures with costs of less than around 510 €/t CH_4, one analysis estimates that up to **80%** of the methane emissions from the oil and gas sector could be avoided (Höglund-Isaksson et al. 2020) while two other studies state that up to **60%** could be avoided (IEA 2020c; United States Environmental Protection Agency 2019). However, (Harmsen et al. 2019) estimates that with this price only **36%** of the methane emissions would be reduced. This shows that huge differences exist also in the examination of the abatement costs of low-cost measures.

There are also **regional differences** in abatement costs. In North America, most mitigation options are relatively cheap. However, in Russia, other former Soviet states and the Middle East, the situation is more uncertain and the compared literature comes to different conclusions regarding the low-cost effects (United Nations Environment Programme/Climate & Clean Air Coalition 2021).

Though there is high uncertainty on how high the abatement costs really are, the literature shows that with a price between around **500 and 700 €/t CH_4**, which is the equivalent to a relatively low price between around **17 and 23 €/t CO_{2eq}** assuming a GWP_{100} (30) for methane, there is a high probability that a relevant amount of emissions would be reduced.[2] We therefore propose to start with a methane import tax between **500 and 700 € per leaked ton of CH_4.**

4.2.2 Climate damage costs

To ensure that the entire damage of methane emissions is internalized, the import tax should increase to the full climate damage costs of methane emissions.

The German Federal Environment Agency (UBA) regularly determines the current state of research on the scope of external costs in its methodological convention for estimating environmental costs. In 2012, UBA recommended a cost rate for external climate damage costs of 80 $€_{2010}/tCO_{2eq}$ (UBA 2012). Due to more recent research results on advancing climate change, this value has been revised upwards significantly. In the Methodological Convention 3.1 from 2020, UBA recommends an average value of climate damage costs of **195 $€_{2020}/tCO_{2eq}$**, which increases over time - up to **250 $€_{2050}/tCO_{2eq}$** in 2050 (UBA 2020).

The case of Norway shows that this price level is not unrealistic - the mandatory greenhouse gas tax assessed on the volume of gas flared in Norway is about 80 €/t CO_{2eq}. However, the government plans to increase the mandatory greenhouse gas tax **up to 200 €/t CO_{2eq} until 2030** (Helgesen 2021).

To estimate the climate damage costs of methane, the period under consideration is decisive as the GWP of methane decreases over time after emission (see Chapter 2.1). In its Methodological Convention, UBA recommends using a **GWP_{100} of 28**. Due to the latest report published by the IPCC this year (IPCC 2021), this value must be updated to a **GWP_{100} of 30.** This would correspond to climate damage costs of methane of **5.850 $€_{2020}$/t CH_4**, which increases over time up to **7.500 $€_{2050}$/t CH_4**.

Taking into account the extremely high short-term climate impact of methane, it could also be calculated with the **GWP_{20} of 83.** Using the GWP_{20} would lead to an increase of the climate damage costs between **16.185 $€_{2020}$/t CH_4** and **20.750 $€_{2050}$/t CH_4**.

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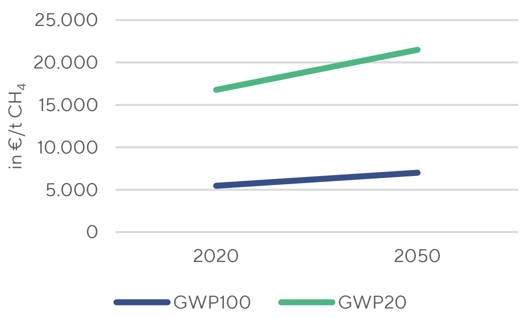
[2] Assuming a GWP_{20}(83), the price would be around 6 and 8 €/t CO_{2eq}. Referring to the GWP_{100}, we choose a conservative cost approach here.

Figure 6: Climate damage costs calculated with GWP_{100} and GWP_{20}



Source: own depiction

4.3 Geographic scope and included emissions

4.3.1 Geographic scope

Another crucial choice to make is the geographic scope of the methane import tax: should it apply to **all foreign countries**, **specific trade partners only** or **exclude certain countries** based on specified criteria?

Theoretically, the import tax could only apply to economic actors from states which export natural gas to Europe. As pointed out in chapter 2.2, the number of exporting states is limited. The great majority of natural gas consumed in the EU comes from seven countries: Russia, Norway, Algeria, Qatar, Nigeria, UK, and the USA.

In practice, limiting the import tax to a certain number of states would be **legally problematic** under the Most-Favoured-Nation (MFN) principle contained in the WTO treaties. This principle prohibits any discrimination against any WTO member country. Therefore, there would be a need to justify the measure legally referring to exceptions contained in GATT Article XX (ERCST 2020). The implementation of the import tax would therefore be legally **most feasible if all countries are included**.

4.3.2 Emissions covered by the tax

Another crucial decision is which emissions are covered by the methane import tax. As discussed in Chapter 2.3, methane emissions occur during the whole supply chain of natural gas – as well as during the combustion of natural gas.

In some countries, e.g. the USA and Netherlands, existing data shows that most of the methane emissions occur at the **upstream level** (IASS 2016). Upstream methane emissions can be defined as emissions from extraction, gathering, boosting, and processing.[3]

In the USA, the share of upstream emissions is around **75%** (IASS 2016). But covering only emissions from production and processing of natural gas (upstream emissions) by the methane import tax would exclude emissions during transmission, distribution, and storage.

In other countries, most methane emissions take place at later stages in the transmission – especially in Russia due to long transportation distances and poor maintenance of infrastructure. According to existing data, almost **70%** of methane leakages in Russia occur during the transport and storage phase (IASS 2016). However, as already pointed out in chapter 2.3, existing data need to be viewed with caution.[4] As Russia is the biggest importer of natural gas to the EU, emissions from transport and storage as well as upstream emissions should be covered by the scope of the methane import tax.

One difficulty in including methane emissions from the total supply chain lies in the fact that typically, those **entities responsible for upstream emissions are not those responsible for transmission emissions**. This means that both entities must be included in the design of the import methane tax, which might be an administrative challenge especially at the start of the tax system (Environmental Defense Fund/Florence School of Regulation 2021).

Therefore, a possible option would be to **cover only upstream methane emissions during the implementation phase** of the methane import tax and to **broaden the emissions scope in a second phase** when measurements are improved and more widespread.

4.4 Use of revenues

In the first years after the implementation of the methane import tax, the revenues are expected to be rather low due to the relatively high default value and a

[3] This refers to the definition of the Oil and Gas Climate Initiative (OGCI).

[4] Distinct estimation procedures and reporting units might cause variability between the national data. Furthermore, as stressed in chapter 2.3, the available data in general must be used with caution. Nevertheless, this data shows clear differences between the main origins of methane emissions in certain countries.

relatively low price level. However, the revenues will increase with an increasing price level and when the default value goes down or is replaced by actual intensity factors.

The use of revenues must be designed carefully – it must be in line with the expectations of member states and trading partners at the same time and be compliant with WTO law (ERCST 2020; Germanwatch 2021; Zachmann/McWilliams 2020).

In order to ensure **WTO compliance**, the total use of revenues should be tied to the purpose of financing climate policy measures within the EU and outside the EU (SWP 2021).

To ensure the cooperation and support of all EU member states, at least a small share of revenues should benefit the **EU budget** (ERCST 2020). One possibility would be to use 15% of revenues, which represent the current share of EU natural gas production, for the EU budget. This share should be spent on measures to reduce greenhouse gas (GHG) emissions (or methane emissions only) in the EU. Other uses, such as the financing of the national recovery plans implemented to tackle the effect of the COVID-19 pandemic, should not be included as this would not be in compliance with WTO law (Stiftung Umweltenergierecht 2021b; SWP 2021).

In order to finance relevant measures, the revenues could go to an EU **GHG- (or methane)-reduction fund**, which especially supports countries with high methane emissions and low economic abilities to finance appropriate mitigation measures. Thereby, the revenues could either go to existing funds like the EU **Modernisation Fund**, which is dedicated to fund programmes to support low-income EU Member States in their transition to climate neutrality (European Commission 2021b), or to **newly established funds that focus on methane reductions** in the EU directly.

In the EU, there is high potential to lower methane emissions arising from the gas sector. A joint measurement campaign by the "Deutsche Umwelthilfe (DUH)" and Clean Air Taskforce showed **significant methane emissions along natural gas infrastructure in Germany**. Other publications show similar results for Hungary and Italy (Deutsche Umwelthilfe 2021).

To guarantee that the administration of the tax does not create further costs for the EU, another small share of the revenues should be spent on **administrative efforts** (ERCST 2020).

The rest of revenues should be **returned to economic actors in countries outside the EU**. During the discussion about the proposed CBAM, it became clear that this aspect is crucial for international acceptance. Some non-European countries like Ukraine and India, for instance, refer to revenue return as a decisive precondition for accepting the EU CBAM (Germanwatch 2021). In the context of the proposed methane import tax, there are two main options for a potential design:

1. Support for climate transition in low- and middle-income countries through investments **in existing climate funds** or
2. **Creating a new investments fund for methane transition** in trade partner countries, which are directly impacted by the methane import tax.

The first option would benefit low- and middle-income countries without them being necessarily directly affected by the methane import tax. Though the focus of existing climate funds does not lie on the mitigation of methane emissions, using the revenues for existing funds would enable **investments in climate change mitigation measures**.

Examples of existing funds, which could be used, are the Adaptation Fund, the Special Climate Change Fund or the Green Climate Fund, from which benefit developing countries (ERCST 2020). The advantage of this option would be the **possibility to use existing infrastructure** due to existing funds.

The second option, by contrast, would benefit those trade partner countries who are affected most by the new import tax. A new fund would be created to finance **methane mitigation projects in these countries**. The fund could grant access to low-interest loans, grants and research and development support.

The disadvantage of this option clearly is the **higher administrative effort** – as the whole infrastructure around the new fund would have to be implemented. However, it would **directly enhance measures to reduce methane** – in those countries, where the need to take action is very high.

Table 5 shows that **both options would be good choices**, which would enhance the fairness and positive climate impact of the proposed methane import tax, and that both could be combined. Table 5: Comparison of two options to return revenues

Table 5: Comparison of two options to return revenues

	Option 1: Investing in existing climate funds	Option 2: Creating a new investments fund for methane transition
Fairness	Socially fair, as low- and middle-income countries, which are generally most affected by the consequences of climate	Fair as those countries, which pay the highest import taxes, will benefit from the revenues

	change without contributing to it correspondingly, will benefit the most	
Climate impact	Positive – but would not focus on the reduction of methane emissions, but overall climate transition	Positive – would focus on the reduction of methane emissions directly
Administrative effort	Usage of existing funds possible	New fund must be created

Source: own depiction

4.5 Impact on methane emissions and EU natural gas prices

A study by (Enervis 2021) analyses the impact that a price on upstream methane emissions has on methane emission rates and EU natural gas prices. In the assumed scenarios, **only upstream emissions** are included. These scenarios therefore can serve as references for the proposed implementation phase of the methane import tax, where only upstream emissions would be covered.

The model is based on distinct assumptions about:

- the abatement incentive and potential,
- the assumed methane emission intensities for gas extraction
- the methane price
- the costs of production and transport, and
- demand elasticities.

The core assumptions and three examined scenarios are presented in

Table 6.

Two distinct methane prices are examined: a price of **25 €/t CO_{2eq}**, which corresponds to 700 €/ t CH_4 assuming a GWP_{100} (28)[5] and a price **of 100 €/t CO_{2eq}**, which corresponds to 2.800 €/ t CH_4.

The lower price level lies in the price range we propose as a starting point for a methane import tax. The upper price level of 100 €/t CO_{2eq} would be a price level which should be achieved some years after the implementation of the import tax.

The assumed **methane emission intensities for gas production** correspond to the intensities presented in chapter 2.3. As the analysis focuses on a relatively short timeframe until the year 2025, only the short-term price elasticities are considered. Based on existing academic literature, an **average elasticity of -0,2** is assumed. This means that an price increase of 10% would lead to a reduction in gas demand by 2% (Enervis 2021).

- The **"Business as usual scenario"** represents the baseline scenario for the assessment. In this scenario, no methane price exists.
- In the scenario **"CH_4 pricing without producer abatement response (PAR)"**, a methane price is implemented, but companies do not abate their methane emissions.
- Contrary, the scenario **"CH_4 pricing with PAR"**, assumes that 75% of the EU methane emissions in the baseline scenario are abated due to the methane price.

As in the CH_4 pricing with PAR scenario abatement is only assumend to happen on the EU share of methane emissions in the gas production country, this scenario represents a **conservative one** as it is probable that not only emissions coming from the EU share would be reduced (Enervis 2021).

Table 6: Overview of core assumptions by Enervis (2021)

	Business as usual scenario	CH_4 pricing without PAR	CH_4 pricing with PAR
Meaning	Baseline with no sector-specific policy on methane and no sustainability requirements on gas	Methane price proportional to upstream emission intensity implemented on all gas traded in the EU	Methane price proportional to upstream emission intensity implemented on all gas traded in the EU; including 75% abatement response
Methane price	No EU CH_4 price	Focus: EU CH_4 price of 25 €/t CO_{2eq} (700 €/t CH_4) Additional: Notional price of 100 €/t CO_{2eq} (2.800 €/t CH_4)	
Emission intensity (upstream)	Central baseline emission intensity estimates in supplier countries range from 0,01 to 6,7%		Abatement emission intensity estimates range from 0,0 to 1,7%

[5] The study by Enervis (2021) uses the GWP_{100} of 28, which has been updated in the latest IPCC report.

Abatement response		none	75% in gas supply regions (focus on EU share)
EU27 gas demand	2025: 378 bcm (9% of global demand)	Demand elasticity considered	Demand elasticity considered

Source: (Enervis 2021)

4.5.1 Impact on methane emissions

The results of Enervis (2021) indicate that the upstream methane emissions of the EU's gas consumption would decline in the first scenario without PAR by almost 0,6 Mt at 25 €/t CO_{2eq} and by almost 1,6 Mt at 100 €/t CO_{2eq}. This corresponds to **18% and 48% of the upstream methane emissions footprint** of the EU's gas consumption.

Assuming a PAR of 75%, the upstream methane emissions decline by about 2,5 Mt at 25 €/t CO_{2eq} and about 2,6 Mt at 100 €/t CO_{2eq}. This would represent a **decline by about 78% or 79%.** The reason for the reduction would be an increase in gas supply from countries which have relatively lower methane intensities and a decrease in supply from countries with relatively higher intensities (Enervis 2021).

On a global level, the decrease of methane emissions in comparison would be much lower than on the EU level as the global gas trade flows to other countries outside the EU. Enervis (2021) consider global oil and gas supply chain methane emissions here due to limited separated data.

In the scenario without PAR, the global oil and gas methane emissions would decline by **1%** at 25 €/t CO_{2eq} and by **1-2%** at 100 €/t CO_{2eq}. In the second scenario with producer abatement response, the reductions would be **2-3% at both** 25 €/t CO_{2eq} and 100 €/t CO_{2eq}.

Assuming that producers outside the EU would also abate 75% of their methane emissions, global oil and gas supply chain methane emissions would even decrease by around **15-25%** (Enervis 2021).

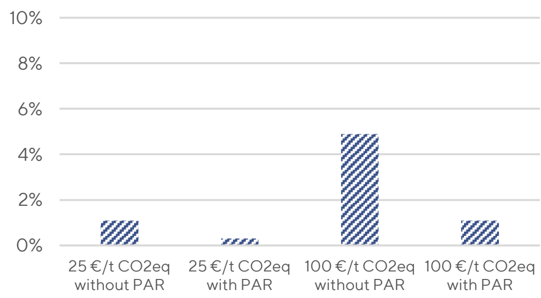
The assumed **methane intensities have a crucial impact on the results**. Due to the high uncertainties and limited data of methane intensities in certain countries, the results must be taken with caution (Enervis 2021).

4.5.2 Impact on natural gas prices

The results by (Enervis 2021) further demonstrate which impact on natural gas prices could be indicated under the proposed methane import tax (see Figure 7 and Figure 8).

The average residential gas price would increase 25 €/t CO_{2eq} without PAR by **1,1%** and with PAR by **0,3%** and at 100 €/t CO_{2eq} without PAR by **4,9%** and with PAR by **1,1%**.

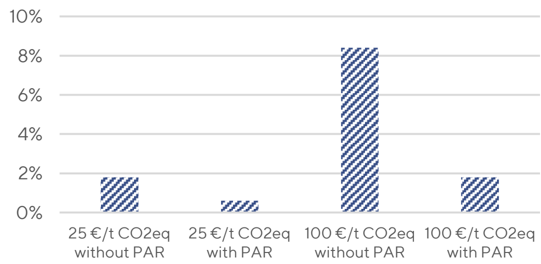
Figure 7: Average increase of residential gas price



Source: own depiction based on (Enervis 2021)

The methane pricing has a greater impact to end user prices for industry as these are generally lower. Here, the increase would be **1,8%** without PAR at 25 €/t CO_{2eq} or **0,6%** with PAR. At 100 €/t CO_{2eq} the industry price would increase by **8,4%** without PAR and by **1,8%** with PAR.

Figure 8: Average increase of industrial gas price



Source: own depiction based on (Enervis 2021)

At least some years after the implementation of the proposed methane import tax when the price signal increases, it can be assumed that gas producers actually enhance abatement measures due to economic reasons. Under this assumption, **the increase in natural gas prices is limited** – even under a relatively high price at 100 €/t CO_{2eq}.

5 Combination with a performance standard

In addition to pricing methane emissions arising from natural gas production in the EU and gas imports into the EU, **a performance standard** should be implemented for all natural gas sold in the EU market. It would assure that the methane intensity of all natural gas traded in the EU would stay below a certain benchmark. If the methane intensity of natural gas would be above the performance standard, importers would not be able to import this type of natural gas into the EU. Thereby, it would represent a **safeguard excluding the sale of natural gas with extraordinarily high methane** intensity on the EU market. This safeguard would be of special value in the short- and medium-term until the methane price inside the EU and the methane import tax would be implemented and a relevant price signal would be created. The combination of a regulatory instrument like a performance standard with methane pricing instruments would therefore include the safeguard excluding extraordinarily high methane intensities and **set incentives to adapt further measures** to reduce methane emissions at the same time.

Therefore, the proposed performance standard should be dynamic over time: It should **start fairly unambitiously** determining a performance standard which corresponds to status quo methane intensities. Over time, it would get more ambitious – excluding highly methane-intensive gas imports into the EU.

The EU Methane Strategy provides a **window of opportunity** to implement such a methane performance standard in the short term. There already exist proposals of how a methane performance standard on EU level could be designed – e.g., by (Environmental Defense Fund/Florence School of Regulation 2021).

Both instruments would have to go **hand in hand**, i.e. the concrete design should be coordinated. This accounts for e.g. the covered emissions or the usage of a default value. To avoid high administrative efforts and costs, the point of obligation, e.g. gas importers, should also be the same.

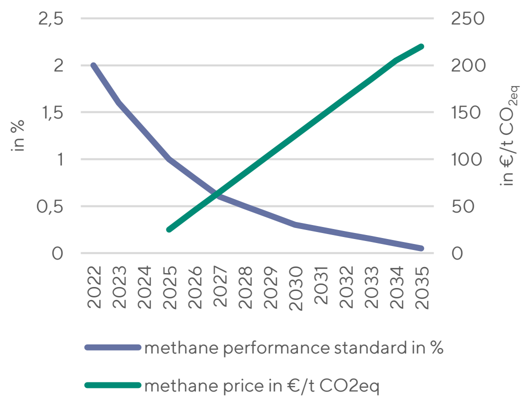
Environmental Defense Fund/Florence School of Regulation (2021) propose to use the 2025 methane intensity target of the OGCI as methane performance standard. Referring to this target, the methane intensity of all natural gas sold should be **0,25 – 0,2 % by the year 2025**. The Global Methane Alliance also recommends a methane intensity of maximum 0,25%.

As presented in chapter 2.3, only the methane intensities of natural gas from Norway and the UK currently fulfill this criterion. The current methane intensities of natural gas from other countries like Russia, the USA or Algeria are estimated to be higher.

To not exclude natural gas from certain countries from the start, we propose to start with a less ambitious performance standard. Referring to the methane intensities estimated by (Enervis 2021; IEA 2020a), which were presented in chapter 2.3, the performance standard could start at **2,0% by a short-term implementation in 2022**. This value should also be achievable for every natural gas exporter in countries outside the EU.

Figure 9 shows how the methane performance standard and the methane price could develop over time if the methane performance standard would be implemented already in 2022 and a methane price – within the EU and also in form of the proposed methane import tax – in 2025. While the methane performance standard would decrease from a methane intensity of **2% in 2022 to 0,05% in 2035,** the methane price would increase from **25 €/t CO_{2eq} in 2025** up to the amount of the total climate damage costs of around **220 €/ t CO_{2eq} in 2035.**

Figure 9: The development of the methane performance standard and the methane price over time



Source: own depiction

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