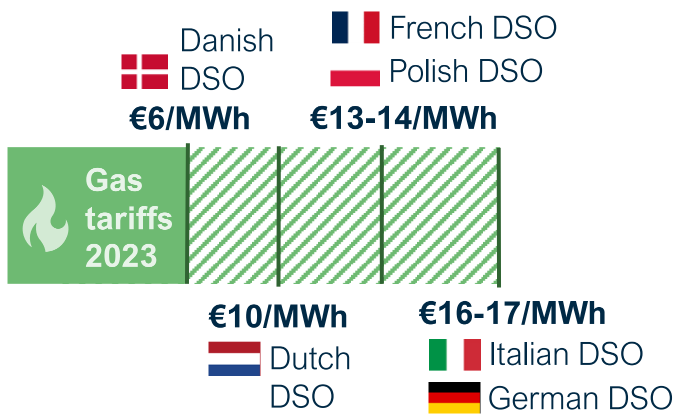
Gas distribution grids have lower costs than electricity grids today and in the future

Energy infrastructure is agnostic to the source of the energy it carries, fossil or renewable, making it valuable to support the transition. Gas grids can be a vital enabler of the European energy transition, particularly in **allowing the widespread production and distribution of biomethane.** This paper sheds light on how gas distribution grids can be a cost-effective method of renewable energy distribution by enabling biomethane.

Low tariffs for consumers on gas distribution grids



A simplified calculation of the average gas tariff for distribution system operator (DSO) connections from across the EU indicates a tariff of ~ € 6 – 17/MWh demand. This is a notable range, however, it a **significant cost advantage compared to electricity DSOs tariffs**. Electricity tariffs for DSO connections ranged from ~ € 39 – 46 per MWh demand, 2 – 7 times more expensive per unit demand distributed.

Gas grid tariffs vary significantly between DSOs in different countries. *Operating pressures* and *pipeline diameters* influence the volumes of gas transported per pipeline; with lower pressures or diameters, meaning more infrastructure is needed per volume of gas transported, increasing costs. A higher *density of gas demand*, lowers the amount of infrastructure length needed per offtaker, and thus the grid costs. Additionally, the *network lifetime and depreciation* influences the tariff, where the younger the network, the higher the payback for capital costs. **Electricity grid tariffs to DSO users also vary significantly between countries and between DSOs within the same country** due to *density of demand, network lifetime, depreciation and the level of new investments* however, differing cost allocation models and billing structures make it difficult to compare tariffs between countries.[1]

1. ACER (2024). *Electricity infrastructure development to support a competitive and sustainable energy system. 2024 Monitoring Report* (link).

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What to expect in the future…

Depreciation

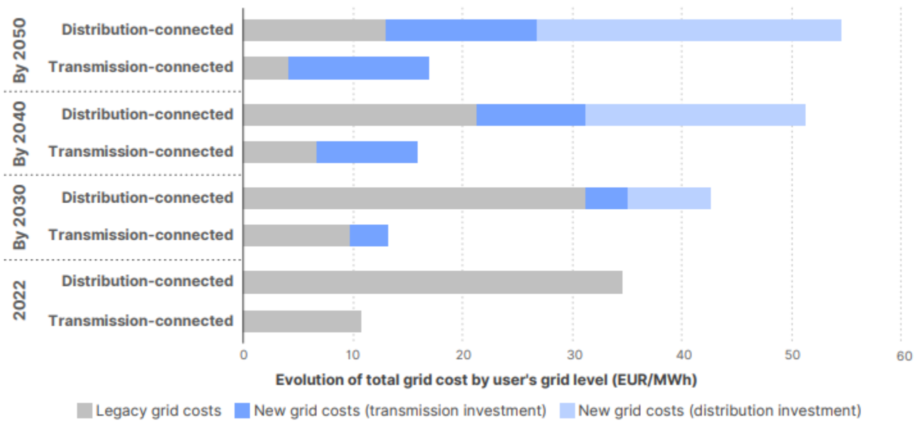
Offtakers

Gas volumes

Investments

Gas distribution grid tariffs can be expected to increase slightly in the future, largely due to a *reduction in demand* and a *decrease in connected users*. This will be offset to some extent by the fact that the gas grid investment is increasingly written off through out time and the grid does not require much new investment. Electricity distribution grid tariffs are expected to increase much more significant due to *large investments* despite the *increasing demand* and *increasing numbers of connections,* as shown below. [1]

Recent ACER report[1] *shows expected development of total grid costs for users of electricity distribution infrastructure up to 2050.*



Electricity infrastructure costs are rapidly increasing. More analysis needed on how lower-cost gas infrastructure can reduce the overall bill

This paper uses a simplified estimation for the average tariff for a consumer, validated by gas DSOs and discussed with national regulatory agencies.
Grid costs vary for different types of consumers such as households, industries, and small-and medium enterprises. This also changes per country and per energy carrier. This paper shows a simplified estimation of the average tariff for electricity and gas distribution grids in euro per megawatthour[2], by dividing the regulated revenues allowed for a particular year by the demand on that gas grid for the same year, using publicly available datasets.

1. ACER (2024). *Electricity infrastructure development to support a competitive and sustainable energy system. 2024 Monitoring Report* (link). See Figure 11. Electricity investments needs for 2050 are based on a moderate Ember scenario.
2. This methodology, which has been discussed and validated with relevant DSOs, serves as an adequate approximation for evaluating the cost of using gas DSOs today. It does not reflect what the tariff is for a consumer or industrial connection, but rather a global average for all consumers. Grid tariffs are influenced by various factors such as depreciation, capacity-based costs, and volume-based costs.

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