Impact of Russia's invasion on the gas markets

Focus on Europe

FTI CONSULTING

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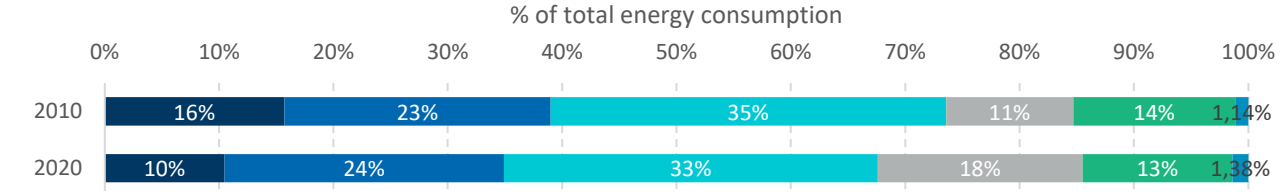
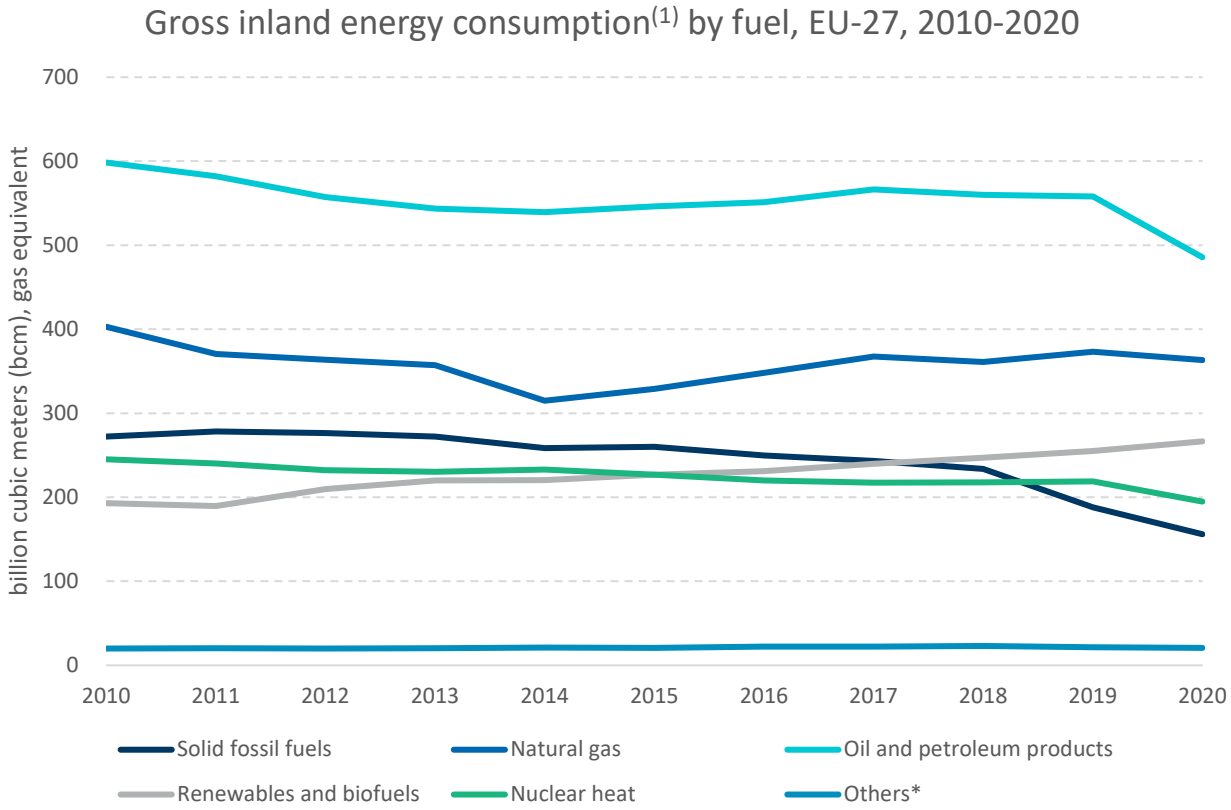
Demand

- Gas is the second largest source of energy in the EU-27, representing 24% of total energy consumption, significantly higher than all renewable energy sources combined (18%).
- Prior to the war, gas consumption in the EU-27 was forecasted to remain at 2019 levels until 2025(2)
- In 2020, 30% of gas was used for power generation, 24% for households' needs, 23% for industry needs and 23% for others (including commercial and public services and transport needs). The split between these sectors remains largely unchanged since 2010.
- In three main sectors, the demand over 2010-2020 period decreased by 1.6% per annum in households, 1.4% in power generation, and 0.4% in industry.





Sources: Eurostat, IEA, FTI-CL analyses

Notes: *Others include : Peat and peat products, non-renewable waste

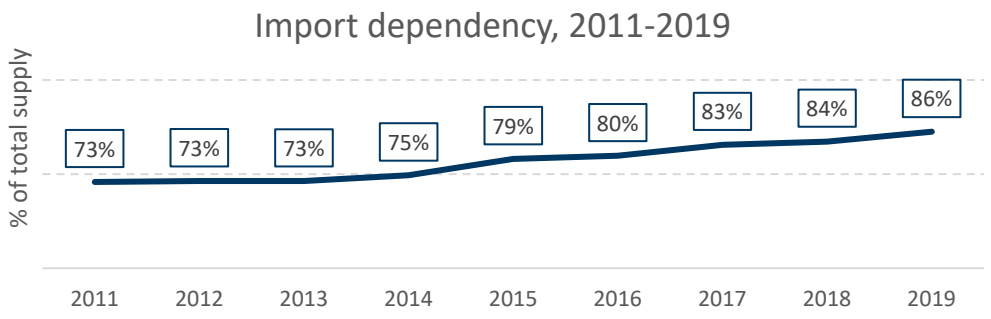
(1) Gross inland energy consumption is the total energy demand of a country or region. It represents the quantity of energy necessary to satisfy inland consumption (Eurostat). Discrepancies between gross inland natural gas consumption volumes and natural gas end-uses volumes might exist due to unit conversion using different gross calorific value of natural gas. Consumption = Imports + production – exports - losses

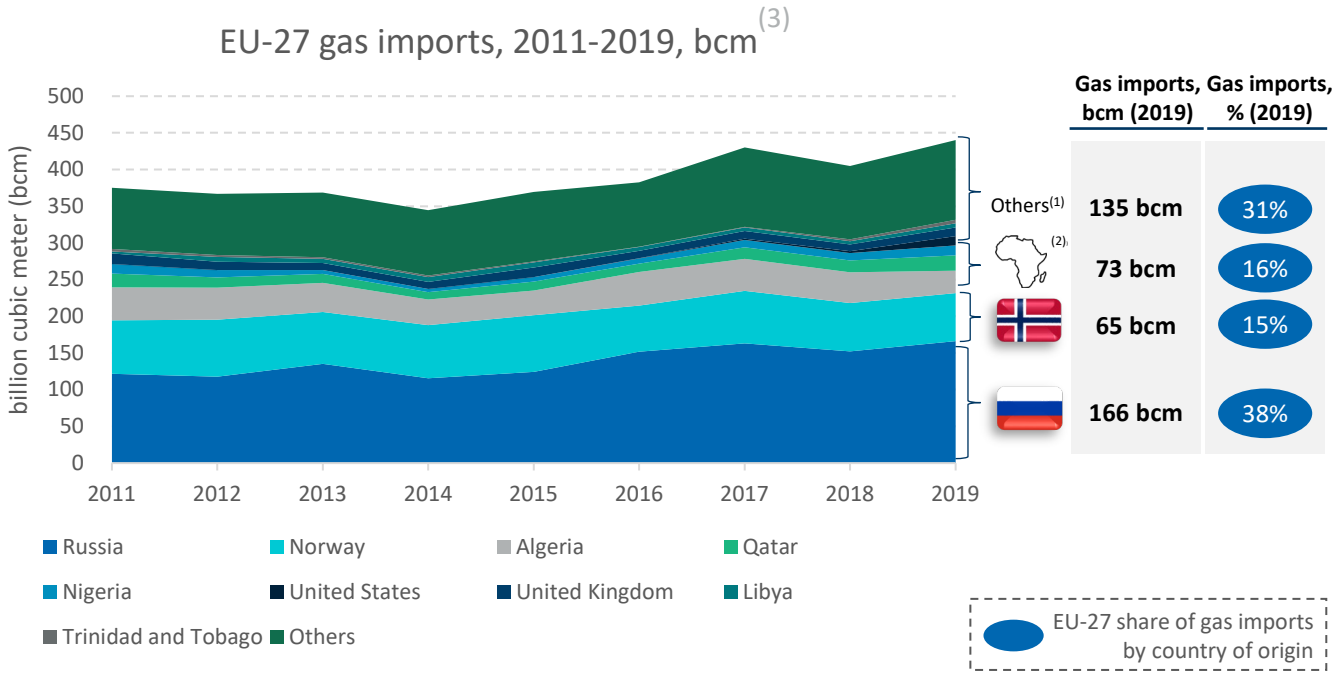
(2) IEA, Gas 2020

Following the decline in domestic production, EU's gas import dependency on Russia increased from 32% in 2011 to 38% of the total imports in 2019

Supply

- There has been a decline in the EU-27 production, accounting for 27% of total gas supply in 2011 and only 14% in 2019.
- In 2019, the EU-27 imported 86% of its total gas needs - an increase of 13% since 2011.
- In 2019, total gas imports to the EU-27 accounted for 440 bcm.
- EU-27's import dependency on Russian gas increased from 32% in 2011 to 38% of the total imports in 2019 (pre-pandemic).
- Other key importers of gas include African and Middle Eastern countries, accounting for 16% of total imports in 2019 and Norway – responsible for 15%.





Sources: BP statistical review of the world energy 2021, Eurostat, FTI-CL analyses
Notes: (1) 'Others' category includes import from other countries. (2) African countries and Qatar
(3) Split of imports by country is not available for 2010 and 2020.

European gas prices increased strongly in past 12 months amidst limited supply and demand growth, but fear of Russian supply cuts compounded that effect

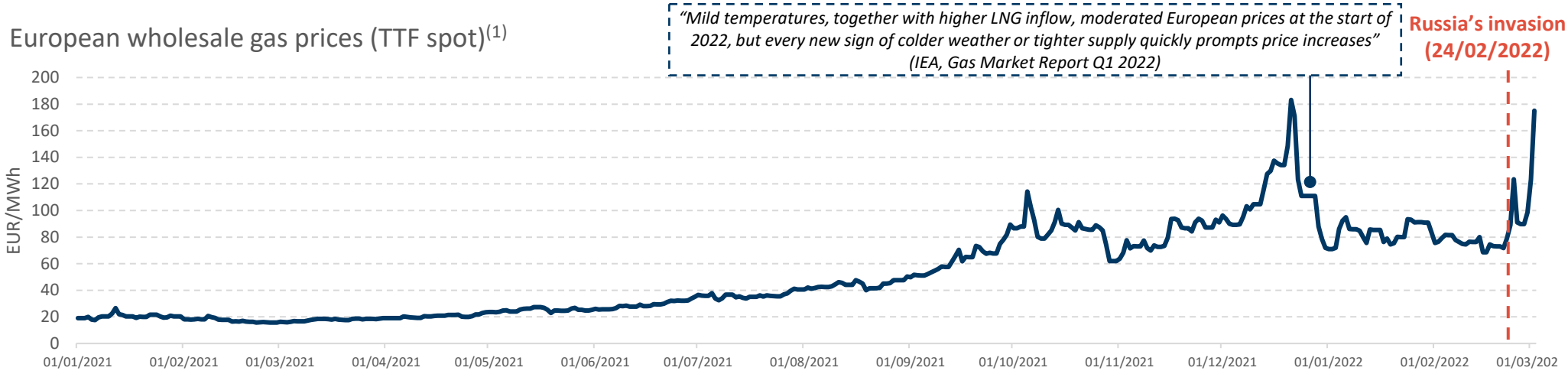
Market situation prior to the war

- Gas prices in Europe and Asia increased even before the war where spot prices grew by 500% in 2021, compared to a 100% increase for the US gas.
- Prices reached a record high in 2021 due to a growing Asian demand for gas and a limited demand price elasticity.
- Pressure on the supply of gas pre-war was due to the limited available liquefaction capacity in LNG terminals and lower export volumes through Russian pipelines.

Market reaction to initial days of the war

- The war induced-fear of Russian supply cuts compounded the effect of upward price pressure, increasing prices in early March by +140% vs February 2022.
- Coal prices increased to 300 EUR/tonne immediately after the invasion.
- Oil prices reached a record high of 113USD/barrel at the onset of war.
- CO_2 prices fell by nearly 30% in response to Russian financial sanctions.
- Nuclear outages, low renewable generation and climbing fossil fuel costs, in response to war, led to multiple surges in power prices over the recent months.

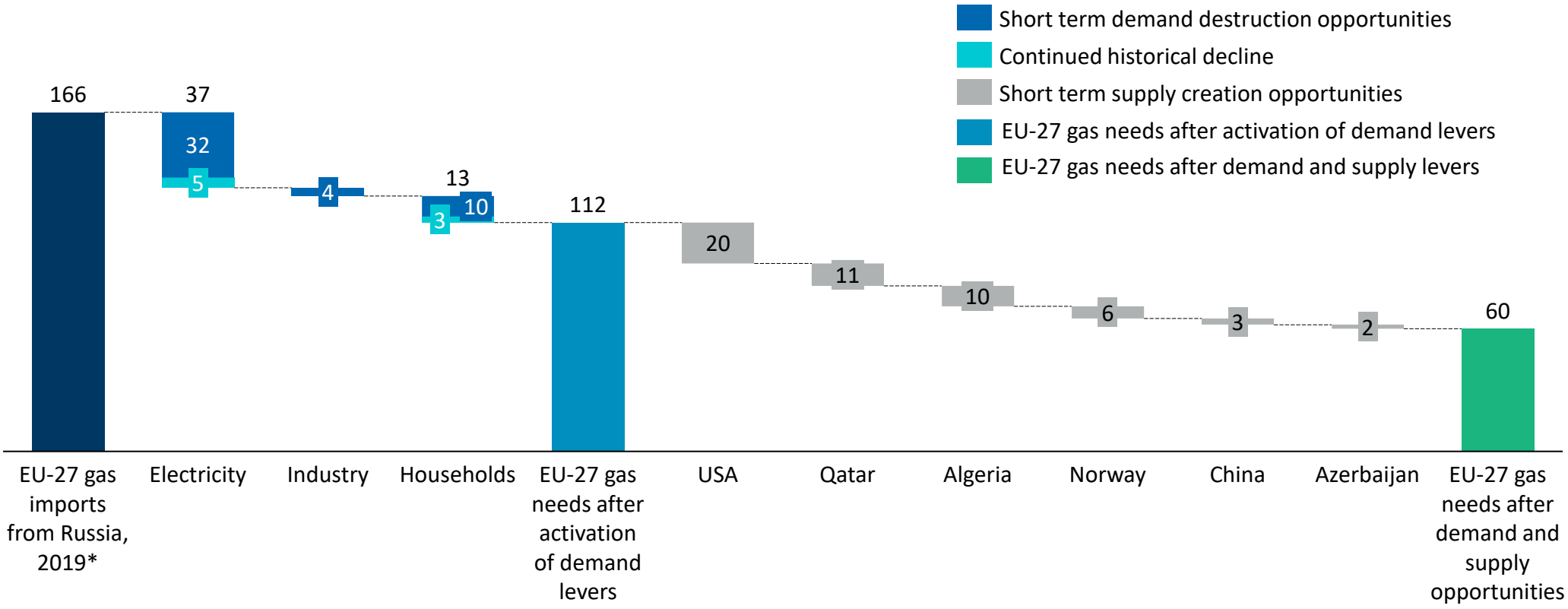
European wholesale gas prices (TTF spot)(1)



Source: FTI-CL analysis
Note (1) TTF stands for Title Transfer Facility, TTF prices correspond to the benchmark European wholesale gas prices

Cutting Russian gas imports is not feasible by end-2022, even if EU reduces heating, re-opens nuclear and coal plants and maximises alternative imports

Demand destruction and supply creation opportunities in the short term (by the end of 2022), billion cubic meters (bcm)

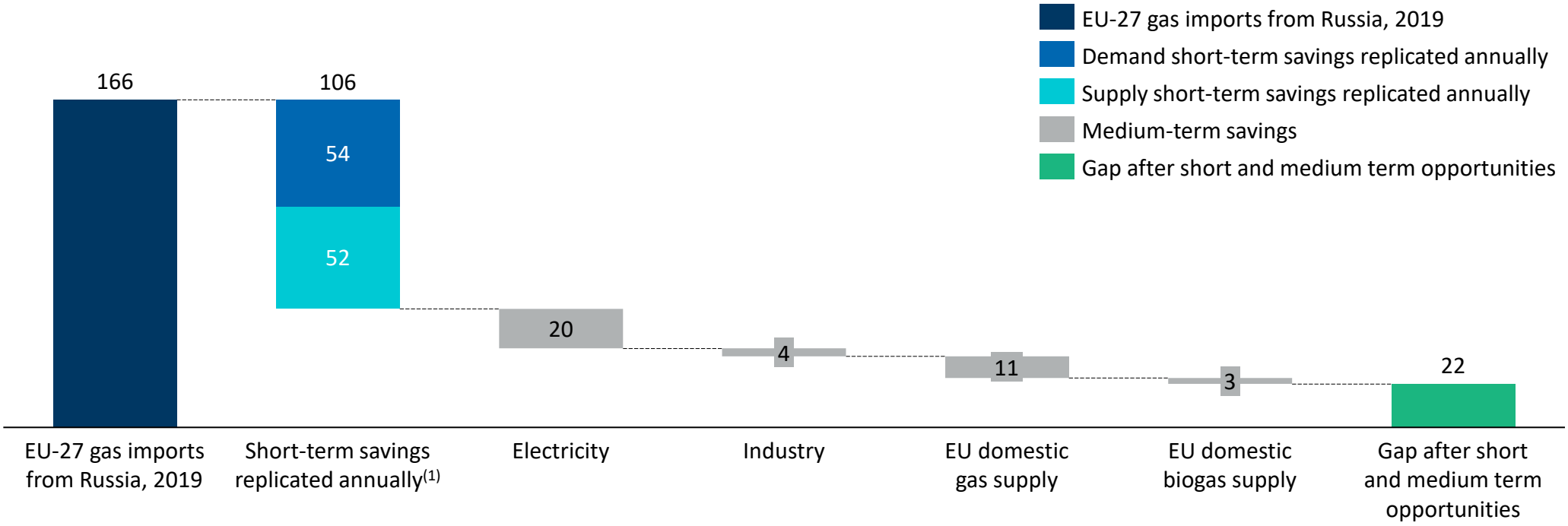


- For Europe, cutting Russian gas imports does not appear feasible by year-end 2022, even if Europeans import as much as possible from around the world (52 bcm), re-open available nuclear or coal power plants (32 bcm) and reduce their heating (13 bcm)
- A significant gap of 60 bcm (36% of the original supply) would still remain, potentially triggering closure of factories and buildings unable to function without gas.

* 2019 shows pre-pandemic level demand that was used as a basis for FTI's analysis

By 2025, the EU could cut most of Russian gas imports by debottlenecking gas infrastructure, accelerating renewables, increasing local and foreign gas supply

Bridging EU-27 gas imports from Russia after the implementation of short and medium term savings, billion cubic meters (bcm)



- In the medium-term (by the end of 2025), the EU could almost fully wean itself off Russian gas imports (166 bcm per year), by:
  - Debottlenecking of European gas infrastructure to allow non-Russian gas to reach its Eastern part,
  - Increasing domestic and foreign fossil supply from nations other than Russia (+11 bcm and +52 bcm respectively),
  - Extending the life of nuclear and coal power plants (+32 bcm), and further accelerating renewable energy development: hydrogen (+4 bcm), biogas (+3 bcm), electric renewables (+20 bcm).
- Measures above would replace 144 bcm (87%) of Russian gas by the end of 2025. A gap of 22 bcm (13% of the Russian supply) remains. It could be further reduced by an accelerated deployment of heat pumps, revisiting EU shale gas bans and installing batteries.

(1) A breakdown of short-term measures is available on the previous slide.

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Full-length version of the report is available on request

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