EUROPEAN ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient Europe

Gas package: energy system efficiency, rather than a fuel switch

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Executive Summary

In December 2021, the European Commission issued two proposals, one Directive and one Regulation, laying down the foundation for a European low-carbon gas industry, the so-called "Gas Package". The European Alliance to Save Energy (EU-ASE) sees in the approach of the Commission the continuation of an old paradigm which fails to implement the Energy Efficiency First Principle (EE1st) and risks leading to stranded assets. The ongoing energy crisis following Russia's invasion of Ukraine calls for an urgent halt in imports of Russian gas, for which energy efficiency, and the application of the energy efficiency first principle must be the way forward rather than switching fuel. Energy efficiency is the safest fuel, and there are a plethora of cost-effective, high-potential, and easily deployable measures that also provide numerous socioeconomic benefits. In comparison, low-carbon gases and hydrogen are extremely energy-intensive, costly, emit CO2 and have limited production capacities. Only in hard-to-abate sectors of the industry does hydrogen have value, provided it is produced from renewable energy sources (green hydrogen) and supported with increased RES capacities. The objectives should be better aligned with other provisions contained in the Fit for 55 package, such as the directives on Energy Efficiency and Energy Performance of Buildings that, for instance, foresees the ban on sales of inefficient gas boilers. Finally, provisions related to governance must be improved to ensure the adequate planning of the transition is based on robust decarbonisation assumptions and prioritises climate and the EE1st principle.

The EU Commission's approach towards decarbonising the gas markets as laid out in the Gas Directive 2009/73/EC, Gas Regulation (EC) No 715/2009, released in December 2021, follows an old paradigm and is framed to promote the development of renewable and low-carbon gases and lay the foundation of the hydrogen economy without consideration for end-users. The proposal focuses exclusively on source diversification and overlooks the need to lower energy demand and optimise energy consumption.

It misses the opportunity to implement the Energy Efficiency First (EE1) principle at the system level and fails to consider the broad socio-economic benefits of energy efficiency measures and system efficiency at a time where energy efficiency should be more of a priority than ever. This is being increasingly reflected in the EU's response to rid Europe of Russian gas imports with the REPowerEU Plan[1] and more recently in the "Save Gas for a Safe Winter" communication. The old paradigm needs to be updated accordingly.

1. Need for speed

Speed is more critical than ever: the best window of opportunity is now as the Russian aggression against Ukraine has led the EU to an unprecedented coordination effort and the general principle that energy security means reducing Europe's fossil fuels imports. In this context, the gas package should be the roadmap to accelerate the complete phase-out of gas, not simply to substitute natural gas with renewable and low-carbon gases. Research shows that diversifying energy sources will not be enough to replace all imports of Russian gas and that an urgent reduction in gas demand is needed[2].

However, speed does not mean rushing things. In response to the current emergency, which is the result of the interwoven climate and energy crises, quick fixes on the supply side might be tempting, but will bring about future problems that will be increasingly challenging to fix. The EU must avoid all risks of locking investment in stranded assets. It should instead focus efforts to reach long-term energy and climate goals and lay down the foundation and the right framework to meet the 2050 decarbonisation target.

Substitutes for fossil gases listed in the gas package – such as sustainable biomethane[3] or green hydrogen – are very limited in their potential production capacity[4]. Indeed, based on current estimates of the total potential of renewable gases in 2050, only a fraction of the current fossil gas consumption could be covered. Even industry projections, like the recent study by Navigant, see overall demand for gaseous levels at much lower levels, at approx. 200 bcm in 2050 compared to the natural gas demand today, which stands at 482 bcm[5].

It is high time we divest public and private investments from gas imports (in particular Russian natural gas) and redirect investments towards energy efficiency and the deployment of renewables to better respond to the surge in energy prices.

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1. REPowerEU Plan: Joint European Action for affordable, secure and sustainable energy, European Commission, March 2022
2. European Union demand reduction needs to cope with Russian gas cuts, Bruegel, July 2022
3. Biomethane production capacities estimated at 17bcm by 2030 instead of the 35bcm foreseen by the European Commission, see study, Institut für Energie- und Umweltforschung (ifeu), Heidelberg, May 2022
4. Gas for Climate. The optimal role for gas in a net-zero emissions energy system, Navigant, 2019
5. Reference made to gas demand levels prior to Covid pandemic and aligned with demand in 2017 and 2018

2. Hydrogen for harder-to-abate sectors

Low-carbon or so-called "blue hydrogen"[6] still emits CO2 and is economically very expensive which the higher electricity and gas prices only make worse. As result, "green" hydrogen, produced from renewable energy sources is the only option to decarbonise the industry compatible with a net-zero scenario. This makes hydrogen an even scarcer resource than expected. On top of this, green hydrogen will require building additional RES capacities to cover the electricity demand to operate electrolysers ("additionality principle"). Decarbonising the steel and chemical sectors with green hydrogen would indeed double or triple the demand for renewable electricity.

The EU Long-Term Decarbonisation Strategy suggests that European renewable hydrogen supply could meet only 15% of today's gas demand or less[7] hence most green hydrogen will have to be supplied by imports or gas end-uses need to be electrified. In turn, imports of green hydrogen from the Middle East and North Africa (MENA) region are likely to have a negative impact on costs, will certainly not increase European security of energy supply and will inevitably generate additional emissions. Electrification of certain gas-using applications would mean a more efficient use of renewable electricity, lower energy prices, and enhanced European energy security.

Moreover, we should not underestimate the negative consequences that hydrogen imports to the EU will have on exporting countries (e.g., water scarcity, land use or just transition dimensions). It is necessary to bear in mind that producing and transporting hydrogen is extremely energy-intensive and that hydrogen is only a valuable resource for the energy transition when limited to very specific applications and to decarbonise harder-to-abate sectors (e.g., freight and heavy industry). The heat produced in such processes could also be recovered and used in district heating networks, which is a good example of system efficiency, energy sector integration and district approach.

6. Blue Hydrogen is hydrogen generated from gas with the use of carbon capture and storage technologies
7. The Limitations of Hydrogen Blending in the European Gas Grid, Fraunhofer (IEE), January 2022

3. Benefits of energy efficiency

Each 1% of energy efficiency allows us to cut 3.5% of gas use[8]. Several studies and industry estimations show that energy efficiency technologies are readily deployable and are a short to mid-term solution to address both the energy and climate crisis[9].

In a recent study[10],Cambridge Econometrics compared the socio-economic impacts of three pathways towards decarbonising the EU building stock by 2050 and found the high energy-efficiency and electrification scenario to bring the highest benefits.

It showed that Europe could cut its annual spending on gas imports by €15 billion in 2030 – the equivalent of 25% (1.45EJ) of the EU's current fossil gas imports from Russia, through renovating and electrifying Europe's residential buildings.

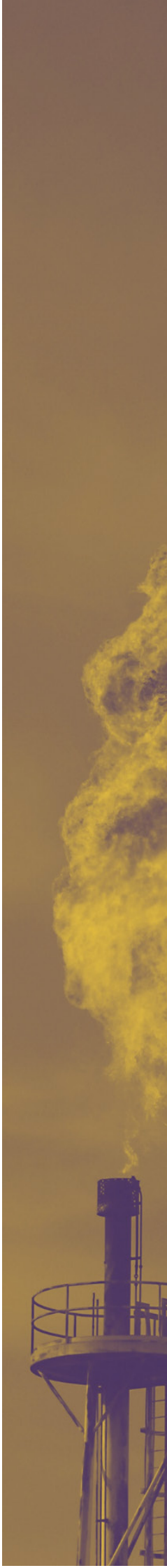
In this context, home renovation and electrification would create more jobs than those that would be created if relying on gas. In total, around 1.2 million extra jobs by 2050, mostly in the construction and power sectors. Along the same lines, the IEA estimated that energy efficiency creates three times as many jobs as hydrogen.

According to the same study, investment in energy efficiency and electrification would lead to an increase of the GDP in the EU-27 and the UK, equivalent to an additional 0.8% of annual GDP in 2030 and 1% in 2050. Energy renovation and electrification would also bring the most financial benefits to consumers. Their deployment at a 3% rate per annum could halve heating bills by 2050, resulting in an increase in disposable income, especially for lowest-income households, and a boost for the economy. It is clear that consumers could benefit from a good gas package in terms of power purchase.

Furthermore, from an environmental perspective, and if compared to 2020, the study's findings highlight that energy renovation and electrification would reduce NOx emissions by 90% by 2050, leading to better air quality in homes.

The EU funded project ENERFirst investigated the cost-effectiveness and societal cost of applying the Energy Efficiency First principle and concluded that ambitious levels of energy efficiency in buildings can reduce cumulative damage cost on climate change and effect on the environments by up to 146.5 bn EUR by 2050[11].

In addition, the indirect use of gas can be further reduced through greater efficiency in the use of electricity, as implemented by some Member States to achieve the voluntary objective of 15% gas demand reduction by this winter[12]. The production of electricity accounts for 25% of the total gas used in Europe. In the building sector alone, electricity consumption can be reduced through, for example, the deployment of Technical Building Systems (TBS) in highly insulated homes. Details about the potential gas consumption reduction of a broad range of existing technologies are available in the EU-ASE short to mid term catalogue of energy efficiency measures[13] .



8. E3G calculation for 1236 Mtoe PEC in 2020 (data from EEA) and the conversion rate of 12.36 Mtoe = 13,7333 bcm (based on European Commission figures)
9. Energy Efficiency To Address The Energy & Climate Crisis Short To Mid-Term Measures To Reduce Gas Consumption In Europe, EU-ASE, March 2022
10. Building Europe's Net-Zero Future, Why the Transition to Energy Efficient and Electrified Buildings Strengthens Europe's Economy, EU-ASE and ECF, 2022
11. Energy Efficiency First and Multiple Impacts: integrating two concepts for decision-making in the EU energy system, Enerfirst, 2022
12. European Council, Press release, 5 August 2022
13. Energy Efficiency To Address The Energy & Climate Crisis Short To Mid-Term Measures To Reduce Gas Consumption In Europe, EU-ASE, March 2022

4. Gas Package and Fit for 55

The gas package has to be considered in an ecosystem or it will not deliver much more than marginal improvement. Although it is not a formal part of the Fit for 55 package, it is a pillar of the EU Green Deal. To deliver its full potential, it should identify all the possible synergies with other files of the Fit for 55 package. In particular, it should:

- Require the full application of the Energy Efficiency First principle to be coherent with the EU GHG emission targets set by 2030 and 2050. In this respect, the energy intensity of the energy carrier must dictate its use. This would de facto exclude the use of hydrogen when alternative more efficient solutions exist (such as direct electrification or efficient district heating and cooling).

- Ensure that the application of the Energy Efficiency First principle includes that local authorities develop local heating and cooling (H&C) plans based on the EE1 principle to promote the most efficient heating and cooling options and promote sector integration. It should encourage a district approach to look at the locally available energy sources for H&C, including waste heat potential and the potential for heat demand through energy efficiency programs.

- Link with the revision proposal for the Energy Efficiency Directive (EED), for example, with art 8 and the proposal to exclude energy savings generated by fossil fuel equipments. The gas package fails to acknowledge the latest developments in gas for heating, while several Member States are planning to ban standalone fossil boilers (Netherlands, Germany, Austria, France).

- Link with the proposal of revision for the Energy Performance of Building Directive (EPBD), for instance by setting energy performance requirements for heat generators such as boilers to deliver on the proposed phase-out of fossil fuel in heating and cooling by 2040 at the latest and by ending the placement in the market of inefficient, stand-alone fossil fuel boilers already by 2030.

- Link with the EPBD and EED to save gas used for electricity generation through energy efficiency measures such as upgrading TBS and through better insulation in buildings.

- Link with the Renewable Energy Directive. For example, with the sub-targets on renewable heating & cooling.

5. Infrastructure and governance: prioritize climate

Energy efficiency is a priority, and fossil gas consumption must be drastically reduced. Research shows that the expansion of natural gas infrastructure puts energy transitions at risk. REPowerEU Plan foresees that, by 2030, gas use in buildings decreases by 27 Mtoe (equivalent to approximately 32 bcm of gas) and is replaced by electrification mainly, and biomethane as far as possible,[14] transported in the existing gas network. The gas package needs to take this new reality into consideration and focus on decreasing gas use across sectors and in particular in buildings to protect consumers against the insecurity of energy supply.

- Improvements in the infrastructure and governance parts of the package will help avoid stranded assets and overbuilding of renewable and low-carbon gas infrastructure, which would make the transition more costly for consumers. To do that, the gas package should aim to:

- Develop integrated network planning aligned with NECPs: this would ensure coordination and planning with policies on decarbonisation of heating & cooling and synergies with the EPBD and the EED

- Ensure that the hydrogen network is developed coherently with the Energy Efficiency First principle and the EED and that is produced where it is needed.

- Create local heat planning for DSOs (Distribution System Operators).

- Avoid the risk of overestimating zero-emission gas, which would lead to hydrogen infrastructure overbuilding, through an adequate, independent and transparent, institutional set-up for ENNOH (European Network of Network Operators for Hydrogen).

- Ensure that the governance of future gas infrastructure relies on robust decarbonisation assumptions, clearly prioritising energy efficiency and electrification-based solutions and leaving renewable gases for hard to electrify sectors only.

- Ease and organise the decommissioning of existing grids due to the expected reduced demand.

- Link ENNOH's and ENTSO-G's, and ENTSO-E's grid development plans to climate targets and to gas reduction pathways.

14. ifeu (n 2)

6. Conclusion: go beyond 1-1 fuel switch and think energy efficient

Based on the Energy Efficiency First principle, the reduction of energy demand and the optimisation of energy consumption via efficiency measures and the promotion of electrification remains the safest and most effective way forward to address the climate and energy crisis. There is evidence that energy efficiency technologies can be deployed swiftly to achieve large-scale energy savings in a cost-effective way while bringing multiple socio-economic benefits for citizens and businesses.

We need to act urgently. However, urgency does not mean rushing. Hasty decisions and quick fixes have long-term consequences and risk jeopardising the EU objective of climate neutrality by 2050.

Policymakers should not engage in a 1-1 fuel switch to substitute gas with renewable and low-carbon gases as this choice comes with high uncertainties in terms of production capacities, increased costs for consumers and taxpayers, sustainability, land-use conflicts, and climate impact.

The European Alliance to Save Energy (EU-ASE) aims to advance the energy efficiency agenda in Europe. The Alliance allows some of the world's leading multinational companies to join environmental campaigners and a cross-party group of Members of the European Parliament.

EU-ASE business members have operations across the 27 Member States of the European Union, employ over 340.000 people in Europe and have an aggregated annual turnover of €115 billion.

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