EU GAS INFRASTRUCTURE DOES NOT NEED MORE SUBSIDIES

Existing fossil gas supply infrastructure can satisfy EU demand under any scenario, including under a rapid coal phase out. Making this infrastructure eligible for EU funds would be an ineffective use of taxpayer money and run counter to agreed and proposed climate targets. Additional EU funding would only add to stranded assets. This is particularly pertinent to funds explicitly intended to support a transition to climate neutrality, such as the Just Transition, Regional Development and Recovery funds. Limited public money should be directed to best in class solutions for the climate neutral transition, including renewables and energy efficiency.

OCTOBER 2020

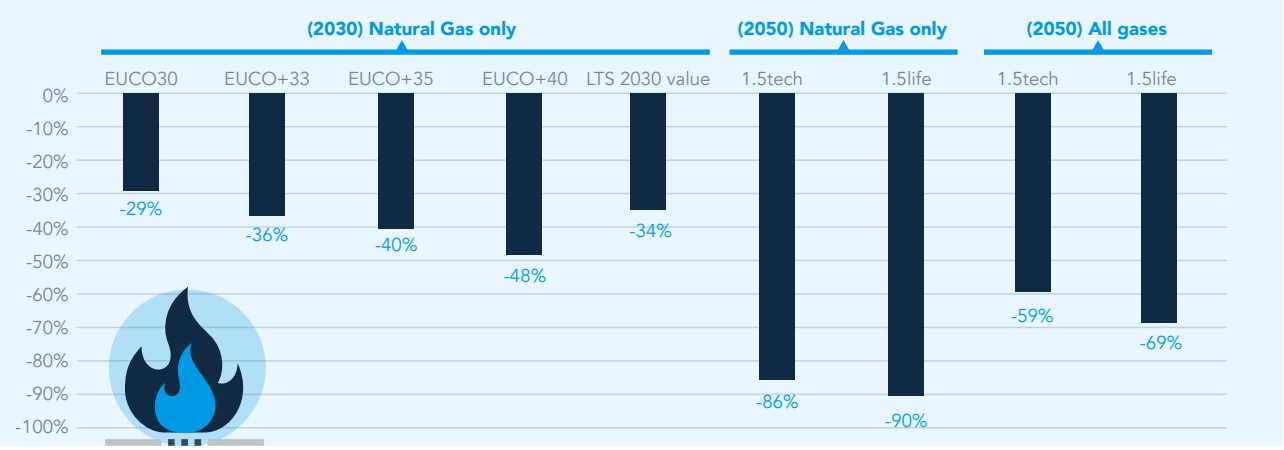
1 Existing fossil gas infrastructure is sufficient

Fossil gas demand is decreasing in Europe: subsidies are not needed to expand it. All credible scenarios, including European Commission projections on Paris Agreement compliant pathways to climate neutrality, show fossil gas demand decreasing from now until 2030 and beyond (figure 1) as the direct use of (renewable) electricity becomes an increasingly important part of the energy mix, alongside efficiency improvements.

Future gas demand is consistently overestimated[1]

For the years 2015 to 2019, the association of transmission system operators for gas, ENTSO-G, consistently overestimated gas demand by 6-17% when compared to actual gas demand[2].

Figure 1: Change in gas consumption compared to 2019

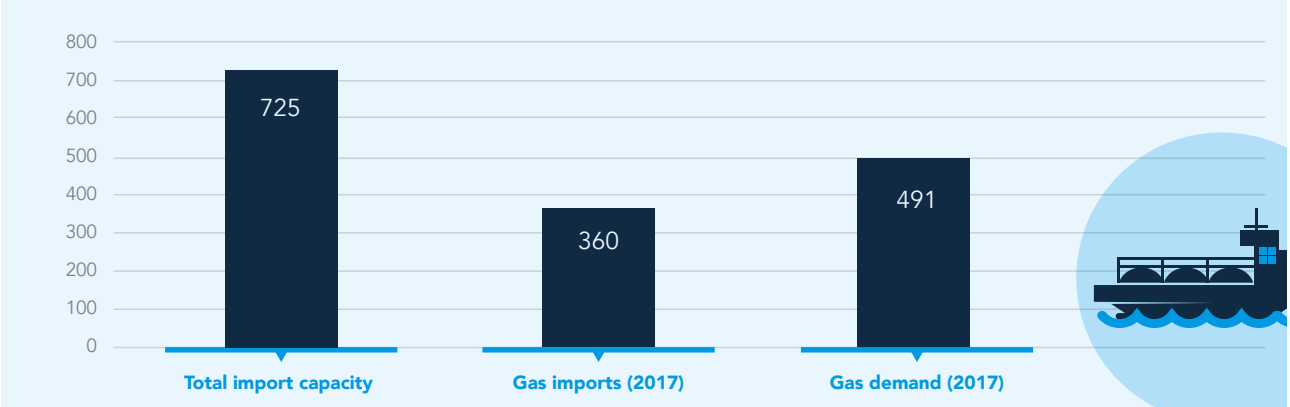


Source: E3G

Current gas capacity is sufficient to meet Europe's needs

- **No incremental capacity fossil gas transmission projects have been economically viable since 2017**, as all such projects have been rejected by the market , "indicating low market interest in new gas transmission capacity" according to the EU Agency for the Cooperation of Energy Regulators (ACER).
- **EU gas pipeline and LNG infrastructure is fully resilient to supply shocks**. A 2020 report by consultants Artelys found that already existing gas supply infrastructure in 2030 is resilient to a wide range of potential extreme supply disruptions, including year-long disruptions of Russian supply via Ukraine and Belarus and Algerian supply[4].
- **The EU is already oversupplied with gas import capacity** (see figure 2). EU gas-fired power capacity has room to respond to short-term increases in demand. EU gas-fired power plants have low 'load factor' when compared globally (34.9%, compared to 51.1% in Japan and 40.0% globally in 2018).
- **An expansion of an additional 22% of generating capacity is already in development**. While in individual cases this does not exclude the possibility of a capacity constraint if other plants go offline, these figures illustrate that this will be the exception, not the rule. With foresight, alternatives such as interconnection, renewables, demand side response and demand reduction could be built out to supply the needed energy security.

Figure 2: 2017 fossil gas imports versus demand (bcm)



Source: Based on: King and Spalding, LNG in Europe 2018: An Overview of Import Terminals in Europe; and McKinsey 2018

2 Fossil gas investments are not job-intensive and not consistent with a just transition

A common argument for bridging the climate neutral transitions with fossil gas is that it is cheaper and can help avoid negative impacts for communities at risk of energy poverty, especially in heating.

Investing in new fossil gas could instead become a liability for consumers if it prevents a faster switch to cleaner and cheaper alternatives and thus lead to higher energy transition costs. If built now, new fossil gas pipelines and boilers would need to be replaced long before the end of their operational lifetimes and it is communities and taxpayers who will be left to foot the bill of this. This problem is intensified by the fact that in many EU countries, gas consumers are forced to directly pay for the costs of maintaining and expanding the gas grid.

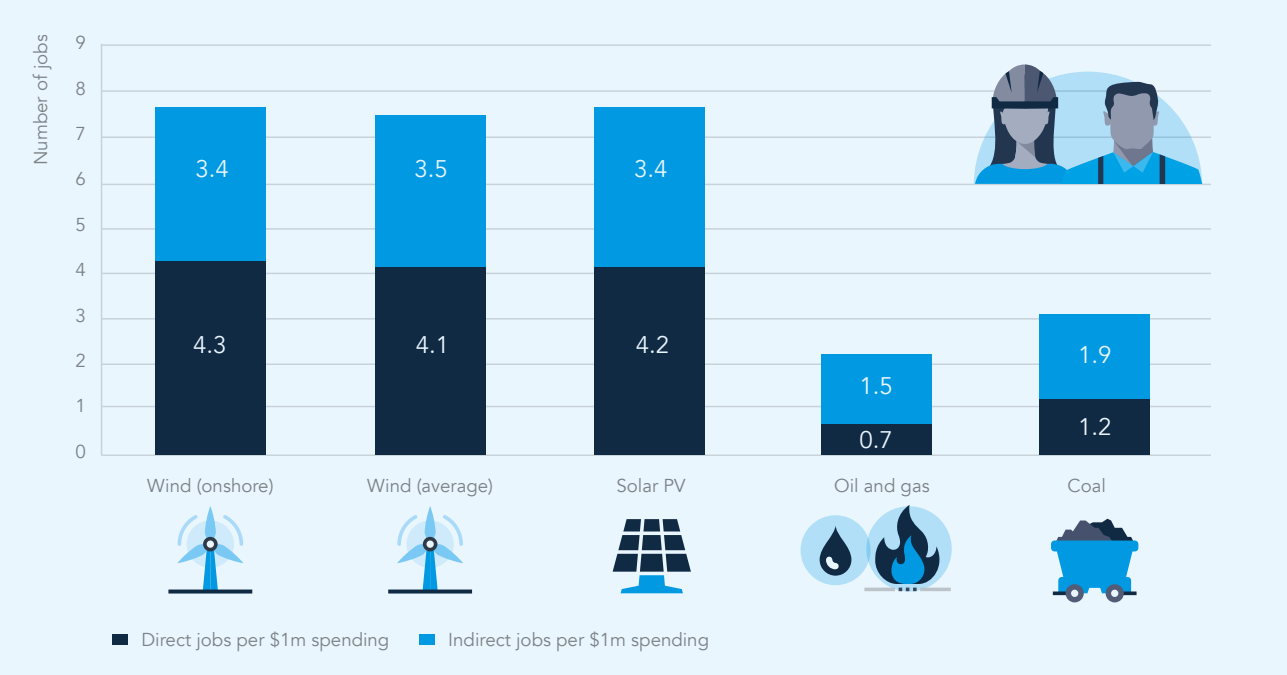
EU gas consumption also maintains energy dependency to gas exporters like Russia, creating geo-political risks that do not exist with European renewable power.

Investing in fossil gas does not generate high numbers of jobs, nor are jobs created often local

Examining net jobs creation across the European economy in all zero-emissions scenarios, the ECF Fossil Free Energy report shows that in pathways with a high-level of renewables, electrification and deep building efficiency renovation, up to 1.8 million additional jobs can be created. This compares to just 1.3 million in a net zero pathway dominated by green gases and Hydrogen[6].

As illustrated in a recent study of UK export finance by Vivid Economics, investments in renewables generally create more jobs than the oil and gas industries because of higher labour requirements[7]. The IEA has also recognised that unabated gas power generates around 3.5 construction and manufacturing jobs permillion euros invested, with high CO_2 abatement costs (€62/tonne CO_2), while new solar PV generates 8.5 to 12 and energy effficieny 10 – 15[8].

Figure 3: Job multipliers (FTE per US$1m spending) of investments in energy projects



Source: Vivid Economics based on Garrett-Peltier (2017)

3 Renewable energy is cheaper or on par with fossil gas now

A large volume of new fossil gas projects risks being be stranded by 2030 because of falling costs from renewables and electricity storage, as well as tightening climate policies. The energy analysts and rating agency S&P writes "Regulated gas utilities in Western Europe face weaker growth prospects and a higher risk of stranded assets beyond 2030 compared to electricity[9]."

- Renewables such as wind and solar PV are already the cheapest source of new electricity generation in many countries, according to data from Bloomberg New Energy Finance[10].
- For storage, battery power is advancing at pace and is fast becoming one of the cheapest resources for short term peaking. Already today, new-build batteries can be competitive on cost with gas peaker plants[11].

Fossil gas will be more expensive than renewable energy in the future. Investing now in new fossil gas infrastructure will make it harder to switch to the increasingly cost-effective alternatives of clean energy solutions and thus increase future energy system costs, and ultimately, consumer bills

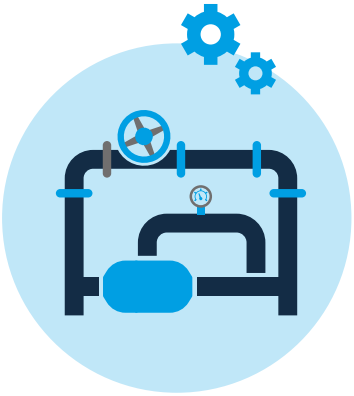
- New gas infrastructures have longer lifetimes than the EU can afford. Most new fossil gas infrastructure risks becoming stranded within 25% of its lifetime The average lifetime of a gas infrastructure project is:
    - 30 years for new gas-powered generators.
    - Up to 80 years for large pipelines and LNG projects[12].

4 Fossil gas infrastructure for renewable uses will be limited and retrofitting is likely to be expensive

Renewable gases will play an important, but limited, role in the achievement of the European Green Deal's objectives. There is however no realistic scenario in which they simply replace today's natural gas use. Renewable hydrogen will be limited and to deliver it at speed and to the scale for those sectors that cannot work without it (some parts of industry and transport), we need to focus our efforts on these. Investing now in fossil-based hydrogen requires additional carbon capture infrastructure and may not pay off by the time it becomes cheaper to switch to green hydrogen (which, according to some studies, could already be in the 2030s).

A hydrogen-based economy does not mean simply retrofitting fossil gas infrastructure

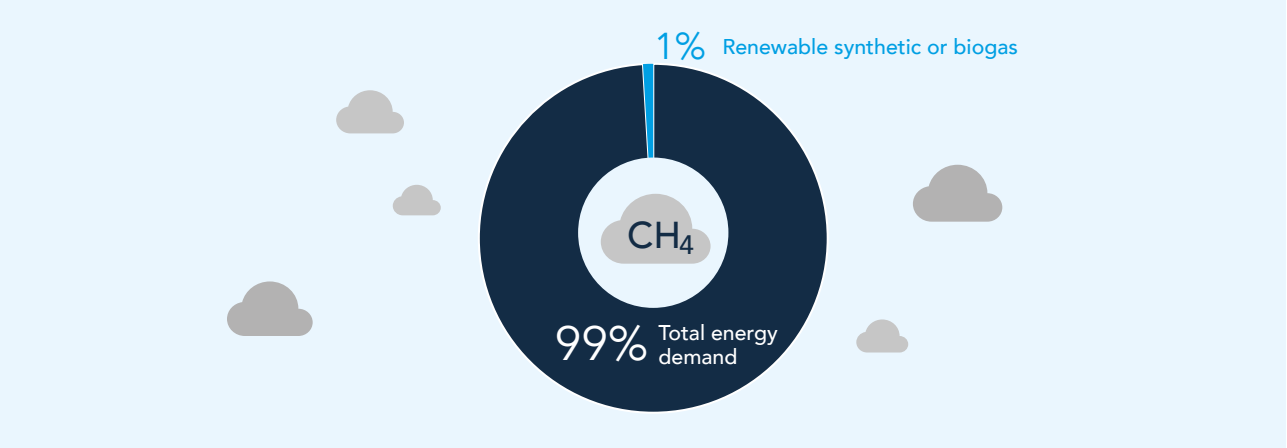
- **Today's gas infrastructure is not ready for transporting hydrogen at scale.** The IEA estimates that current maximum capacities for blending hydrogen into the existing grid are at a hydrogen share of around 10%[13].The logistics of a switch over are complex and require retrofitting and coordination across all parts of the supply chain including end users.
- **Hydrogen will likely be used in regional clusters with few transregional pipes.** Production, distribution and consumption sites will be different from current LNG terminals and gas transmission and extraction activities today, so infrastructure for fossil gas will likely be in the wrong place for new renewable gas sources. LNG infrastructure is not suitable for hydrogen use, as the liquefaction of hydrogen requires much lower temperatures, and thus requires significant investments[14].
- **Producing hydrogen from natural gas using CCS ("blue hydrogen") is not a sustainable option.** As the European Academies' Science Advisory Council points out, there are still significant residual emissions generated from these processes, with emissions of 30-120 gCO_2/kWh, in addition to the methane emissions during production and transportation of fossil gas[15].



Domestic sustainable gas production will not meet current gas demand

- According to a Europe-wide energy scenario constructed by a consortium of NGOs and industry to project energy supply and demand in a transition aligned with the Pairs Agreement's objective of limiting global heating to 1.5°C[16], only 6.9% of final energy demand in 2030 and 20% by 2050 will come from renewable gases (biogas and renewable hydrogen). All this renewable (or "green") hydrogen will be needed in transport and industry, not in residential heating or power generation.
- Figure 4 shows that sustainable and synthetic methane available to blend in future fossil gas infrastructure will be extremely limited or non-existent. Only 1% of final energy demand in 2030 and less than 2.4% in 2050 will be met by sustainable biomethane and synthetic methane.

Figure 4: Sustainable and synthetic methane use potential as a percentage of total energy demand in 2030



Source: CAN Europe and EEB, Building a Paris Agreement Compatible (PAC) energy scenario, scenario datasets Version 1.0, 2020

Hydrogen based on renewable electricity will be valuable and limited

Whilst very much needed for hard to abate sectors, hydrogen based on renewables will be a limited resource that must be prioritised. For low grade heating or power generation, direct electrification is much more efficient.

- **The EU hydrogen strategy sets the target of producing 10 megatonnes of green hydrogen by 2030,** which is just 11% of the global consumption of hydrogen today[17]. This shows that hydrogen will always remain a limited resource, and that decarbonizing the present consumption of hydrogen is already a challenge.
- **Prices for hydrogen could double if widely used in residential heating and transport,** rather than targeted at hard to abate sectors, negatively affecting industry competitiveness in a low carbon world[18].

5 Gas is not the best solution for heating – renewable energy and direct electrification will be more cost effective and efficient

Gas plays an important role in providing heat in Europe today, but this will fundamentally change during the green transition. Investing in renewable heating solutions now will avoid further transition needs later on – and recognises the increasing competitiveness and greater efficiency of many sustainable solutions, such as electric heat pumps.

Heat pumps are at least 3 times as efficient as the best gas boilers

- **Heat pumps can leverage ambient air heat energy and so can exceed 100% efficiency,** producing more heat energy than the electricity units put in. They are typically around 300% efficient, while the best condensing gas boilers attain 90-96% efficiency[19].
- **Hydrogen and green gas is inefficient versus direct electrification:** heat pumps generate 4-6 times more heat than burning hydrogen per unit of electricity used and entail lower transmission losses[20]. Using blue hydrogen instead of natural gas requires 45% more input gas[21].

For district heating, the priority should be to combine energy efficiency of buildings, modernisation of heating systems and their shift to sustainable renewable sources of energy. In particular, heat pumps in heating networks can complement other solutions, such as innovative use of former deep mine water[22].

It is however important that policies and public investments are used so that all EU citizens have access to these more efficient solutions which ultimately will cut their energy bills, especially those who are energy poor.

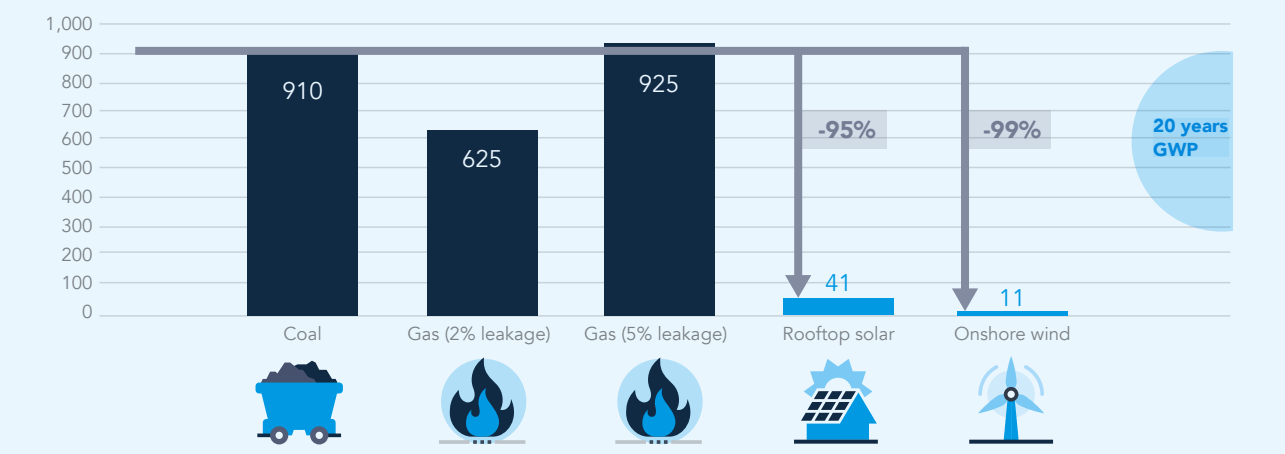
6 Fossil gas is not climate friendly

Fossil gas is already responsible for more emissions in Europe than coal[23]. There is no space for tapping into additional fossil fuel reserves, including natural gas, if Europe respects the objectives of the Paris Agreement.

Power generation with fossil gas is already higher emission intensity than the EU average

- EU average hourly emission intensity of power and heat generation was between 199 and 282g CO_2/kWh in 2018[24]. New fossil gas plants produce around 300 g CO_2/kWh[25].
- Combined Heat and Power gas plants can go down to 230 g CO_2/kWh, but this is still far above the level at which it can make a "substantial" contribution to climate mitigation objectives[26].

Figure 5: Lifecycle greenhouse gas emissions as $KgCO_2$ equivalent/MWh

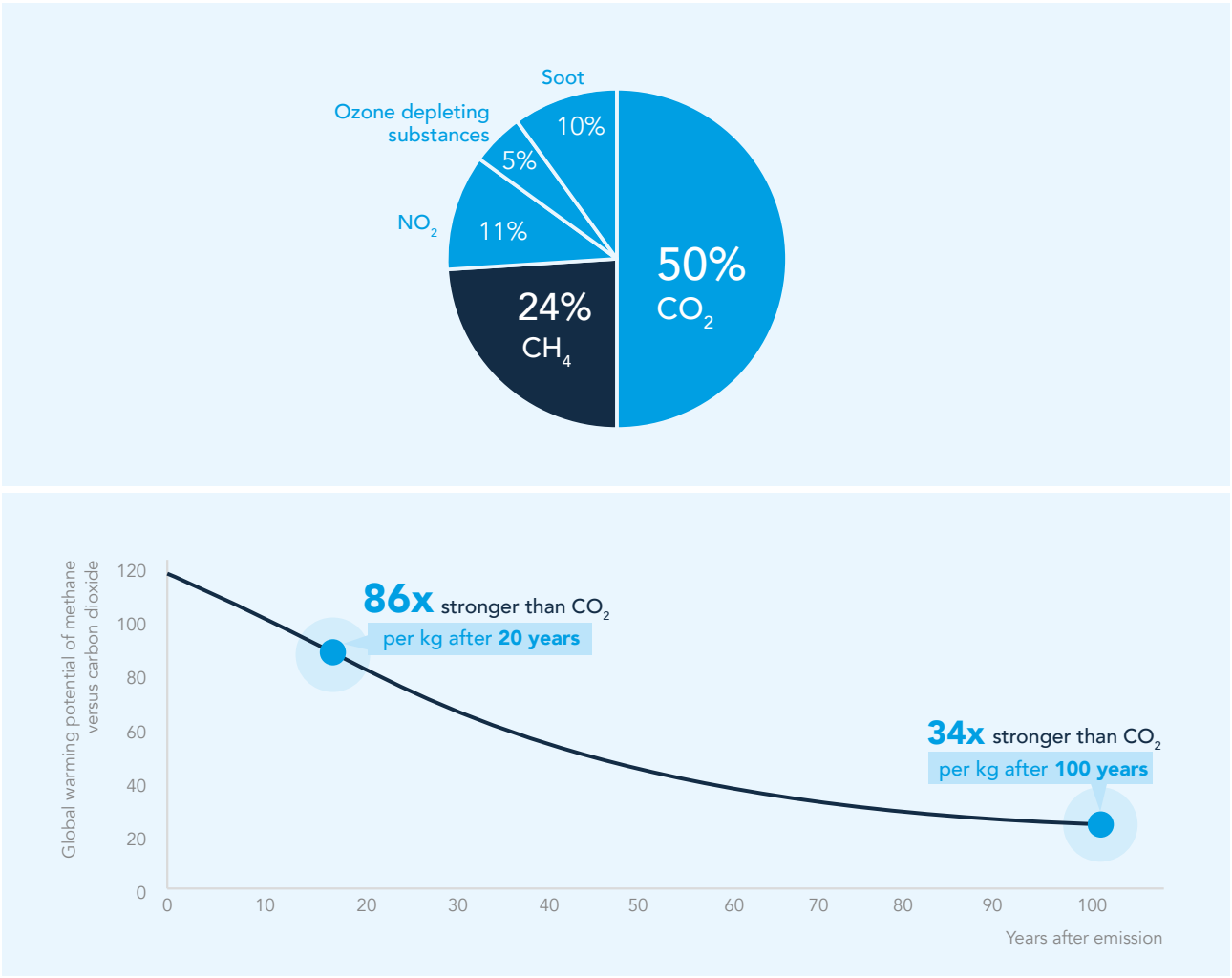


Source: CEE Bankwatch Network, 2019 based on EBRD 2018 and IPCC 2014

Methane, which leaks during the production, transport and use of natural gas, has a much higher warming potential than carbon, estimates ranging from 28-80 times that of carbon dioxide over 20 years[27]. Methane is responsible for nearly 25% of global heating observed today

- Recent ESA satellite data shows that fossil fuel activities, including gas production and distribution, are responsible for 50% of the world's major methane leaks[28].
- Above a leakage rate of only 3% along the supply chain[29], the climate impact of fossil gas is worse than that of coal in power generation. LNG carries similar risks for climate[30] (see figure 6[31]).

Figure 6: Proportion of methane (CH_4) on global warming (top) and climate effect after 20 and 100 years (bottom)



Source: Environmental Defence Fund based on IPCC AR5 (2013)

This open briefing was developed with inputs from policy experts at CAN Europe, CEE Bankwatch, E3G and WWF European Policy Office.

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