Expert Commentary

Electrification to 35% by 2035: Implications of the COP31 Goal for Natural Gas Demand

Mohammad Amin Naderian

Masoumeh Moradzadeh

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Executive Summary

The COP31 Presidency has proposed that electricity should account for 35% of world final energy consumption by 2035, up from about 24% today. The proposal is often presented as a step that will steadily reduce the use of fossil fuels. This commentary argues that, for natural gas, the opposite is true over the period the target covers: meeting 35-by-35 would increase world gas demand, and the target is unlikely to be achieved unless this is recognised in its design. The analysis is based on a normative scenario built with the GECF Global Gas Model (HE2026), which imposes the 35% share in 2035 and asks what reaching it would require, compared with the GECF Reference Case Scenario (RCS), in which the share reaches 29.4%.

The target works on gas in two opposite directions. Electrifying heating, industry and transport removes about 220 bcm of gas from final consumption in 2035, mainly through some 675 GW of additional heat pumps in buildings. But the additional electricity has to be generated. Even if wind and solar supply nearly two-thirds of the increase, with close to 200 GW of extra capacity added every year and no new coal, power plants would need about 282 bcm more gas. The second effect is larger than the first. On balance, **world gas demand is about 7 bcm higher in 2030 and 73 bcm (+1.5%) higher in 2035** than in the Reference Case, and this is a conservative estimate. The International Energy Agency's own analysis of a 35% pathway points in the same direction.

Three further findings follow. First, the outcome is decided on the supply side: gas demand would stay unchanged only if wind and solar met about 69% of the additional electricity, sustained over a decade of unprecedented growth, and any shortfall pushes gas demand up. Second, gas protects the climate benefit of electrification. CO_2 emissions fall by about 2.1 Gt in 2035, roughly fourteen times the emissions of the additional gas, whereas meeting the new demand with coal, as the model did when coal was not restricted, would have cancelled most of that benefit. Third, the additional gas demand is concentrated in Asia Pacific, Latin America and Africa, where electricity demand is growing fastest; Europe is the only region where gas demand falls.

The pathway also moves risk into the electricity system. Grid investment must rise sharply, household electricity prices have already outpaced incomes in many countries, and security of supply would depend increasingly on concentrated supply chains for minerals and equipment and on the cyber resilience of the grid. The conclusion for COP31 is not to weaken the target but to complete it, by planning the supply of electricity as carefully as its use.

1. Introduction

The case for electrification is strong, and this commentary does not dispute it. Electric technologies are more efficient than the fuel-based technologies they replace: a heat pump delivers several units of heat for each unit of electricity, and an electric motor converts most of its energy into motion. Electrification also moves emissions away from millions of boilers, furnaces and engines towards a smaller number of power plants that can be decarbonised. Ember estimates that about three-quarters of final energy demand could ultimately be electrified economically, compared with about one-fifth today (Ember, 2026). The COP31 proposal builds on this logic with a measurable global goal, a tracking mechanism, an implementation forum and a buildings compact.

The target is nevertheless far ahead of current trends. In the GECF Reference Case, the share of electricity reaches 29.4% in 2035. The IEA estimates around 30% under today's policies and about 33% if all cost-effective options were taken up, and finds that reaching 35% would require electricity demand to grow by about 1,400 TWh a year, nearly twice the pace of the past decade (IEA, 2026a). Other outlooks are more cautious still: DNV does not see electricity reaching a third of final energy until 2045, and McKinsey's baseline reaches 32% only in 2050 (DNV, 2026; McKinsey & Company,

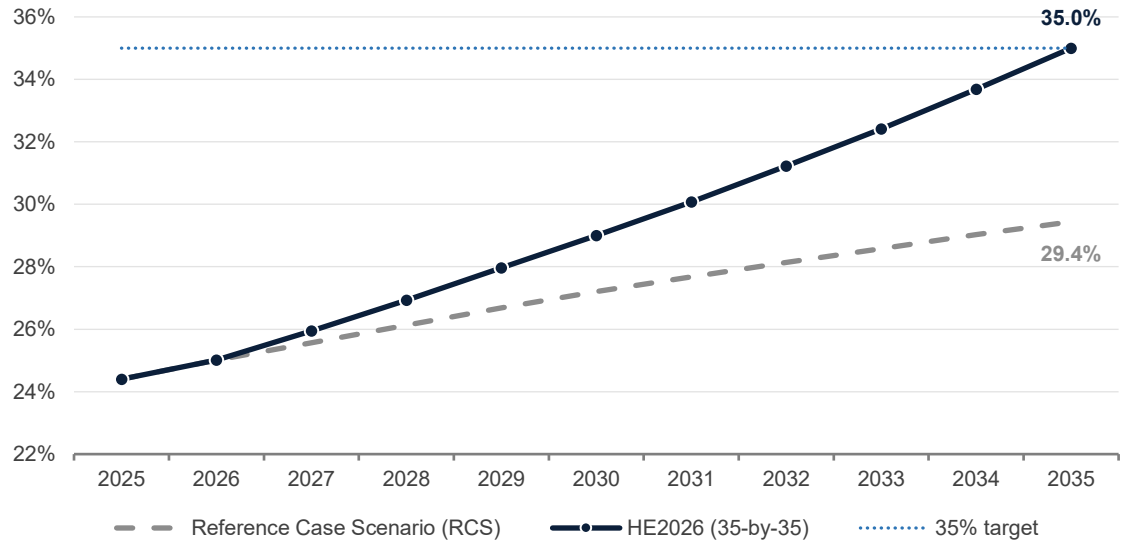
2026a). Meeting the target therefore means roughly doubling the pace of electrification and sustaining it for a decade.

The difficulty lies less in the goal than in what it measures. 35-by-35 counts how much final energy is delivered as electricity; it says nothing about how that electricity is produced. Yet every unit of electricity that replaces a boiler or an engine must first be generated and delivered, and the fuel used to generate it decides what the target means for emissions, costs and security. A target that looks only at the consumer's side of the meter risks a predictable outcome: demand grows faster than clean supply can follow, and the gap is filled by whatever dispatchable capacity is available. Over the period to 2035, if that capacity is not gas, it will be coal.

2. Approach

HE2026 is a normative scenario. Rather than projecting what is likely to happen, it fixes the outcome, a 35% electricity share in 2035, and works out what would be needed to reach it. Electrification was accelerated in buildings, industry and transport, with residential heat pumps doubled relative to the model run and road transport electrified to the extent needed to reach the target. On the supply side, the assumptions deliberately favour renewables: wind and solar meet 63% of the additional electricity, in line with recent experience; nuclear grows only through upgrades of existing plants; batteries expand with solar; no new coal is allowed; and gas-fired plants supply the rest. These assumptions bias the result against gas. Figure 1 shows the resulting path, in which the share of electricity rises by about 1.1 percentage points a year, twice the pace of the Reference Case.

Figure 1: Share of electricity in world final energy consumption, 2025–2035 (%)



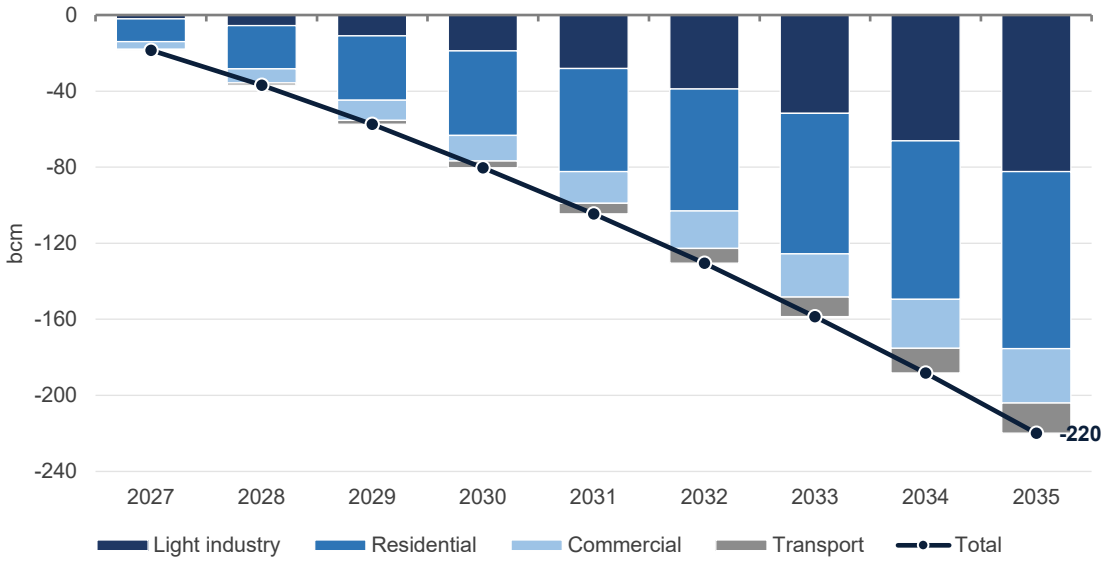
Source: GECF Secretariat analysis, GGM HE2026 and Reference Case Scenario (RCS) (2026); COP31 Presidency (2026).

3. What meeting the target implies for gas

3.1 Electrifying end uses removes 220 bcm of gas

Reaching 35% requires about 4,600 TWh more electricity to be consumed in 2035 than in the Reference Case. Because electric technologies are more efficient, total final energy consumption falls by about 5%. The gas no longer burned in homes, businesses, factories and vehicles rises from about 80 bcm in 2030 to **about 220 bcm in 2035** (Figure 2): 93 bcm in homes, 82 bcm in light industry, 29 bcm in commercial buildings and 16 bcm in transport.

Figure 2: Change in gas final consumption relative to the Reference Case, by sector (bcm)



Source: GECF Secretariat analysis, GGM HE2026 relative to the Reference Case Scenario (RCS) (2026).

The savings differ greatly between sectors. In homes and in transport, each unit of electricity replaces more than three units of fuel; in industry, little more than one. And saving energy is not the same as saving gas. Transport sees the largest jump in electrification, with electricity's share rising from under 5% to about 12%, but the fuel it replaces is almost entirely oil. Heat pumps are the clearest case of gas savings: where they replace gas boilers, gas demand falls even if all the extra electricity comes from gas-fired plants. It is the broader growth in electricity use, beyond heating, that tips the balance. On average, each additional unit of electricity removes about half a unit of gas from final consumption.

Even this level of substitution is demanding. It requires about 675 GW of additional heat-pump capacity in buildings, roughly 70–155 million additional units, or 8–17 million a year more than in the Reference Case. The market is not moving at that pace: global heat-pump sales have been broadly flat since 2023, and heat pumps still meet less than 15% of heating needs in buildings (IEA, 2026d). High upfront costs, the price of electricity relative to gas, the need to retrofit buildings and a shortage of installers all stand in the way, and they weigh most on lower-income households.

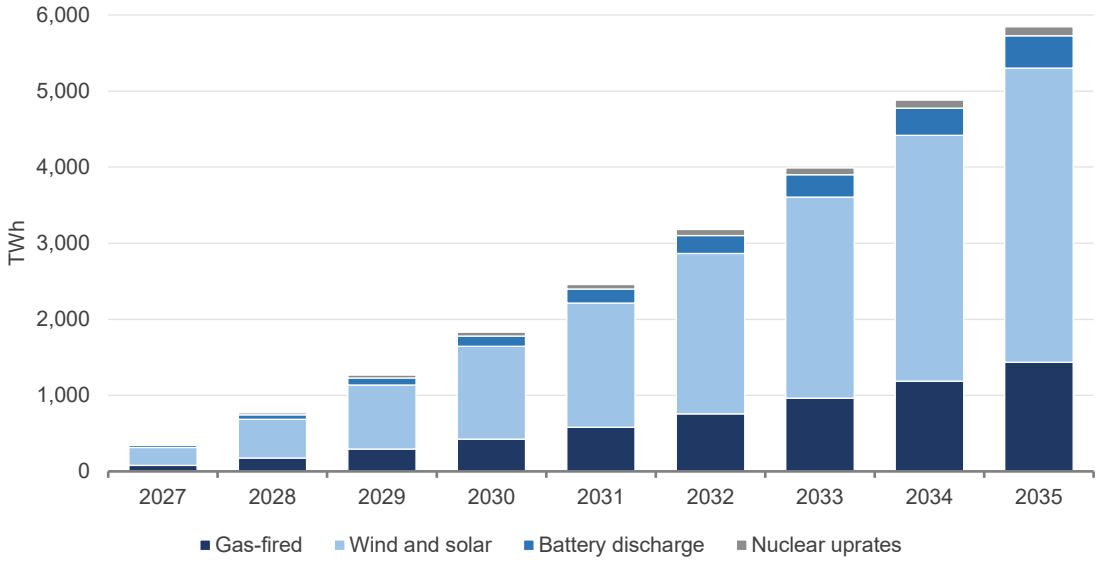
3.2 Generating the extra electricity requires 282 bcm more gas

The extra electricity has to be generated, and more has to be generated than is finally consumed, because of losses in the grid, consumption at power plants and storage. In 2035 the target requires about **5,900 TWh of additional generation** (Figure 3). Wind and solar provide about 3,870 TWh, which means about 1,770 GW of new capacity, or close to 200 GW a year on top of a Reference Case that already assumes record growth. Batteries and nuclear upgrades add a further 540 TWh. Gas-fired plants supply the remaining **1,435 TWh, about a quarter of the increase**, which requires **282 bcm** of gas, equivalent to about 300 GW of combined-cycle plants running more than half the time.

This is the arithmetic that much of the debate overlooks. Each additional unit of electricity consumed saves about 0.50 units of gas at the point of use but burns about 0.64 units at the power plant. Total energy use falls, yet gas demand rises, because the efficiency gain happens in the home, the factory or the vehicle, while the extra fuel is needed in the power sector. Other outlooks reflect the same logic: OPEC expects gas use in power to keep rising with electricity demand and

the need for flexible capacity, and the Oxford Institute for Energy Studies attributes more than half of global gas demand growth to 2035 to power generation (OPEC, 2026; OIES, 2025a).

Figure 3: Change in electricity generation relative to the Reference Case, by source (TWh)



Source: GECF Secretariat analysis, GGM HE2026 relative to the Reference Case Scenario (RCS) (2026).

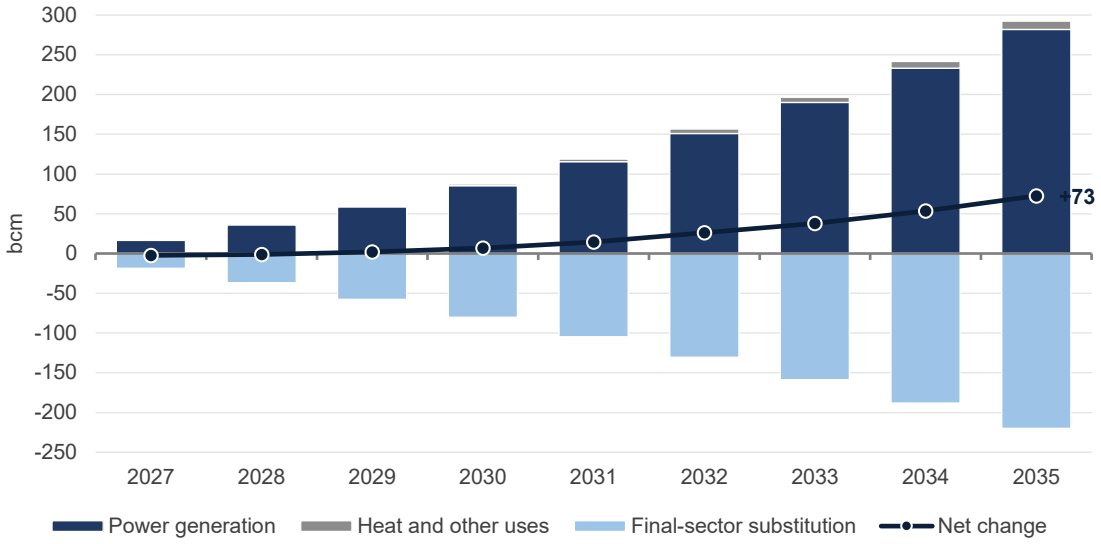
The result is not a contest between gas and renewables. Both grow together. Total generation in 2035 is about 14% higher than in the Reference Case; the share of wind and solar rises from about 34% to 38%, gas rises slightly, from 20.6% to 21.1%, and coal, held at its Reference Case level, falls from 22% to 19%. Gas acts as the flexible partner of a faster-growing renewable system.

3.3 The net effect: more gas, and a gap that widens

Putting the two effects together (Figure 4), gas savings in final consumption slightly outweigh the extra gas for power in 2027–2028. From 2029 the power sector dominates, and the difference grows to **+7 bcm (+0.2%) in 2030 and +73 bcm (+1.5%) in 2035**. Put simply, each percentage point of electrification removes about 40 bcm of gas from final consumption but adds about 51 bcm in power plants, a net increase of about 13 bcm. The more ambitious the target, the larger the gas requirement.

The gap widens because the easiest and most gas-intensive substitutions, replacing gas boilers with heat pumps, come first. Later gains come from transport and industry, where less gas is displaced, while the need for new generation keeps growing. The finding is supported by independent evidence. The IEA's analysis of its own 35% pathway shows gas use in power rising by about 300 bcm by 2035 with the power mix of its Stated Policies Scenario and by about 430 bcm with that of its Current Policies Scenario; gas use in power falls only if the world builds more than 1,200 GW of solar and 400 GW of wind every year (IEA, 2026a). Seen against that range, the 282 bcm in HE2026 is a moderate estimate. In mature markets with flat electricity demand, such as Europe, lower gas use in buildings can outweigh the extra gas for power; the increase arises in the growing power systems of emerging economies.

Figure 4: Change in gas demand relative to the Reference Case, by component (bcm)

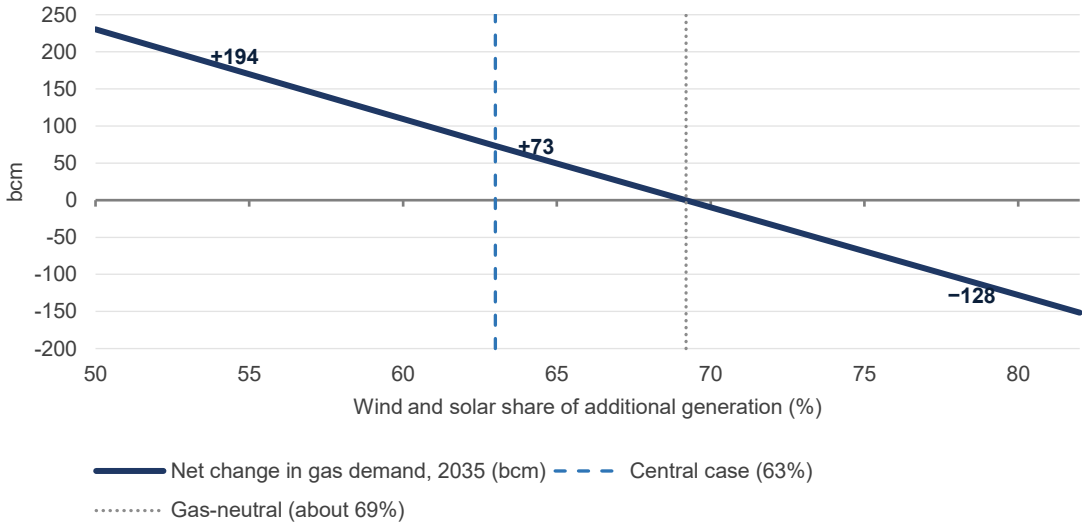


Source: GECF Secretariat analysis, GGM HE2026 relative to the Reference Case Scenario (RCS) (2026). Other uses include heat plants and the energy sector's own use.

4. The outcome is decided on the supply side

An obvious objection is that the result simply reflects a cautious view of renewables, and that building more wind and solar would reduce gas demand. Figure 5 tests this directly by showing how the net change in gas demand in 2035 varies with the share of the additional electricity supplied by wind and solar. For the target merely to leave gas demand unchanged, that share would need to reach about 69%. Renewables have covered the growth in electricity demand in individual years, most recently in 2025, when they met virtually all of an 855 TWh increase (Energy Institute, 2026). But the target requires growth of around 1,400 TWh every year for a decade, almost twice that volume. At an 80% share, gas demand would fall by about 128 bcm; at 53%, it would rise by about 194 bcm.

Figure 5: Change in gas demand in 2035 relative to the Reference Case, by share of wind and solar in additional generation (bcm)



Source: GECF Secretariat analysis, GGM HE2026 sensitivity cases (53%, 63% and 80%) relative to the Reference Case Scenario (RCS) (2026).

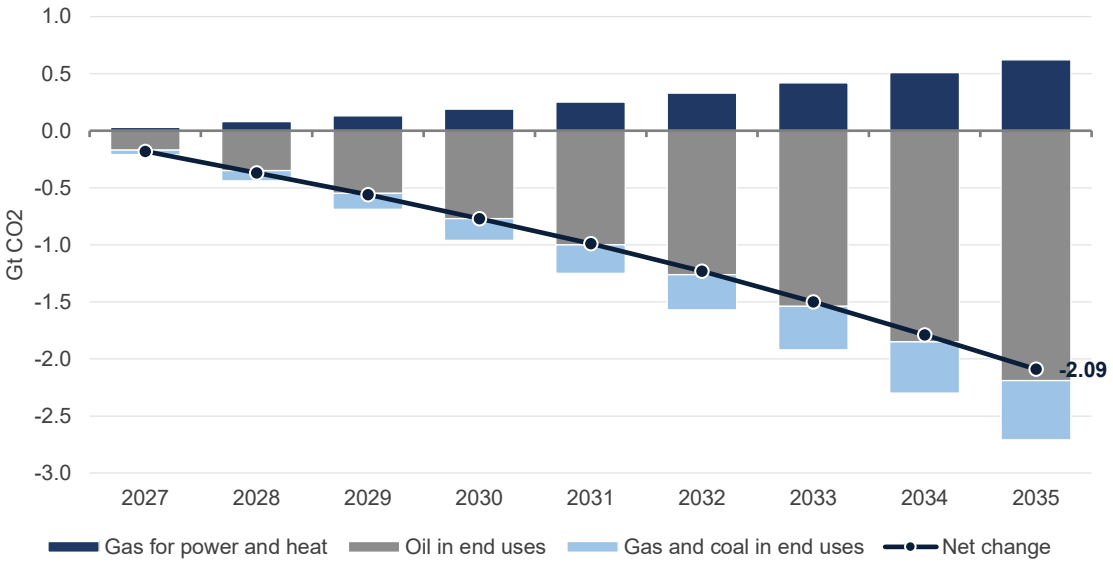
What limits the pace is not the cost of panels and turbines but the system around them. New grid lines take 5–15 years to build, compared with 1–5 years for renewable projects; more than 2,500 GW of projects are already waiting to be connected; and the price of grid equipment has nearly doubled in five years (IEA, 2026b). McKinsey finds that grid expansion lags new generation by three to five years in most major markets (McKinsey & Company, 2026a). With 2035 only nine years away, the grids needed to carry the target's electricity must largely be committed before 2030. The risk is one-sided: every shortfall in clean supply raises gas demand, so the 73 bcm estimate is closer to a floor than a ceiling.

5. Gas safeguards the climate benefit of electrification

A second objection is that more gas undermines the climate case for the target. The evidence points the other way. Meeting the target reduces CO_2 emissions by about 0.8 Gt in 2030 and **2.1 Gt in 2035** compared with the Reference Case (Figure 6). Almost all of the reduction comes from oil: electric vehicles and other electrified uses cut oil demand by about 13 mb/d, avoiding 2.2 Gt. In emissions terms, 35-by-35 is above all a policy that displaces oil. Gas and coal saved in final uses avoid a further 0.5 Gt, while the extra gas burned in power plants adds about 0.6 Gt. The net contribution of gas is about +0.15 Gt, roughly one-fourteenth of the total reduction.

The real comparison is with coal. When the model was free to meet the additional demand at least cost, it turned to coal and added about 1,900 TWh of coal-fired generation, which would emit roughly 1.8 Gt of CO_2 a year and cancel most of the benefit of electrification. HE2026 rules this out by assumption, but power systems will not do so on their own: carbon pricing covers only 29% of global emissions, at an average of about USD 21 per tonne (World Bank, 2026), and much of the world's coal fleet is young and located in developing Asia. The events of 2026 confirmed the point. When the disruption of LNG flows through the Strait of Hormuz pushed gas prices up, several importing countries burned more coal to make up for lost gas (McKinsey & Company, 2026b). The choice for the dispatchable share of new demand is therefore not between gas and renewables, which grow together, but between gas and coal. Secure and affordable gas is what keeps the climate benefit of electrification intact.

Figure 6: Change in energy-related CO_2 emissions relative to the Reference Case, by component (Gt)



Source: GECF Secretariat analysis, GGM HE2026 relative to the Reference Case Scenario (RCS) (2026). Methane emissions not included.

The remaining emissions from gas can be dealt with. Capturing about 0.15 Gt of CO_2 a year at gas-fired power plants and industrial sites would neutralise them, a volume comparable to the capture capacity DNV expects to be operating by 2030 (DNV, 2026). Cutting methane leaks, venting and flaring along the gas value chain is among the cheapest climate measures available. Together, these steps allow the gas that electrification needs to be consistent with the Paris Agreement.

6. The additional gas demand arises in emerging economies

The debate on electrification is often shaped by the European experience, where heat pumps replace gas boilers and electricity demand is flat. Between 2021 and 2025, wind and solar rose from 19% to 30% of EU electricity generation while gas-fired generation fell by 15% (Energy Institute, 2026). That experience does not apply elsewhere. In HE2026, Europe is the only region where gas demand falls (−18 bcm, −4.6%), because gas dominates heating and the gas saved in buildings and industry (49 bcm) outweighs the extra gas for power (31 bcm). In Asia Pacific the picture reverses: substitution saves about 74 bcm, but fast-growing power systems need about 120 bcm more, a net increase of 45 bcm. Latin America (+25 bcm, +11.7%) and Africa (+13 bcm, +5.0%) see the largest increases relative to their demand, while in North America the gas saved and the gas added almost cancel out.

Independent outlooks point the same way. The Oxford Institute for Energy Studies expects global gas demand to grow by about 613 bcm between 2024 and 2035, with power accounting for 335 bcm, and sees demand in sub-Saharan Africa more than doubling (OIES, 2025a). OPEC expects gas demand in developing Asia outside China and India to rise by more than a third by 2035, and in Africa and Latin America by around 40% (OPEC, 2026). The small increases shown for the Middle East and Eurasia understate reality. The scenario applies the same renewables share to every region, which gives gas only about a quarter of their additional generation, although gas supplies about two-thirds of electricity in the Middle East today (Energy Institute, 2026) and about 45% in Eurasia. A more realistic allocation would raise the increase to about 35 bcm in the Middle East and 14 bcm in Eurasia, and the world total to about 115 bcm in 2035.

This raises a question of fairness. The economies where the target would raise gas demand most are those with the fastest-growing need for electricity, the highest cost of capital and the least ability to absorb higher power prices. McKinsey observes that in many emerging economies the question is whether the required system can be built at all (McKinsey & Company, 2026a), and Africa has received less than 2% of global renewable energy investment over the past two decades (OIES, 2025b). For these economies, affordable gas is not an obstacle to electrification but what makes it affordable while grids and renewables are built out.

7. The costs and risks of the pathway

A pathway can be technically possible and still fail if it becomes too expensive or too insecure. 35-by-35 moves much of the burden of the energy transition onto the electricity system, and with it the main risks. Cheaper generation does not automatically mean cheaper energy, because grids, storage and back-up capacity must also be paid for, and these costs end up in electricity bills. IRENA estimates that grid investment needs to reach about USD 1 trillion a year on average over 2026–2035 (IRENA, 2026), and McKinsey expects spending on transmission and distribution to rise from USD 443 billion in 2025 to USD 970 billion a year by 2050, describing affordability as a central constraint on the transition (McKinsey & Company, 2026a). Consumers already feel the pressure: household electricity prices have risen faster than incomes in many countries since 2019,

and electricity is often taxed more heavily than gas (IEA, 2026b). If electricity becomes more expensive relative to gas, consumers will not switch, and the target will fail where it is measured.

Security risks shift from fuels to minerals, equipment and software. China produces about 80% of the world's solar modules and 75% of its battery cells, refines about 90% of the rare earths used in magnets and processes more than 70% of its lithium, cobalt and graphite (McKinsey & Company, 2026a). The number of mineral products under Chinese export controls has tripled since 2023 (IEA, 2026c), and building alternative supply chains is costly: McKinsey estimates that it could raise the cost of solar by 20–25% and of battery storage by 40–50% in Europe and the United States. Cyberattacks on energy systems more than tripled between 2020 and 2024 (IEA, 2026e), and every smart meter, inverter, vehicle charger and connected heat pump adds to the points of attack in a system on which more of the economy depends.

Gas helps on both fronts. Gas-fired plants back up variable renewables and stabilise the grid without adding to mineral dependence, and existing gas infrastructure keeps the cost of reliability down while the system is rebuilt. McKinsey notes that a coordinated cyberattack would sharply raise the value of dispatchable back-up (McKinsey & Company, 2026a). The 2026 crisis also showed that gas security depends on diverse and resilient supply, which strengthens the case for continued investment across the gas value chain.

8. Policy considerations for COP31

The evidence does not argue for a weaker target; it argues for a complete one, in which the supply of electricity is planned as deliberately as its use. First, the tracking mechanism should monitor supply as well as demand, reporting additions of clean and dispatchable capacity, grid investment and interconnections alongside the electricity share, so that gaps become visible early rather than being filled by default. Second, countries should ensure that new electricity demand is matched by low-emission and dispatchable capacity, and should recognise in their national plans and nationally determined contributions the role of gas-fired generation, particularly where it replaces coal. Without such safeguards, the cheapest outcome risks becoming the most polluting one.

Third, the remaining emissions from gas should be addressed through commitments to reduce methane emissions along the value chain and through carbon capture at gas-fired power plants and industrial sites. Fourth, finance should follow the target's gas footprint: concessional finance and risk-sharing for grids, storage and gas-to-power projects in Asia, Africa and Latin America would make the target achievable where electricity demand grows fastest and capital is most expensive. Fifth, resilience should be built in from the start, through diversified mineral and equipment supply chains, common cybersecurity standards for connected devices and sufficient firm capacity.

9. Conclusions

35-by-35 points in the right direction, but as designed it is incomplete. Meeting it would require the pace of electrification to roughly double, hundreds of gigawatts of heat pumps, close to 200 GW a year of additional wind and solar capacity and a sharp increase in grid investment. Even under assumptions that favour renewables and exclude new coal, it would raise world gas demand by about 73 bcm in 2035, and by more if clean supply falls short. That gas is also what keeps the climate benefit intact: emissions fall by 2.1 Gt, while the 0.15 Gt from the additional gas can be addressed through carbon capture and methane abatement.

The choice facing COP31 is therefore not between electrification and natural gas. It is between a target that plans for the firm, affordable and secure electricity supply it depends on and one that

leaves that supply to chance. For GECF Member Countries, and for the economies whose electricity demand will grow fastest, natural gas is a partner of accelerated electrification. Recognising that partnership in the design of 35-by-35 would make the target more achievable.

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