CLIMATE ANALYTICS

Briefing

From setting targets to limiting overshoot – Understanding the challenge

Dimitris Tsekeris, Olivia Waterton,

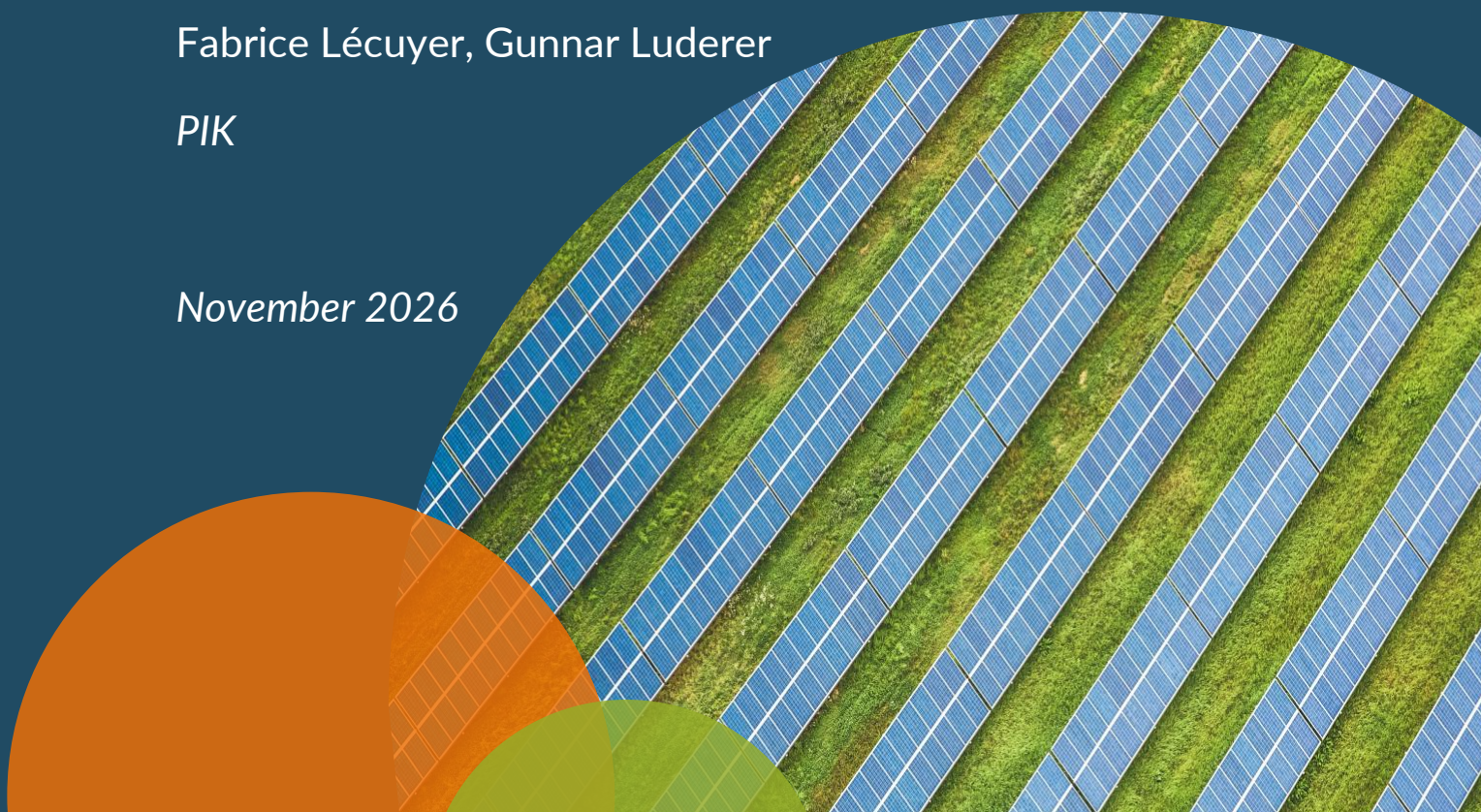
Neil Grant, Richard Black, Claudio Forner

Climate Analytics

Fabrice Lécuyer, Gunnar Luderer

PIK

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Introduction

Due to insufficient action in recent years, overshoot of the Paris Agreement's 1.5°C limit is now inevitable (UNEP, 2026). The world will very likely reach 1.5°C of warming on a long-term basis by the early 2030s. The high risks and damages of overshooting 1.5°C have been well established: the scientific community identifies 1.5°C as a physical limit beyond which the scale, severity and frequency of climate impacts escalate substantially, with these impacts disproportionately affecting the most vulnerable. Many of these risks and impacts grow with the overall magnitude and duration of overshoot and the risk of tipping points, with the effectiveness of adaptation falling and its costs rising accordingly (Dickau et al., 2025; Reisinger et al., 2025; Schleussner et al., 2024).

Policy now needs to focus on limiting both the magnitude and duration of overshoot to bring warming back well below 1.5°C before 2100. This requires a rapid fossil fuel phase out, combined with deep electrification of the global economy powered by renewable energy.

At COP28 in Dubai, as part of the outcomes of the first global stocktake (GST1), Parties to the Paris Agreement agreed to two headline targets by 2030: tripling global installed renewable energy capacity and doubling the annual global rate of energy efficiency improvements (UNFCCC, 2024; hereinafter referred to as the GST1 targets).[1]

While switching from coal, oil and gas generation to renewables will curb fossil fuel emissions in the power sector, it does not affect fossil fuel use in end-use sectors - transport, buildings and industry. To enact a clean energy transition there and limit the magnitude and duration of overshoot, electrification is the dominant requirement. Taken together, renewables and electrification cut fossil fuel use across the economy, with efficiency gains reducing the amount of energy needed versus a system where those gains are not made.

Electrification is not only critical for accelerating and deepening the energy transition, it shields economies and societies from fossil fuel price volatility and improves energy security. Recognising this, and also the need to set a complementary milestone to guide action aligned with 1.5°C, the COP31 Presidency introduced the 35 by 35 initiative, which aims to boost the global electrification rate to 35% of final energy by 2035, from just over 20% currently (UNFCCC, 2026).

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[1] 11 days before the end of COP 28, the COP Presidency launched the Global Renewables and Efficiency pledge. Unlike the GST outcome, which was agreed by all Parties under the Paris Agreement, the pledge was brings together around 130 signatories which do not include some large countries such as China, India, Russia and Saudi Arabia.

The pledge commits signatories to work together to triple the world's installed renewable energy generation capacity to at least 11,000 GW by 2030 from 2022 levels, taking into consideration different starting points and national circumstances; and to collectively double the global average annual rate of energy efficiency improvements from around 2% to over 4% by 2030.

In this policy brief, we assess how far GST1 targets have been implemented to date, and at the current implementation rate of electrification. We also compare progress and targets with benchmarks on a pathway that limits overshoot of 1.5°C, and highlight potential policy gaps as the world enters the overshoot period.

Limiting overshoot - The HPA scenario

Climate Analytics' 2025 report ''Rescuing 1.5°C: New evidence on the highest possible ambition to deliver the Paris Agreement'', published in collaboration with the Potsdam Institute for Climate Impact Research (PIK) just ahead of COP30, introduced its new Highest Possible Ambition (HPA) scenario (Climate Analytics & PIK, 2025). The HPA demonstrates that it is still possible to limit the magnitude and the duration of overshoot and bring global warming back well below 1.5°C by the end of the century, which should now become a key priority for policymakers to avoid escalating climate damages. In effect, this means the world should reach net zero CO_2 before 2050 and net zero greenhouse gas (GHG) emissions in the 2060s. Overshooting 1.5°C does not void the Paris Agreement limit but rather highlights the urgency to double down on the emission reductions needed to limit the magnitude and duration of overshoot.

Key levers

The HPA scenario identifies four key levers at the heart of the transformation of our energy and land-use systems. These levers must be pulled in parallel to minimise the magnitude and duration of 1.5°C overshoot, achieve net zero greenhouse gas emissions in the second half of the century and bring warming to well below 1.5° C by 2100. These levers are:

1. **Widespread electrification powered by renewables.** In the HPA scenario, over two-thirds of the 2050 energy system is powered by renewable electricity, driven by the rapid rollout and cost reduction of wind, solar, and battery storage. Renewable electrification is the mainstay of the energy transition, as it significantly outperforms all other options on cost, scalability and energy efficiency. The HPA scenario sees global electricity generation nearly quadruple by 2050, with wind and solar supplying over 90% of electricity demand, and all sectors see a large increase in electrified end-uses: electric vehicles and heat pumps become the norm while most industrial processes electrify. The remaining 10% will be supplied by primarily hydropower with less than 1% each of hydrogen, geothermal, biomass, and nuclear.

2. **A rapid fossil fuel phase-out.** Clean electricity pushes fossil fuels out of the energy system at pace and scale. Production and consumption of all fossil fuels

peak immediately and fall rapidly, with coal effectively phased out in the 2040s, gas in the 2050s and oil in the 2060s. Advanced economies take the lead, achieving a fossil-free energy system by mid-century. Developing economies base their growth in energy access on renewables and avoid locked-in fossil infrastructure.

3. **Carbon dioxide removal (CDR) at a commercial scale.** The HPA scenario rapidly scales CDR from the 2030s onwards, with engineered removals reaching over 5 $GtCO_2$/yr by 2050, supported by limited removals of around 2 $GtCO_2$/yr from the land-use system. The HPA scenario avoids large-scale nature-based CDR, given the risks of overreliance on natural sinks in a warming world. The main role of CDR is to bring temperatures back to 1.5°C and below, not to compensate for residual fossil emissions.

4. **Faster action on methane.** As a short-lived yet highly potent greenhouse gas, faster action to cut methane emissions plays a crucial role in reducing peak temperatures. Cutting methane emissions post-2050 can also support long-term temperature decline. In the HPA scenario, methane emissions fall around 20% by 2030 and 32% by 2035 (relative to 2020), driven particularly by emissions reductions from fossil fuel extraction, in addition to more modest reductions in agriculture and waste.

Tripling renewables

The HPA scenario

With over two thirds of final energy provided by direct electrification (and more electricity meeting energy demand indirectly via green hydrogen and e-fuels), the HPA scenario sees a vast expansion in electricity generation by mid-century. Power generation almost quadruples from 2025 levels to almost 120,000 TWh annually by 2050. The acceleration in global power demand is particularly notable across the 2030s and 2040s, when electricity demand grows at about 3,500–4,000 TWh/yr. This transition is driven by wind and solar, which provide over 90% of electricity demand by 2050. To support the transition, large-scale deployment of batteries and grid infrastructure helps by storing and transmitting electricity produced by variable renewables.

In 2022, global renewable energy capacity stood at around 3.4 TW. In the HPA, global capacity grows 3.5-fold by 2030 relative to 2022 levels, reaching 11.9 TW in 2030, mostly wind and solar (10.2 TW in 2030), with solar (7.9 TW), accounting for two-thirds of total installed capacity.

The HPA is broadly in line with the tripling target agreed at GST1, though an even faster renewables rollout occurs under the HPA. From 2030 to 2035 capacity doubles in five

years, reaching almost 25 TW, around seven times higher than 2022 levels. Rapid renewable electrification, adequate grid infrastructure (optimisation of the existing grid as well as expansion), and flexibility through storage are the cornerstones of any transition that keeps the Paris Agreement's long-term temperature goal alive, further accelerating and deepening the energy transition.

The GST1 target on tripling renewables globally points into the right direction but it should be seen as a floor. From a limiting overshoot perspective, the HPA scenario implies a capacity of 11.9 TW in 2030 and 25 TW in 2035.

Trends and gaps

Achieving a capacity of 11 TW by 2030 implies an addition of 7.6 TW from 2022, corresponding to average annual capacity additions of 0.95 TW. According to IRENA, in 2025 the world reached a cumulative renewable capacity of roughly 5.2 TW, led by China (44%), the EU (18%), the US (9%), and India (5%) with an average of 0.6 TW added annually between 2022 and 2025 (IRENA, 2026).

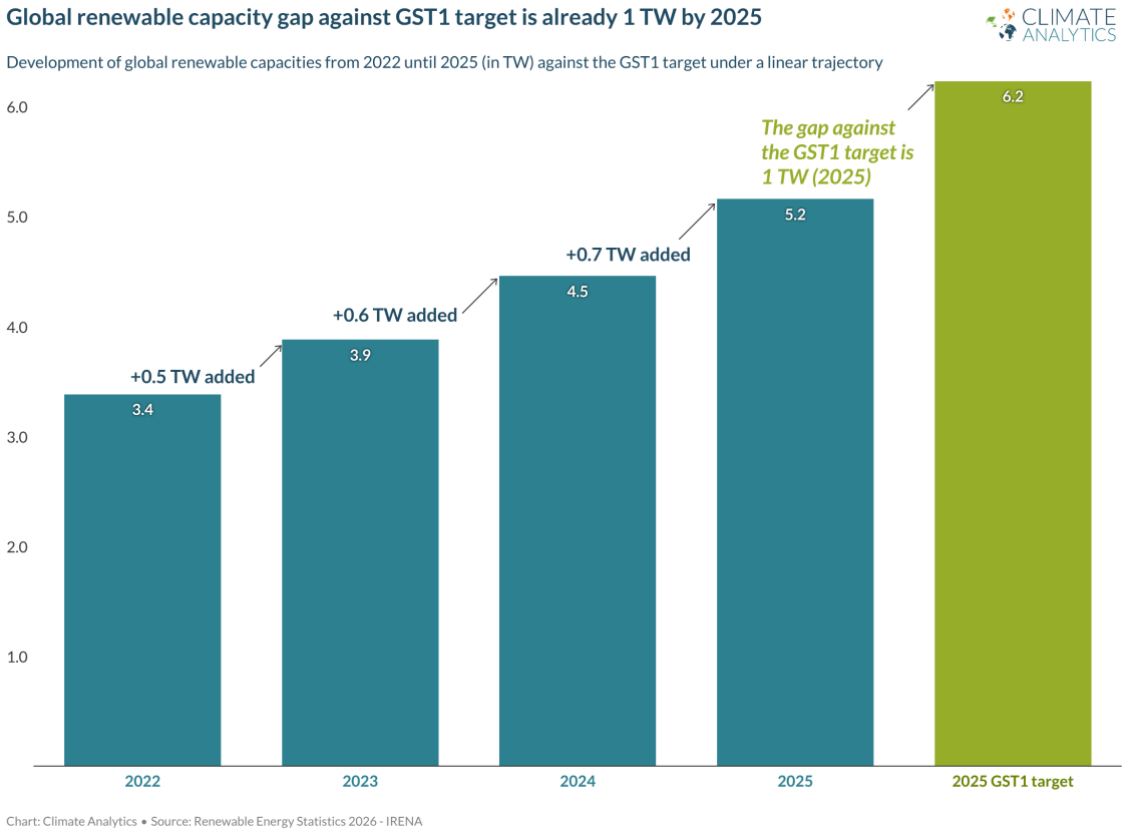


Figure 1 Global renewable capacity development indicates a theoretical gap of 1 TW by 2025 compared to the expected global renewable capacity, based on the GST1 target (annualised until 2025).

By 2025, assuming a linear annualised trajectory based on the GST1 target, the total renewable capacity would reach approximately 10 TW. This would leave a 1 TW gap between what is required to achieve the tripling target and the actual global renewable

additions has already reached a total of 1 TW. In reality, renewable capacity additions grow each year; but even deployment of 0.95 TW annually between 2026 and 2030 would see a shortfall against the GST1 target.

In order to assess different possible futures based on the existing data, five different scenarios have been conducted, assuming a common and existing starting point (2025).

Table 1 Scenarios assessed, including a brief description

Scenarios	Description
Current policy projections (CPP)	Assuming a pace of 0.6 TW annually until 2030, equivalent to the annual 2022-2025 average, the world would land at 8.2 TW or approximately 3 TW below the GST1 target and 3.7 TW below the HPA benchmark.
2025 pace	Assuming a 0.7 TW pace of annual increase of installed capacity (equivalent to the 2025 capacity added), the world could reach 8.7 TW by 2030, leaving a gap of 2.3 TW compared to the GST1 target and 3.2 TW against the HPA.
Continuous increase	Assuming an ongoing increase of renewables capacity by 0.1 TW annually (as observed between 2022 and 2025), the world could reach 10.2 TW in 2030, falling short by 0.8 TW against the GST1 target and 1.7 TW against the HPA.
Tripling RES	To triple renewables capacity by 2030 in line with the GST1 target, the world would need to install 5.85 TW of additional capacity, with 2025 as a reference point. The pace of annual renewable capacity additions would need to reach around 1.2 TW annually, as of 2026. This is essentially a doubling of effort compared to the current average pace of increase between 2022-2025 (CPP), but still 1 TW below the HPA.
HPA	Achieving the HPA target of 11.9 TW to limit the magnitude and duration of overshoot would require a further increase compared to the Tripling RES scenario, reaching annual additions of 1.35 TW as of 2026.

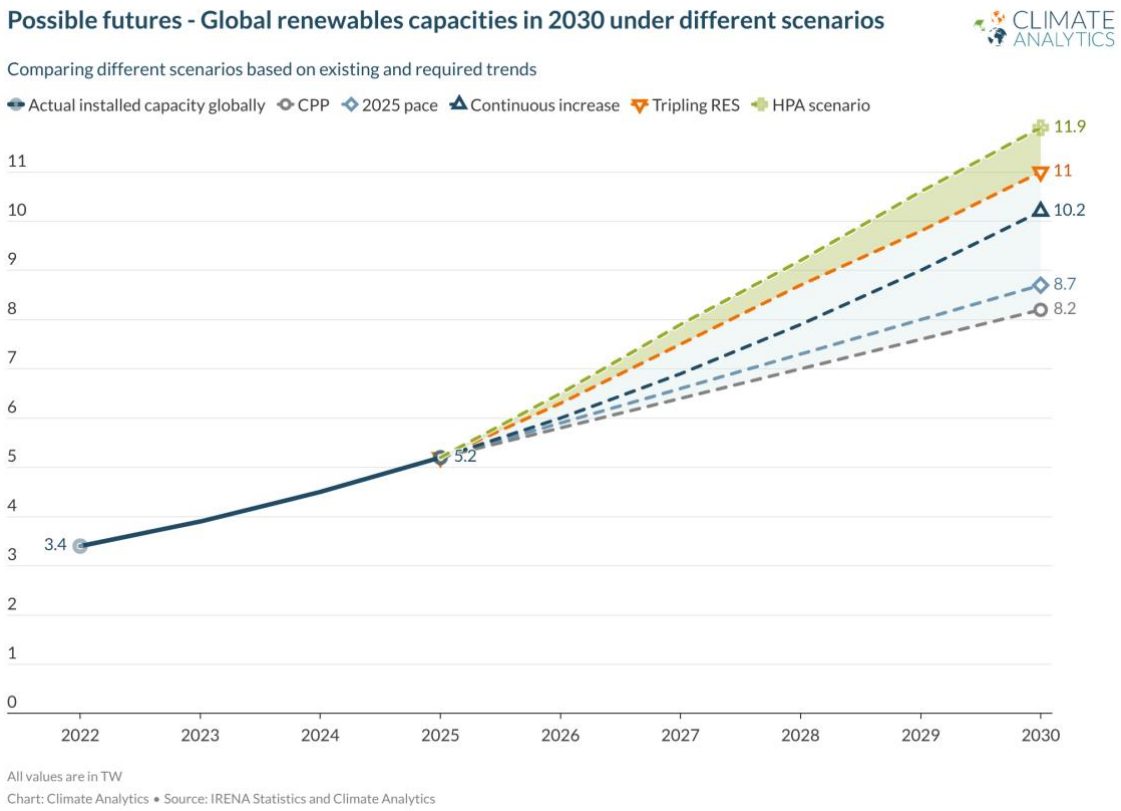


Figure 2 Possible futures for global renewable capacities by 2030 in TW, scenario description in Table 1

None of the assessed scenarios aside from the Tripling RES scenario itself and the HPA (Figure 2 Possible futures for global renewable capacities by 2030 in TW, scenario description in Table 1) achieve the tripling of renewables: they fall short by a range of 0.8–2.8 TW and subsequently a gap of 0.9–3.7 TW with regards to the HPA benchmark commensurate with limiting overshoot. Even the tripling trajectory falls short by around 1 TW, compared with what is required to limit overshoot and align with the Paris Agreement. However, the current trends indicate that the potential is there. Based on the current volatility in fossil fuel markets, increasing the pace of renewables deployment is not just possible but desirable from a short-term economic perspective.

The longer there is an implementation gap, the more challenging it will be to realise the GST1 target. However, strengthening implementation – though crucial – is not enough by itself. The 2030 target also needs to be enhanced to 11.9 TW to limit the magnitude and duration of overshoot. Moreover, we should also adopt more long-term targets (2035 and beyond) that align with the necessary ambition levels.

Doubling the energy efficiency improvement rate

The HPA scenario

In the HPA scenario, the compound rate of efficiency improvement between 2022 and 2030 reaches 3.6%, which is slightly below the 4% improvement rate needed to achieve the doubling target of the GST1 target. A key reason for this is the fact that the HPA takes into account global inaction in the first half of this decade, taking 2025 as its starting point. However, after 2030 the compound efficiency improvement rate picks up to 2035, reaching 3.9% globally (with 2022 as reference), roughly equal to the target.[2] A switch from fossil fuel use to renewable generation and electrification generates some efficiency gains, as these technologies are inherently less wasteful, but other measures are also needed to achieve the improvement rates in both the GST1 target and the HPA.

As with the historical rate of energy efficiency improvements, considering only the global average masks the highly differentiated energy efficiency landscape in the HPA scenario. In the HPA, a number of countries including Australia, China, Japan, Germany, the USA, Türkiye and Kenya have the highest potential to move above the 4% threshold by 2030. All of them maintain a high efficiency improvement rate until 2035, although with a relative slowdown for Germany, Japan and Kenya. All of them present a much higher rate compared to their historical average.

Annual improvements in many emerging economies such as Brazil, Colombia, India, Mexico, the Philippines, and Viet Nam range between 2-4% by 2030 under the HPA, as does South Korea. Most of the countries in this group tend to increase their efficiency improvement rates until 2035, with the exceptions of Senegal and South Korea. The United Kingdom maintains a stable rate of efficiency improvement of 3.5% until 2035. South Africa's improvement is also worth mentioning, starting from a lower point (<2%) and reaching more than 4% by 2035, indicating that the transformation towards renewables instead of coal and electrification until 2035 is providing efficiency gains. In most cases, the historical average for this group of countries is generally lower, with the exception of Korea which has roughly the same historical rate as in the HPA.

Lastly, there is a group of countries that see efficiency improvements well below 2% up to 2035. These countries are often facing significant structural challenges which hinder energy efficiency improvements; these may include structural barriers to electrification, high cost of capital or state capacity constraints, for example. More support and better coordination are needed in order for Pakistan, Bangladesh, Senegal, Egypt, and Nigeria

[2] See methodology for the calculation approach in ANNEX I.

to enhance their efficiency efforts. Interestingly, in some cases (Pakistan, Bangladesh, Nigeria) have seen a higher historical rate compared to the HPA scenario.

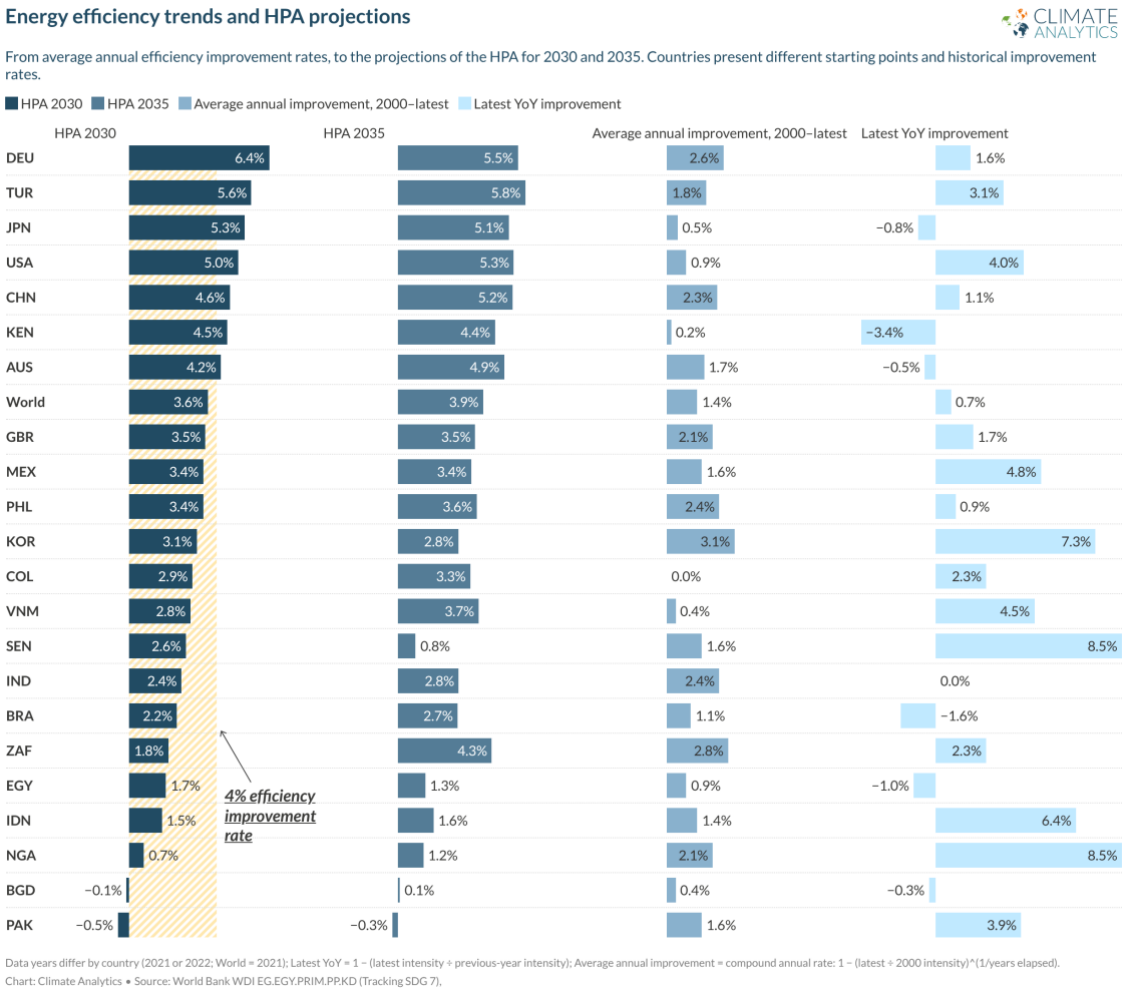


Figure 3 Compound energy efficiency improvement per country by 2030 and 2035 based on the downscaled Highest Possible ambition scenario, in relation to countries' average annual efficiency improvement since 2000 and latest year-on-year improvement.[3]

Trends and gaps

Three years on from COP28, energy efficiency improvements remain a largely neglected element of the transition despite being essential to its success.

The IEA recognises that despite increased ambition, the implementation of energy efficiency improvements lags, remaining slow and uneven. Global energy efficiency improvement has averaged around 1.3-1.8% annually since 2019, significantly below the doubling target of 4%. Energy efficiency improvements stand at just 1.1% (2023), 1.1% (2024) and 1.7% (2025) in the last three years. Global primary energy intensity is set to improve by 1.8% in 2025, up from around 1% in 2024 (IEA, 2025a). To deliver the

3 Data years differ by country (2021 or 2022; World = 2021), list of country codes in ANNEX II

GST1 target, efficiency now needs to increase by 5.6% per year to 2030, which is a challenging target (IRENA et al., 2026).

Progress is slowing especially in industry. It accounts for nearly 40% of global final energy use, yet energy intensity improvements have fallen to under 0.5% per year since 2019, compared to almost 2% in the previous decade (IEA, 2025b). There is significant variance across different regions and economies; looking only at the global average obscures regional variance. Energy intensity progress in 2025 is estimated to be over 3% in China and over 4% in India, well above their averages in the years since 2019. In the United States and the European Union, on the other hand, progress in 2025 is set to fall below 1% after several years of stronger performance following the energy crisis.

As a result, the world is off track to achieve its GST1 target for 2030 and governments must up their efforts to catch up with the time lost so far. The global energy crises of 2022 and 2026 highlight the need to accelerate efforts in energy efficiency to reduce energy consumption, cut costs, and improve system resilience against price volatility.

At the end of June 2026, the IEA hosted the 11th Global Conference on Energy Efficiency in Montreal, Canada (IEA, 2026c). The ministerial roundtable served as a space to reaffirm governments' commitment to enhance energy efficiency and identify practical ways to accelerate implementation. This resulted in the Montreal Collaboration Framework, which aims to accelerate implementation and foster collaboration to achieve the doubling of the energy efficiency rate by 2030, in alignment with the GST1 target (IEA, 2026b).

Senior leaders agreed that for companies to deploy and invest in energy efficiency, financial institutions need to finance and derisk investments so that energy efficiency improvements could scale up. Additionally, governments need to create the enabling conditions for the above to materialise.

Since 2019, electricity demand has increased two to three times faster than energy demand. This needs to be met with renewable energy generation, to avoid the use of inefficient fossil fuel alternatives and the subsequent increase of primary energy demand, which in turn slows the energy intensity process (IEA, 2025a). If electricity demand growth outpaces renewable supply, it could lead to an overall increase in less efficient fossil fuel generation. In some regions, this rising demand has led to greater use of inefficient generation sources, placing upward pressure on primary energy demand and slowing energy intensity reductions.

Through targeted interventions which consider each country's specific national context, energy efficiency can streamline the energy transition, reduce energy bills, and reach the required levels to limit overshoot. Given the HPA results in a 3.6% efficiency improvement globally by 2030 with 2022 as a reference (and 3.9% by 2035), the 4% target by 2030 contained in the GST1 target aligns with limiting overshoot. Taking into account that the global energy efficiency improvement has averaged around 1.3-1.8% annually since 2019 according to the IEA, the HPA scenario is effectively suggesting an immediate doubling of ambition.

Electrification: From “35 by 35” to the HPA

Electrification stands at the crossroads of both renewables’ deployment and efficiency. Electrification is not just a fuel switch from molecules to electrons. As electrotech is far more efficient than its fossil fuel counterparts, electrification is a cornerstone of any energy efficiency effort. An electric motor turns around 90% of its input into useful work versus a combustion engine’s 25%, and a heat pump delivers three to five units of heat per unit of electricity compared to a gas heater, which produces less than one unit of heat per unit of fossil gas.

The HPA

The HPA scenario leans into the electrification and energy efficiency nexus. Grids and cables, batteries, electric vehicles (EVs), heat pumps, and other technologies are rapidly scaled up to deliver electricity to industry, buildings and transport systems at high efficiency, low costs, and zero emissions. The share of energy demand met by electricity reaches 39% in 2035 and stabilises above two-thirds in 2050.

Global electrification trends under the HPA

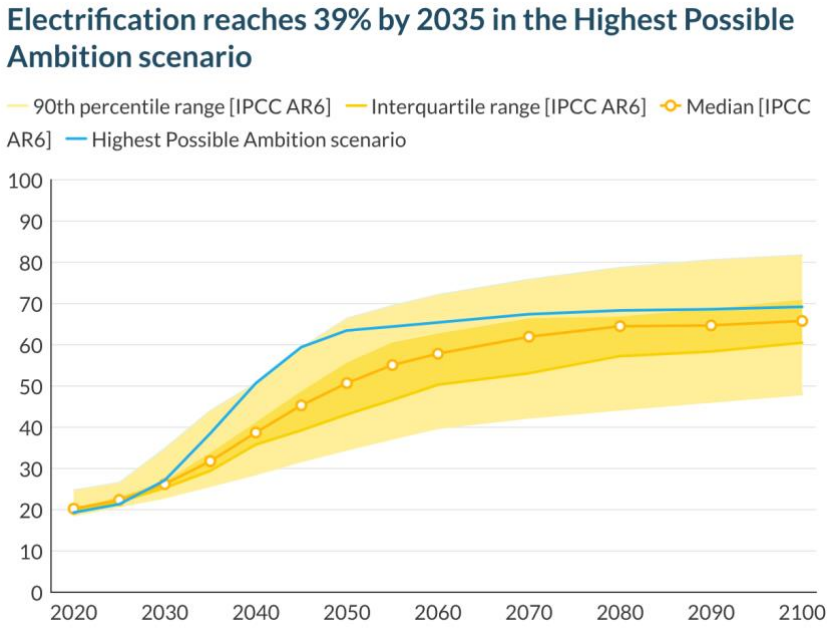


Figure 4 Compares the share of global final energy demand that is met by electricity in the Highest Possible Ambition scenario with the IPCC AR6 scenarios.

	2023	2030	2035	2050
Buildings	36%	44%	**57%**	83%
Transport (excluding aviation and shipping)	2%	9%	**22%**	74%
Industry	22%	28%	**37%**	50%
Industry (excl. feedstocks)	25%	32%	**42%**	57%
Total	21%	28%	**39%**	65%

Table 2 Global sectoral electrification rates under the Highest Possible ambition scenario per time horizon.[4]

The electrification rate globally reaches 28% in 2030 and 39% by 2035, according to the HPA scenario, slightly above the target set by the COP31 Presidency. In other Paris-aligned pathways (the latest multi-model set of low-overshoot scenarios from the IPCC) electrification reaches 34–41% in 2035 and thereafter continues to increase, reaching 54–68% by 2050. This shows that the "35 by 35" goal is a target in the right direction but should not be seen as an ambition ceiling. There are pathways which go beyond 35%, including the HPA scenario as indicated above, which can help accelerate a fossil phase-out while reducing reliance on other options like biofuels.

Breaking this down into the sectors: in the HPA scenario, buildings present the highest electrification potential, reaching 57% by 2035 and above 80% by 2050. This is aided by the buildings sector's higher baseline in 2023 (36%). Heat pumps will play a vital role. Industry (excluding feedstocks) had a 25% electrification rate in 2023. Under the HPA, this increases to 42% by 2035 and essentially more than doubles by 2050, when it reaches 57%.

Transport, excluding aviation and shipping, has a very low starting point in 2023 (2%). However, this can more than quadruple by 2030 and go above 20% by 2035, driven by electrification of surface transport, covering cars, vans, trucks, two-wheelers, buses and trains. By 2050, the electrification rate for (surface) transport reaches 74%.

[4] Electrification rates can be calculated without non-energy and with bunkers added, if so, the electrification rate varies by a few % points, see CAT briefing: https://climateactiontracker.org/publications/unpacking-electrification-for-a-15c-aligned-world/

Regional trends under the HPA

Despite the global surge in electrification that occurs under the HPA scenario there are significant regional differences in the rate of electrification. Starting from the lowest to the highest levels, Figure 5 presents the regional breakdown of electrification to highlight the different starting (2025) and end (2035) points. Developed economies and China have the highest potential to electrify well above the global average (due to their increased readiness), ranging from 44-51% in 2035. Middle Eastern countries, N. Africa and Russia, despite having highly differentiated contexts, could reach 30% on average. India can essentially more than double its electrification rate within 10 years. All regions have great potential to electrify their economies, but they do start from a different maturity level. Most regions can move beyond the 35% threshold by 2035, with coordinated efforts. Sub-Saharan Africa has the lowest regional starting point, standing just below 10% in 2025. This region shows significant acceleration from this point, a 2.6-fold increase to reach 26% by 2035.

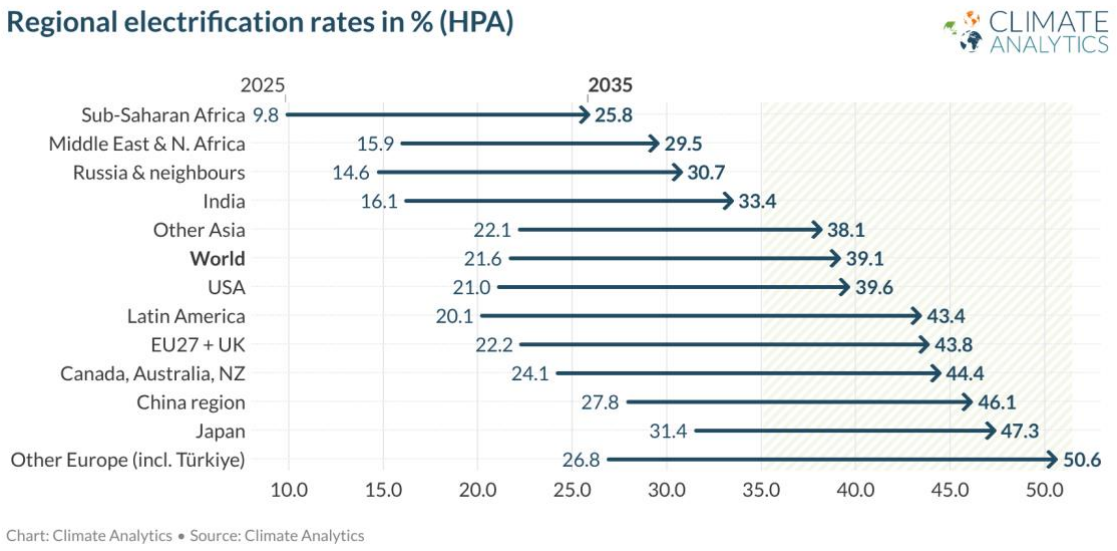


Figure 5 Regional electrification rates by 2035, according to the downscaled Highest Possible Ambition scenario.

Country level trends under the HPA

If we take a closer look at the country-level electrification rates in 2035 based on the HPA scenario and analyse the key demand sectors (transport, industry, buildings and economy-wide), it is clear that there are different routes and paces, depending on the starting point and the ability of each country to accelerate. Electrification in 2035 is a combination of both the starting point and the country's ambition, with advanced economies having a higher initial starting point and higher ambition in general.

What defines a country's level of readiness to electrify, is:

- The current economic structure, such as starting shares and sectoral mix, asset age, climate and relevant infrastructure
- The demand, including access, growth rates, population, industrial activity, and other emerging loads

- The equity, referring to affordability, finance, technology capacity and transfer

Buildings present the highest potential to electrify, mostly through heat pumps but also due to energy savings through renovations or new buildings with very low energy consumption.

Transport has the lowest starting point among all countries, with Germany, the UK and China showing the highest potential to electrify. The key development is EVs and the related charging infrastructure. For the electrification of transport to be effective in reducing its emissions, it must be combined by the highest possible penetration of renewables in the power sector, so that EVs are charged with zero-carbon electricity. Sector coupling should also be considered, as EVs can potentially participate in demand response practices and measures, e.g. through vehicle-to-grid charging.

Finally, industry is generally considered to be a difficult sector to fully electrify. However, substantial electrification can be achieved with current technologies. The frontrunners of this transition could benefit from low costs, provided that they are also supported in this process through financial and policy structures.

Considering the selected group of countries in Table 3, Türkiye, Australia and South Africa can meet over half of demand with electricity by 2035, with buildings and industry guiding this transformation. Brazil, the UK, Japan, Germany, China, and the EU also have high electrification potential, with these countries' electrification rate ranging from 43-50% in 2035. The US, at 40%, stands right above the 39% global benchmark. Colombia and India are below, indicating lower readiness and starting points.

Table 3 Country-specific sectoral and economy-wide electrification rates under the Highest Possible Ambition scenario in 2035 against the present economy-wide electrification rate.[5]

	Present	2035			
	Economy-wide	Transport	Industry	Buildings	Economy-wide
Australia[6]	25%	23%	59%	91%	54%
Brazil	21%	16%	47%	85%	43%
China	30%	40%	42%	62%	46%
Colombia	19%	14%	31%	77%	37%
EU27	23%	36%	42%	49%	43%
Germany	21%	48%	44%	49%	47%
India	19%	21%	32%	45%	33%
Japan	31%	20%	41%	76%	47%
South Africa	27%	49%	40%	88%	53%
Türkiye	25%	29%	55%	66%	54%
UK	21%	42%	45%	60%	50%
USA	22%	14%	36%	75%	40%
World[7]	22%	22%	37%	57%	39%

[5] All present economy-wide data refer to 2024, except for Brazil, EU27 and USA, where 2025 is used. Data extracted from IEA World Energy Balances 2026 and Eurostat - Complete energy balances (nrg_bal_c) for EU27

[6] With data from "Climate Analytics (2026). A fossil-free Australia: An ambitious but achievable Paris-aligned phase out of coal, gas and oil from the national energy system"

[7] 2025 data

The global electrification rate has increased by only 4.3% since 2010 – an average increase of 0.3% per year. The global electrification rate was just above 22% in 2025, mostly due to increased electricity use in industry, residential and services sector as well as EVs and data centres (Enerdata, 2026).

Achieving the proposed 35% electrification target by 2035 therefore requires a major step-change in government policymaking, achieving a growth rate of approximately 1.4% annually, essentially more than quadrupling the current rate of progress to deliver the 2035 target.

The Age of Electricity

Global electricity demand is rising rapidly due to increasing electrification of industry, transport and buildings, as well as emerging sub-sectors such as artificial intelligence (AI), data centres, and evolving technological innovations enabling further electrification (IEA, 2026a). Year-on-year growth in 2025 was slightly lower than in 2024 (3% and 4.4%, respectively), with emerging market and developing economies accounting for 80% of global electricity demand growth. This increase was driven mostly by buildings and transport and less from industry, where electricity demand growth fell to 3.7% in 2025 (from 6% in 2023 and 5.1% in 2024).

Annual electricity demand growth between 2026 and 2030 is expected to be 50% higher on average compared with the average across the previous decade. The IEA expects global electricity demand will increase at an average annual rate of 3.6% over this period due to rising consumption from industry, EVs, air conditioning and data centres.

Conclusion

This analysis generates two main conclusions:

1. overall, real-world progress is not fast enough to meet either the GST1 targets or the proposed 35 by 35 electrification target.

2. such targets need periodic revision to take account of real-world progress and the impact that progress has on future pathways, in particular as regards efforts to limit the magnitude and duration of overshoot.

These two conclusions are of particular relevance as Parties initiate discussions on the second Global Stocktake under the Paris Agreement, notably for identification of policy directions needed under overshoot scenarios.

Implementation is lagging, even behind existing commitments

As we show, if renewable deployment continues to accelerate, capacity in 2030 could end up close to the 11GW target set in 2023. However, it is likely that solar will make up a larger share of 2030 capacity than was conceived in 2023. This will mean that overall generation from the global fleet will then be lower than conceived, as solar has the lowest capacity factor among renewable technologies. The implications of this for the global target remain to be analysed. Nevertheless, the continuing cost falls in wind, solar and battery storage provide some optimism that annual additions will continue increasing.

The implementation gap is most serious with the energy efficiency improvement target. With annual improvements for the last three years standing at just 1.1%, 1.1% and 1.7% respectively, progress is critically insufficient. To go from the current rates up to the 5.6% per year now required for the rest of the decade implies a sudden acceleration of heroic proportions by national governments.

Achieving the proposed 35% electrification target by 2035 also implies a major step-change in government policymaking. The global electrification rate has increased by only 4.3% since 2010, an average of 0.3% per year (Enerdata, 2026). Delivering the 2035 target would therefore imply more than quadrupling the current rate of progress.

It is worth mentioning that progress on technical enablers, in particular grid expansion, lags behind the optimum rate; this in turn may slow the rate of renewables expansion and adoption of critical electrification technologies.

GST1 targets are not fully aligned with limiting overshoot

The GST1 renewable energy capacity target and the proposed COP31 "35 by 35" electrification target come close to alignment with scenarios that minimise overshoot, while the GST1 energy efficiency target remains broadly aligned.

There are several reasons why these targets should be seen as floors rather than ceilings on ambition:

- There are pathways which go beyond 35%, including the HPA scenario that reaches 39%, which can help accelerate a fossil phase-out while reducing reliance on other options like biofuels, keep overshoot to a minimum and return significantly below 1.5°C. Similarly for the renewables target, we should aim for 11.9 TW in 2030 and 25TW in 2035.
- A shortfall in one of these three areas has implications for the others. For example, undershooting the efficiency target will result in more electricity needing to be generated, and therefore in a bigger capacity of installed renewables. Slower progress on electrification will mean that renewables need to accelerate even faster, to produce the same amount of emission cuts across the entire economy. It is therefore prudent to aim higher than the global targets in all three areas
- Because we are now in the era of overshoot, climate feedbacks could become more significant. If they do, emissions will need to be reduced even faster to achieve the HPA timings for peak emissions and net zero, with possibly even higher levels of carbon removals.

Recommendations

This assessment is situated within a new global reality; one in which overshoot of 1.5°C is now an inevitability. Limiting the duration and magnitude of overshoot is now the top climate policy priority.

The GST1 targets were developed during a period where overshoot was not yet a reality. This has implications for the targets, which need increased ambition to remain relevant and aligned with the Paris Agreement. New scenarios that limit the magnitude and the duration of overshoot are critical to further guide this reassessment of global ambition, in conjunction with policies that enhance implementation.

As we have seen, however, real-world progress is inadequate to meet the three targets, while the targets themselves are not as high as needed to align with lowest-possible-overshoot pathways.

Based on the analysis in this briefing, we recommend the following considerations as Parties initiate discussions on the second Global Stocktake (GST2):

- Consistency between global and national targets: The existing and proposed global targets need to translate into differentiated regional, national and

sectoral pathways, reflecting different starting points, transformation potential, capacities and equity considerations. At the same time, those national and sectoral pathways need to consistently align with the global targets and efforts to limit overshoot.

- Governments should see national targets derived from these pathways as a floor rather than a ceiling, and plan to over-achieve on all of them in case of either under-achievement in one area, or a need for faster progress deriving from overshoot-generated climate feedbacks.
- Governments should see progress on renewables, efficiency, electrification and grids as a coherent package of work, developing and enacting policies that develop all areas simultaneously and maximise synergies. They should not plan just on the basis of 2030 and 2035 targets but aim for the much larger volumes of deployment needed beyond.
- National ambitions need to be supported by concrete policies, investment and accelerated implementation, particularly on energy efficiency.
- Governments must keep global targets under periodic review through the UNFCCC and revise them when the need is clear. The next obvious opportunity is the second Global Stocktake (GST2), which will commence at CMA 8 (November 2026) and conclude at CMA10 (November 2028). It provides an opportunity to reassess existing GST1 targets against scenarios that limit overshoot and establish aligned targets for 2035 and beyond.
- Initiatives outside the UNFCCC setting should be supported by governments, civil society and business. These include the Electrify Now movement, launched in June 2026 during London Climate Action Week (LCAW), comprising governments, business groups, think tanks, and civil society organisations united by a common mission: “to accelerate the rollout of electrification, and fast-track our renewable, electric future” (Electrify Now coalition, 2026).

Climate action today should address two distinct gaps:

- the ambition gap between GST1 targets and what is needed to limit overshoot, and
- the implementation gap between commitments and actual progress.

Both must be addressed simultaneously, in addition to using other critical levers in methane abatement and carbon removal, to keep overshoot to the minimum and bring global warming back down well below 1.5°C by the end of the century – as science and commonsense demands.

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ANNEX I

Measuring energy efficiency

$$Energy\ Intensity\ (EI) = Total\ Primary\ Energy\ Supply\ (TPES) / Gross\ Domestic\ Product\ (GDP)$$

- TPES: Measured in Joules (EJ, PJ) or Tons of Oil Equivalent (toe). It includes all raw energy extracted or imported (coal, oil, solar, wind) before it is converted into electricity or fuels.
- GDP: Measured in constant currency (usually USD) adjusted for Purchasing Power Parity (PPP) to ensure fair comparison across different countries and inflation years.

Annual improvement rate (g)

$$g = (1 - (EI1\ /\ EI0)) * 100\%$$

The GST1 target: To meet the doubling target, g must be ≥ 4.0% every year between 2024 and 2030.

In order to compare 2030 with 2022 (since this is the reference point, we used the **Compound Annual Growth Rate (CAGR)** to calculate the improvement based on the HPA.

$$Annual\ improvement\ rate\ = (1 - (EI2030/EI2022)^{1/8}) * 100\%$$

ANNEX II

Country codes			
AUS	Australia	**MEX**	Mexico
BGD	Bangladesh	**NGA**	Nigeria
BRA	Brazil	**PAK**	Pakistan
CHN	China	**PHL**	Philippines
COL	Colombia	**SEN**	Senegal
EGY	Egypt	**ZAF**	South Africa
DEU	Germany	**KOR**	Republic of Korea
IND	India	**TUR**	Türkiye
IDN	Indonesia	**GBR**	Great Britain
JPN	Japan	**USA**	United States of America
KEN	Kenya	**VNM**	Viet Nam