SUSTAINABLE ENERGY FOR ALL

ENERGY. CLIMATE.
DEVELOPMENT.

Tracking SDG7: The Energy Progress Report 2025

DEEP DIVE PERSPECTIVE 2025

DECEMBER 2025

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SECTION ONE

Executive Summary

Snapshot: SDG7 tracking report data from 2010 to the latest available data (2022 / 2023)

SDG7	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Goal 7.1.1: Universal Electricity Access, million of people without access	1,141	1,081	1,063	1,022	999	958	882	829	772	757	742	675	685	666
Average Annual Growth Rate		-5.3%	-1.6%	-3.9%	-2.3%	-4.1%	-7.9%	-5.9%	-6.9%	-2.0%	-2.0%	-9.0%	+1.5%	-2.7%
Goal 7.1.2: Universal Access to Clean Fuels & Technologies for Cooking, million of people without access	2,999	2,952	2896	2,830	2,767	2,691	2,610	2,534	2,450	2,371	2,289	2,213	2,149	2,087
Goal 7.2A: Increase Share of Renewable Energy, % share energy consumption from renewables	16.0%	16.0%	16.3%	16.5%	16.7%	16.7%	16.9%	17.1%	17.3%	17.7%	19.1%	18.7%	17.9%	--
Goal 7.2B: Increase Share of Renewable Energy, % share energy consumption from **modern renewables**	8.7%	8.8%	9.2%	9.7%	9.8%	10.0%	10.4%	10.6%	11.1%	11.5%	12.5%	12.5%	13%	--
Goal 7.3: Double Rate of Energy Efficiency, % Improvement, yearly rate of improvement of global primary energy intensity	--	2.1%	1.9%	1.8%	2.0%	3.0%	2.1%	1.4%	1.2%	1.5%	0.7%	0.5%	2.1%	--

SOURCES: World Bank / ESMAP Tracking SDG7 Database, 2025 and Tracking SDG7 Report 2025

Executive summary (1/3) – Findings

7.1.1 ELECTRICITY (2023)

- Almost 92% of the world's population now has access to electricity
- 666 million people still without access to electricity, around 19 million less than 2022 figure
- Sub-Saharan Africa (SSA) accounts for 85% of deficit

7.1.2 CLEAN COOKING (2023)

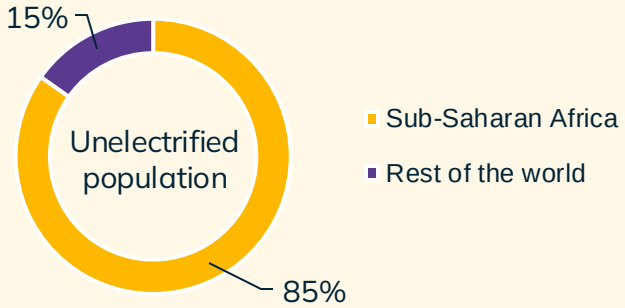
- Approximately 2.1 billion people lack access to clean cooking; little to no change from 2022
- 47% of these people are in Asia and 47% in Africa.

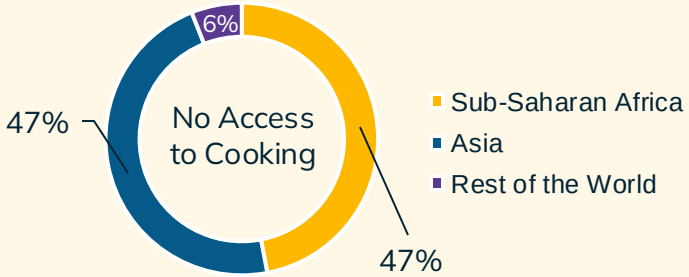
7.2 RENEWABLE ENERGY (2022)

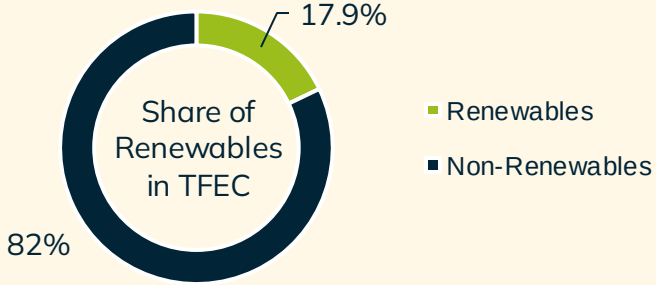
- The share of renewables in Total Final Energy Consumption (TFEC) is 17.9%, 0.8% below 2021 levels;
- The share of modern renewables in TFEC is 13%, representing an increase of 0.5% over 2021 levels
- International public financial flows to developing countries in support of clean energy increased by 27% from 2022, reaching USD 21.6 billion in 2023.
- Installed renewable energy capacity reached 478 watts per capita in 2023, indicating almost 13% growth from 2022; averaged 342 W/capita in developing countries versus 1,162 W/capita in developed countries

7.3 ENERGY EFFICIENCY (2022)

- Energy Intensity is defined as the ratio of total energy supply to gross domestic product
- A 2.1% improvement in global energy intensity is seen in 2022, a 1.6 %-point improvement over 2021 levels

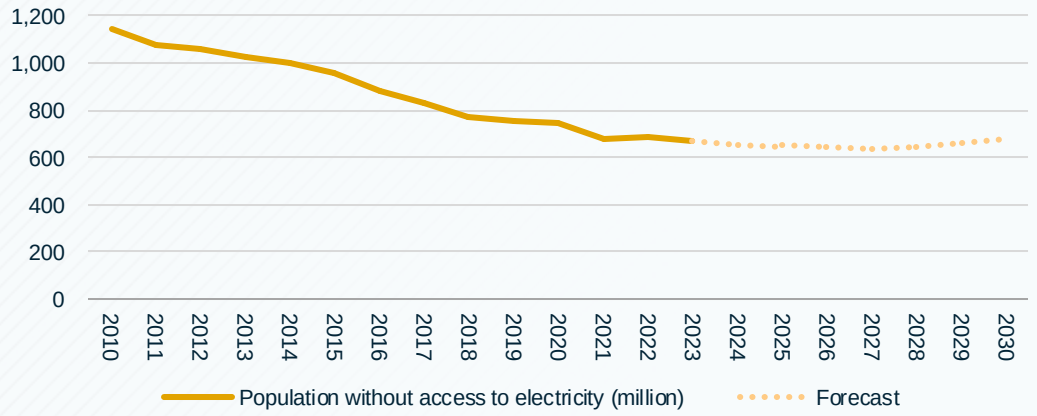




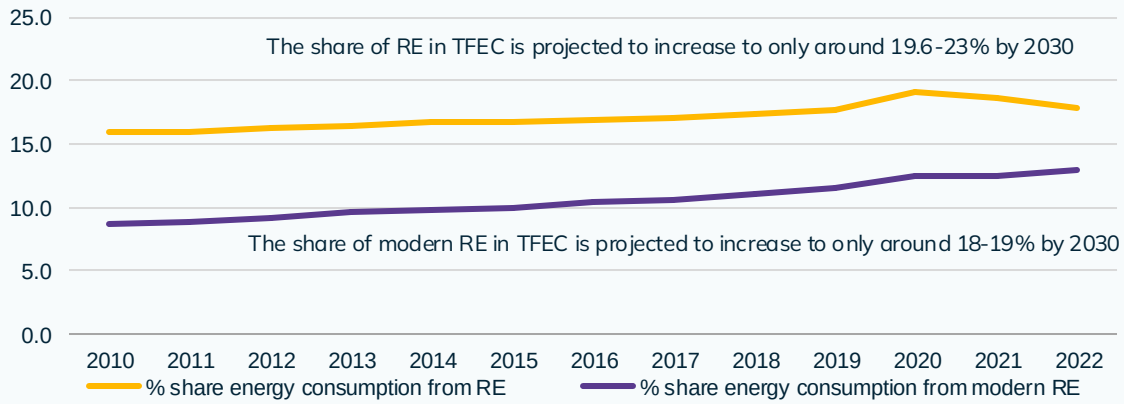


Executive summary (2/3) – Projections

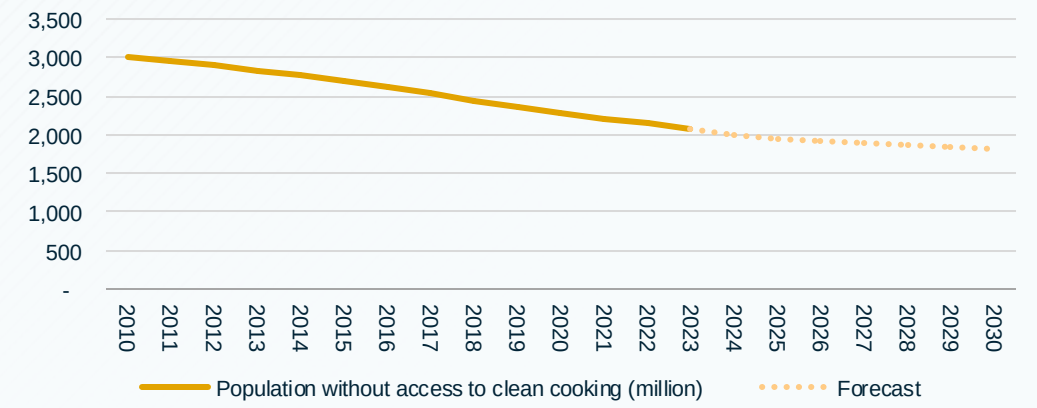
7.1.1 ELECTRICITY: Based on the current trends, we will still have around at least 645 million unelectrified people by 2030



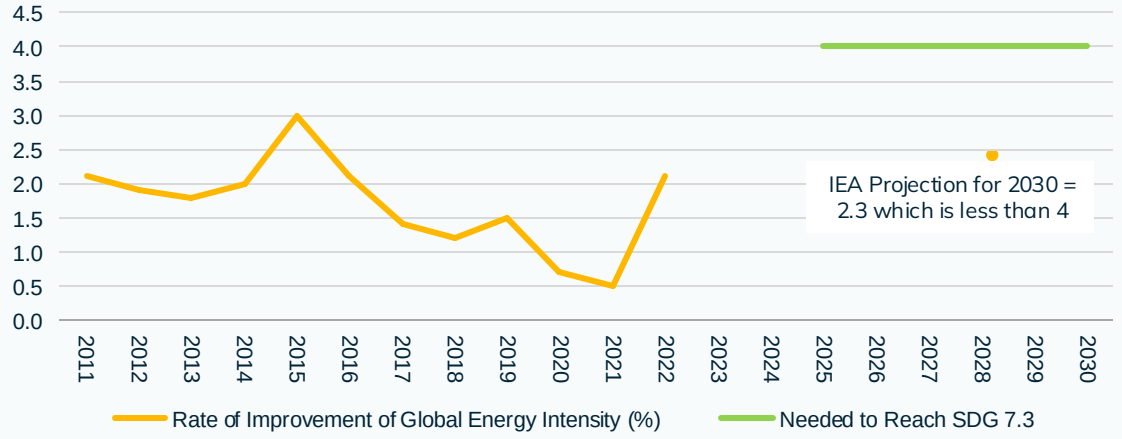
7.2 RENEWABLE ENERGY: Based on current trends, renewable energy will have modest increase by 2030, far below IEA NZE 2050 goals



7.1.2 CLEAN COOKING: Based on the current trends, 1.7-1.8 billion people will not have clean cooking access in 2030



7.3 ENERGY EFFICIENCY: Based on recent data, the energy intensity improvement rate in 2030 will be 2.3%, much less than the average 4 percent per year necessary to achieve SDG 7.3



Executive summary (3/3) – Implications (2025-2030)

7.1.1 ELECTRIFICATION — DELIVER RELIABLE CONNECTIONS AT LEAST COST

- To achieve SDG 7.1.1, we must provide electricity access to 136 million people every year, approximately the combined populations of Germany and Spain.
- Countries below ~90% access should pursue a blended pathway that combines grid densification and extensions with high-quality DRE where it is least-cost.
- In remote areas, DRE (a combination of mini-grid and off-grid solar systems) is important to accelerate access; cost-effective and rapidly scalable, decentralized solutions are able to reach communities in remote, lower-income, and fragile areas
- Country platforms (e.g., national roadmaps, Mission 300 where relevant) should sequence projects and publish open dashboards of connections and track SAIDI/SAIFI outcomes alongside tracking national Compact progress.

7.1.2 CLEAN COOKING — TARGET ECOOKING WITH ELECTRIFICATION; CLOSE THE DELIVERY FINANCE GAP AND SCALE DISTRIBUTION

- Target eCooking where geographies overlap with tackling electrification (many electricity access deficit countries are also lacking access to clean cooking)
- Pair standards (stoves/fuels) with consumer finance and last-mile distribution
- Mobilize concessional + results-based finance at scale, prioritizing LDCs and peri-urban/rural markets.

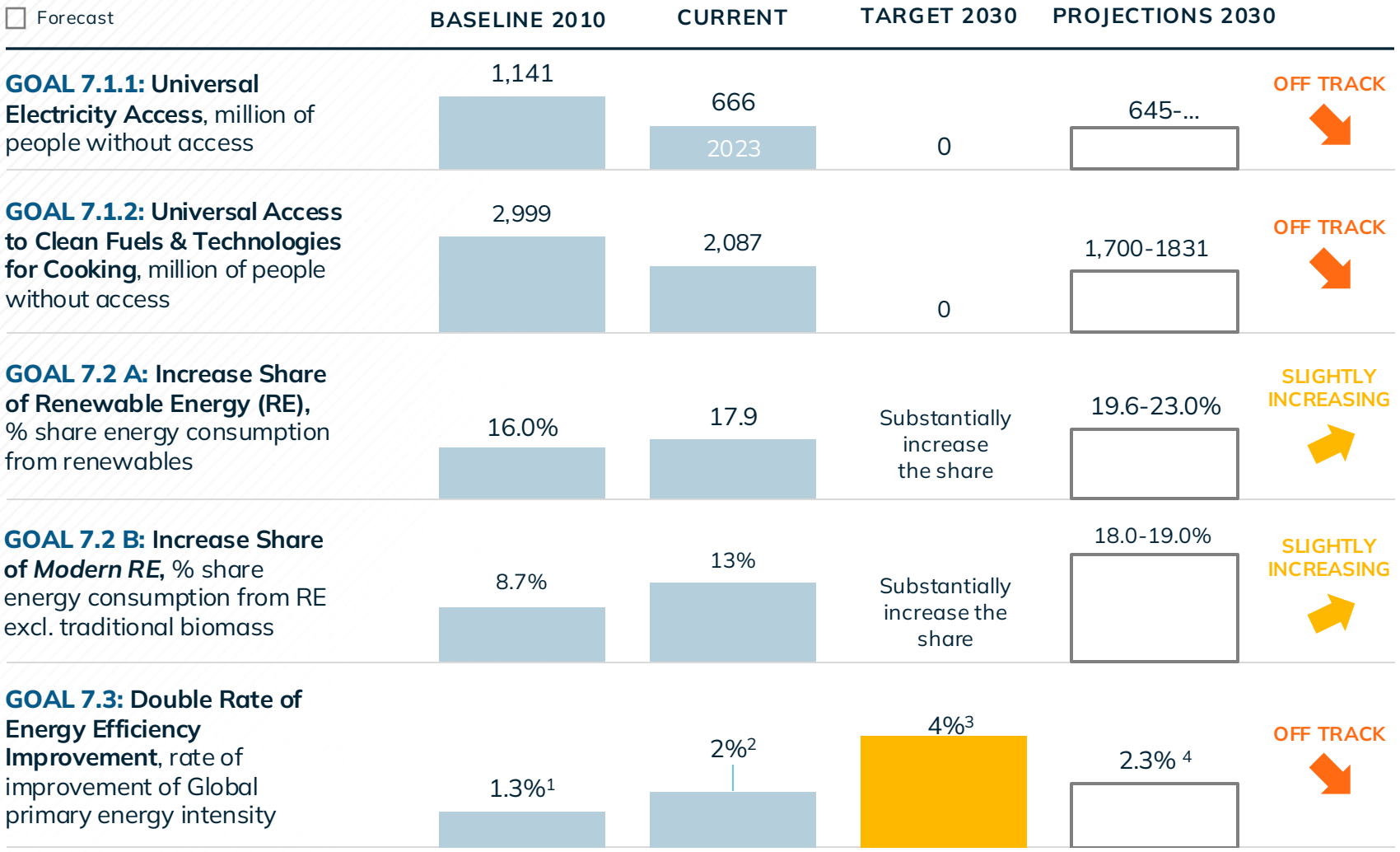
7.2 RENEWABLE ENERGY — BUILD MODERN RENEWABLES, ENABLE EFFICIENT GRIDS AND REGIONAL INTEGRATION, AND MOBILIZE FINANCING IN RE

- The IEA estimates that modern uses of renewables would represent just over a third of TFEC in 2030 under its the Net Zero Emissions by 2050 scenario. Modern RE deployment needs to be accelerated further
- Policy and finance should prioritize modern renewables tied to end-use electrification in transport and heat, rather than relying on traditional biomass
- Fast-track efficient grids, storage, and interconnection (regional integration) projects to raise W/capita, streamline permitting and interconnection
- Despite the rebound in 2023, flows remain below the 2016 peak; new commitments should prioritize grid-enabling investments and under-served groups (LDCs/SIDS)

7.3 ENERGY EFFICIENCY — ENERGY INTENSITY NEEDS TO IMPROVE BY 4% PER YEAR ON AVERAGE.

- All end-use sectors (industry, transport, and buildings) need stronger incentives, investment, and supportive policies for energy efficiency. Detailed, country-specific analysis of sector energy intensity is essential to design effective strategies that account for diverse economies and climates.
- More efforts needed towards enforcing minimum energy performance standards in buildings and appliances, launching industrial efficiency programs should be priority
- Publish annual intensity deltas against a 4%/year pathway to keep attention on implementation, not just policy intent

As the latest data shows slow or negative progress from the previous data year in all SDG7 areas, the off-tracking trends get worse



- Africa may not progress in reducing unelectrified population by 2030 with the current rate of improvement (7.1.1)
- The challenges in access to clean cooking (7.1.2) remain enormous with around 2.1 billion people without access.
- Progress in total RE and modern RE deployment is not sufficient (7.2)
- An energy intensity annual improvement rate of at least 4 percent per year from now through to 2030 is required, further increased from the originally required 2.6 percent due to recent weak progress. (7.3)

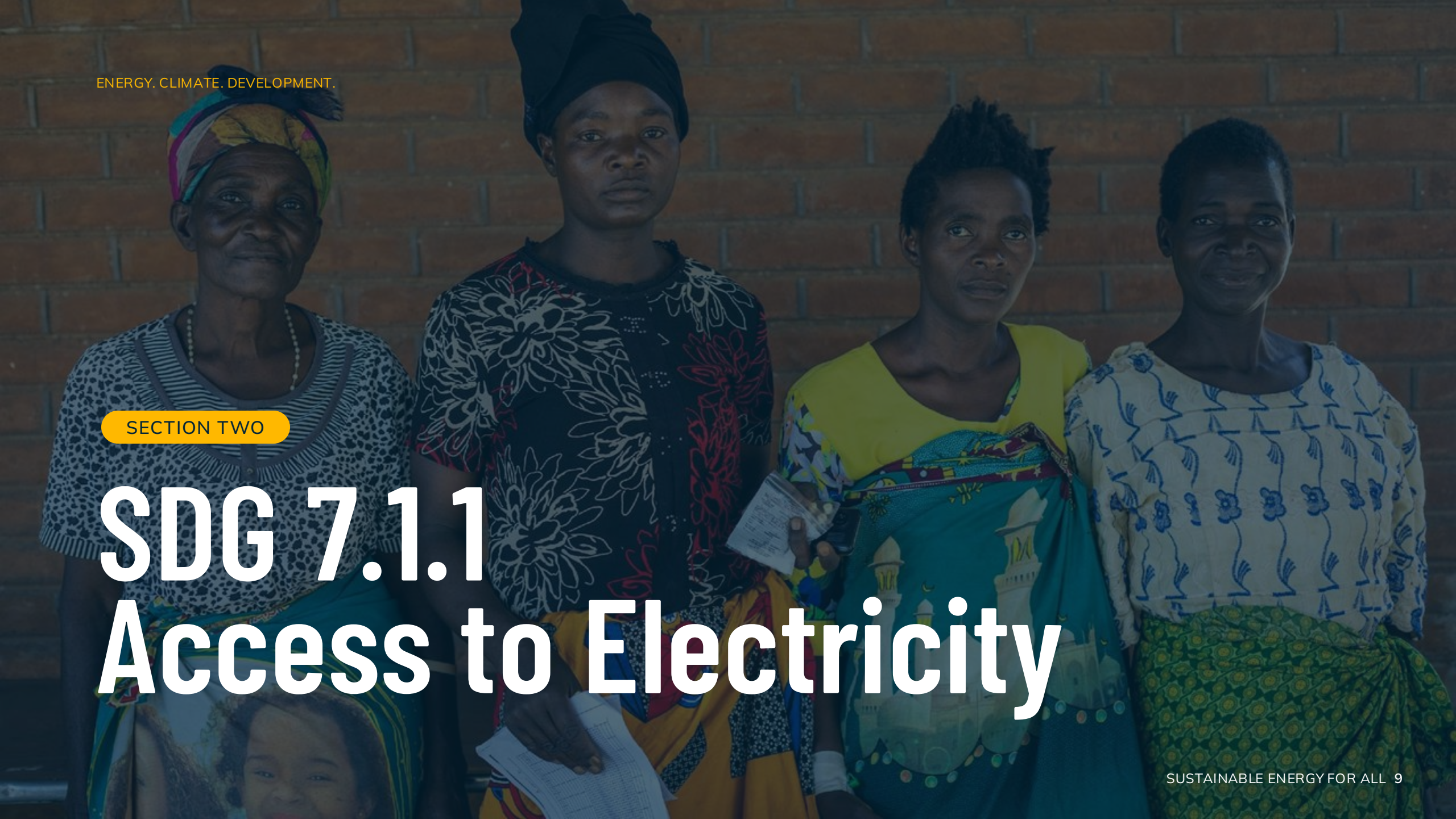
1: Baseline for Goal 7.3: Double Rate of Energy Efficiency Improvement is the value for the years 2006-2010

2: annual rate of improvement from 2021 to 2022

3 Yearly rate of energy efficiency improvement required to meet 2030 Target 2023-2030

4: 2030 projection by the IEA Stated Policies Scenario (STEPS)

DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report and its Datasets



SECTION TWO

SDG 7.1.1 Access to Electricity

SDG 7.1.1 Electrification Access

2023 saw a reduction in total unelectrified population, consistent with the trend from 2010-2021. While Africa has the majority (87.5%) of unelectrified population, Asia continues to be challenged by last-mile electrification.

- 80% of the unelectrified people live in just 23 countries (19 of them in Africa, 3 in Asia, and 1 in Oceania).
- The number of total unelectrified population in the world decreased by ~475 million between 2010 and 2023. 95% of this gain came from Asia (~452 million).
- Africa's gain in electricity access rate has been 16 percentage points, from 45% to 61%, since 2010. However, with significant population growth, the 2023 unelectrified population (583 million) has reduced marginally compared to the 2010 value (591 million).
- The countries with negative changes (increased unelectrified population and / or reversed electrification rates) or no material changes need to be further targeted for securing positive energy access outcomes

Looking forward, based on the current trends, we are not on track to achieve SDG 7.1.1 by 2030.

- A current trend projection and the IEA's scenario analysis show that we continue not to be on track to achieve universal electricity access by 2030, as 645-678 million people are expected to remain unelectrified in 2030.
- We need much stronger and tailor-made actions and investments, particularly for Africa, but also for Asia's last mile electrification.
  - Regardless of the improvement rates since 2010 and the current size of unelectrified populations, all countries with total access rates below 50-60% need more and accelerating efforts. 11 African countries in top 23 deficit countries have less than 50% access rates.
  - Even countries with relatively high rate of access (above 60-65%) still require continuous tailor-made efforts for both urban and rural populations to cross the goal line by 2030. Persistent differences in the rural and urban electrification rates in both Asia and Africa demand different approaches to close the gap in each region.
- Asian countries in top 23 unelectrified population country list have close to 100% urban electrification rates and high rural electrification rates. Last mile rural electrification efforts needs to be strengthened in these countries to reach 100% access in rural areas
- Sub-Saharan Africa has 80% urban electrification rate (many a times unreliable) and rural electrification rates of about 37%. Focused efforts for electrification of urban areas and stronger rollout of large-scale rural electrification programs must be prioritized.

Methodology - Description

Data Sources

- The following data was gathered from WORLD BANK / ESMAP's Tracking SDG 7 database (**download link**)
  - Total electricity access rate and population without access to electricity per country
  - Urban electricity access rate and population in urban areas without access to electricity per country
  - Rural electricity access rate and population in rural areas without access to electricity per country
  - Renewable installed capacity per capita per country and region
- The following data was gathered from WORLD BANK open data source
  - Total population per country between 2010-2024.
  - Total population estimates per country from 2025 to 2030.

Projections

- Straight line extrapolation projections were made via the following process
  - The rate of change of the number of people without access to electricity (Compound Annual Growth Rate, CAGR) between 2020 and 2023 was calculated for each individual country. For countries with missing or unreliable data, available data between 2010 and 2023 was used to calculate CAGR.
  - Each country's 2024 population without access to electricity was projected forwards to 2030 (by 6 years) by adding the calculated average change to the 2023 population 7 times.
  - 0 was set as a minimum to prevent the unconnected population from being negative
  - The projected data was then summed up according to each country's regional classification
- IEA stated policy scenario was taken from the IEA's World Energy Outlook 2023 report and Tracking SDG7 2025 Report.

Definition of electricity access

Electricity access is defined as a household being connected to an electricity supply at Tier 1 and above, aligned with the IEA's "basic bundle" threshold

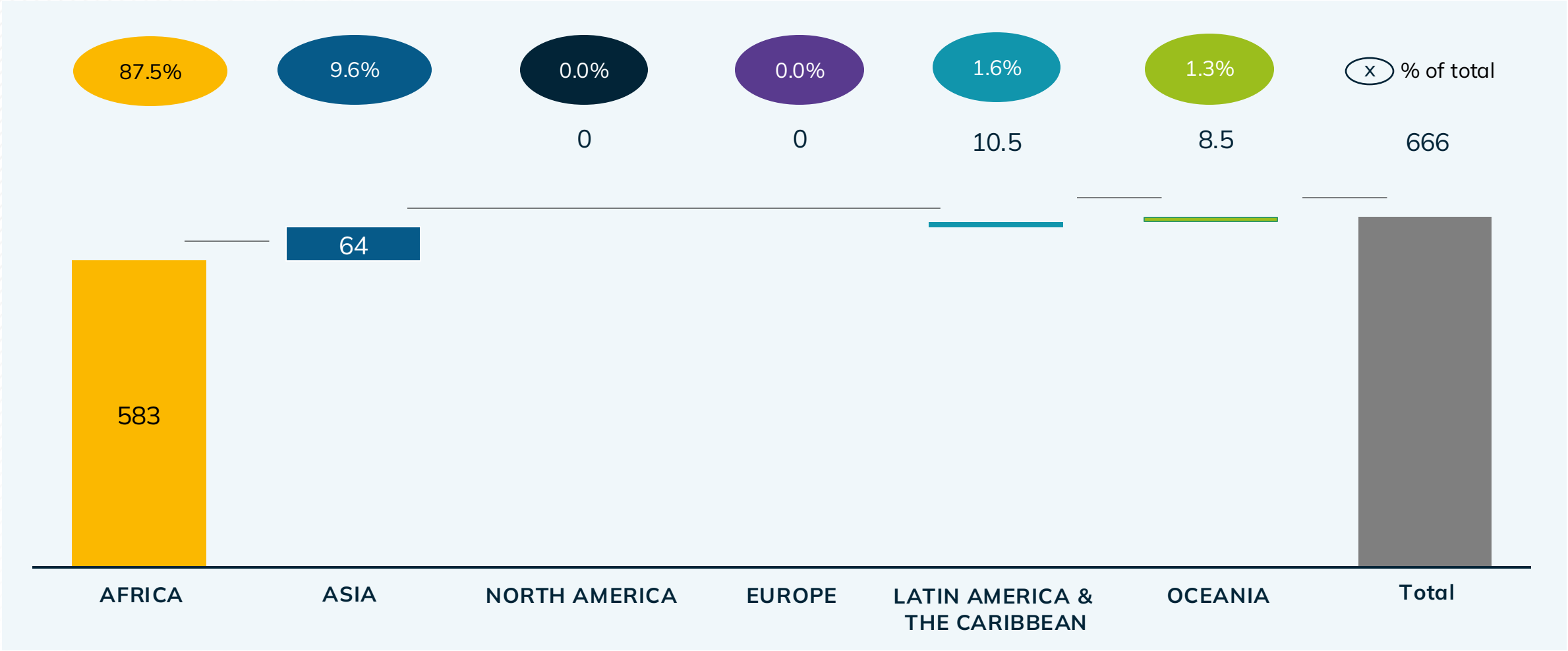
		ELECTRICITY ACCESS				
	TIER 0	TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
MINIMUM HOURS AVAILABLE PER DAY	<4 hours	4 hours	4 hours	8 hours	16 hours	23 hours
MINIMUM POWER	<3 W	3 W	50 W	200 W	800 W	2,000 W
MINIMUM DAILY POWER CAPACITY	<12 Wh	12 Wh	200 Wh	1,000 Wh	3,425 Wh	8,219 Wh

- The numbers presented above are only to supply the absolute minimum of each stage to each household.
- **The Modern Energy Minimum advocates universal electricity consumption of at least 1,000 kWh** (of which approx. 300 kWh at the residential level)**,** if we aspire for all people to reach an income of at least USD 2,500 per capita per year (or about USD 6.85 per day, midpoint for lower-middle income status), based on historical data.
- Meanwhile, this historical data does not include the **impacts of energy efficiency improvement,** which can make the same income level correlate to much less electricity consumption in the future. Hence, this should be considered as an indicative historical number, not an absolute minimum. What really matters is **energy service contents** enabled by a certain consumption level and **their impacts on people's lives.**

SOURCE: Beyond Connections: Energy Access Redefined, ESMAP, 2015; ENERGY FOR GROWTH HUB (2021) The Modern Energy Minimum: The case for a new global electricity consumption threshold; 2025 Tracking SDG7 Report

There are ~666 million people globally without access to electricity as of 2023. This represents an 18.8 million decrease from the previous year.

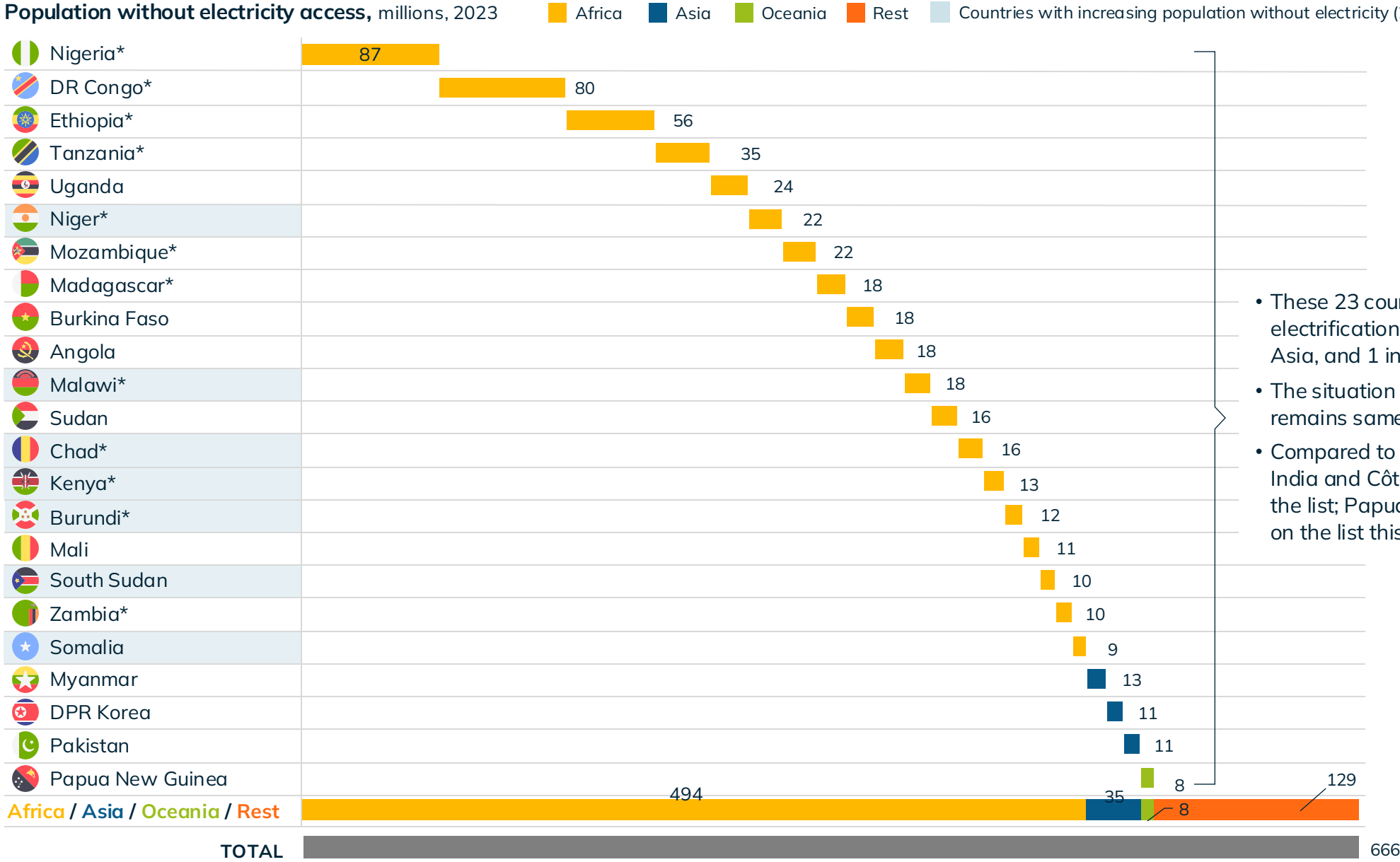
Population without electricity access[1] by region, millions, 2023



1 Electricity access is defined as a household being connected to an electricity supply at Tier 1 and above

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

23 countries make up 80% of the electrification gap and 19 countries are in Africa

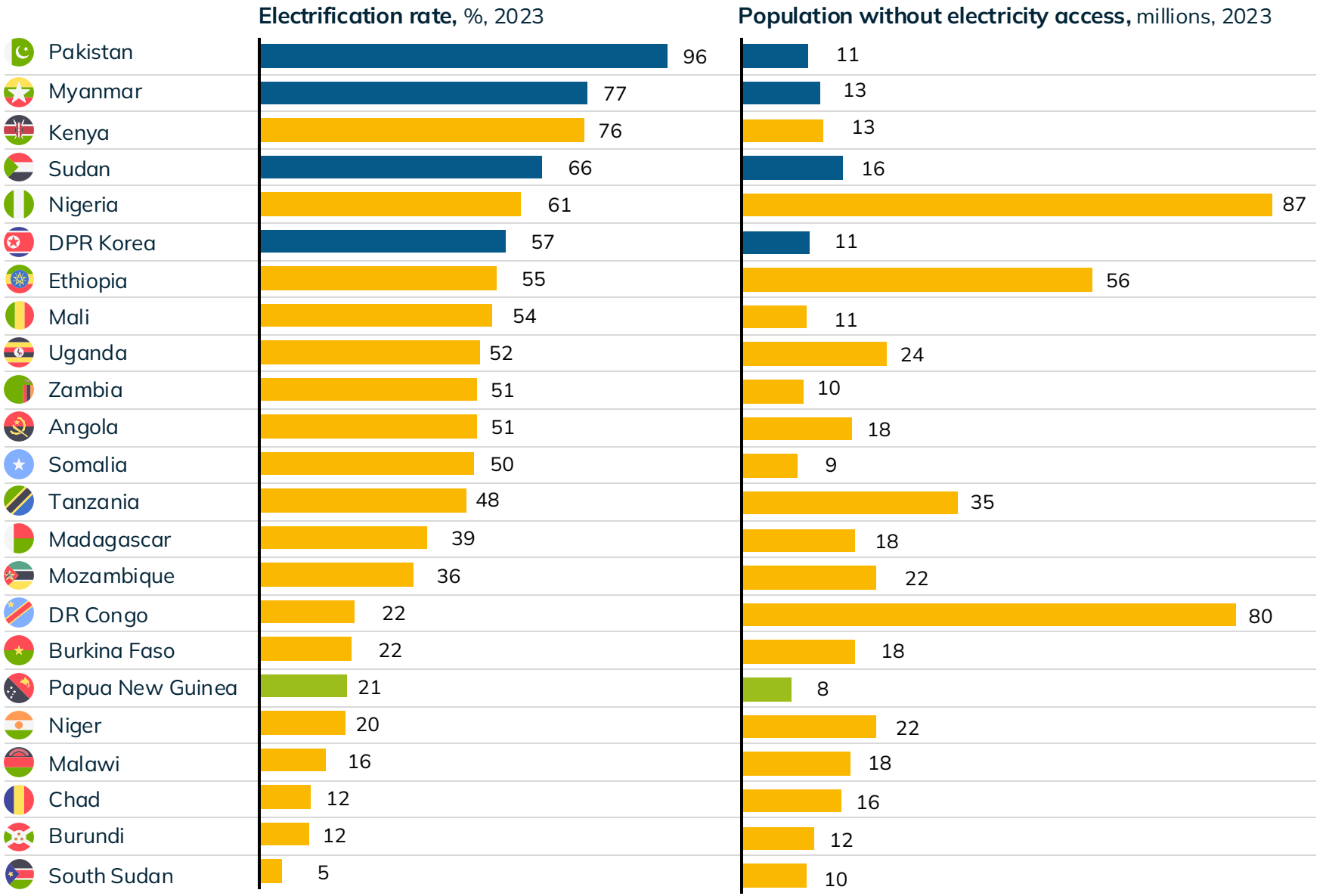


- These 23 countries make up 80% of the electrification challenge (19 in Africa, 3 in Asia, and 1 in Oceania).
- The situation (country and ranking) largely remains same since last year's analysis.
- Compared to the previous year's analysis, India and Côte d'Ivoire no longer appear on the list; Papua New Guinea newly appears on the list this year.

* Countries have Mission 300 National Energy Compact by Oct. 2025

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

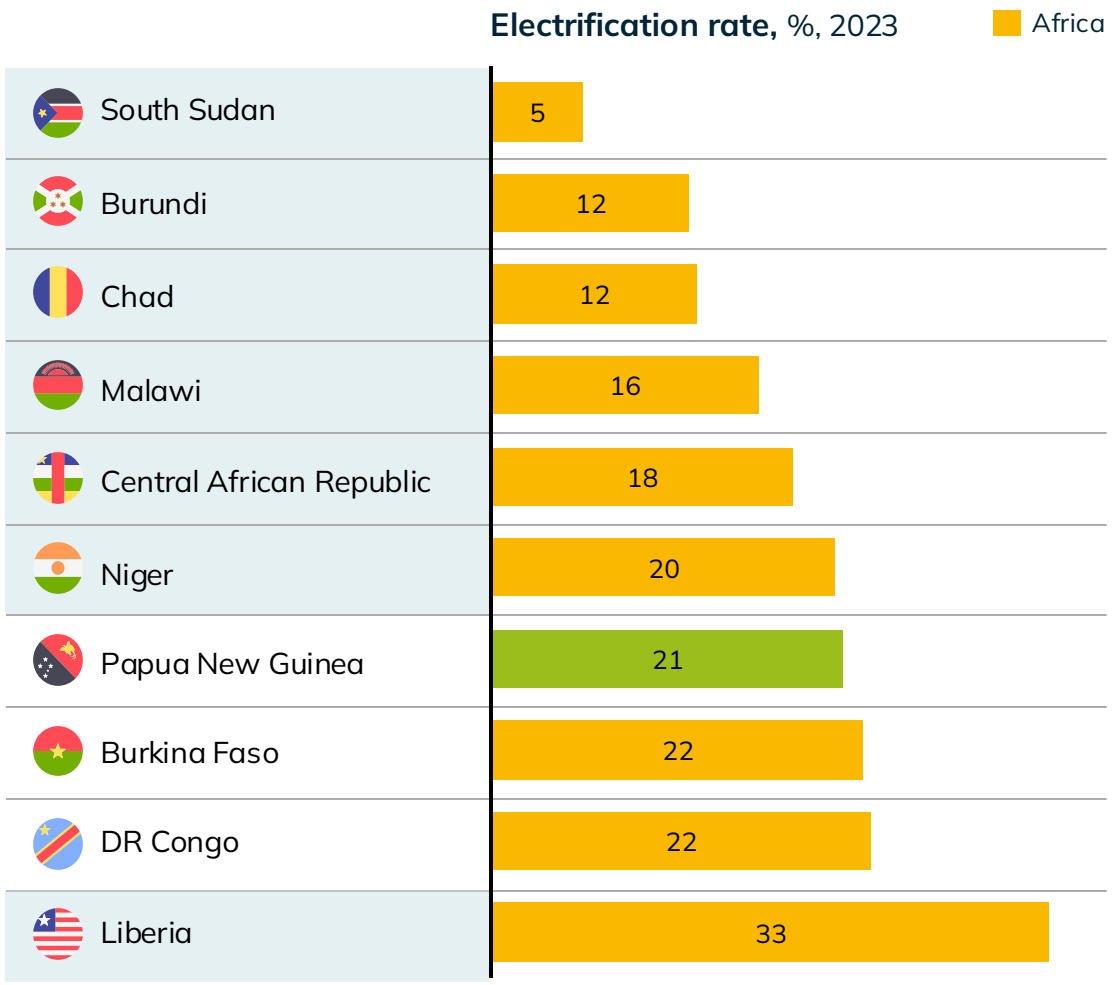
Among the 23 countries with the largest access gaps, Asian countries have higher electrification rates than African countries



- Only 8 out of the 19 African countries have electricity access rates of 50% or higher.
- Nigeria has the largest unelectrified population, followed by DR Congo and Ethiopia.
- Although Asian countries have fewer people left to electrify compared to African countries, they face the difficulty of sustained last-mile electrification. The numbers for Pakistan, Myanmar, and DPR Korea have improved marginally from 2022-2023, thus validating the point above.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Top 10 countries with the lowest electrification rates

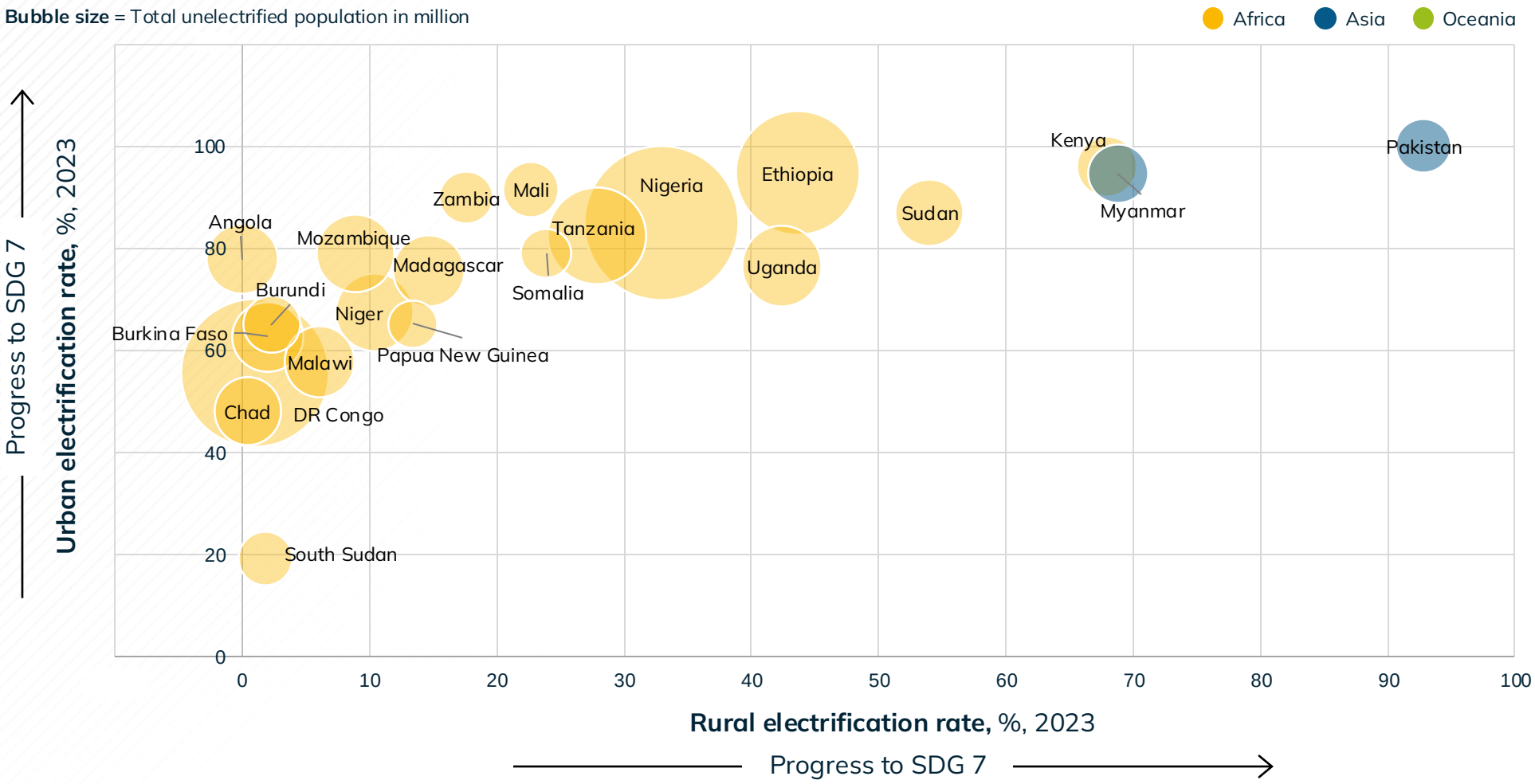


- Half of the top 10 countries with the lowest electrification rates have less than 20% access.
- Backsliding in the top 6 countries with the lowest electrification rates indicates that the most vulnerable populations are falling further behind, as population growth outpaces new access, highlighting the urgent need to accelerate access efforts.
- Significant overlap between relative and absolute gaps: 8 of the top 10 lowest-access countries are part of the 23 largest-gap countries.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Both Asia and Africa need strong rural push, while most African countries also need urban electrification progress

Rural vs Urban electrification rates (top 23 countries), 2023



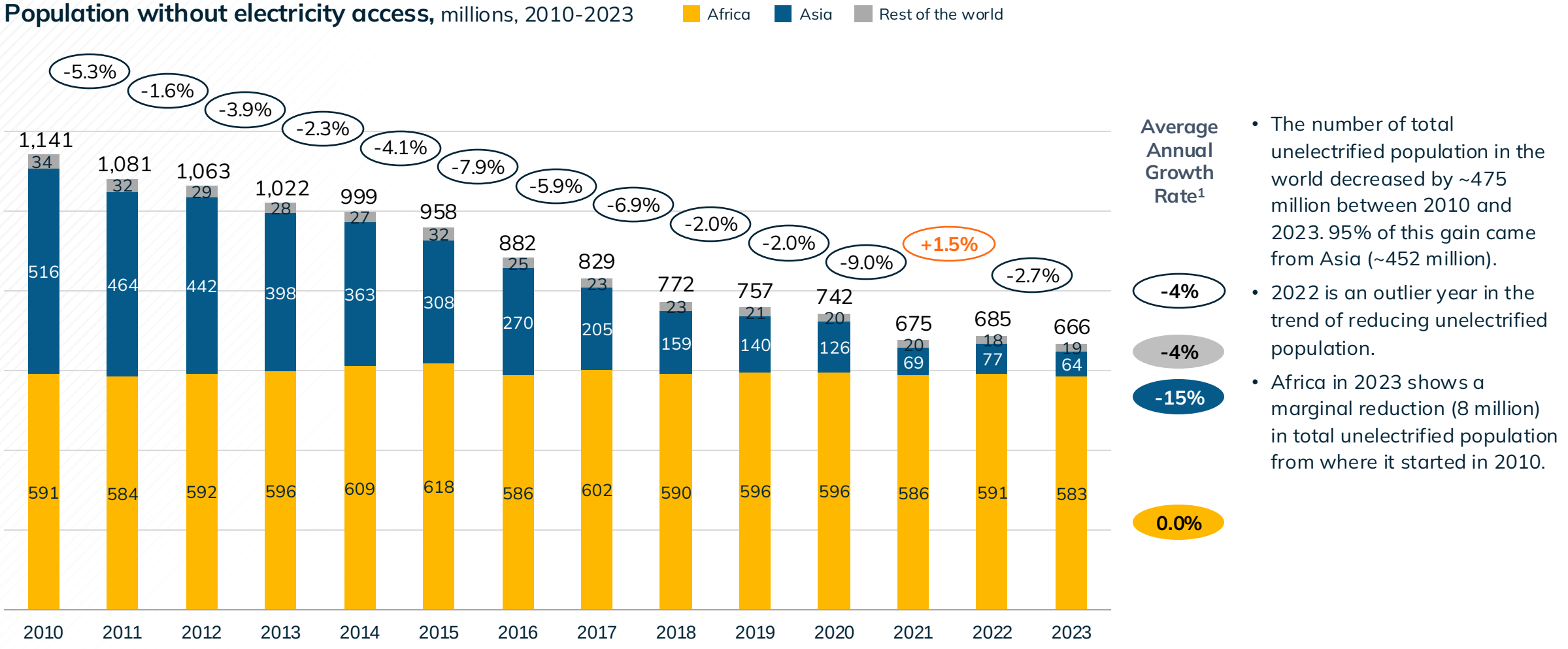
- As evident for Pakistan and Myanmar, focusing on last mile electrification, is the key for Asian countries to advance rural electrification.
- Sub-Saharan Africa has 80% urban electrification rate, but rural electrification rates of just 36.6%. Simultaneous urban push and massive roll-out of rural electrification schemes while stopping backsliding are required for all countries.

NOTE: Both urban and rural rates of DPR Korea were not available for any years from the 2025 database. Therefore, DPR Korea is not on this graph. Angola's rural rate is not available in the 2025 database.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

2023 saw a reduction in total unelectrified population, consistent with the trend from 2010-2021. While Asia has been significant reduction in unelectrified population, Africa is stagnant.

Population without electricity access, millions, 2010-2023



Average Annual Growth Rate[1]

- -4%
- -4%
- -15%
- 0.0%

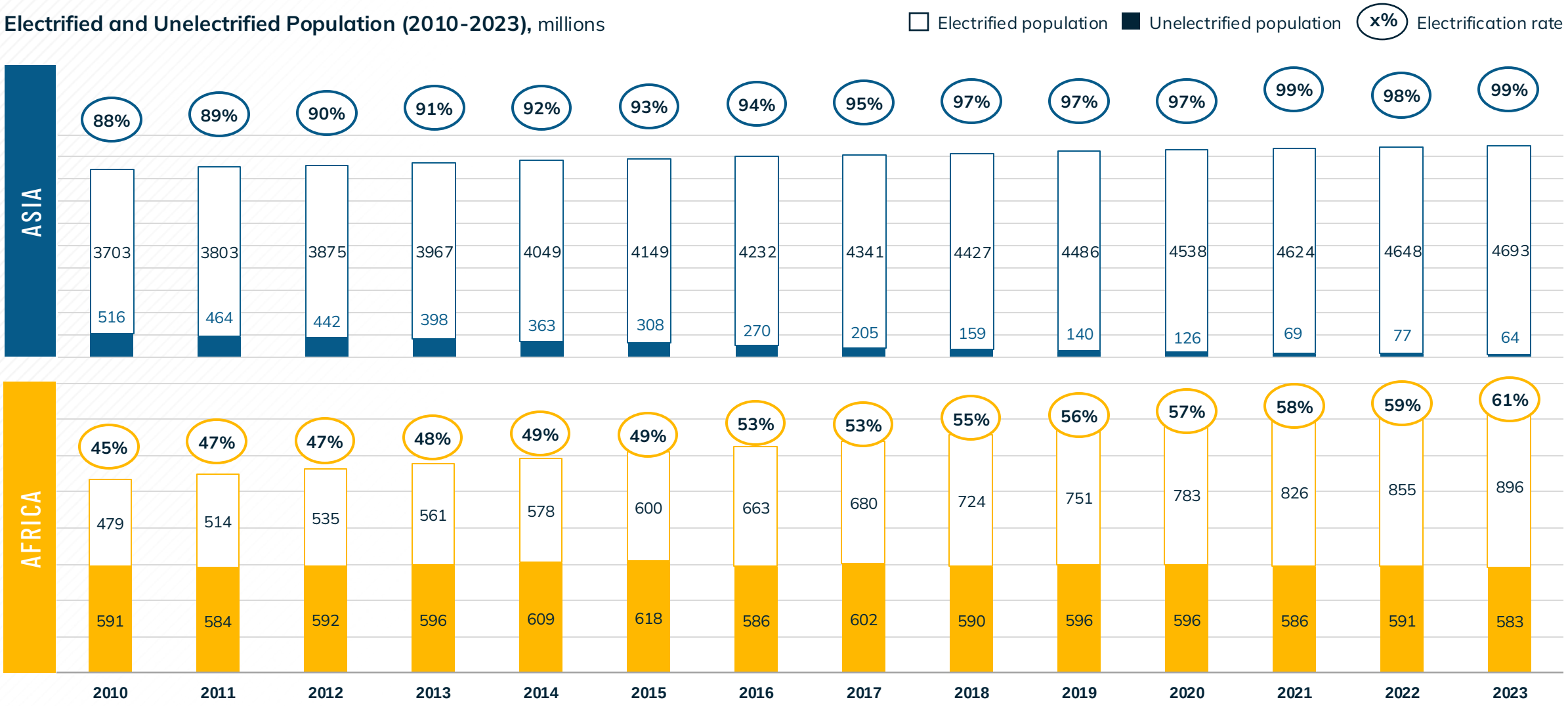
- The number of total unelectrified population in the world decreased by ~475 million between 2010 and 2023. 95% of this gain came from Asia (~452 million).
- 2022 is an outlier year in the trend of reducing unelectrified population.
- Africa in 2023 shows a marginal reduction (8 million) in total unelectrified population from where it started in 2010.

1 2010 – 2023 Compound annual growth rate = the average annual growth rate

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Africa's unelectrified population stays the same as 2011, while Asia has struggled to reach universal access for multiple years.

Electrified and Unelectrified Population (2010-2023), millions



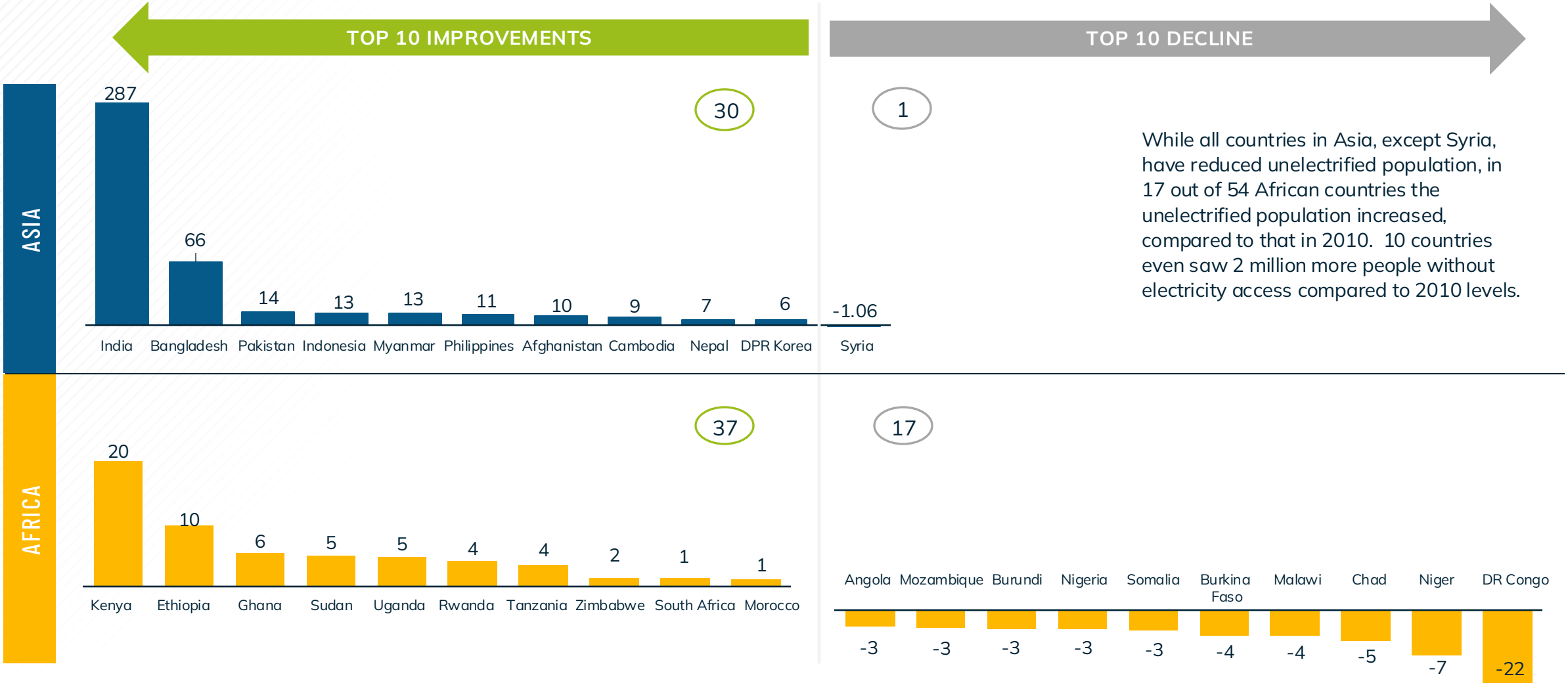
SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Open Data – Total Population downloaded on July 4th 2025

17 African countries show the number of unelectrified population backsliding from 2010

Reduction in unelectrified population between 2010 and 2023, millions

x Number of countries with improvements

x Number of countries with decline



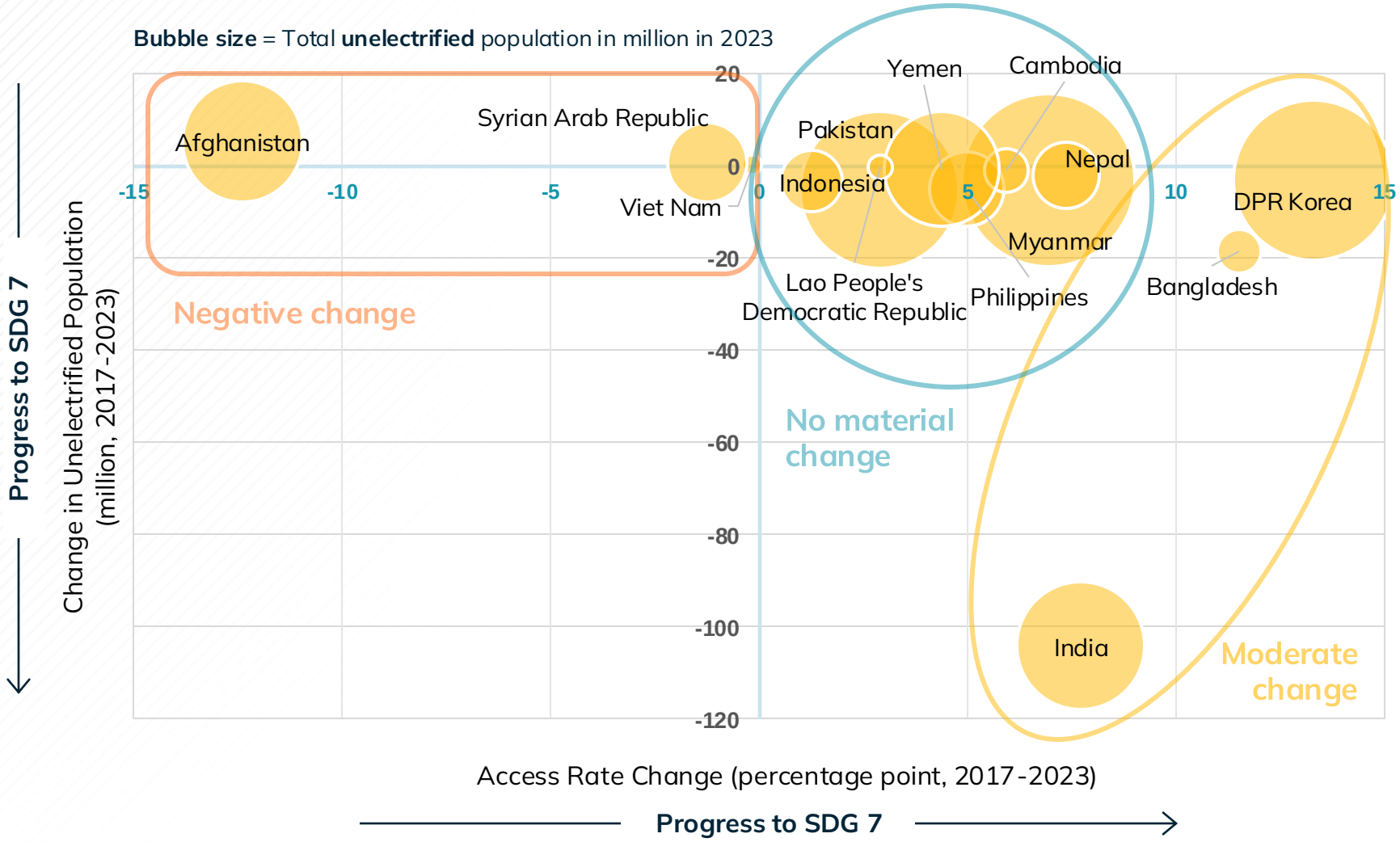
While all countries in Asia, except Syria, have reduced unelectrified population, in 17 out of 54 African countries the unelectrified population increased, compared to that in 2010. 10 countries even saw 2 million more people without electricity access compared to 2010 levels.

NOTE: These figures represent the absolute change in the number of unelectrified people between 2010 and 2023 and does not account for changes in the population due to birth rates, human migration etc.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Electricity access: Deep dive on Asia

Changes in population without access and in electricity access rates between 2017 and 2023



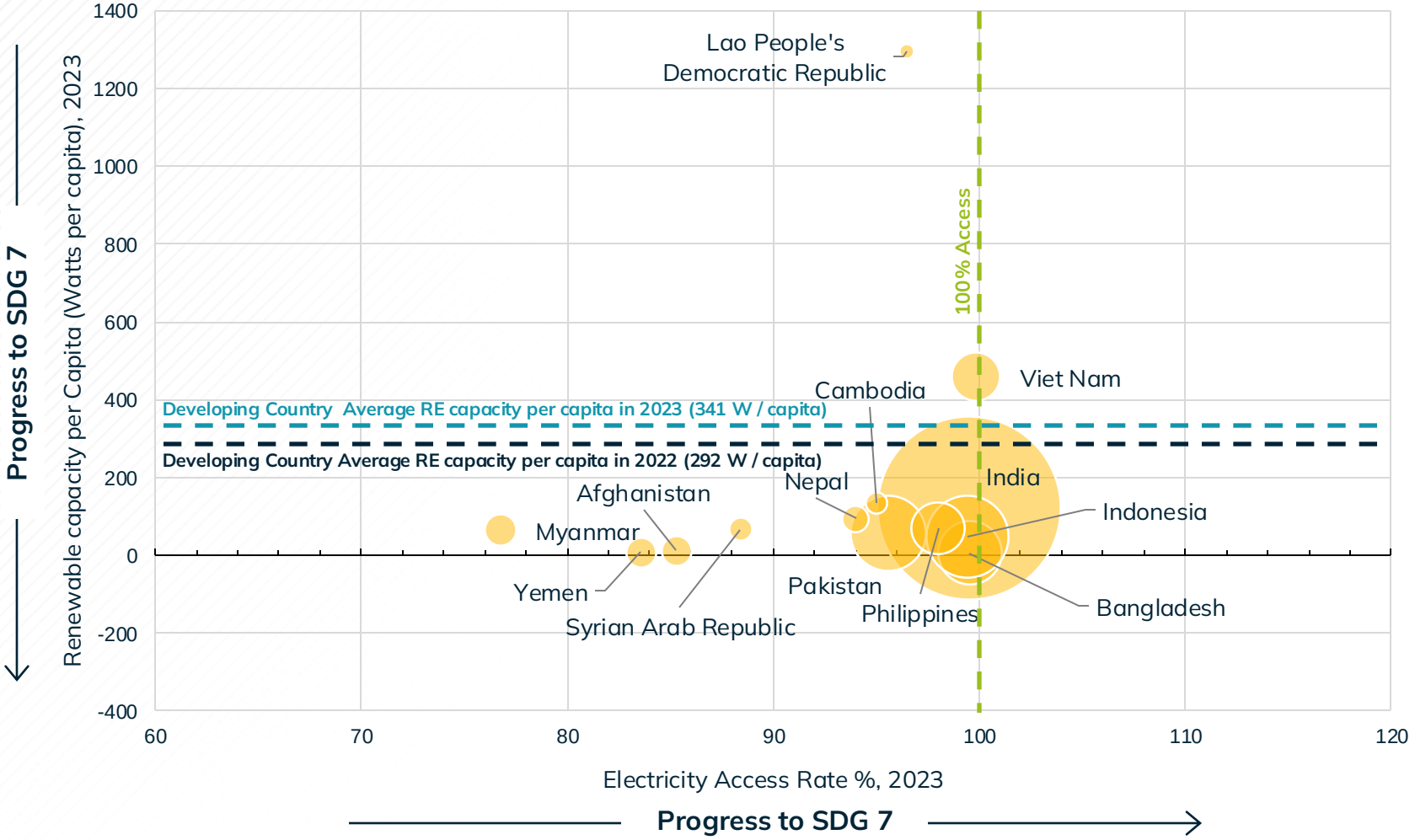
- An analysis of recent 7 data years reveals that Afghanistan, Syria and Viet Nam have been backsliding in access rate and increased unelectrified populations. Strong attentions and actions are needed to reverse the trend.
- DPR Korea and Bangladesh lead in improving electricity access rates in recent years, but because of its vast population, India has a greater impact on the total number of people gaining access.
- Other countries saw modest gains in electricity access rates, but population growth offset these improvements, preventing a significant reduction in their unelectrified populations.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Many Asian countries need to focus on increasing renewable capacity per capita while achieving universal electricity access

Electrified Population, Electricity Access Rate, and Renewable capacity per capita by country in Asia 2023

Bubble size = Total **electrified** population in million in 2023



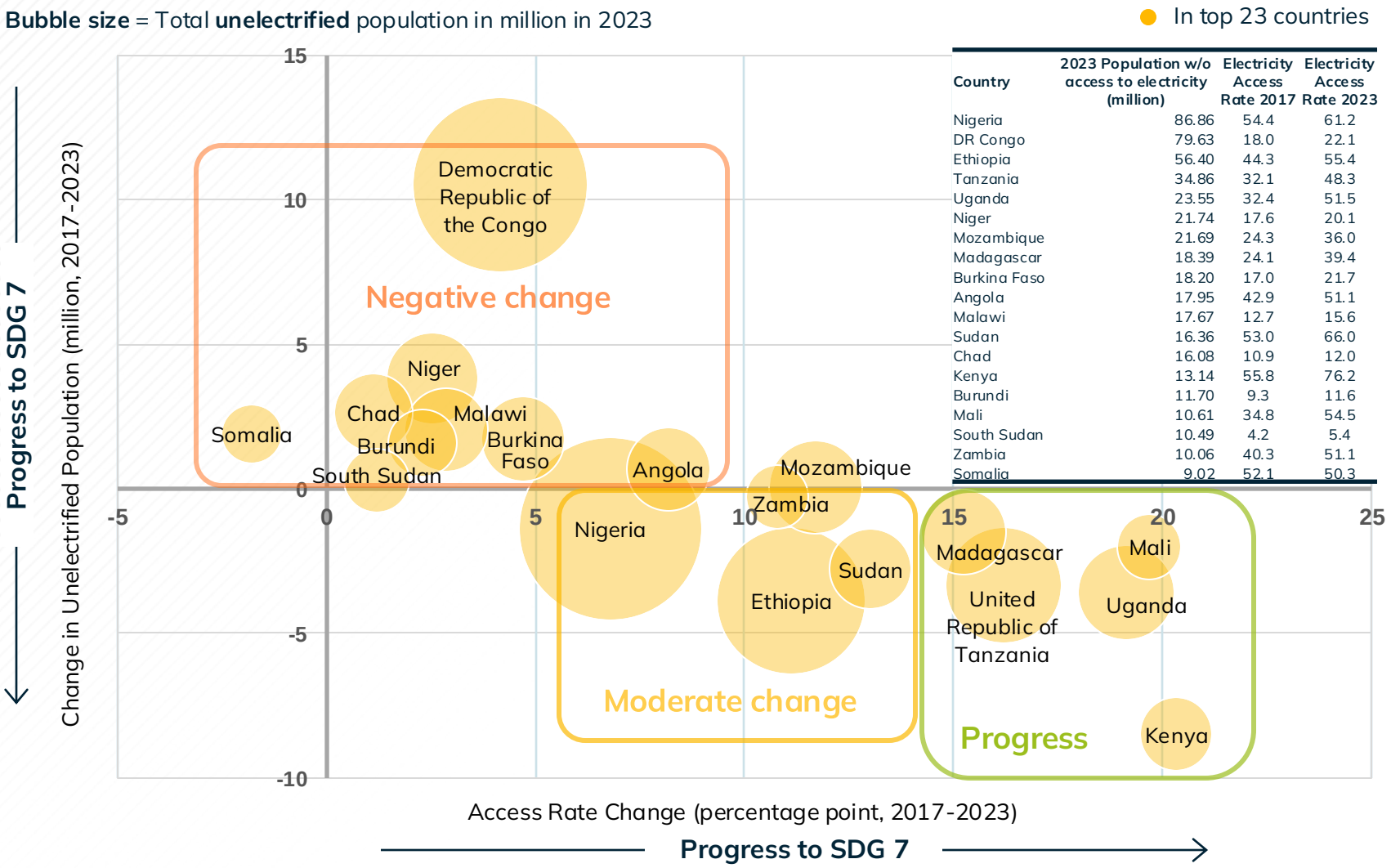
- Developing counties' average renewable power installed capacity per capita increased by 49 W / capita from 2022. However, the progress of Asian countries was much lower.
- Many Asian developing countries have more than 90% access rates, except Myanmar, Yemen, Syrian Arab Republic, and Afghanistan. However, their renewable capacity per capita are much lower than the developing country average (341 W / capita), indicating their newly gained access could be low Tier access such as Tier 1, 2 or lower Tier 3.
- To provide Modern Energy Service with clean energy for all, these Asian countries need to increase supply from renewable energy. Asian electricity access strategy needs to turn its attention to creating win-win situation of higher energy consumption with renewable energy provision.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Electricity access: Deep dive on Africa (Top 23 Access Deficit countries)

2023 Population without access vs Changes in population without access and in electricity access rates *between 2017 and 2023*

Bubble size = Total **unelectrified** population in million in 2023



Country	2023 Population w/o access to electricity (million)	Electricity Access Rate 2017	Electricity Access Rate 2023
Nigeria	86.86	54.4	61.2
DR Congo	79.63	18.0	22.1
Ethiopia	56.40	44.3	55.4
Tanzania	34.86	32.1	48.3
Uganda	23.55	32.4	51.5
Niger	21.74	17.6	20.1
Mozambique	21.69	24.3	36.0
Madagascar	18.39	24.1	39.4
Burkina Faso	18.20	17.0	21.7
Angola	17.95	42.9	51.1
Malawi	17.67	12.7	15.6
Sudan	16.36	53.0	66.0
Chad	16.08	10.9	12.0
Kenya	13.14	55.8	76.2
Burundi	11.70	9.3	11.6
Mali	10.61	34.8	54.5
South Sudan	10.49	4.2	5.4
Zambia	10.06	40.3	51.1
Somalia	9.02	52.1	50.3

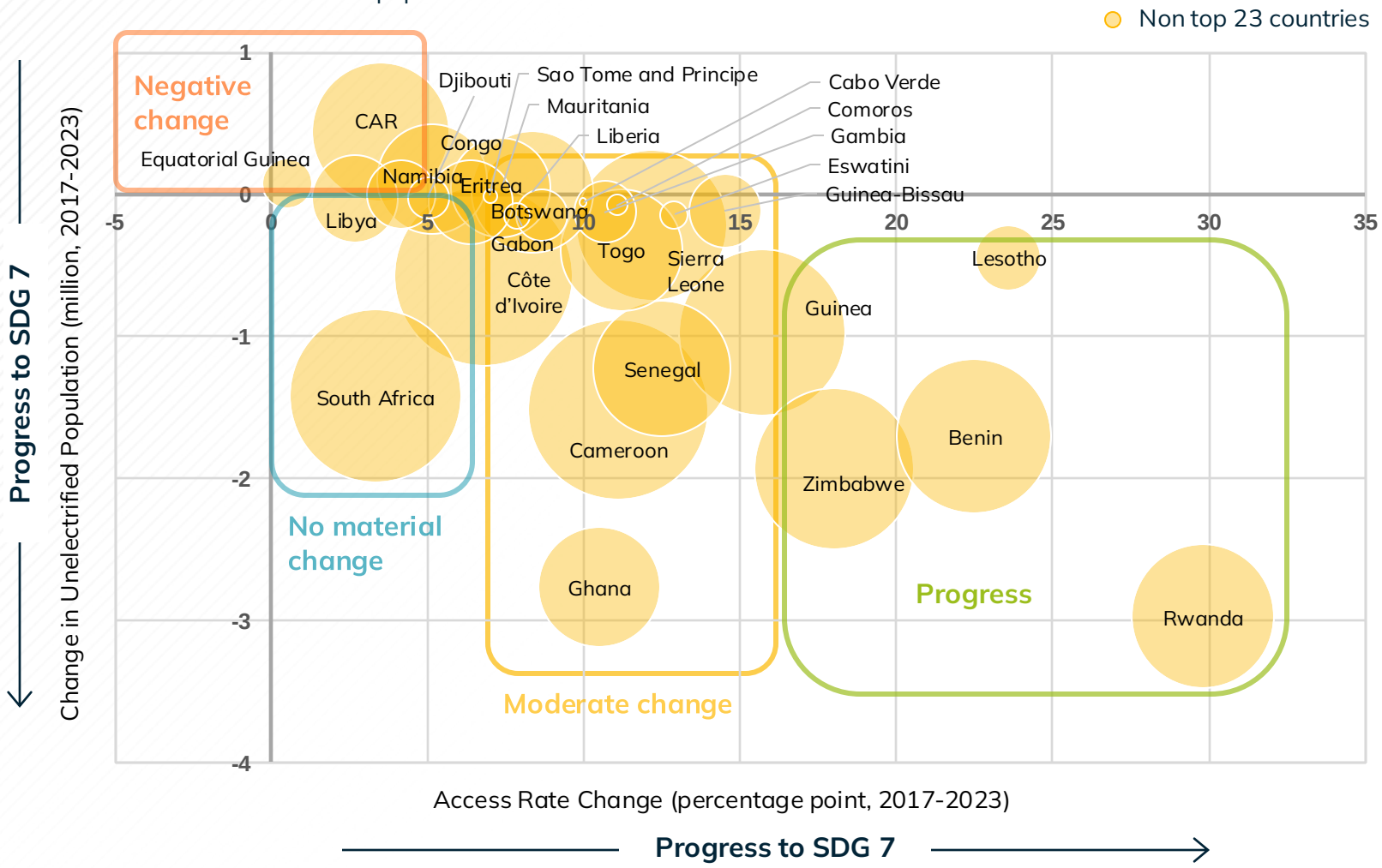
- 10 African countries in top 24 access deficit countries have less than 50% access rates in 2023.
- Kenya, Uganda, Mali, Tanzania, Madagascar, Sudan, Ethiopia, Zambia, and Nigeria have increased access rates and reduced unelectrified population.
- Meanwhile Somalia has been reducing access rate and increasing unelectrified population in recent years.
- Mozambique's unelectrified population has been stable, while it improved its access rate
- Other 8 countries increased access rate but the number of unelectrified population increased.
- All countries with increased unelectrified population since 2017 need to fortify the electrification effort regardless the remaining unelectrified population and access rate improvement.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Electricity access: Deep dive on Africa (non-Top 23 Access Deficit countries)

2023 Population without access vs Changes in population without access and in electricity access rates *between 2017 and 2023*

Bubble size = Total **unelectrified** population in million in 2023

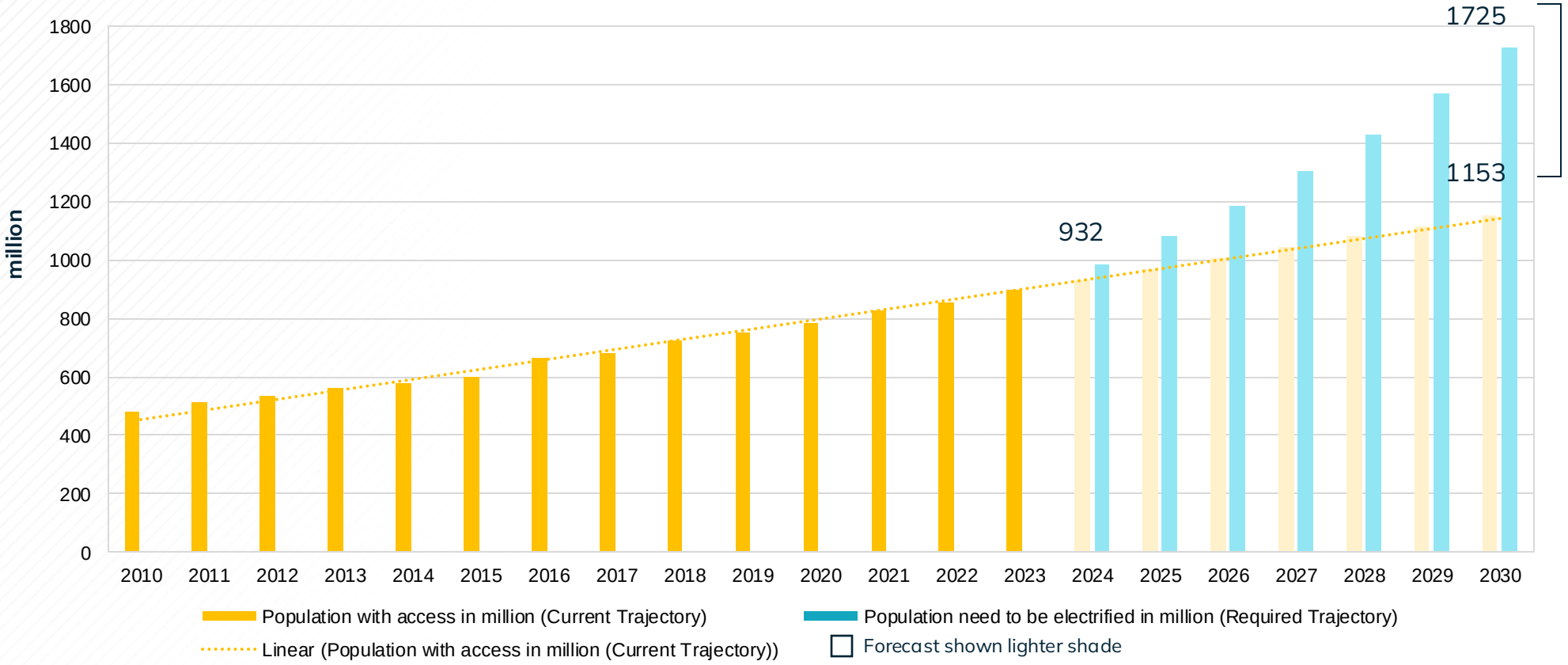


- All the 30 African countries that are not in Top 24 access deficit county list have shown improved access rates since 2017.
- Benin, Guinea, Lesotho, Rwanda, and Zimbabwe have shown strongest improvement in access rates.
- Meanwhile, Central African Republic, Equatorial Guinea, Congo, and Sao Tome and Principe had increased the numbers of unelectrified population despite their access rate improvement.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

With the current trajectory, Africa will still have 572 million people unelectrified in 2030

Current trend trajectory vs required trajectory to achieve electricity access in Africa



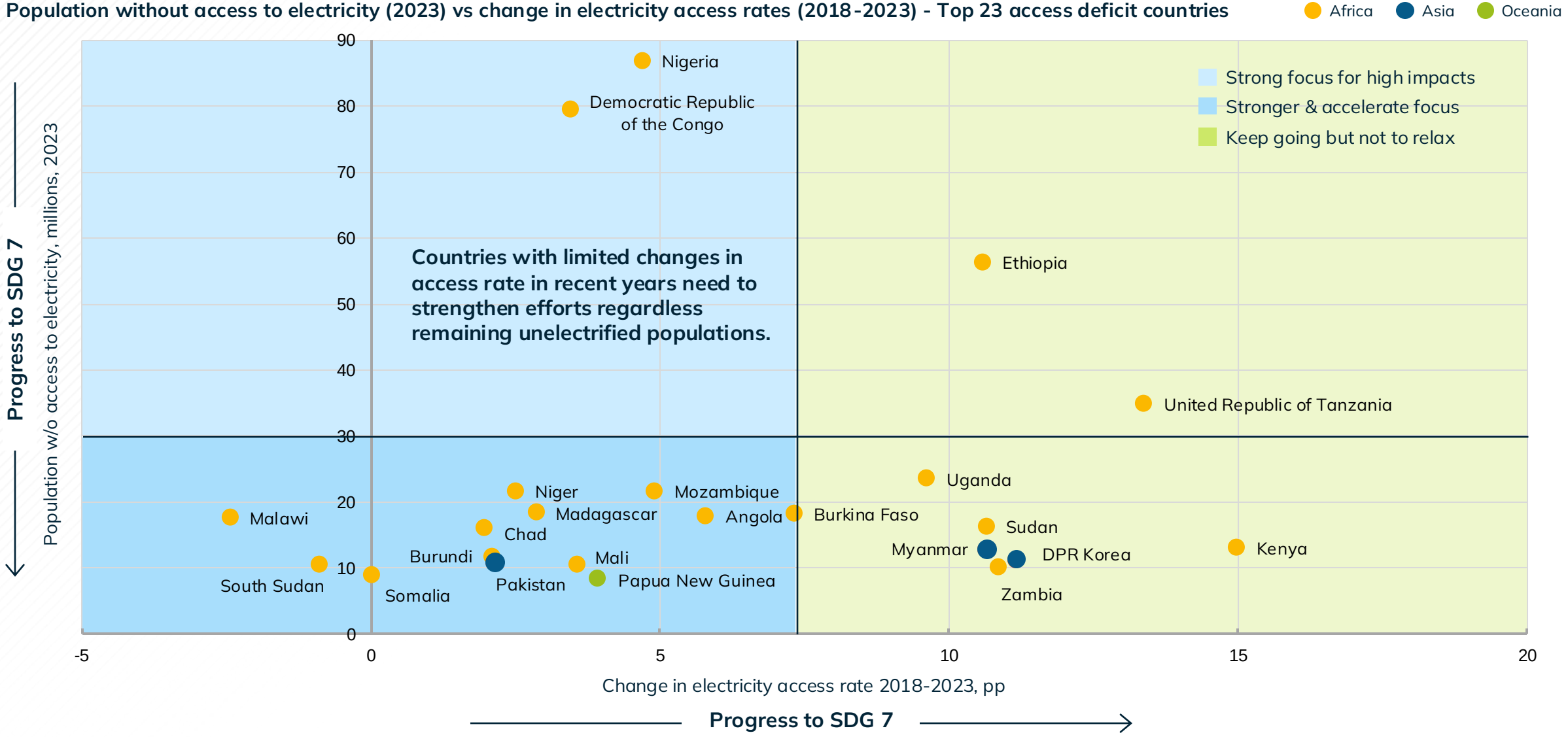
A straight-line projection based on the past three data year's growth rate shows that 572 million people will be unelectrified in Africa in 2030. This include 557 million in Sub-Saharan Africa.

NOTE: This projection is a simple straight-line projection based on historical growth rates

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 Report 2025 Datasets; World Bank Open Data – Total Population downloaded on July 4th 2025; World Bank Data Bank – Population Projections and Estimates downloaded on July 8th 2025;

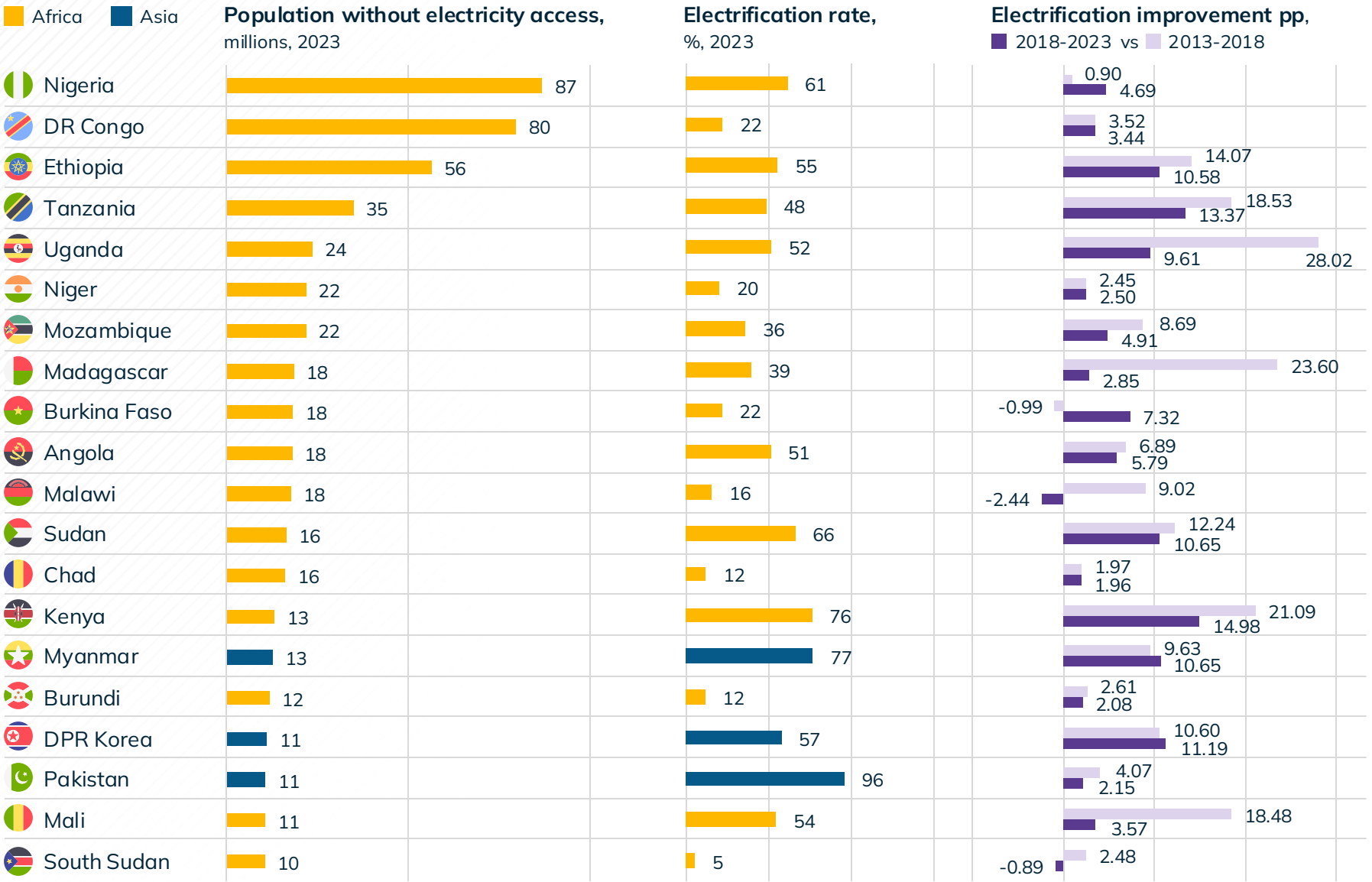
Countries with large unelectrified populations have high impact potential, but tailored strategies are needed for all slow progress and low access rate countries

Population without access to electricity (2023) vs change in electricity access rates (2018-2023) - Top 23 access deficit countries



SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Many countries that lost momentum to improve access rate in recently years require stronger focus, regardless the current number of population without electricity access

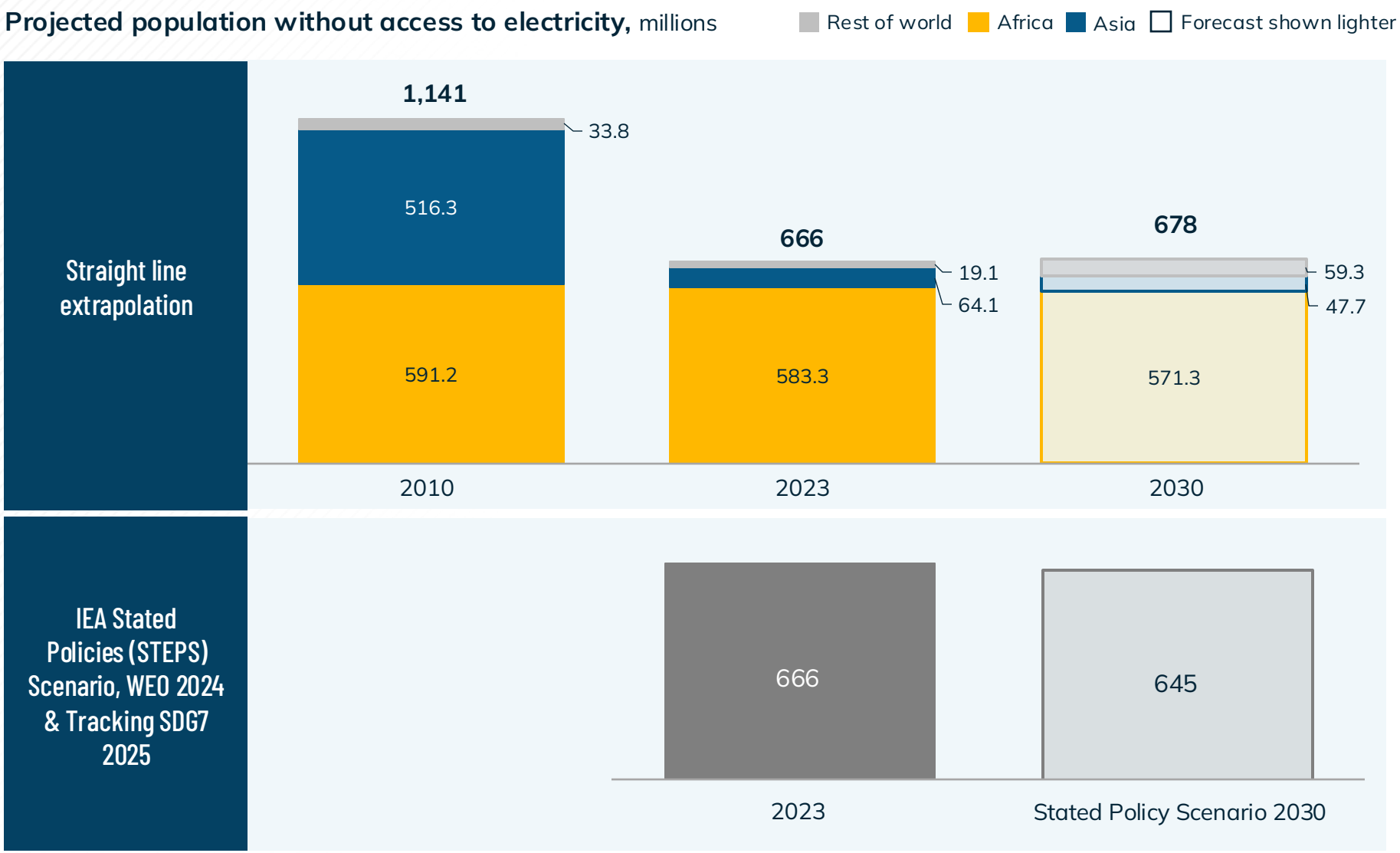


- While the countries in the chart are still making progress in energy access, the improvements for many of them over the past five years have been slower compared to the 2013–2018 period
- Strongly focused actions are needed to turn negative trends into positive ones

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Projections show that we are not on track to reach universal electricity access by 2030

Projected population without access to electricity, millions



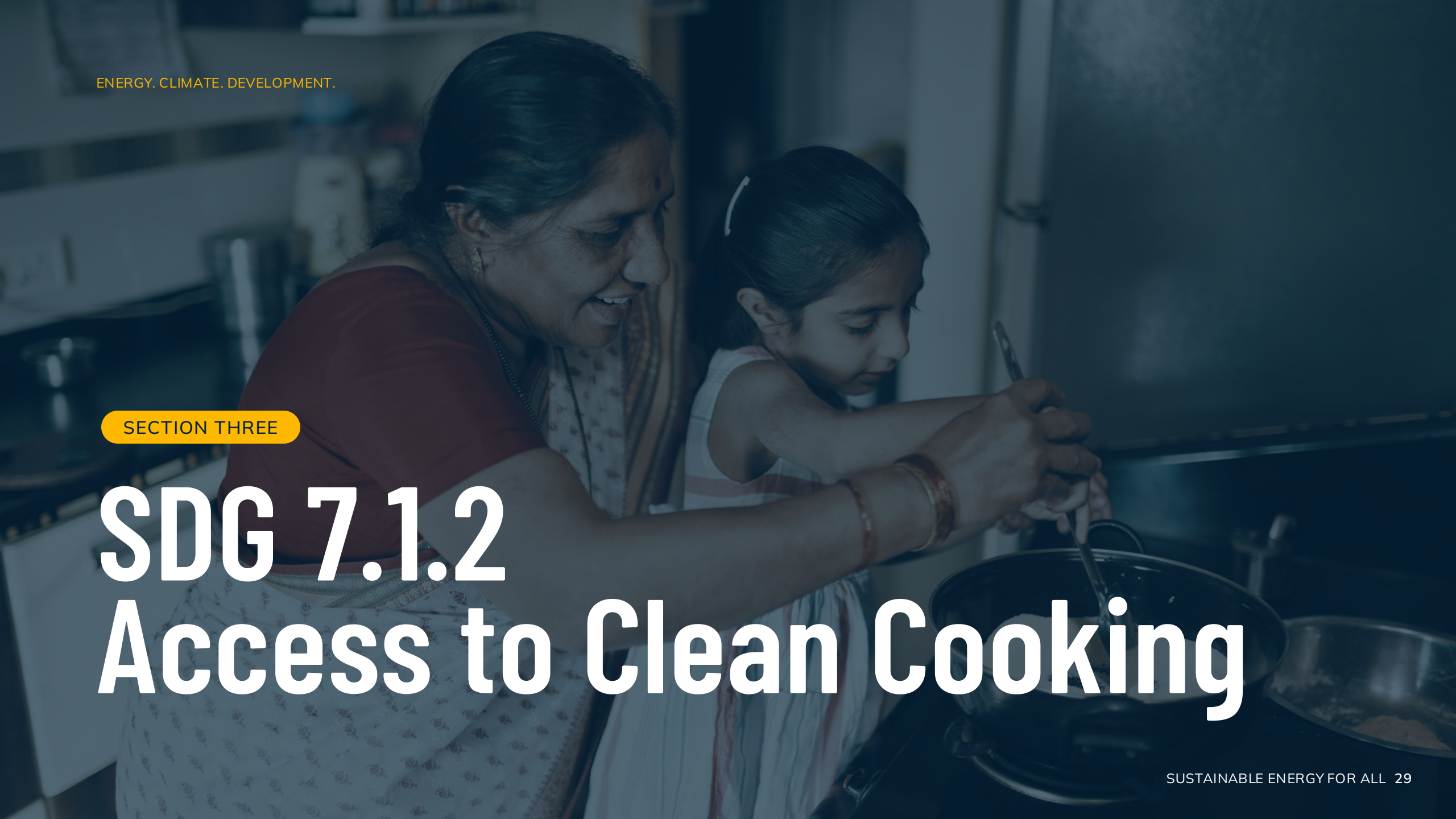
With a straight-line projection with the current rates of electrification,

- globally 17 additional countries will achieve universal access by 2030, including 6 Asian countries and 1 African country (the lists in appendix)
- 8 Asian countries would still have unelectrified populations (list in appendix) in 2030
- 18 African countries will still have significant unelectrified populations of ~10 million or more (list in appendix) in 2030

Under IEA's Net Zero Emissions by 2050 Scenario, achieving universal electricity access in developing economies requires average annual investments of USD 30 billion.

NOTE: For the 2024 report, the Electricity Access figure for Afghanistan was revised downwards using MICS data, as specified under agreed methodology. The country's unelectrified population dramatically increased in 2022 data as a result. The country's projection, therefore, took annual improvement rate from 2015, instead of the recent three years.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report & its Datasets, IEA World Energy Outlook 2024



SECTION THREE

SDG 7.1.2 Access to Clean Cooking

SDG 7.1.2 Access to Clean Cooking

There are currently 2.1 billion people without access to clean fuels and technologies for cooking with roughly 47% in Asia and Africa respectively.

- 74% of the people without access live in just 20 countries with 9 of them in Asia and the remaining 11 in Africa
- Asian countries in this 20 high-impact group mostly have higher access rates than their African counterparts. However, Asia's large population size makes the absolute number without access larger than that of African countries.
- Only 4 of the 11 African countries (Ethiopia, Ghana, Kenya, and Nigeria) in the 20 high-impact countries have access rates over 10%.

The global average annual reduction rate of the population without clean cooking access since 2010 is around 3%

- Asia's progress is stronger than other regions with annual improvement rate of 6.1% since 2010. The population without access has declined from 2.1 billion to 983 million in the region. While 24 Asian countries reduced the population without access, 10 countries went backward since 2010.
- The population without clean cooking access in Africa has increased by 186 million (from ~789 million to ~975 million) since 2010, with annual average growth rate of 1.8%. 38 African countries increased the population without access since 2010 while 14 countries reduced the numbers.

Looking forward, based on the current trends, we are not on track to achieve SDG 7.1.2 by 2030

- A current trend projection and the IEA's scenario analysis show that we are not on track to achieve universal access to clean fuels and technologies for cooking by 2030, as between 1.7 and 1.8 billion people are expected to remain without clean cooking access
- India, China, Indonesia, Nigeria, Pakistan and Ethiopia, will likely remain with more than 100 million people without clean cooking access, and all other top 20 access deficit countries will also have more than 20 million population without access. These countries can be prioritized for higher impacts on SDG7.1.2 achievement.
- While the current annual global investment in clean cooking access is around 2.5 billion USD, this needs to be increased 3.2-fold to 8 billion USD annually by 2030 to achieve SDG7.1.2, according to the IEA.
- Electric cooking can be an option for solving both electricity and clean cooking access for 13 of high access deficit countries in both areas. However, it is not an easy task as well-coordinated planning accompanied with enabling policy and regulatory measures, realistic projects, and support investments are needed to provide higher tiers of electricity access for cooking and increased affordability.

Methodology - Description

Data Sources

- The following data was gathered from WORLD BANK / ESMAP's Tracking SDG 7 database (**download link**)
  - Total access rate to clean cooking per country
- The following data was gathered from WORLD BANK open data source
  - Total population per country between 2010-2024
  - Total population estimates per country from 2025 to 2030
- The following data was gathered from the IEA's publication
  - Clean Cooking Investment needs (A Vision for Clean Cooking Access for All, 2023)

Projections

- Straight line extrapolation projections toward 2030 were made via the following process
  - The average change made between 2018 and 2023 was calculated for Africa, Asia and the World
  - Each region's 2023 population without access to clean cooking was projected forwards to 2030 (by 7 years) by adding the calculated average change to the 2023 population 7 times
  - 0 was set as a minimum to prevent the unconnected population from being negative
  - Africa and Asia regions' projected population are subtracted from the World projection to obtain the remaining region's projection.
- IEA stated policy scenario was taken from the IEA's World Energy Outlook 2023 report and Tracking SDG 2025 report

Methodology – Description

Clean fuels for cooking

Clean fuels recommended by WHO[1] are

- LPG
- Ethanol
- Biogas
- Solar cookers
- Electricity

Improved technologies for cooking

Emissions rates for improved technologies are defined by the WHO1 and should be less than

- 0.23mg/min (unvented) and 0.8mg/min (vented) of $PM_{2.5}$[2]
- 0.16g/min (unvented) and 0.59g.min (vented) of CO

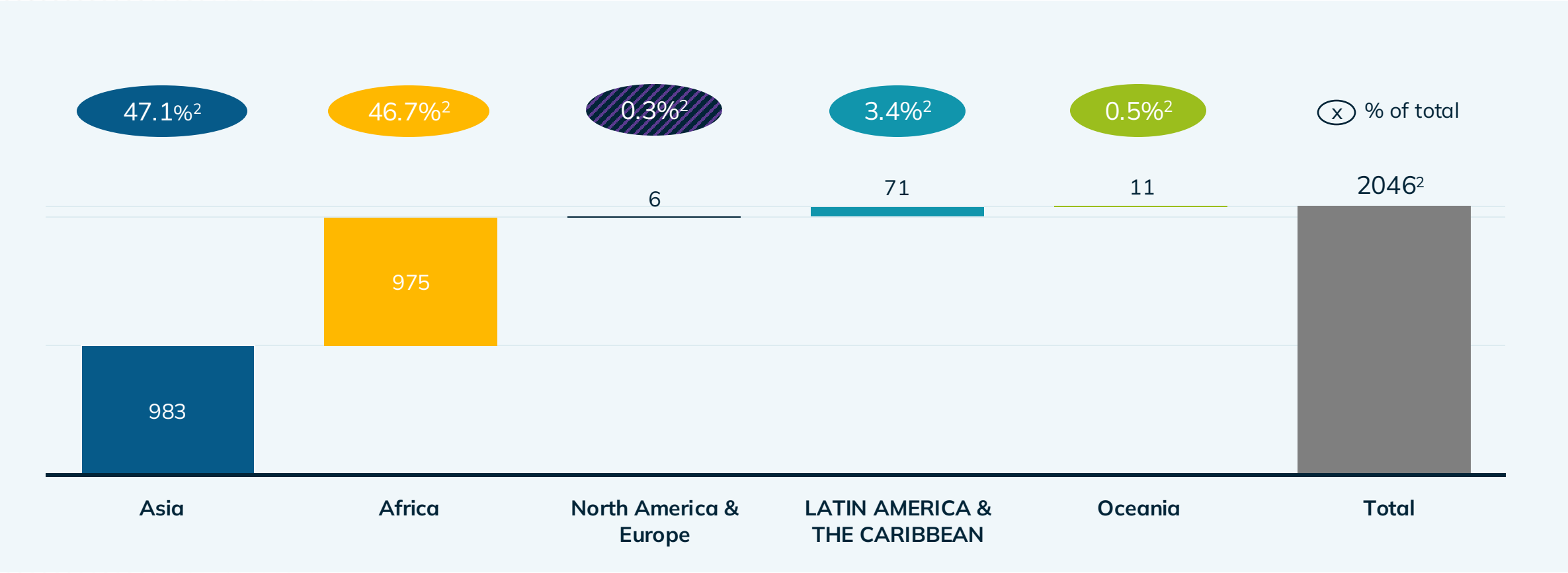
1 In the Normative guidance World Health Organization guidelines for indoor air quality: household fuel combustion

2 Atmospheric Particulate Matter with diameter less than 2.5 micrometers

SOURCE: Beyond Connections: Energy Access Redefined, ESMAP, 2015; WHO Guidelines for Indoor Air Quality, 2014

There are ~2.1 billion[2] people in the world without access to clean fuels and technologies for cooking

Population without access to clean fuels and technologies for cooking[1] by region, millions, 2023



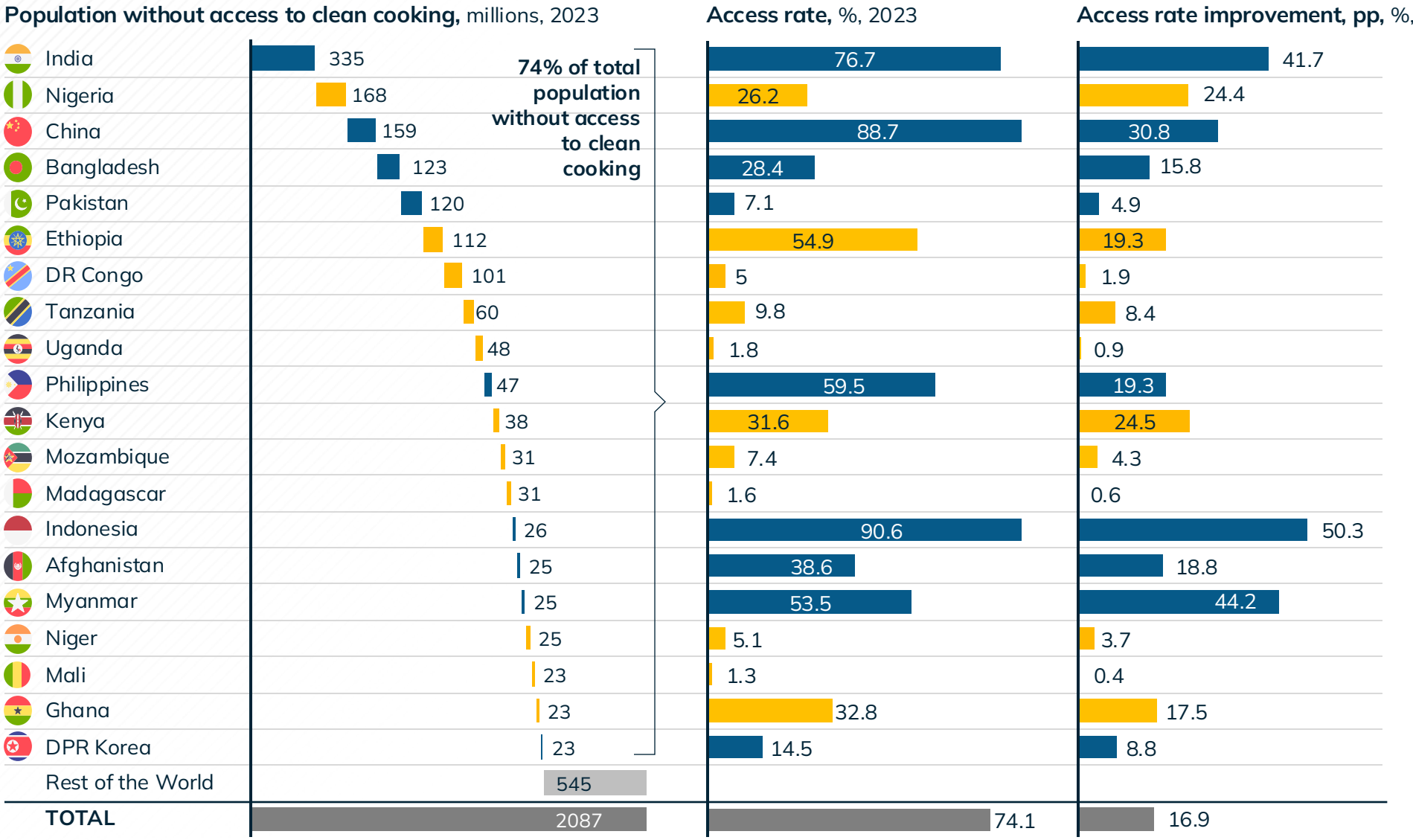
NOTES:

1 Clean cooking access is defined as a household using clean fuels or improved technologies for cooking as defined by the WHO

2 Due to lack of access rate data for various countries in the 2025 dataset as well as the possible data disparity of total population data used, there is 41 million difference between the population calculated without access using the world access rate (2087 million) in the report and the sum of all countries population without clean cooking access of individual countries and regions (2046 million) calculated by the datasets. This creates the sum of the shares of each region only adds up to 98.1%. The 2024 Tracking SDG7 dataset and the World Bank Total Population dataset as of July 2025, were used for calculation.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

Top 20 access deficit countries are in Africa and Asia, making up 74% of the access to clean cooking challenge

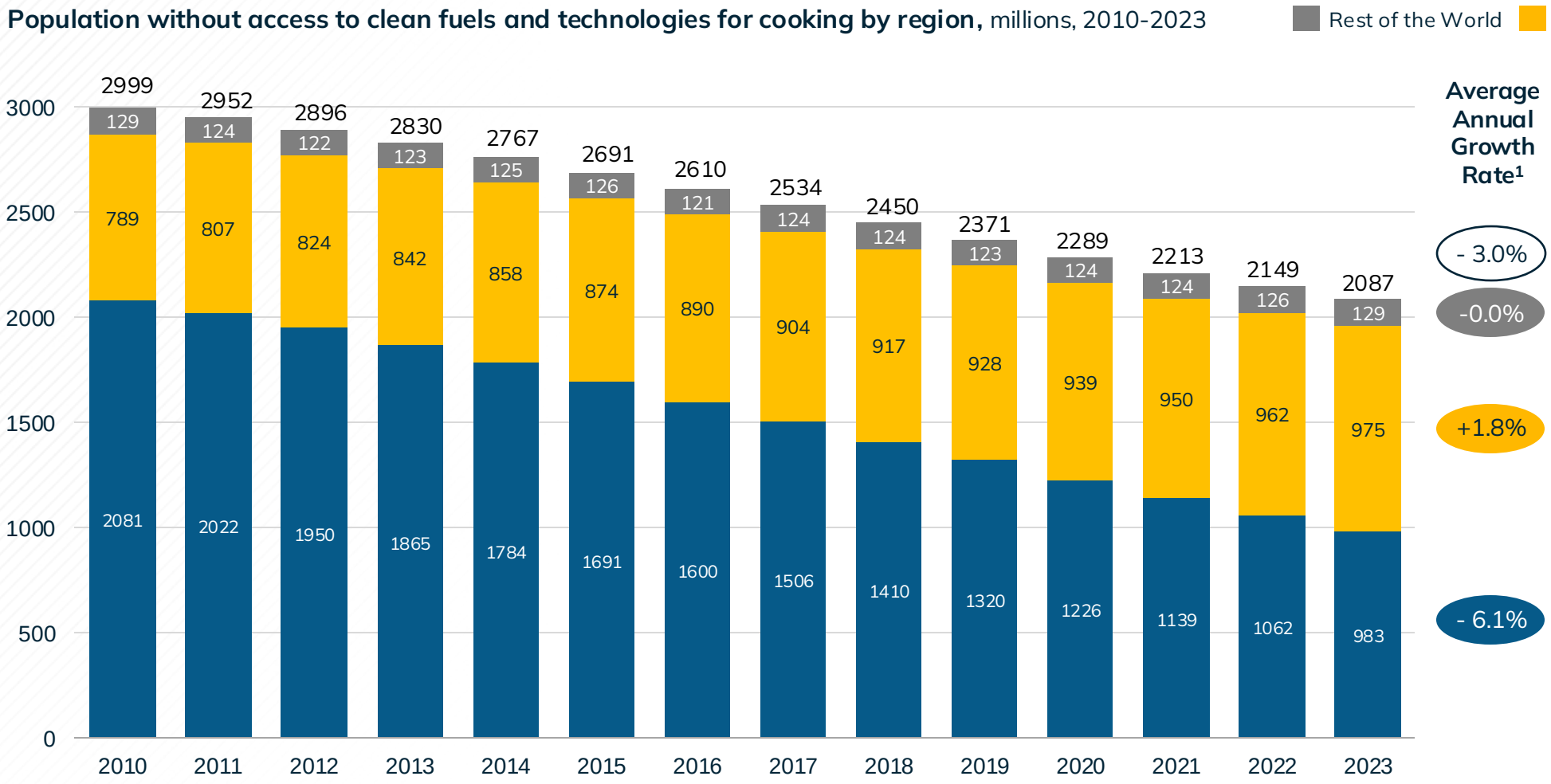


- 20 countries account for 74% of the clean cooking access gap. 9 are in Asia and 11 in Africa.
- 7 out of 11 African countries have access rates less than 10% and their progress rates are also very low.
- 5 Asian countries have more than 50% access rate. India and China are alone close to a quarter of world population without clean cooking access, however they have made good advancement in increasing access rates.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

The number of people without access to clean fuels and technologies for cooking has declined from 3 bn in 2010 to 2.1 bn in 2023

Population without access to clean fuels and technologies for cooking by region, millions, 2010-2023



Average Annual Growth Rate[1]

- 3.0%

-0.0%

+1.8%

- 6.1%

- Progress of increasing access to clean cooking has been slow over the past decade.
- Asia has reduced its access deficit population by 53% since 2010, but its large population means it is on par with Africa in the number of people without clean cooking access.
- The number of people without access in Africa shows 24% increase since 2010.

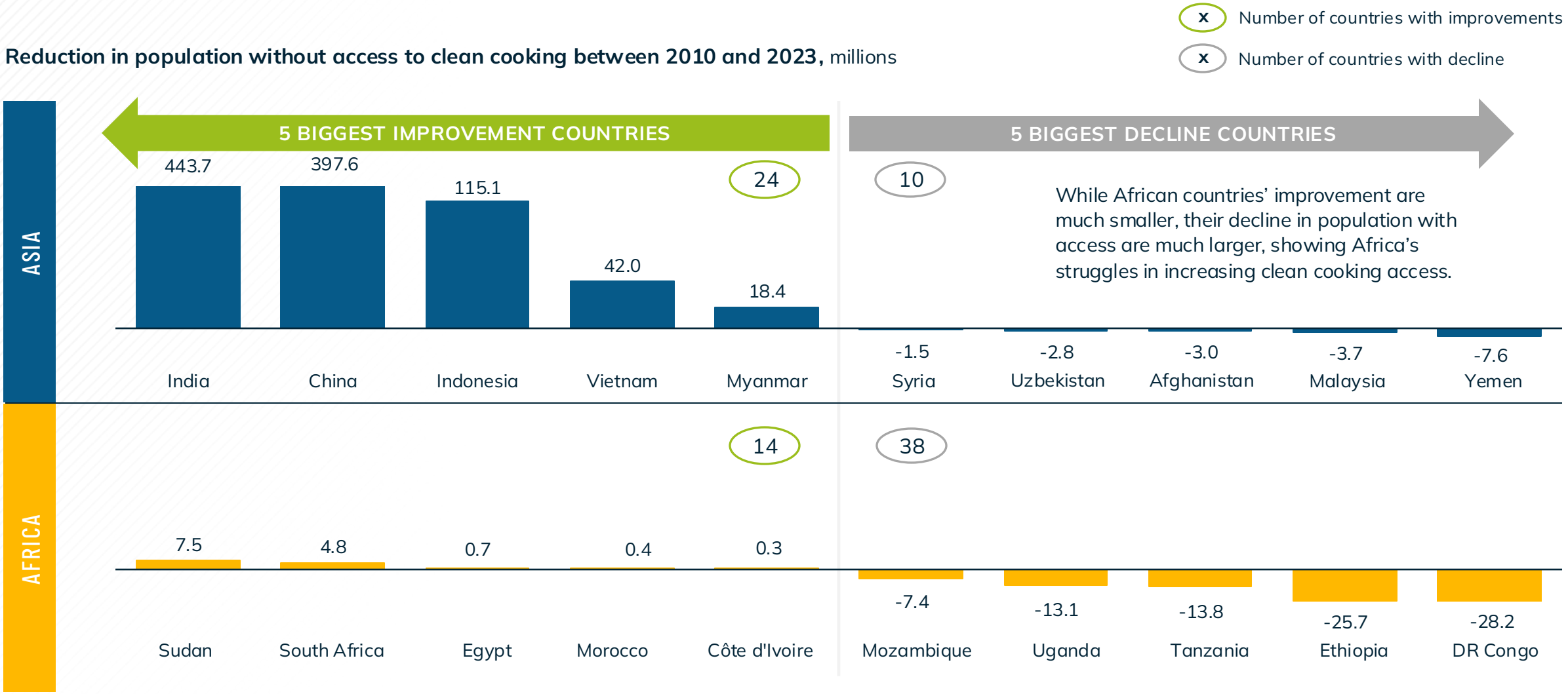
NOTE: The World Bank .ESMAP historical data up to 2021 and the total population historical data were both updated with the 2024 dataset. This creates inconsistencies with the analysis in the previous year

1 Compound annual growth rate = the average annual growth rate

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

73% of African countries (38 out of 54 countries) increased the population without access between 2010 and 2023 while more than 70% of Asian countries reduced access deficit population

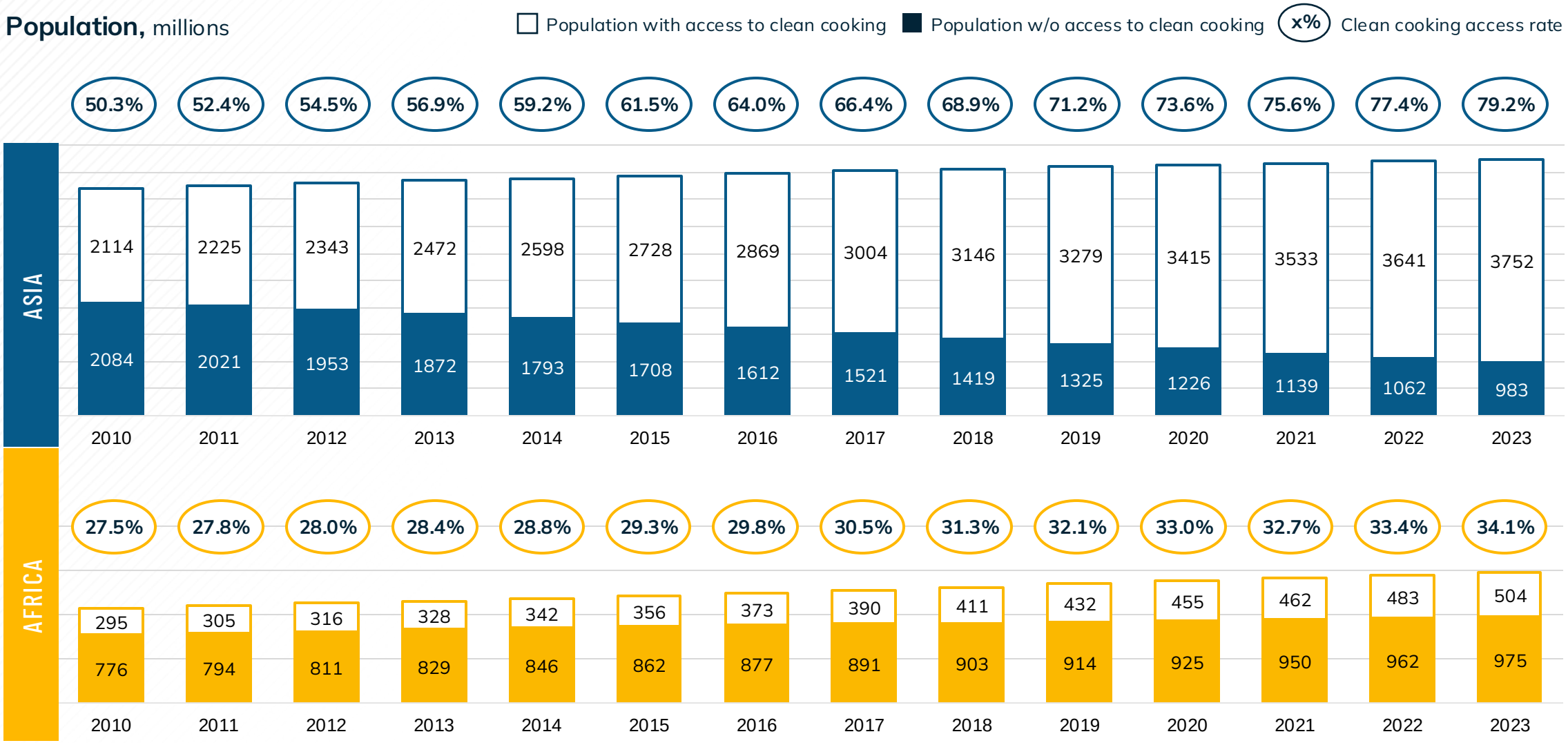
Reduction in population without access to clean cooking between 2010 and 2023, millions



NOTE: These figures represent the absolute change in the number of people without access to clean cooking solutions between 2010 and 2023 .

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

Asia almost 80% of people with clean cooking access while Africa' rate stays at around a third



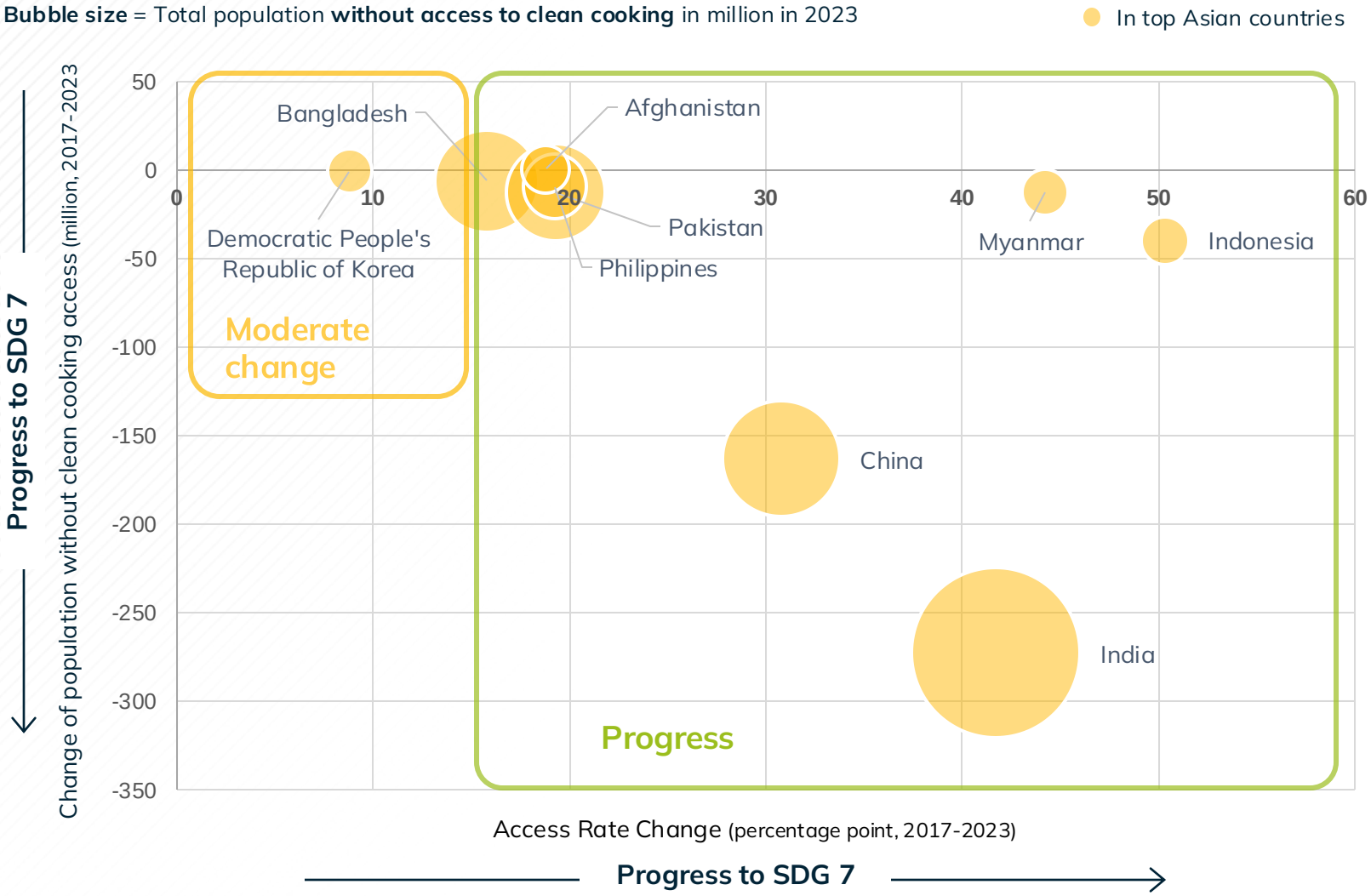
NOTE: The World Bank. ESMAP historical data up to 2022 was updated with the 2025 dataset. This creates inconsistencies with the analysis in the previous year

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

Clean cooking access: Deep dive on Asia

2023 Population without access vs Changes in population without access and in clean cooking access rates *between 2017 and 2023*

Bubble size = Total population **without access to clean cooking** in million in 2023



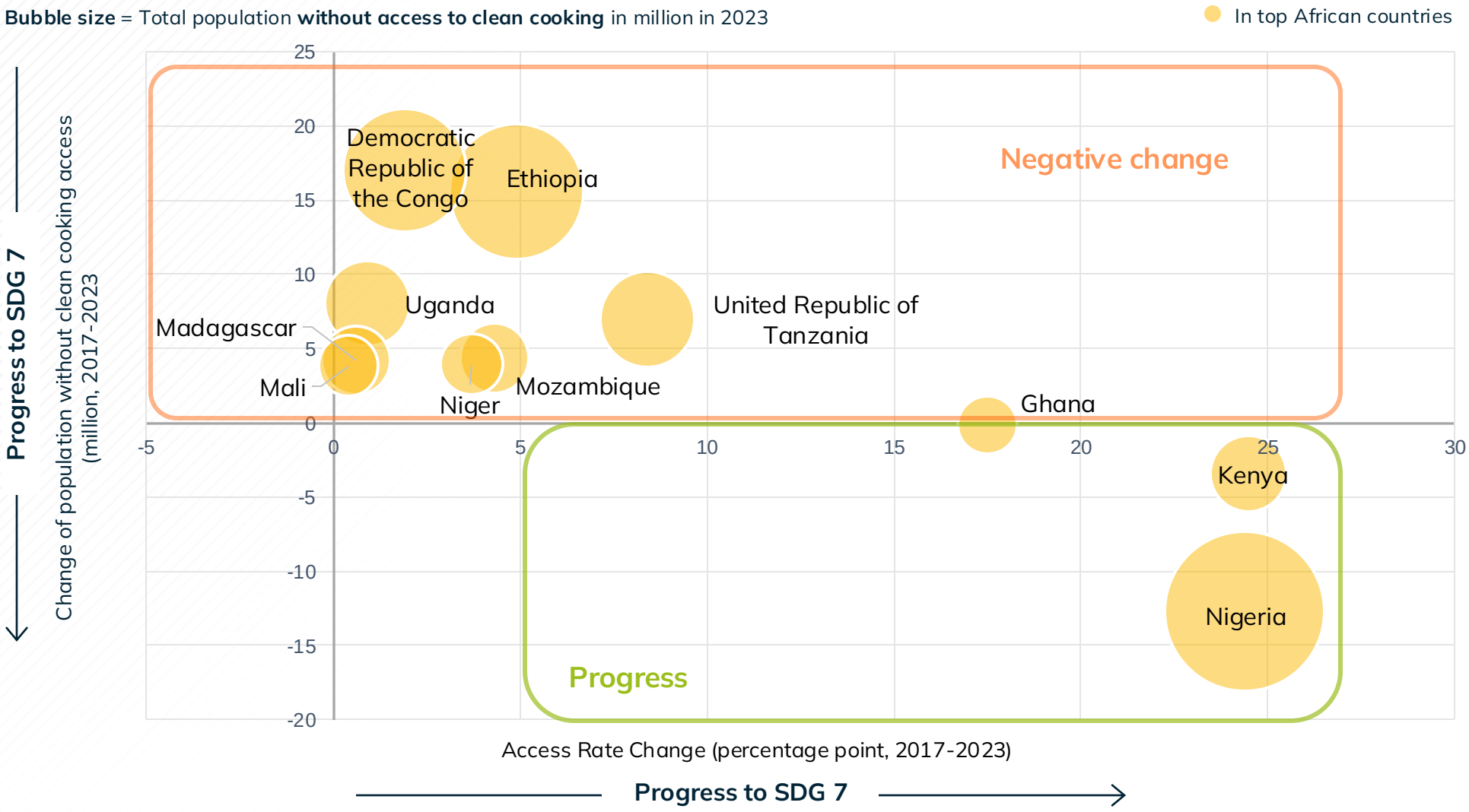
- An analysis of recent years shows that many leading Asian countries have made significant progress, with no country backsliding or experiencing negative change.
- India and China show good progress in reduction of population without clean cooking access, while Indonesia exhibits the highest improvement of access rate in recent years in this group.
- However, given the remaining unelectrified population, countries need to intensify and focus their efforts.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

Clean cooking access: Deep dive on Africa

2023 Population without access vs Changes in population without access and in clean cooking access rates *between 2017 and 2023*

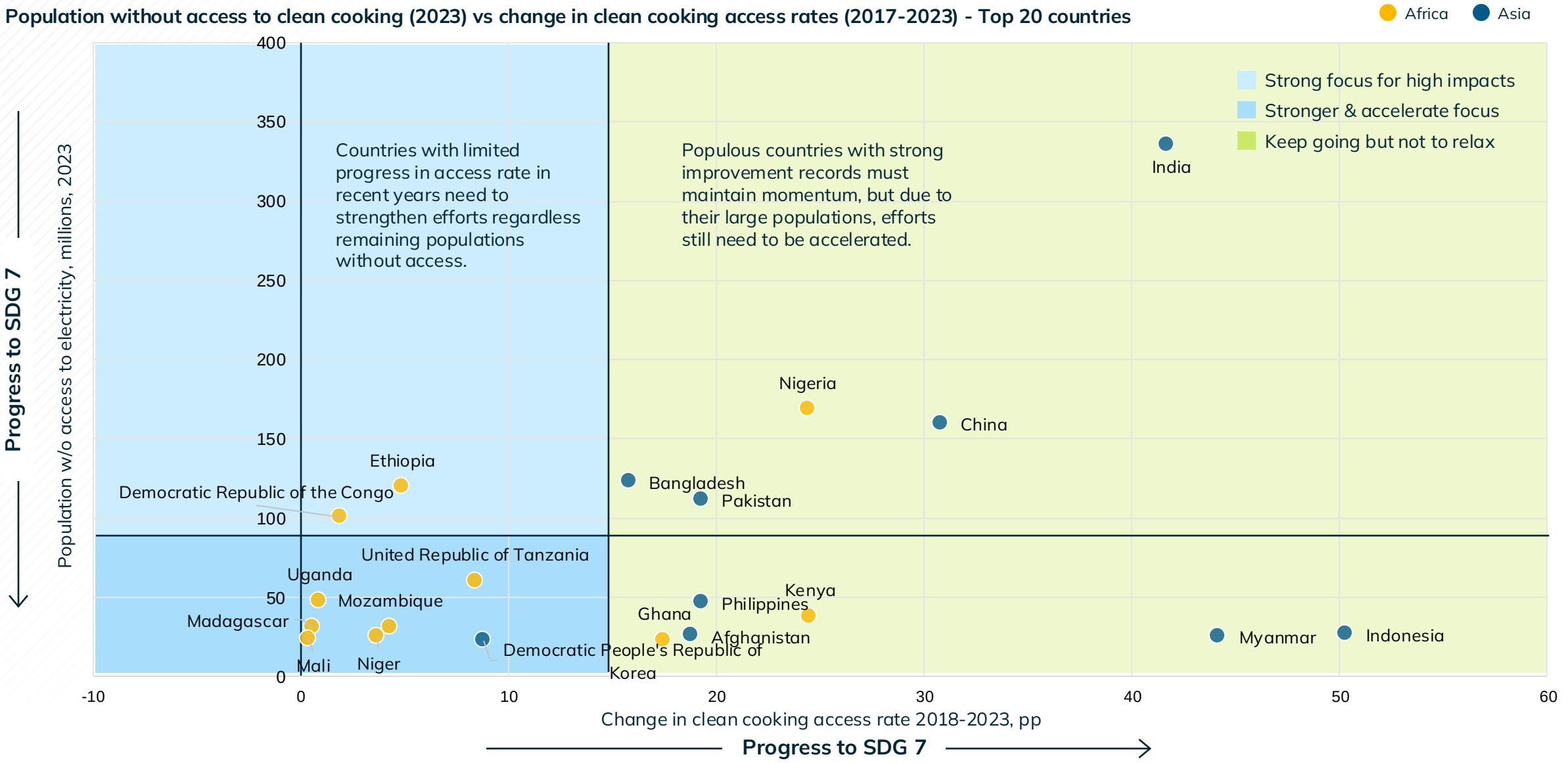
Bubble size = Total population **without access to clean cooking** in million in 2023



- An analysis of recent years reveals that while many countries have improved their access rates, 9 out of 11 countries have seen an increase in the number of people without access to clean cooking. This is an alarming trend for these African nations.
- Only Kenya and Nigeria made real progress of both increasing access rates and reducing population without access.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

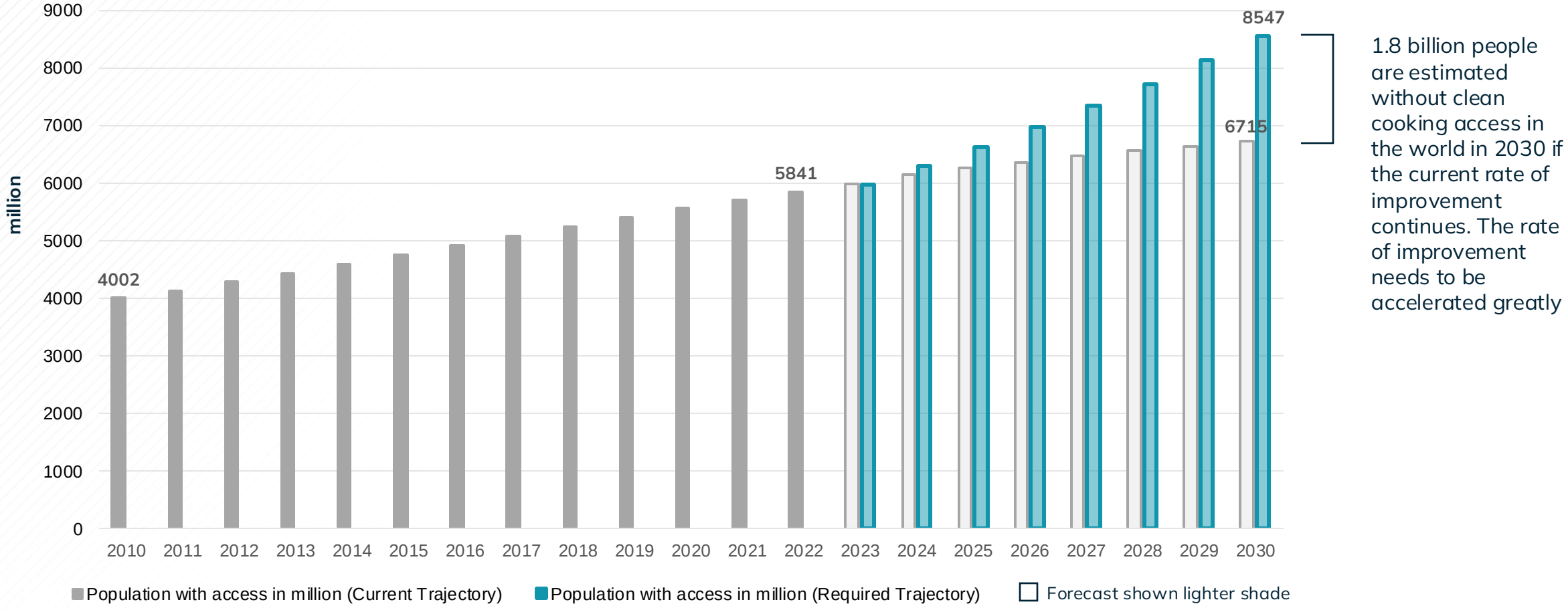
Countries with large unelectrified populations have high impact potential, but tailored strategies are needed for all slow progress and low access rate countries



SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets; World Bank Total Population data 2025

1.8 billion people are expected without clean cooking access in 2030 with the current trajectory

Current trend trajectory vs required trajectory to achieve clean cooking access



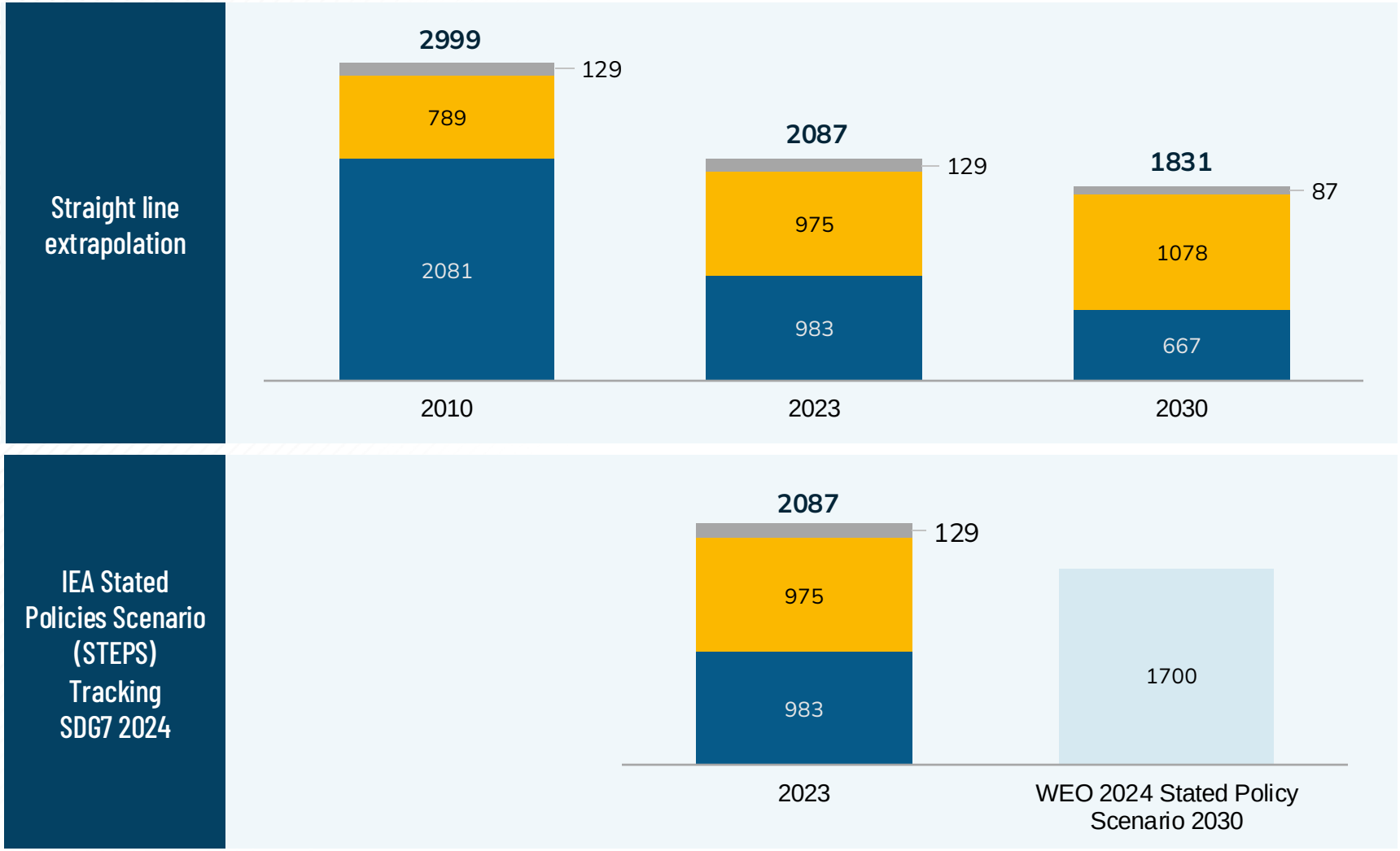
1.8 billion people are estimated without clean cooking access in the world in 2030 if the current rate of improvement continues. The rate of improvement needs to be accelerated greatly

NOTE: The "current trajectory" forecast is extrapolated from the trend of the last three available years, using the Compound Annual Growth Rate (CAGR) to project future population without access, and using World Bank's estimates of future total population

SOURCE: SEforALL Analysis. DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 Report 2025 Datasets; World Bank Development Indicators (2025)– Population, total, World Bank Data Bank (2025) Population projections and estimates

Projections show that SDG7.1.2 is off-track for 2030 achievement with large margin

Number of people without access to clean cooking, millions



Universal access to clean cooking is very much off track at the current pace.

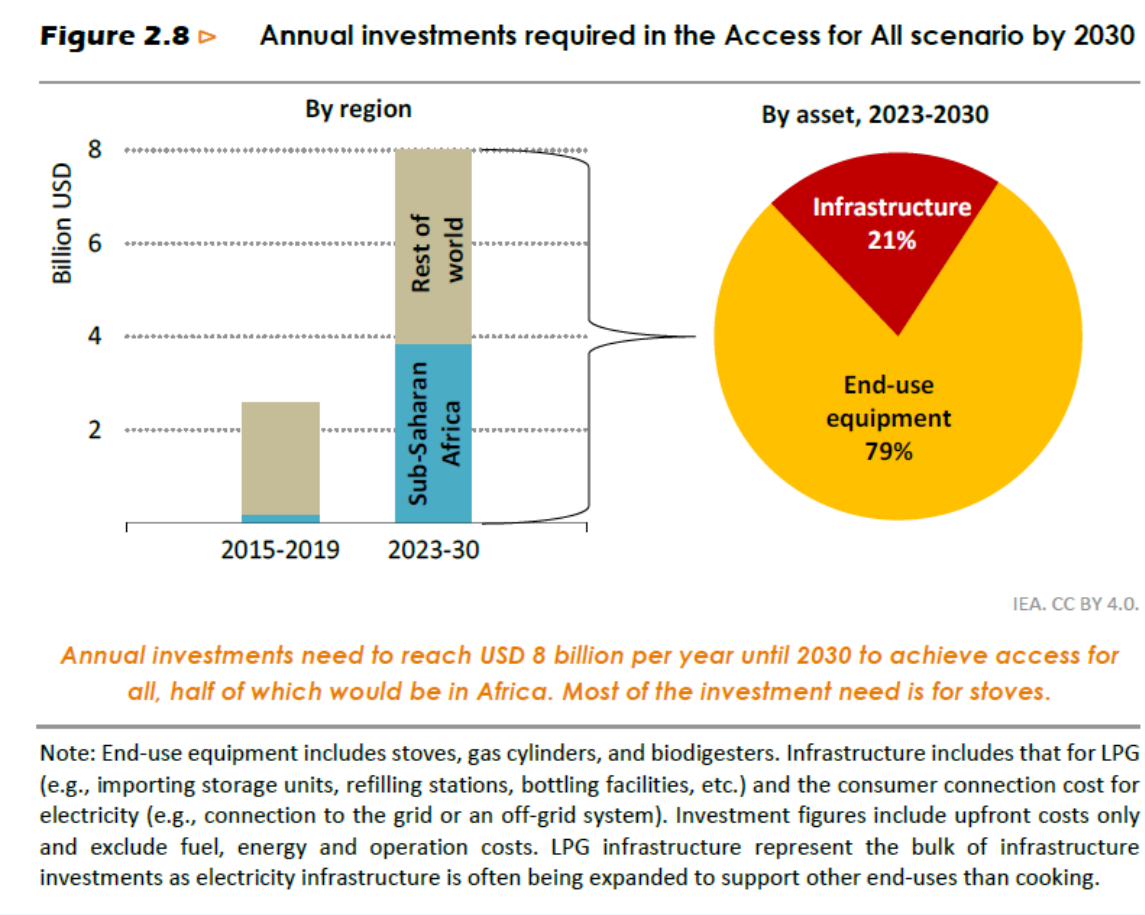
- The straight-line projection shows that population without access to clean cooking in Asia is expected decrease by 2030, but still a large population will remain without access. Africa is expected to increase the population without access to clean cooking due to the expected population increase. To achieve universal access by 2030, the world needs to reduce more than 5% of population without access annually, close to average 370 million per year.
- IEA and WHO project ~1.7 billion people without access in 2030, approximately 20% of the world population. IEA's scenario expects more than 1 billion people without access in Sub-Saharan Africa alone, and universal clean cooking access by 2030 requires over 300 million people each year getting access (about half of them in Sub-Saharan Africa) through the decade's end.

NOTE: The World Bank .ESMAP historical data up to 2022 was also updated with the 2025 dataset. This creates inconsistencies with the analysis in the previous year

SOURCE: SEforALL analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report & its Datasets; IEA World Energy Outlook (2025)

Average annual investment of USD 8 billion (2022-30) needed for universal clean cooking access

Average annual investment for clean cooking access under IEA' Net Zero Emissions by 2050 Scenario, 2022-2030



- Today, clean cooking investments are around USD 2.5 billion annually.
- In the IEA's Access for All scenario, this would need to rise to USD 8 billion annually between now and 2030 – requiring a cumulative investment of around USD 60 billion.
- Africa makes up around half of these investment needs, standing at almost USD 4 billion annually.
- The required investments in clean cooking through the rest of this decade will need to be split between stoves, accompanying equipment and supporting infrastructure to ensure continued delivery. Roughly 80% of the total investment goes into providing stoves and equipment. The remainder is designated for infrastructure, largely to serve LPG delivery with a smaller share for electricity. This does not account for the investments needed to build up clean cook stove supply chains.

Source: IEA A Vision for Clean Cooking Access for All, 2023

Note: IEA's Access for All Scenario examines practical regional strategies required to guarantee universal access to clean cooking, thereby aligning with the objectives of SDG7

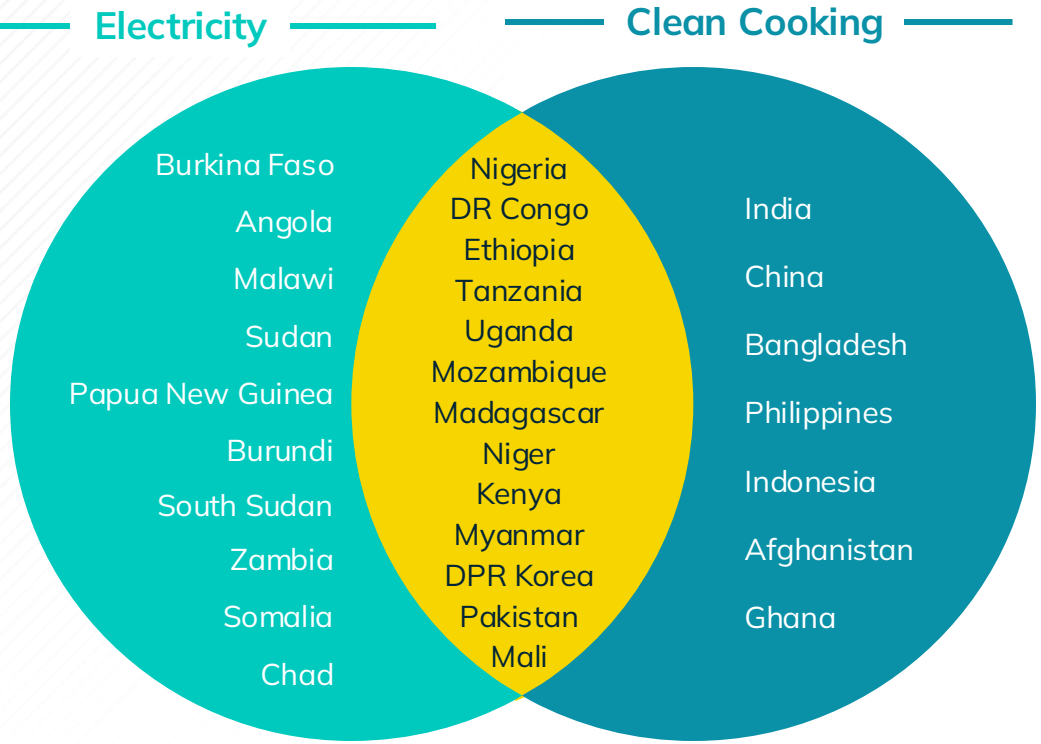
Electrification and clean cooking deficit countries often overlap

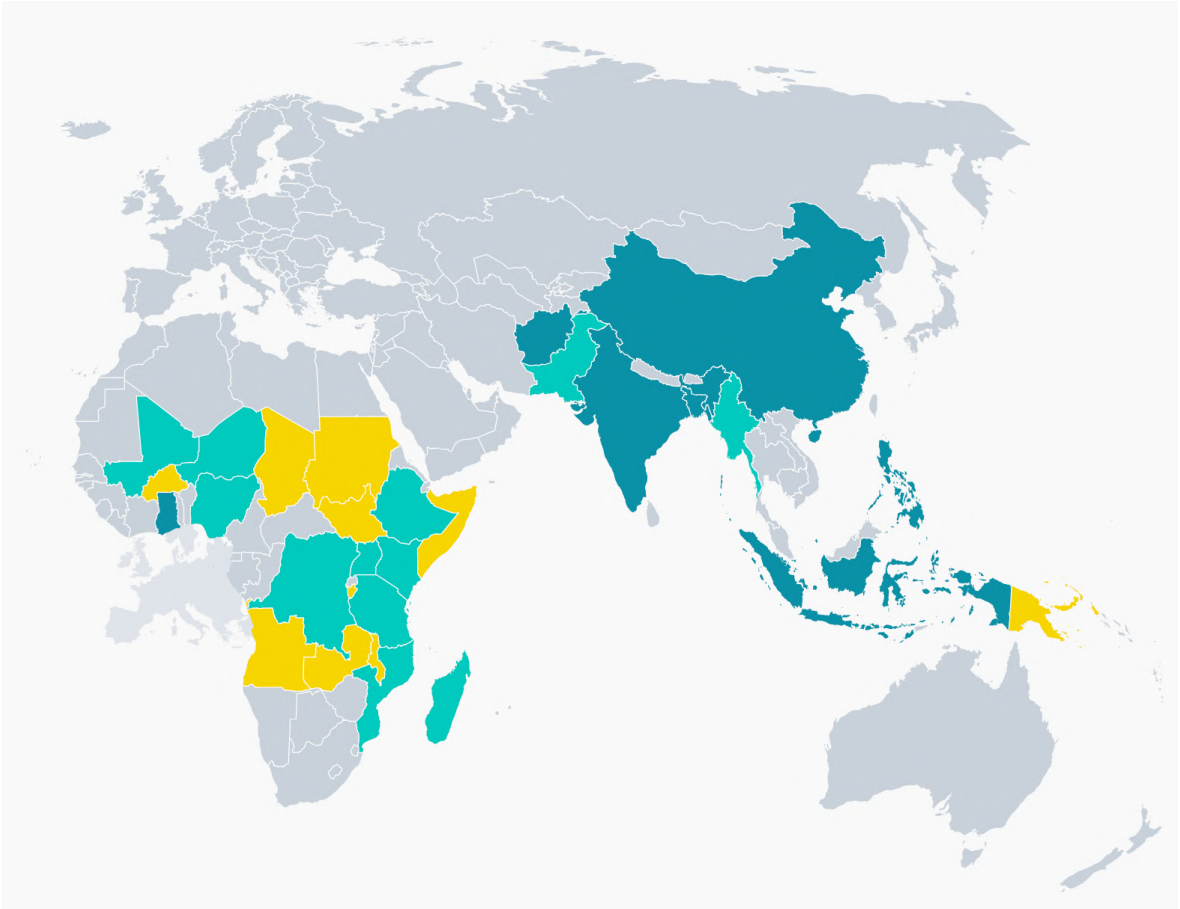
13 **countries make up both the top** 80% of electricity access gap and 74% of clean cooking access gap (these are at the intersection of the Venn diagram below)

COUNTRY OVERLAP BETWEEN ELECTRICITY ACCESS AND CLEAN COOKING ACCESS CHALLENGES

~666 million people lack access to electricity with the countries making the top 80% being...

~2.1 billion people lack access to clean cooking with the countries making up the top 74% being...





SOURCE: SEforALL Analysis; DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report & its Datasets

SECTION FOUR

SDG 7.2 Renewable Energy

SDG 7.2 Share of Renewables Energy (RE) in Total Final Energy Consumption (TFEC)

The share of renewables, including the use of traditional biomass, in total final energy consumption (TFEC) was 17.9% in 2022, receding from 2021 levels by 0.8%. The world share of modern renewables 1 in total energy consumption was 13%, showing a marginal jump of 0.5% from 2021 levels.

- The increase of global share of renewables in its total final energy consumption (TFEC) in 2022 was 1.9 percentage point from 16.0% in 2010, while the increase of the share of modern renewables in 2022 was 4.3 percentage points from 8.7% in 2010.
- All regions, except Africa, show slow progress since 2010, particularly Asia. Africa is the only region that regressed since 2010 although share of modern renewables has slightly increased.
- As for modern RE share, all the regions have increased their shares between 2010-2022. Africa's modern renewable share is around 21% of RE consumption, while all other regions have above 50% of modern sources among RE shares.
- In terms of RE power generating capacity per capita, Asia has made strong progress since 2010, exceeding developed countries' average growth rate, while Sub-Saharan Africa (SSA) and Least Developed Countries (LDCs, many in SSA) have much smaller growth rates consistent with the slow pace of electrification.

International public investment in renewables to developing countries bounced back in 2022.

- The decline of international public financial flows in support of renewable and clean energy hit bottom in 2019, 2020 and 2021, and showed a comeback in 2022 and 2023.
- Global total investment in renewables has been increasing but the 2023 amount (IEA) is still only three-quarter of what is needed to achieve net zero by 2050. More than 80% of the total investment remains concentrated in advanced economies and China.

Looking forward, based on the current trends, we are not on track to achieve SDG 7.2 by 2030.

- The share of RE in TFEC is projected to increase to only around 20-23% by 2030.
- The IEA estimates that modern uses of RE would represent just over a third of TFEC in 2030 under its Net Zero Emissions by 2050 scenario.
- Use of RE for heat has dipped since 2010 despite the high numbers, while use of RE for power has strong annual average growth rates since 2010. Use of RE for transportation is growing steadily but it needs to make up for an extremely low starting point. All the trends in heat, electricity and transport have strong variations among regions.

1 The term "Modern renewables" include modern bioenergy (excluding traditional use of biomass), solar PV, solar thermal, geothermal, wind, hydropower, and tidal energy.

Methodology - Description

Data Sources

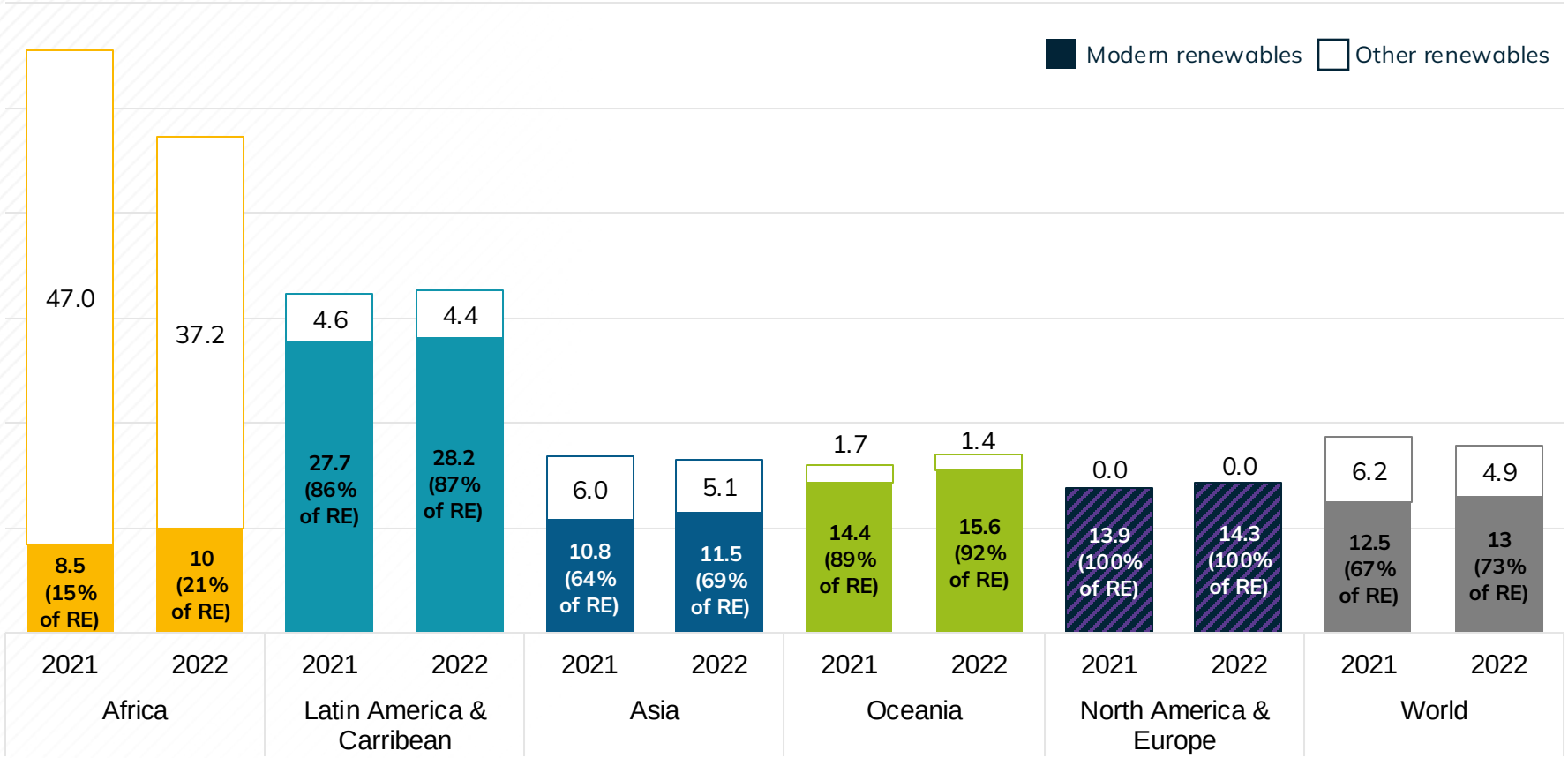
- The following data was gathered from WORLD BANK / ESMAP's Tracking SDG 7 database (**download link**):
  - The total share of renewables in total final energy consumption in the world between 2010 and 2022.
  - The total share of renewables in total final energy consumption per country and per region between 2010 and 2022
  - The share of modern renewables in total final energy consumption per country and per region between 2010 and 2022
  - The total energy consumption per country in 2010 and 2022
  - International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems between 2010 and 2023
  - Installed renewable power installed capacity in developing countries (in watts per capita) between 2010 and 2023
- The following data was gathered from the IEA's publications and their datasets:
  - Energy investment by sector and by region (World Energy Investment 2024)

Projections

- Straight line extrapolation projections were made via the following process:
  - The rate of change of the share of renewables in final energy consumption (Compound Annual Growth Rate, CAGR) between 2010 and 2022 was calculated at a global level
  - The share of renewables in energy mix was projected forward to 2030 using calculated CAGR as the growth rate
- IEA Stated Policies Scenario was taken from the Tracking SDG7 2025 report & World Energy Outlook 2023

Today, the share of renewables in the energy consumption is 17.9%, 13% of which is modern renewables

Share of renewables in total energy consumption by region, %, 2021 and 2022

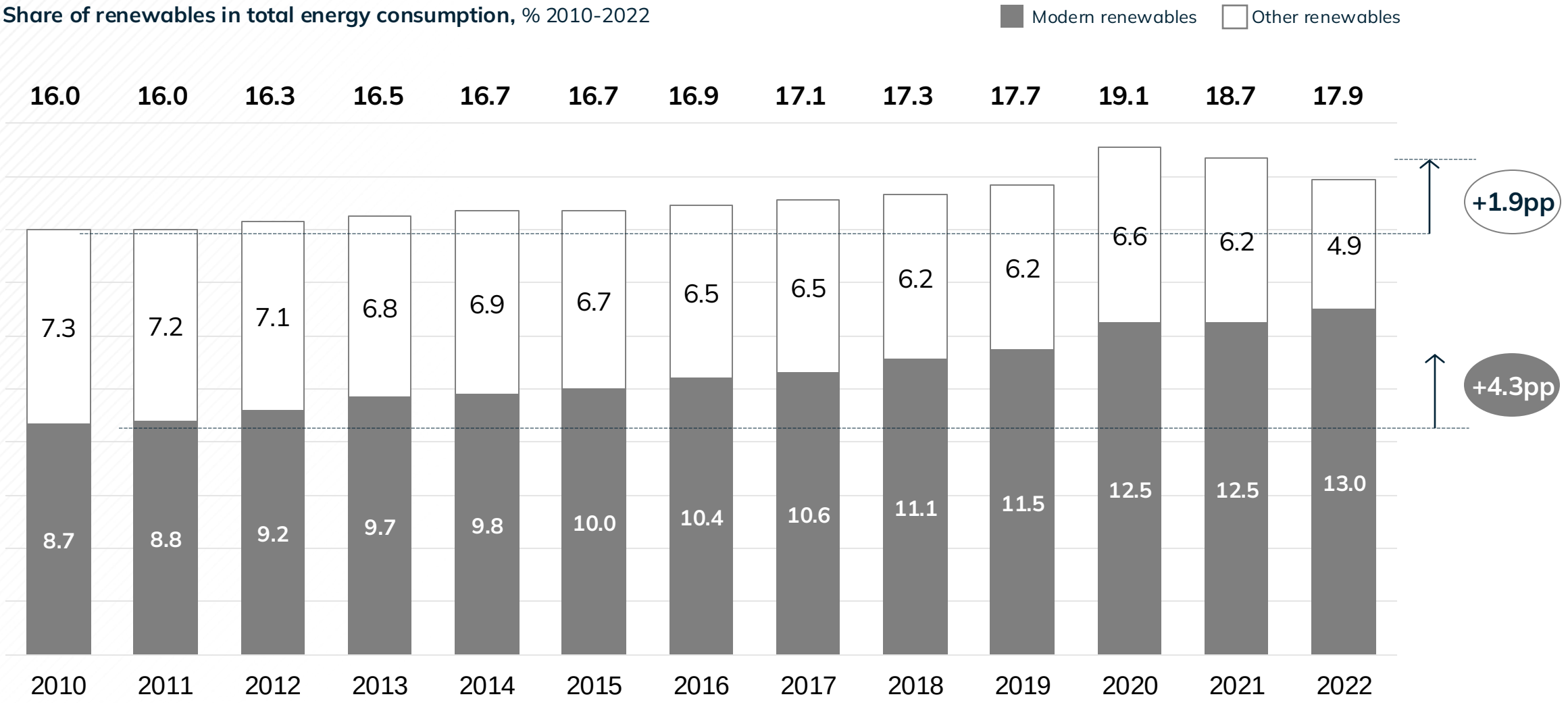


- The world has only 13% of modern renewables (excl. traditional biomass) in its TFEC (Total Final Energy Consumption), with a minor increase of 0.3% since 2021.
- The World and all regions, except Africa, showed stagnating results – an improvement of less than 1% - in both renewable share and modern renewable share in TFEC in 2022, compared to 2021.
- Africa showed advancements in modern renewable energy, with an increase of 1.5% in 2022, compared to 2021.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

The share of renewables and that of modern renewables in total energy consumption increased by 1.9pp and 4.3pp, respectively, in 2010-22

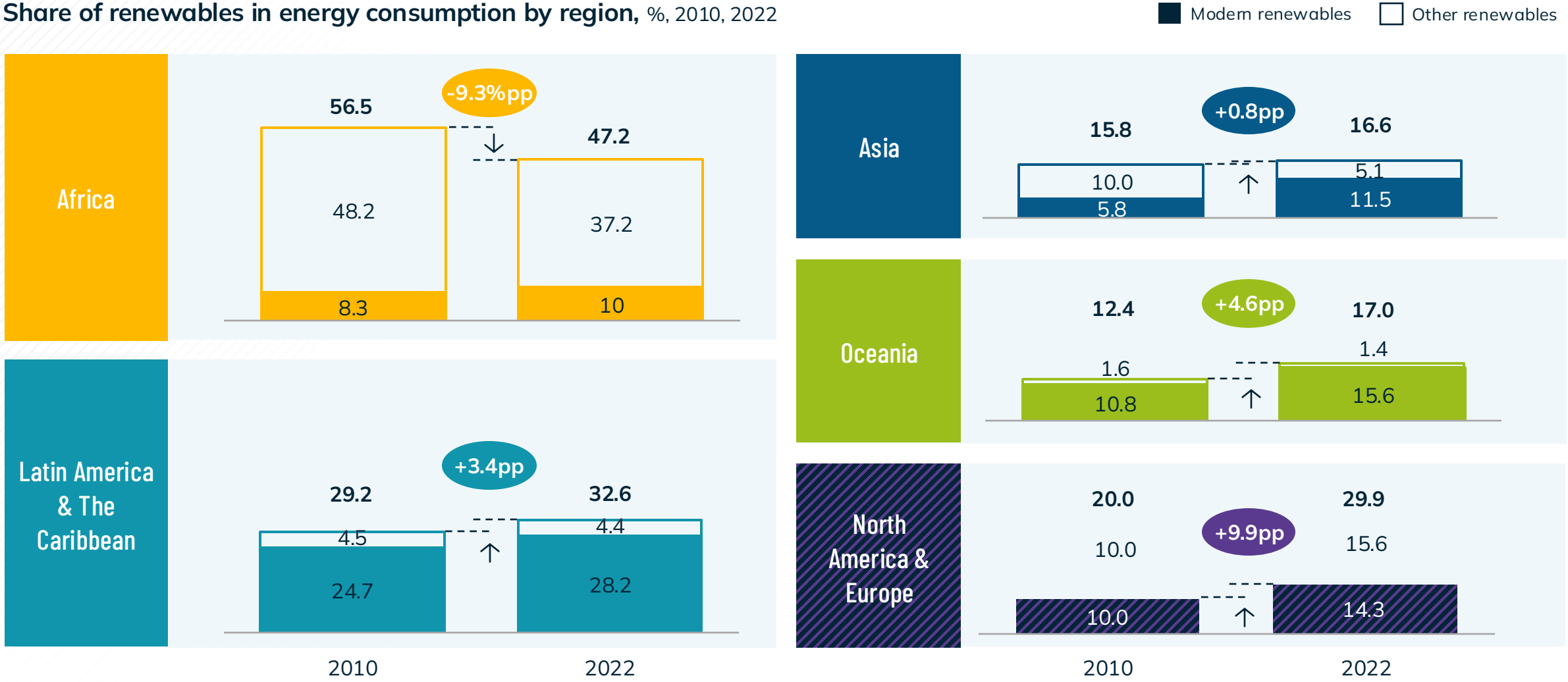
Share of renewables in total energy consumption, % 2010-2022



SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Africa is the only region that regressed since 2010 although share of modern renewables has slightly increased. Other regions have shown some progress (although slow) in share of RE

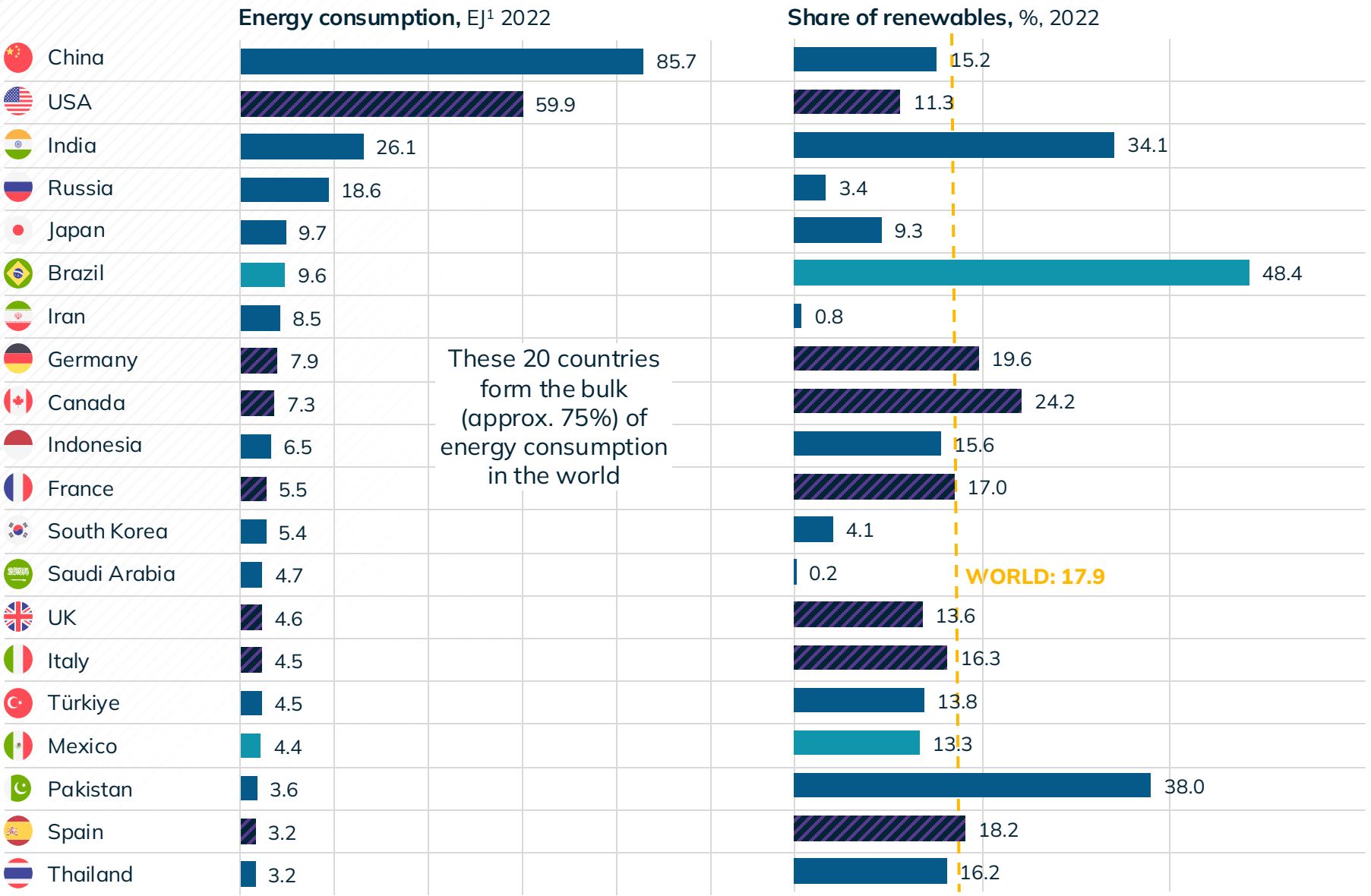
Share of renewables in energy consumption by region, %, 2010, 2022



NOTE: The historical data up to 2022 was also updated with the 2025 dataset. This creates inconsistencies with the analysis in the previous year

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Only 16.3% of energy consumption of the top 20 energy-consuming countries are from renewables, 0.9 percentage point up from 2021



Africa
Asia
Oceania
North America & Europe
Latin America & The Caribbean

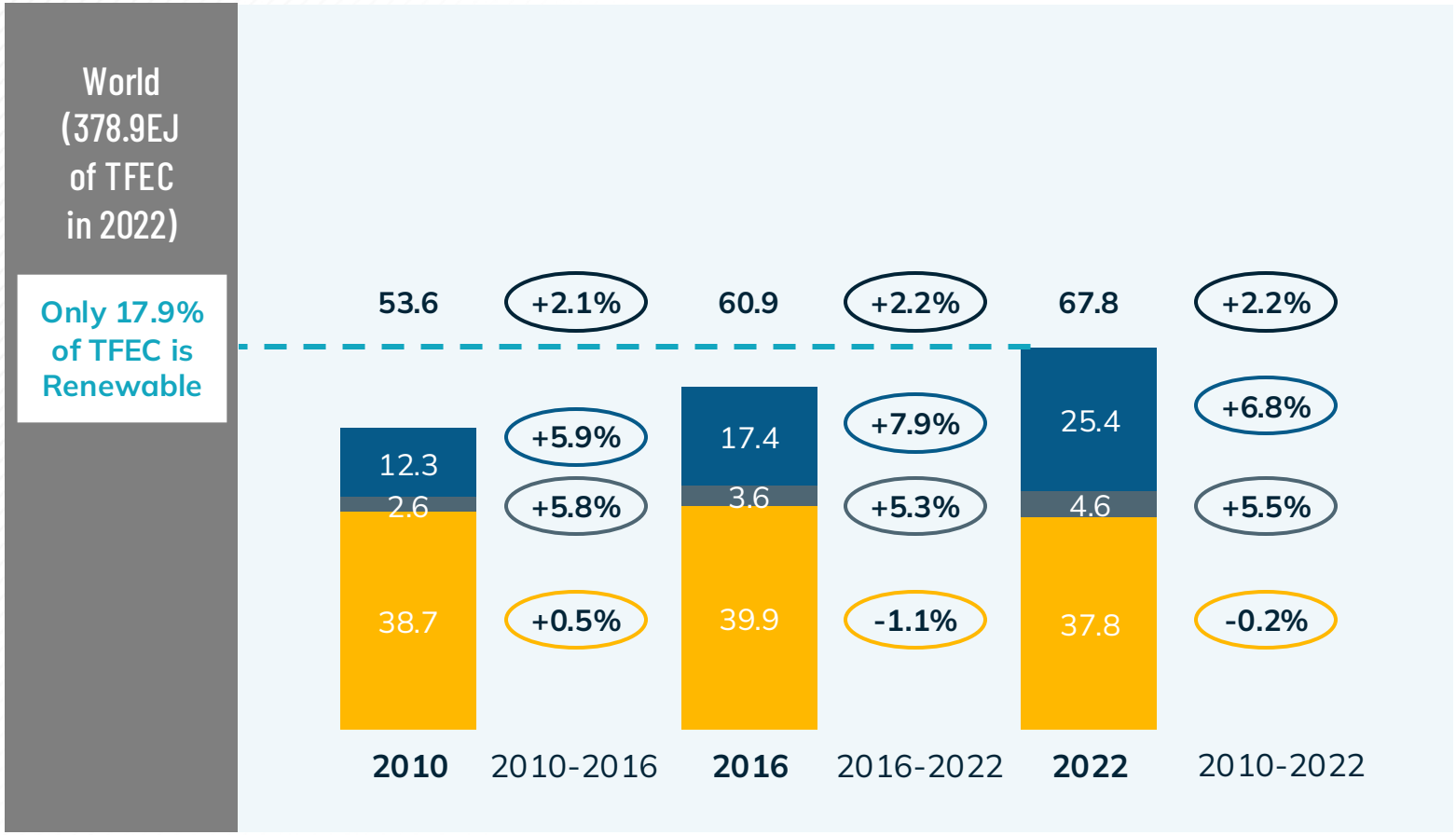
- Only 6 countries out of the top 20 energy-consuming countries have a higher share of renewables in their energy TFEC than the world average.
- Only 46.04 EJ (16.3%) in 282.5 EJ TFEC of top 20 countries come from renewables, slight improvement from 2021.
- To substantially increase RE share in TFEC, fortifying efforts in all sectors in these top 20 High-Impact Countries will be most effective, especially in high consumption countries with low renewable / modern renewable shares such as China, the United States, and Russia.

1: EJ = Exajoule = 1000 PJ

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Heat has the largest renewable consumption but shows reduction in use, while power sector has the strongest growth rate

Renewables total, heat, transport, and electricity final energy consumptions, EJ, 2010, 2016, 2022



- Renewable heat consumption[1] in TFEC in 2022 was only 10.0%. Renewable consumption of transport was 1.2% and that of power was 6.7% in 2022.
- Heat sector uses most renewable energy, but its growth rates are very low and has fallen by 1.1% since 2021. Concerted efforts are needed to reduce traditional biomass for cooking and heating in developing countries, while replacing fossil fuel-based heat supply with modern renewable in hard-to-abate sectors.
- Transport sector shows good annual growth rates. However, since its starting point was very low, efforts must accelerate to make material differences.
- Power sector is growing fastest, reflecting the strong growth of renewable electricity supply over the decade.

1 Covers final consumption of renewable energy for heat raising purposes (excluding electricity) in all sectors excluding transport: manufacturing industries, construction and non fuel mining industries, residential, commercial and public services, agriculture, forestry, fishing and not elsewhere specified.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Asia has struggled to increase RE consumption in Heat, while showing strong growth in the Power sector. North America & Europe are the only regions where RE consumption in Power sector exceeds Heat.

Renewables total, heat, transport and electricity final energy consumption by region, EJ, 2010, 2016, 2022

- Asia's renewable consumption is the largest.
- Heat has the largest share in Asia's renewable consumption. However, it has decreased since 2010 and requires strong attentions to reduce traditional biomass while increasing modern renewable consumption.
- Transport and Power show good annual growth but no acceleration. Transport sector renewable consumption is low
- All sectors need faster growth.

- Renewable consumption in North America and Europe is the second largest.
- Unlike other regions, Power sector has the largest consumption share of renewable energy with steady annual average growth rates.
- Transport sector's renewable consumption is also growing steadily.
- Heat sector has the slowest annual growth rates but with improvements in more recent years.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Africa's RE consumption patterns are very different from other regions. Both Power and Transport RE consumptions need to grow. Oceania also needs to accelerate RE consumption in all sectors.

Renewables total, heat, transport and electricity final energy consumption by region, EJ, 2010, 2016, 2022

- Africa's renewable consumption patterns are very different from other regions. It is dominated by heat (RE heat with 44.3% of TFEC) although at declining levels
- Transport and Power renewable consumptions show strong annual growth rates, but their actual levels of consumptions are miniscule.

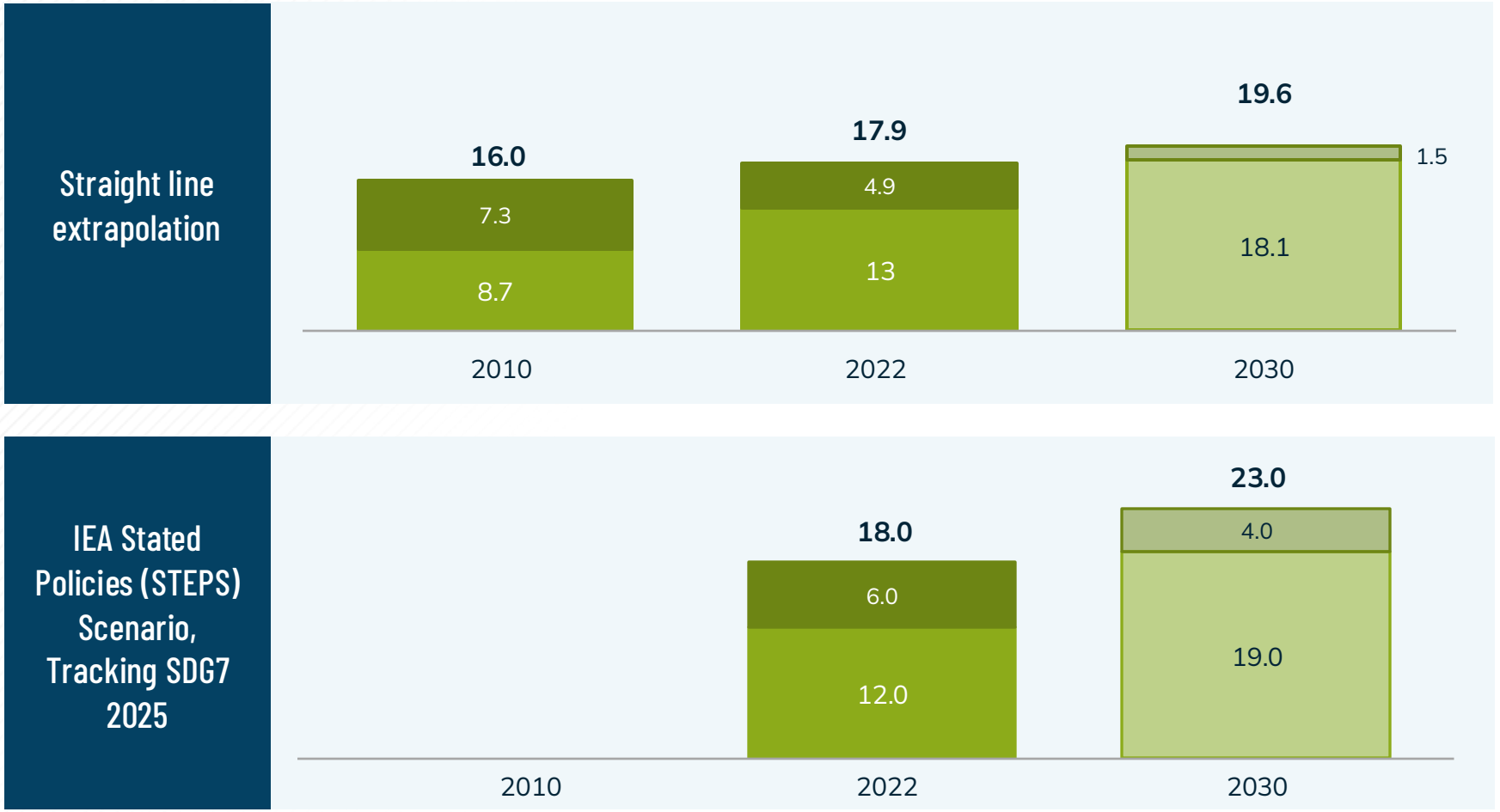
- Latin America & the Caribbean has the second weakest regional annual average growth (1.8%) in RE consumption since 2010.
- Its renewable heat consumption levels barely changed.
- Transport and power sectors show good growth while heat sector shows the weakest annual regional growth rate since 2010.
- The region needs to pay attentions to all sectors to boost RE consumption levels and annual growth rates.

- Oceania's RE consumption was only 17% of TFEC in 2022.
- Oceania shows moderate annual average growth rate overall with good growth in Power Sector
- However, it needs paying attentions to Heat RE consumptions, as both overall share and growth rates are quite low.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Projections show that we could see very slow progress and moderate gains to 2030

Share of renewables in energy consumption, % Modern renewables Other renewables Forecast shown lighter shade

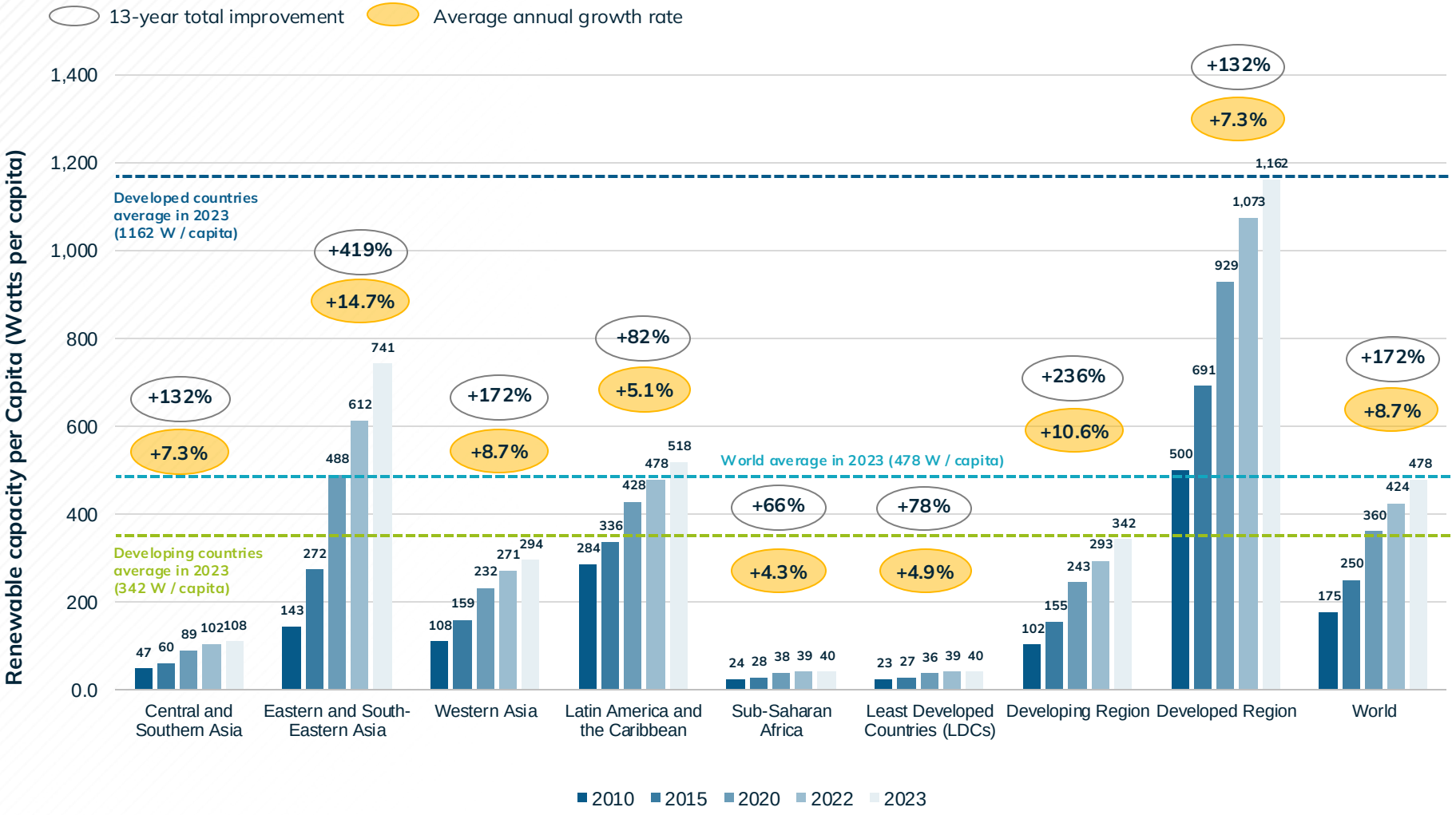


- There is no quantitative target for SDG 7.2. But the IEA estimates that modern uses of renewables would represent just over a third of TFEC in 2030 under its the Net Zero Emissions by 2050 scenario. To achieve this level of share, modern RE needs to be accelerated further, particularly in Africa
- To accelerate SDG7.2, most of the unelectrified population should be directly connected to electricity via renewable energy while also expanding renewable energy use in industry, buildings and transport.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report & its Datasets; IEA World Energy Outlook (2023)

Sub-Saharan Africa's renewable capacity per capita is quite low, while Asia's advancement has been strong since 2010

Renewable capacity per capita by region and development status, 2010, 2015, 2020, 2022, 2023 Watts per capita

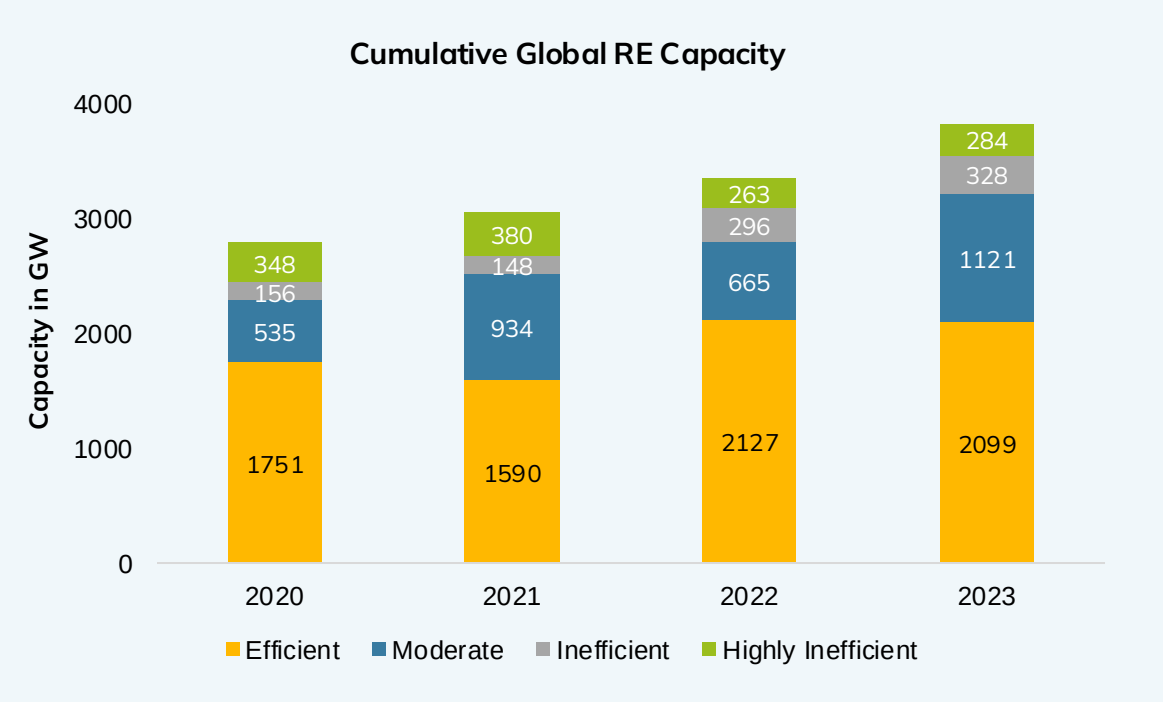


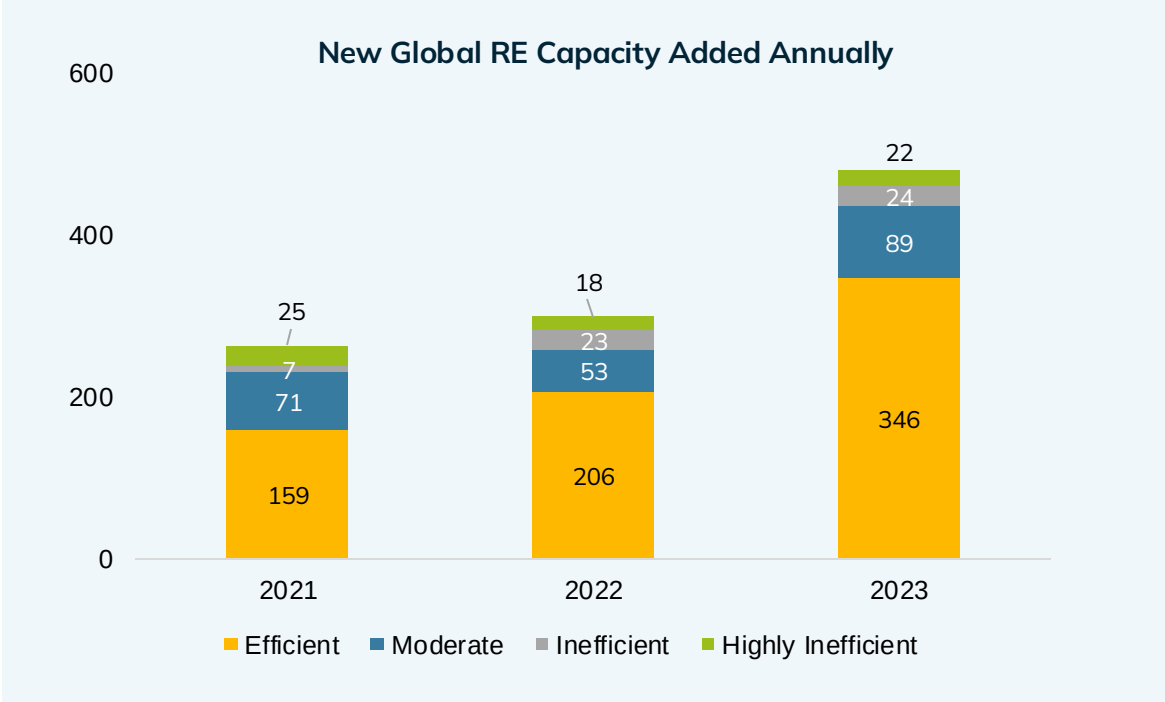
- Renewable power generating capacity per capita in Sub-Saharan Africa and LDCs (many in SSA) is much smaller and shows slower growth than in Asia, corresponding to slow pace of electrification in SSA.
- All Asian sub-regions have made strong progress since 2010, with most exceeding average growth rates of developed countries.
- Eastern and South-Eastern Asia and Latin America and the Caribbean show higher capacity per capita than the developing country average.
- Central and Southern Asia's low capacity per capita, despite strong electrification progress in India, Bangladesh and Pakistan, suggests low Tier electrification in those populous countries (India: 122 W/capita, Bangladesh: 6 W/capita & Pakistan 57 W/capita in 2023)

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Inefficient grids globally continue to host 45% of renewable energy generation capacity, leading to loss of clean electricity in transmission and distribution network

Renewable Energy Capacity and Grid Efficiency, 2020-2023, Gigawatts (GW)



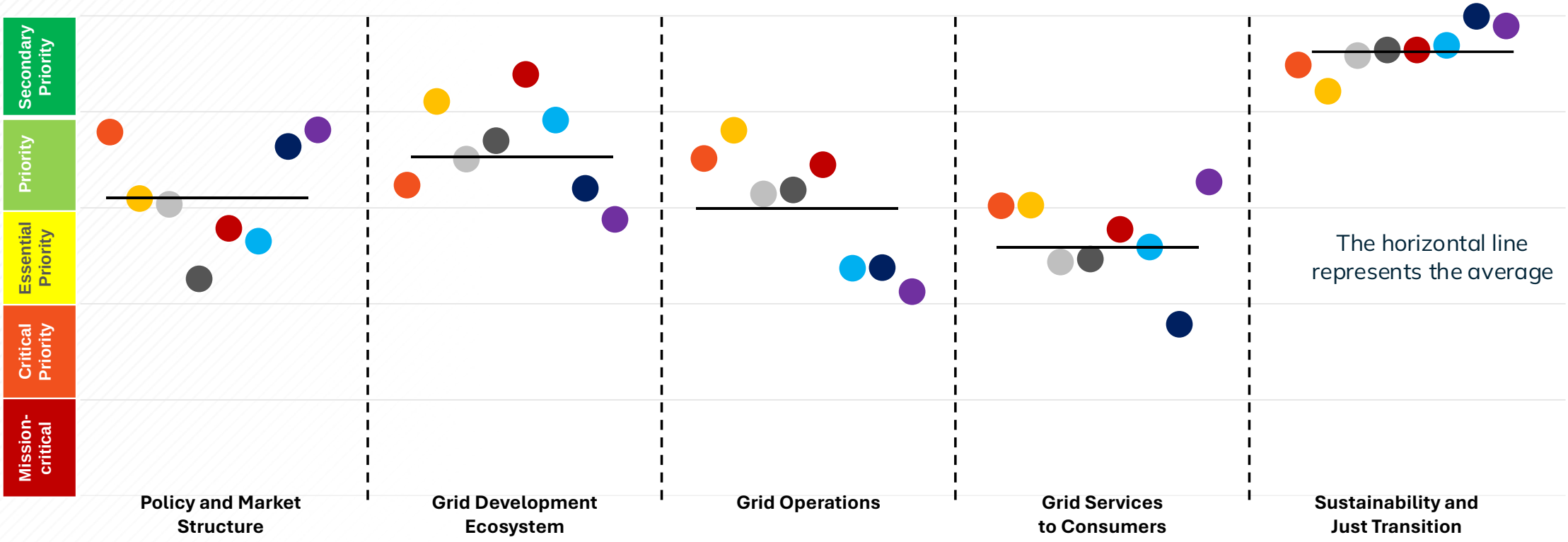


- At the end of 2023, of the total installed renewable energy capacity (3832 GW), 1733 GW (45%) was connected to inefficient grids globally. Around 284 GW of RE capacity, operating in countries with poor grid, was facing losses above 15%.
- With the growing uptake of renewable energy installations in global south, the addition of RE in poor grid is also growing. Annual capacity addition in poor grid has increased from 94 GW in 2022 to 135 GW in 2023.

Data Source: World Bank and IRENA Statistics on Electricity

Health of grid infrastructure in Africa: Assessing grid across five categories

Examining 8 countries in Africa, trends show that higher priorities for action include digitized grid operations and massive grid expansion to consumers.



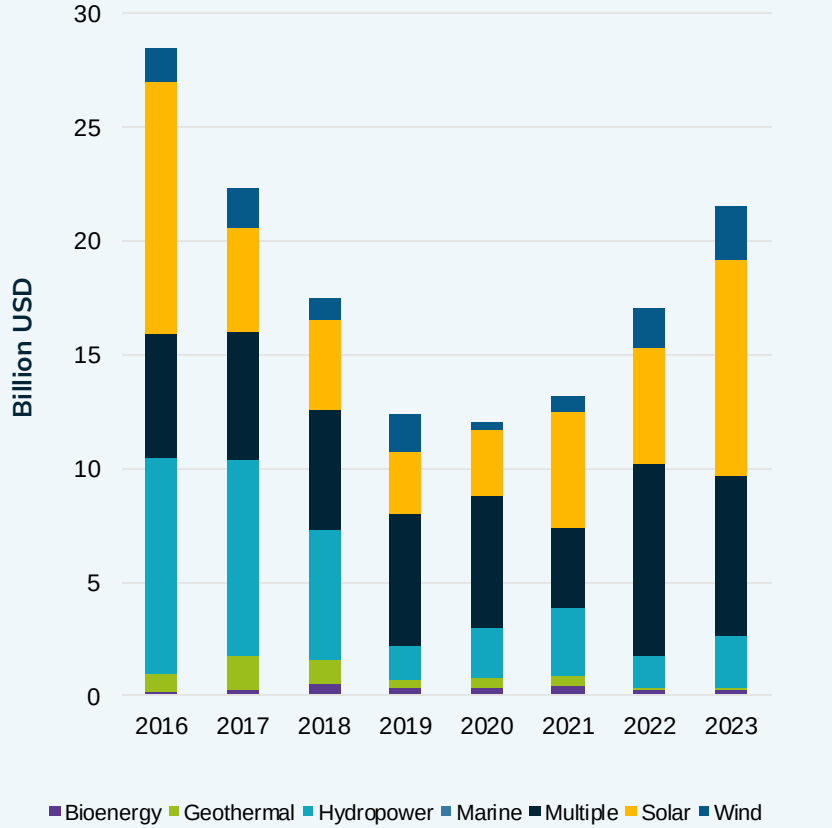
- Countries in Sub-Saharan Africa are actively engaging in expansion of interconnectors through collaboration with regional pools and international donors to increase power trading. However, the age of assets greatly impacts the performance and potential to incorporate advanced VRE-related grid operation.
- All countries assessed have operational frameworks and practices, often based on international standards, including environmental social impact assessments (ESIA)

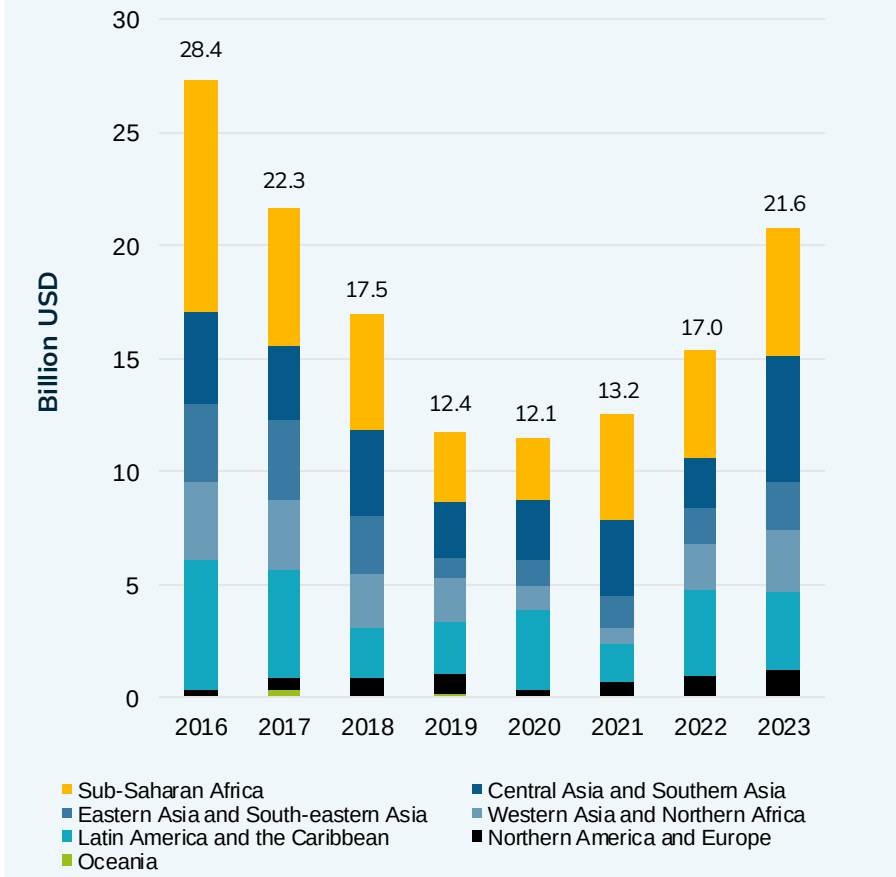
Note: The intent of the infographic is to present the grid health spectrum for Africa, rather than provide an inter-country comparison. The eight countries include Kenya, Ghana, Ethiopia, Nigeria, Rwanda, Tanzania, Uganda, Zambia.

Data Source: SEforALL Report on "Assessing Grids in Africa", May 2025

International public financial flows to support Clean and Renewable Energy Investment in developing countries bounced back in 2022 and 2023, but remains far below the 2016 level

International Public Investment in Renewable and Clean Energy to Developing Countries, 2016-2023



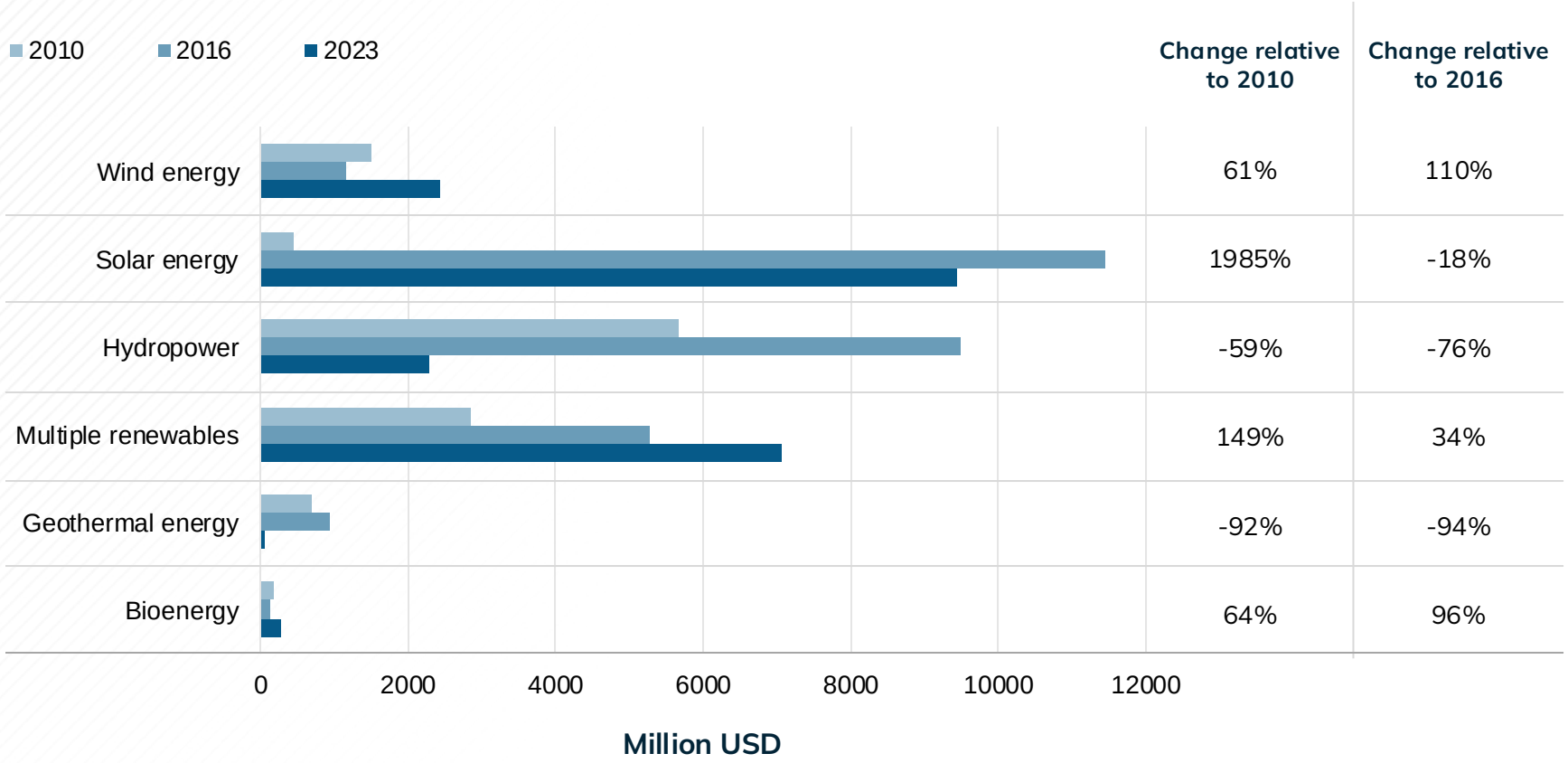


- International public financial flows in support of renewable and clean energy peaked in 2016 (around 28.4 billion USD). It declined steadily since 2016, but the year 2023 shows a bouncing back (21.6 billion USD). However, the 2023 investment total was 75.8% of the 2016 amount.
- Multiple technology projects have received the largest support for the past 5 years (2019 onwards) in total (USD 30.6 billion), followed by solar energy (USD 25.2 billion). Hydropower has steadily lost its popularity.
- Sub-Saharan Africa received the largest amount in total (USD 20.9 billion USD) between 2019 and 2023, followed by Central and Southern Asia (USD 16.3 billion) and Latin America and the Caribbeans (USD 14.9 billion).

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Solar and Multiple hybrid technology projects are the clear investment winner in the past decade. Where local resource availability permits, diversification of energy sources should be prioritized for the clean energy transition

International Public Investment in Renewable and Clean Energy in Developing Countries, 2010, 2016 and 2023

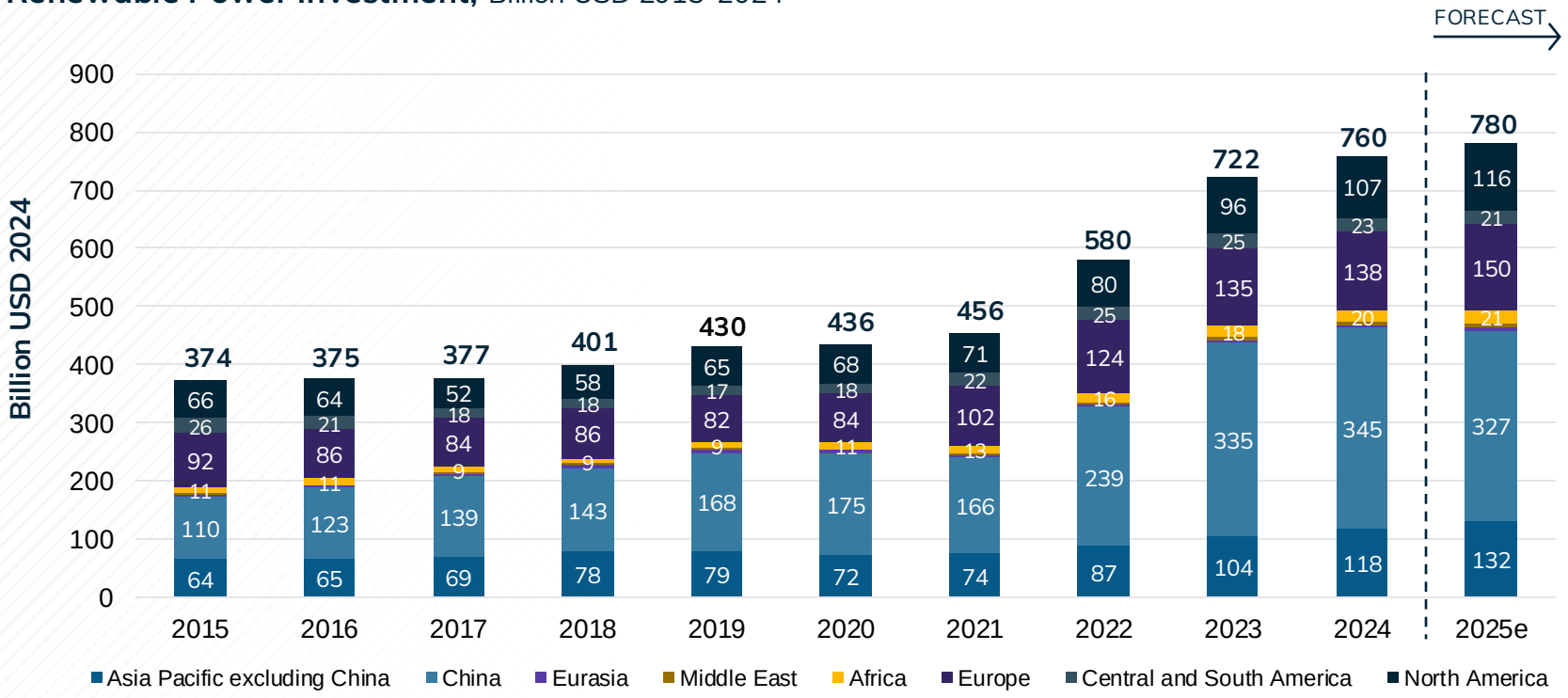


- Solar's 2023 investment was almost 20-fold increase from 2010 but 18% less than the peak in 2016.
- Hydropower investments have greatly reduced since 2010, showing shifting technology preferences.
- In 2023, Solar and Multiple technology projects are the clear winner in investment.
- Where resource endowment permits, diversifying energy resources could bring energy security benefits and system resiliency. Wherever suitable, bioenergy, geothermal energy and hydropower should be considered for investment, as they are non-variable renewables that can support system integration.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Global investment in renewable power reached USD 760 billion in 2024, but the distribution is very uneven

Renewable Power Investment, Billion USD 2015-2024



- The global investment in renewable power reached USD 760 billion in 2024.
- The investments have steadily increased, but quite unevenly among geographies.
- China (40%) surpassed the Advanced Economies (23%) in Renewable Power Investment in 2023 and 2024. Together, they accounted for 58% of the total investment in 2024.
- Asia Pacific (including China) accounted for 56% of total investment made between 2015 and 2024. Within it, China alone accounted for 40% of the world total, more than any single country or region, followed by Europe (21%) and North America (15%).

Renewable Power Investment, 2024

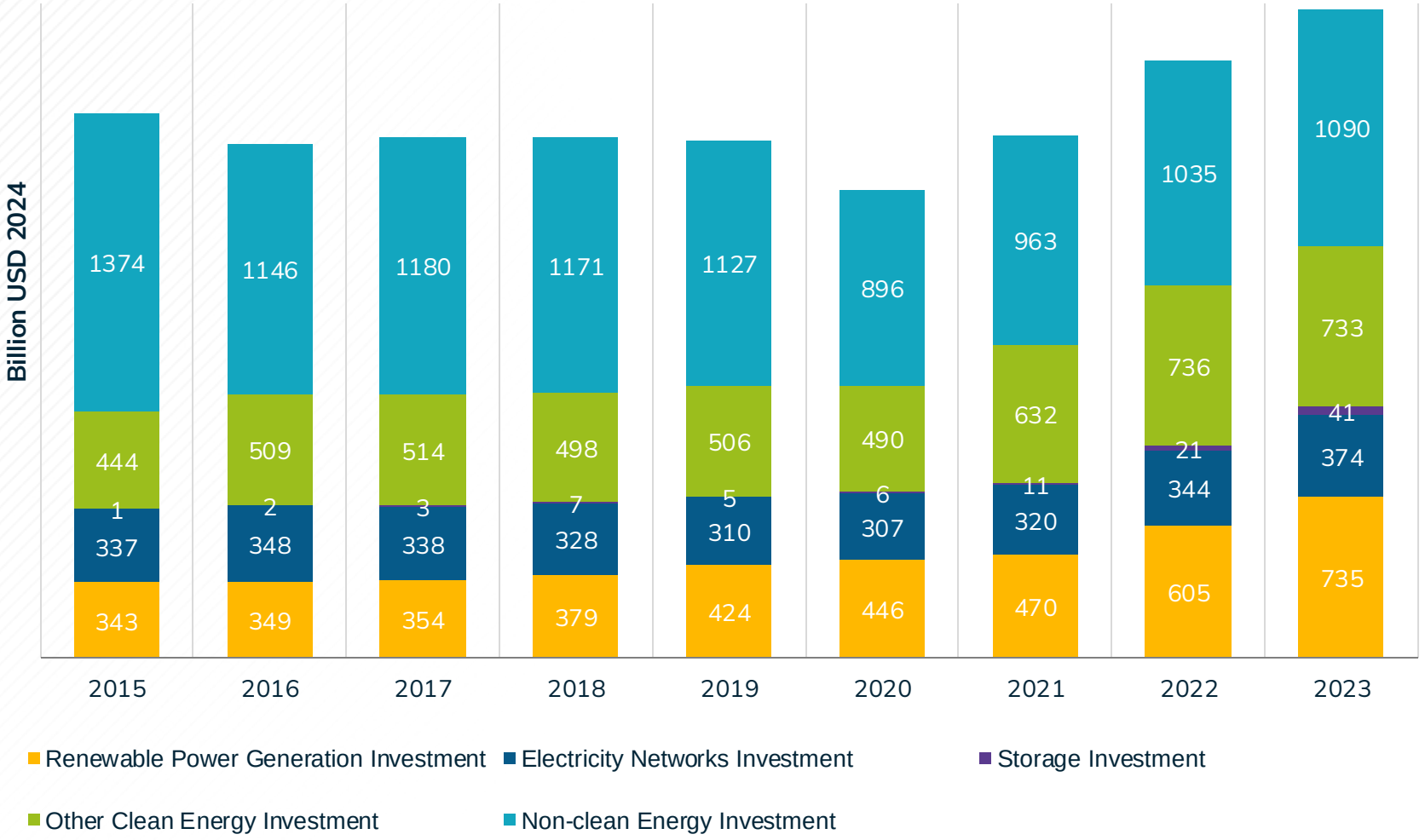
EMERGING MARKET & DEVELOPING ECONOMIES (EMDEs)	CHINA	ADVANCED ECONOMIES
USD 466 billion (46%)	USD 345 billion (31%)	USD 293 billion (23%)

NOTE: The historical data up to 2025 estimates also updated with the 2025 dataset. This creates inconsistencies with the analysis from the previous year.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

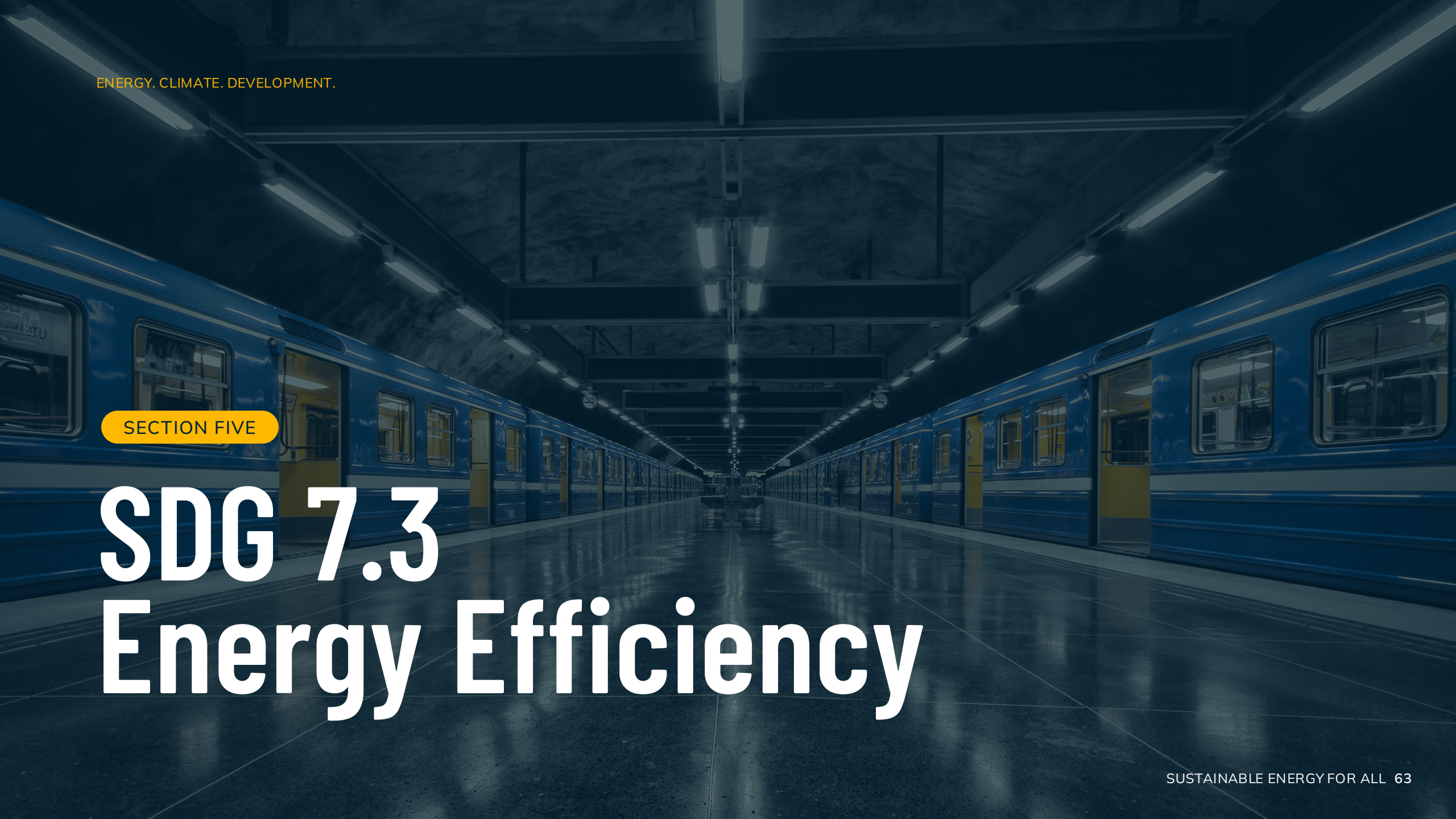
Global investment in renewable power generation and electricity networks have been growing. However, they need further boosting under Net Zero by 2050 Scenario.

Global Energy Investment, 2015-2023, billion USD



- Global investment of clean energy in 2023 has increased 10% from 2022. In particular, renewable power generation investment grew more than 20% from 2022, while electricity network investment increased close to 9%.
- The IEA estimates that the investment required to meet the SDG 7 targets under the Net Zero Emissions by 2050 Scenario for renewables-based electricity generation (including batteries) amounts to USD 1,016 billion per year (2022 USD). Additional average annual spending of 494 billion (2022 USD) on expanding and modernizing electricity networks is essential to support investments in renewables-based power.
- The 2023 investment amount is only around 76% of this figure.

Data Source: IEA World Energy Investment Datafile 2024



SECTION FIVE

SDG 7.3 Energy Efficiency

SDG 7.3 Energy Efficiency

The world used 3.87 MJ of energy to generate USD 1 of economic activity in 2022, marginally lesser than 2021 levels.

- Africa (3.98 MJ/USD GDP) and Asia (4.31 MJ/USD GDP) remained more energy intensive than the world average with slow progress.
- Latin America & the Caribbean is the least energy intensive region with 2.86 MJ/USD GDP. It is followed by North America and Europe (3.29 MJ/USD GDP) and Oceania (3.34 MJ/USD GDP). Both regions reduced their intensity slightly than 2021 levels.
- Of top 20 most energy consuming countries:
  - 14 countries have lower energy intensity than the group average
  - Reducing the energy intensity of the other 6 countries (China, Russia, Iran, Canada, South Korea, and Saudi Arabia), which have higher than the world average energy intensity, can help accelerate global decarbonization progress greatly.

The global energy intensity has decreased from 4.75 MJ/USD GDP in 2010 to 3.87 MJ/USD GDP in 2022, with an average annual rate of improvement of 1.8% between 2010 and 2022[1]

- While 2021-2022 was a good year, the rates of improvement have significantly slowed down in the recent years. The 0.5% annual improvement from 2020 to 2021 was the second lowest since 2010 and remains well below SDG 7.3 targets.
- Global end-use energy efficiency investment increased 15% from 2023. In 2024, the world invested only around 75% of the annual amount required to meet the SDG7.3 under the IEA's Net Zero Emissions by 2050 Scenario (USD 566 billion per year (2022 USD))

We will need an energy intensity improvement rate of 4 percent per year through 2030 to achieve SDG 7.3

- Due to the slowdown in the rate of improvement of energy intensity since 2015, reaching SDG 7.3 will require much higher improvement rate than the original rate of 2.6%. The estimate by the IEA's scenario analysis shows that we need 4% of annual improvement rate between 2023 and 2030 to achieve SDG 7.3 (Double the rate of energy efficiency)
- All end-use sectors (industry, transport and building) need to be incentivized to be more energy efficient with more investment and better enabling policies and regulations. In-depth analysis of sector specific energy intensity for each country is important to create sound and targeted and effective strategies, considering wide diversity of economic structure and climatic conditions.

1. While analyzing improvements in global energy intensity, qualitative metrics such as structural efficiencies and changes in economy are not captured

Methodology - Description

Data Sources

The following data was gathered from WORLD BANK / ESMAP's Tracking SDG 7 database (download link):

- Energy intensity per country (Energy intensity level of primary energy (megajoules per constant 2017 purchasing power parity GDP)
- Total Final Energy Consumption per Country (PJ)
- Total Energy Supply per Country (ktoe)
- GDP per Country (billion USD 2021 prices and PPPs)
- Total Energy Intensity per Region

The following data was gathered from the IEA's publications and their datasets

- Sources and uses of energy for consumption in 2021 for the World (World Energy Outlook 2024)
- Energy Investment by sector (World Energy Investment 2024)

Projections

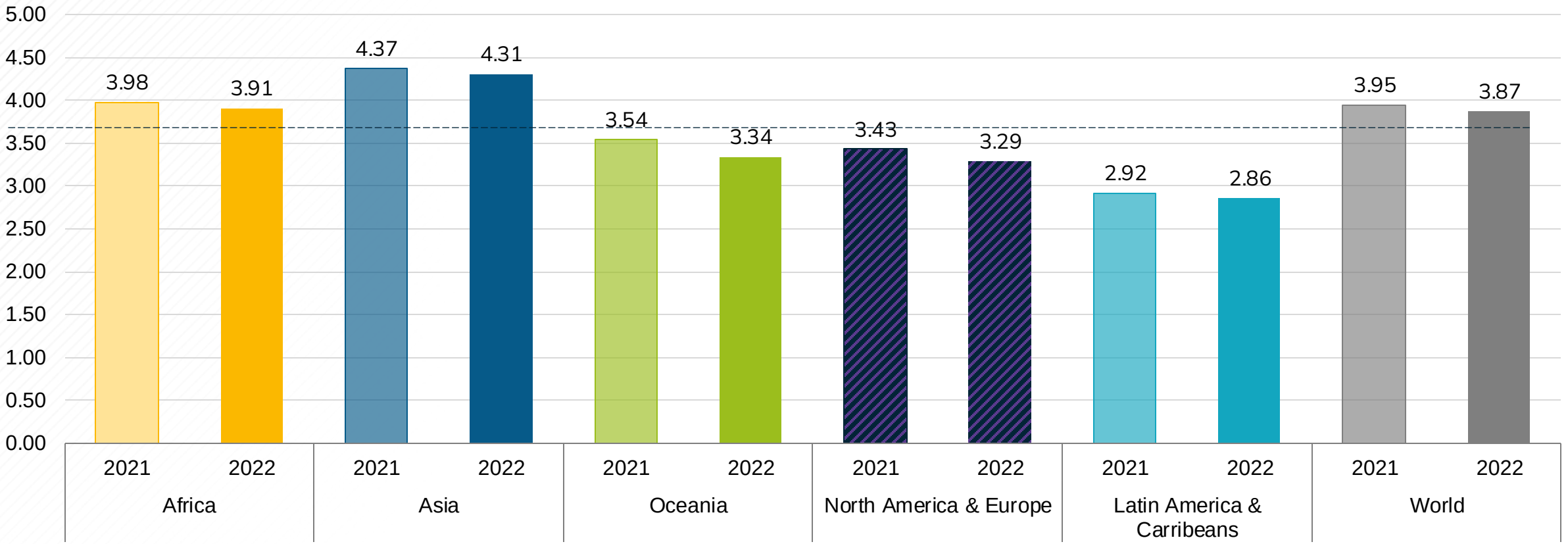
The straight-line extrapolation projection was made via the following process:

- The rate of change of the energy intensity of GDP (Compound Annual Growth Rate, CAGR) between 2019 and 2022 was calculated at a global level
- The energy intensity of GDP was projected forward to 2030 (by 8 years) using the calculated CAGR as the growth rate

IEA Stated Policies Scenario was taken from the Tracking SDG7 2025 report & World Energy Outlook 2024

The World uses 3.87 MJ of energy to generate USD 1 of economic output. The change (reduction) from 2021 to 2022 is not significant

Energy intensity by region, MJ/USD 2021 ppp[1], 2021 and 2022

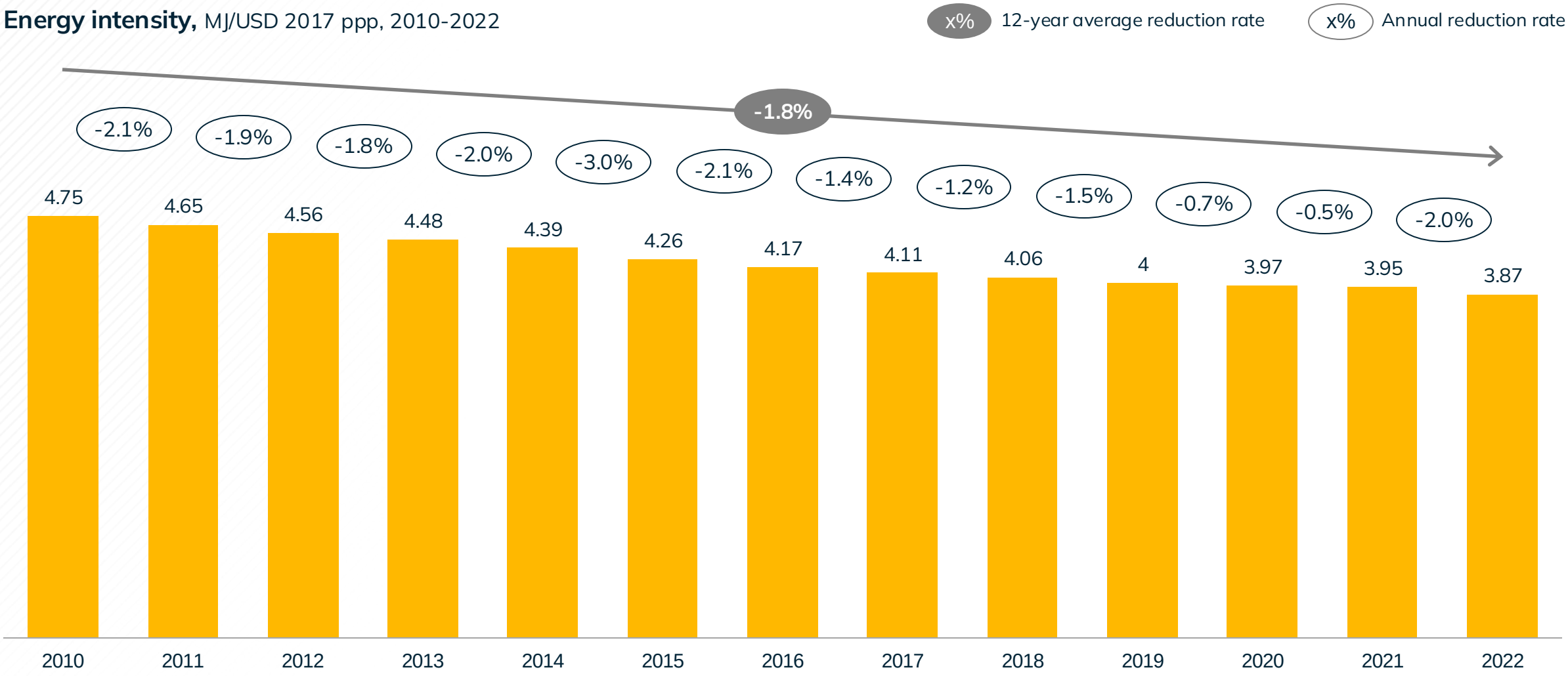


1 Unit is in megajoules per US dollar of GDP at 2021 purchasing power parity (PPP)

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

There has been a 0.88 MJ/USD improvement in energy efficiency over the past 12 years. The average annual reduction rate is 1.8%

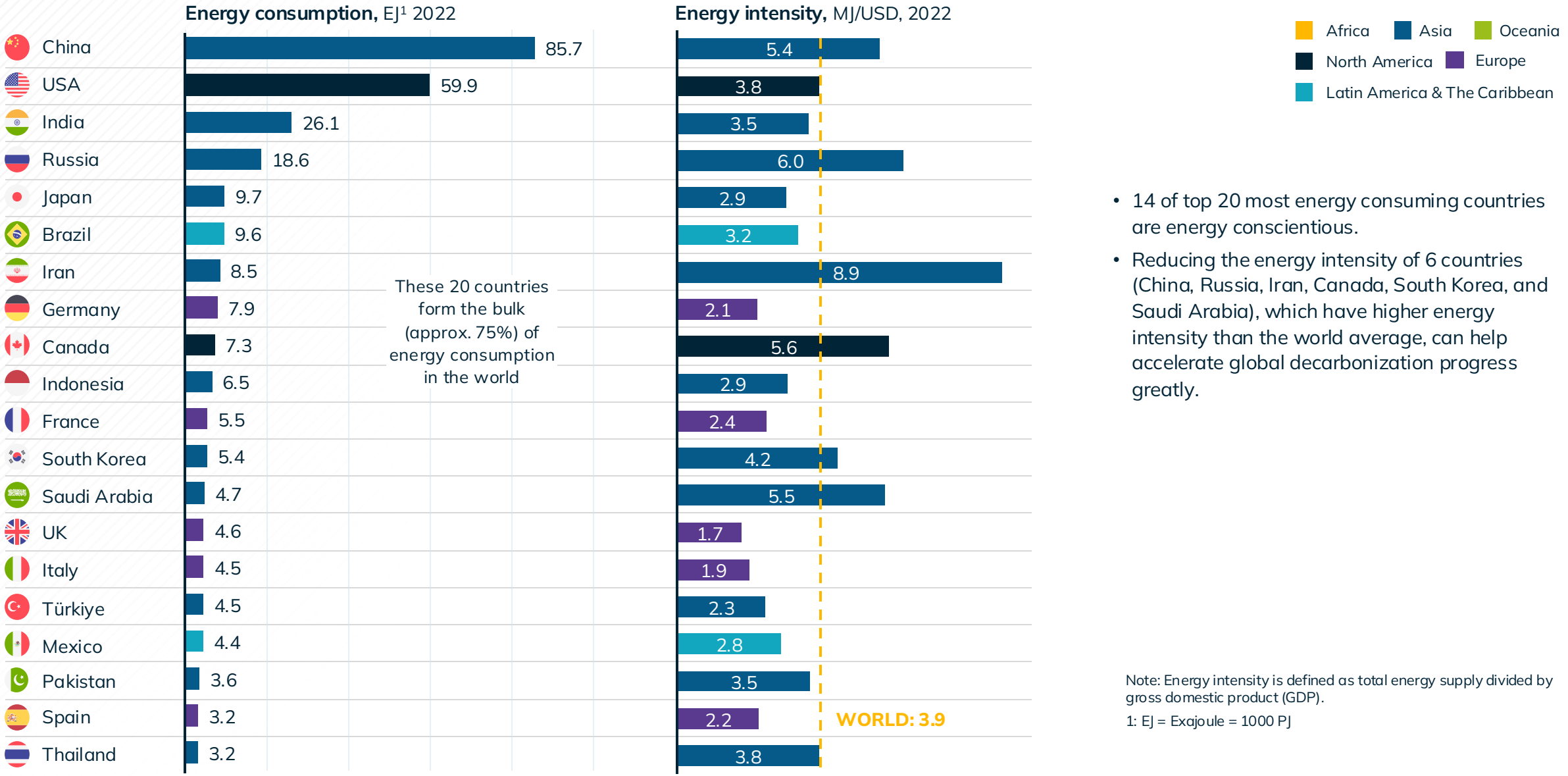
Energy intensity, MJ/USD 2017 ppp, 2010-2022



NOTE: The historical data up to 2022 was also updated with the 2025 dataset. This creates inconsistencies with the analysis in the previous year

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

6 of top 20 energy consumption countries have energy intensity higher than the world average



- 14 of top 20 most energy consuming countries are energy conscientious.
- Reducing the energy intensity of 6 countries (China, Russia, Iran, Canada, South Korea, and Saudi Arabia), which have higher energy intensity than the world average, can help accelerate global decarbonization progress greatly.

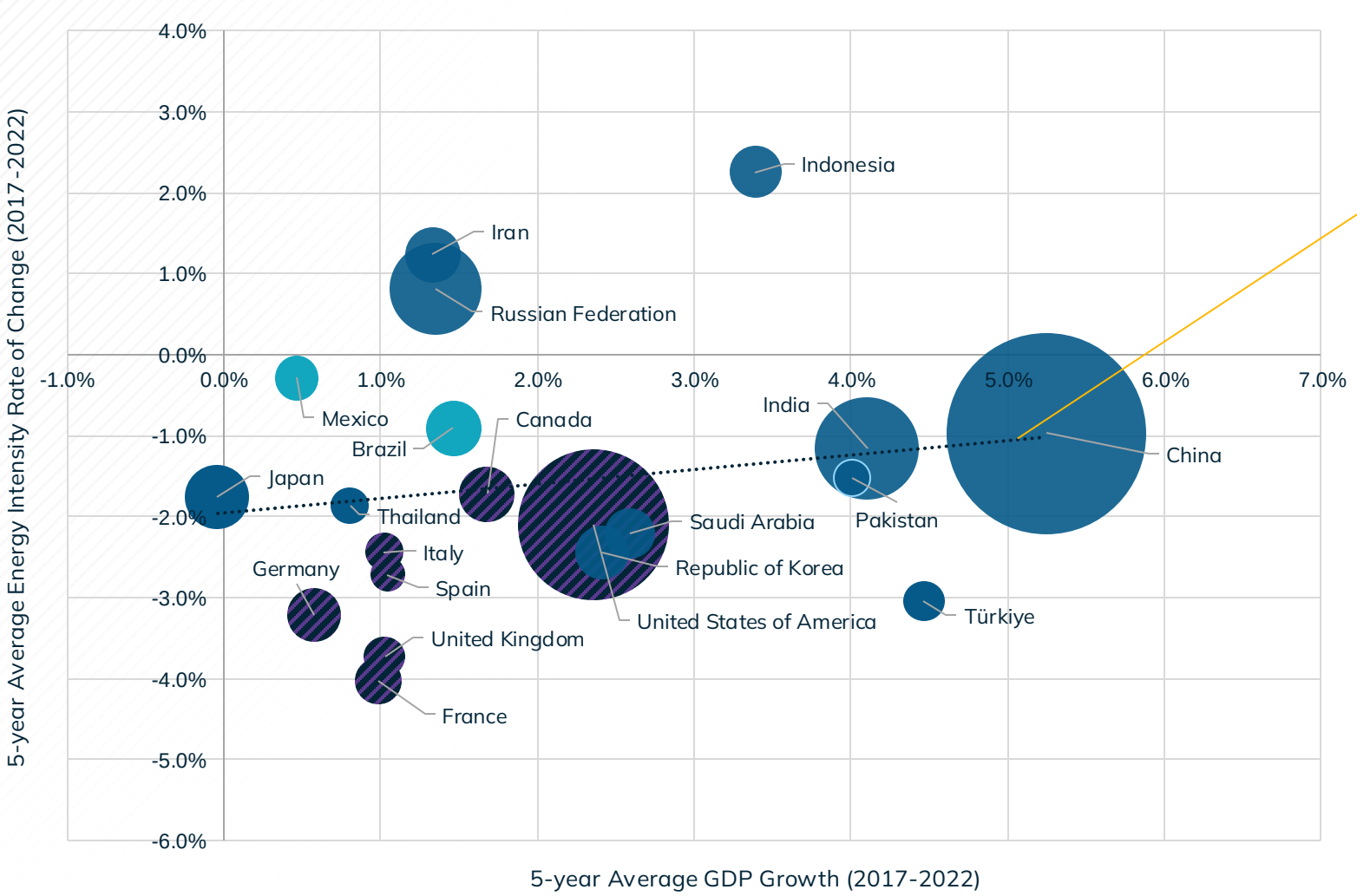
Note: Energy intensity is defined as total energy supply divided by gross domestic product (GDP).

1: EJ = Exajoule = 1000 PJ

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

17 highest energy consumption countries have decreased energy intensity, while Indonesia, Iran, and Russia increased their energy intensity since 2017

Growth of Energy Intensity and GDP of Top 20 Energy Consuming Countries, 2017-2022



World 5-year Average Annual Growth Rates
- Energy Intensity Reduction -1.2%
- GDP Growth 2.6%

Linear regression of 5-year average energy intensity rate
of change and 5-year average GDP growth
(top 20 energy consuming country data)

Comparison among the top 20 energy consumers shows:

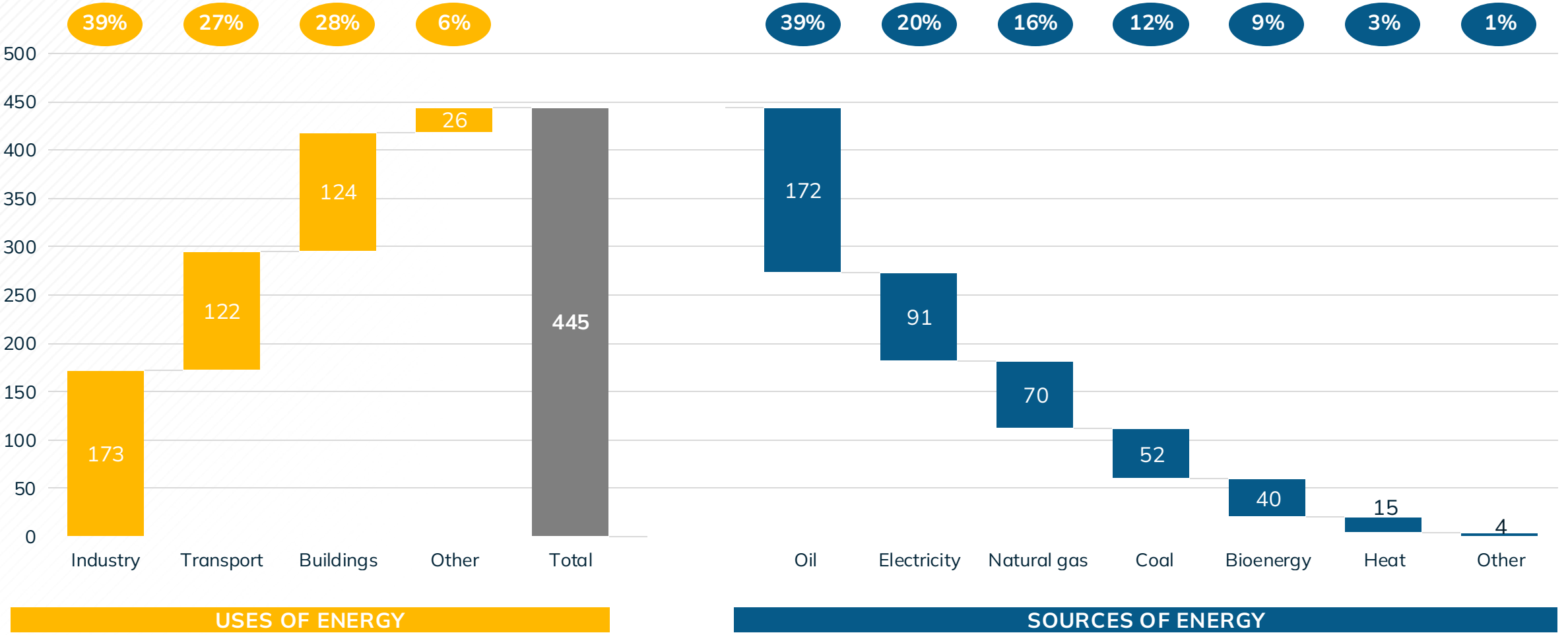
- **17 of the top 20 high energy consuming countries** have improved their energy intensity over the last five data years (2017-2022).
- **UK, France, Germany, Turkey** have been improving their energy intensity the most when reflecting their GDP growth against other top 20 peers.
- **Indonesia, Russia, and Iran** have performed poorly in their energy intensity reduction when considering their GDP growth against other top 20 peers.
- **Changes in energy intensity reflect not only changes in energy efficiency, but also in economic structure and activity levels which affect GDP.** Countries with the slow and negative progress have an opportunity to improve energy efficiency, as well as diversify their economies, for instance away from energy-intensive fossil fuel extraction to more service-oriented economies.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report Datasets

Energy is mainly used in industry, transport and buildings with fossil fuel as the dominant source (67%), followed by electricity

Sources and uses of energy for consumption by sector, EJ, 2023

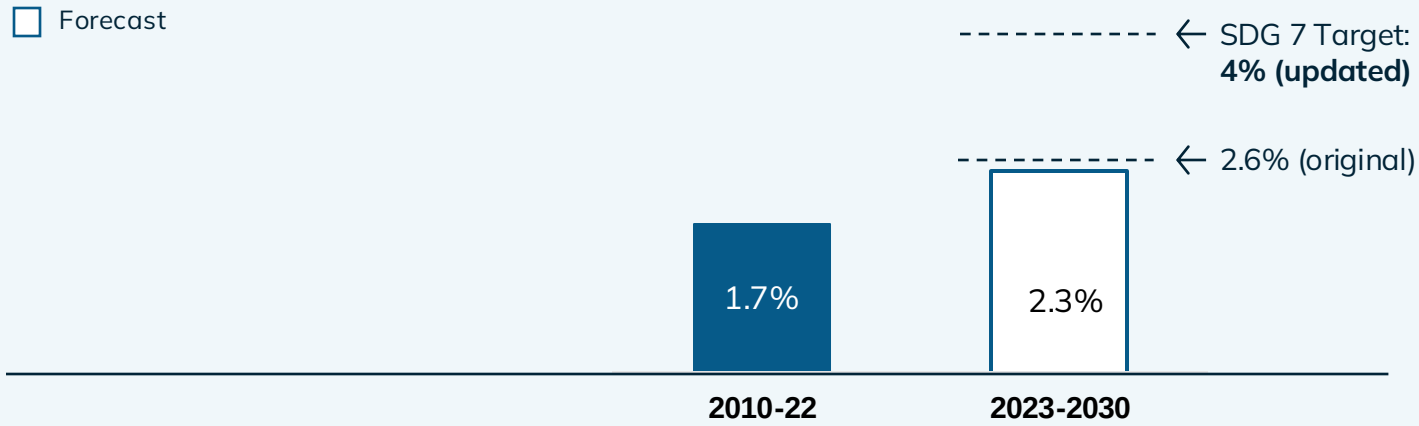
x% Share of total final energy consumption



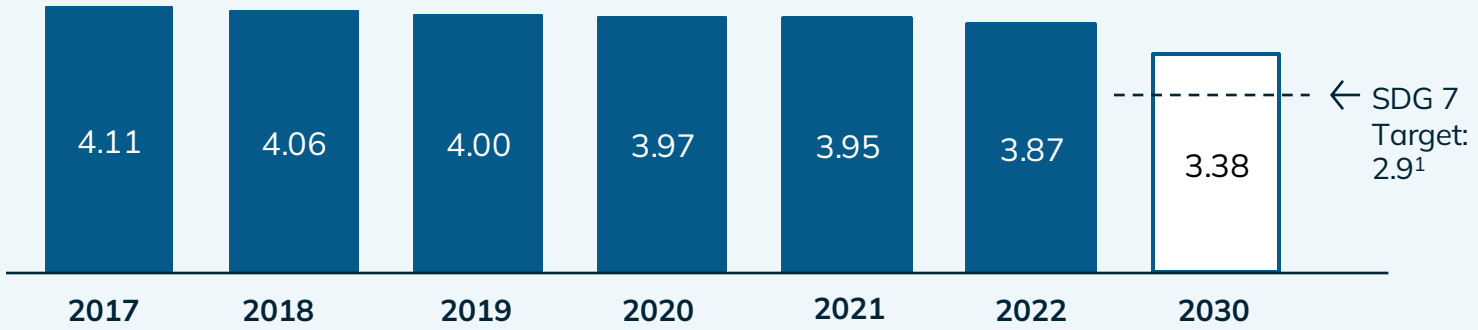
SOURCE: IEA World Energy Outlook World Dataset, 2024

Doubling the energy intensity improvement rate to world average of 4% per year will be needed to achieve SDG 7.3

IEA WEO Stated Policies Scenario (STEPS) 2023, Annual Primary Energy Intensity Improvement Rates



Energy Intensity, MJ/USD 2021 ppp



- Slow improvement rates of recent years mean that a 4% annual rate of improvement is necessary from 2023 to achieve SDG7.3 by 2030. However, the IEA's STEP shows that only 2.3% will be achieved with the currently stated policies.
- More aggressive and diverse policy and investments are necessary to achieve the required improvement rate by 2030, across all sectors and countries.
- High energy consumption economies with high energy intensity or slow progress can have large impacts with stronger improvements.
- However, all countries need to pay more attentions to energy efficiency.

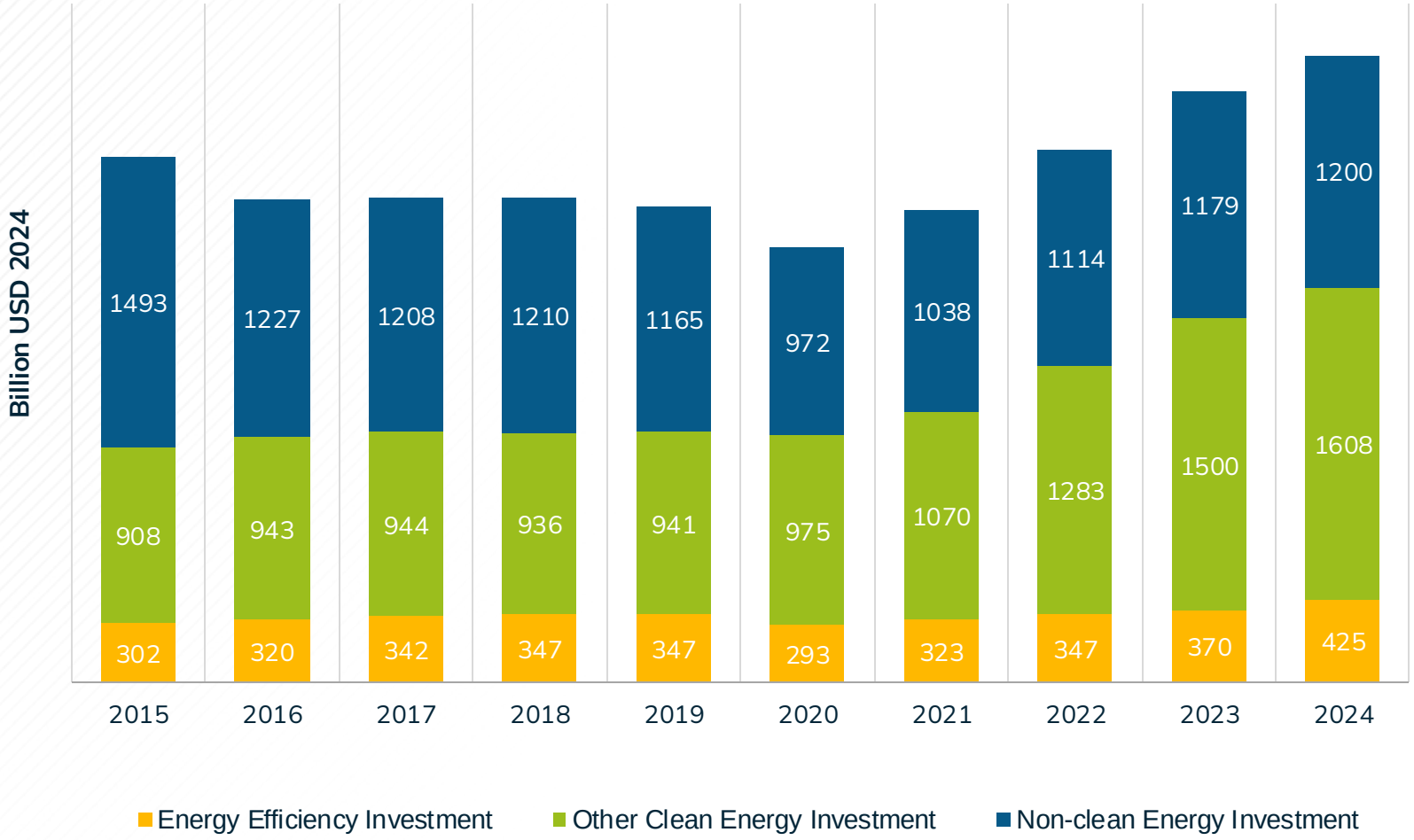
1 The target calculated with 2.6% of improvement rate after 2015.

NOTE: The World Bank/ESMAP historical data up to 2021 were also updated with the 2025 dataset, and the unit changed from MJ/USD 2017 ppp to MJ/USD 2021 ppp. This creates inconsistencies with the analysis from the previous year.

SOURCE: SEforALL Analysis DATA SOURCES: IEA, IRENA, UNSD, World Bank, and WHO (2025) Tracking SDG7 2025 Report & its Datasets; IEA World Energy Outlook (2024)

Global investment in energy efficiency in 2024 was USD 425 billion, 15% above 2023 levels

Global Energy Investment, 2015-2024, billion USD



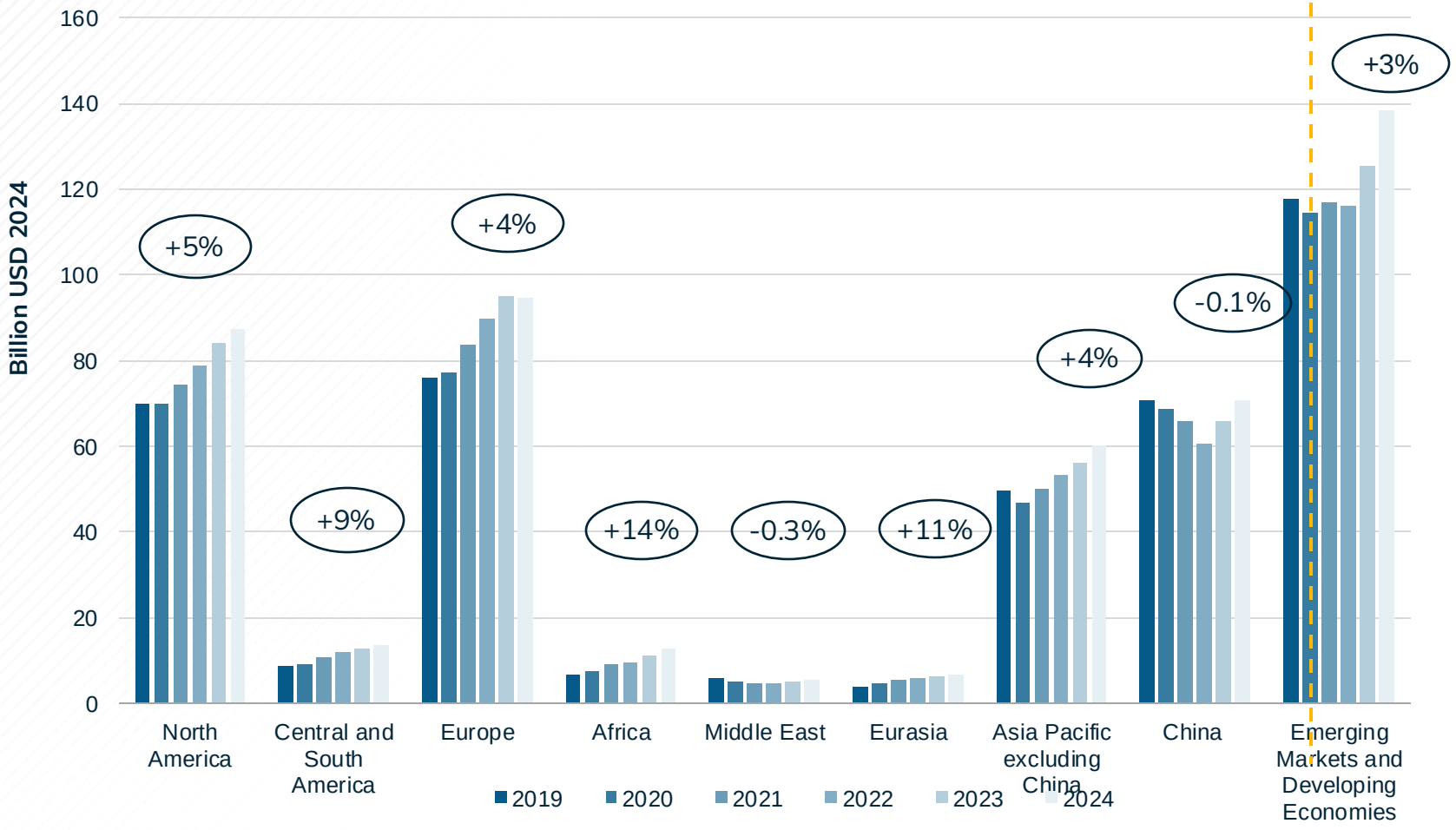
- Global investment in clean energy (including energy efficiency) in 2024 has increased 9% from 2023. Energy efficiency investment alone increased 15% from 2023
- The IEA estimates that the investment required to meet the SDG 7 targets under the Net Zero Emissions by 2050 Scenario for energy efficiency amounts to USD 566 billion per year (2022 USD). The 2024 investment amount is around 75% of this figure.

Data Source: IEA World Energy Investment Datafile 2025

Only Europe shows decrease in energy efficiency investment in 2024 compared to 2023 levels

Energy Efficiency Investment by Region, 2019-2024, billion USD

x% Average annual growth rate 2019-2024



- There is significant regional discrepancy in energy efficiency investment
- 2024 saw the increase of investment in all regions except Europe.
- Over the past six years, Europe, North America, and Asia Pacific including China have been strongly leading energy efficiency investments.
- Central and South America, Africa, Middle East, and Eurasia regions have much weaker overall investments.
- Emerging Markets and Developing Economies (EMDE) need a higher growth rate in investments in energy efficiency.

Data Source: IEA World Energy Investment Datafile 2025

Appendix

While only 1 additional African country will achieve universal access by 2030 with the current rate of improvement, 47 countries will remain with unelectrified populations and 18 of them will have significant numbers of unelectrified populations (10 million or more)

Countries expected to achieve universal access by 2030	Cabo Verde	
Countries expected to have ~10 million or more unelectrified population by 2030	Angola	Mozambique
	Burkina Faso	Niger
	Burundi	Nigeria
	Chad	Somalia
	DR Congo	South Africa
	Ethiopia	South Sudan
	Madagascar	Sudan
	Malawi	Tanzania
	Mali	Uganda

DATA SOURCE: WORLD BANK / ESMAP Tracking SDG7 Database, 2025; SEforALL analysis

6 Asian countries will achieve universal access by 2030 with the current rate of improvement, while 8 countries will still have unelectrified populations

Countries expected to achieve universal access by 2030	Bangladesh	Indonesia
	Cambodia	Philippines
	India	Viet Nam
Countries expected to have unelectrified population by 2030	Afghanistan	Nepal
	DPR Korea	Pakistan
	Lao PDR	Syria
	Myanmar	Yemen

DATA SOURCE: WORLD BANK / ESMAP Tracking SDG7 Database, 2025; SEforALL analysis

10 non-Africa / Asia countries will achieve universal access by 2030 if they continue to deliver at the current levels

Countries currently projected to achieve universal access by 2030		
	Belize	Guyana
	Bolivia	Kiribati
	Brazil	Mexico
	Dominican Republic	Paraguay
	Fiji	Suriname

DATA SOURCE: WORLD BANK / ESMAP Tracking SDG7 Database, 2025; SEforALL analysis

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