Harnessing digital technology for energy efficiency

Forum on Sustainable Digital Transformation in the Africa Region

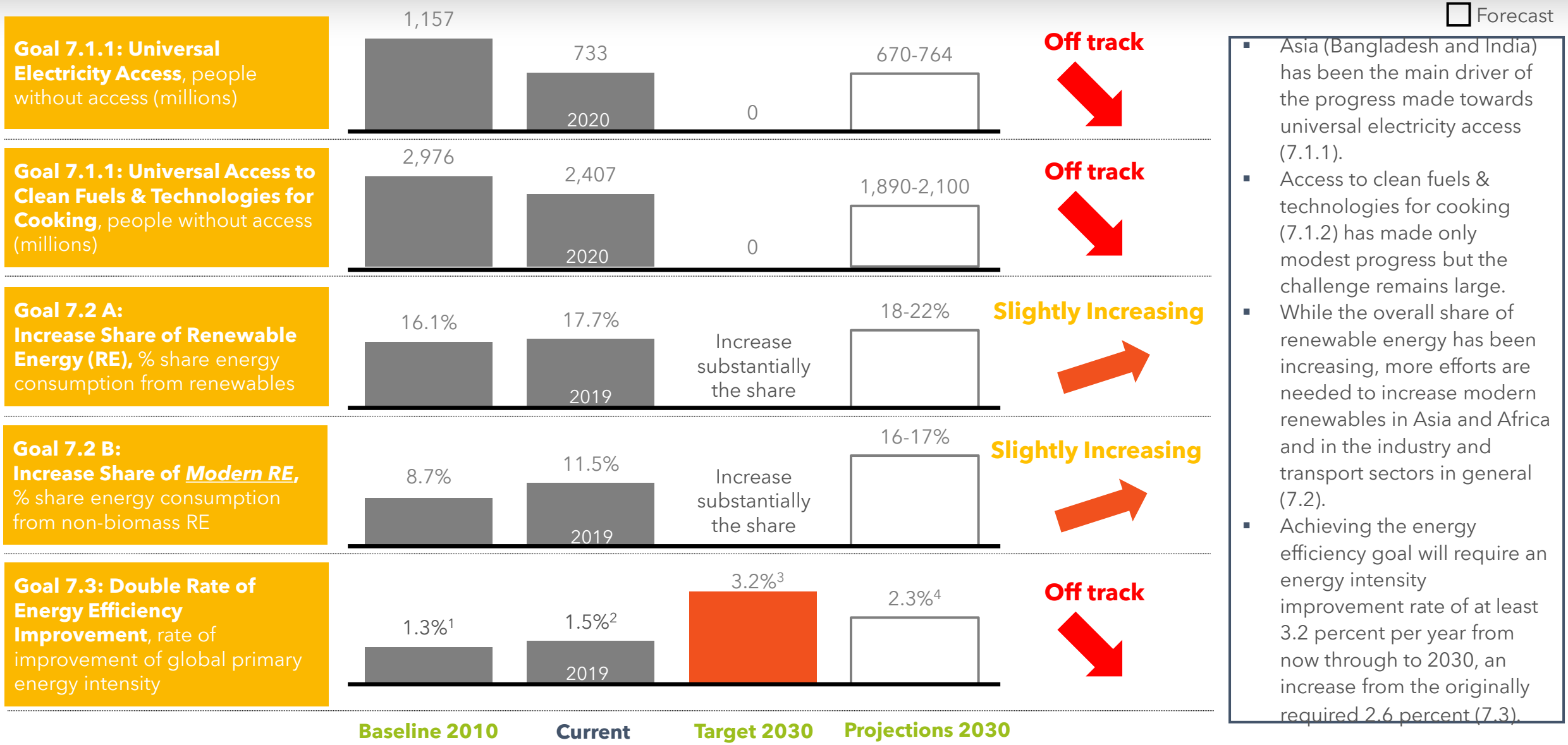
17/05/2023

The energy efficiency opportunity

SDG 7.3 calls for doubling the rate of improvement in energy efficiency by 2030

- Energy efficiency is also the quickest and most cost-effective opportunity to underpin the clean energy transition and universal access to energy
- It could deliver over 40% of the emissions reductions required by the Paris Agreement
- It also brings multiple social, economic and health benefits
- Many energy efficiency policy and technology solutions are well-known, and most of the improvement needed to achieve net-zero could be implemented cost-effectively by 2030

We are lagging behind in providing access to both electricity and clean cooking, and much more needs to be done to increase efficiency and modern renewables



- Asia (Bangladesh and India) has been the main driver of the progress made towards universal electricity access (7.1.1).
- Access to clean fuels & technologies for cooking (7.1.2) has made only modest progress but the challenge remains large.
- While the overall share of renewable energy has been increasing, more efforts are needed to increase modern renewables in Asia and Africa and in the industry and transport sectors in general (7.2).
- Achieving the energy efficiency goal will require an energy intensity improvement rate of at least 3.2 percent per year from now through to 2030, an increase from the originally required 2.6 percent (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 2018–2019.
3. Yearly rate of energy efficiency improvement required to meet 2030 target 2020–2030. 4. 2030 projection by the IEA Stated Policies Scenario (STEP).

SOURCES: World Bank/ESMAP Tracking SDG7 Database 2022, IEA *World Energy Outlook 2021*, SEforALL analysis.

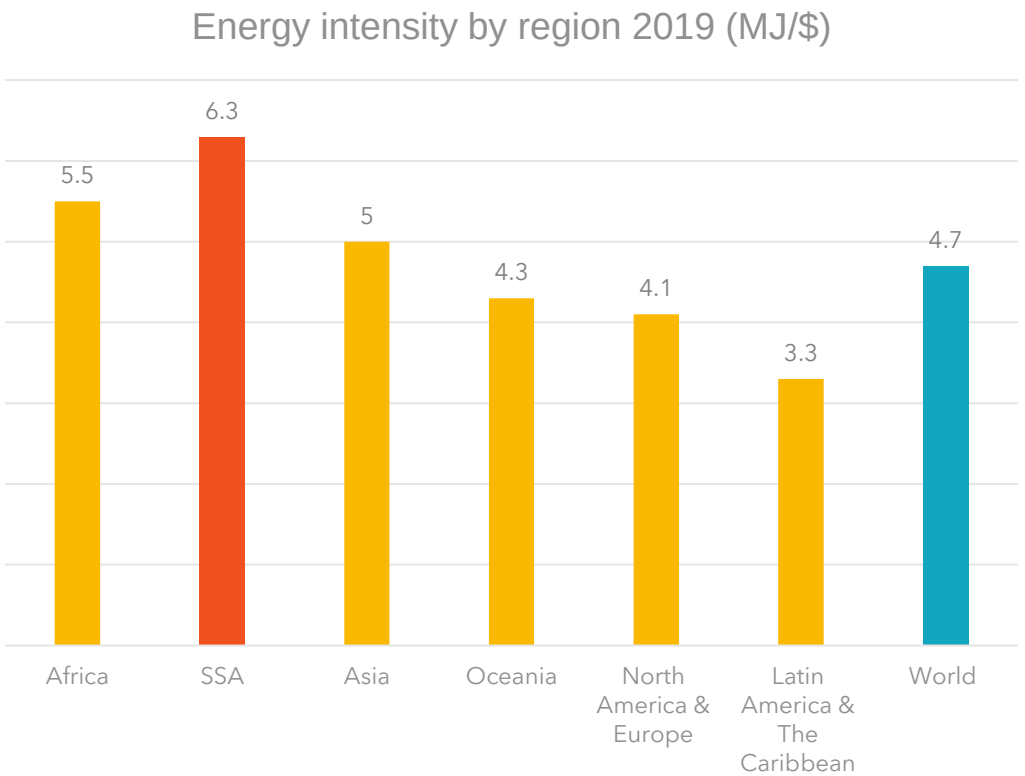
Energy Efficiency is out of track with important opportunities in Africa

Significant efforts are needed to put the world back on track

- The energy intensity rate of improvement has significantly slowed down in recent years.
- It currently takes 4.7 MJ (megajoules) of energy to generate USD 1 of economic activity globally.
- To achieve SDG7.3 **the world must achieve an average of 3.2** annual improvement – compared to the initial annual target of 2.6.

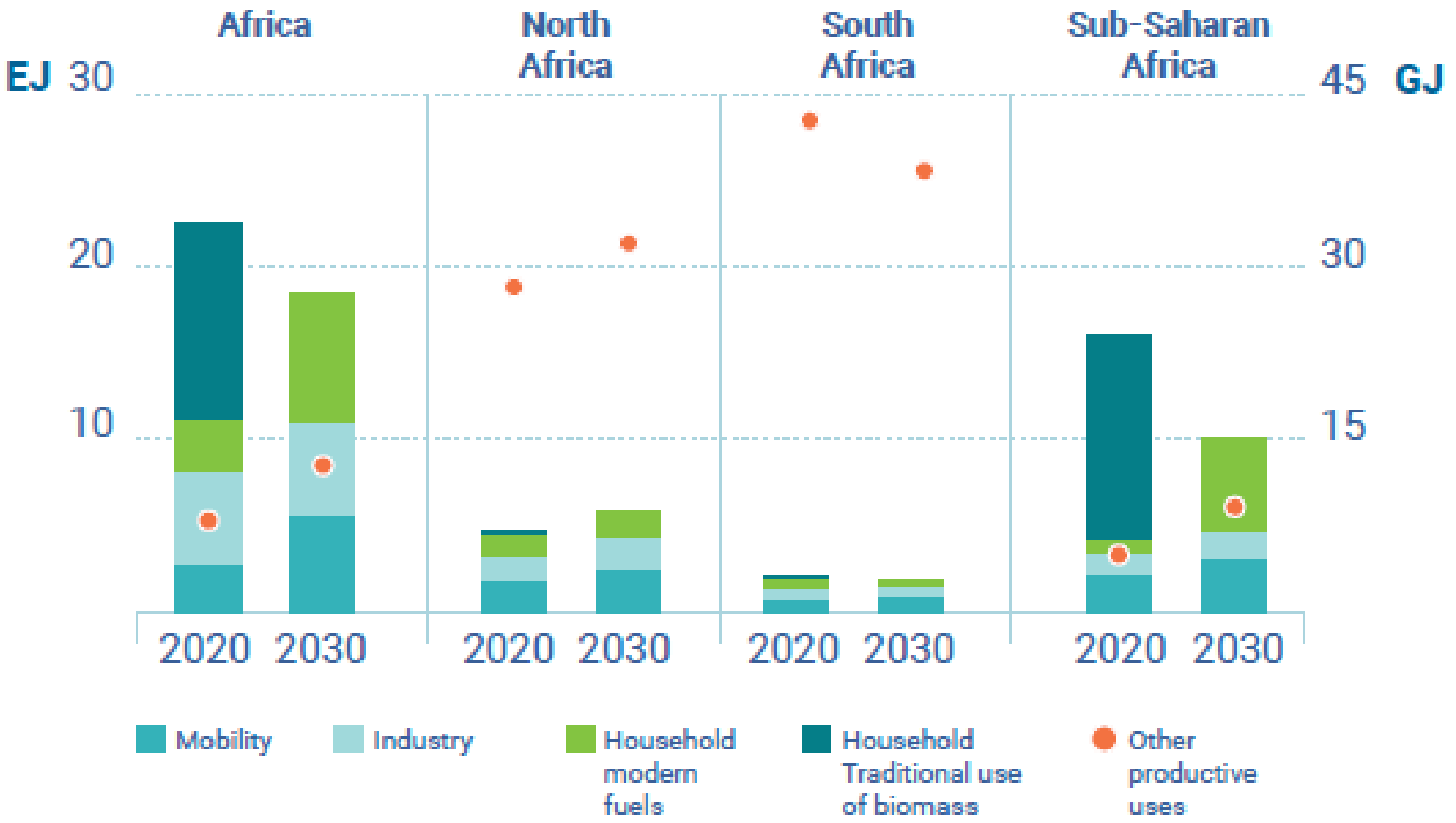
A clear urgency for energy efficiency in Africa

- **Africa is the least efficient region** with 5.5 MJ/USD GDP, followed by Asia with 5.0 MJ/USD GDP while **SSA** uses 6.3 MJ of energy to generate 1 USD of economic activity.



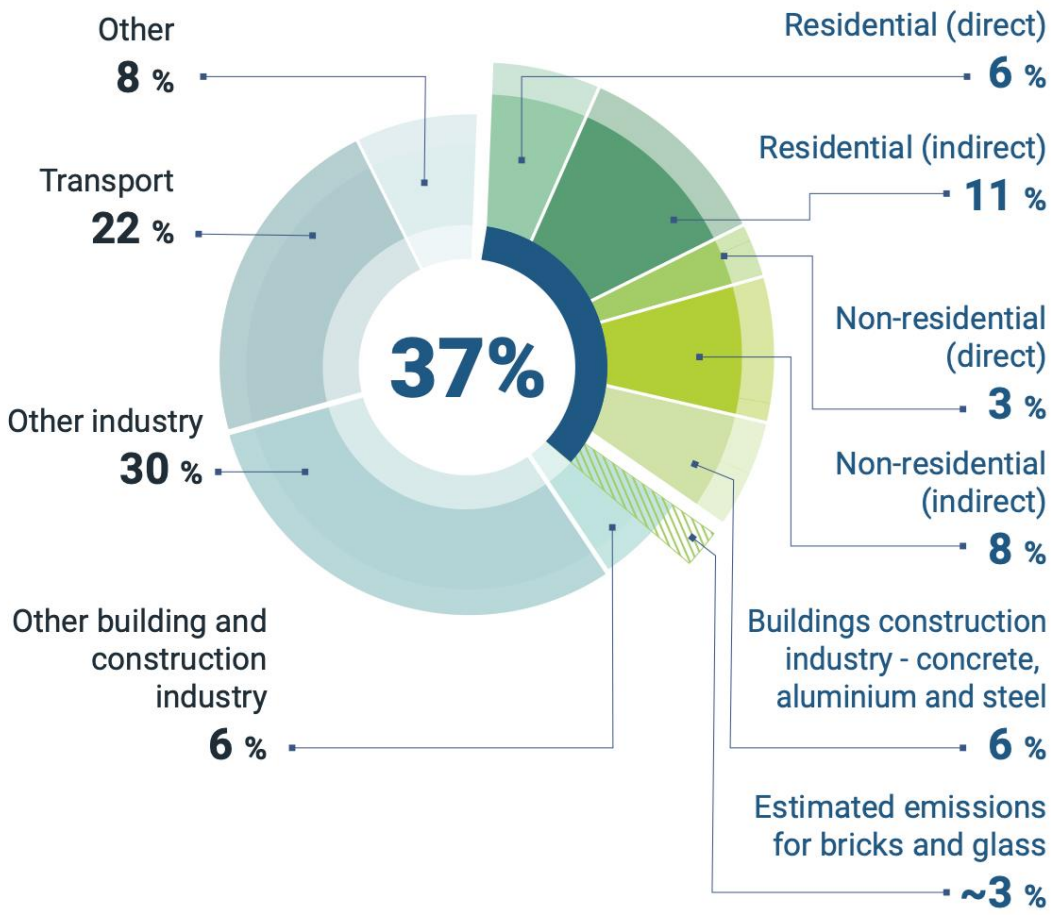
Source: ESMAP, 2022
Chart: Energy intensity in Africa includes SSA.

Africa's final energy consumption by sector 2020-2030

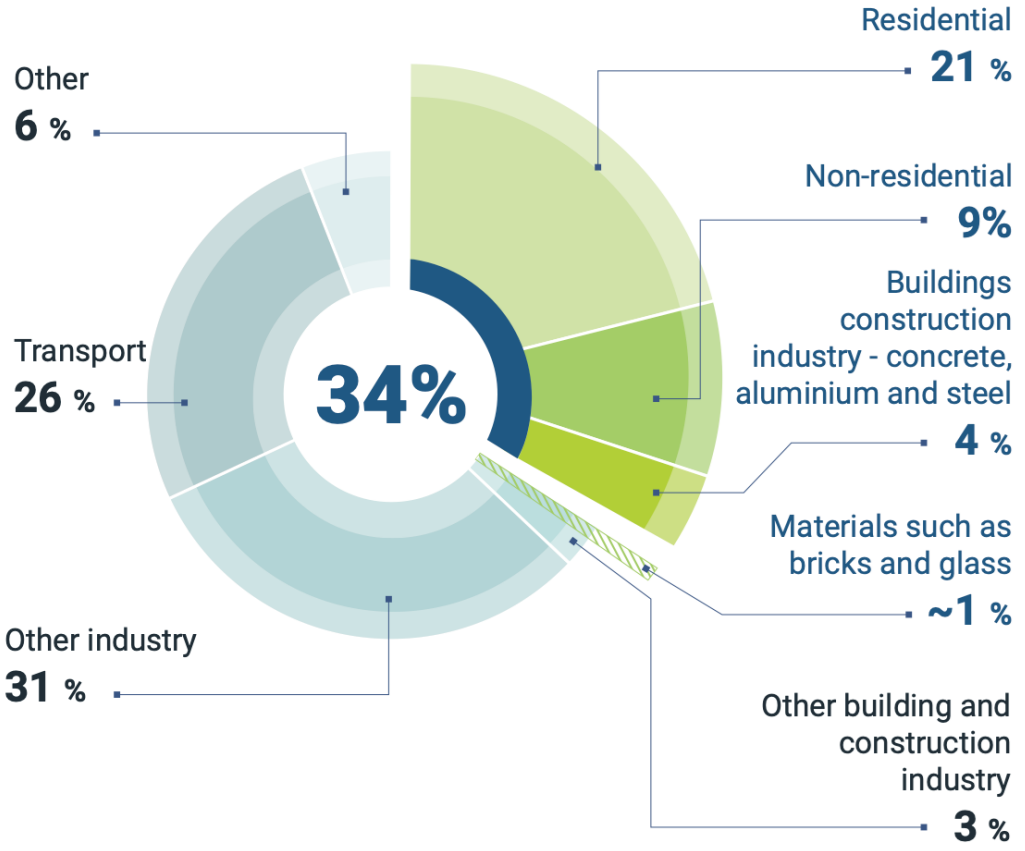


Source: IEA Africa Energy Outlook 2022 (IEA 2022b).

Global share of buildings and construction operational and process CO2 emissions, 2021



Global share of buildings and construction final energy demand, 2021



Energy efficiency may not be visible, but it has power.

Energy Efficiency Powers: First Fuel

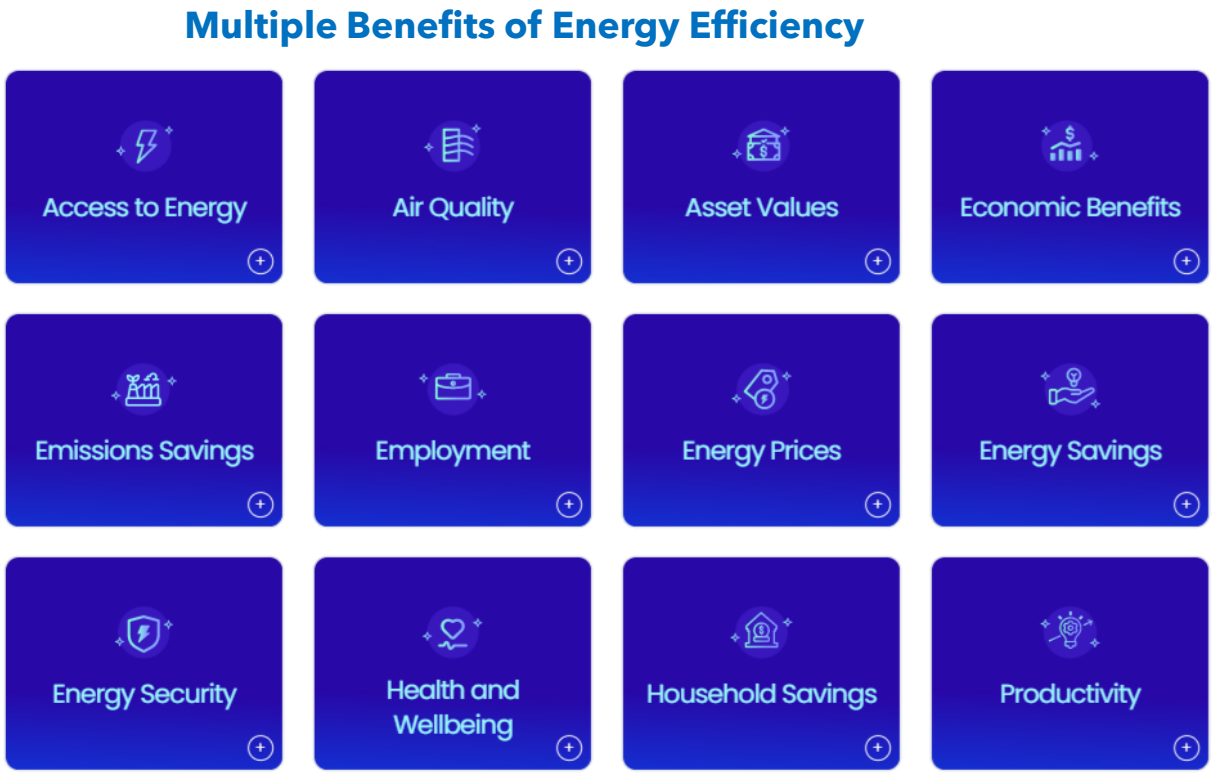
Climate progress
Cost-effectively contribute 40 percent of the emissions savings goals of the Paris Agreement.

Increase the share of renewables in TFEC
Renewable energy coupled with energy efficiency measures enable energy applications that could not have been otherwise technically or economically feasible.

Universal electricity access
Accelerating energy access progress by allowing the energy produced to serve more people. Reducing peak load and improve **reliability of the grid.**

Productive use of electricity
Energy efficiency can free up resources that can serve to improve access to clean cooking, sustainable cooling, lighting, etc.

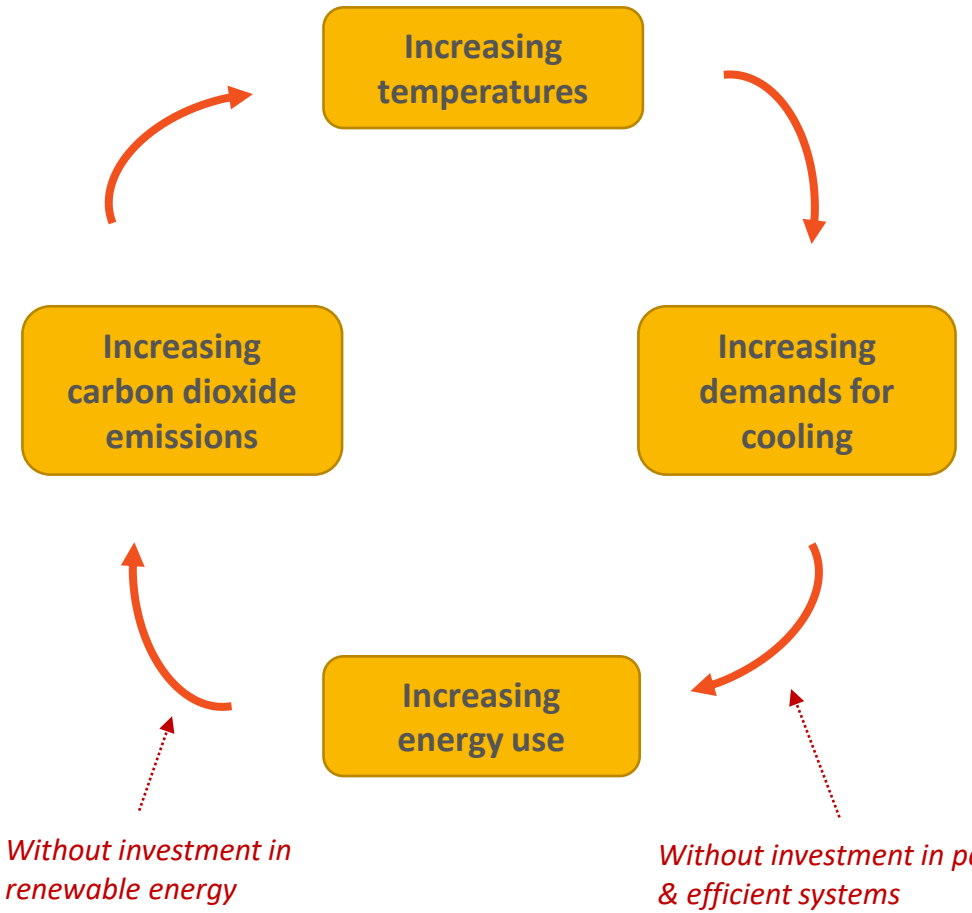
Achievement of SDG 7.3 and other SDGs
Creating jobs, improving productivity, lowering energy burden for low-income households, delaying the construction of new energy plants, improving air quality, etc.

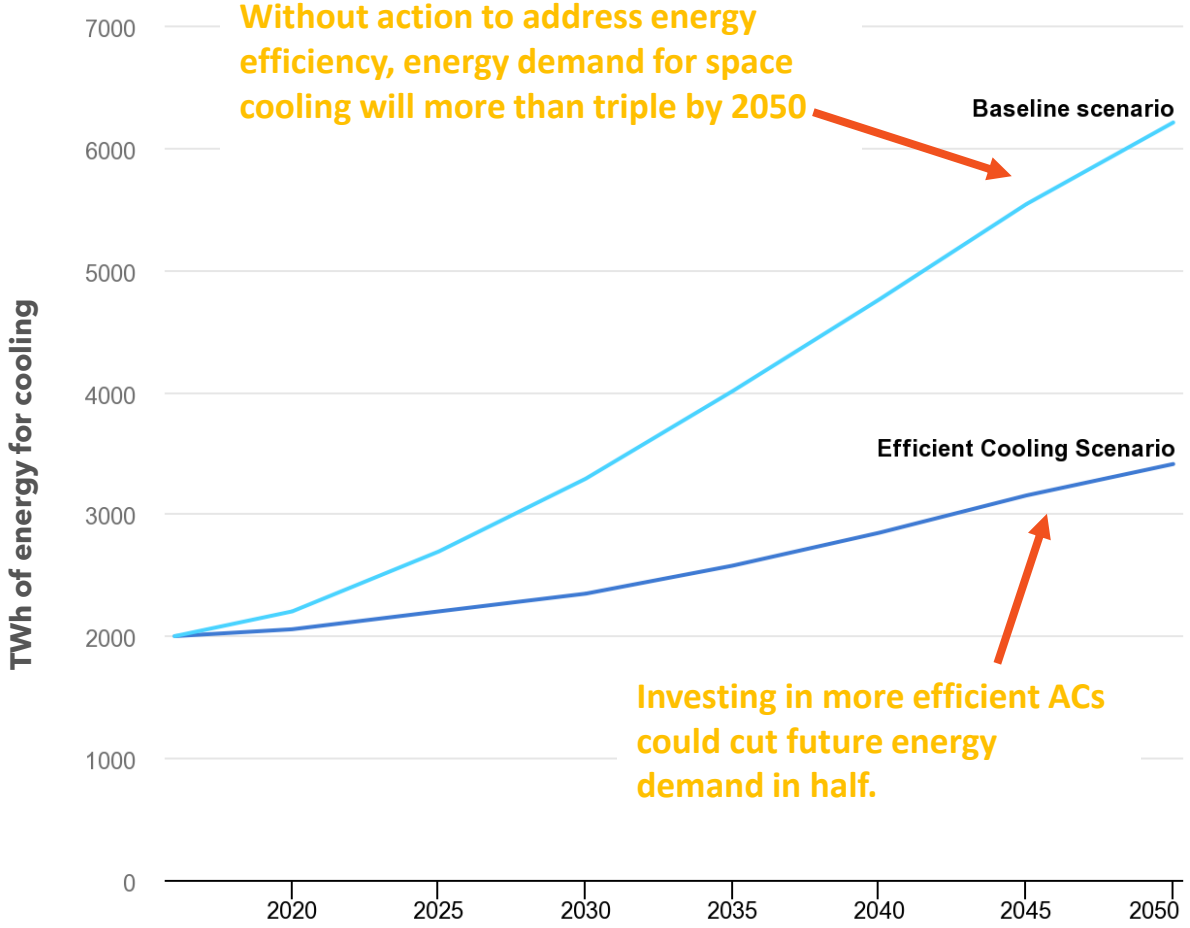


Source: IEA 2014, IEA 2021, Mission Efficiency 2022

Consequences of heat exposure

The Dangerous Feedback Loop





Source: IEA (2018)

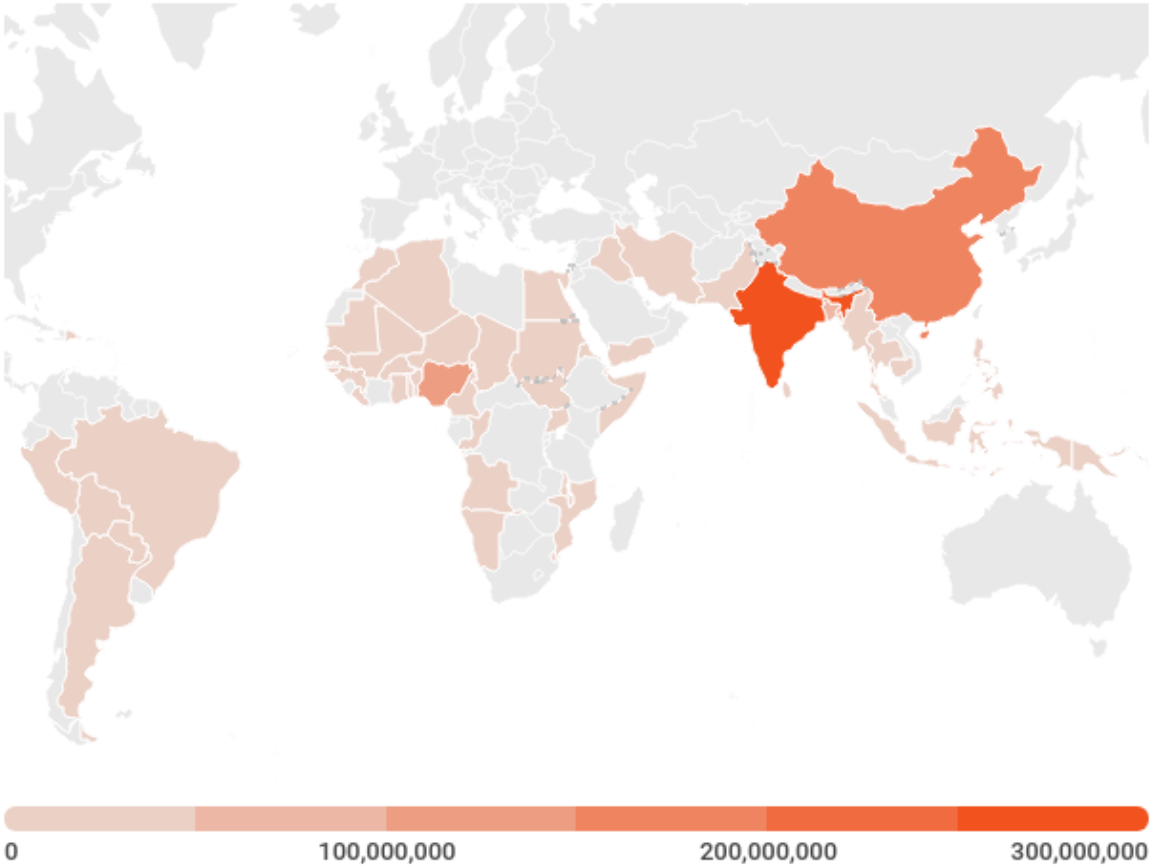
GLOBAL TRACKING | GLOBAL COOLING ACCESS GAPS

In a warming world, access to cooling is not a luxury. It is an issue of equity, necessary to adapt and thrive.

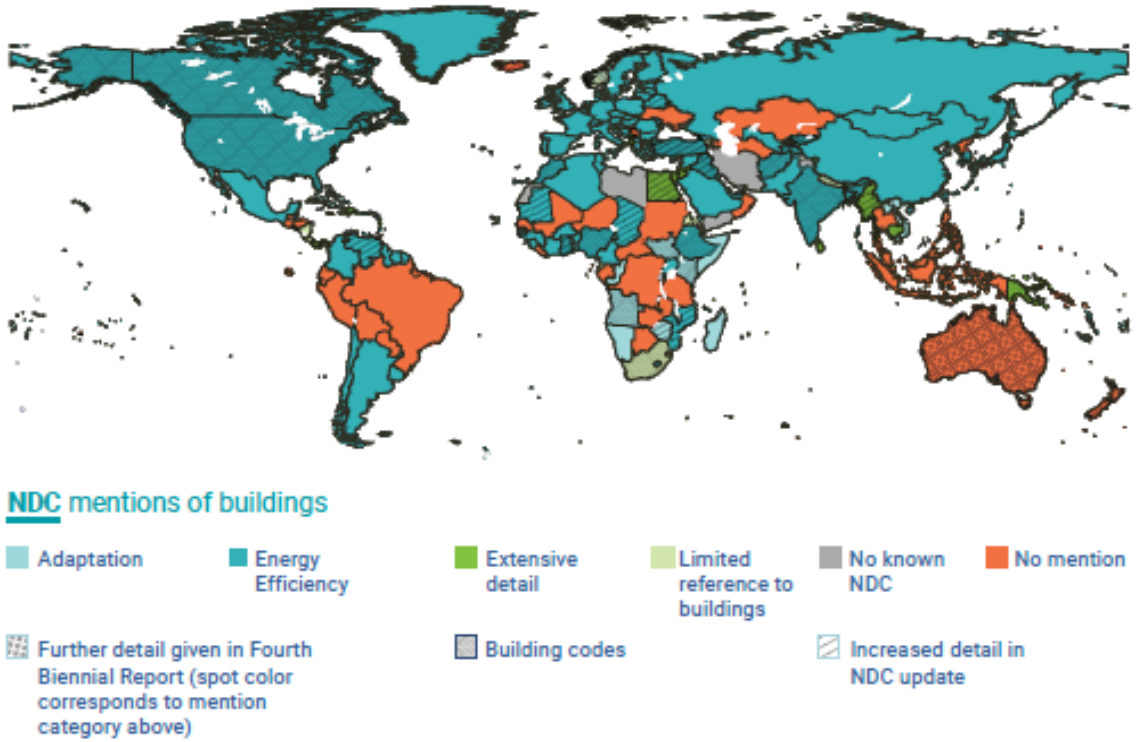
1.2 billion people are at high risk due to lack of lack access to cooling in 2022. 70% are poor urban dwellers.

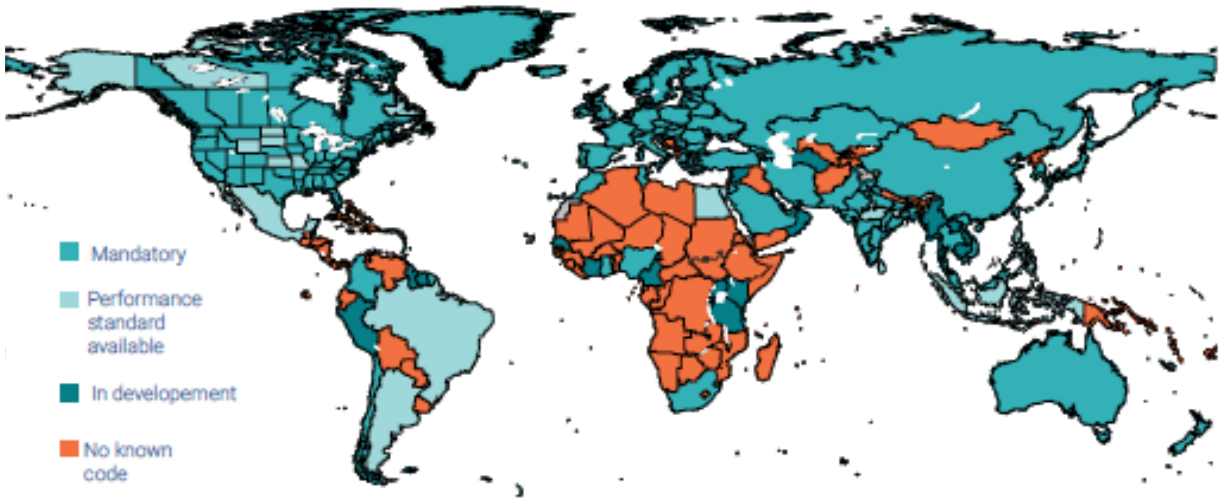
Additional **2.47 billion lower-middle income are at medium risk**, in need of cooling solutions that are sustainable and affordable.

Populations at high risk by country



Global status of NDC mentions vs building energy codes in 2021





*In total, 51 out of 196 countries tracked by the Buildings Global Status Report have mandatory building energy codes which cover both residential and non residential buildings. This number is higher than last year's total, but the methodological changes this year means these numbers should not be directly compared.

Source: 2022 Global Status Report for Buildings and Construction

Doubling energy efficiency of fans and air conditioners could reduce energy demand for cooling by 45%

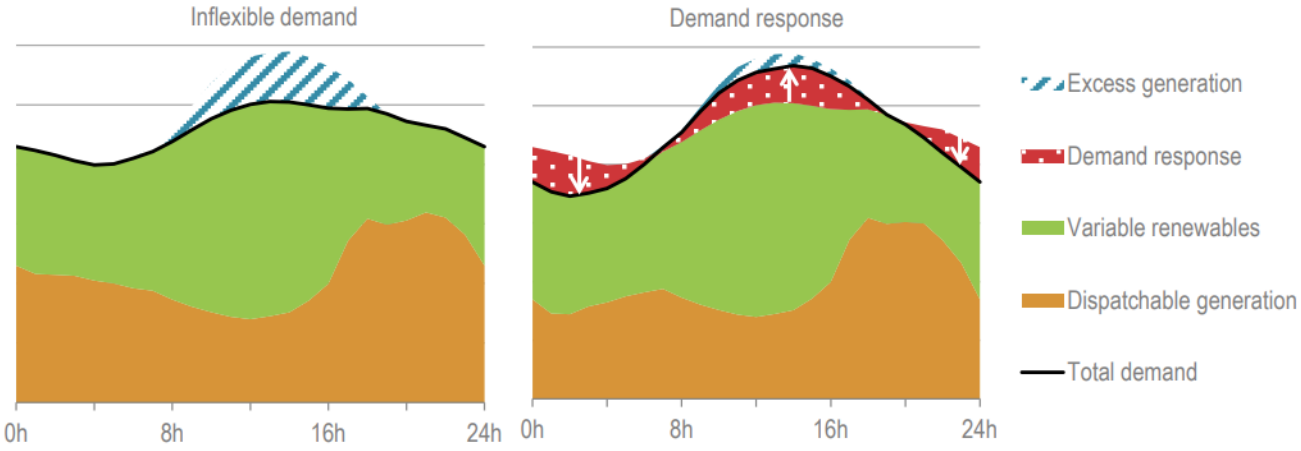
- Energy consumption in buildings increased 4% in 2021.
- While space and water heating are responsible for almost 50% of the energy demand, space cooling is expected to be the second strongest driver of growth in buildings- after motors.
- Doubling energy efficiency of fans and air conditioners could reduce energy demand for cooling by 45%

Source: IEA, 2022.

Digitalization can reduce the demand for cooling and support the integration of renewable energy

- ✓ Use of supply and demand-side data to adjust energy consumption
  - ✓ Smart ACs,
  - ✓ Digital controls
  - ✓ Smart building management systems
  - ✓ Digitalization in key processes of cold chains

Figure 2.7 • Impact of demand response on the daily load curve



Source: IEA (2017a), *Digitalization and Energy*.

Examples of digitalization to provide sustainable cooling

- Digitalization coupled with innovative business models such as Pay As You GO can enable sustainable and affordable cooling services

- Your VCCA (virtual cold chain assistant) implemented by BASE and the Swiss Federal Laboratories for Materials Sciences and Technologies, enables smallholder farmers to access cold storage by incorporating a cooling as a service business model + an app that process market intelligence to predict the shelf life of produce in storage rooms. This data allows farmers to secure the best possible price for their produce.

Mission Efficiency

Elevate. Support. Invest.

An Energy Efficiency Ecosystem

Mission Efficiency is a global collective of actions, commitments and goals on energy efficiency by a coalition of governments, organizations and initiatives. Energy efficiency represents the largest share of cost-effective actions to achieve the Paris Agreement. Mission Efficiency unites these partners and actions to accelerate the transition towards energy efficient economies worldwide.

www.missionefficiency.org

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Seeking to drive progress on energy efficiency:

Elevate energy efficiency in personal, organizational and global agendas - a clear narrative, convening partners, matching solution offers and advocating for energy efficiency.

Support energy efficiency with strategic and technical assistance by partners for progress in countries on key issues in high impact sectors, across multiple sectors or economy wide.

Invest in energy efficiency with coordinated and actionable project funding through loans, grants and incentives for infrastructure and projects by countries, funds and financial institutions.

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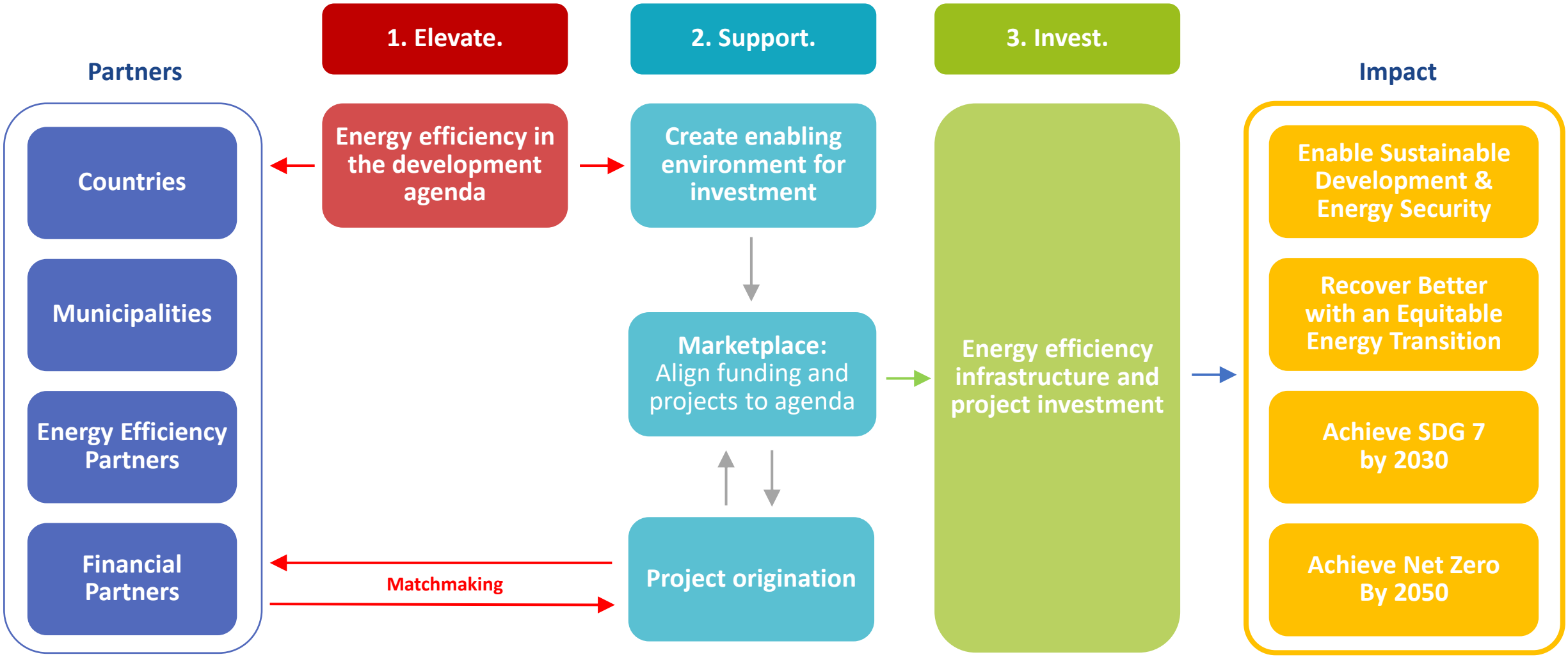
Mission Efficiency Activities



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Thank you!

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