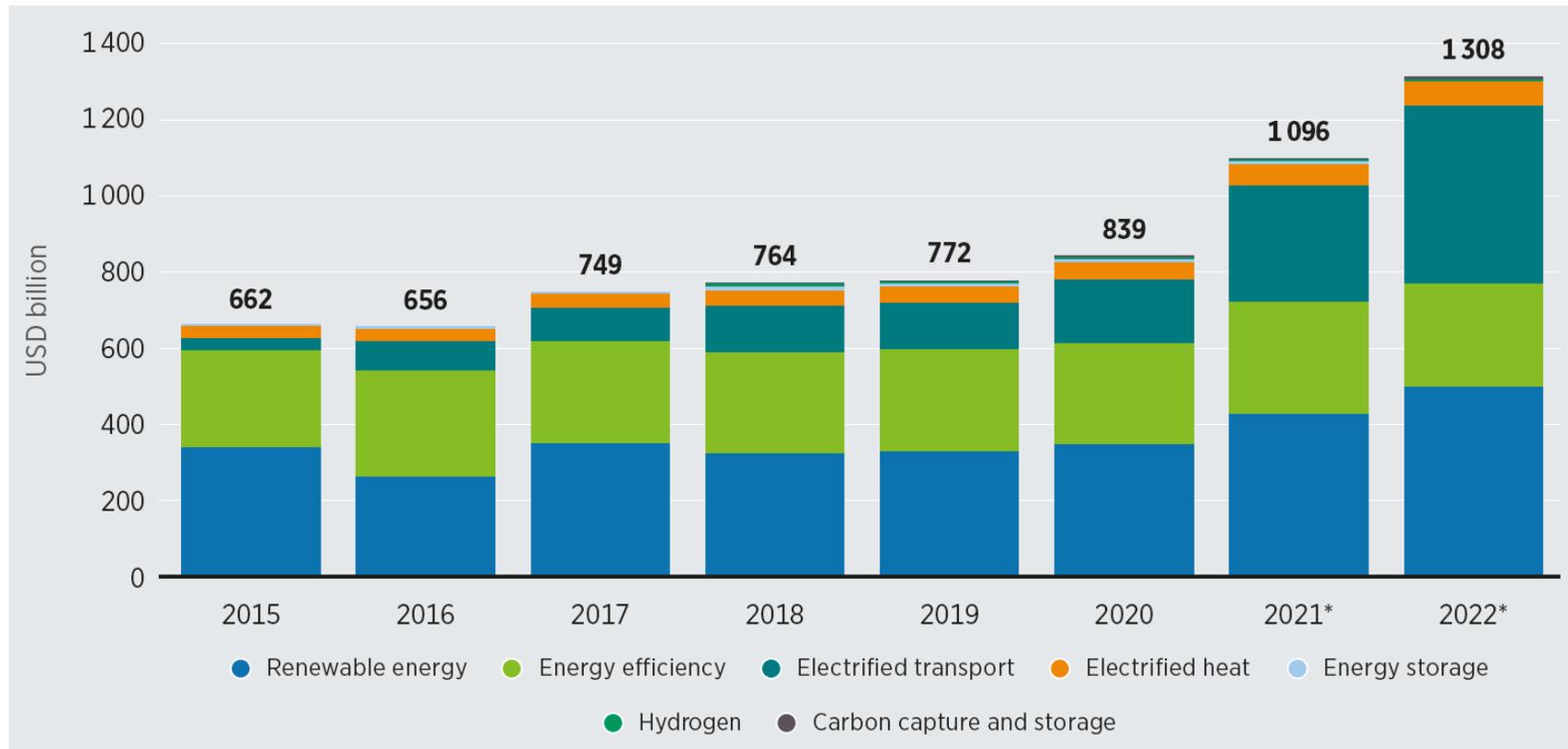


# The global landscape of renewable energy finance



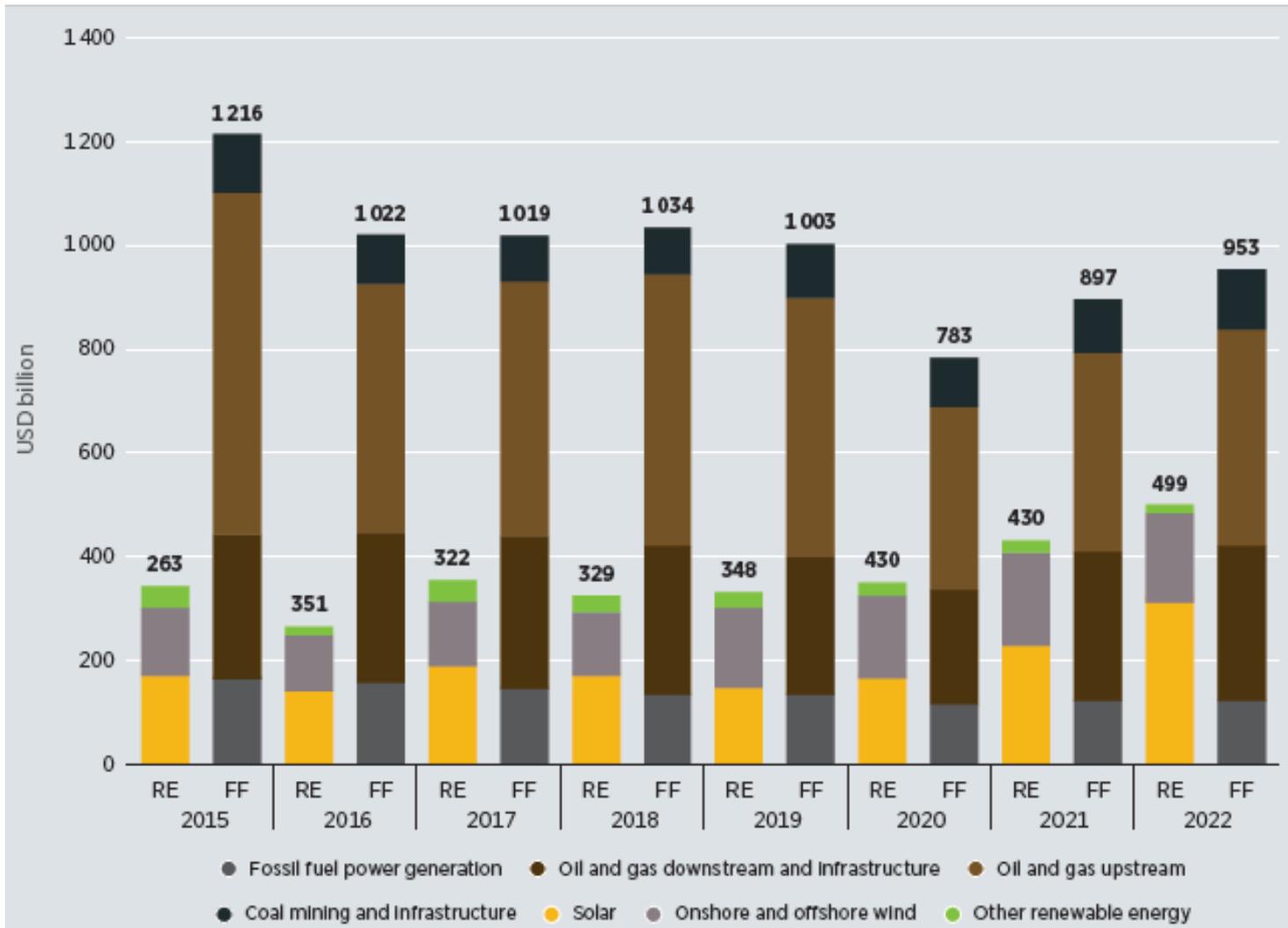
# Global investment in energy transition technologies



- In 2022, global investments in the energy transition **grew 70%** from before the pandemic in **2019**
- They need to **more than quadruple until 2030** according to IRENA's 1.5°C Scenario
- Investment in **electrified transport** grew by **54%** compared to 2021

Based on IEA (2022) and BNEF (2023)

# Renewable energy vs. fossil fuel annual investment

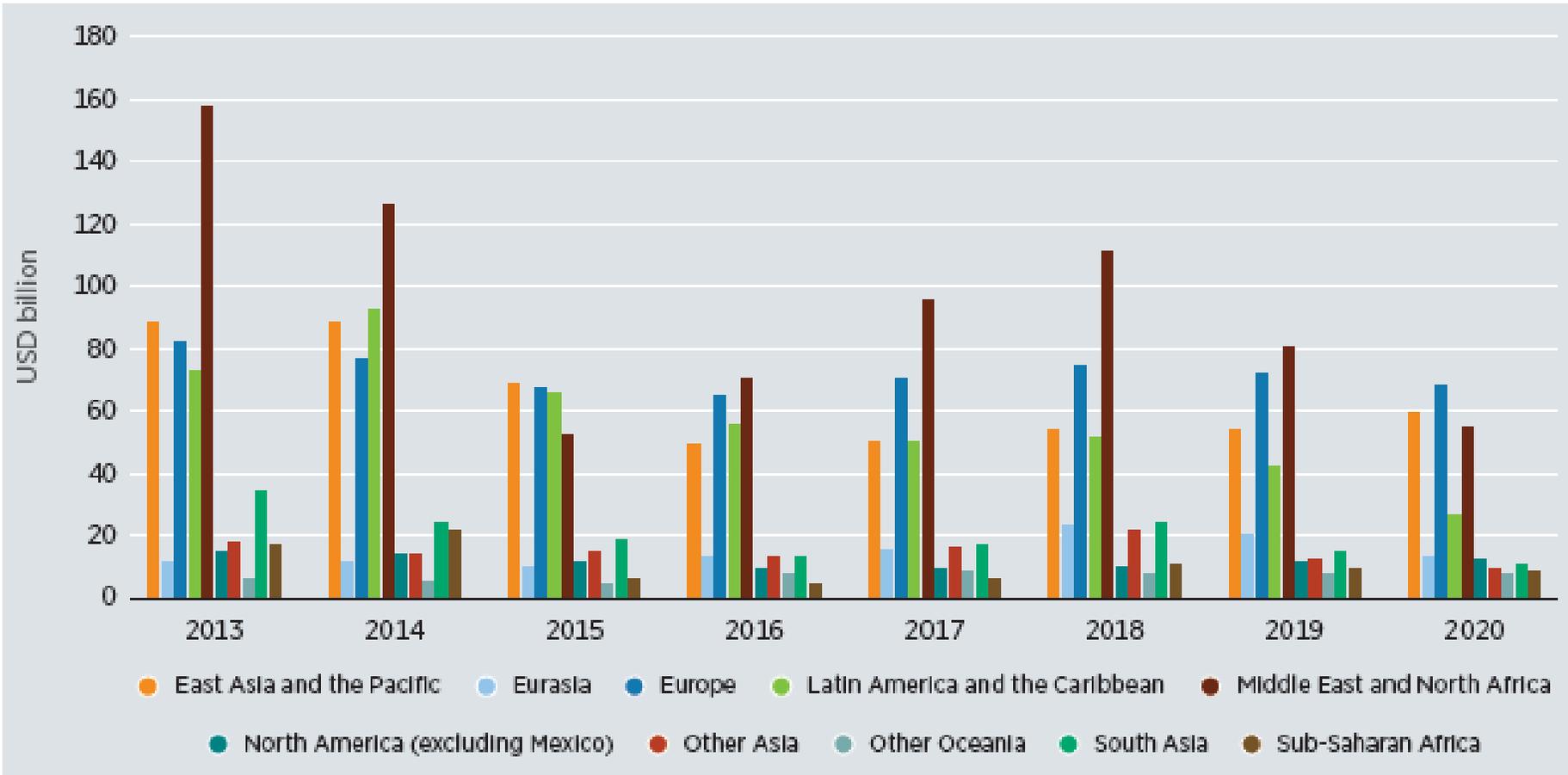


Note: FF = fossil fuel; RE = renewable energy.

Based on CPI (2022) and IEA (2022).

- Investment in energy is still going into funding new oil and gas fields instead of renewables
- Large multi-national banks maintained and even increased **investments in fossil fuels** at an average of about **USD 750 billion a year**
- It is estimated that **USD 570 billion will be spent on new oil and gas** development and exploration every year until 2030

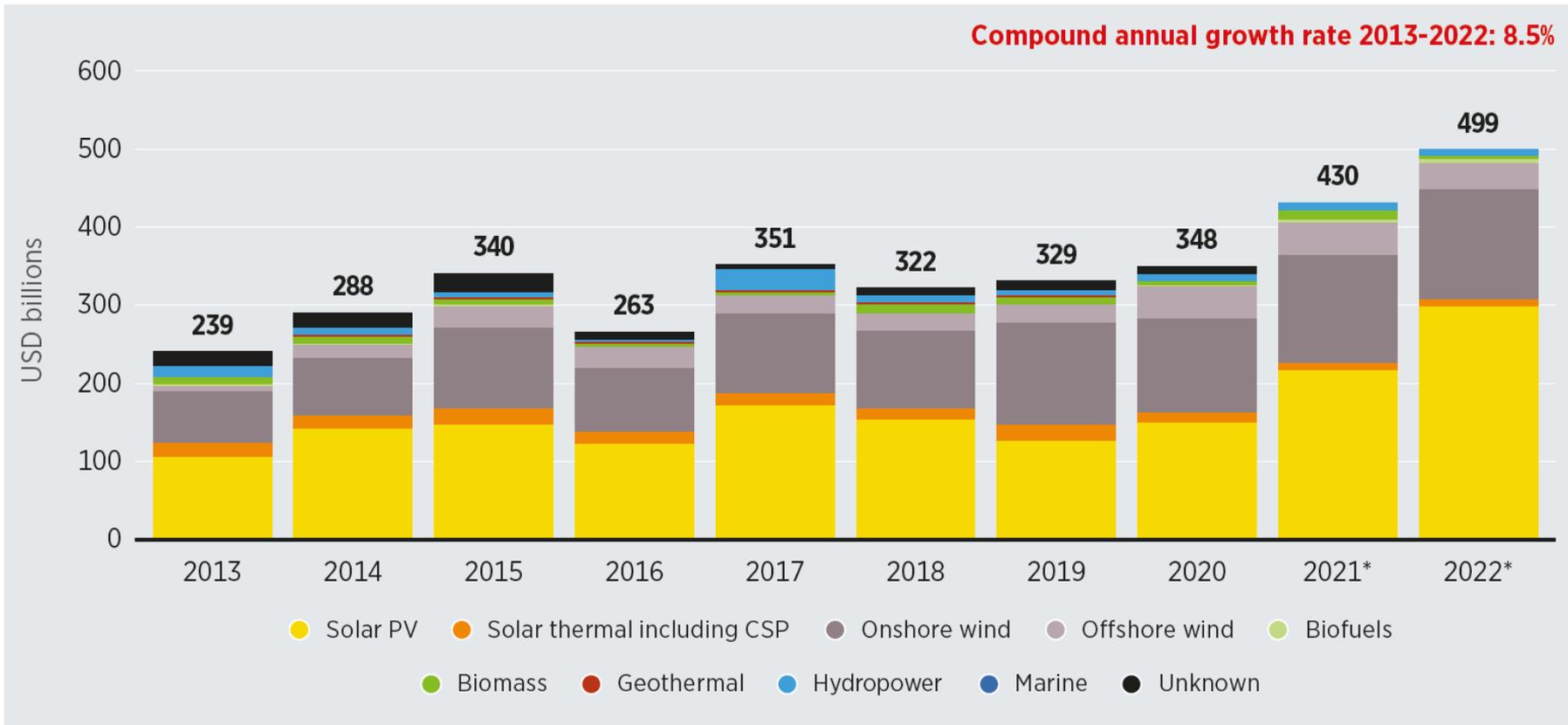
# Annual fossil fuels subsidies by region



Source: Fossil Fuels Subsidy Tracker (2022).

- Between 2013 and 2020, **USD 2.9 trillion** was spent globally on **fossil fuel subsidies**
- In 2020, **Europe** provided the most subsidies: **USD 113 /person** more than triple those in **MENA** at **USD 36 /person**
- Subsidies **doubled** in **2021** across **51 countries** and reached **USD 697 billion**

# Financial commitments in renewables by technology

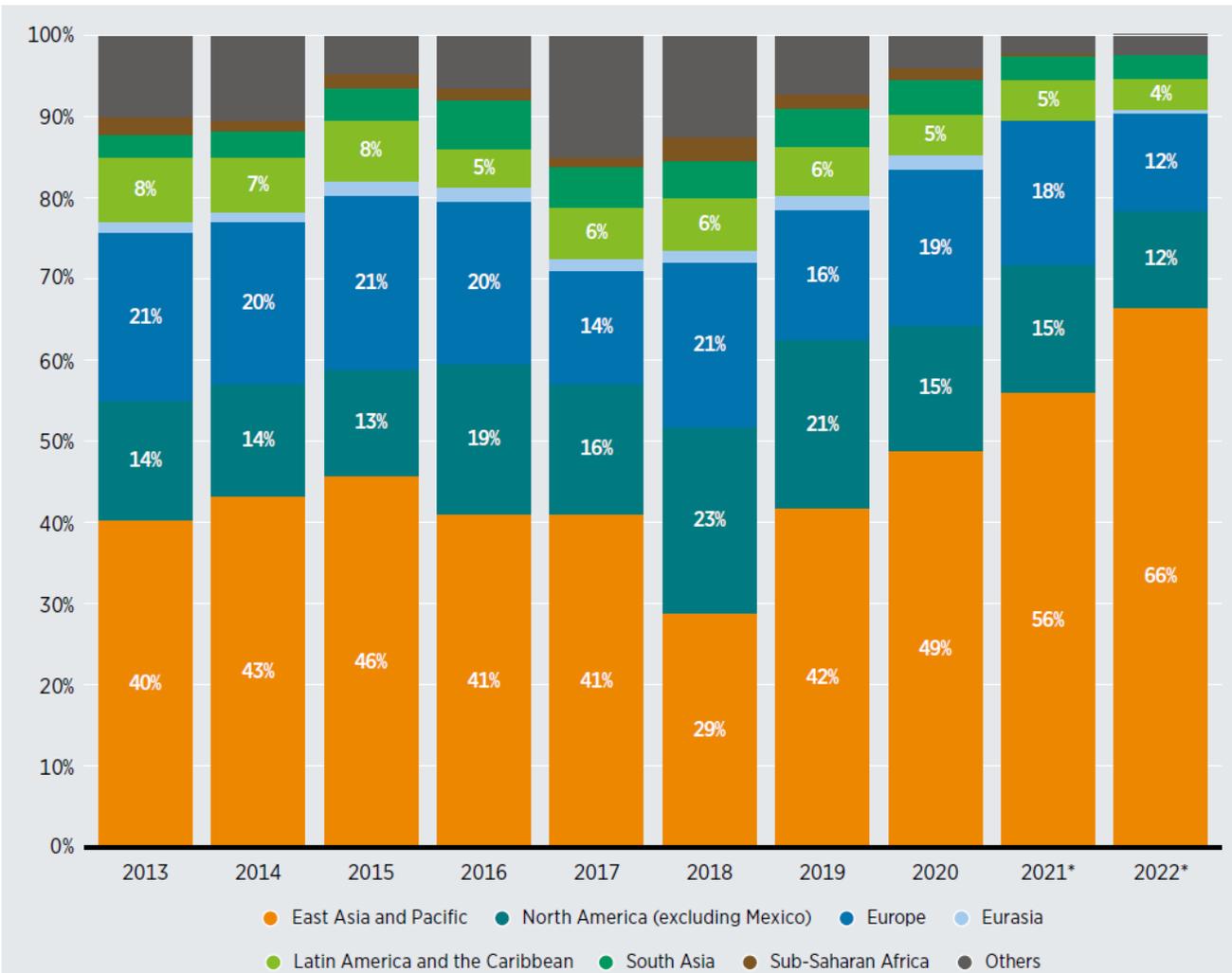


- In 2021, investments reached USD 430 billion (24% up from 2020) and **in 2022** they further increased by 16% reaching almost **USD 0.5 trillion**
- Investment made in 2022 was **less than a third of the average investment needed each year until 2030**

**Note:** CAGR = compound annual growth rate; CSP = concentrated solar power; PV = photovoltaic.

**Source:** CPI (2022a). Investments for 2021 and 2022 are based on data from BNEF (2023).

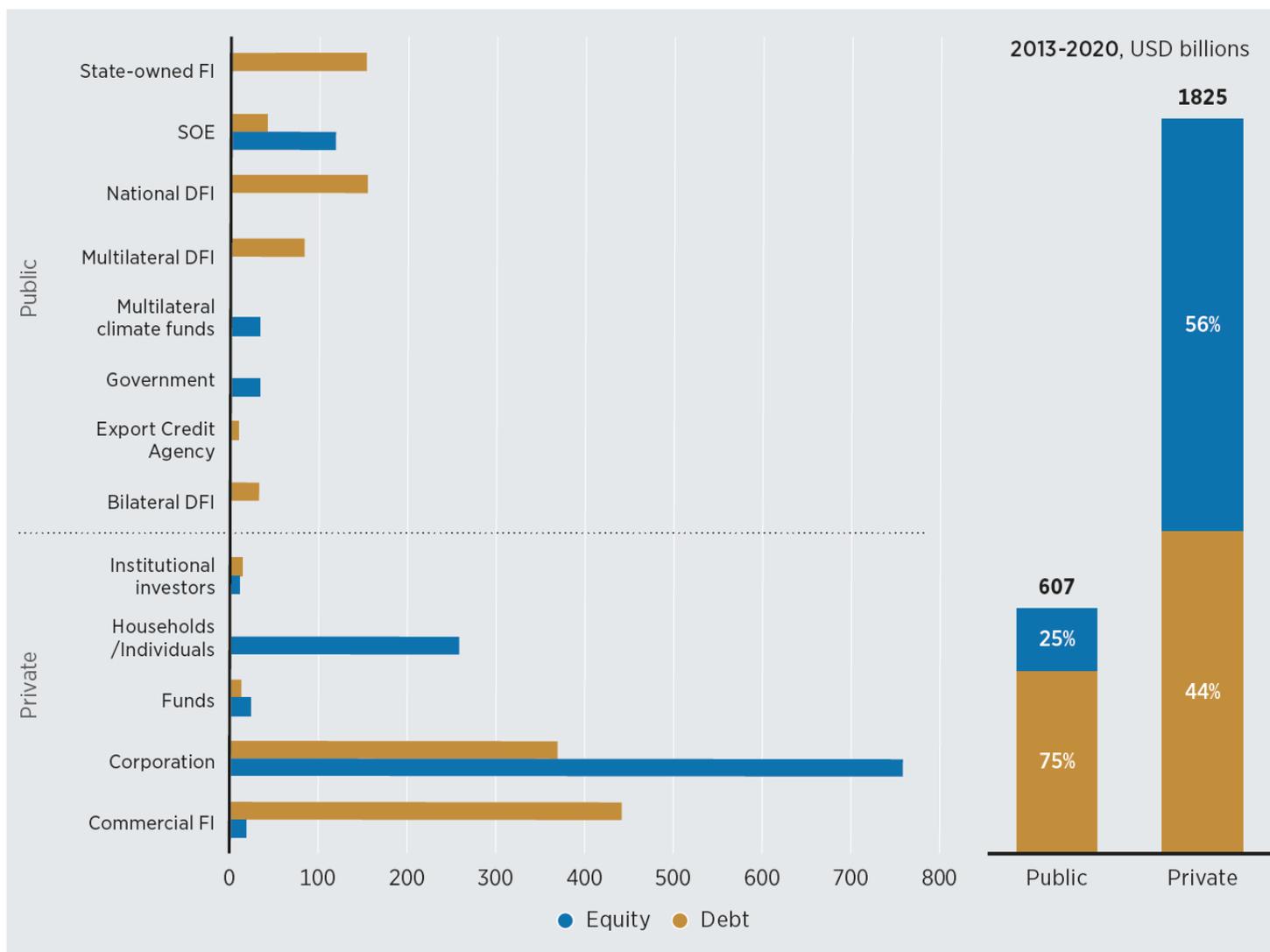
# Investment in renewables by region of destination



- More than **half of the world's population** received **only 15% of investments** in 2022
- The **share of investments** they receive has been **declining** since 2018 at an average **rate of 36% per year**
- **Least Developed Countries** attracted less than **1% of investments** on average between 2013 and 2020

**Source:** CPI (2022). Investments for 2021 and 2022 represent preliminary estimates based on data from BNEF (2023).

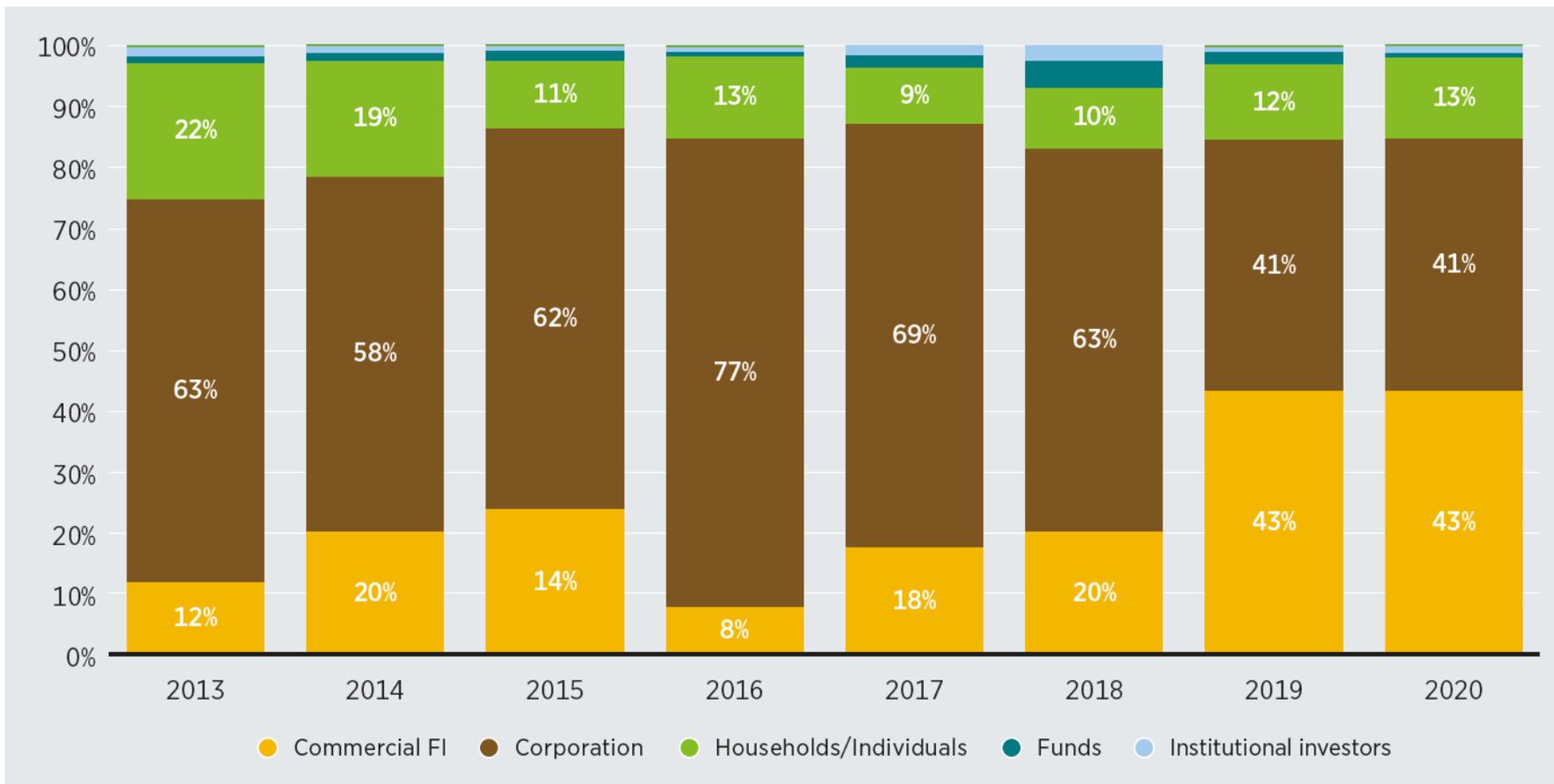
# Debt and equity investment by type of investor



- The **private** sector committed **75% of total investment in 2013-2020**
- The share of public versus private investments varies by context and technology
- In 2020, **83%** of commitments in **solar PV** came from **private finance**
- **Geothermal** and **hydropower** rely mostly on **public finance**; only **32%** and **3%** of investments in these technologies, respectively, came from **private investors** in 2020

**Note:** DFI = development finance institution; FI = finance institution; SOE = state-owned enterprise.  
**Source:** CPI (2022).

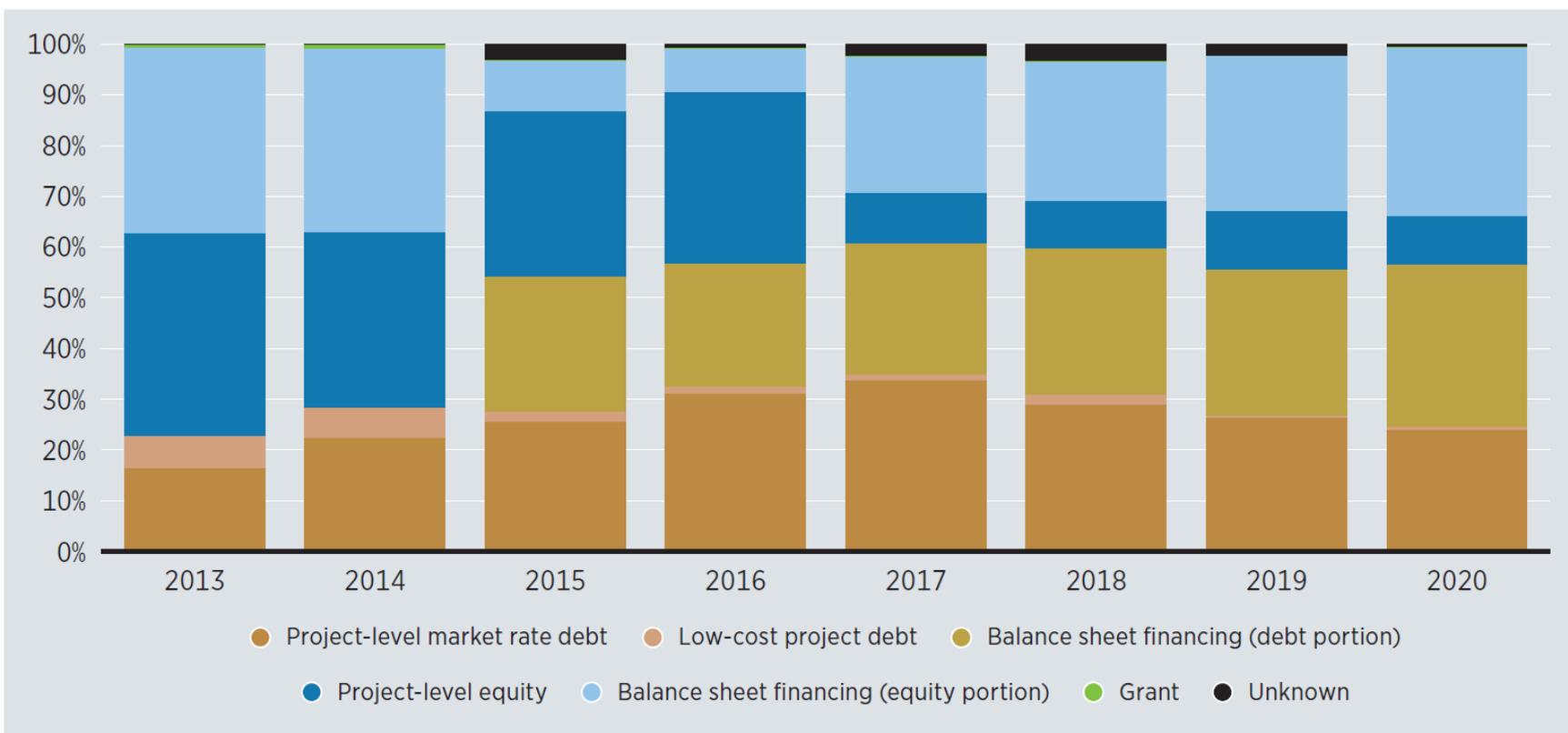
# Private investment in renewable energy by investor



- Up until **2018**, private investments came predominantly from **corporations (65% during 2013-2018)**
- In 2019 and 2020 the share of **corporations** went **down to 41%**, and **commercial financial institutions** provided **43%** of investments

**Note:** FI = finance institution.

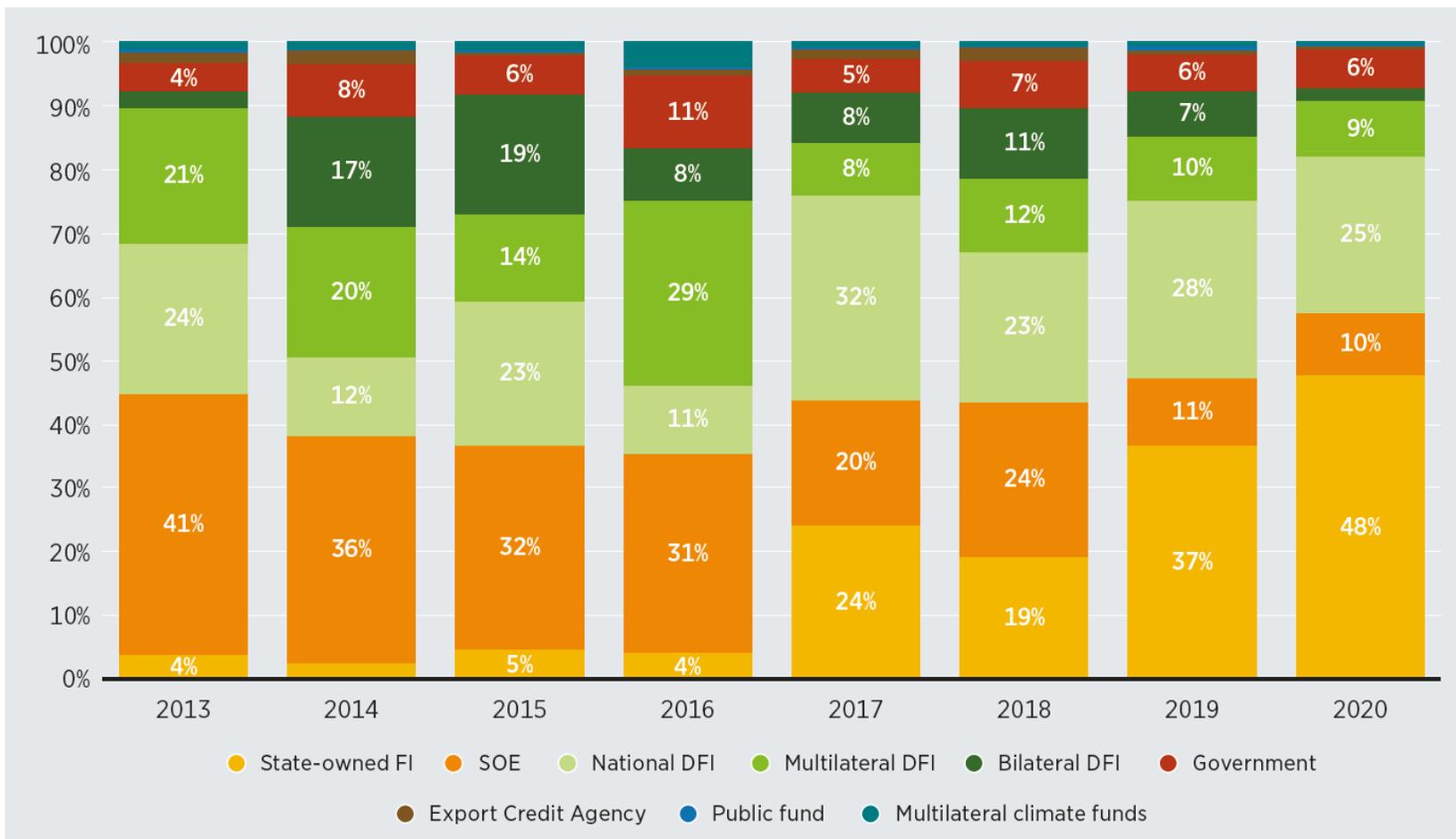
# Investment in renewable energy by financial instrument



Source: CPI (2022).

- Aligns with the falling share of **equity financing** from **77% in 2013 to 43% by 2020**
- In **2013-2020**, the share of **debt financing** increased from **23% in 2013 to 56% in 2020**
- Linked to the **maturation and consolidation of major technologies** able to attract debt
- Lenders envision **regular and predictable cash flows** over the long term (PPAs)

# Public investment in renewable energy by investor type



- **Public sector** provided less than **one-third** of investment in **2020**
- **State-owned FIs, national DFIs** and **SOEs** provided more than **80%** of public finance
- **Multilateral DFIs** provided **9%** of public finance and accounted for about **half of international flows** coming from the public sector
- Commitments from **bilateral DFIs** in 2020 **fell 70%** compared to 2019
- This means that **multilateral and bilateral DFIs** provided less than **3%** of total renewable energy investments in 2020

**Note:** DFI = development finance institution; FI = finance institution; SOE = state-owned enterprise.

# Off-grid renewable energy finance in developing countries

GLOBAL LANDSCAPE OF RENEWABLE ENERGY FINANCE 2023

## THE LANDSCAPE OF OFF-GRID RENEWABLE ENERGY INVESTMENT IN DEVELOPING COUNTRIES



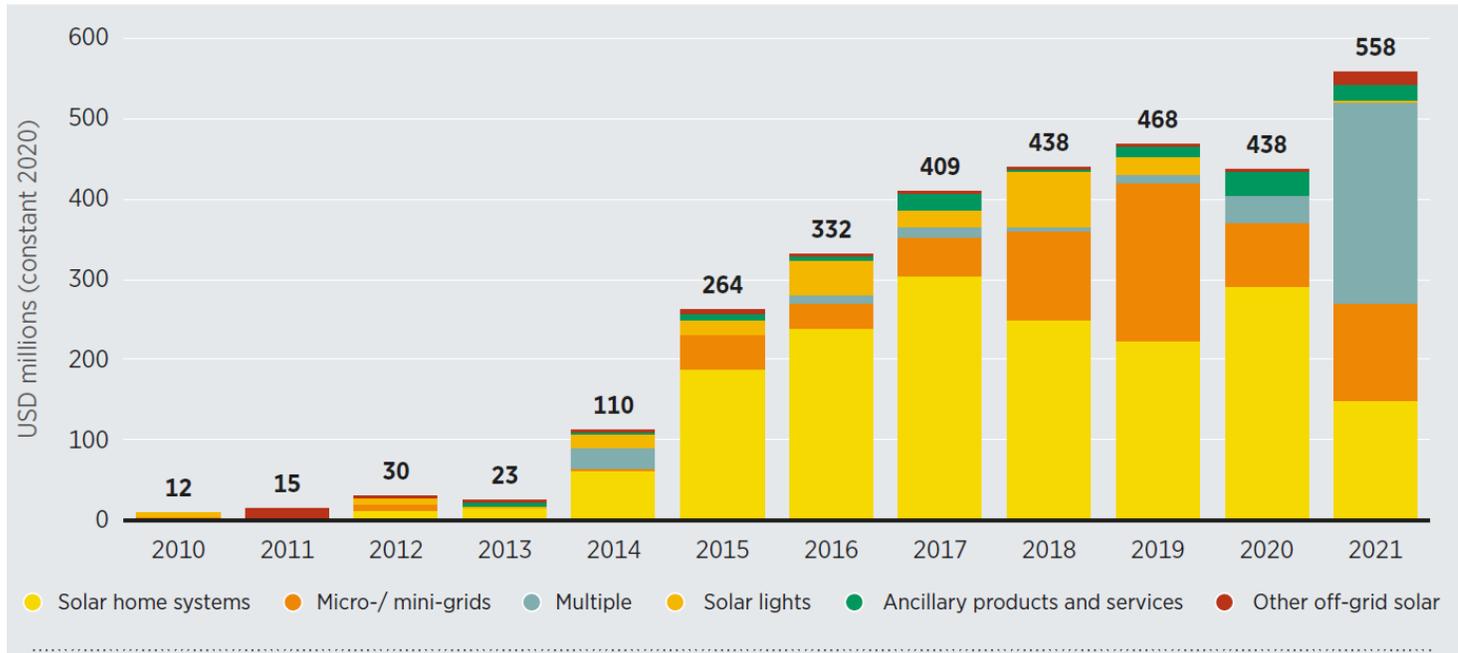
# Investment in off-grid renewable energy, 2010-2021



Based on Wood Mackenzie (2022).

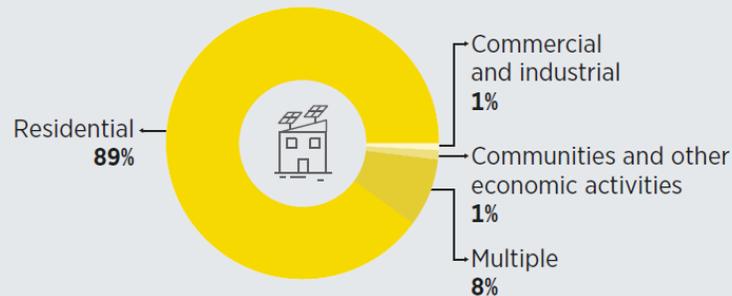
- Off-grid renewables investments reached **USD 558 million in 2021**, a 27% increase from 2020
- **Investments driven by:**
  - i. Strong growth in Africa
  - ii. Increased public financing
  - iii. Seven large companies with strong market position
- **Average transaction size** more than doubled between 2020-2021
- Overall investments are far short of the **USD 15 billion needed annually** between 2021 and 2030

# Investments in off-grid renewables by product and energy use, 2010-2021

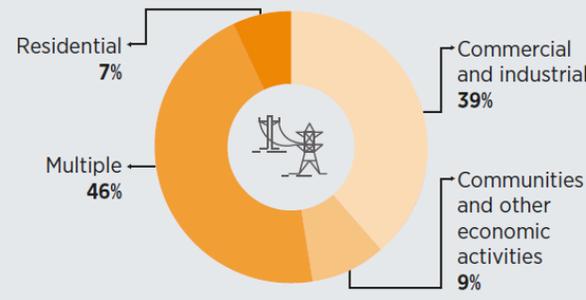


- Majority of off-grid investments went to **SHSs** and **residential applications** between 2010 and 2021 (USD 1.74 billion, 56%)
- **Micro- and mini-grids** attracted about USD 650 million (21% of total)
- The share going to **commercial and industrial (C&I)** applications has **expanded from 8% in 2015 to 32% in 2021**
- Powering C&I applications can **promote local economies** by creating jobs and spurring economic growth, while **enhancing food security and resilience**

Investments in solar home systems by sector

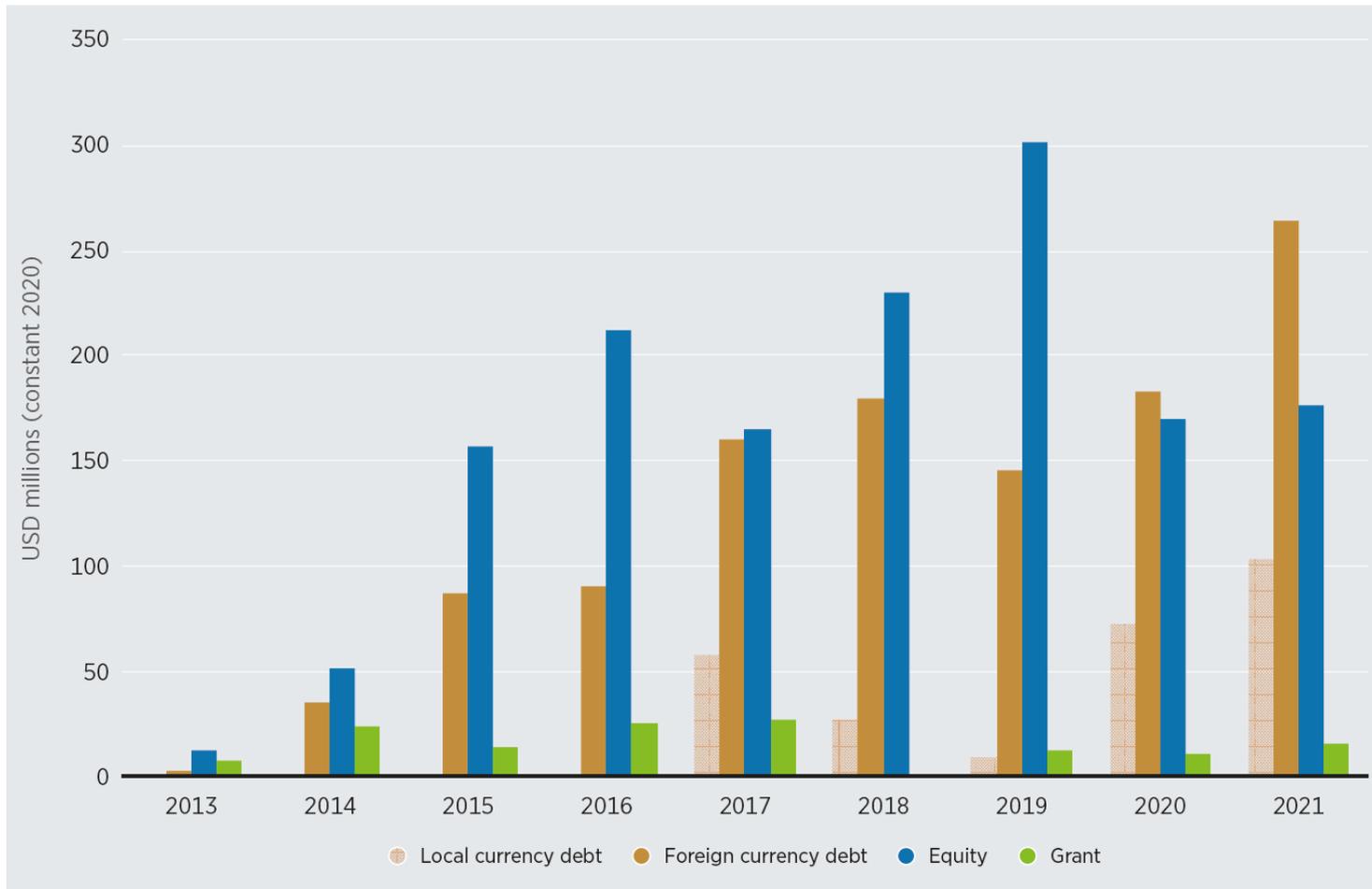


Investments in micro/mini grids by sector



Based on Wood Mackenzie (2022).

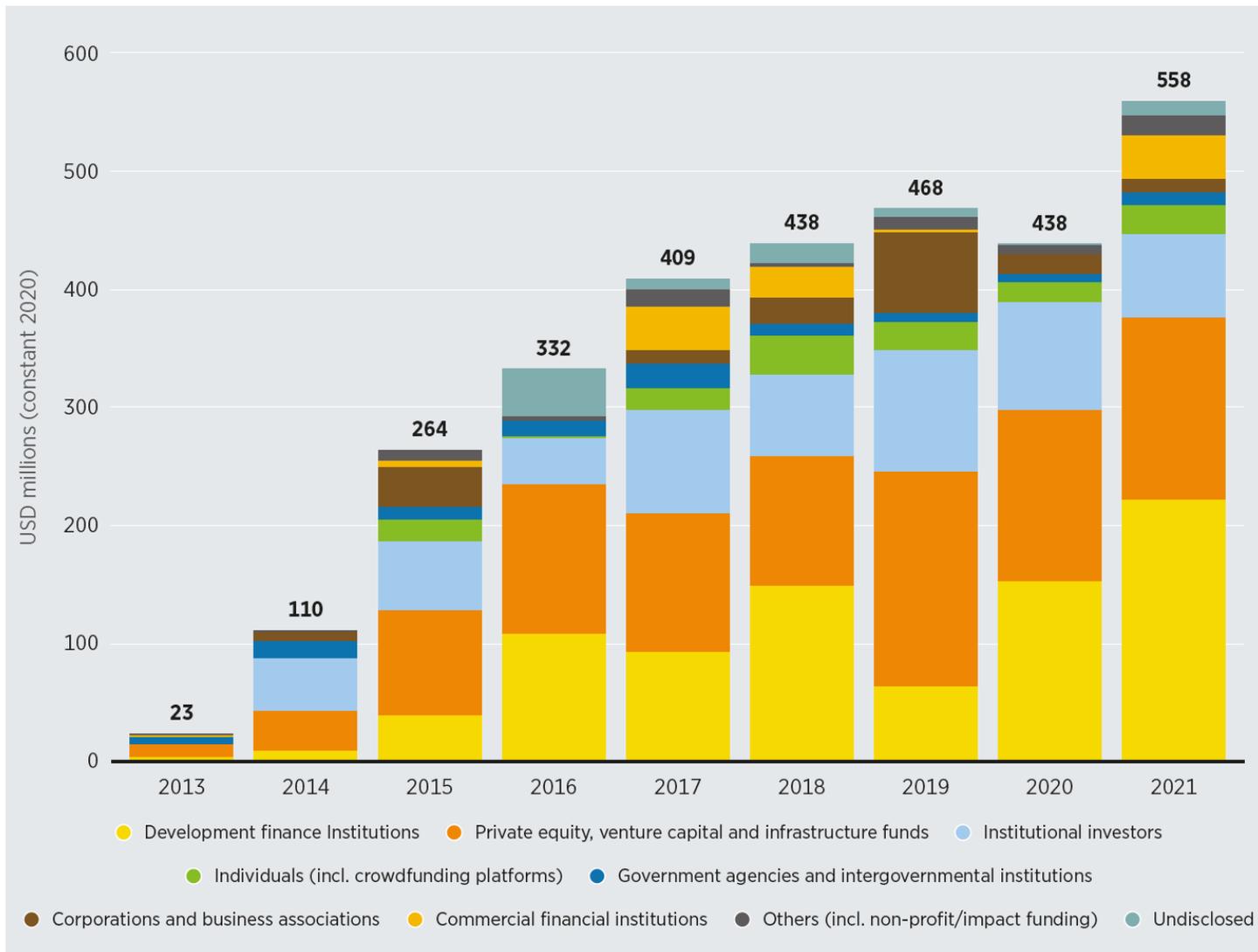
# Annual investment in off-grid renewable energy, by financing instrument and local versus foreign currency debt, 2013-2021



Based on: Wood Mackenzie (2022a).

- Debt and equity investments contributed 47% and 48% of financing in 2010 -2021, with 5% from grants.
- **Debt** financing constituted 54% of investments in **SHSs and solar lights**; **equity financing** dominated the **micro-/mini-grid** space
- **Before COVID**, majority of financing came from **equity** (private equity, venture capital and infrastructure funds and the lack of debt access)
- Share of **private equity** has **declined**, due to uncertainties, limited track record of exits and capital recycling
- **Contribution of debt has increased** sharply, as debt-preferring **DFIs bolstered their support** during the pandemic

# Annual commitments to off-grid renewable energy by type of investor, 2015-2021



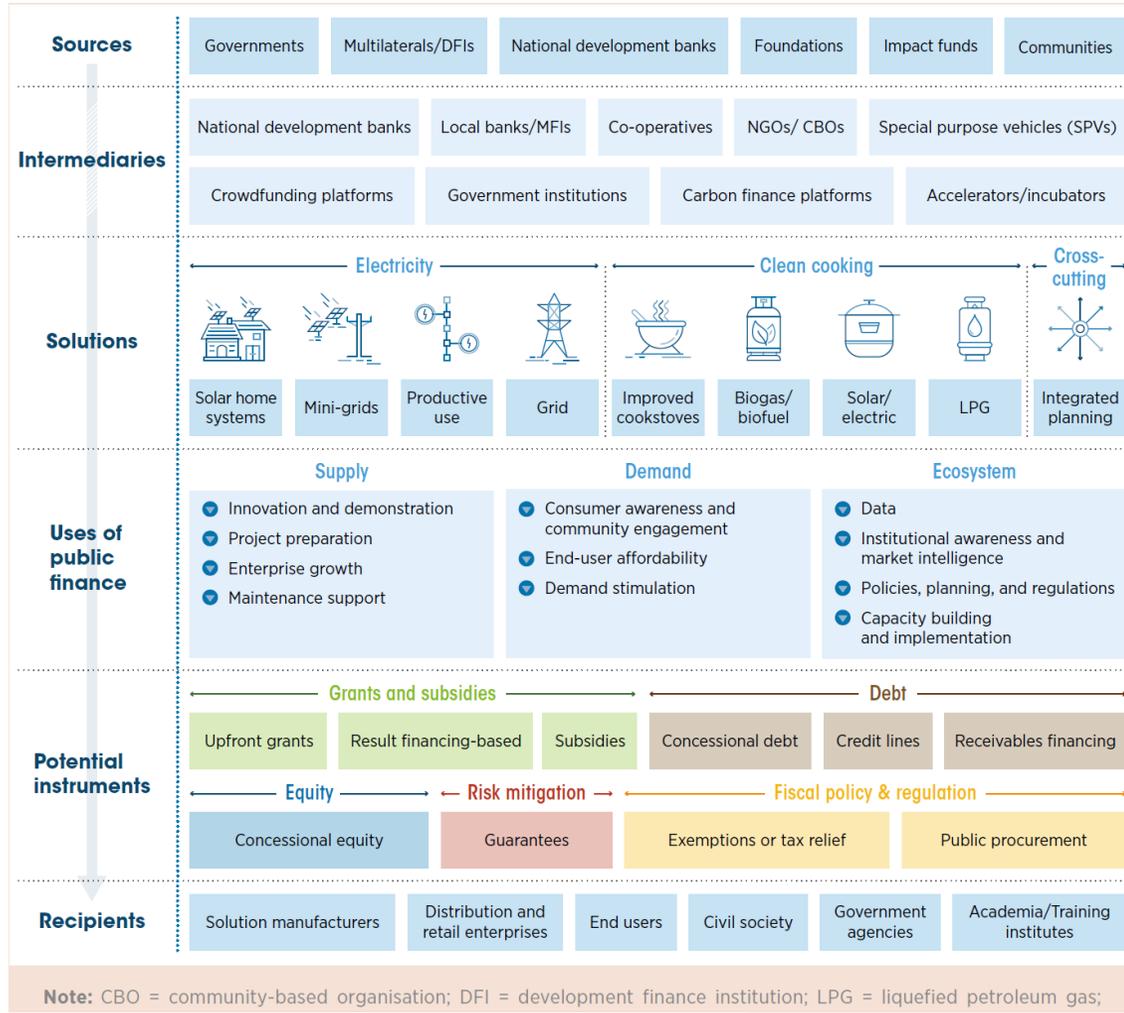
- Public investors contributions' increased by 67% between 2019-2021 to USD 260 million and covered the shortfall from private investments
- **DFIs are the largest public capital providers** (accounting for 79% of the public investments in off-grid solutions and 27% of the total investments in off-grid solutions in 2010-2021)
- This constitutes half of their overall contributions since 2010

**Note:** Definitions of all investor type included in this analysis are provided in the accompanying methodology document.

**Based on:** Wood Mackenzie (2022a).

# The way forward for off-grid investments

## Public finance framework for universal energy access



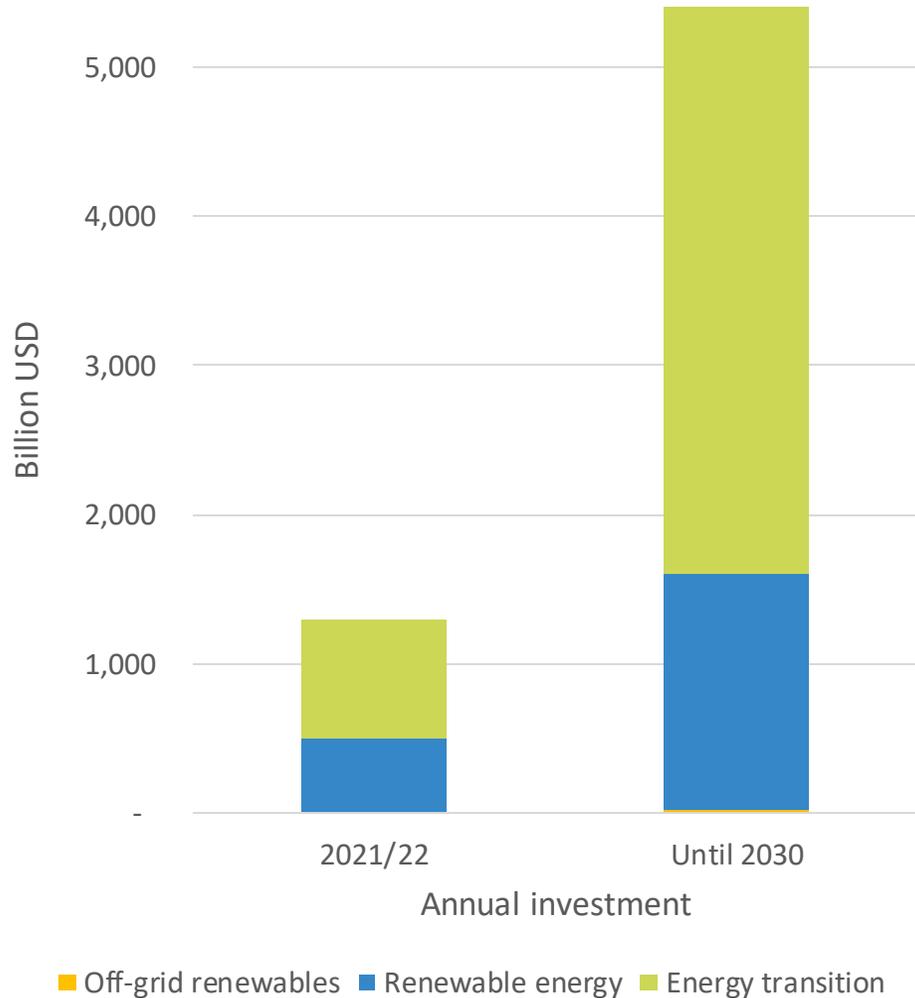
- Significantly increase public and private investments, both to support companies, but also on the consumer side to bridge affordability gaps and create market awareness
- Local currency financing is preferred for the next phase of the sectors development
- But companies need to increasingly focus on profitability and exits to encourage more investors from come in
- Tools like financial aggregation have potential to attract large investments
- Public investments have a large role to play

## CONCLUSIONS AND WAY FORWARD

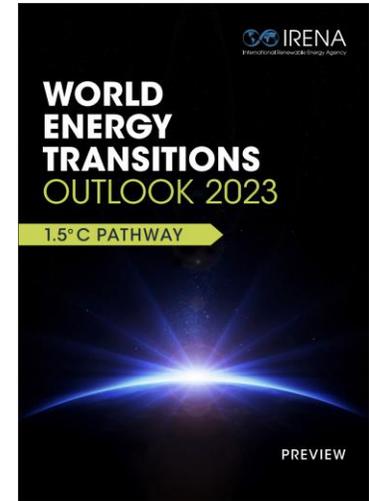
# Conclusions and way forward



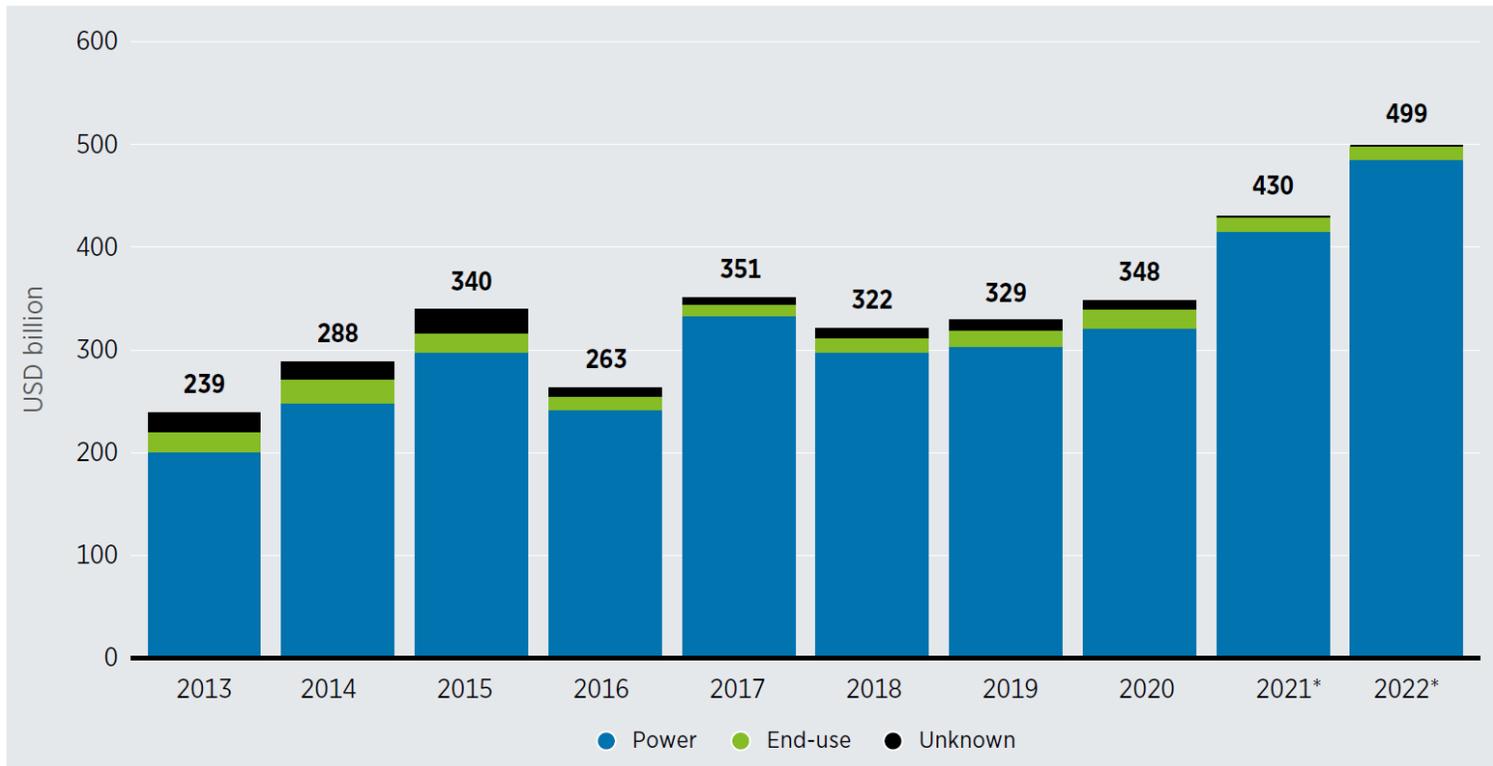
# Annual investments are increasing but not fast enough



- Global investment in **energy transition-related technologies** (at USD 1.3 trillion in 2022) **needs to quadruple** each year between 2023 and 2030
- Global investment in **renewable energy** (at USD 0.5 trillion in 2022) needs to **more than triple** each year between 2023 and 2030
- Investments in **off-grid renewables** (at USD 0.5 billion in 2021) is **far short of** the USD 15 billion needed annually - including mini-grids - between 2021 and 2030 (ESMAP *et al.*, 2022)



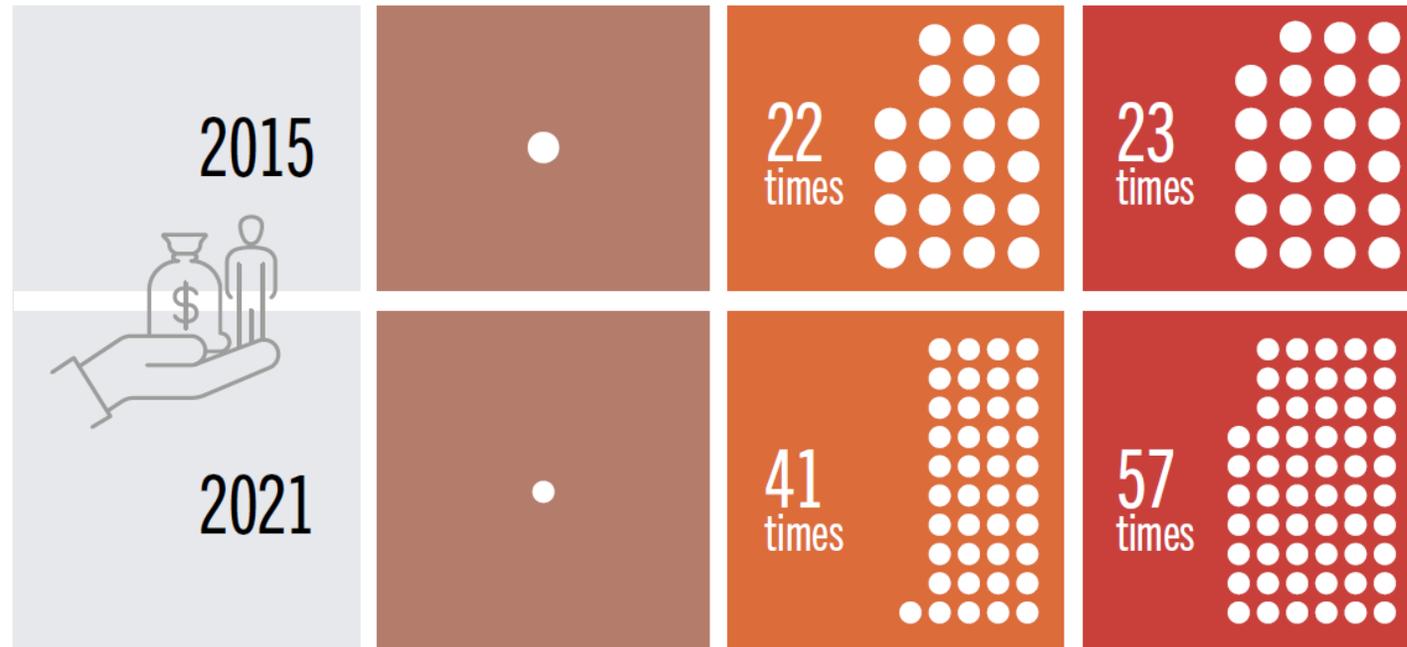
# Annual investments increasingly concentrated in the power sector



- Between **2013 and 2020**, **power generation** assets attracted, on average, **90% of renewable investments** each year
- Preliminary data suggests their share went up to **97% in 2021 and 2022**
- In 2020, renewable energy for **end-use applications** received **less than 5% of the total** (or USD 17 billion), **down from 8.5% in 2013** (or USD 20 billion)
- Preliminary data shows their share decreased to **less than 3% in 2022**
- Annual **renewable energy investment in end uses** must increase from **13 billion in 2022** to **269 billion** per year between 2023 and 2030

# The regional disparity in investments keeps growing

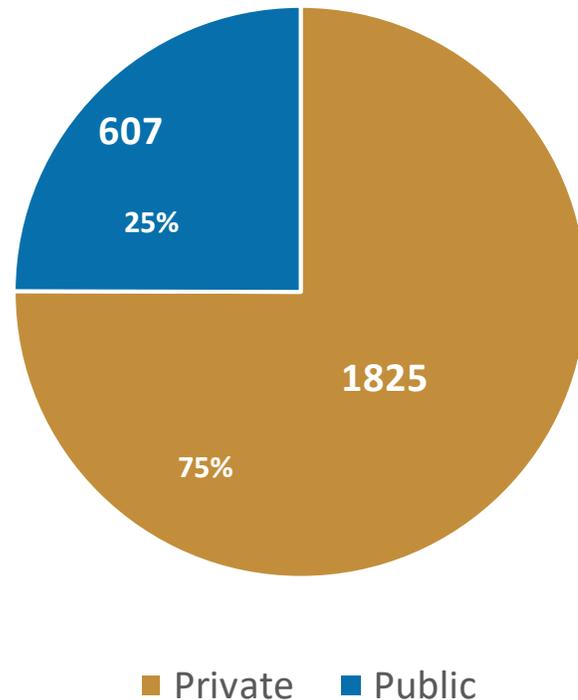
Investment  
in renewable energy  
per capita



- More importantly, more than **85% of global renewable energy investment** in 2022 benefited less than half of **the world's population**
- **Disparities in per capital investments** between North America (excl Mexico) or Europe and Sub-Saharan Africa **have more than doubled** between 2015 and 2021
- For a just and inclusive energy transition, investments need to be **more equitably distributed**

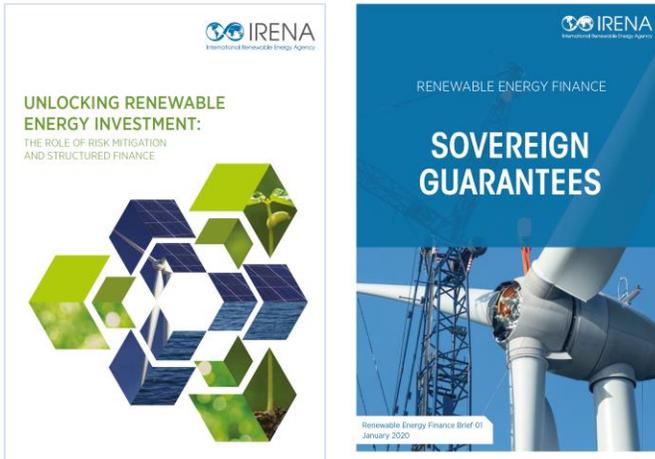
# Limitations of fully relying on private capital

Renewable energy investments (billion USD 2013 – 2020)

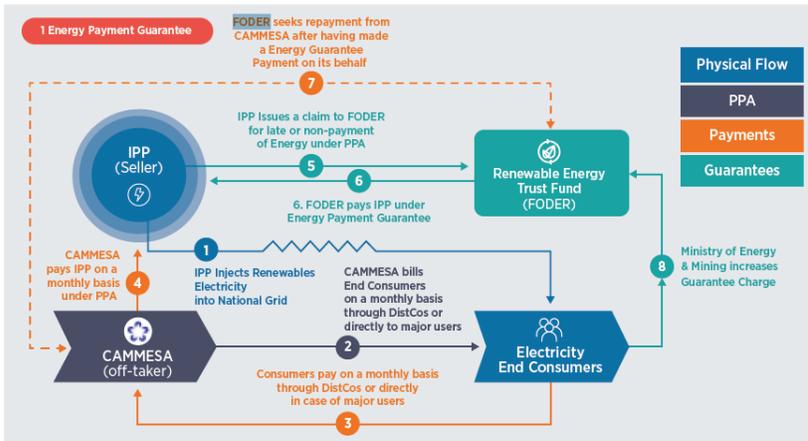


- **Private capital** tends to go to **countries with lower real or perceived risks**, or into frontier markets only when effective risk mitigation facilities are provided, while **a large portion of the world's population remains underserved**
- When capital does flow to higher-risk environments, it generally does so **at a much higher cost**
- This means that **the lowest income populations end up paying the most for (often basic) energy** which is universally recognised as essential for alleviating poverty and promoting socio-economic advancement
- **This necessitates a much stronger role for public financing** in these contexts and not fully relying on private capital which may keep widening the disparities.

# But public funds are limited, and many economies are stressed



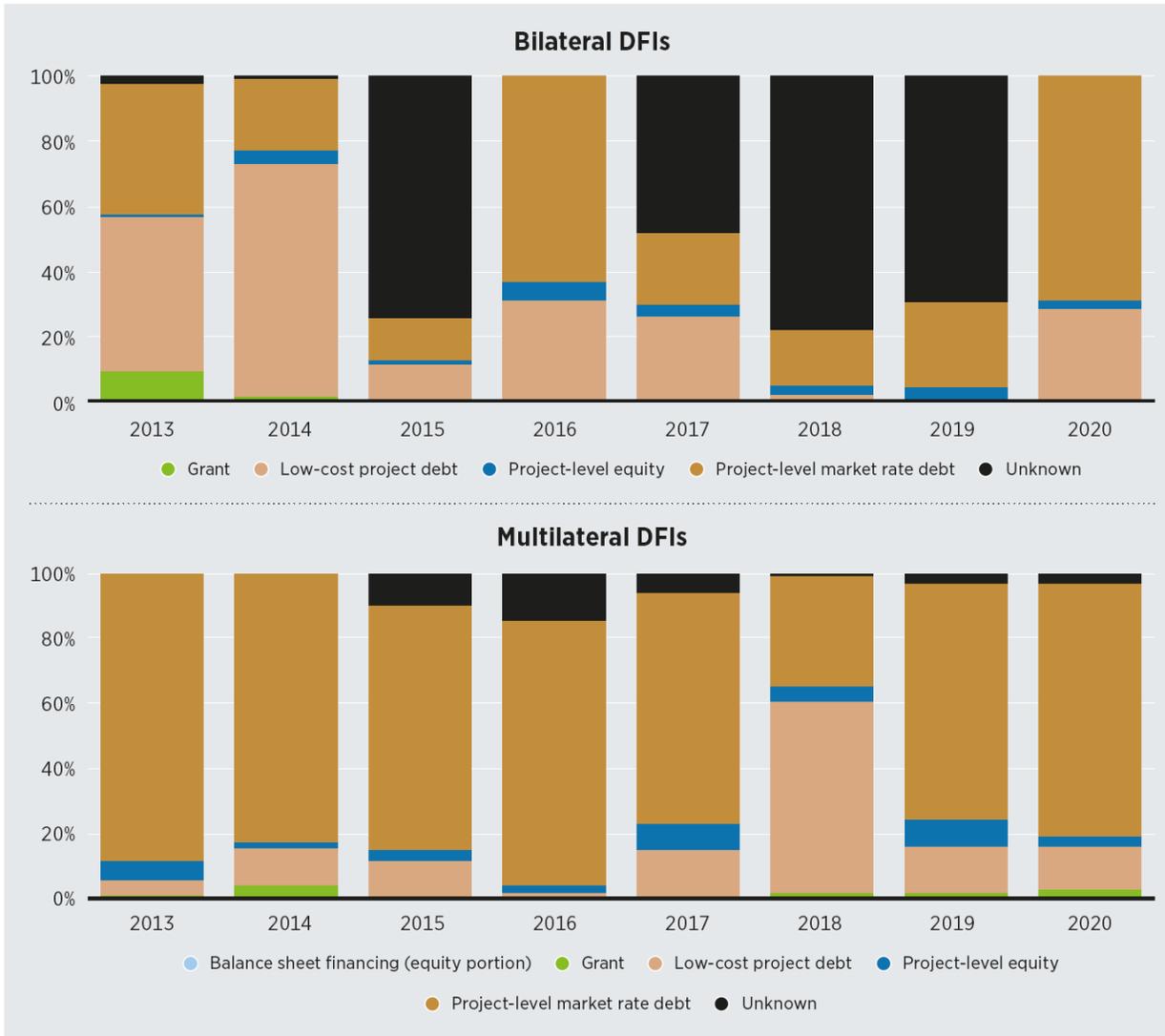
Liquidity guarantee in Argentina's RenovAR programme



Source: MINEM, 2016

- Governments have been **focusing what is available on derisking projects** and improving their risk-return profiles to attract private capital
- **Sovereign guarantees have been preferred** for lenders looking to obtain a “one-size-fits-all” solution for credit risks
- But such **guarantees are treated as contingent liabilities** and may hamper a country’s ability to take on additional debt
- Sovereign debts are already stressed to their breaking point in many emerging economies
- **Many countries cannot access affordable capital** in global financial markets or **provide sovereign guarantees** as a risk mitigation instrument
- Need for more **innovative instruments** and a **more comprehensive way of defining risk**
- With the **very limited public funds available** in the developing world, **the international community must step up.**

# The international flow of public money has been declining since 2018

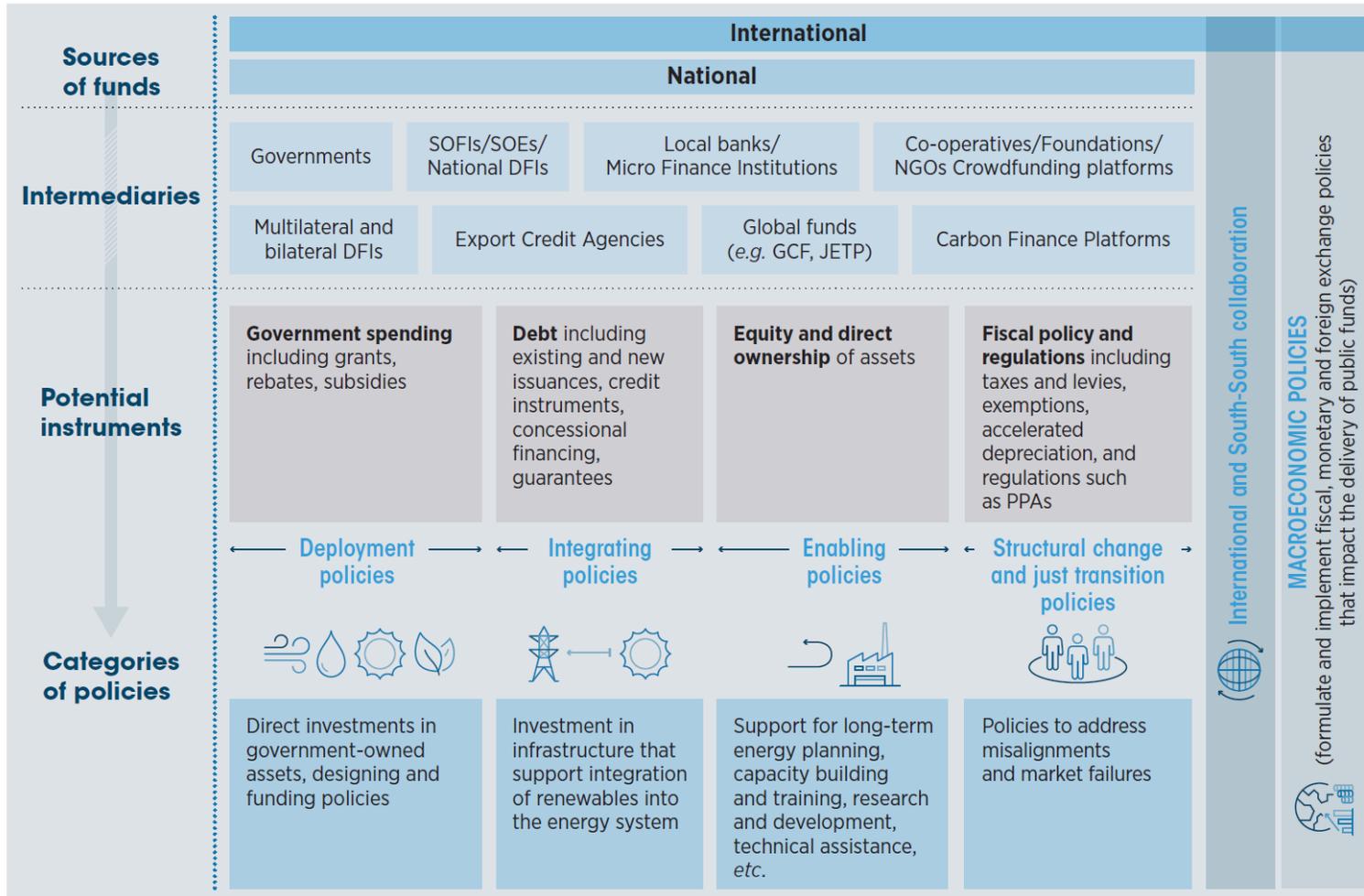


- **Bilateral and multilateral DFIs provided less than 3% of global investment in 2020**
- **Financing from DFIs was provided mainly in the form of debt financing at market rates** (requiring repayment with interest rates charged at market value)
- **Grants and concessional loans amounted to just 1% of total renewable energy finance**
- Since the interest rates are the same, the only difference that DFI financing provides is to making finance available, albeit at the same high costs for users
- Even the JETPs mainly provide loans with very few grants

Note: DFI = development finance institution.

Source: CPI analysis.

# Need for public financing including through international collaboration



- **Public funding** must flow into the renewable energy sector (covering all segments of the value chain), the wider energy sector and the economy as a whole for a just and equitable energy transition
- Public funds can be mobilised and provided using a **variety of instruments**

**Note:** DFI = development finance institution; GCF = Green Climate Fund; JETP = Just Energy Transition Partnership; NGO = non-governmental organisation; PPA = power purchase agreement; SOFI = state-owned financial institution; SOE = state-owned enterprise.

- The availability of capital for public investments in renewable energy will need to be increased, and lending to developing nations transformed
- Funds with more grants and concessional loans will be needed (e.g. the Loss and Damage fund)
- Meanwhile, public finance and policy should continue to be used to crowd in private capital. Policies and instruments beyond those used to mitigate risks are needed, for example:
  - Incentivise an investment swap from fossil fuels to renewable energy by banks and national oil companies
  - Mobilise institutional investment and promote greater use of green bonds for renewables
  - Incentivise the participation of philanthropies





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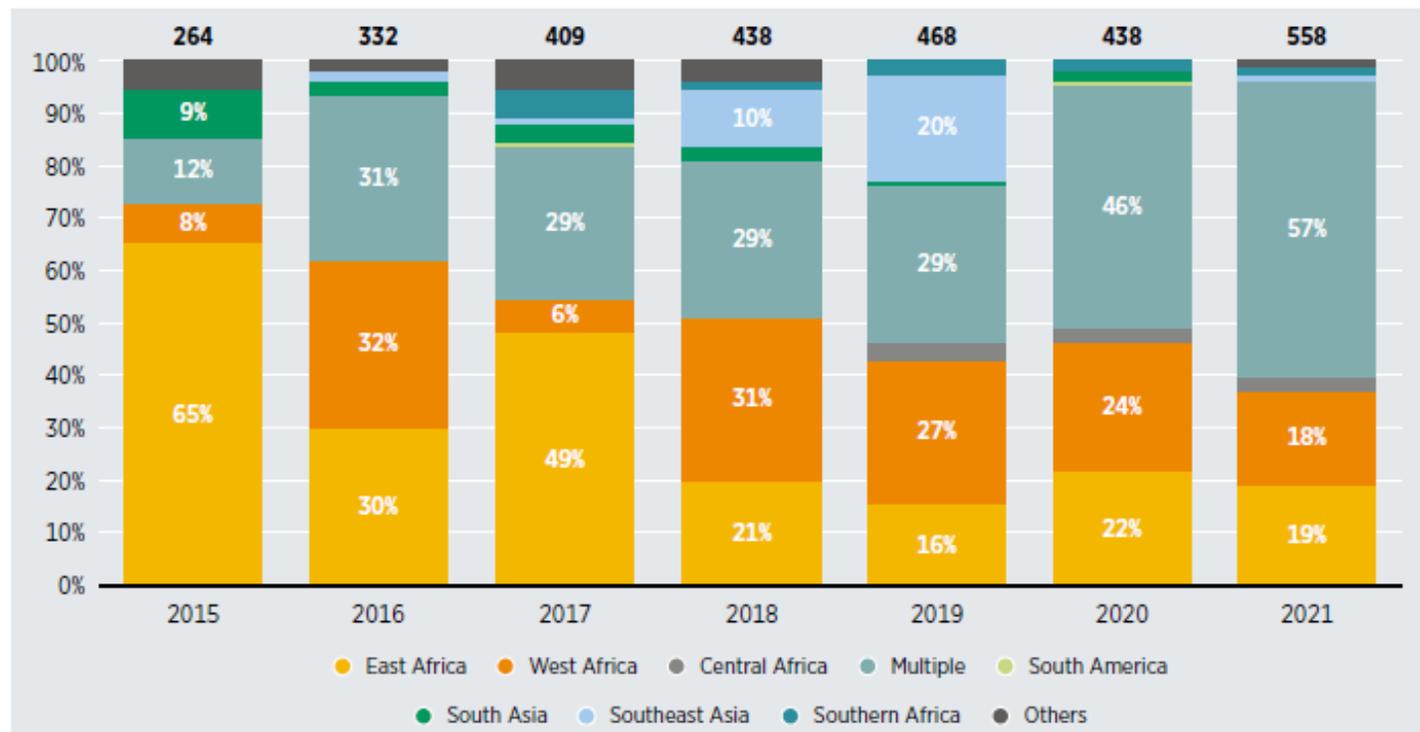
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[www.youtube.com/user/irenaorg](http://www.youtube.com/user/irenaorg)



# Shares of annual investment in off-grid renewables by subregion of destination, 2015-2021



- **Sub-Saharan Africa** remains the primary destination, taking more than **70% of the investments made to date**.
- **Southeast Asia** saw **investments** decline by 98% in 2020 compared to 2019 levels
- Only 12 countries accounted for 90% of all investments during 2010-2021