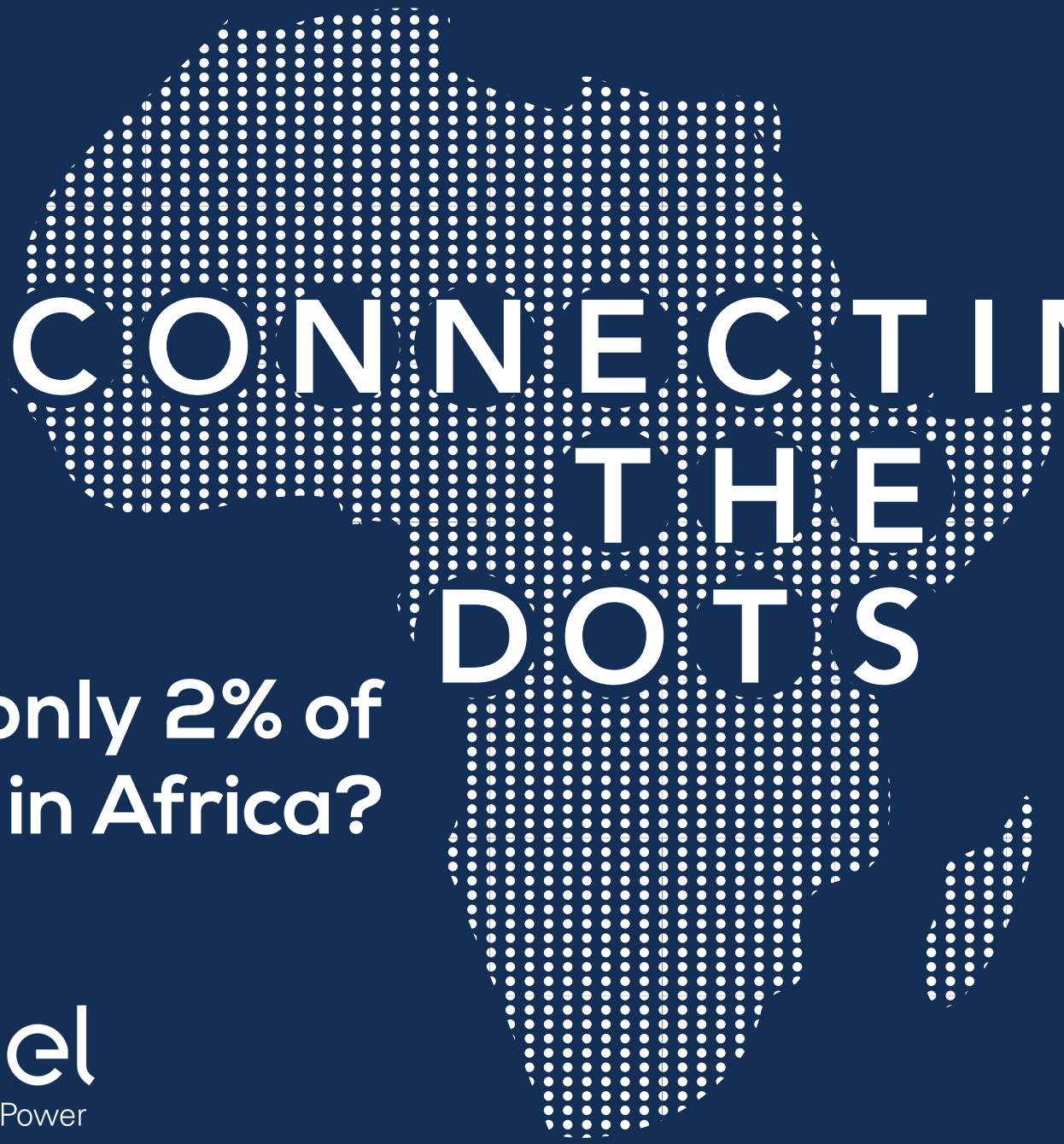


CONNECTING THE DOTS

Why only 2% of global RE in Africa?

RES4AFRICA
RENEWABLE ENERGY SOLUTIONS FOR AFRICA
FOUNDATION

enel
Green Power

Acknowledgments

Production: RES4Africa Foundation, Rome, Italy
Supervisor: Roberto Vigotti, RES4Africa Foundation
Lead coordinator: Luca Traini, RES4Africa Foundation

Authors: Chiara Buzzico (RES4Africa Foundation), Matthieu Ledauphin (Enel Green Power), Silvia Piana (Enel Green Power), Eligia Stefanelli (Enel Green Power), Luca Traini (RES4Africa Foundation).
Contributors: Marco Aresti (RES4Africa Foundation), Carlo Cecchetti (RES4Africa Foundation), Dario D'Angelo (RES4Africa Foundation), Enrique De Las Morenas Moneo (Enel Green Power), Federico Ferrante (RES4Africa Foundation), Andrea Gattini (Enel Green Power), Marianna Petrosillo (RES4Africa Foundation), Andrea Renzulli (RES4Africa Foundation), Josefina Stubbs (RES4Africa Foundation).

Editor: Gangemi Editore

Disclaimer: The views expressed are solely those of the authors.
This publication was lunched during a RES4Africa Webinar hold on the 8th of July and is available for download on: www.res4africa.org/library.

© July 2020, RES4Africa Foundation

For further information: info@res4africa.org
© July 2020, RES4Africa Foundation
Via Ticino, 14 – 00198, Rome
T: +39 06 85355598 -www.res4africa.org

RES4AFRICA RENEWABLE ENERGY SOLUTIONS FOR AFRICA FOUNDATION

The study was developed in collaboration with Enel Green Power

enel Green Power

Introduction

5 years after the adoption of the SDGs and with **just 10 years ahead to achieve the Agenda's objectives**, RES4Africa Foundation and Enel Green Power present a **strategic analysis to look at what happened in the last 10 years in Africa**, as well as main gaps, best practices and lessons learned to achieve access to affordable, reliable, sustainable and modern energy for all.

This strategic narrative will move from the status of renewable energy in Africa to the needed actions, where RES4Africa is committed with its *renewAfrica*, *The Missing Link* and the *Water-Energy-Food Nexus* initiatives, along with many other local and international partners and stakeholders.

Preface

Renewable solutions have never been better suited to support the world and Africa to getting back up again and to sustaining their sustainable development. Renewables can bring a key contribution to Africa's post-Covid recovery improving the quality of life of millions of people.

Africa is a continent in continuous transformation, with a sustained economic and population growth, a fast-paced urbanization and a generation of talents who is leading a neglected business revolution. This transformation requires energy and will require it even more in the next decades. While in the rest of the world the growth of renewable energy has intensively increased, only 2% of renewables addition occurred in Africa in the last decade. We cannot settle with what has been achieved. Universal access to electricity will not be ensured if we won't be able to accelerate the renewable energy transition.

This has never been more urgent.

Renewable energy is now the cheapest sources of energy generation and, what is more important, is the most suitable and effective solution to achieve Africa's energy security, energy equity and environmental sustainability all at once.

Unlocking Africa's renewable energy potential requires to bridge the missing link between commitments and actions. An attractive electricity market, integrated power transmission grid, properly designed stable policies and regulatory frameworks, mature developed projects, as well as a comprehensive de-risking instrument to foster investments are the cornerstones of a just energy transition able to fill the continent's energy access gap.

In this context, RES4Africa Foundation, in collaboration with Enel Green Power, has launched this analysis as the first in a series of publications that will focus on what happened in the last years and the way forward to achieve a sustainable and prosperous future for Africa.

We all have the historical opportunity and the responsibility to make it happen, now.



Antonio Cammisecra
President at RES4Africa Foundation,
CEO of Enel Green Power,

Abbreviations and Acronyms

AC	Africa Case The Africa Case scenario reflects the Agenda 2063 and incorporates key sustainable development goals by 2030, including achieving full electricity
AfDB	Africa Development Bank
Bn	Billion
BNEF	Bloomberg New Energy Finance
C&I	Commercial and industrial
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GW	Gigawatts
GWh	Gigawatt-hours
IEA	International Energy Agency
IEEFA	Institute for Energy Economics and Financial Analysis
IRENA	International Renewable Energy Agency
kW	Kilowatts
kWh	Kilowatt-hours
LAC	Latin America & the Caribbean
LATAM	Latin America
LCOE	Levelized Cost of Energy
MENA	Middle East & North Africa
Mtoe	Million Tonnes of Oil Equivalent
MW	Megawatts
MWh	Megawatt-hours
OECD	Organisationfor Economic Co-operation and Development
PPA	Private purchase agreement
Ppl	People
PV	Photovoltaic
QFD	Quasi Fiscal Deficit
RE	Renewable Energy
RISE	Regulatory Indicators for Sustainable Energy
SIC	Central Interconnected System
SIGN	Northern Interconnected System
SMEs	Small and Medium Enterprises
SACE	Italian export credit agency
SSA	Sub-SaharanAfrica
STEPS	StatedPolicy Scenario The Stated Policies Scenario reflects the impact of existing policy frameworks and today's announced policy intentions.
T&D	Transmission & Distribution
UN	United Nations
USD	United States Dollars
WACC	Weighted Average Cost of Capital

CONNECTING THE DOTS

Chapter 1.

"What happened in the last 10 years" analyses, among others, population and GDP growth, installed capacity, energy and electricity demand, LCOE and investment trends in the last 10 years.

Chapter 2.

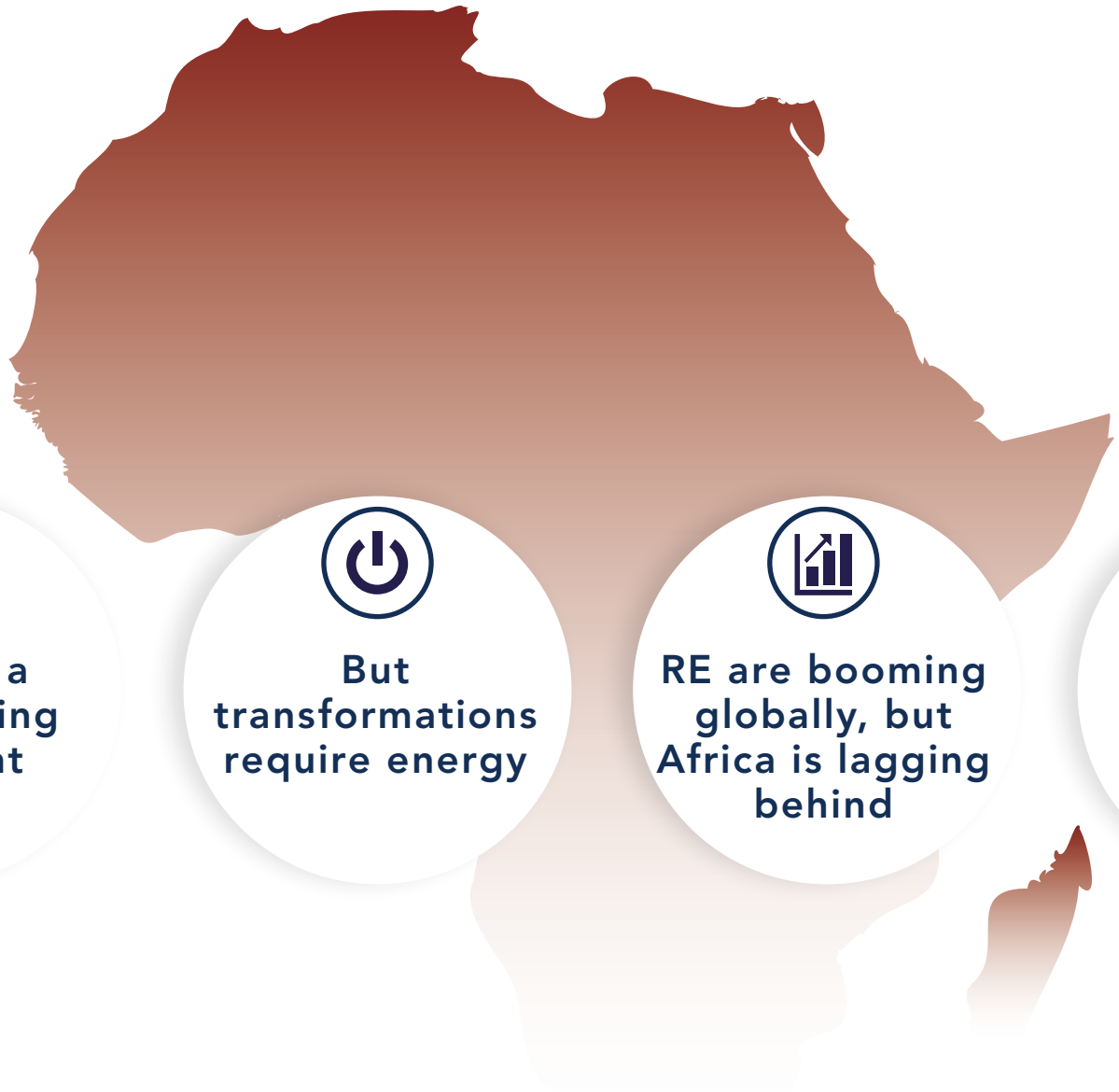
"What limited the renewable energy growth" analyses political commitment, objectives and targets achievement, grid and electrical system development, productive uses of energy, regulatory framework and investment risks.

Chapter 3.

"The time to act is now" presents the key recommendations to overcoming highlighted challenges, fostering renewable energy investments, and meeting continent and countries' needs.



RES4AFRICA FOUNDATION



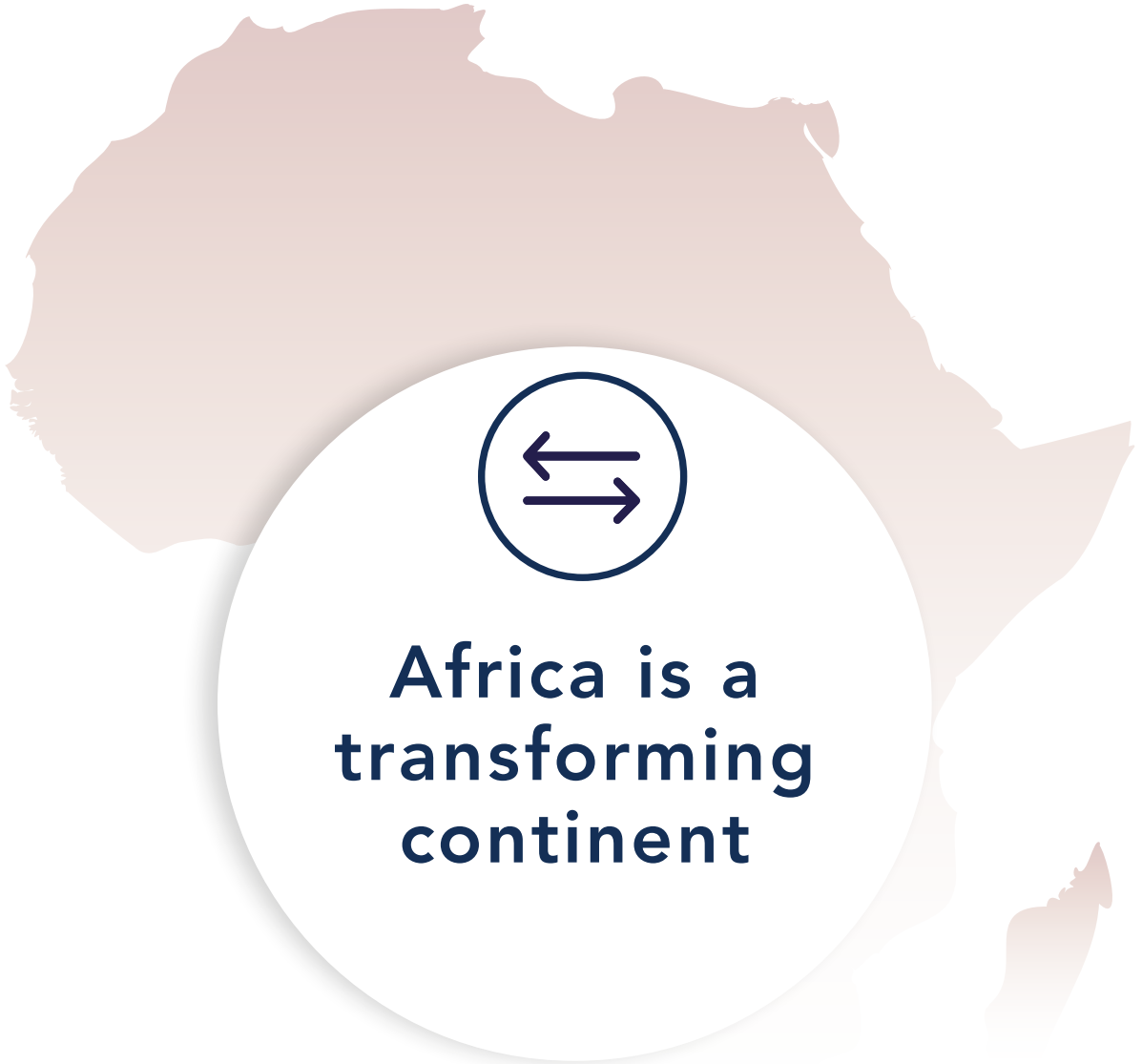
Africa is a transforming continent

But transformations require energy

RE are booming globally, but Africa is lagging behind

RE are now the cheapest sources of energy

1. What happened in the last 10 years

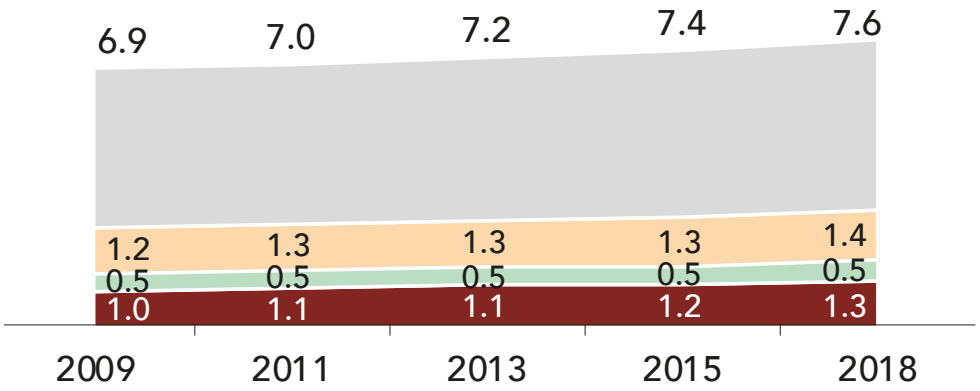


Africa is a transforming continent

1. What happened in the last 10 years

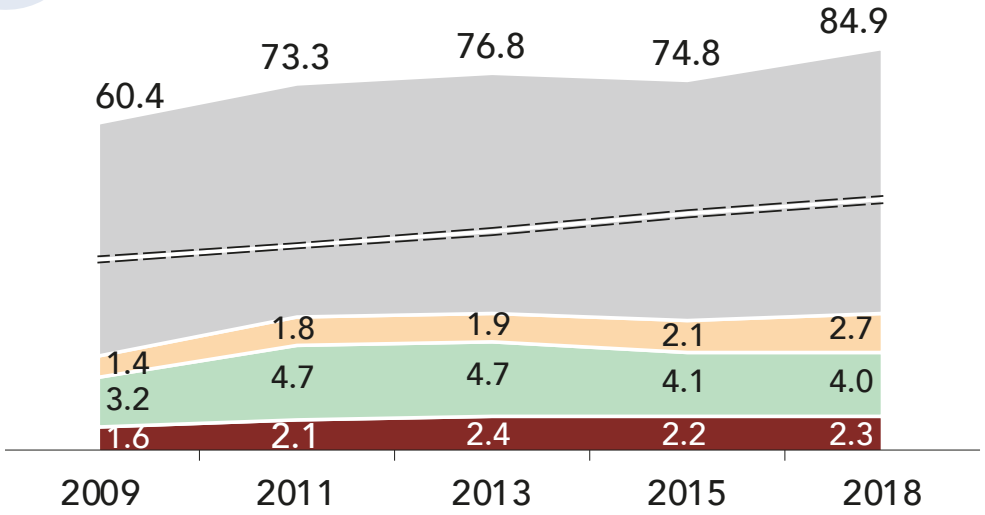
It has among the fastest growing population and economies

Global Population
Billion people



	AFRICA	LATAM	INDIA	WORLD
Bn ppl	**Δ: +0.26**	Δ: +0.04	Δ: +0.13	Δ: +0.76
Y%	**2.6%**	1.0%	1.2%	1.2%
Share 2018	**17%**	7%	18%	

GDP Growth
Trillion USD



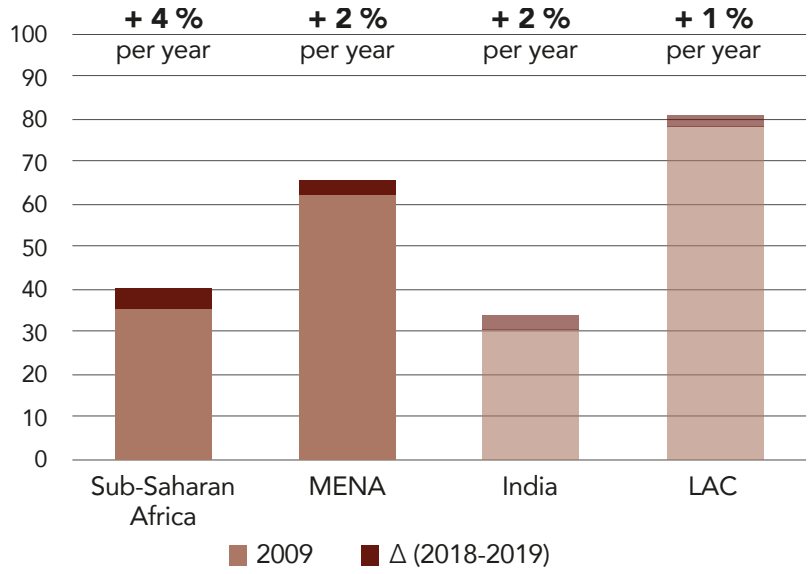
	AFRICA	LATAM	INDIA	WORLD
Tn $	**Δ: +0.65**	Δ: +0.88	Δ: +1.35	Δ: +24.49
Y%	**3.8%**	2.8%	8.0%	3.9%
Share 2018	**3%**	5%	3%	

Sources: UN dataset, 2019 / IMF, Oct 2019

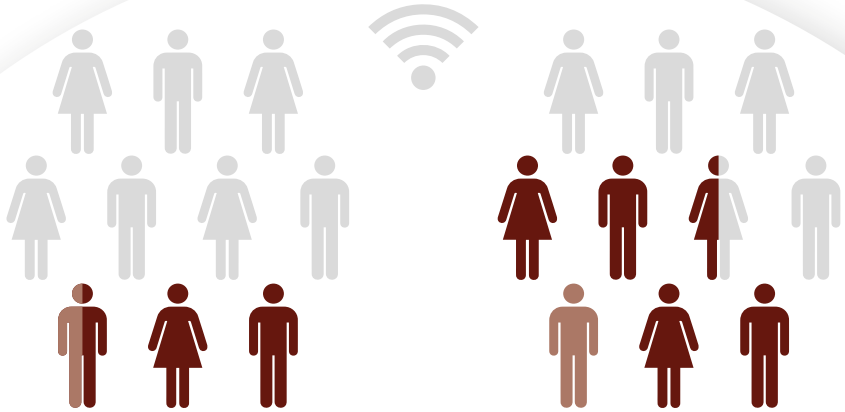
People are moving to urban cities and getting connected

Urbanization in sub-Saharan Africa has been moving faster compared to other regions in the world. This trend will be more and more evident due to the population growth foreseen for the coming years.

People living in urban areas by region (% of population) – 2009-2018



Source: World Bank dataset, 2020



Sub-Saharian Africa
5% → 25%
from 2009 to 2017

MENA
22% → 56%
from 2009 to 2017

Individuals using the Internet (% of population) – 2009-2017

Africa experienced a digital transformation. In 2017 the Internet was used by 25% of people in sub-Saharan countries and by 65% in the MENA region, while the World and the OECD's average was 50% and 82% respectively.

SMEs and big companies lead a neglected business revolution

Small and medium-size enterprises (SMEs) **provide most of Africa's formal sector jobs.** High unemployment rates have pushed many young people into entrepreneurship leading to the emergence of a **large number of new businesses** among SMEs, often characterized by high discontinuance rates.

Despite the predominance of SMEs, **Africa accounts for about 700 big companies, mostly based in South Africa**, and of which just over a half are owned by Africa-based private shareholders, while 17% are state-owned enterprises and 27% are foreign-based multinationals.

Note: "Big companies" refers to enterprises earning more than $500mn/year

more than **70%** of jobs provided by **small and medium enterprises**

more than **20%** of working-age population engaged in **emerging businesses**

about **700** enterprises earning more than **$500mn/year**

nearly **½** of big companies headquartered in **South Africa**

Sources: AfDB, 2017 McKinsey, 2018

Uncertain governance and political environment undermine its growth

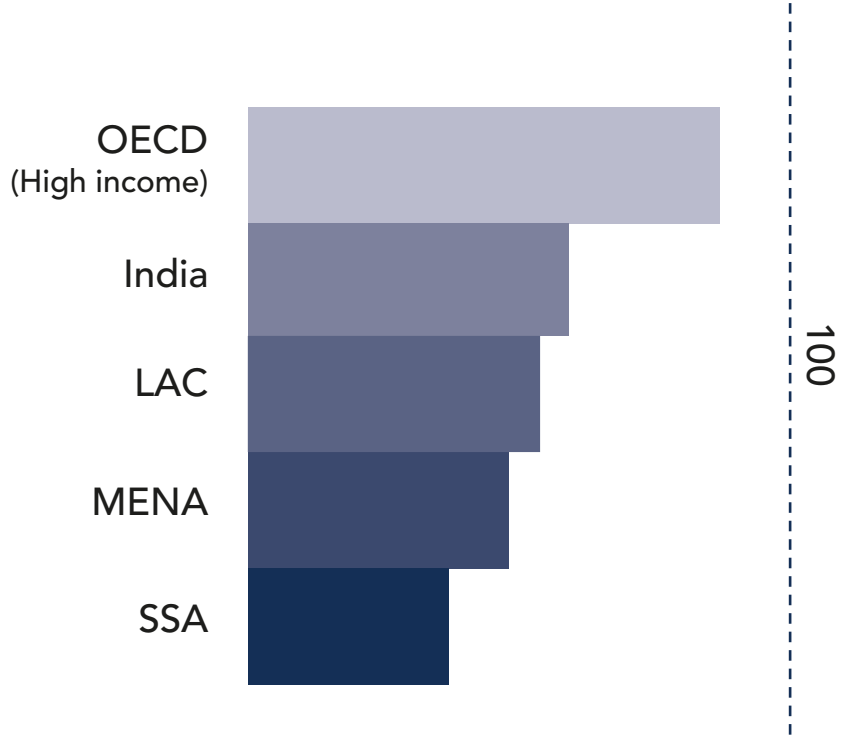
Among the fastest growing regions worldwide (in terms of GDP, population, etc.), **only India has experienced an increase**, although limited, **of the perceived quality of governance** in the last years. **In sub-Saharan Africa, MENA and LAC it has decreased constantly**.

- voice and accountability
- political stability
- government effectiveness
- regulatory quality
- rule of law
- control of corruption

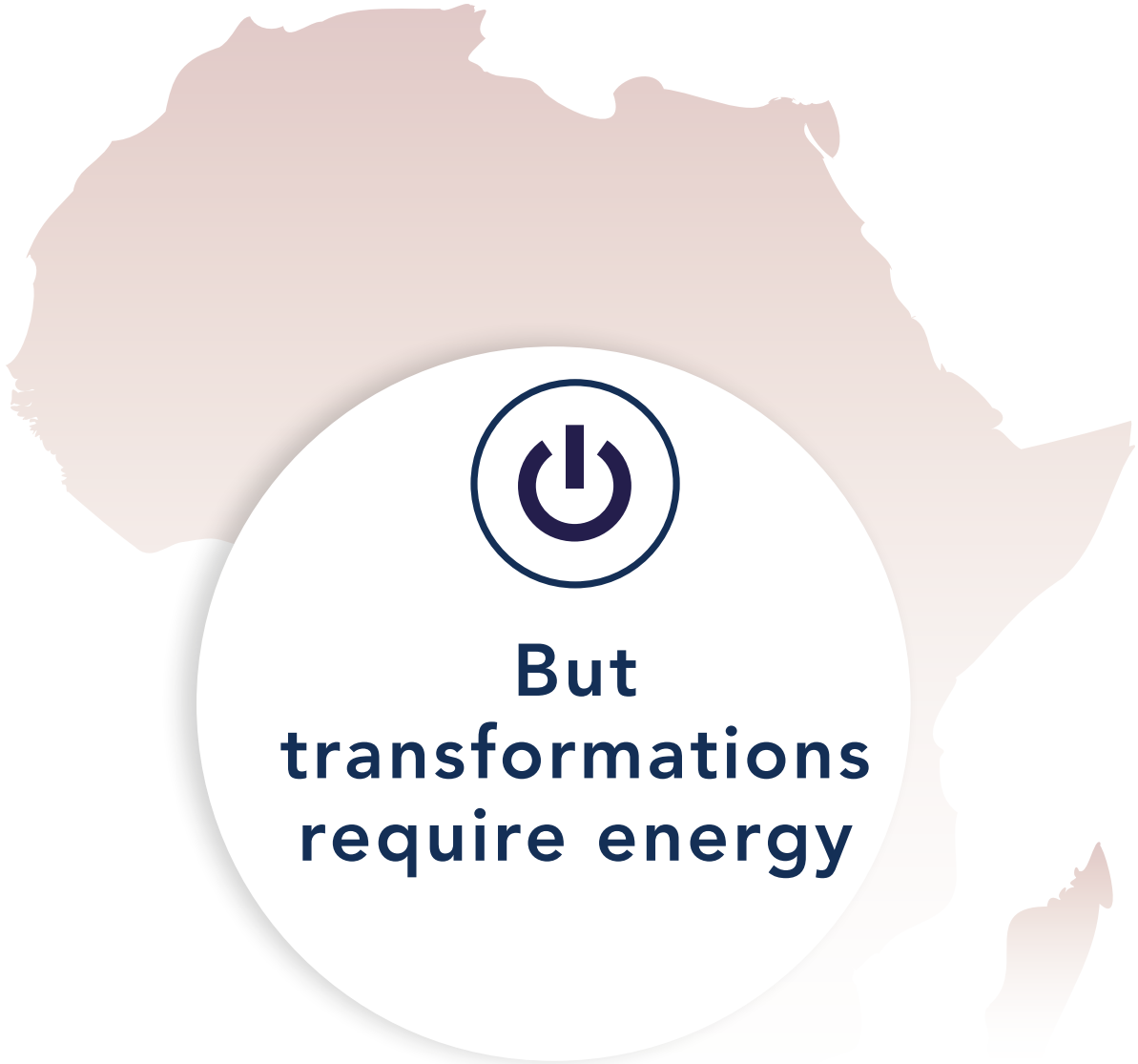
} Quality of governance



Quality of governance (2018)
percentile rank (0 - 100)



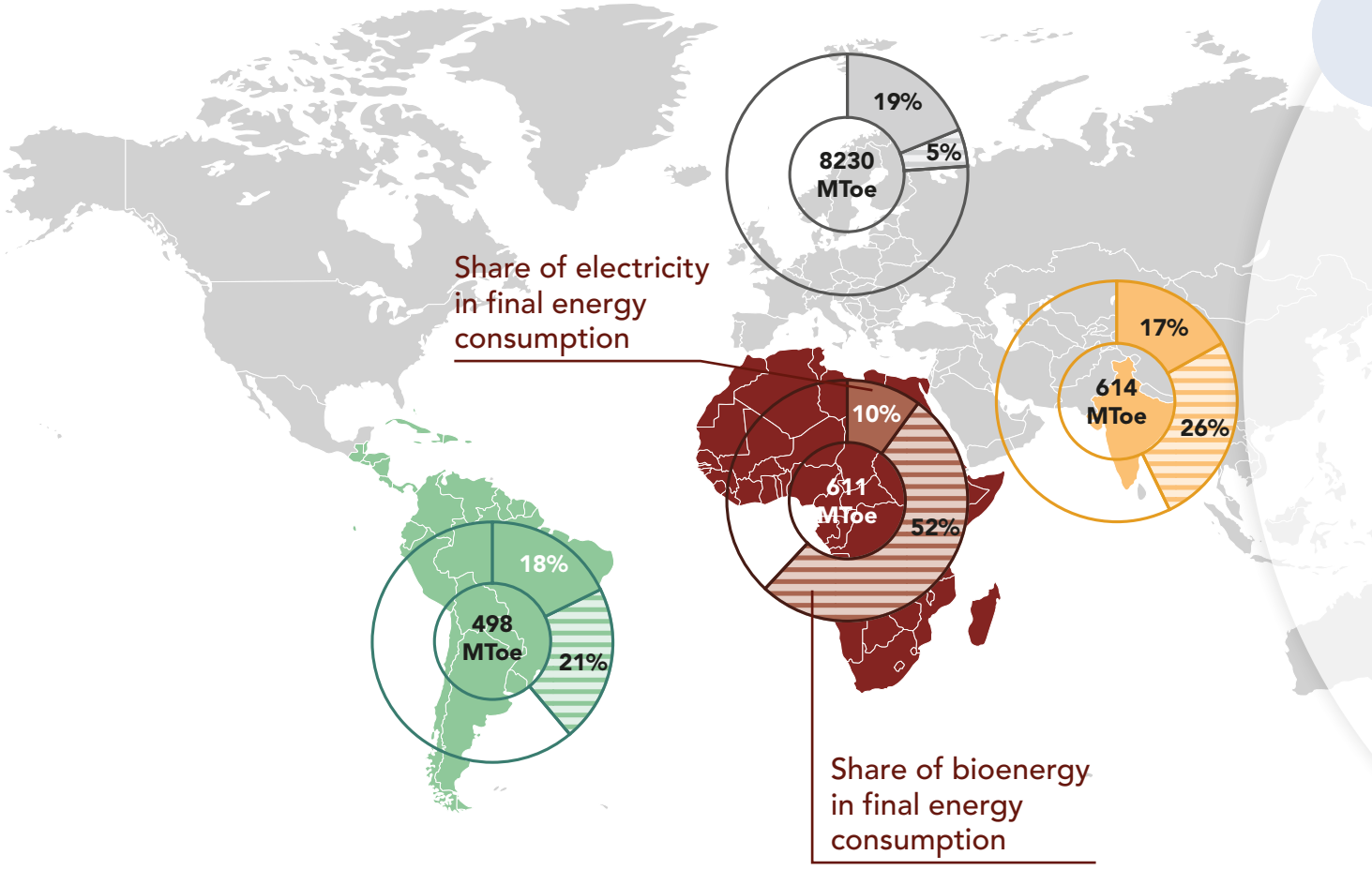
Source: World Bank dataset, 2020



But transformations require energy

1. What happened in the last 10 years

Bioenergy is still the largest source of energy



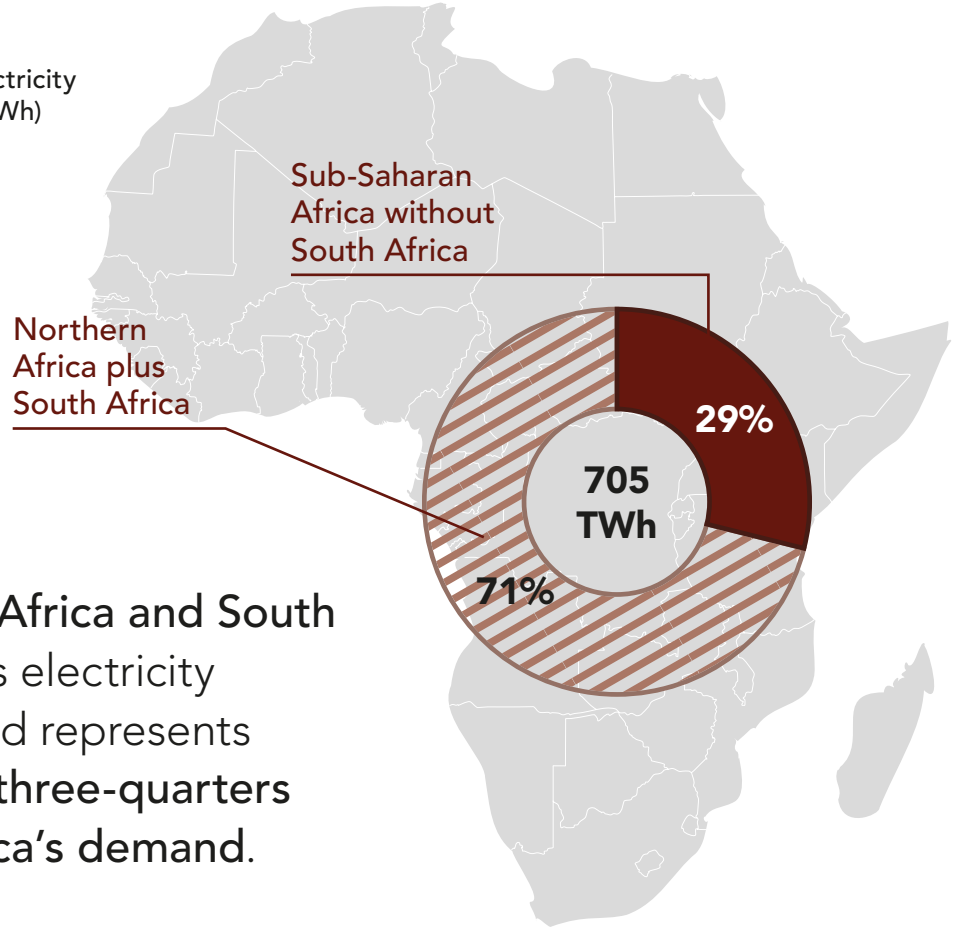
With 16% of the world's population, **Africa accounts for only 6% of the global energy demand** and little more than **3% of the electricity demand.**

Bioenergy is the largest source of energy in Africa today, meeting over half of the final energy consumption, but the use of charcoal for heating and cooking brings environmental (emission and uncontrolled deforestation) and healthy issues.

Source: IEA, 2019

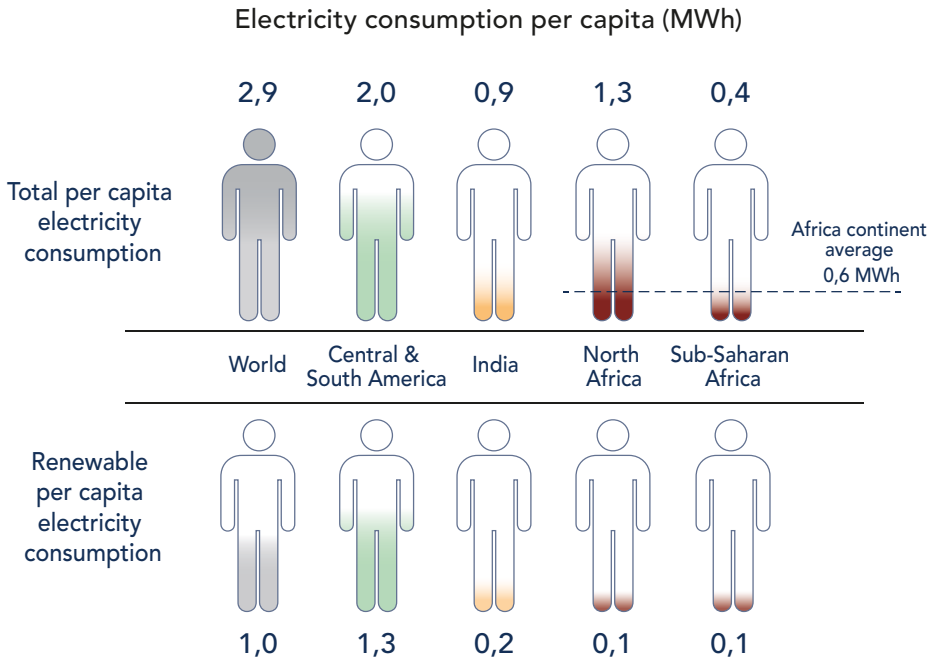
Electricity consumption is low and concentrated in North and South Africa

African electricity demand (TWh)



North Africa and South Africa's electricity demand represents nearly **three-quarters of Africa's demand.**

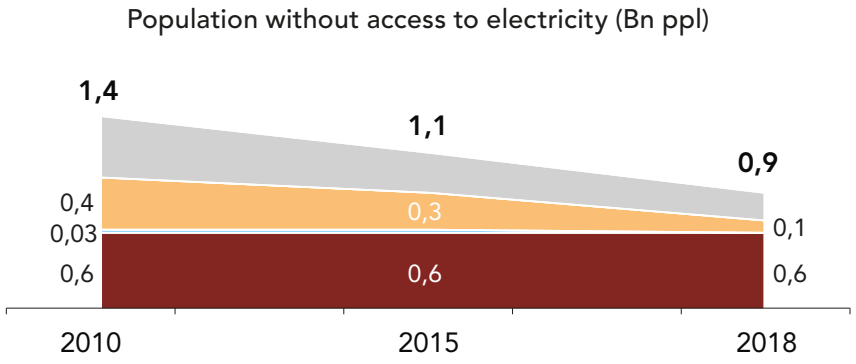
Sub-Saharan Africa's per capita consumption is very low compared to India or Central & South America



Sources: UN dataset, 2019 IEA, 2019 / Enerdata. 2020

600 million people still lack access to electricity

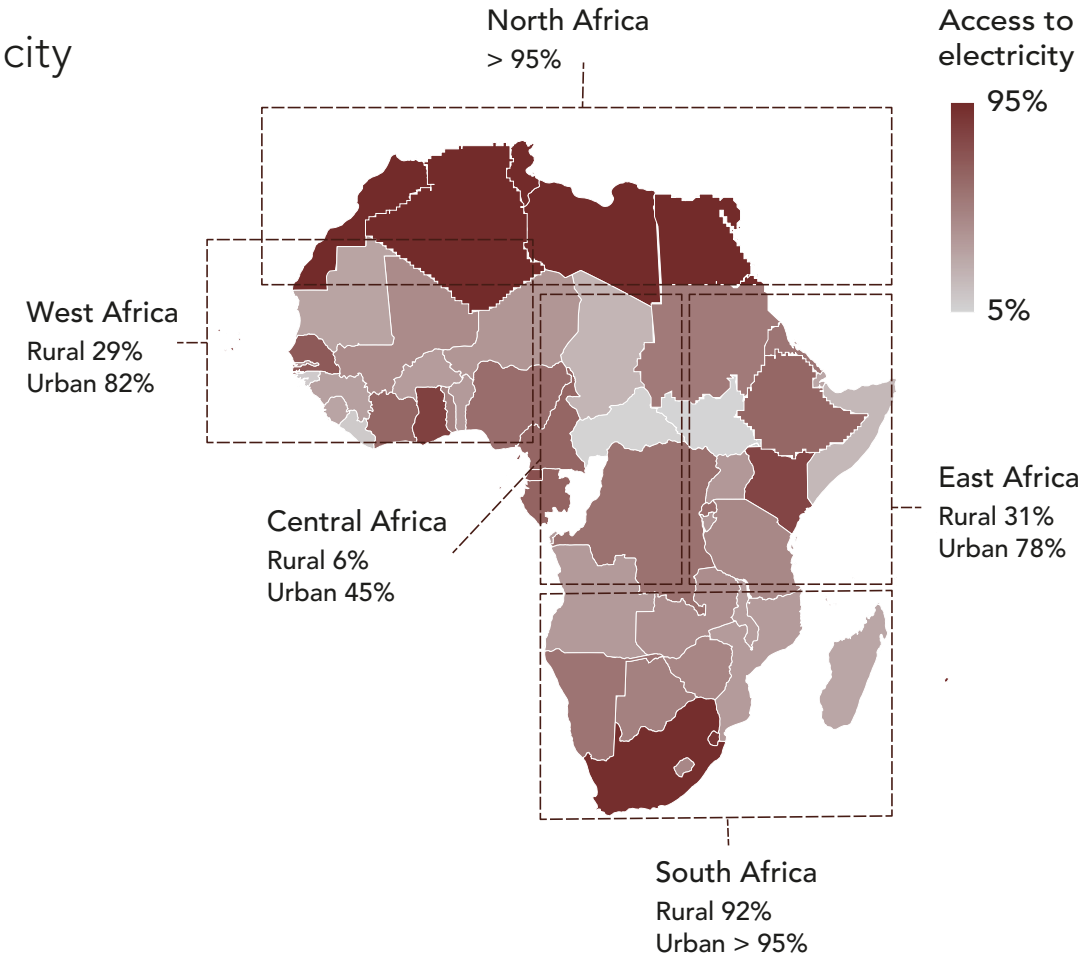
While India and Latam experienced a reduction in the number of people without access to electricity with a yearly rate of 19.1% and 6.5% respectively, **in sub-Saharan Africa the electrification pace is not keeping up with population growth.**



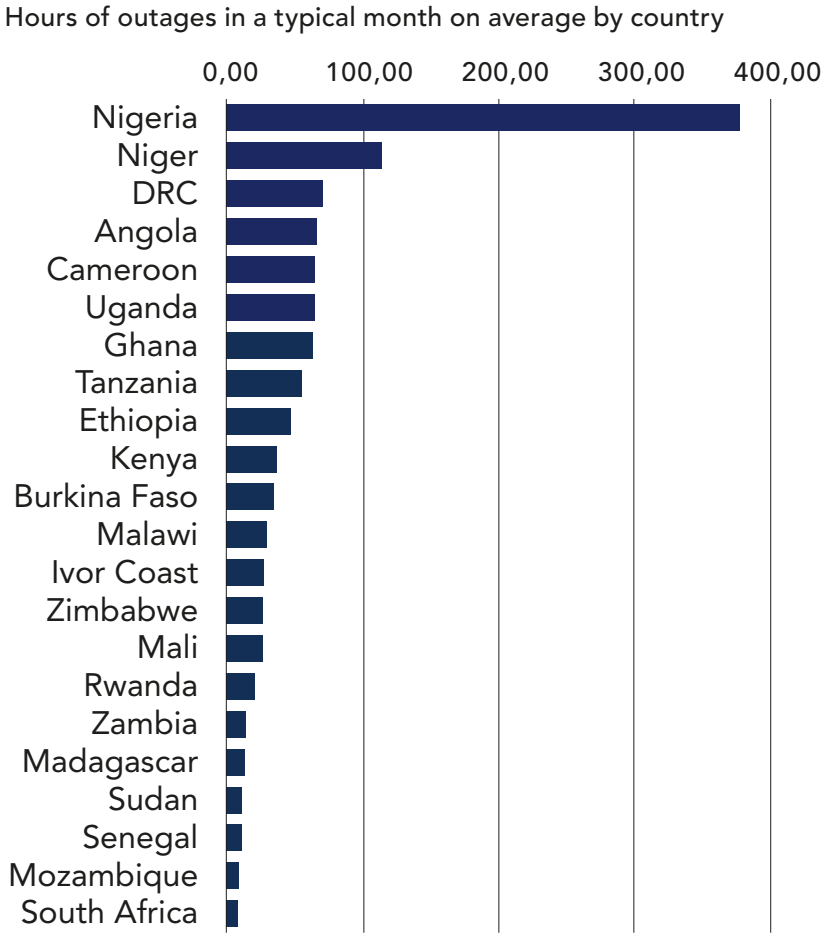
	SUB-SAHARAN AFRICA	LATAM	INDIA	WORLD
Bn ppl	–	Δ: -0.01	Δ: -0.3	Δ: -0.5
Y%	–	-6.5%	-19.1%	-5.9%
Share 2018	**66%**	2%	8%	

Note: Y% = Annual Growth Rate / Note: North Africa has >99% electricity access rate

Sources: UN dataset, 2019 IEA, 2019



Firms are suffering economic losses because of lack of quality services



Note: Data refers to latest available for country.

Sources: World Bank dataset, 2020 IEA, 2019

80% of firms in sub-Saharan Africa suffer **frequent electricity disruptions.**

Outages vary **from 15 up to more than 60 hours each month** in many sub-Saharan Africa countries, compared to 27 hours experienced in India and half an hour by OECD countries.

Frequent outages lead to economic annual losses for many firms in sub-Saharan Africa, with an average of 8% of total turnover (2% of annual GDP).

Low water levels due to droughts strongly affect the number of outages of countries that depend on hydropower for much of their electricity generation.



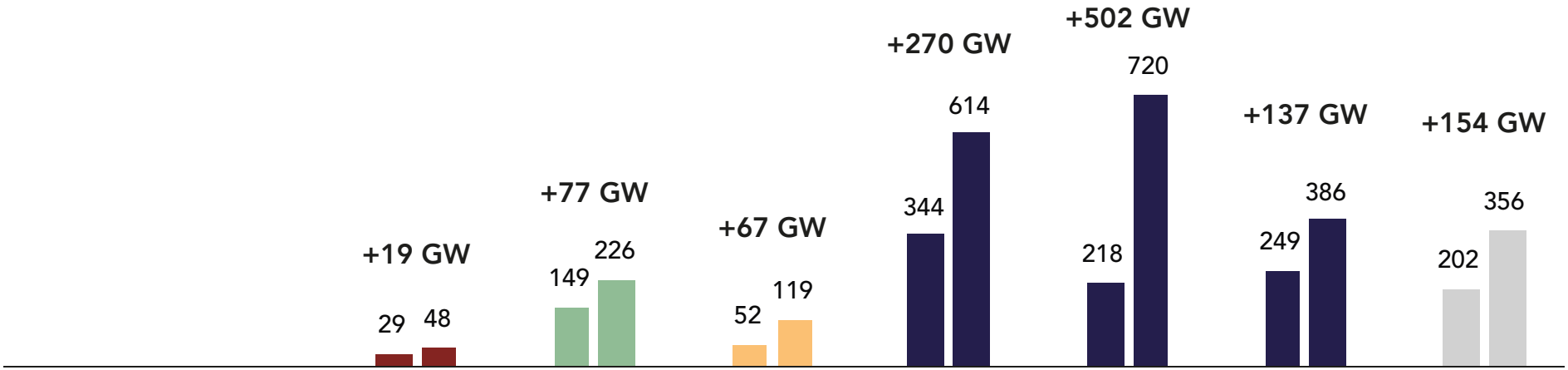
RE are booming globally, but Africa is lagging behind

1. What happened in the last 10 years

Just 2% of global RE capacity installed in the continent

Share of Africa on world **RE additional capacity** 2009-2018 accounts for only 2% while population accounts for a 16%.

RE share in electricity capacity 2009 - 2018 (GW)

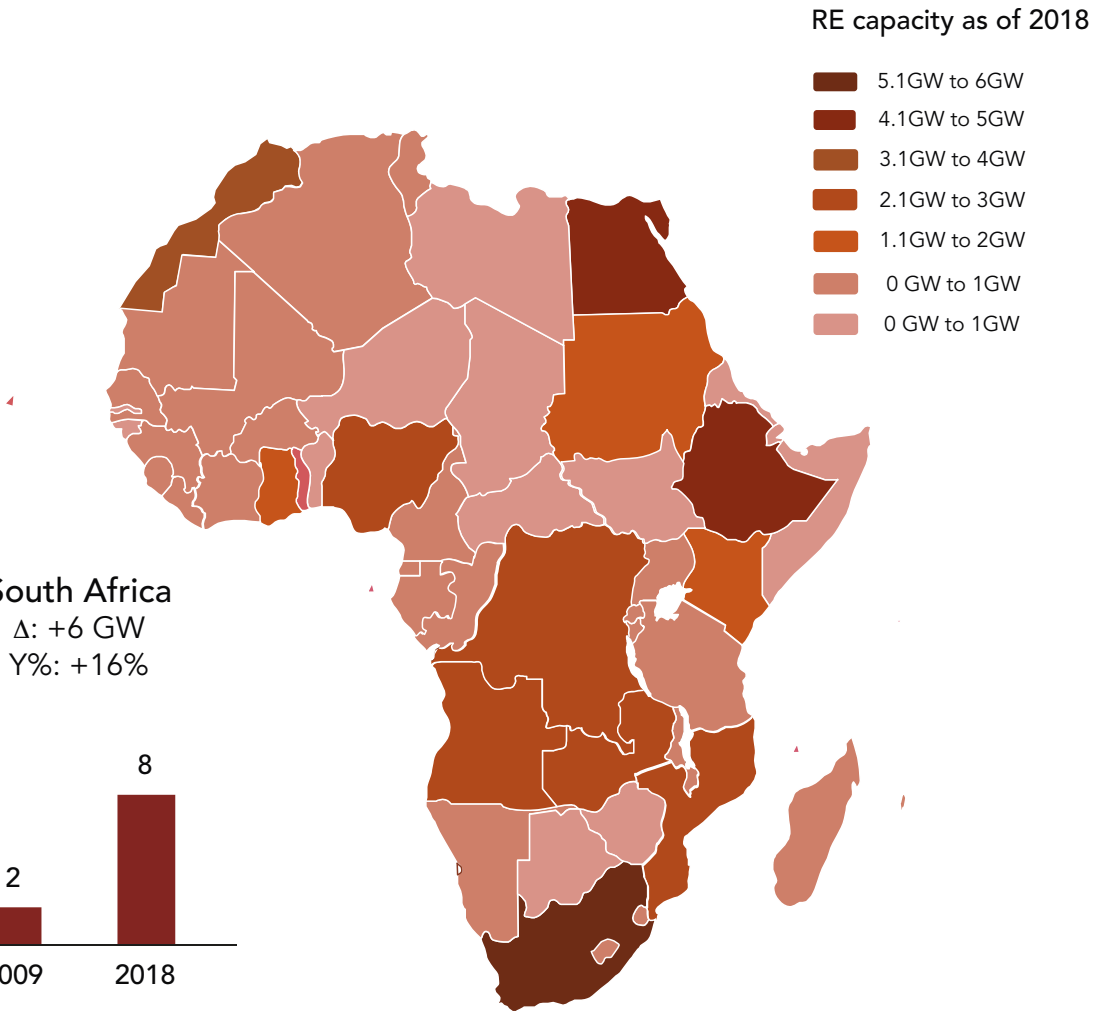


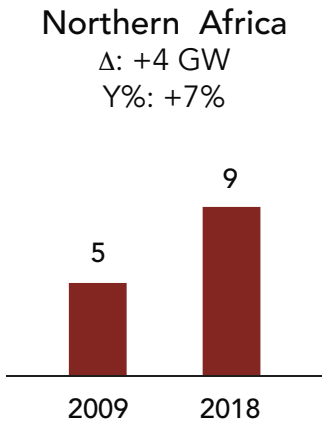
World Δ +1226 GW	2%	6%	5%	22%	41%	11%	13%
World RE capacity 2009 **1.243** GW 2018 **2.469** GW	Africa	Central & South America	India	Europe	China	North America	Rest of the World

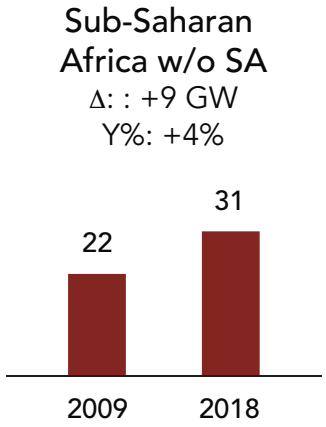
Sources: IEA, 2019 Enerdata, 2020

RE growth has been limited and uneven across the continent

North Africa and South Africa represent more than **50%** **of all additional RE capacity since 2009.**







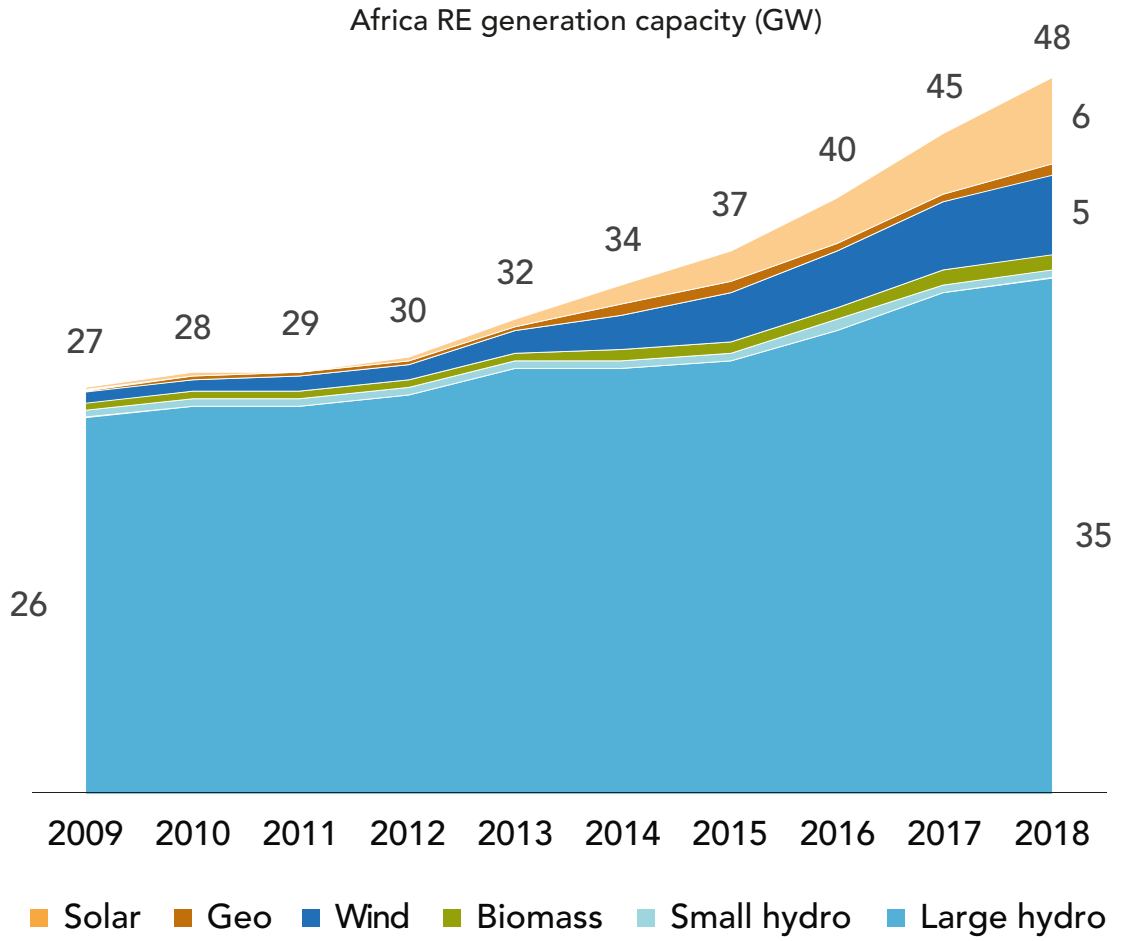
Source: IEA, 2019 Enerdata, 2020

Large hydro still has the main share of generation capacity

Africa' RE growth has been continuous, and almost half of new capacity comes from hydro. However **onshore wind and solar PV are now rapidly growing**.

Share of different RE sources (2018)

- Solar 12%
- Wind 10%
- Geo & bioenergy 4%
- Small hydro 1%
- Large hydro 73%



Source: IEA, 2019 Enerdata, 2020

Huge untapped resources can meet the continent's growing demand

Africa has plentiful renewable energy resources: bioenergy, hydropower, solar and wind power account for the bulk of the resources.

This RE potential capacity could generate up to **24 000 TWh of electricity each year**: this is almost 90% of the World's electricity generation in 2018, and more than **26 times the African electricity generation**.

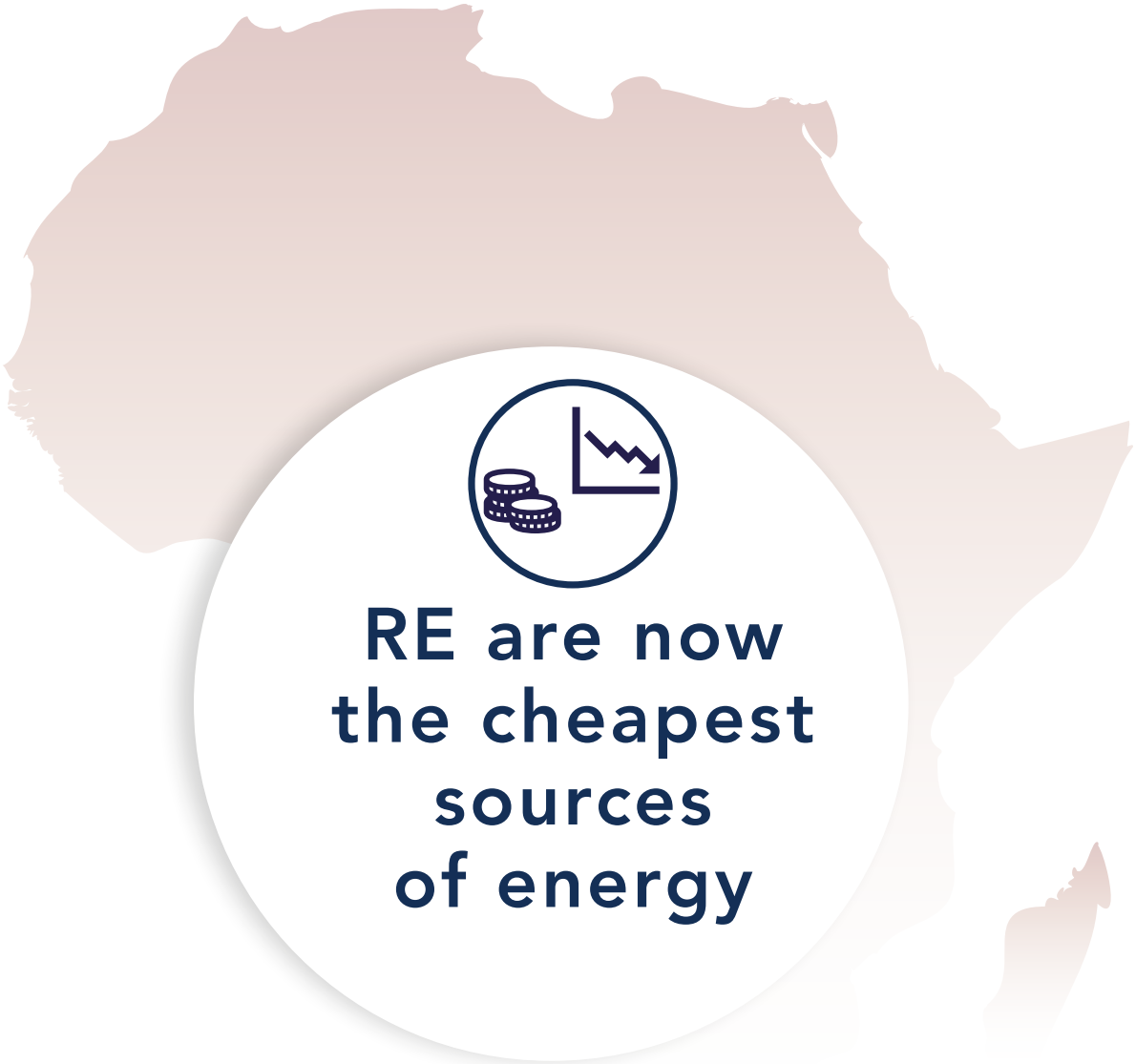
Solar potential	**11000 GW**
Hydro potential	**1750 GW**
Wind potential	**1300 GW**
Geo Potential	**15 GW (East Africa)**

Note:
Africa RE installed capacity in 2018: 48 GW

Africa RE potential by source



Sources: IRENA, 2013 IEA, 2019

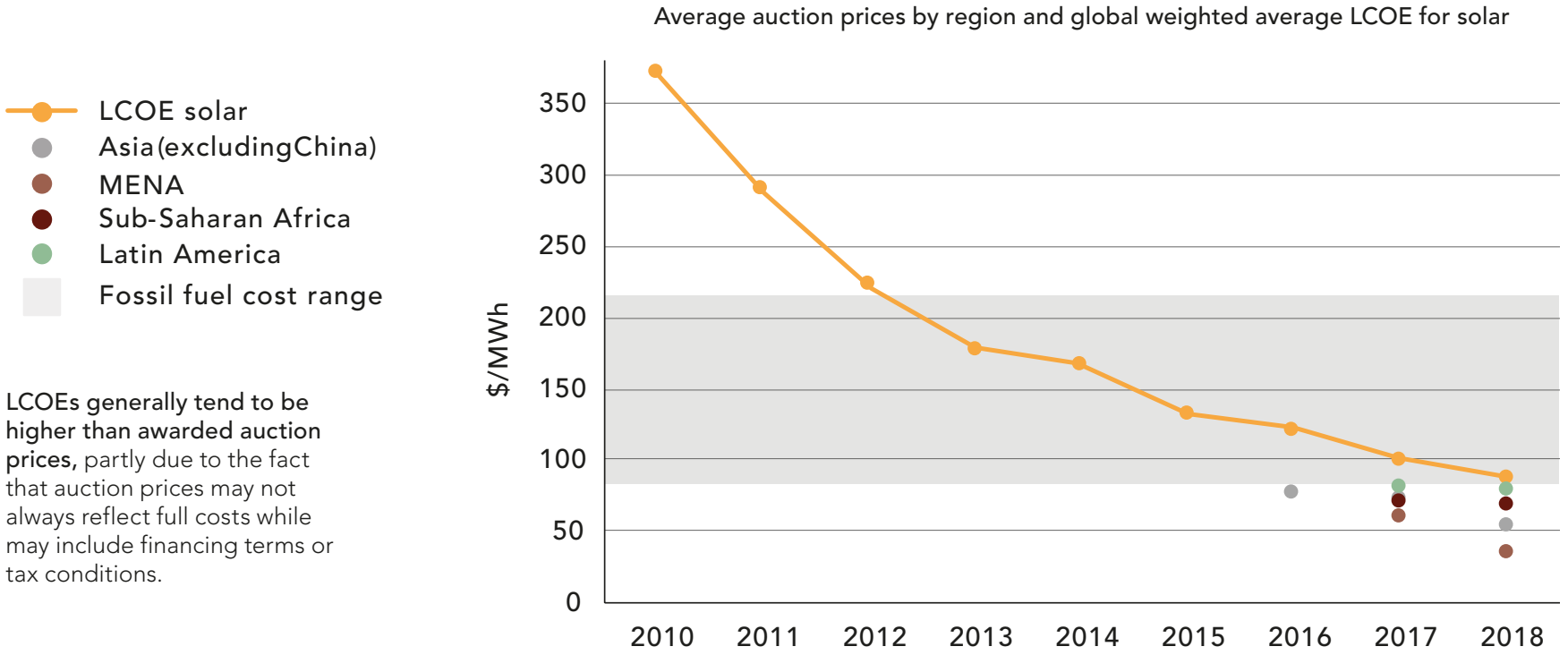


RE are now the cheapest sources of energy

1. What happened in the last 10 years

Solar is already more convenient than most conventional sources

Levelized cost of electricity (LCOE) of solar technologies has constantly **declined since 2010**, gaining increased competitiveness compared to fossil fuels, with solar technologies experiencing the **highest decrease in LCOE** with a **reduction of 77%** since 2010.



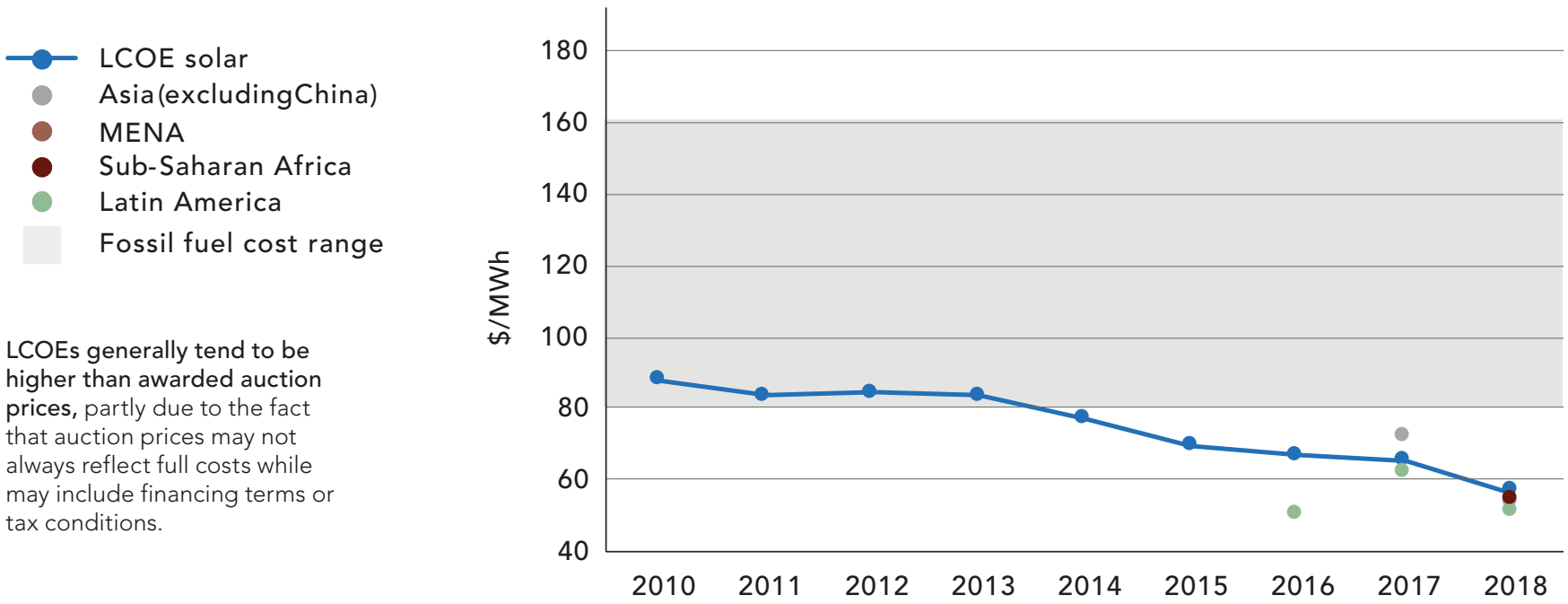
LCOEs generally tend to be higher than awarded auction prices, partly due to the fact that auction prices may not always reflect full costs while may include financing terms or tax conditions.

Sources: IEA database, 2020 IRENA, 2019

On-shore wind has the lowest averaged cost among renewables

Levelized cost of electricity (LCOE) of wind technologies has **declined by 35% since 2010.**

Average auction prices by region and global weighted average LCOE for solar



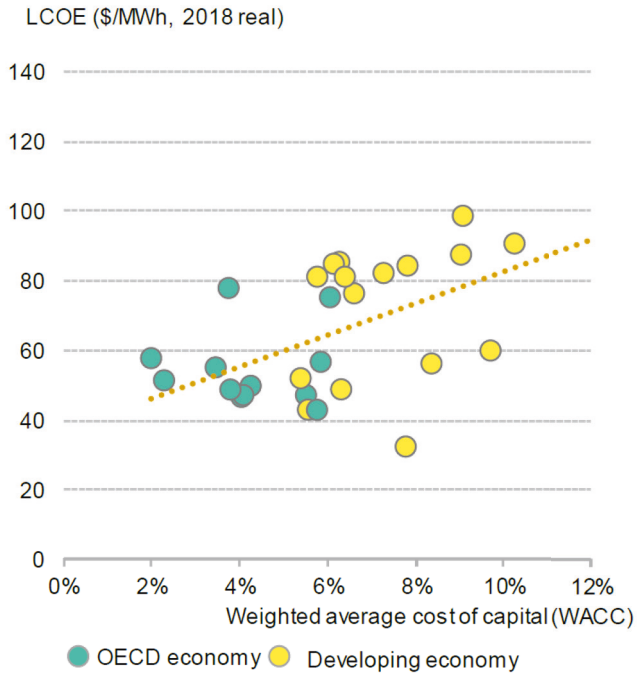
LCOEs generally tend to be higher than awarded auction prices, partly due to the fact that auction prices may not always reflect full costs while may include financing terms or tax conditions.

Sources: IEA database, 2020 IRENA, 2019

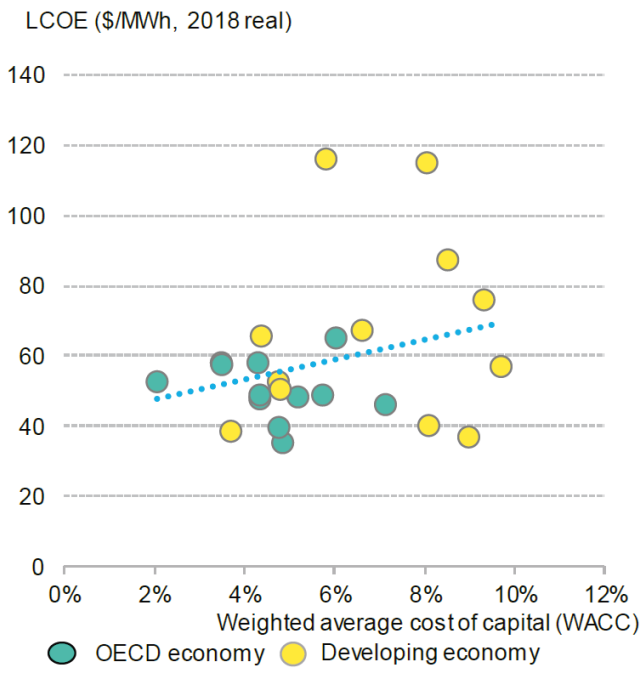
Perceived high-risk environment pushes up project financing costs and LCOE

Given the scarcity of bankable sub-Saharan African utilities, special measures are required to address risks, **increasing project financing costs across emerging markets.**

The effect of financing costs on levelized costs of electricity, utility-scale PV, 2019



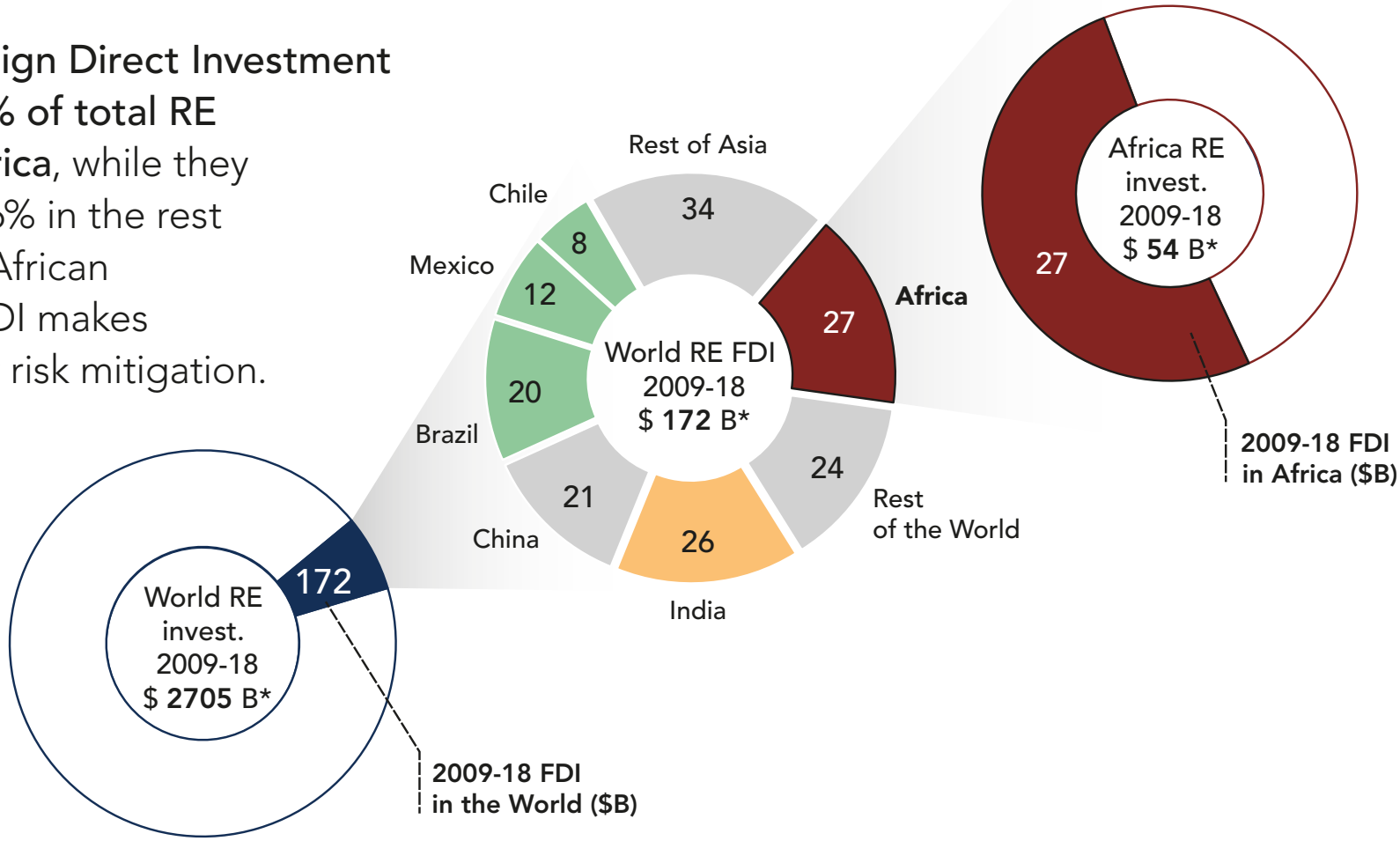
The effect of financing cost on levelized costs of electricity, onshore wind, 2019



Source: Bloomberg NEF, 2020

RE investments in Africa are still limited and highly reliant on FDI

Over 2009-18 **Foreign Direct Investment accounted for 50% of total RE investments in Africa**, while they represented only 6% in the rest of the world. The African dependency on FDI makes necessary a better risk mitigation.

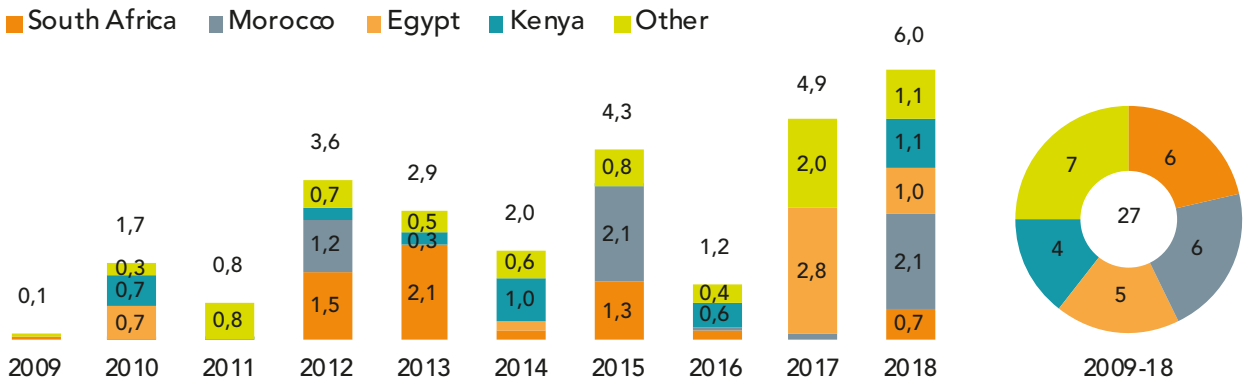


* Total value for small hydro, onshore wind, solar, geothermal, biofuels and biomass & waste technologies

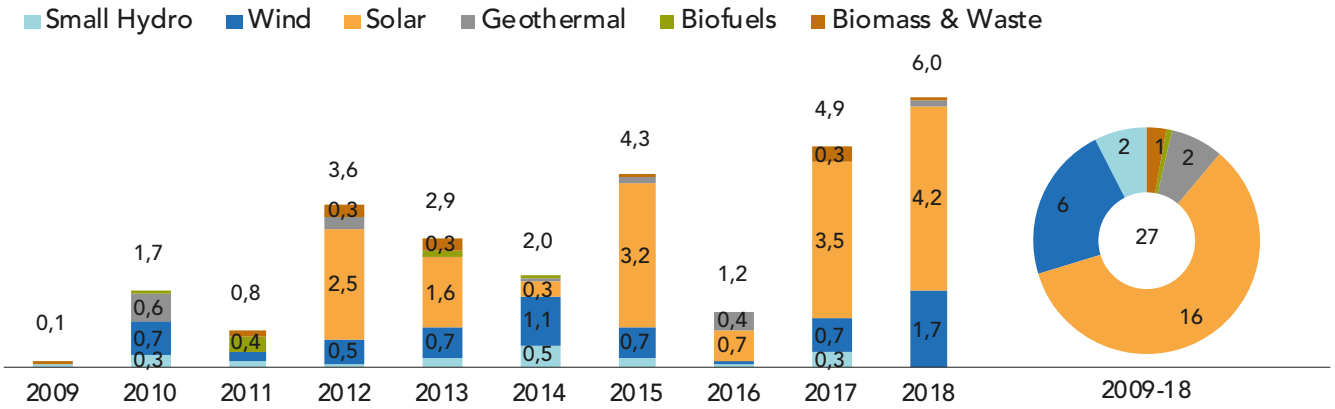
Source: Bloomberg NEF, 2020

FDI are growing but remain concentrated in few countries

FDI by country ($B)



FDI by technology ($B)



Note: only values > 0.2 are reported.

Source: Bloomberg NEF, 2020

- **South Africa, Morocco and Egypt attract most of the investment,** accounting for 60% of the total, but other countries like Kenya and Ethiopia are growing their share.
- **Solar technology attracted most of the investment** followed by wind.

CONNECTING THE DOTS

Last 10 years of RE

Uncertain political stability





Stable GDP growth

Low electricity share on total energy consumption





Sustained population growth

Low access-to-energy rate





Fast paced urbanization

Poor quality of power supply





High RE potential

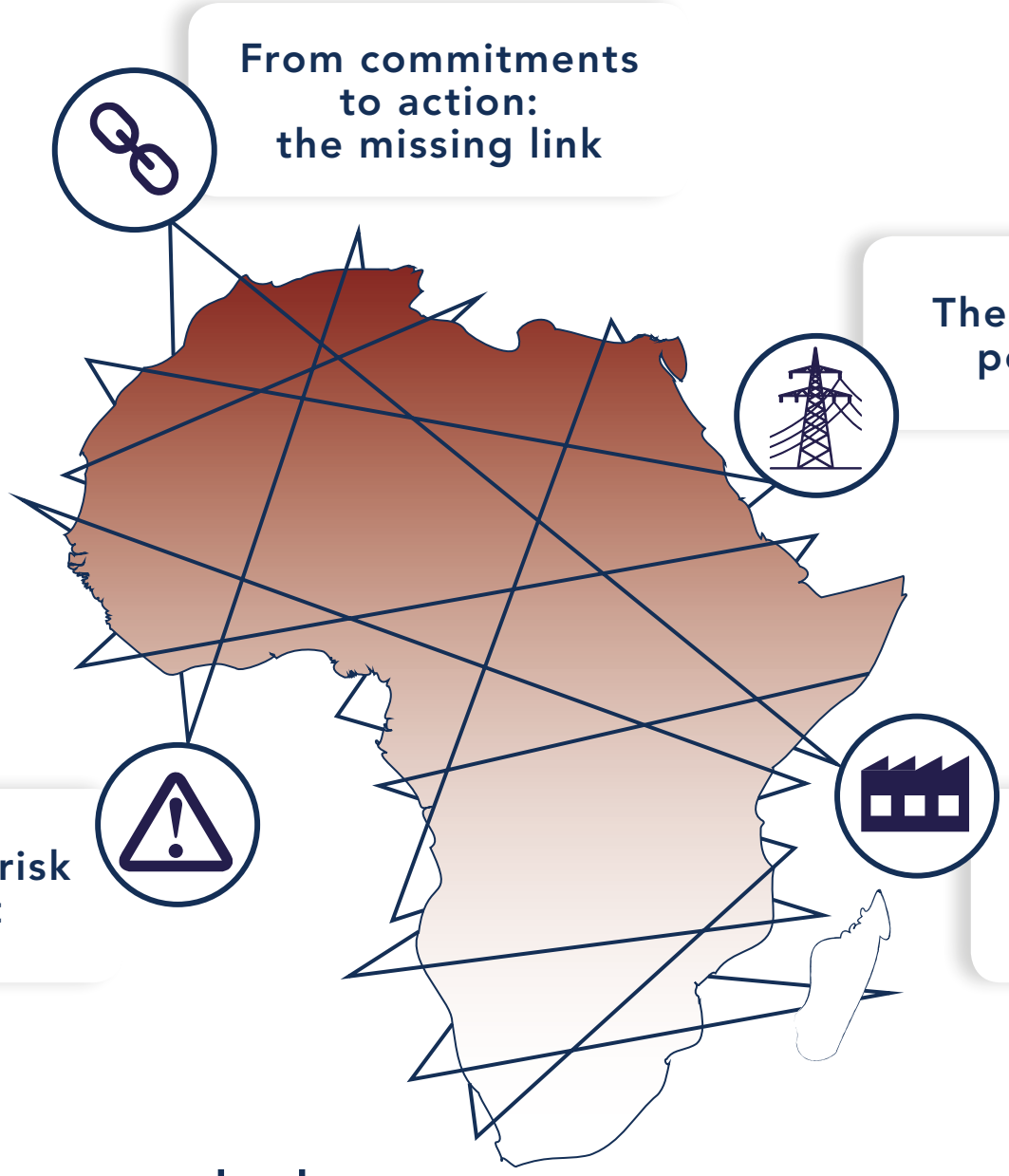
Uneven increase of RE accros the continent



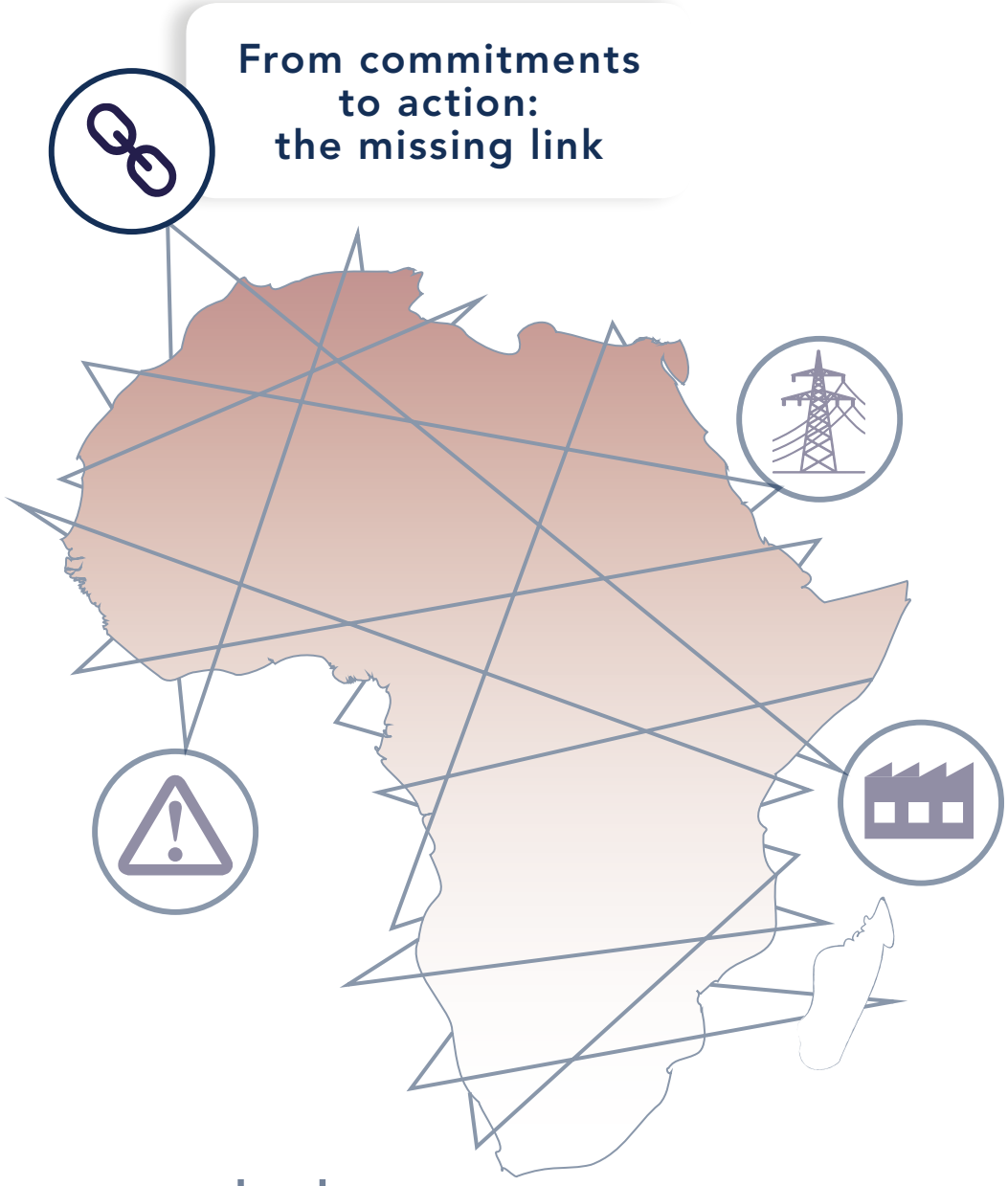


Decreased RE generation costs

RES4AFRICA FOUNDATION



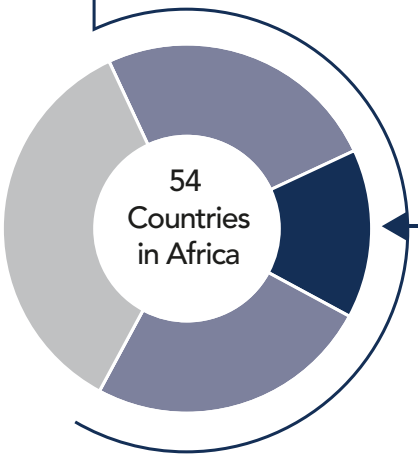
2. What limited the renewable energy growth



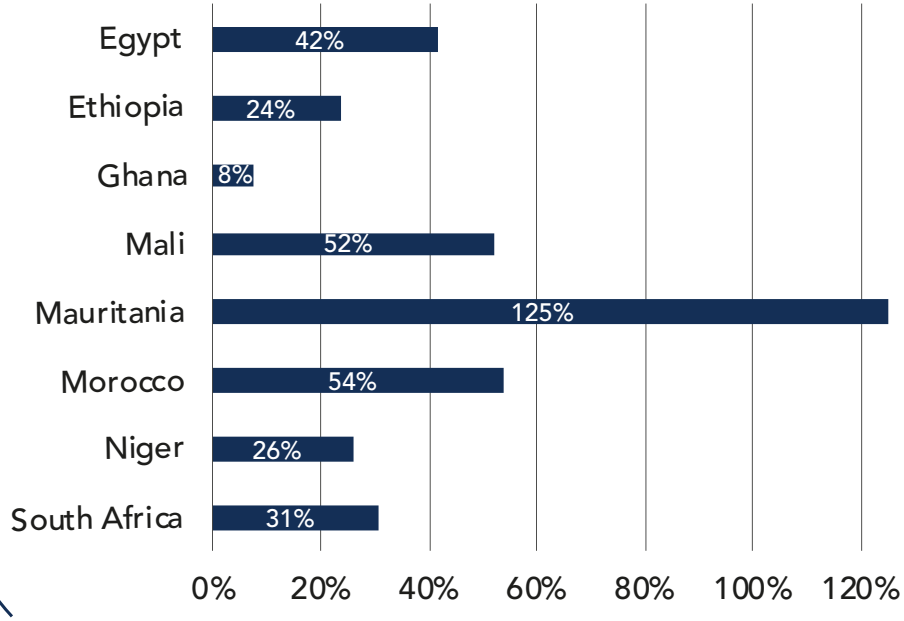
2. What limited the renewable energy growth

It's hard to take on commitments and even harder to keep them

Nearly 30 African countries have set national renewables targets.



8 countries had set clear 2020 renewables targets at some point before 2015



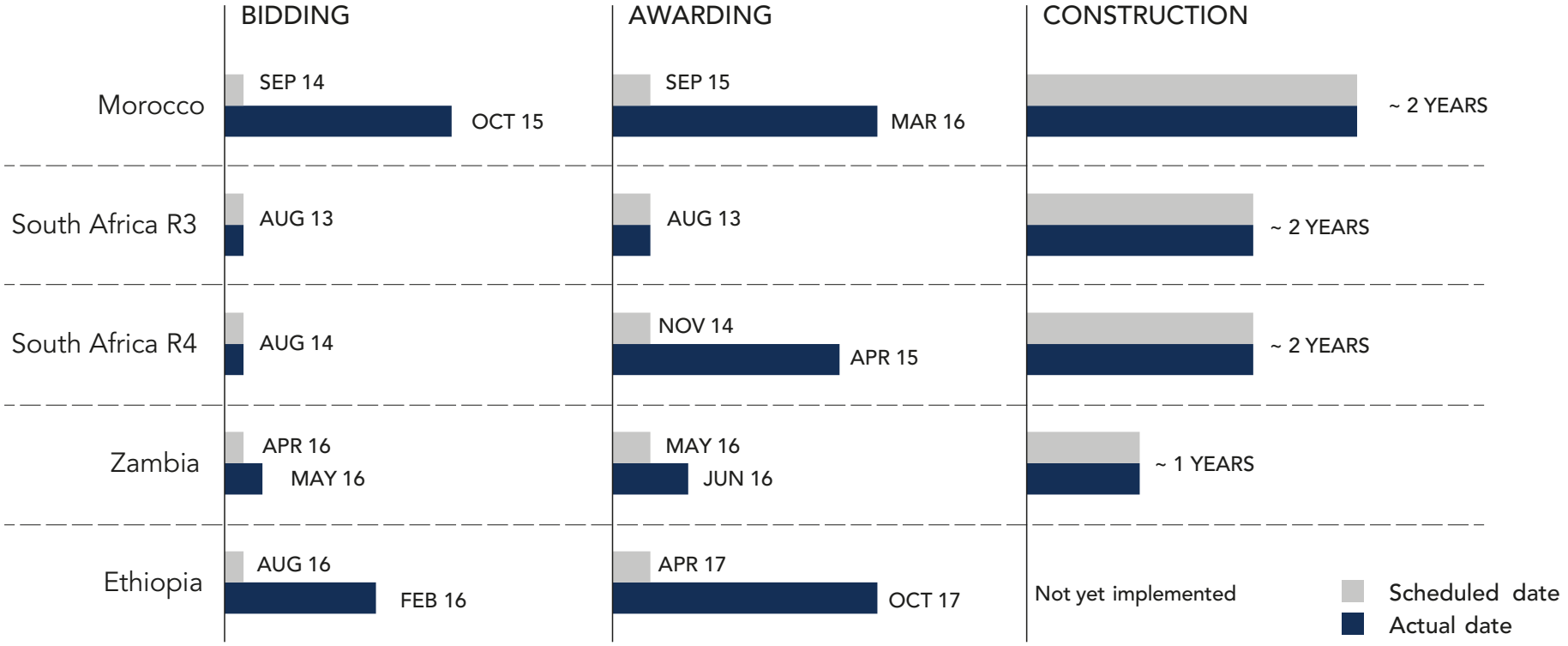
Progress toward 2020 RE targets as of 2018 operational capacity

Eye-catching targets are often trumpeted by administrations eager to burnish their green credentials, but an **absence of further state support for renewables can render them all but meaningless**.

Sources: Bloomberg NEF, 2020 Enerdata, 2020

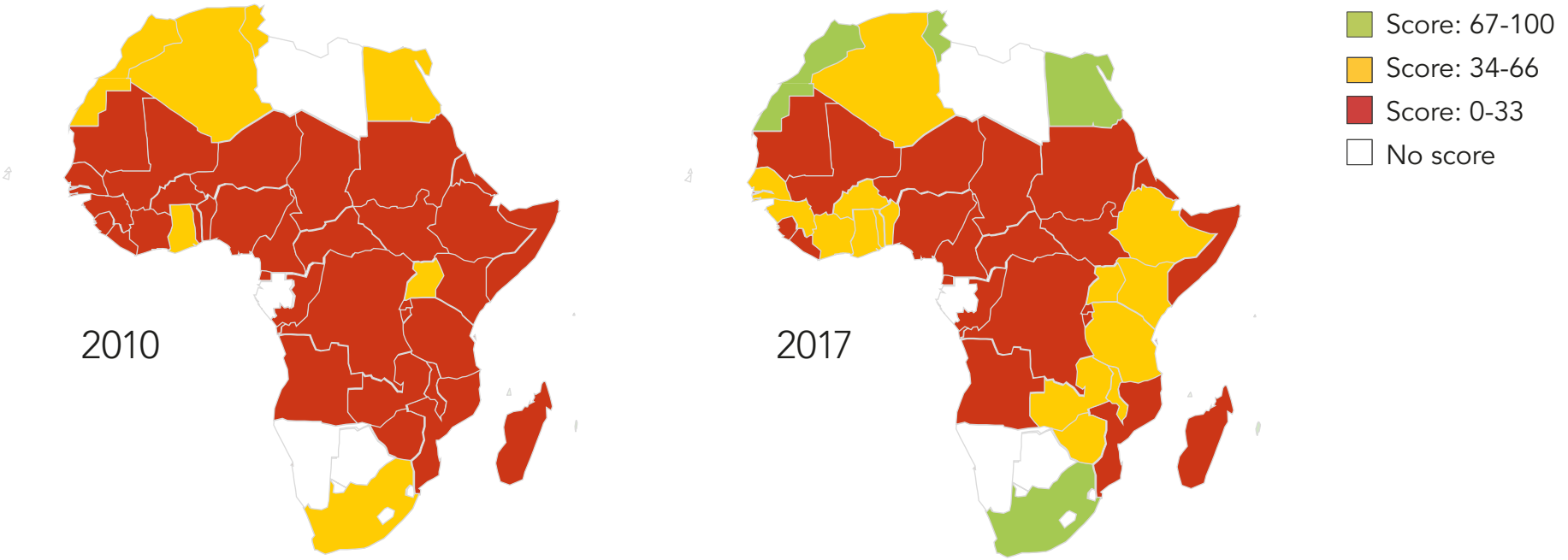
The time factor: process from tender to construction is often lengthy and costly

Except for South Africa, investments are often characterized by **mismatches of planned and actual dates of both bidding and awarding phases**, which negatively affect investors' risk perception.



Regulatory frameworks have advanced but space for improvements still remains

RISE score by country in Africa (2010-2017)

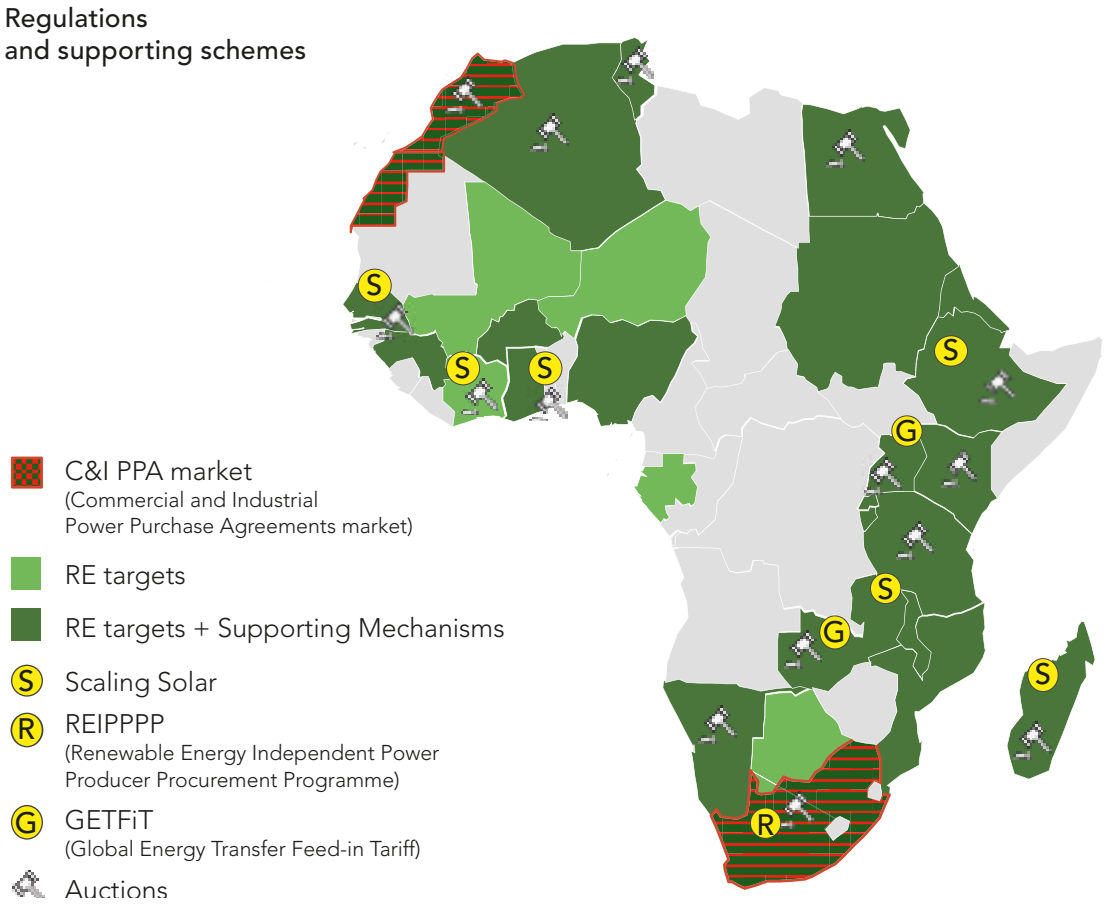


RISE scores reflect a snapshot of a country's policies and regulations in the energy sector, organized by the three pillars of sustainable energy: **energy access**, **energy efficiency**, and **renewable energy**. It shows that the results achieved in Africa have been limited to a small number of countries.

RISE: Regulatory Indicators for Sustainable Energy

Sources: ESMAP database, 2020

Few countries are adopting regulations and supporting schemes



- **Regulation and supporting schemes vary across African countries.**
- **Central Africa's** regulation systems remains the **less attractive for Renewables.**
- Additional incentive measures have been adopted, like **feed-in-tariffs** in Algeria, Kenya, Uganda, Ghana and Tanzania.
- In sub-Saharan Africa, **more than 60% of IPP capacity** was awarded through a **competitive process in 2018.**

Note: for RE targets we refer to capacity targets (MW)

Source: renewAfrica Initiative, 2019

Regulatory effectiveness: behind 4 countries success

- Morocco
- Tunisia
- Egypt
- South Africa

				Solid **masterplan** for RE development with targets differentiated by technology and with milestones
Partial	Ongoing	Ongoing		Direct contracts between private generators and bulk customers (**commercial PPAs**) + net-metering
Ongoing				Independent energy **regulator**
				Partial **unbundling** of power market
				Auctions as preferred procurement scheme



The deficit of the power sector

2. What limited the renewable energy growth

Lack of T&D lines between countries hinders access to power integration

With a total length of 89,731 km, **transmission network in Africa is small if compared to the continent's area**: 3.3 meters of line per square km, about 10 times less than in India.

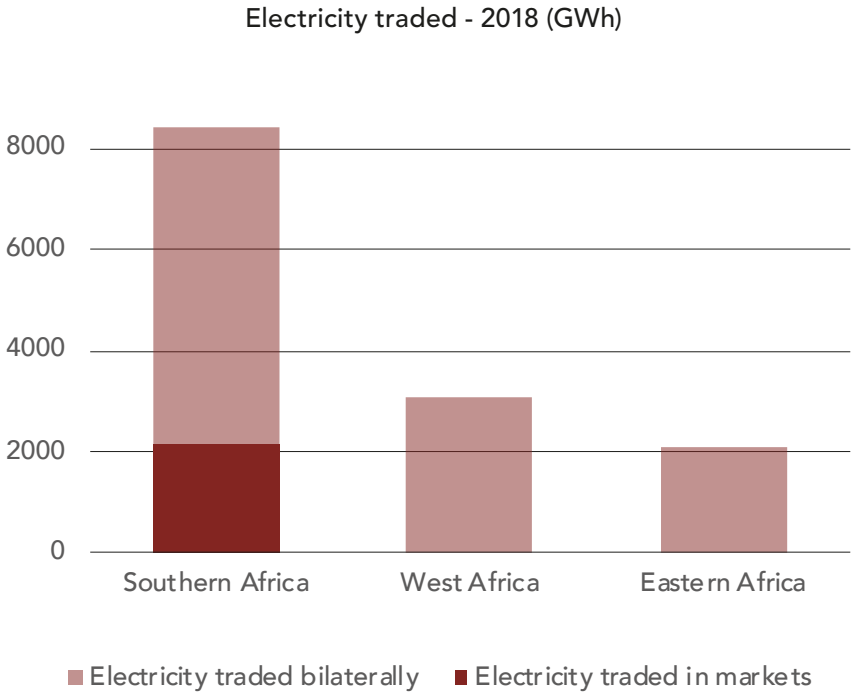
Transmission lines between national grids are insufficient in Sub-Saharan Africa even in power integrated region (Eastern Africa, Southern Africa and West Africa).

Poor power integration limits the access to new markets and new sources of supply, requiring the single utilities a larger investment and preventing countries for taking advantage of economies of scale.



Source: AfDB, 2017

Power trade is low across the interconnected regions



- **Inside the power integrated regions, power trade is still low** and mostly realised through bilateral contracts. Among the three regions, West Africa has the highest share of trade in total electricity demand (just ~5%).
- Even where **transmission interconnections** exist, they are **sometimes congested and some countries remain then isolated from regional grids**. To facilitate trading, interconnections need to be upgraded.
- Transmission cost allocation is also an issue. **Fully integrated regional power markets** have also the potential to **reduce the cost of electricity services** in many countries.
- On the contrary, **in Northern Africa**, even if the region is well interconnected, **power trade between the countries remains well under the interconnection capacities**.

Sources: IEA, 2019 Cambridge University, 2017

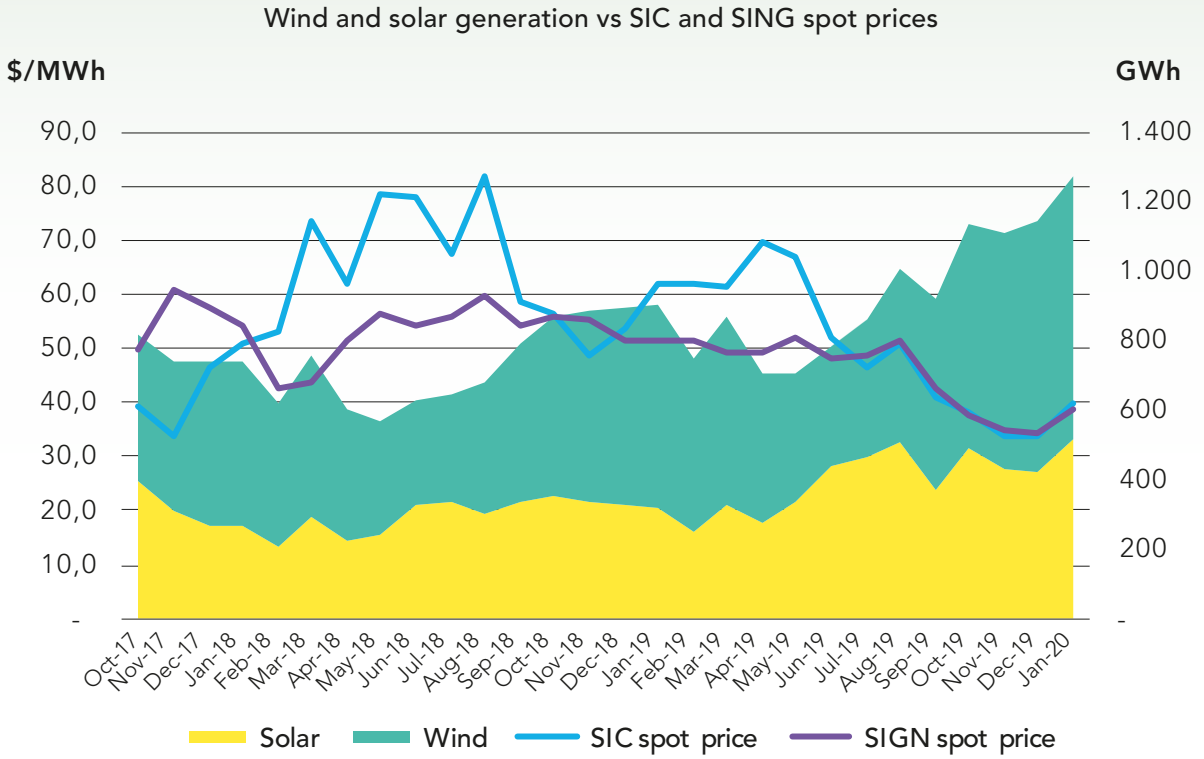
Best practices in transmission enhancement: Chile

The RE generation rapid uptake, coupled with lack of interconnection between the two main grids, caused grid congestions, curtailments and volatile/unprofitable prices for RE until 2016.

In 2017 and 2019 two new transmission lines (600 + 750 km) **connected the two main grids** leading to two main effects:

- nodal prices converged;
- congestions reduced: from 14% curtailment rate for wind and solar in 2017 to 1% in 2019.

Transmission expansion plan considers generation options, location and costs; it's updated every year, with a 20-years simulation (plus a mechanism to allow for urgent interventions).



Source: Bloomberg NEF, 2019

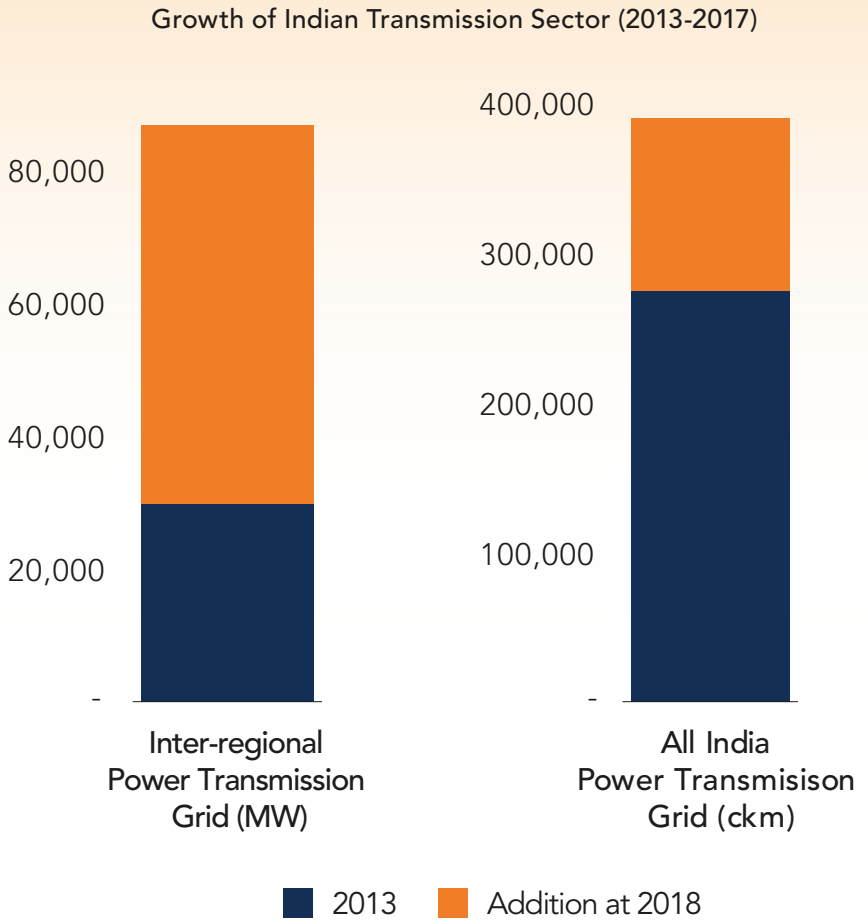
Note: SIC Central Interconnected System, SIGN Northern Interconnected System

Best practices in transmission enhancement: India



India got 100% electrified in 2019 (from 59% in 2000); all regional grids got synchronised with national grid in 2013. **National Electricity Plan** consists of a 5+5 year plan for electricity development, including projections for growth of HV inter-regional transmission capacity, considering **ambitious target** of 175 GW of RE by 2022. RE integration is enabled by a co-optimized planning for generation and transmission development:

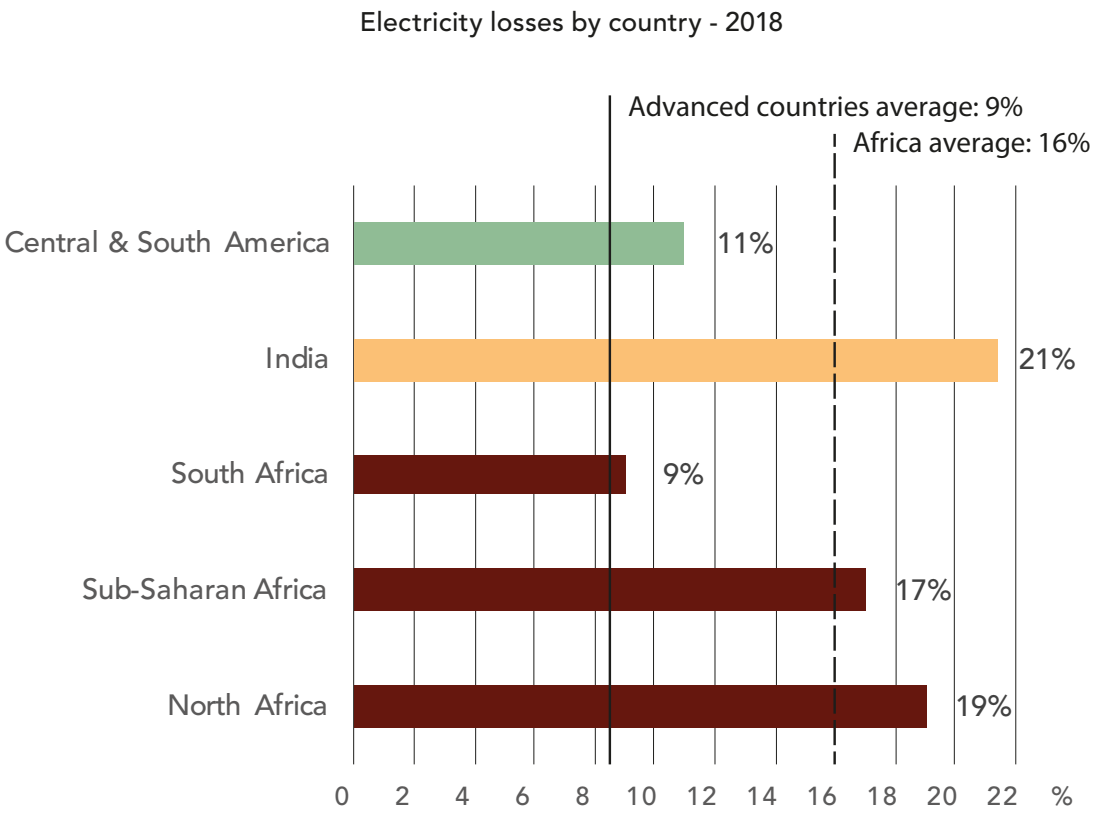
- In mid 2018, a committee on power transmission networks proposed the implementation of **transmission lines to support 67 GW of solar and wind capacity** in 7 States, to be completed by 2021 with an investment of US$6bn.
- In Dec 2018 the government announced a 23GW solar project in Ladach region, **including a 850 km transmission line**.



Source: IEEFA. 2019

Most countries suffer from a low-quality and unreliable grid

Most African Countries suffer from a **low-quality and unreliable grid**, affecting the whole economic system.

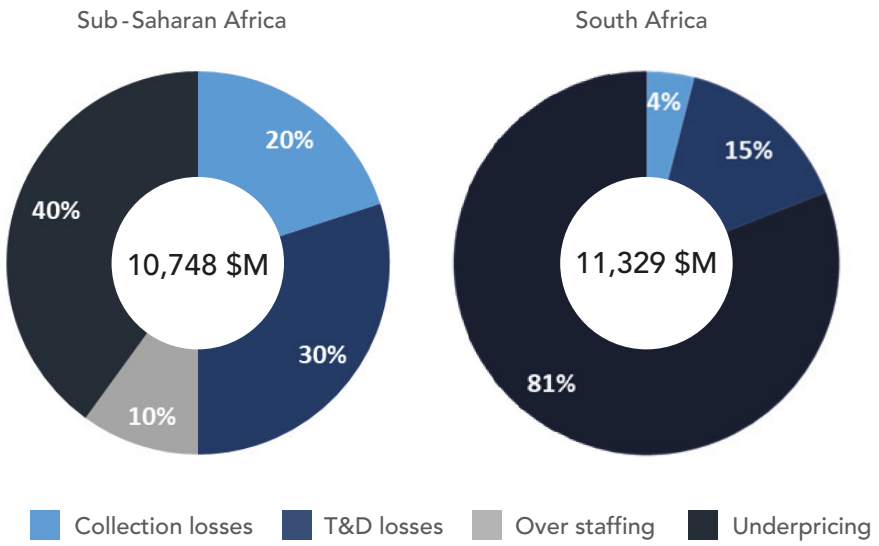


Source: IEA, 2019

- With 16% of transmission and distribution (T&D) losses, Africa's average is 7 percentage points higher compared to the average of advanced countries.
- **Losses also vary by region**, with a difference of ten percentage points between South and North Africa.
- **High T&D losses strongly affect the economy** of sub-Saharan utilities, leading to losses equivalent to the 0.3% of annual GDP (median value).

Utilities are challenged by underpricing and operational inefficiencies

Breakdown of hidden costs in SSA



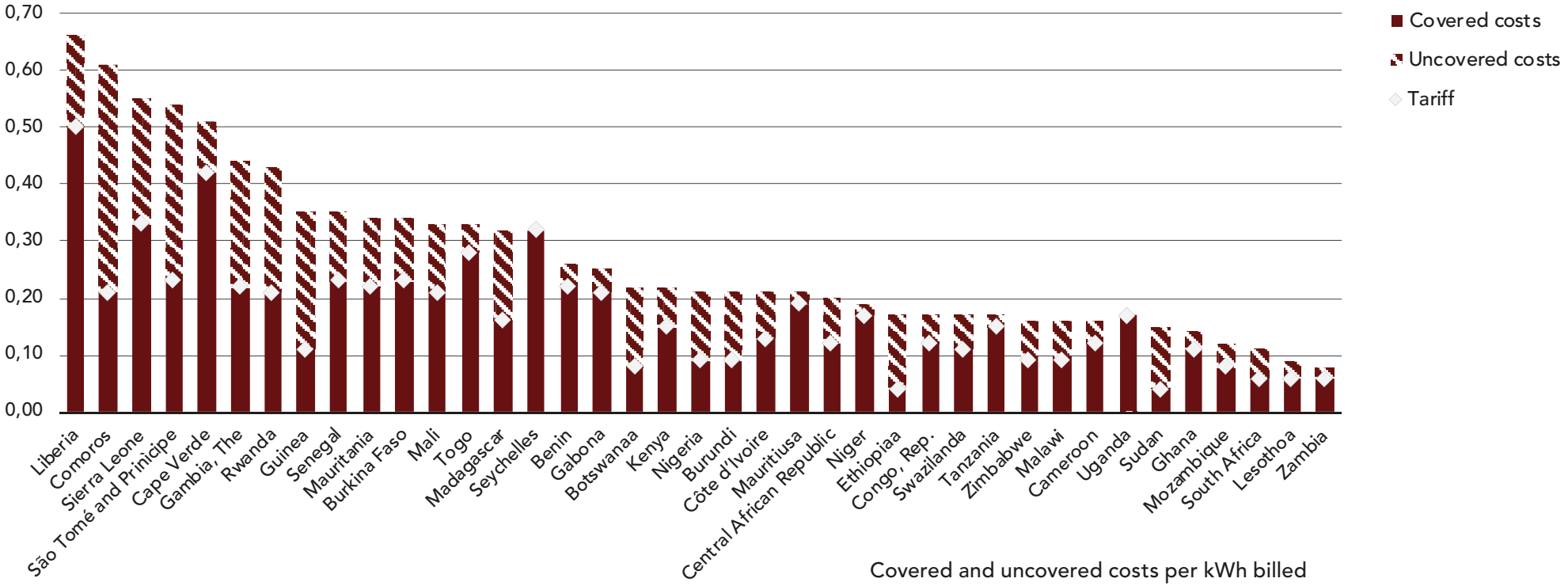
The QFD is the difference between the net revenue of an efficient electricity sector covering operational and capital costs and the net cash collected by the utilities.

Sources: World Bank, 2016

- In only **2 out of 39 (5%) countries in sub-Saharan Africa utilities are able to cover their capital and operating cost of service** (Seychelles and Uganda), while operating costs are covered by only 49% of them.
- **Underpricing, transmission and distribution losses, under-collection of bills and overstaffing** are the hidden costs responsible for the fiscal deficit of sub-Saharan Utilities, with underpricing counting for more than 40%.
- Across sub-Saharan Africa, the **quasi-fiscal deficit (QFD)** is equivalent to **US$21 billion** (2014), or **1.1% of GDP** (2014).
- This strongly affects the ability of utilities to make investments, braking the development of necessary transmission and distribution grids across the continent.

Non-reflective tariffs are increasingly unsustainable

The **weighted average tariff in SSA is US$0.08** per kWh, with significant variations across the region. The financial gap due to underpricing accounts for **US$0.10 per kWh** billed, leading to losses equivalent to 0.4% of the annual GDP (median values).



Covered and uncovered costs per kWh billed

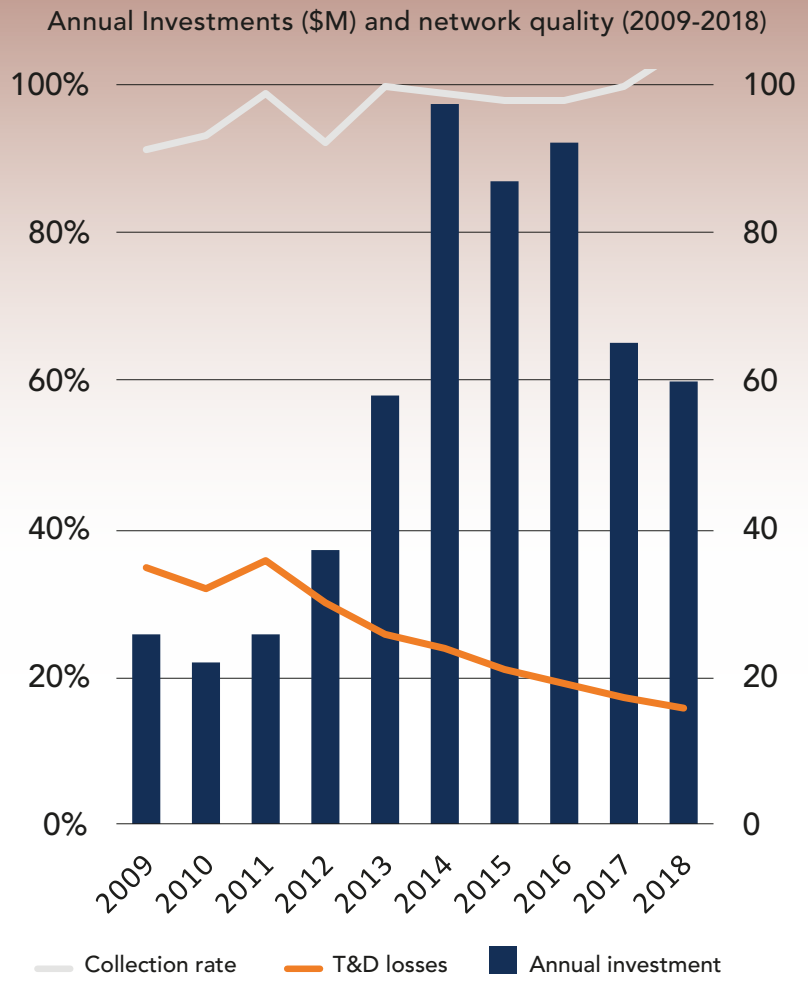
Note: the tariff mentioned is the average of residential, commercial & industrial, government and export tariffs

Source: World Bank, 2016

Uganda's utility reform: a success story

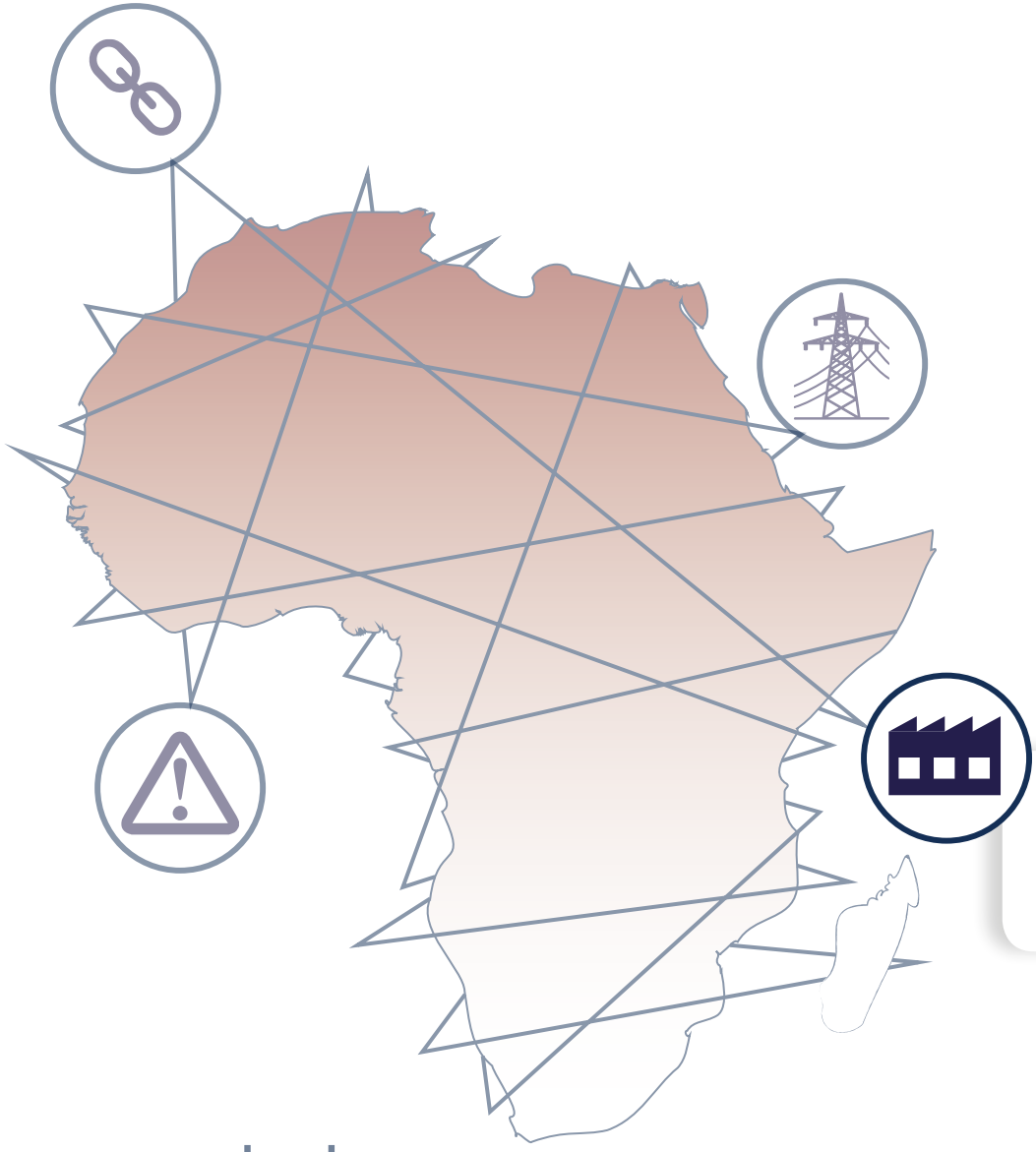
Following the reform to unbundle the state-owned utility network, **losses halved from 38% in 2005 to 17% in 2018**, driven by an increase in annual investments and an improvement in power supply.
Key factors of Uganda's reform include:

- **Contract-based performance indicators**, including loss reduction targets and investment obligations;
- **Regulatory independence**, allowing the regulator to set annual cost-reflective tariffs based on a methodology defined in the concession contract;
- **Increased channels to pay** bills and introduction of roll-out of prepayment metering which in 2018 represented 24% of revenues;
- Various **risk mitigation mechanisms**.



Note: collection rates surpass 100% due to pre-paid metering

Source: IEA, 2019



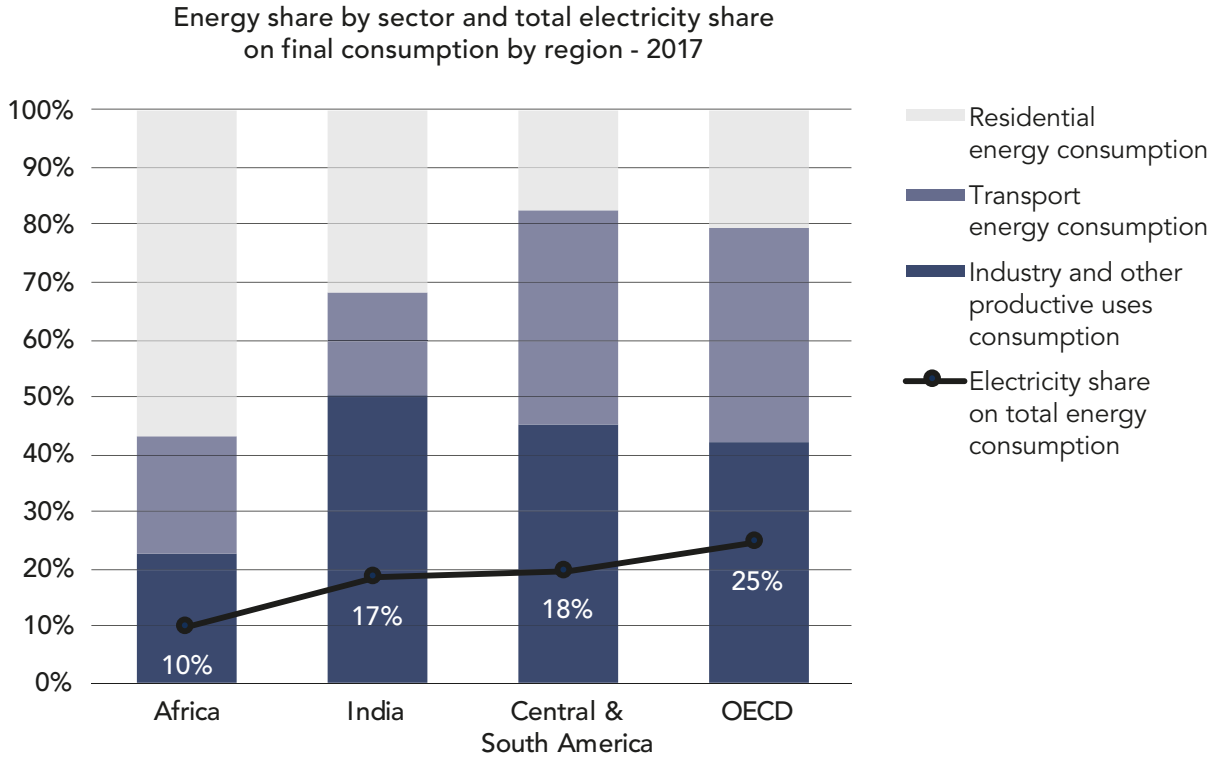
Productive uses of energy: the middle piece of the puzzle

2. What limited the renewable energy growth

Less than ¼ of total final energy consumption goes to productive uses

Low electricity share and residential sector predominance on total final energy consumption are indicative of a **slow industrialization process** playing a braking role in the Africa's economic growth.

Despite North Africa and South Africa are relatively **industrialized, industry and other services currently constitute less than 20%** of final consumption **in Sub-Saharan Africa**.



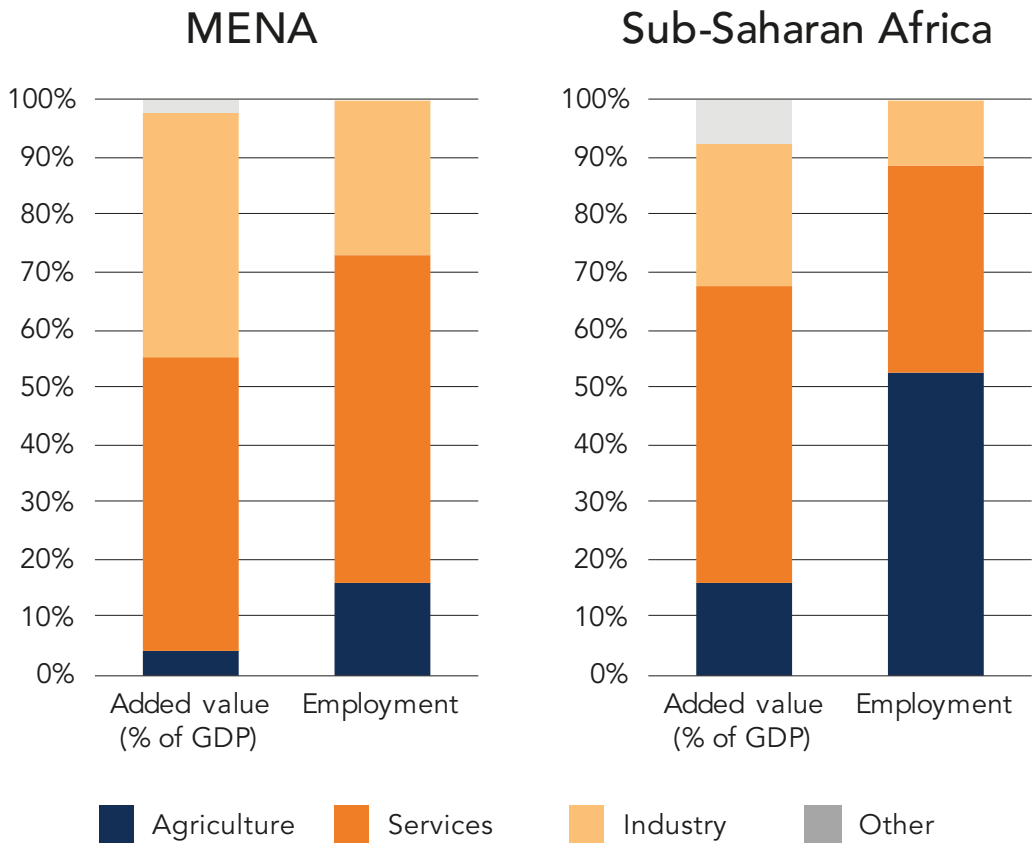
Source: World Bank database, 2020

Agriculture is the dominant sector by employment, despite its low added value

Despite its low added value to Africa's economy, agriculture is the dominant sector by employment in sub-Saharan Africa accounting for more than 50%, while **less than 20% of total population is employed in industry**.

Services contribute for the higher share to GDP in both North and sub-Saharan Africa.

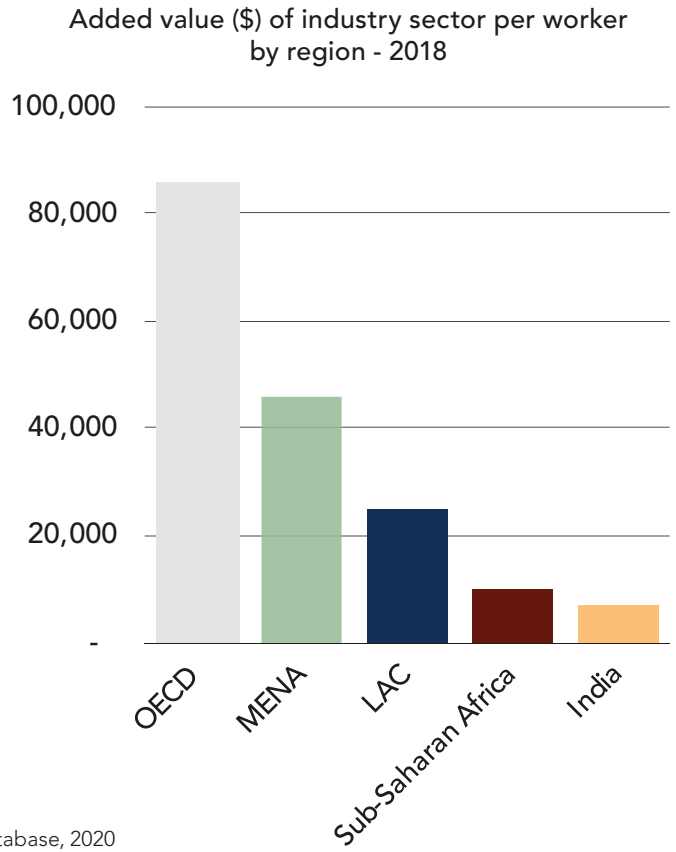
Added value and employment rates by sector in different regions - 2018

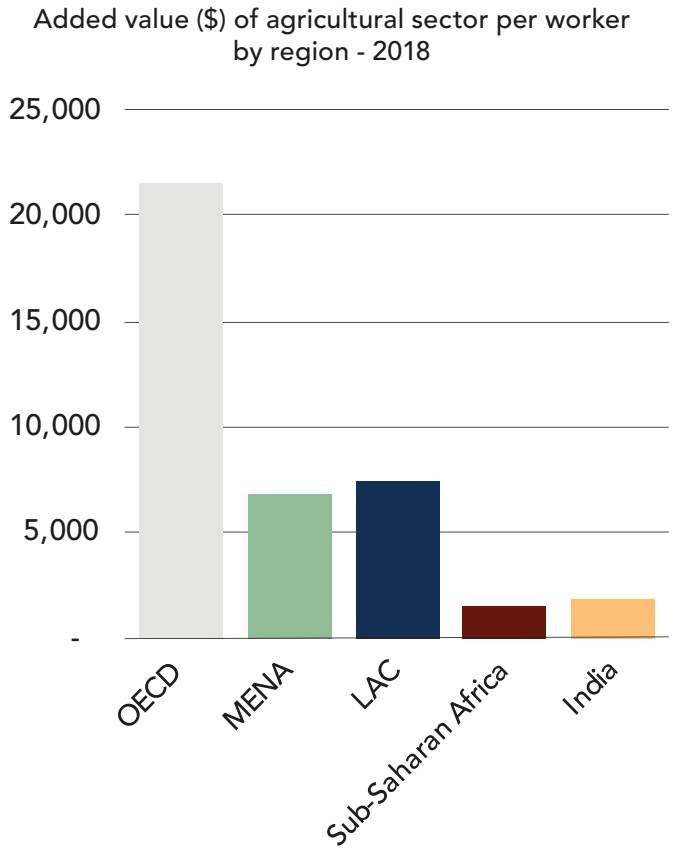


Source: World Bank database, 2020

Inadequate energy supply affects industrial and agriculture sectors

The **low productivity rates**, shown by their respective added values per workers, could be enhanced by a reliable energy supply supported by a clear regulatory system.





Source: World Bank database, 2020

Renewable energy: a driver to foster productive activities and added value

Sector	**Rural**	**Commercial and industrial**
Country	**TANZANIA**	**SOUTH AFRICA**
Project developed	**Small-hydro energy for rural integrated project** The 550 kW hydro-powered rural project supplies electricity and water to local population, while running agro-forestry and livestock activities as part of a Water-Energy-Food integrated business model.	**Solar energy for beverage industry** 11 rooftop solar photovoltaic (PV) units, with a combined installed capacity of 10.4 MW, produce 18 GWh per year for the production of beverages.
Benefits	• Increased productivity and farmers income. • Increased access to electricity for basic and productive uses of 23 percentage points. • Improved health conditions and food security. • Avoided carbon emissions by 172 t/y.	• Increased productivity (+ 9.24% in a year). • Savings in electricity drawn from the grid. • Avoided carbon emissions by 14 000 t/y.



2. What limited the renewable energy growth

Business environment: from economic conditions to transparency

Despite a growing energy demand and a huge potential in electricity production from renewable energy sources, **investments in renewables are still limited in Africa**.

This scarce investment appetite can be interpreted as a sign of **market unreadiness and high-level of perceived risk** of the business environment mainly due to the lack of:

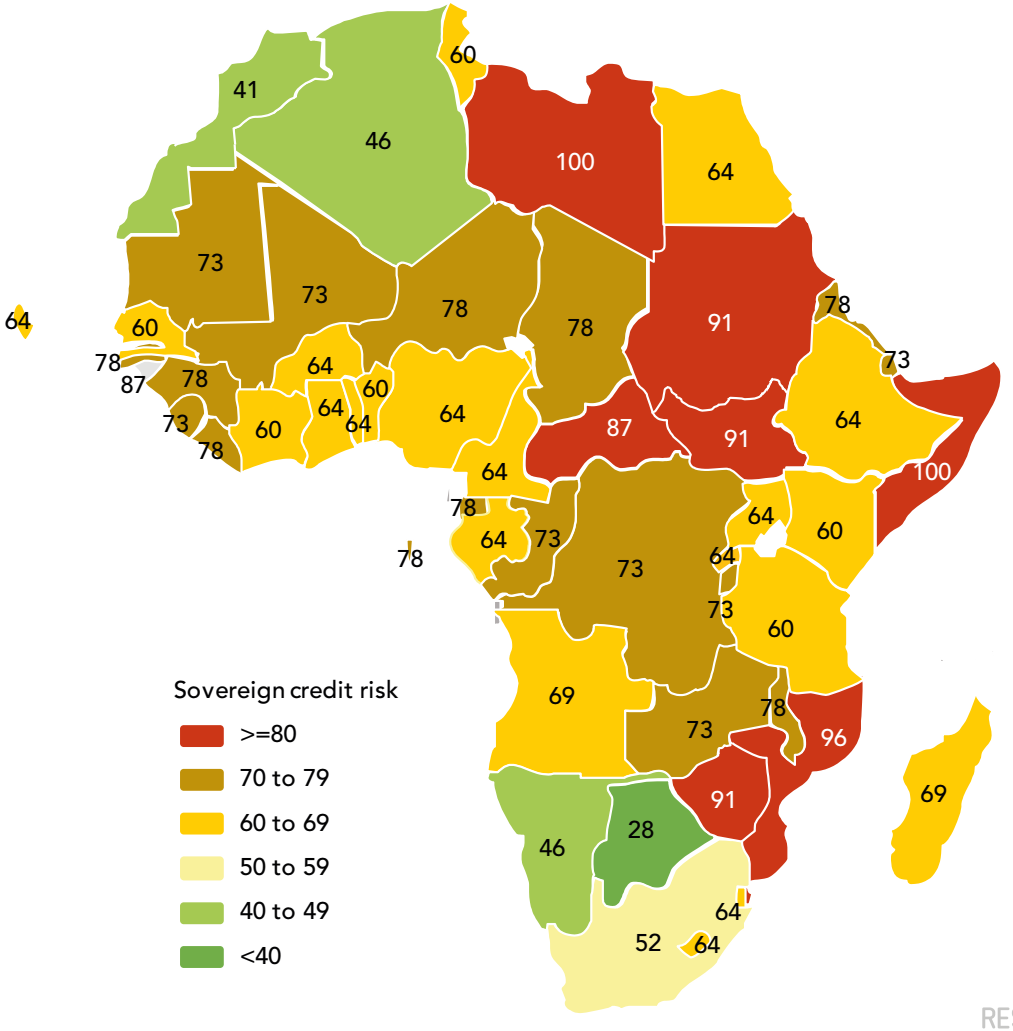
1. Political stability
2. Macroeconomic conditions
3. Clear and ready policy and regulatory frameworks
4. Institutional stability
5. Transparency

Risky environments limit the potential appetite of investors

A **sovereign credit risk** can be defined as a measure of 4 dimensions:

- Financial
- Economic
- Exposure to international credit agencies
- Political

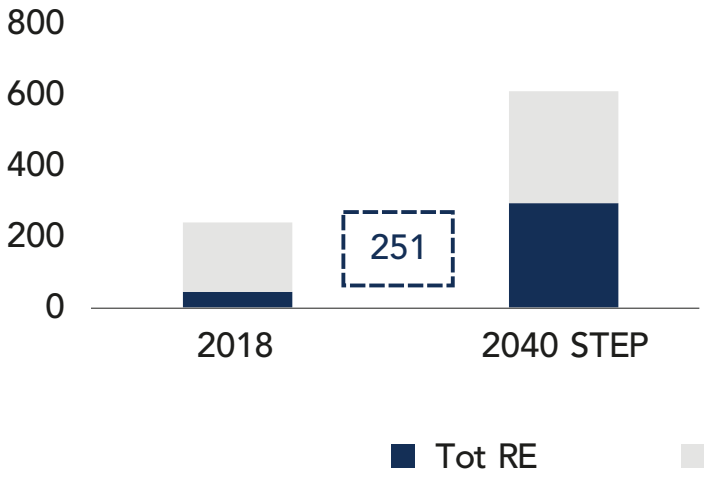
Efficient and comprehensive **de-risking tools** are essential to minimize the overall business risk and improve the **attractiveness** of the continent to **investors**.



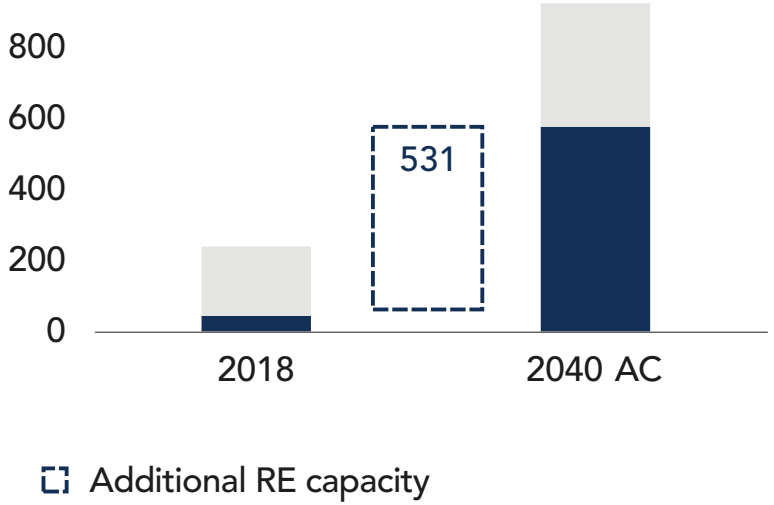
Source: SACE database, 2020

Bridging Africa's energy access gap requires unlocking investments in RE

By 2040 **~33 billion dollars/year** to be invested in generation capacity in the **IEA's Stated Policy Scenario.**



By 2040 **~60 billion dollars/year** are to be invested in generation capacity in the **IEA's Africa Case**.



Tot RE Tot non RE Additional RE capacity

Source: IEA, 2019

Most of de-risking instruments do not cover all investment phases

Areas to be covered

Preparation: Legal, technical and economic analysis

Bidding Phase: Tender information & documents

Tender Process and Awarding: Bidder consultation RFP & proposal review signing

Final Agreement: Loan, insurances, PPA, guarantees

Construction and O&M: Construction, commissioning, O&M

Minimizing the risks of investing in RE projects is a complex process that should encompass different phases.

An analysis carried out on EU de-risking instruments shows that while 100% of the instruments provide support in the early stages of the project, tender process is the most uncovered area, addressed by only 18% of the instruments.

Moreover, the bidding phase is covered by 29% of the EU tools, final agreement by 65%, and construction and operation phases by 41%.

Source: renewAfrica Initiative, 2019

Best existing instruments, but with space for improvements

	Scaling Solar	GETFiT	REIPPPP
Strengths	Ensures political support Ensures bidders' reliability and competitiveness Fully developed project agreements and credit	Fair risk allocation between public and private sector Allocation of risks to the party which is best positioned to manage it Public sector to absorb the credit risk in relation to the single offtaker of electricity (counterparty risk guarantee)	First structured auction program in the continent (2011) Delivered almost 4 GW in operation of wind and solar plants Bankable PPA backed by sovereign guarantee
Weaknesses	Limited technological and geographical coverage After 5 years since the launch of the initiative, operational plants only in Zambia	Limited to small scale projects Private sector to absorb all manageable risks, particularly technological and operational risk	Interferences by the State-owned off-taker Eskom caused substantial delays in program implementation Grid connection issues (costs higher than expected) Challenging local content/ ownership requirements due to limited local manifacturing capacity

Why only 2%?



- Inadequate de-risking instruments
- Unrealistic eye-catching targets
- High sovereign credit risk
- Weak regulatory frameworks
- Low share of productive uses of energy
- Lengthy tender to construction processes
- Poor power trading in interconnected regions
- Uncertain utilities' financial viability
- Limited reliability and development of the grid
- Non cost-reflective tariff

1. Foster Africa's electricity market openness, attractiveness and readiness

2. Provide an integrated power transmission grid and create regional energy markets

3. Put productive uses of energy on top of the agenda

4. Develop a comprehensive de-risking instrument to unlock Africa's renewable energy potential



3. The time to act is now

Foster Africa's electricity market openness, attractiveness and readiness

To ensure an effective regulatory system to foster RE development, an open, attractive and ready market is needed



1. Openness

Ensuring trustworthiness of the energy strategy through:

- **Adoption, integration and monitoring of renewable targets;**
- **Separation between the natural monopoly of T&D services and the competitive activities;**
- **Clear rules for network access.**

2. Attractiveness

Guaranteeing fair competition among generation technologies through:

- A **transparent procurement framework** for both conventional and renewable technologies (competitive tenders);
- The **withdrawal of all electricity price distortion mechanisms** such as fossil fuel subsidies and not-cost-reflective retail tariffs.

3. Readiness

Fostering an adequate network development through:

- Definition of a **structured network development plan**;
- **Establishment of a clear and cost-based remuneration system for the TSO.**

Guaranteeing availability of multiple and viable routes-to-market for renewable energy by allowing renewable generators to freely sell their energy to end-users through a spot market or bilateral PPAs.

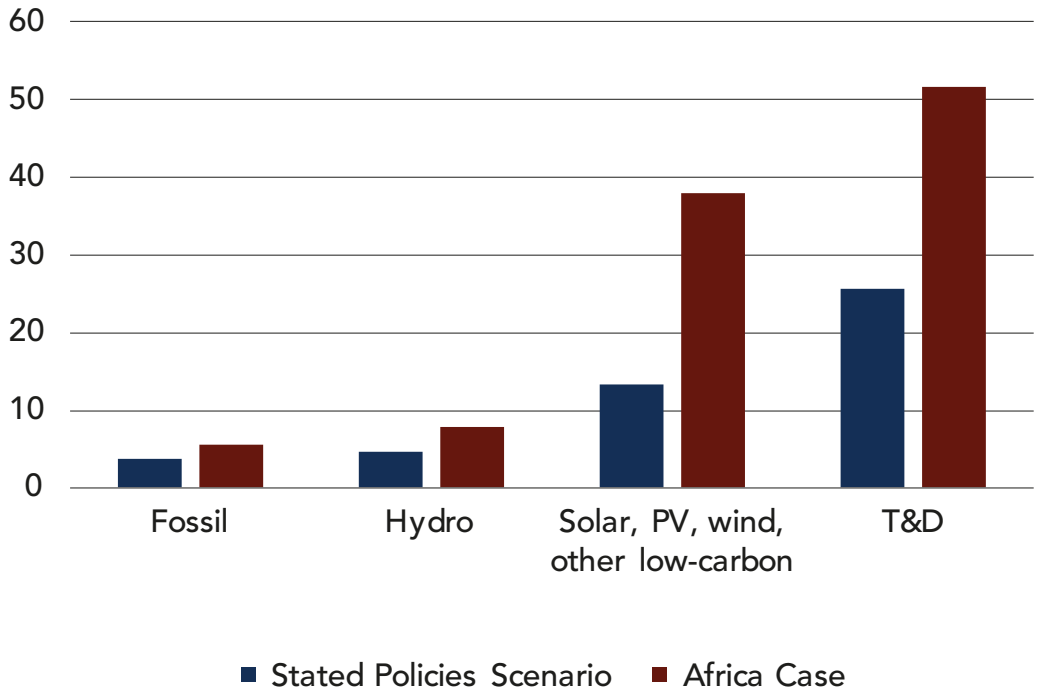
Stimulate integrated power transmissior and create regional energy markets

According to IEA's outlook, in 2040 **90% of electricity will be provided through national grids** (Africa Case), with mini-grids and stand alone systems covering the remaining 10%.

Addressing the deficit of power infrastructure in sub-Saharan Africa will **require a huge expenditure in the coming years**, half of which is expected to be invested by utilities to **expand and upgrade electricity network**s.

Improving regional power integrations will help to reduce the investment needed by opening up a wider range of supply sources.

The traditional "transmission follows generation" approach does not work anymore. A planned approach has to be adopted, **coordinating generation and transmission development at different geographic levels** (regional, national and local).



Average annual power sector investment in sub-Saharan Africa by scenario, 2019-2040 (billion dollars, 2018)

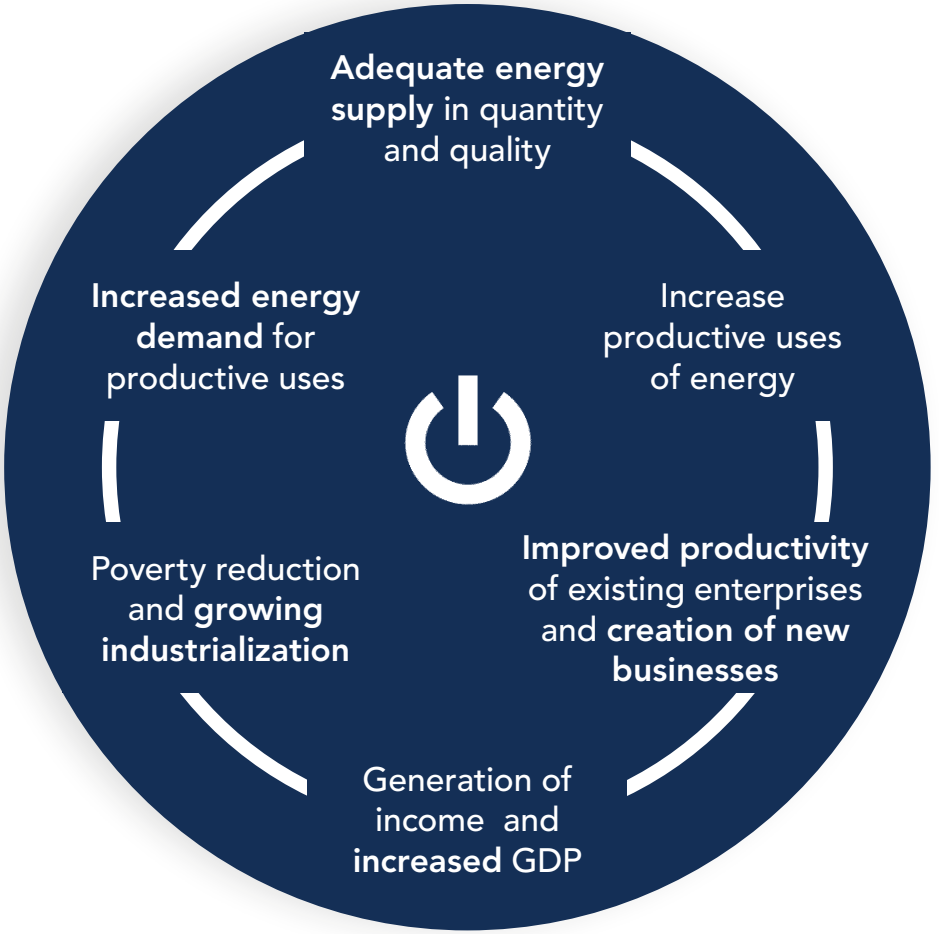
Source: IEA, 2019

Put productive uses of energy on top of the agenda

The provision **of quality power for productive uses** enables the activation of a **wider value chain**, leading to the increase of energy demand.

Long-term investment masterplans, aiming to increase countries' **electricity demand** through the creation of new productive activities and to ensure them a **reliable and abundant electricity supply**, will foster the **economic growth** of many African countries.

According to the IEA, the share of productive activities' energy consumption will increase of 23 percentage points by 2040 (Africa Case).



Sources: IEA, 2019

Develop a comprehensive de-risking instrument to unlock Africa's RE potential

The renewAfrica Initiative aims to boost renewable energy investments in Africa by covering all the phases

renewAfrica Initiative



Preparation
Bidding Phase

- Public-Private Partnerships
- Capacity building and knowledge transfer
- Renewable energy projects portfolio
- Allocation of funds for project financing

Tender Process and Award

- Standardized documents for the tendering process
- Project evaluation

Final Agreement

- Negotiation process for the contracts' finalization
- Guarantees and insurances to cover risks

Construction and O&M

- Monitoring the construction and operation phase
- Development of local skilled workforce

Source: renewAfrica Initiative, 2019

Bibliography

Africa Development Bank (2017). *African Economic Outlook 2017: Entrepreneurship and Industrialization.*

Bloomberg NEF. *New Energy Finance database.* (Accessed 19 April 2020).

Bloomberg NEF. *Sub-Saharan Africa Market Outlook 2020.* 2020

Cambridge University, 2017. *International Trade in Sustainable Electricity.* 2017

Enerdata. Database (Accessed 18 February 2020).

ESMAP. *Rise Index.* Available online: https://rise.esmap.org/ (Accessed 06 May 2020)

IEA, IRENA, UNSD, World Bank Group, WHO (2018). *Tracking SDG7: The Energy Progress Report.*

IEA (2018). *World Energy Outlook 2018.*

IEA (2019). *World Energy Outlook 2019.*

IEA (2019). *Africa Energy Outlook 2019.*

IEA. Average auction prices for solar PV.
Available online: https://www.iea.org/data-and-statistics/charts/average-auction-prices-for-solar-pv-by-region-and-commissioning-date-2016-2022 (Accessed 20 April 2020)

IEA. Average auction prices for wind.
Available online: https://www.iea.org/data-and-statistics/charts/average-auction-price-for-wind-by-region-and-commissioning-date-2016-2022 (Accessed 20 April 2020)

IEA. Electricity final consumption by sector.
Available online: https://www.iea.org/data-and-statistics?country=WEOAFRICA&fuel=Energy%20consumption&indicator=Electricity%20final%20consumption%20by%20sector (Accessed 15 May 2020)

IEA. Total final consumption (TFC) by sector.
Available online: https://www.iea.org/data-and-statistics?country=WEOAFRICA&fuel=Energy%20consumption&indicator=Total%20final%20 consumption%20(TFC)%20by%20sector (Accessed 15 May 2020)

IEA. Renewable electricity capacity by region and scenario, 2018-2040.
Available online: https://www.iea.org/data-and-statistics/charts/renewable-electricity-capacity-by-region-and-scenario-2018-2040 (Accessed 16 April 2020)

IEEFA (2019). *India's grid transmission infrastructure needs further modernization, urgently*

IMF. Database. (Accessed 18 February 2020)

IRENA (2015). *Africa 2030: Roadmap for a Renewable Energy Future.*

IRENA. *Renewable Power Generation Costs in 2018 – Dataset.*
Available online: https://www.irena.org/publications/2019/May/Renewable-power-generation-costs-in-2018 (Accessed 15 May 2020).

McKinsey (2018). *Africa's overlooked business revolution.*

RES4Africa (2019). *RE-thinking Access to Energy Business Models.*

RES4Africa (2019). *What does it take to accelerate RES investments in Africa: priorities and recommendations.*

RES4Africa (2017). *White Paper 2017.*

Sace. *Risk Index Map.*
Available online: https://www.sacesimest.it/en/maps#/maps/risk-map (Accessed 6 May 2020).

UN. Population Dataset.
Available online: https://www.un.org/en/development/desa/population/publications/database/index.asp (Accessed 18 February 2020).

World Bank (2018). *Annual Report 2018.*

World Bank. Electricity Access.
Available online: https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS (Accessed 10 April 2020).

World Bank (2016). *Financial Viability of Electricity Sectors in Sub-Saharan Africa - Quasi-Fiscal Deficits and Hidden Costs.*

World Bank. Urban population growth.
Available online: https://data.worldbank.org/indicator/SP.URB.GROW (Accessed 1 June 2020)

World Bank. Individuals using the Internet.
Available online: https://data.worldbank.org/indicator/IT.NET.USER.ZS (Accessed 1 June 2020)

World Bank. Power outages in firms in a typical month (numbers of outages and duration)
Available online: https://www.enterprisesurveys.org/en/data/exploretopics/infrastructure (Accessed 27 April 2020).

World Bank. Industry (including construction), value added per worker.
Available online: https://data.worldbank.org/indicator/NV.IND.EMPL.KD (Accessed 7 May 2020)

World Bank. Services, value added per worker.
Available online: https://data.worldbank.org/indicator/NV.SRV.EMPL.KD (Accessed 7 May 2020)

World Bank. Agriculture, forestry, and fishing, value added per worker.
Available online: https://data.worldbank.org/indicator/NV.AGR.EMPL.KD (Accessed 15 May 2020)

World Bank. Employment in industry.
Available online: https://data.worldbank.org/indicator/SL.IND.EMPL.ZS (Accessed 7 May 2020)

World Bank. Employment in services.
Available online: https://data.worldbank.org/indicator/SL.SRV.EMPL.ZS (Accessed 7 May 2020)

World Bank. Employment in agriculture.
Available online: https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS (Accessed 7 May 2020)

World Bank. Worldwide Governance Indicators. Available online: https://databank.worldbank.org/source/worldwide-governance-indicators (Accessed 15 May 2020)

Looking back at the past to face the present and plan for a sustainable energy future and prosperous Africa

RES4AFRICA
RENEWABLE ENERGY SOLUTIONS FOR AFRICA
FOUNDATION

enel
Green Power