

# IRENA: Climate Action and CMP in Sub-Saharan Africa

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# Overview

- Established in 2011
- Headquarters in Masdar City, Abu Dhabi, UAE
- IRENA Innovation and Technology Centre – Bonn, Germany
- Permanent Observer to the United Nations – New York, USA
- 170 Members and 14 States in Accession



## Mandate

To promote the widespread adoption and sustainable use of **all forms of renewable energy** worldwide



Bioenergy



Geothermal  
Energy



Hydropower



Ocean  
Energy



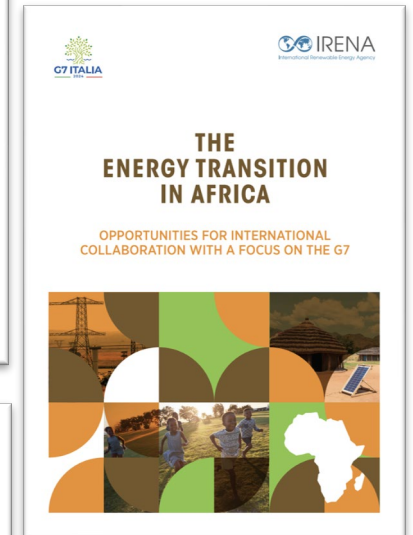
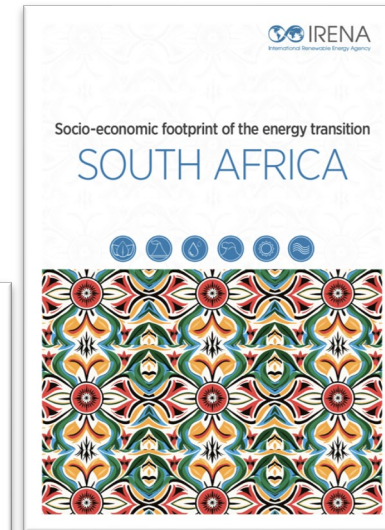
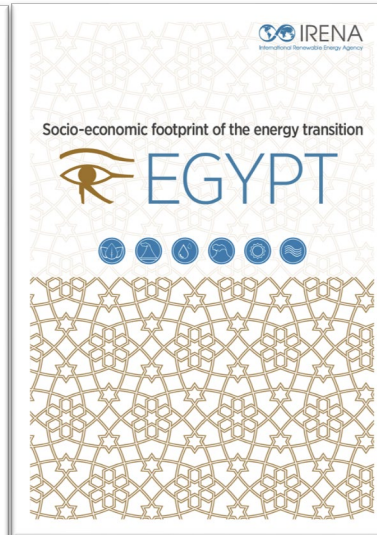
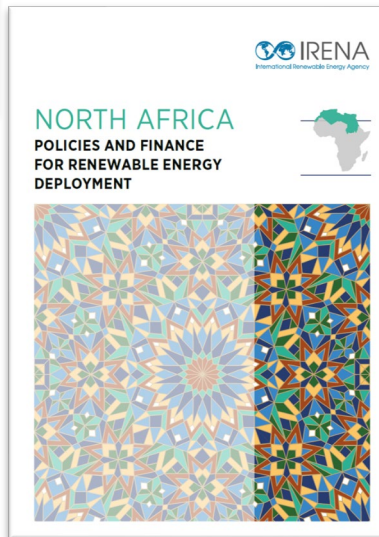
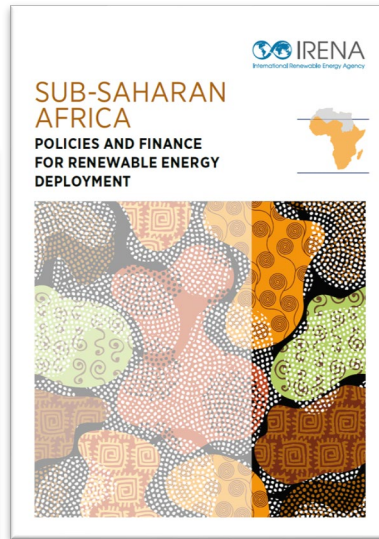
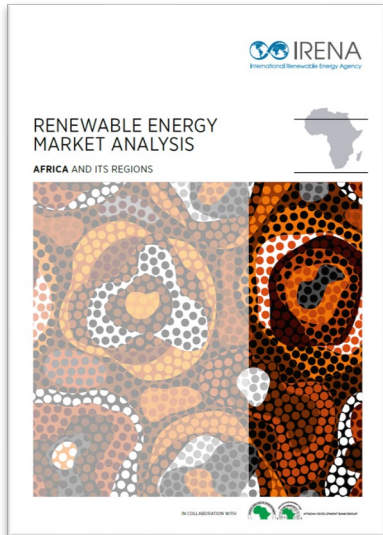
Solar  
Energy



Wind  
Energy



# IRENA's work on the Energy Transitions in Africa





# IRENA's Climate Action support in Africa



74

## Total number of activities

Enhancement activities

21

Implementation activities

43

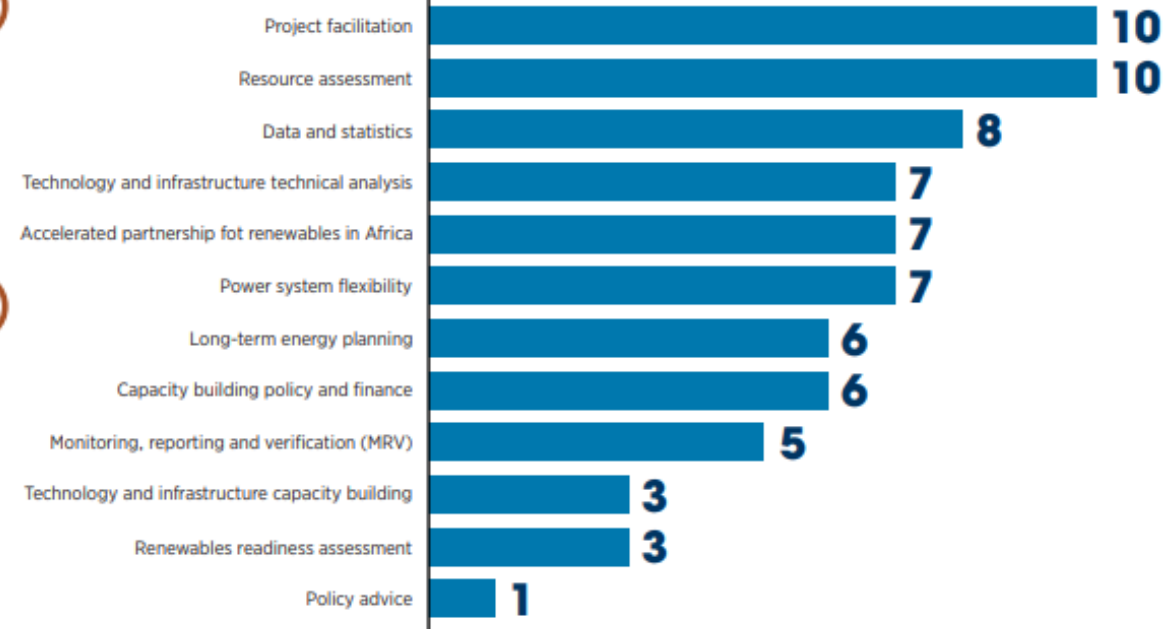
Enhancement and implementation activities

10

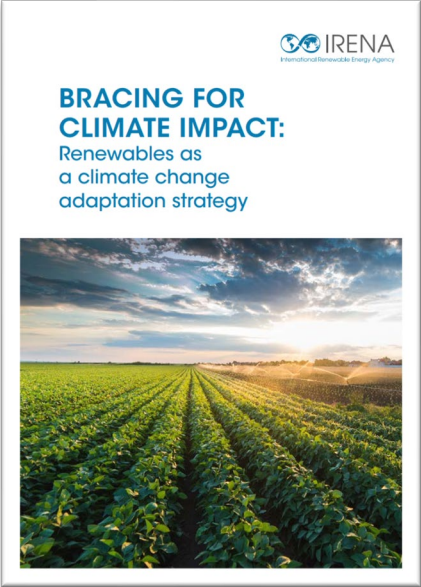
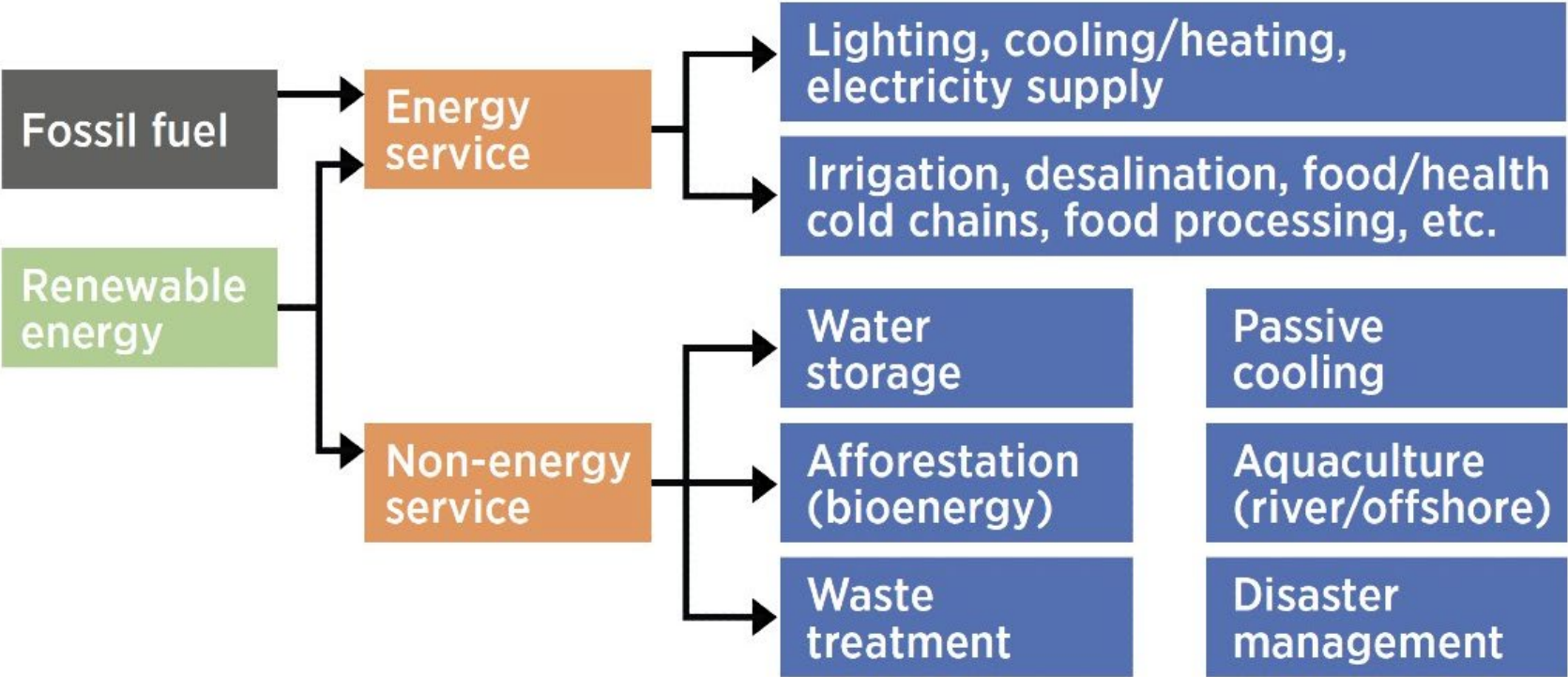
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## Africa

Angola	Gabon	Nigeria
Benin	The Gambia	Rwanda
Burkina Faso	Ghana	São Tomé and Príncipe
Cameroon	Kenya	Senegal
Chad	Lesotho	Seychelles
Comoros	Liberia	Sierra Leone
Congo	Madagascar	Somalia
Côte d'Ivoire	Malawi	South Africa
Democratic Republic of Congo	Mali	Sudan
Egypt	Mauritius	United Republic of Tanzania
Eswatini	Mozambique	Uganda
Ethiopia	Namibia	Zambia
	Niger	Zimbabwe



# NDCs: Climate Change Adaptation

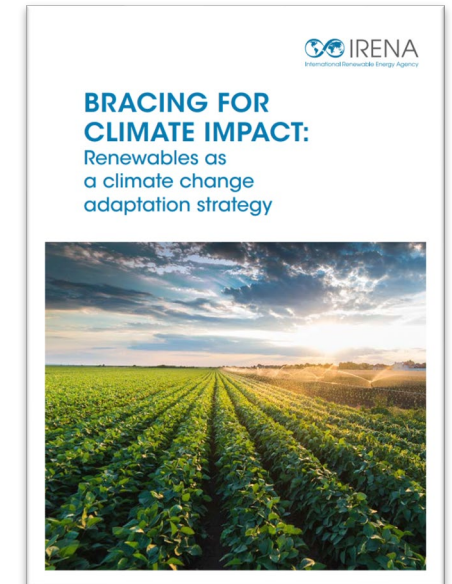


- Multifunctional aspects of renewable energy contribution to climate change adaptation



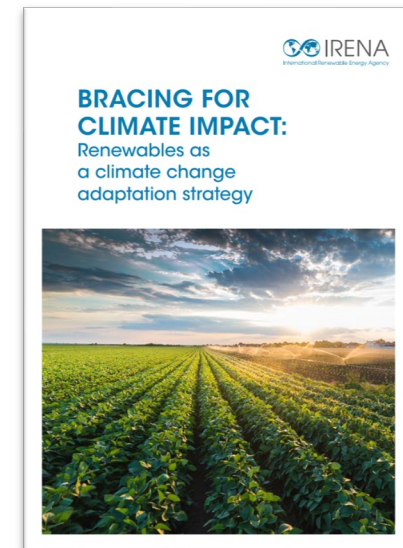
# Renewable energy solutions for adaptation in the water sector

Climate Impacts	Adaptation Needs	Energy-related Measures	Renewable Energy Solutions
Water scarcity	<ul style="list-style-type: none"> <li>Stable freshwater supply</li> <li>Water resource management</li> </ul>	<ul style="list-style-type: none"> <li>Desalination</li> <li>Distillation</li> <li>Groundwater or aquifer pumping</li> </ul>	<ul style="list-style-type: none"> <li>Renewable energy systems to power underground pumping</li> <li>Renewable energy systems to power desalination plants</li> </ul>
			<p><i>(non-energy service)</i></p> <ul style="list-style-type: none"> <li>Hydro dam to increase water reservoir capacity</li> <li>Floating photovoltaics to reduce evaporation</li> </ul>
Increased water pollution and contamination	Water quality enhancement	Water purification and sanitation	<ul style="list-style-type: none"> <li>Renewable energy systems to power water clearing pumps</li> <li>Remote and small-scale water purification through renewable energy systems</li> </ul>
	Wastewater treatment and recycling	Wastewater, sewage and sludge treatment	<p><i>(energy + non-energy service)</i></p> <ul style="list-style-type: none"> <li>Biogas plant for wastewater treatment and recycling</li> </ul>
Flood or drought disruption	<ul style="list-style-type: none"> <li>Flood control and drainage</li> <li>Water conveyance and distribution</li> </ul>	Water distribution and drainage control (non-energy service)	<ul style="list-style-type: none"> <li>Hydro dam to control flooding</li> </ul>
			<ul style="list-style-type: none"> <li>Solar or wind pumping</li> </ul>



# Renewable energy solutions for adaptation in the food, agriculture and forestry sector

Climate Impacts	Adaptation Needs	Energy-related Measures	Renewable Energy Solutions
<b>Reduction in crops and cattle production</b>	(to stresses such as water and heat stress, salinity and new pests) • Enhanced food production • Animal health and disease control	• Air cooling system (indoor and outdoor) • Water spray for cooling • Soil fertiliser	• Clean cooling • Renewable energy system to power groundwater pumping • Agricultural waste fertiliser
			<i>(non-energy service)</i> • Agroforestry • Mixed farming with perennial energy crop
<b>Food supply chain impact caused by high temperatures</b>	• Food processing, storage, distribution and sales	• Cooling, chilling, freezing • Drying, pasteurisation • Cooking fuel supply	• Renewable energy-based food freezers, refrigerators, storage • Renewable energy-based food dryers or pasteurisers • Renewable energy-based clean cooking solution
	• Food utilisation (food nutrient, food safety) enhancement		
<b>Climate extreme events</b>	• Food system stability enhancement	• Early warnings for pre-emptive crop protection • Greenhouse fuel supply	• Climate information service powered by renewable energy • Renewable energy-based greenhouse horticulture and vertical farming
<b>Reduction in fishery production</b>	• Fishery resource management and conservation	• Fuel supply for fishing ships	<i>(non-energy service)</i> • Fisheries and aquaculture in offshore wind farm • Marine protection areas around offshore wind farm
<b>Water scarcity (indirect)</b>	• Water supply for agricultural usage	• Groundwater or aquifer pumping and irrigation	• Renewable energy systems for groundwater pumping
			<i>(energy + non-energy service)</i> • Agro-photovoltaics





# Empowering Lives and Livelihoods – Renewables for Climate Action

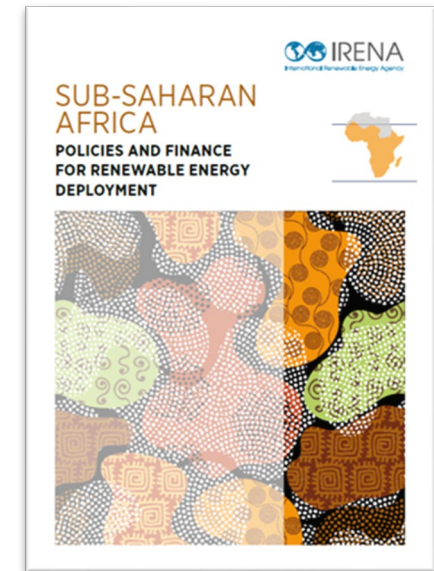
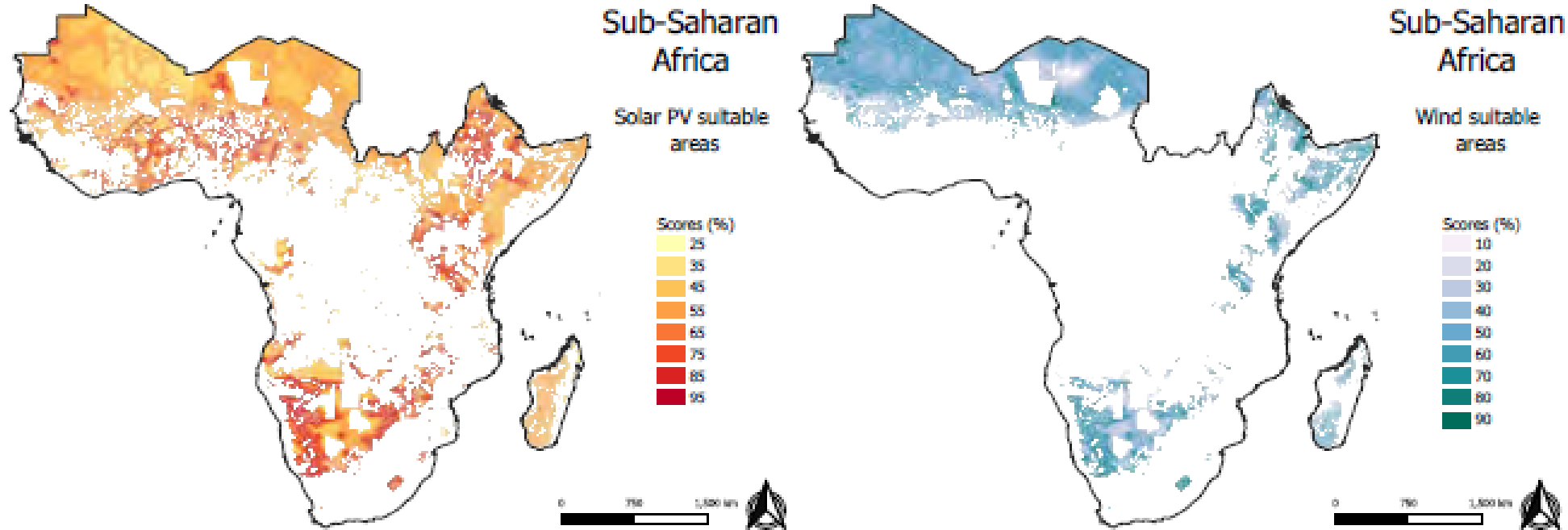


- ✓ Improve well-being and livelihoods through decentralised renewables
- ✓ Catalyse systematic energy transformation in agri-food, health, and clean cooking sectors
- ✓ Improve resilience and productivity in agri-food and health
- ✓ Reinforce climate adaptation, with mitigation co-benefits





# The Potential for solar and wind energy is significant



Source: IRENA Global Atlas for Renewable Energy (IRENA, 2021b); Base map: UN boundaries.

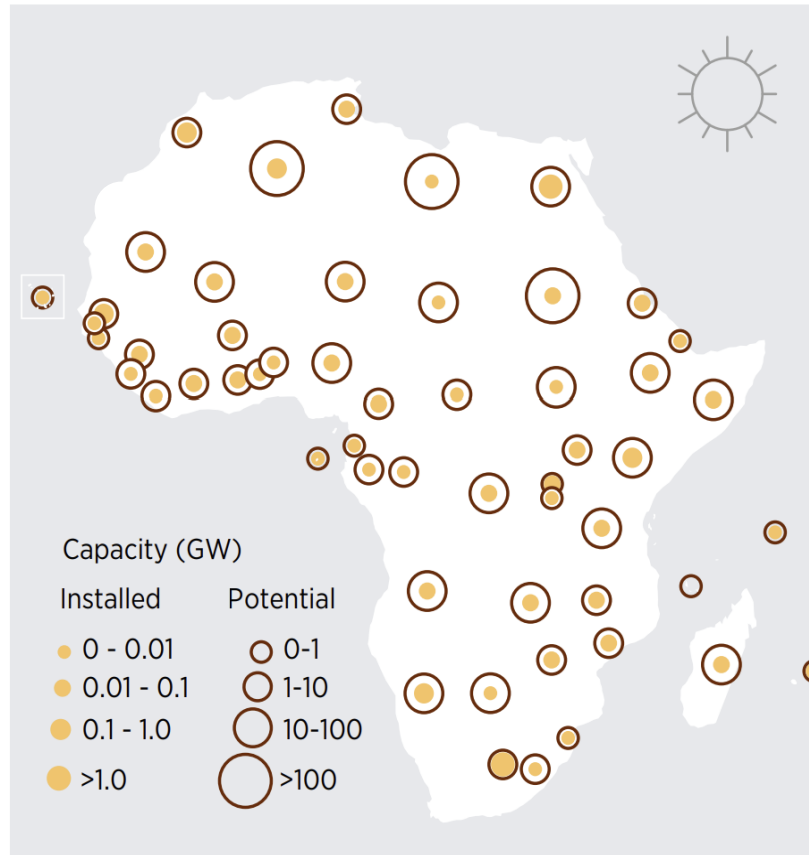
Note: PV = photovoltaic.

*Disclaimer:* This map is provided for illustration purposes only. The boundaries and names shown on the map do not imply the expression of any opinion on the part of IRENA concerning the status of any region, country, territory, city or area, or of its authorities, or concerning the delimitation of frontiers or boundaries.

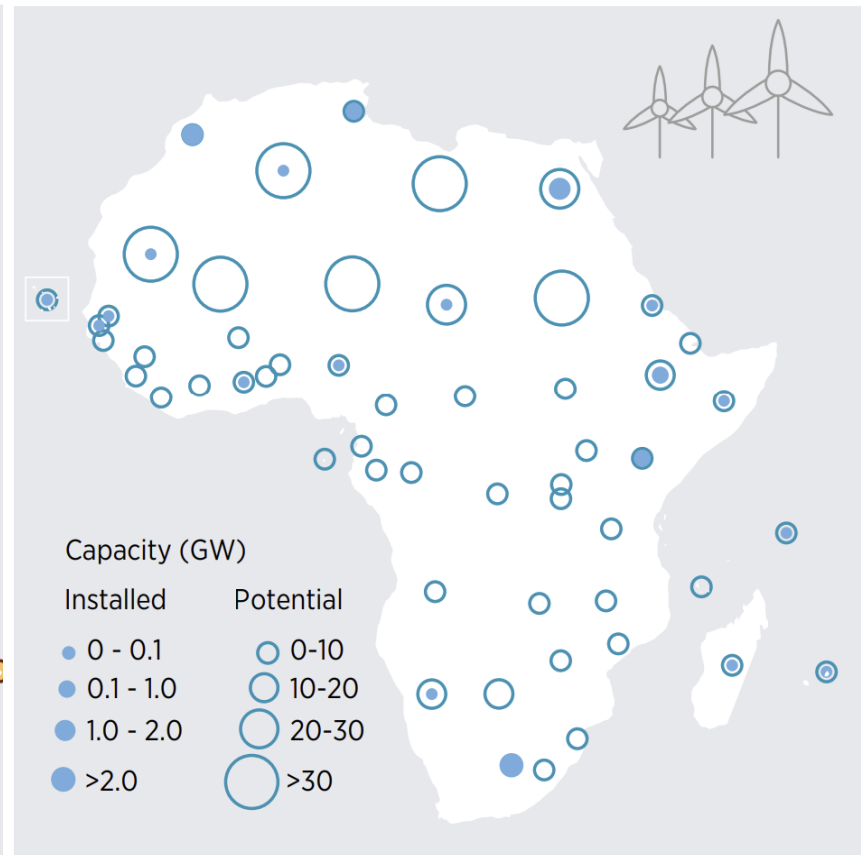


# Renewable energy technologies potential and installed capacity in Africa

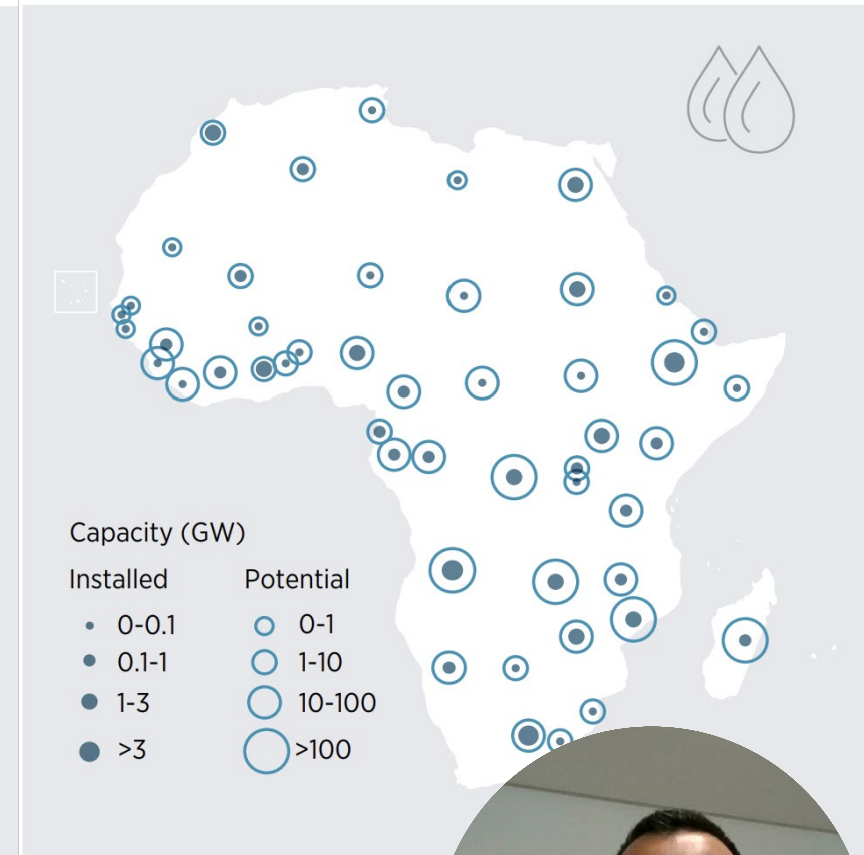
## Solar PV



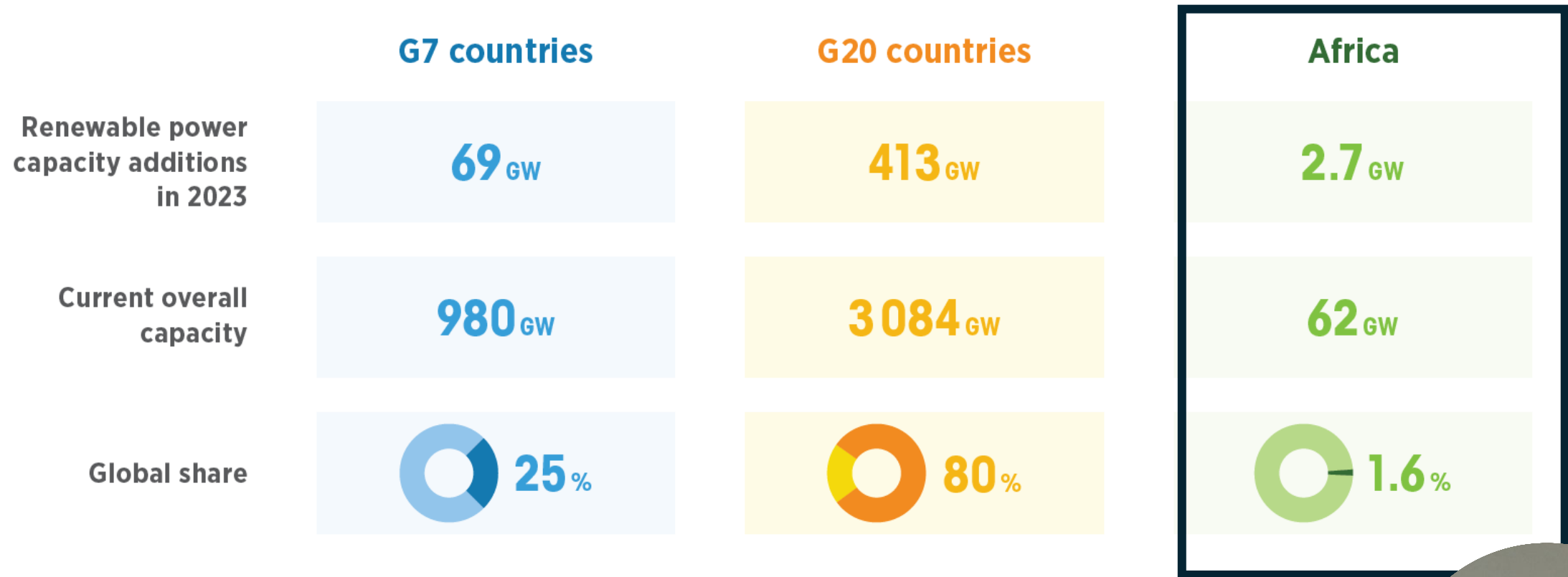
## Wind



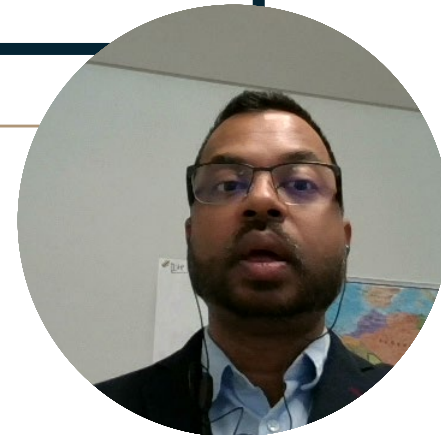
## Hydro



# Renewable capacity growth disparities

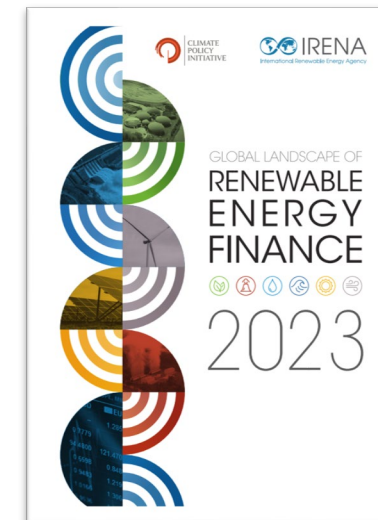
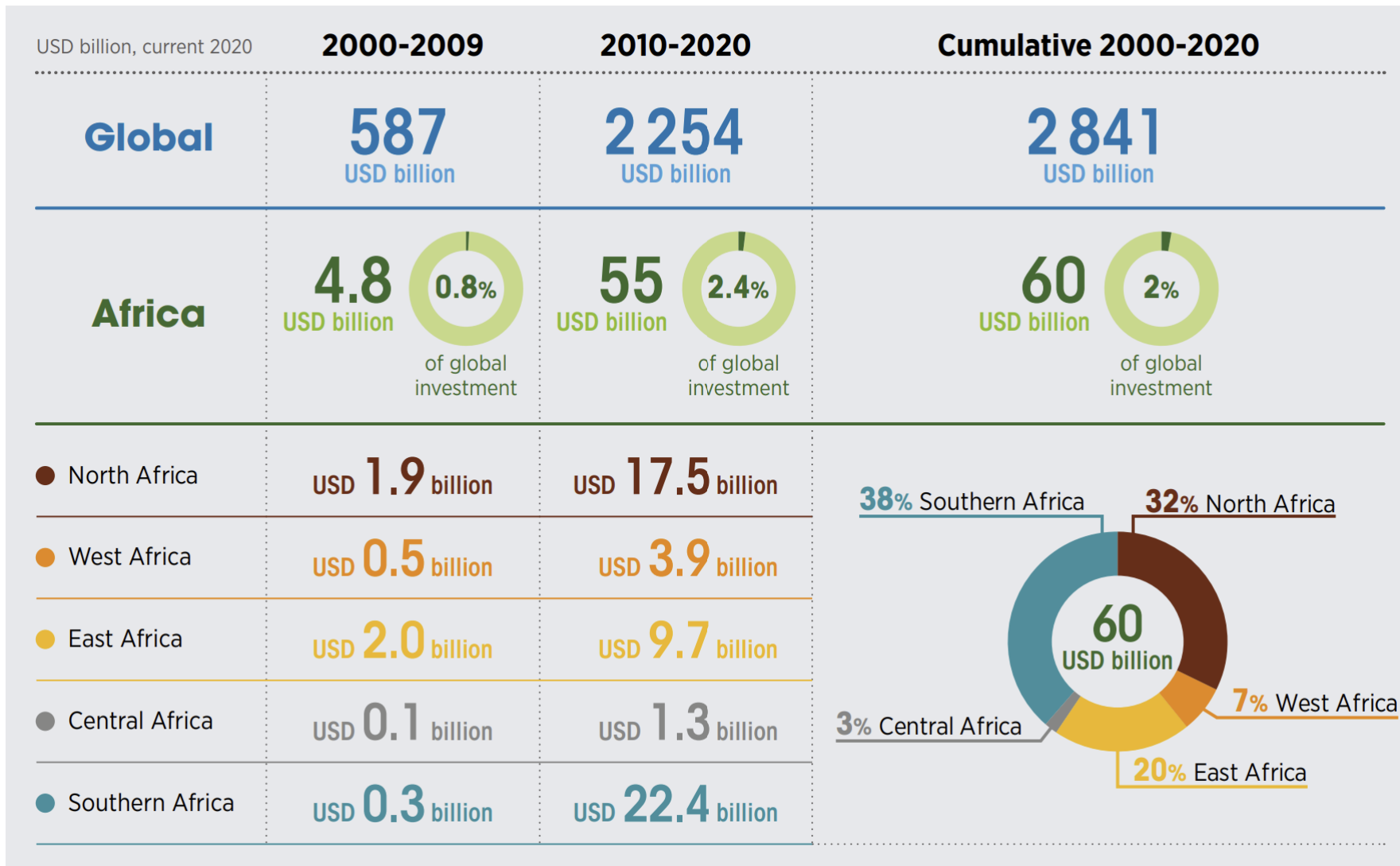


Source: (IRENA, 2024b).

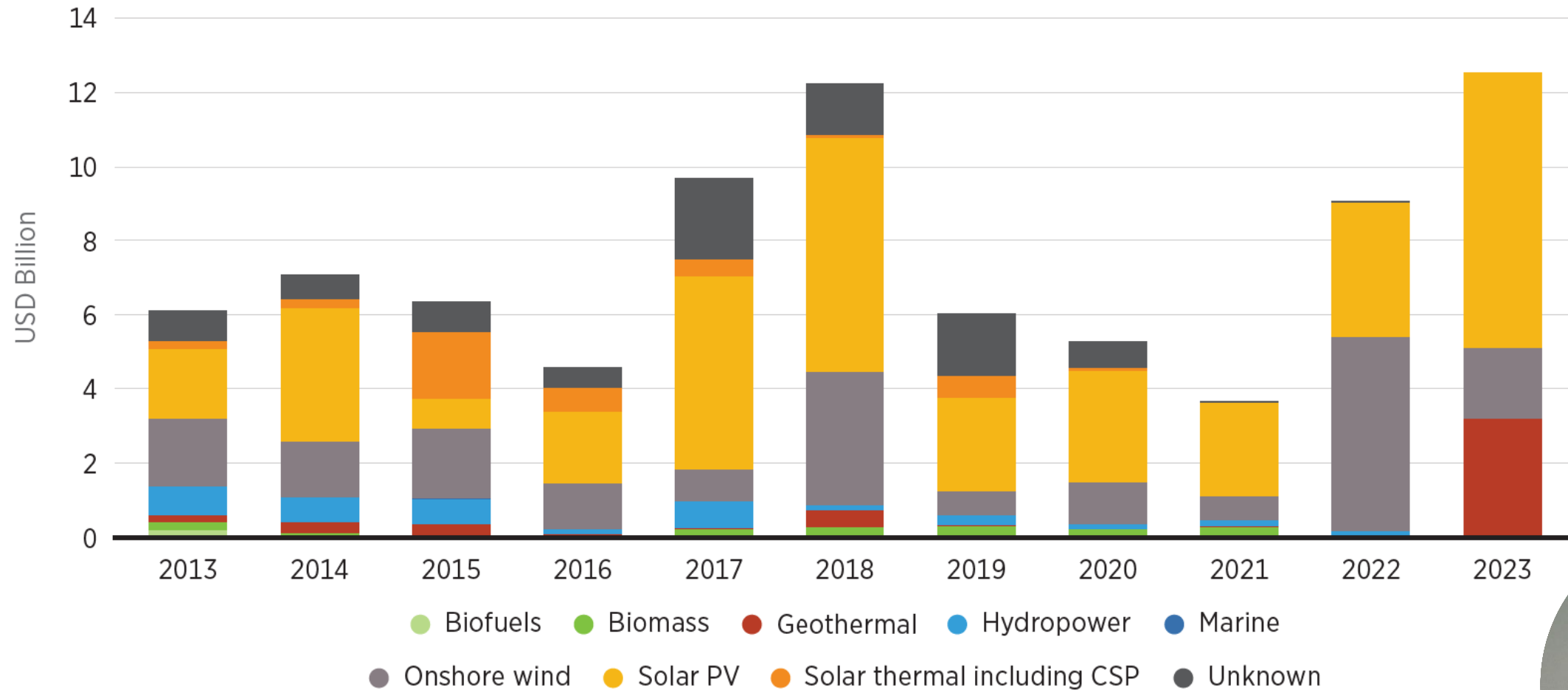




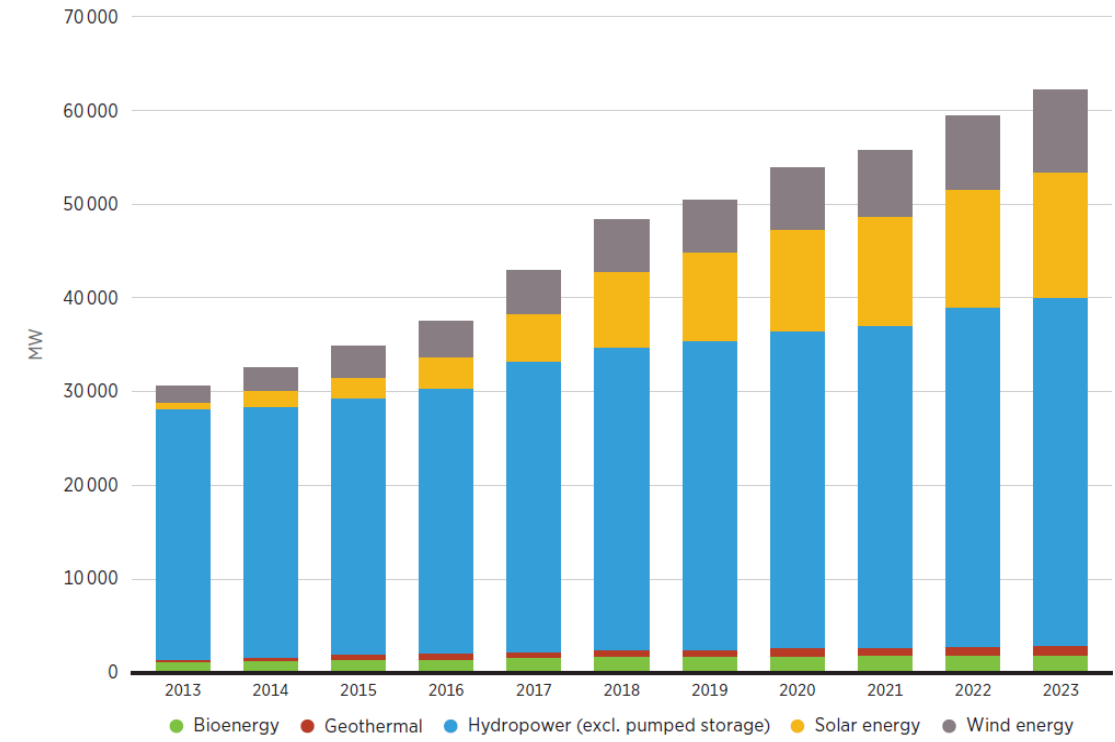
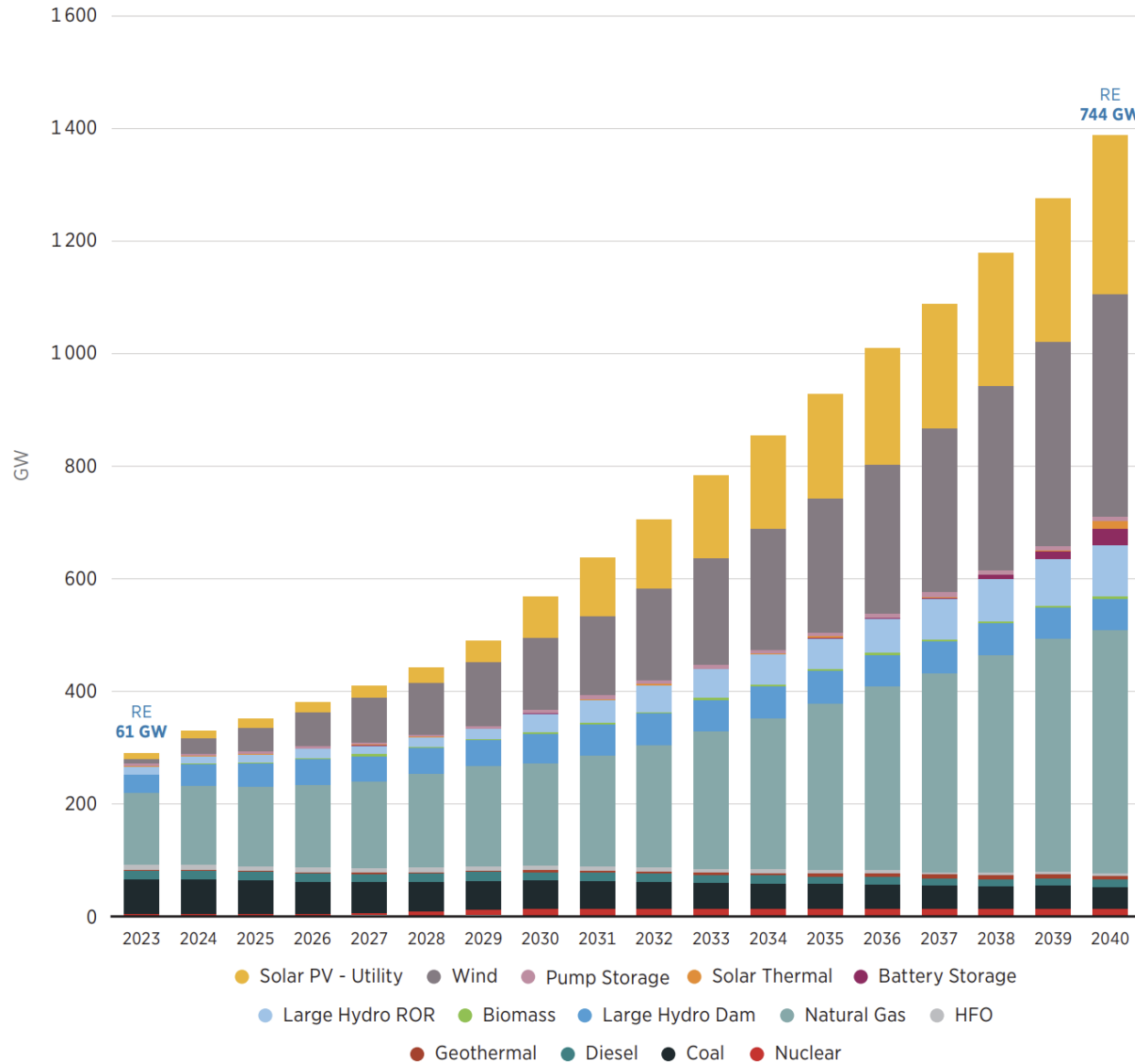
# Cumulative renewable energy investment in Africa and globally, 2000-2020



# Renewable energy investments in Africa by technology (2013-2023)



# Capacity in CMP's Full Continental Integration scenario



Source: (IRENA, 2024a).  
Note: MW = megawatt.

Total investment needs till 2040: **USD 1.3 trillion**

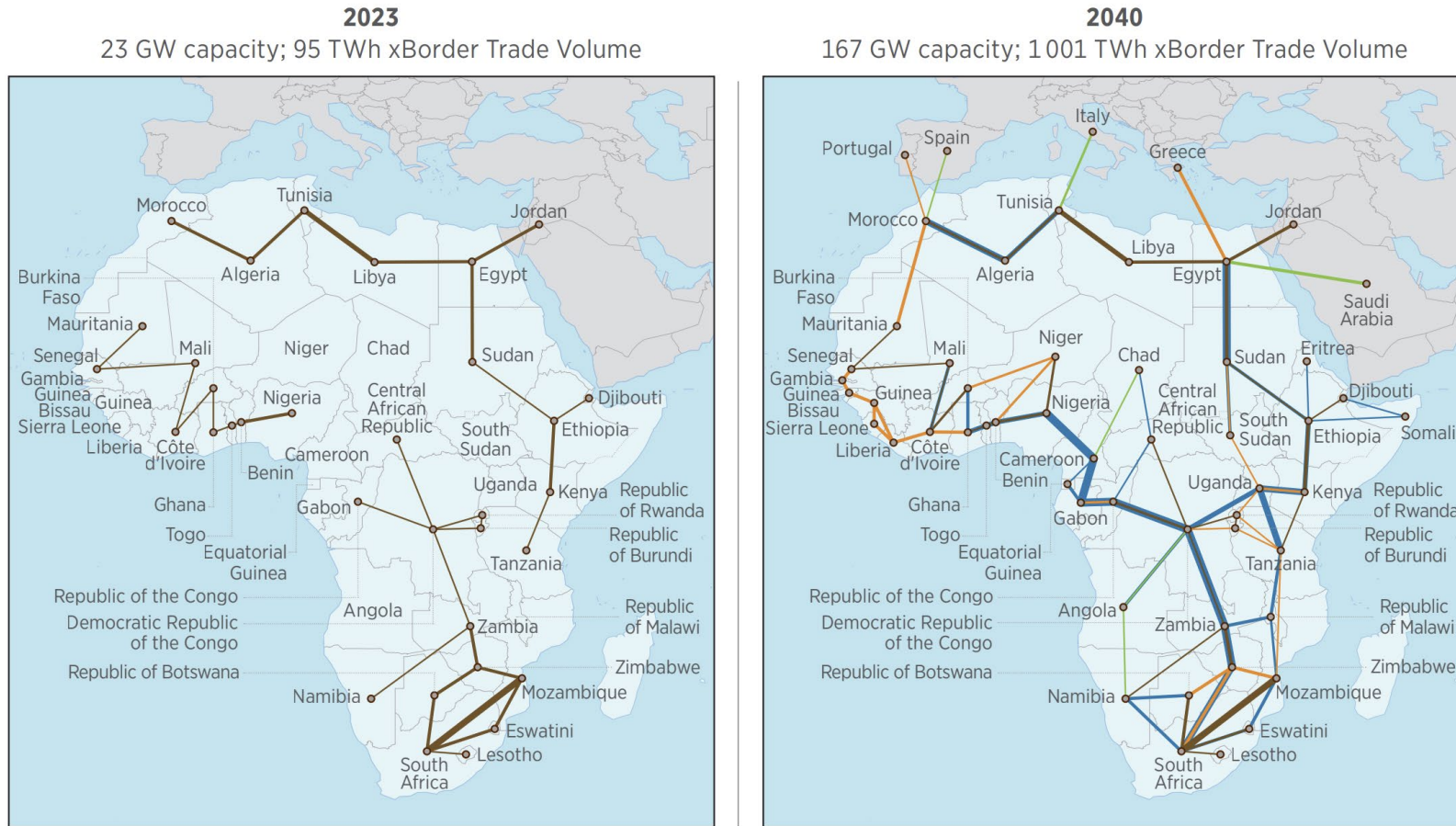
### Promoted under CMP for 2040

- Solar PV – 262 GW
- Wind – 342 GW
- Flexibility investments (including Battery storage – 25 GW)





# Cross-border interconnections in CMP's Full Continental Integration scenario



— Generic — Existing — Candidate — Committed

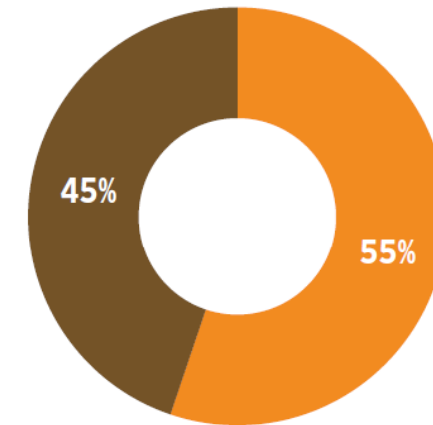
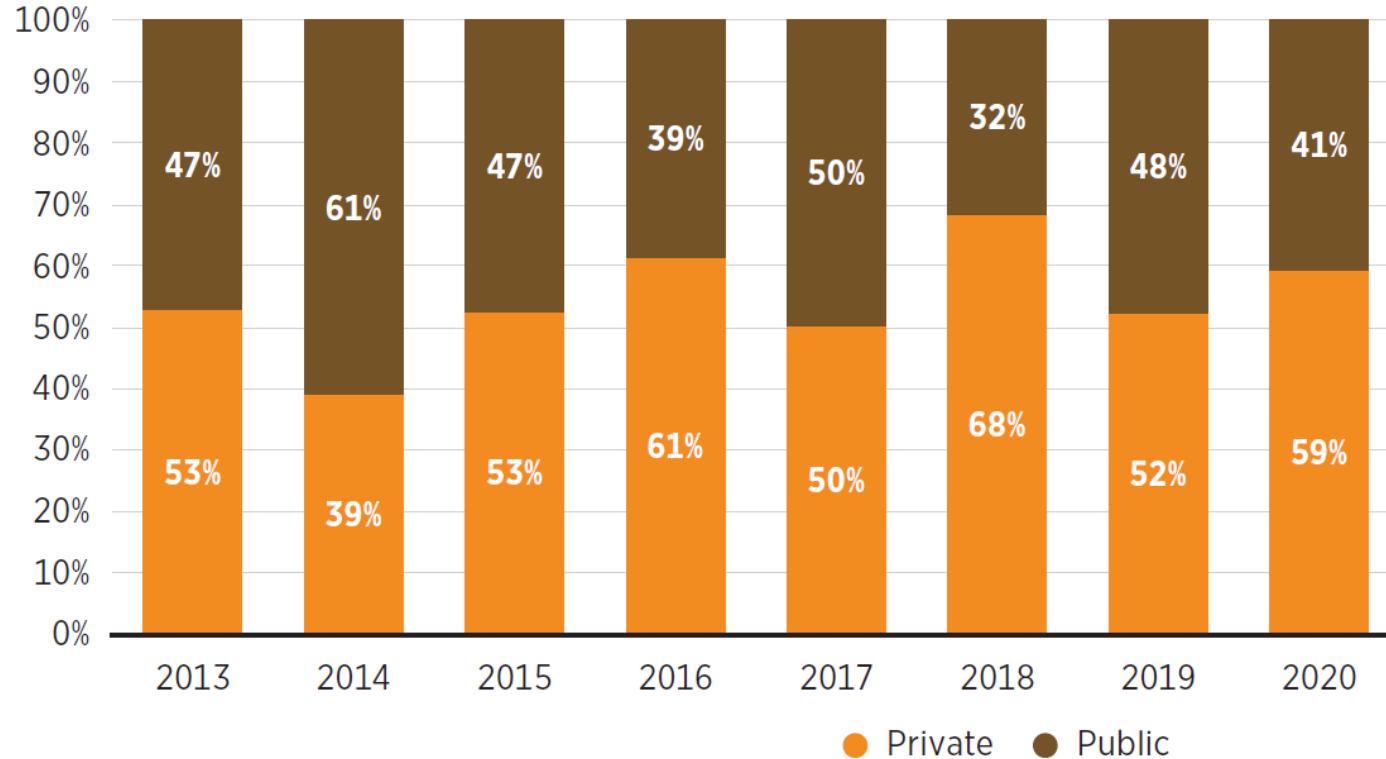
- The Continental Power System Master Plan (CMP) envisions a significant expansion of cross-border interconnections to optimise the use of renewable energy resources across Africa.
- USD 40 billion worth of cross-border transmission investment is being promoted by the African Union.

**Disclaimer:** This map is provided for illustration purpose only. Boundaries and names shown on this map do not imply any endorsement or acceptance by IRENA.



# Public investment plays a more dominant role in Africa

Renewable energy investments in Africa by source, 2013-2020 (left), and average over the period (right)

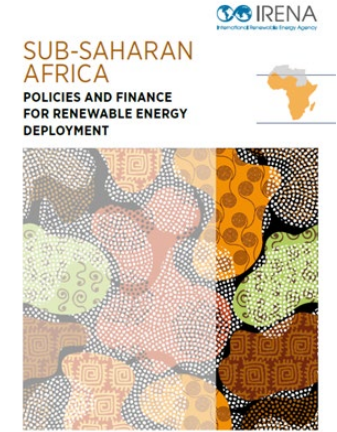


- **International support is needed**, for an enabling policy environment, institutional capacity and markets.

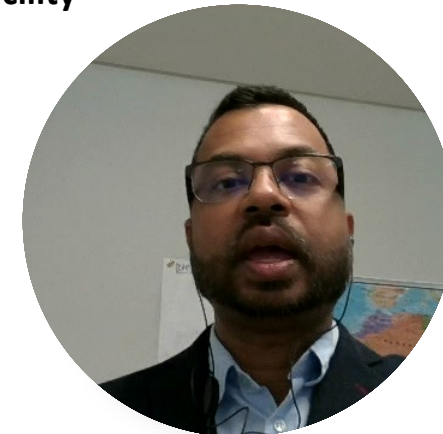


# Investment funds in support of renewables in Africa

Name	Purpose
<b>Africa Renewable Energy Fund (AREF)</b>	AREF's goal is to improve energy supply in Sub-Saharan Africa, by investing in renewable energy projects that have a track record of successful deployment of mature technologies. The fund size is USD 200 million, and it seeks to have a controlling position at all development stages in projects with 5 MW and 50 MW of installed capacity (Berkeley Energy, 2021).
<b>Beyond the Grid Fund for Africa (BGFA)</b>	Established through an initiative of the Swedish International Development Cooperation Agency, BGFA aims to provide 6 million people in Burkina Faso, Liberia, Mozambique, Uganda and Zambia with access to clean and affordable off-grid energy by 2025. The fund provides financing for companies offering off-grid solutions and offers technical assistance and capacity building for local energy authorities (BGFA, 2022).
<b>Clean Technology Fund (CTF)</b>	CTF is part of the USD 8.5 billion Climate Investment Fund established in 2008 by donor countries and implemented by six multilateral development banks to provide financing and technical assistance for programmes in clean technology, energy access, climate resilience and sustainable forests (CIF (Climate Investment Funds), 2021a). The USD 5.4 billion CTF aims to facilitate the scale-up of low-carbon technologies that result in long-term greenhouse gas savings (CIF, 2021a).
<b>Green Climate Fund (GCF)</b>	GCF, the world's largest climate fund, was established in 2010 within the framework of the United Nations Framework Convention on Climate Change to help developing countries meet their Nationally Determined Contributions and finance climate change mitigation and adaptation. The GCF aims for at least a 50% allocation to climate adaptation investments in the least-developed countries, small island developing states and African states (CIF, 2021b). As of July 2021, the GCF had approved 70 projects in Africa worth USD 3.29 billion – and another USD 7.7 billion in co-financing.
<b>Renewable Energy Challenge Fund (RECF)</b>	RECF is managed by the United Nations Capital Development Fund and funded by the Embassy of Sweden in Uganda. It provides co-financing for decentralised solar photovoltaic solutions in Uganda and prioritises underserved, low-income customers in rural and peri-urban areas. The fund's goal is to help 153 000 Ugandans transition to renewable energy while creating 1 000 new jobs. Grants range from USD 100 000 to USD 500 000 per project (UNCDF, 2021).
<b>Sustainable Energy Fund for Africa (SEFA)</b>	SEFA is a USD 95 million fund managed by the African Development Bank and funded by the governments of Denmark, Italy, Norway, Spain, Sweden, the United Kingdom, and the United States. Its goal is to help unlock private finance for small- to medium-scale renewable energy and energy efficiency in Africa (SEFA, 2020) projects in Africa.



**Assistance to financial closure and debt facility**





# Water-Energy-Food-Ecosystems Nexus

## Sub-Saharan Africa Workshop

Session 3: WEFE nexus, NDCs and climate finance commitments

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Thank you

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Спасибо

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