

ENERGY AND SUSTAINABLE DEVELOPMENT IN AFRICA



MESERET T ZEMEDKUN

**Workshop on Mainstreaming and Implementing the
Water-Energy Nexus for Sustainable Development in
the African Region**

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Africa Responses to Global and continental development agendas and policy processes in Energy sector

Global Development Agenda SDG 2030

Continental AU AGENDA 2063- Africa We Want

Paris Agreement 2015

UN SE4ALL

CEMA/STC

AMCEN



AU Agenda 2063: commits to **fast-tracking modern, efficient, reliable and cost effective renewable energy** for all households, businesses, industries and institutions.

REGIONAL POLICY PROCESSES

THE RATIONALE

- Affordable, reliable, sustainable and modern energy services are **a critical development enabler for Africa**, as they create solutions to the climate crisis and are essential for implementing, **SDG 2030 Agenda and, in particular, “Agenda 2063: The Africa We Want”** of the African Union.
- Specifically, energy is an enabler and a pathway towards addressing **social, economical and environmental challenges** by:
 - providing equal **energy access and consumption**
 - leapfrogging the **dirty fuels of the past with a future of clean renewable energy development**; and
 - balancing the demand and supply of energy, notably through programmes **such as energy efficiency, to enhance economic growth.**



Presenter's
Organisation
Logo



INTERRELATED CHALLENGES OF ENERGY POVERTY, ENERGY SECURITY AND CLIMATE CHANGE

- Energy Poverty : **Low Access to Modern Energy Services (Social)**

- ❖ Rely mainly on traditional biomass (Wood Fuel and Charcoal) to meet their energy requirements;
- ❖ Household **access to electricity services is only around 20%** (40% in urban and 6-8% in rural areas)



- **Energy Security Concerns (Economy)**

- ❖ High vulnerability to fossil fuel price volatility (60 % of electricity generation from oil)
- ❖ High losses in the energy systems (e.g. high energy intensity and low demand and supply side efficiency);

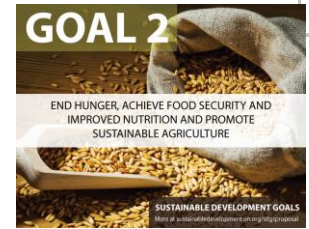
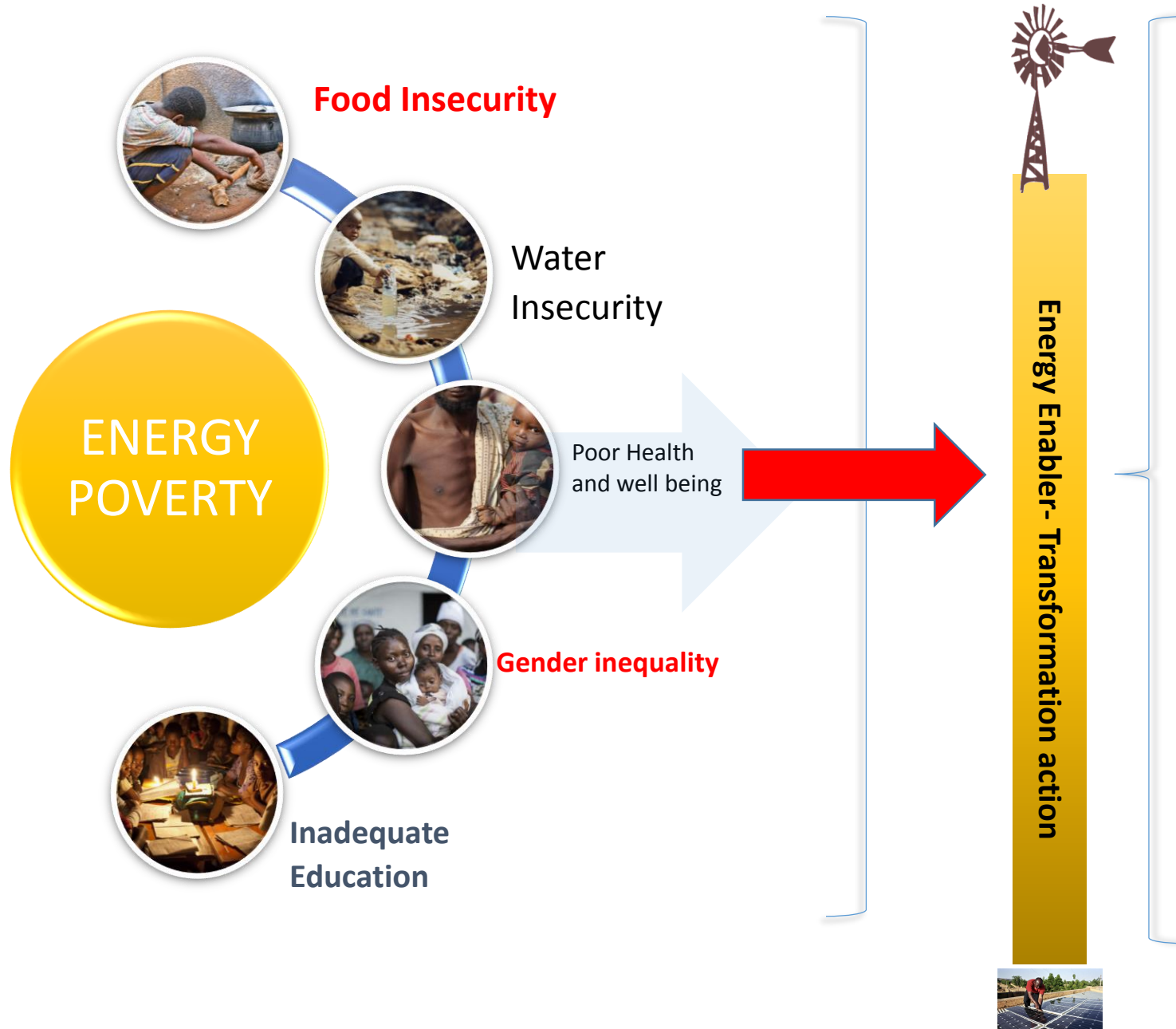


- **Climate Changes Concerns (Environment)**

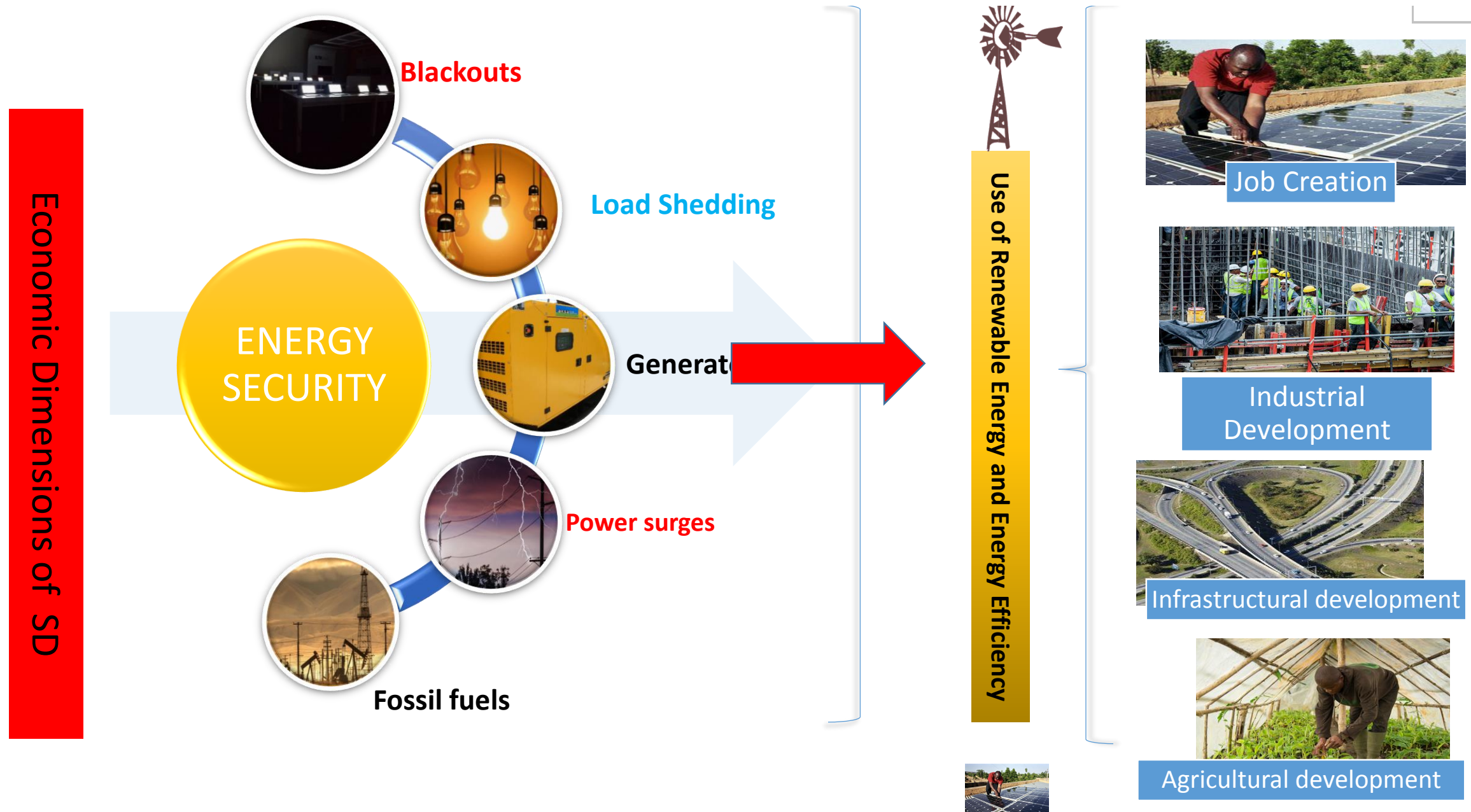
Increasing energy related GHG emissions (new investments determine GHGs for the next 20 - 30 years)
Climate change impacts vulnerable African energy systems (e.g. water flows, extreme weather events)

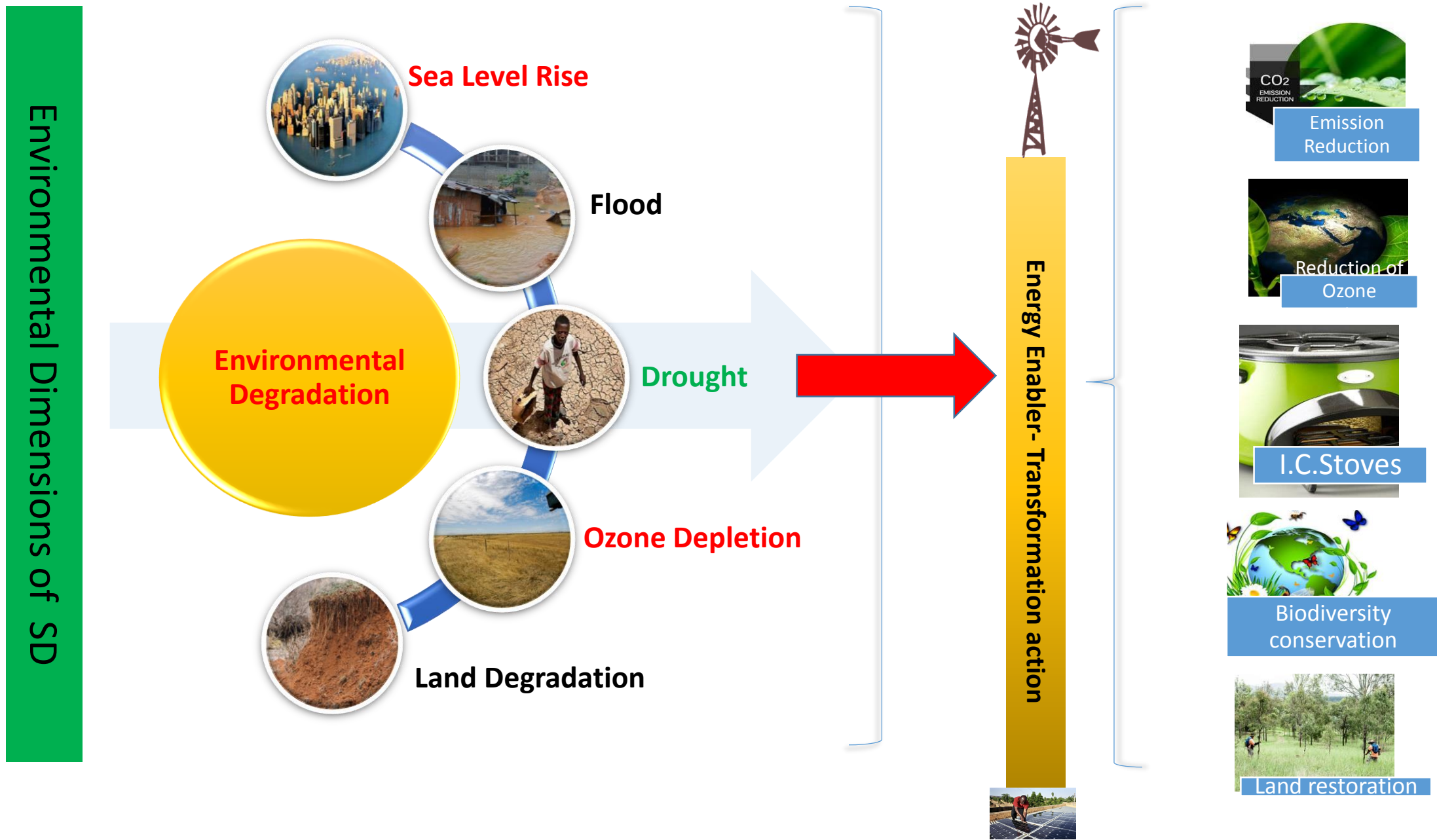


Social Dimensions of SD



ENERGY AS ENABLER AND PATHWAY TO SUSTAINABLE DEVELOPMENT IN AFRICA





KEY ISSUES: AFRICA CONTEXT

- Africa faces an enormous energy challenge due to significant growth in population and sustained period of economic growth and transformation. Rapid increase in energy supply in the continent.
- Africa endowed vast NRE and RE resources However a continuous reliance on oil and gas and use of traditional biomass fuel brings considerable S, E and environmental constraints.
- Tackling today's energy challenge in the continent requires a firm commitment by governments, multi-lateral organizations as well as N, R and C Energy initiatives to the accelerated use of RE sources and EE for SD in Africa.

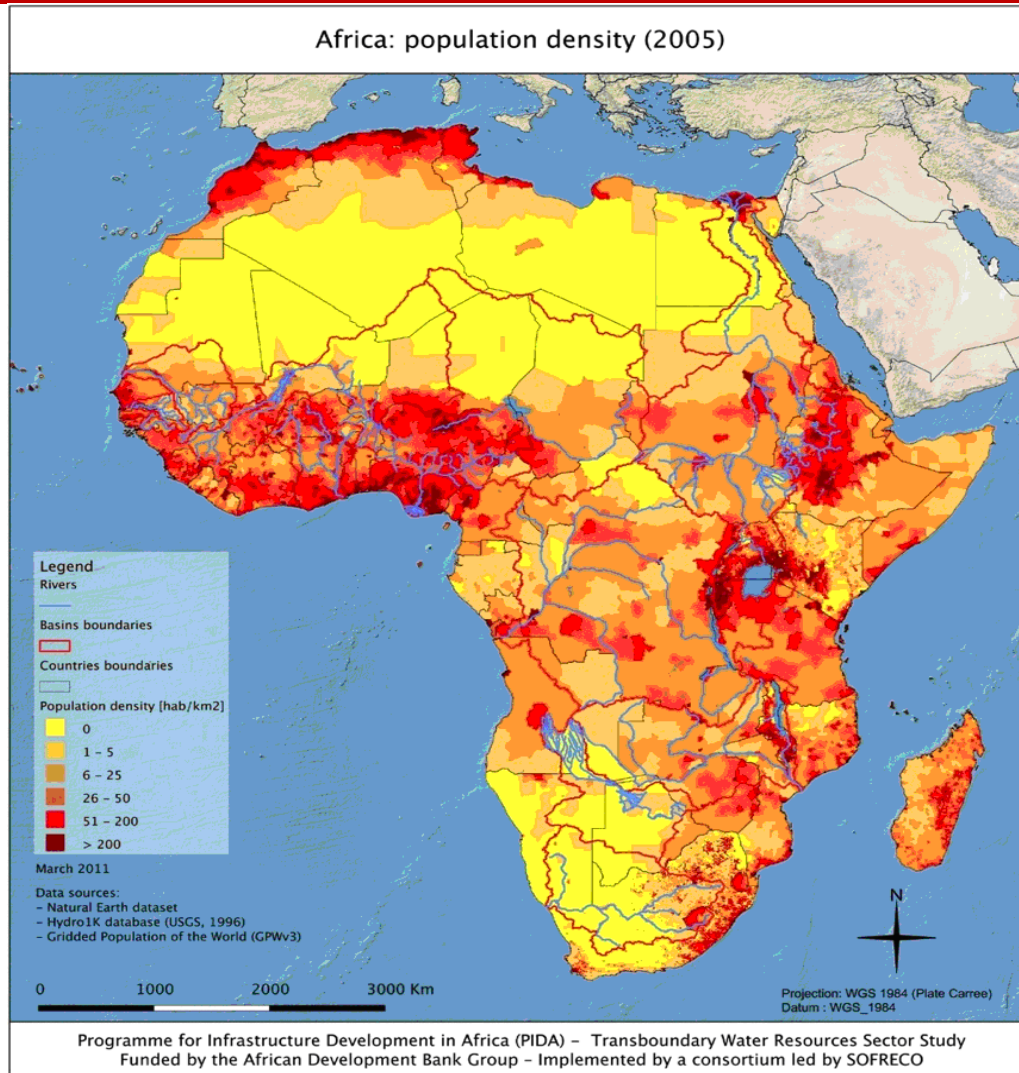


FACTS AND FIGURES : Africa Energy Atlas 2017

- 600 M people in Africa still do not have electricity
- 730 M people rely in traditional biomass (Wood fuel and charcoal)
- About 600,000 people in Africa die each year as a result of household air pollution and 60 % of these victims are women.
- 846 Million people without access to clean cooking and will reach to 900 Million by 2030 under BAU
- RE capacity 23 % (Wind, solar, geothermal, large hydro etc..)
- About 34.2 Billion /year are needed to ensure the attainment of SDG 7 in Africa by 2030
- Based on the current trends, it will take until 2080 to achieve universal access to electricity and mid 22 century for access to non-polluting energy for cooking.



POPULATION GROWTH IN AFRICA



1900: 118 million

1980: 480 million

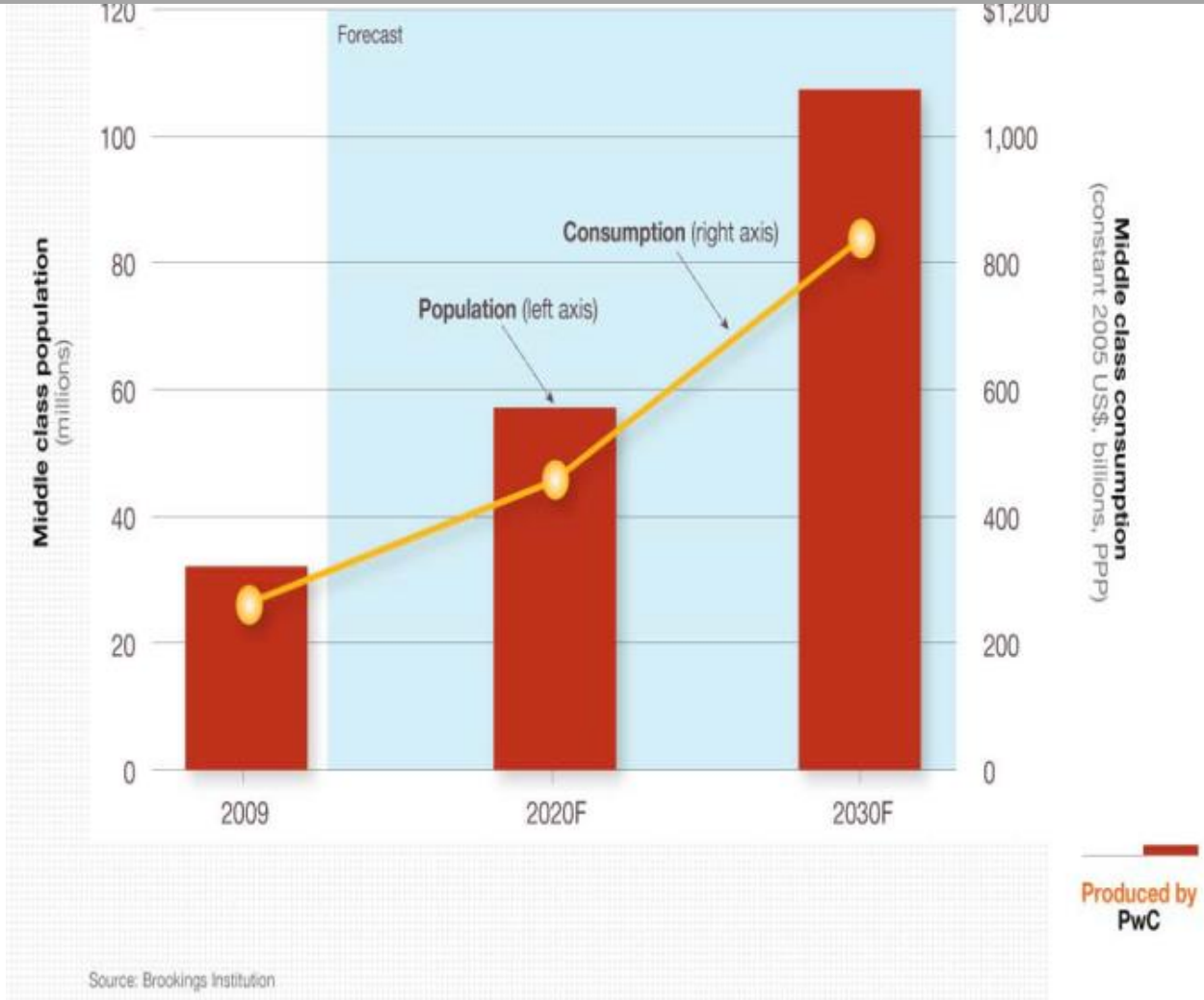
2013: Over 1 billion

2050: 1.9 billion (2 billion)



IEA projects that by 2030 there will still be 1.1 billion people without electricity

ECONOMY GROWTH -GDP



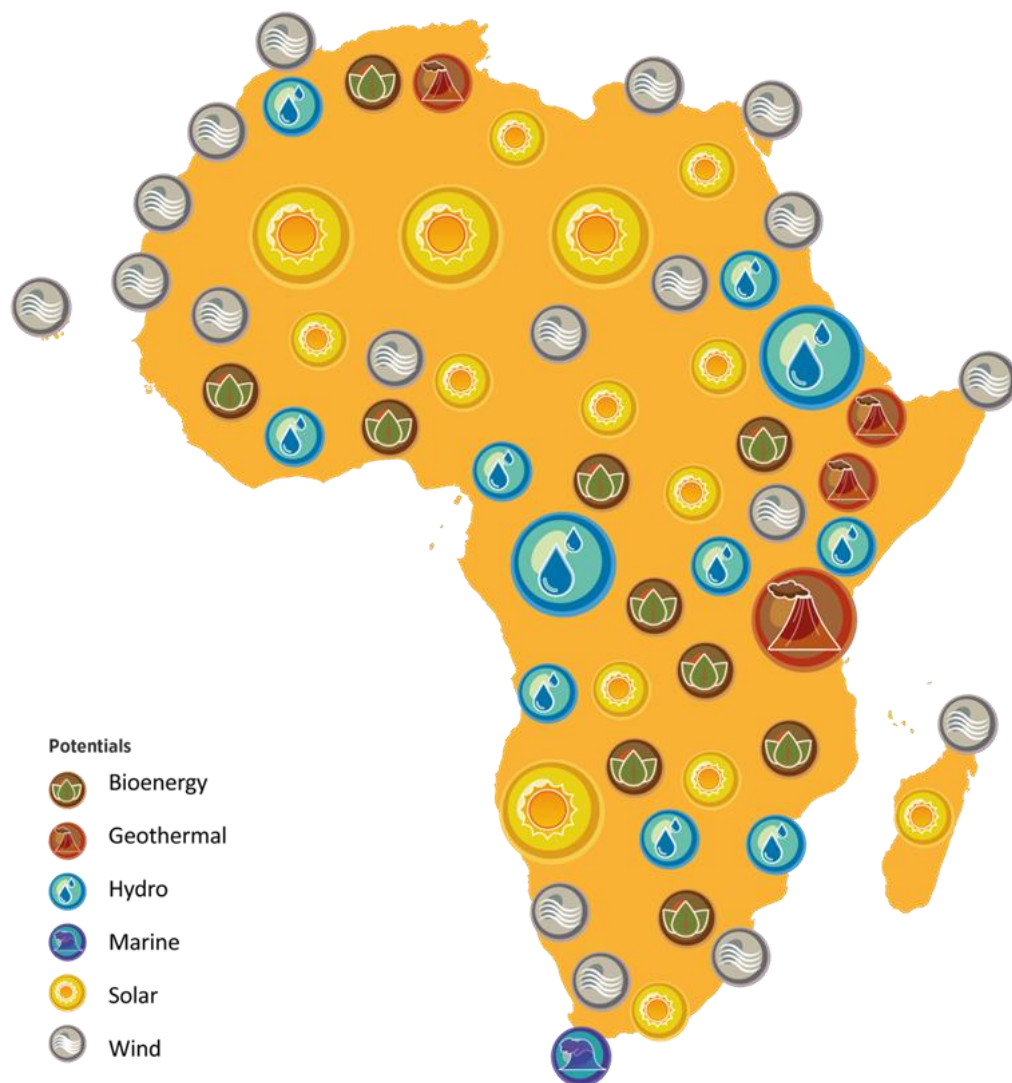
With the average annual GDP growth rate of **6.2%** (PIDA, 2010) , predicted **three fold** growth in GDP by 2030 and **seven fold** by 2050.

This entails a much **larger energy demand** and call for a better performing energy sector.

Growth of Sub-Saharan Africa's Middle Class

Energy Poverty Remains Obstacle to economic and human development in the Continent.

Distribution of identified renewable energy potential in Africa (IRENA 2015)



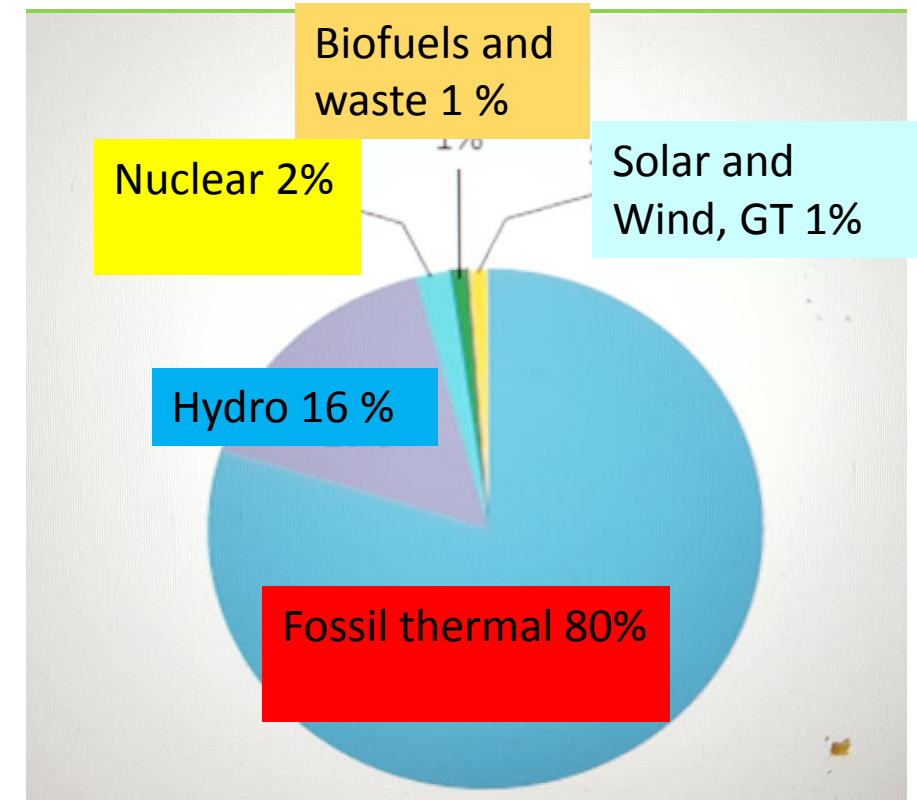
Source: IRENA analysis based on the Global Atlas

- Africa is endowed with huge diversified renewable energy resources across the continent.
 - About 350 GW hydropower,
 - “ 10 TW Solar
 - About 110 GW wind
 - “ 20 GW Geothermal
 - Biomass 3-13.6
- Renewable energy is therefore in many cases the optimal solution for modern energy access
- Decisions made today in Energy Mix and Energy Efficiency will make the continent's energy use of decades to come.

Africa's Existing Installed Generating Capacity(MWe)

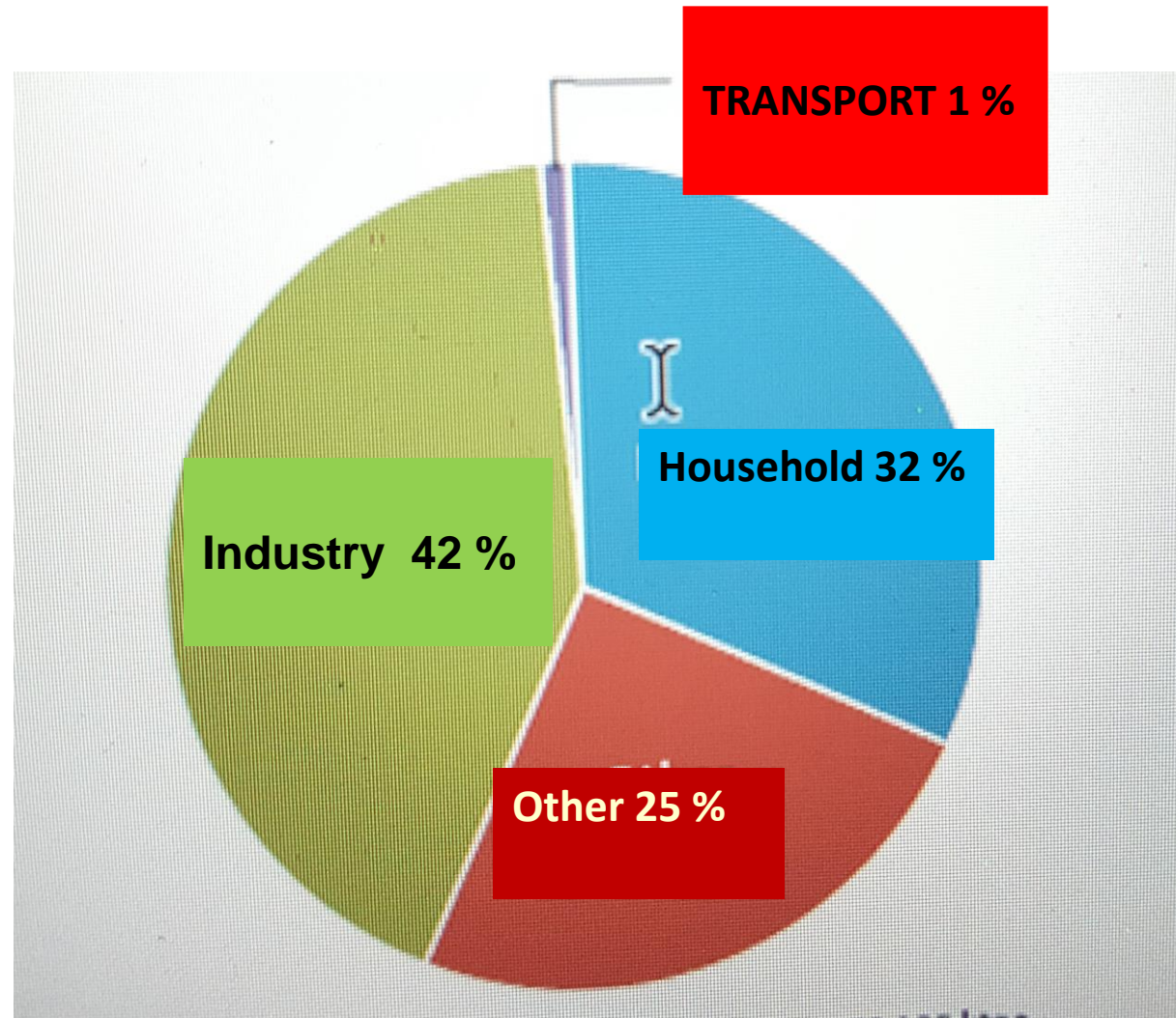
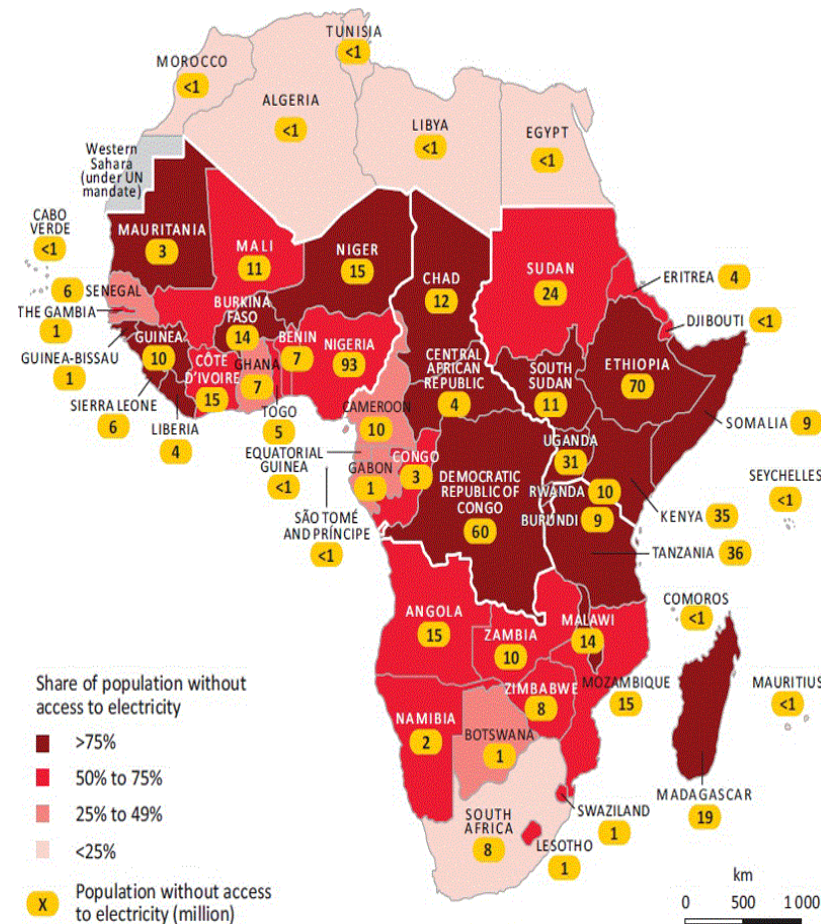
Africa is still dependent on fossil fuel (Coal, Oil and Natural Gas) to generate Electricity.

Plant Type	Installed Capacity (MWe)
Thermal	100,939
Hydro	24,723
Other	906
Total Africa	125,318



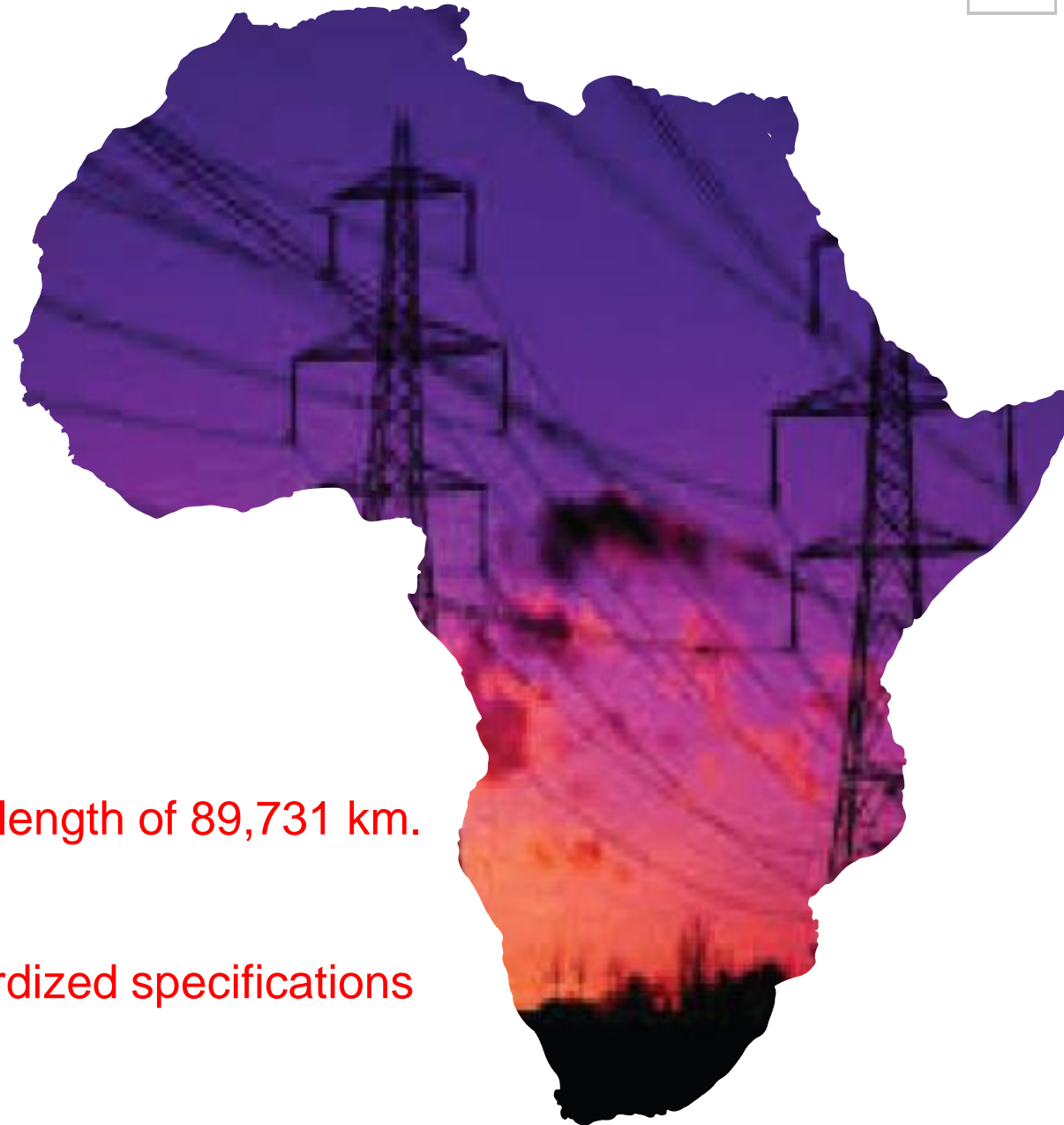
Fuel Shares of Electricity Generation 2015 (AFREC)

AFRICA'S SHARES OF ELECTRICITY BY SECTOR



Africa's Transmission Line Systems (AFREC 2015)

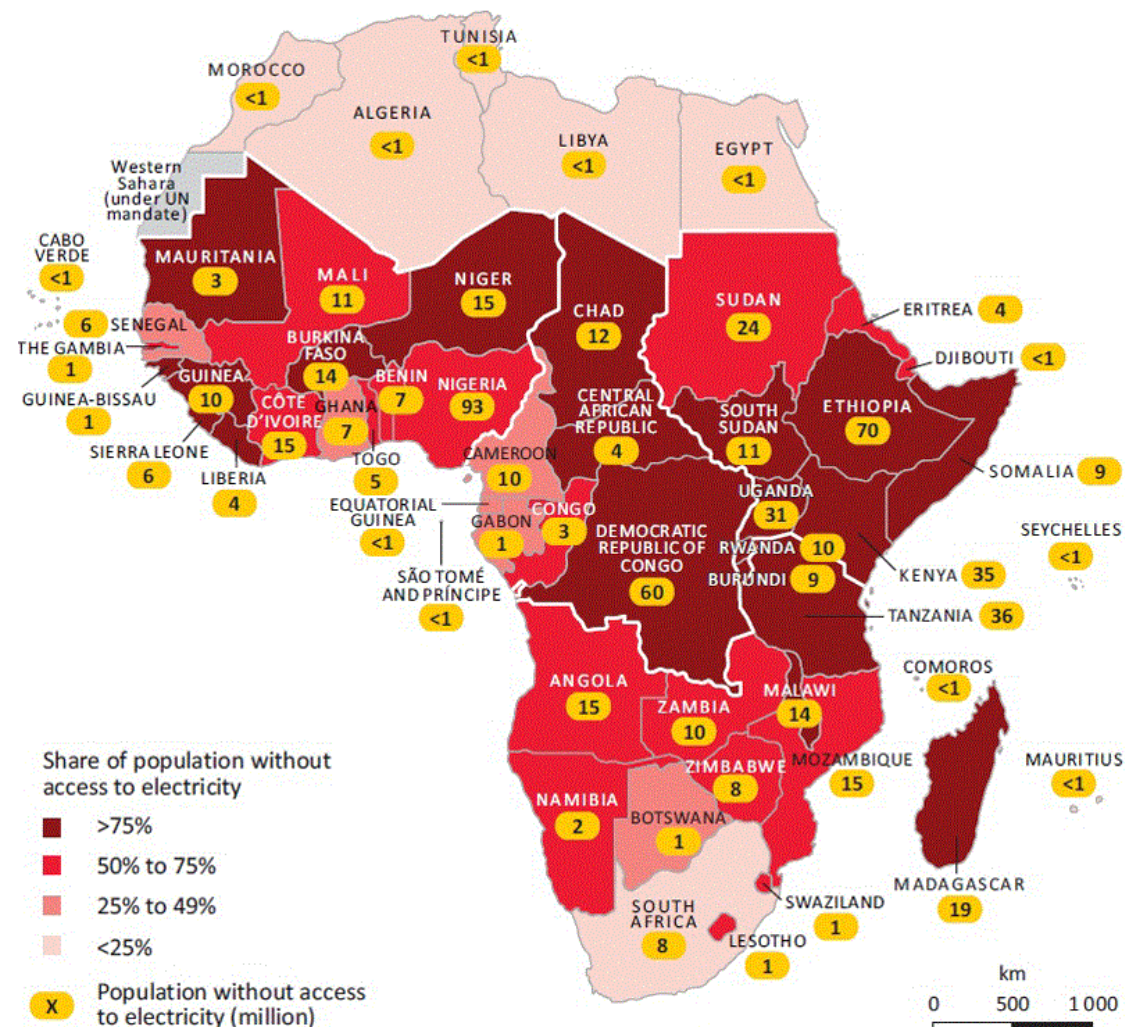
TL Voltages (KV)	Length of TL (Km)
100-100	9,655
110-220	34,899
220-330	31,096
330-400	10,200
>500	3,732



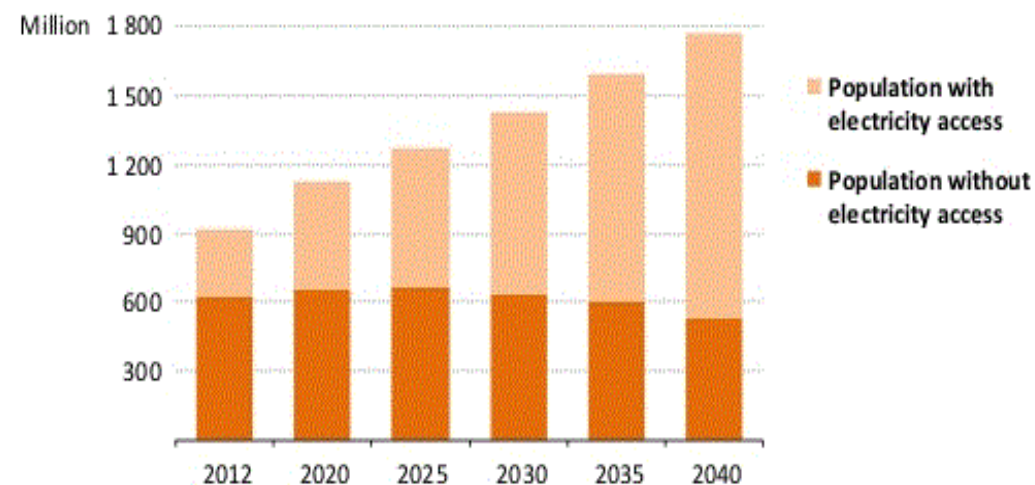
Africa's existing power transmission system **has a total length of 89,731 km.**
Power Stations (Thermal and Hydro).

The transmission system- Absence of **unified or standardized specifications**
(AfDB 2014)

Energy Access Gap

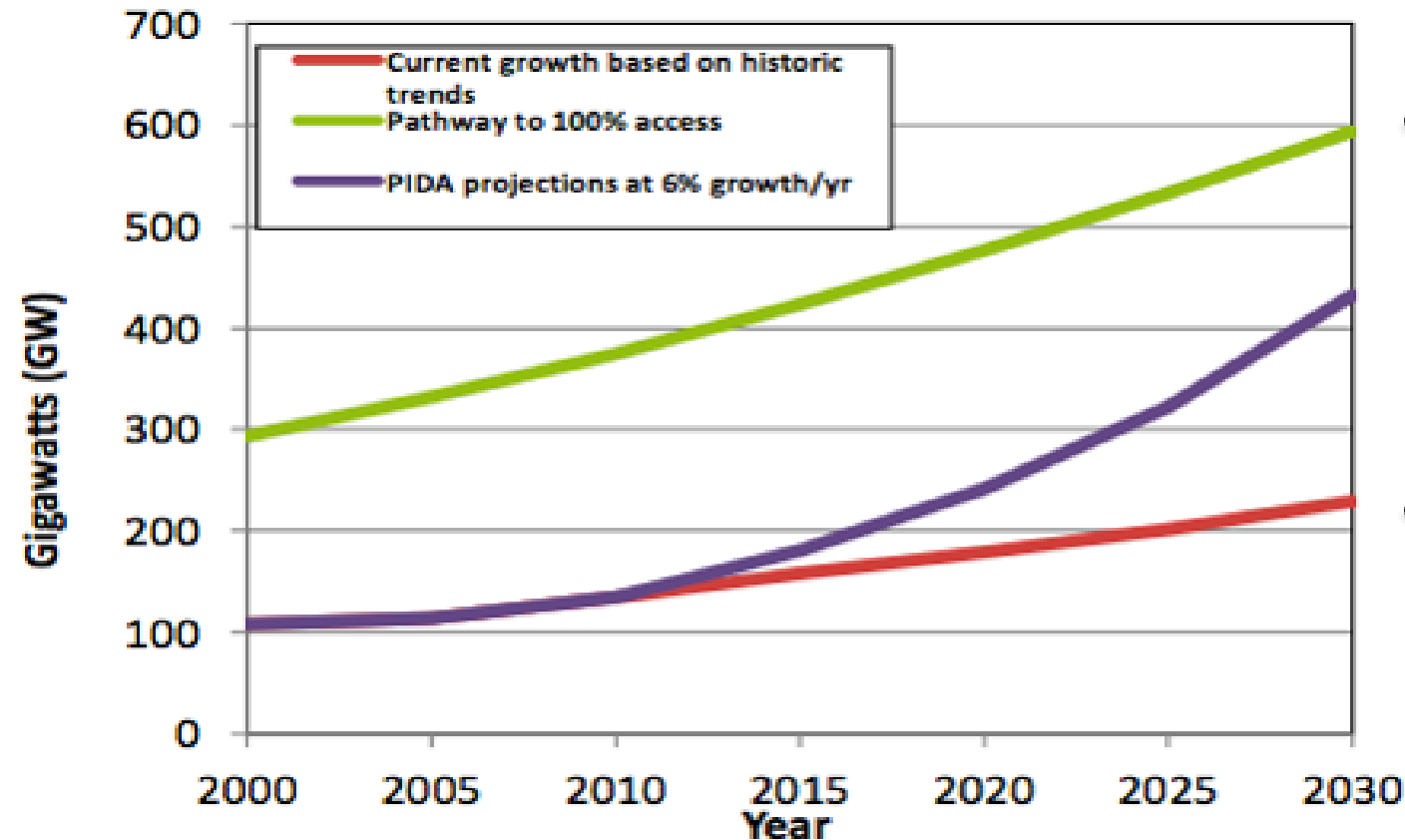


- Future access situation: BAU scenario



About **600 million people** in Africa do not have access to electricity, and approximately **730 million people** rely on traditional uses of biomass (IEA, 2014a).

ENERGY INVESTMENT GAP



2030
Access
Gap

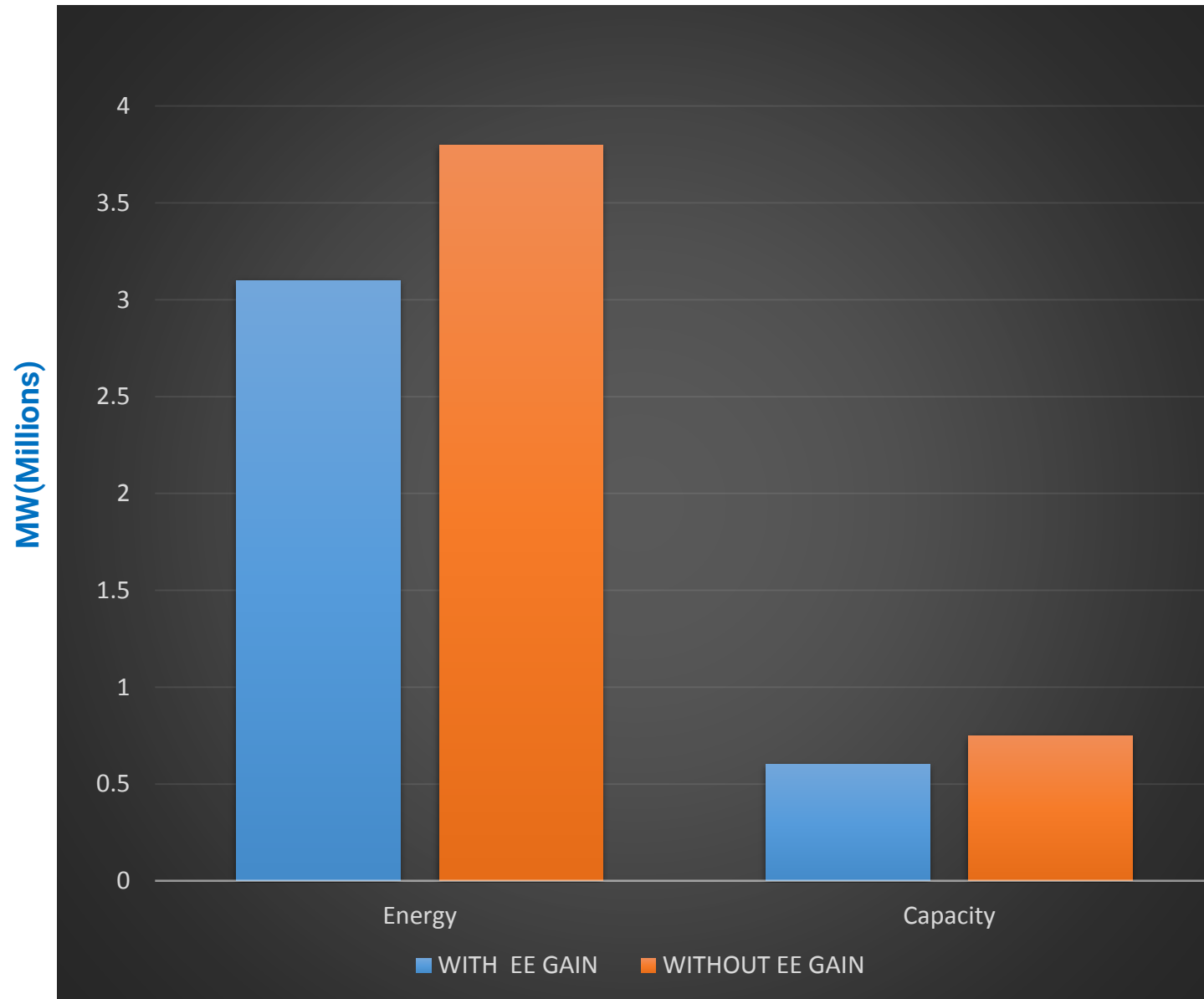
Africa will face a gap of at least 300 GW generation under a BAUS

Share of RE in generation mix Could grow by 2030 (Hydro+Wind each)= 100 GW; Solar to 90 GW: Requires about USD 70 Billion/year

Results in reduction of 310 Mt. of CO₂ in emissions by 2030 (IRENA 2015)

ENERGY EFFICIENCY PER CAPITA CONSUMPTION AND DEMAND

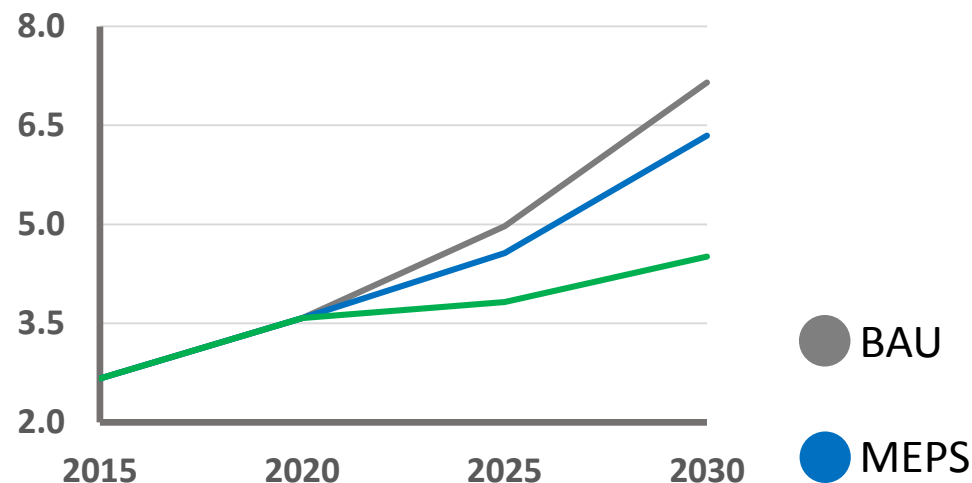
- Projected gains from implementing energy efficiency (EE) policies are expected to save **139 MW (16.7 per cent) in capacity needs and 634 TWh in energy produced** (16.6 per cent)
- With increased **industrialization and modernization across the continent**, the total energy demand from industries is forecast to increase from **431 TWh in 2011 to 1,806 TWh by 2040**, representing a 5.1 per cent annual growth.



Savings Opportunities in Africa



Room AC



142 TWh Cumulative Site Energy Savings by 2030



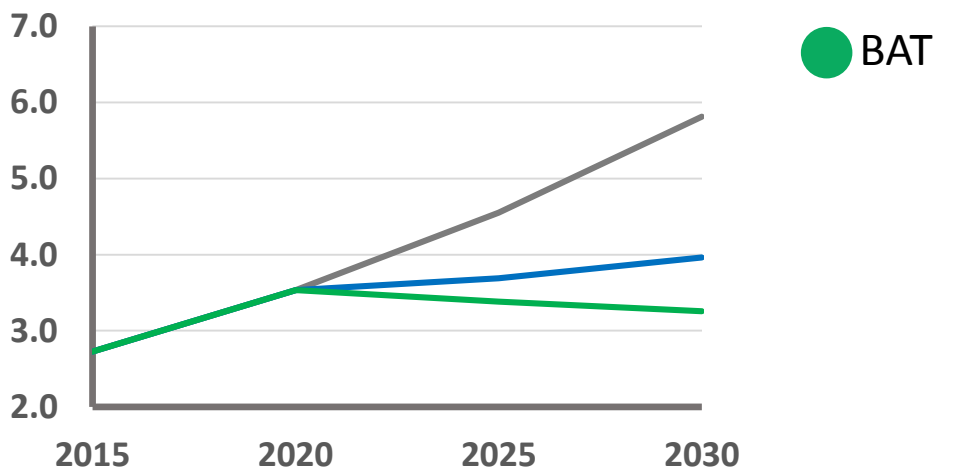
\$2.4 billion Energy Bill Savings in 2030 (undiscounted)



70 Megatonnes of Cumulative CO2 Emissions Avoided by 2030



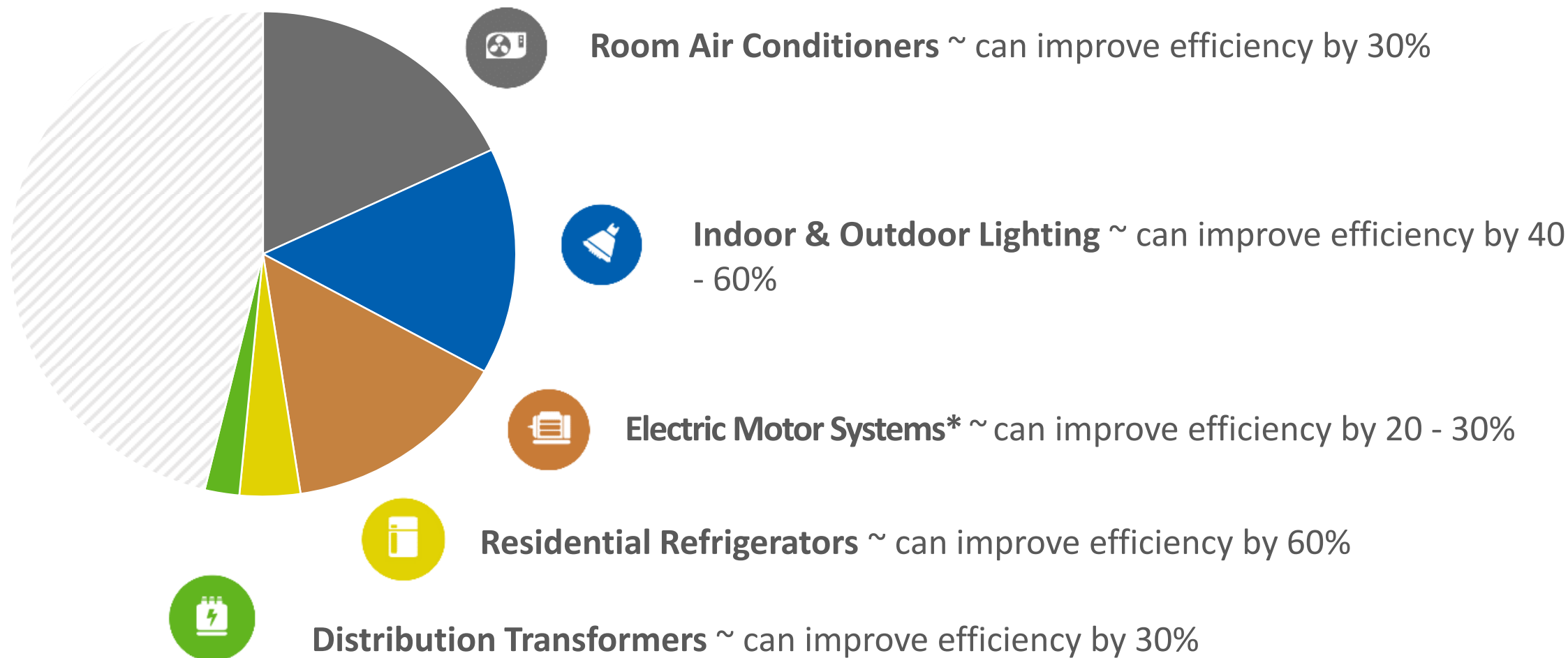
Residential Refrigerators



Annual Energy Consumption (TWh)

Approximation from U4E Country Savings Assessment, 2016

Examples: Electricity End-Use



Sources: International Energy Agency; Lawrence Berkeley National Laboratory; UN Environment

Method: Approx. savings in 2030 in emerging & developing economies if today's best available technologies are adopted

*Not including electricity used by motors in ACs and Refrigerators

Challenges in ED in Africa

- **Lack of Clear and** Coherent Policy, Regulatory and Institutional framework
- Inadequate **Information and Technical Capacity**
- Inadequate **Financing and Investment**
- Limited Technology transfer and skill
- Lack of **Well organized Renewable Energy resource data**
- **Deploying** large-scale renewable energy projects **in networks with** poor transmission and distribution infrastructure



Opportunities for ED in Africa

- A variety of **Renewable and NR Energy Sources**
- **Increased National and Regional Level Policy Commitment**
- Climate Related Financing (SREP, CIF, GCF etc.).
- **Emerging Financiers (e.g BRICS)**
- Renewable Technology **advancement and reduction** Costs of RE systems
- Various Global, Continental and Regional Energy Programmes/Projects (SE4ALL, PIDA, AREI, US Power Africa, GRMF etc)
- Regional Consideration to harmonize **AU-Agenda 2063 and SDG 2030 “CAP”**



REGIONAL & CONTINENTAL ENERGY PROGRAMMES (AO)

- Programme for Infrastructure and Energy (PIDA)- Continental and big RE projects
- SE4 ALL African Hub- AfDB, **NEPAD, AUC, UNDP**
- **Africa-EU Energy Partnership (AEEP)**
- African Renewable Energy Initiative (AREI)- **Transformative African led effort facilitated by UN Environment**
- US -Power Africa
- AUC-KfW Geothermal Risk Mitigation Facility
- **UN Environment Energy programmes/projects of Renewables, Energy efficiency and Energy Finance (e.g. ARGeo , UNITED FOR EFFICIENCY)**



Africa RE Initiative (AREI)

AREI- Transformative and Africa led effort – Facilitated by UNEP

Development Objective

Overall Goal

Accelerate the growth
of markets for RE and
EE technologies and
services

- Energizing Agricultural Products
- Powering Enterprises
- Powering Industry
- Powering Essential Community

Increase contribution of RE to
poverty elimination, economic
growth, and sustainable
development

Off-grid and on grid based
electrification

New and additional RE G. capacity 10 GW - by 2020 and 300
GW by 2030



Encourage and promote collaborations
among various Actors - African Energy
Specialized institutions, Regional Centers for
REEE,



Ensure the implementation of the proposed
solution action plans by strengthening the
capacities of **women energy entrepreneurs and**
tackle the global



Gender **Responsive**
Policies



Access to **Finance** and Market



Enhance and **Strengthen** skill and
capacity

REGIONAL CONSIDERATION



AU AGENDA 2063

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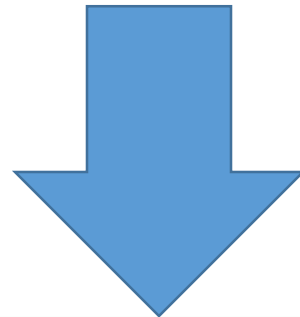
AGENDA 2030 SDG

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CAP- 10 Year Implementation Plan



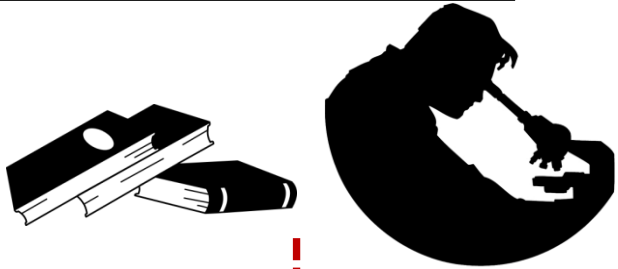
A Prosperous Africa Based on Inclusive
Growth and Sustainable Development



Increase **contribution of RE and EE** to poverty elimination,
economic growth, and sustainable development

Innovative Environmental Solutions

Climate Science & Research



Harmonized Policies



Skill and capacity Development



Technology transfer



Demonstration Projects



Innovative Financing



Partnership



ENERGY AS ENABLER AND PATHWAY TO SUSTAINABLE DEVELOPMENT IN AFRICA



- Eradicate poverty,
- increase food production,
- provide clean water,
- improve public health,
- enhance education,
- address climate change,
- create economic opportunity
- empower youth and women.

SUMMARY

- A clear and coherent **harmonized policies, institutional and regulatory framework required** to spur investment and facilitate market development.
- the new energy paradigm of “**Decentralized, Decarbonized, Digitalized and Democratized energy services**” will enable Africa to reach Universal Energy access by 2030 in pursuit of the SDGs and AU Agenda 2063”.
- Need for **Capacity, skill and technology transfer in use of Clean energy tech. as well as adequate and quality data** to achieve SDGs
- A strong regional Cooperation, **integration and partnership** to support the continent **in accessing SE** and well-being of its people
- Transform energy systems to make them compatible with **climate and sustainability targets** .
- Africa’s economic growth **will need to be fuelled by a massive investment** in energy sector for Sustainable development.



Dear Panelists and Distinguished participants,

How do we Seize the Moment: Investing in Innovative Environmental Solution to accelerate the SDG 2030, AU Agenda 2063- Africa we want and Paris agreement 2015?

SDG- 7 and Africa's Perspective: The Reality Check



The latest findings on SDG's progress as documented in the 2016 SDG's report and Africa's Reality Check on SDG 7 in the Africa Energy Forum 2017, SDG 7 (like other SDG's) is far from being a reality for a majority in the continent with the adoption of SDG 2030 and AU Agenda 2063,

GENERAL

- How do you think that affordable and practical solutions can be provided to achieve the targets in these global and continental development agendas?
- What are the issues impeding effective development and use of renewable energy in Africa in general and in Sub-Saharan Africa in Particular?

Climate:

- How can we promote sustainable energy and climate goals through strong economic growth policies, especially in developing countries?
- What opportunities do we see in Africa for the next five years within the renewable energy space that will contribute to the Socio-economic development?

Policy

- What Policy and institutional transformations are required to realize social, economic and environmental benefits from clean energy in an African context?
- In your view, what are the main opportunities for sustainable energy policy and technology post-Paris agreement 2015?
- How can African governments can do better to set more aggressive targets for energy efficiency and to improve the regulations and standards across the continent?

(D) Finance:

- How do Africa secure innovative financing and attracting investors in renewable energy for both the grid and off-grid?

(E)Partnership

- How do we ensure that there are cooperation and integration among member states, and all these initiatives are aligned to the same target and create synergy, leverage resources and maximize the benefit of this continent?

THANK YOU

CONTACT



MESERET TEKLEMARIAM
Email: Meseret.Zemedkun@un.org