Renewable Energy Potentials and Applications in Africa

Daniel Ayuk Mbi EGBE

African Network for Solar Energy (ANSOLE)

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African Society of Physics (ASP) Online Lectures, 30 June 2020

Daniel Ayuk Mbi EGBE (Bridging People)

- Born on 20th of May 1966 in Mambanda-Kumba, Cameroon
- French Baccalaureat and English Advanced Level: 1986
- BSc in Chemistry and Physics at the University of Yaoundé in 1991
- Diplom (1995), PhD (1999) and Habilitation (2006) at the FSU Jena, Germany
- MPI-P Mainz (2006), TU Eindhoven (2006-2007), TU Chemnitz (2007-2008),
- **JKU Linz (Since 2009)**

- **Board member of World University Service (WUS) e.V.**
- Initiator of German-Cameroonian Coordination Office (KBK)
- Initiator and international coordinator of ANSOLE & Chairperson of ANSOLE e.V.
- Initiator of Cameroon Renewable Energy Network (CAMREN)
- Initiator and coordinator of BALEWARE

- **Independent evaluator of the World Bank Group and African governemnts in capacity building issues**
- Research Agenda committee member of PAUWES
- **First Distinguished Brian O´Connell Visiting Fellowship for African Scholars of the University of the Western Cape, South Africa**
- Scientific Council member of ESMER Cotonou, Benin
- Scientific committee member of many international events on renewable energy in Africa

- Published till date124 peer-reviewed articles, H-index= 31 Citations > 3300
- Speak more than 5 languages
- Father of 4 children, believing christian
- **Hobbies: Cooking, jogging and dancing Salsa**

The inconsiderate capitalistic technological development has fostered **environmental underdevelopment** characterized by extinction of many biological species, air pollution and climate change, among other effects. Walking with air-filtering masks in Peking is clear evidence of underdevelopment.

As such, the underdeveloped are the developed…

Egbe, D. A. M. , ANSOLE e-Magazine , Vol.5, 2019

Sustainable Development Goals (2016-2030)

https://www.un.org/sustainabledevelopment/sustainable-development-goals/

https://www.bertelsmann-stiftung.de/fileadmin/files/user_upload/Sustainable_Development_Report_2019_Complete.pdf

AFRICAN NETWORK FOR SOLAR ENERGY (ANSOLE)

www.ansole.org

- Initiated on 4 November 2010 in Sousse Tunisia by D. A. M. Egbe (Coordinator)
- Launched on 4 February 2011 at Johannes Kepler University Linz, Austria
- Registered as NGO (ANSOLE e.V.) on 26 January 2012 in Jena Germany
- **Focus: Training, Education and Research (+ Entrepreneurship) in Sustainable Energies**
- > 1120 members in 45 African and 31 non-African countries
- Members from > 300 universities
- So far (co)organized 30 scientific events in 16 countries
- Has graduated 13 PhDs) and 1 MSc thru its 3 fellowship programs (2011-2016)

→ **INEX** (intra-African Exchange)

→ **ANEX**´(Africa-North Exchange)

→ **ANSUP** (ANSOLE Sur-Place)

- Facilitator of joint research proposals within Africa and between Africa and Europe.
- ANSOLE office in Jena Germany: Focal Point for People of African Origin (AMAH-Project)

Jena Declaration 2019:
The Concept of Race is a Result of Racism and not its Prerequisite

….

It was mostly through scientific research on genetic variation among and between human populations that the concept of race was finally exposed as a typological construct. Among humans, by far the largest share of genetic differences exists not between geographical populations, but within such groups. The greatest genetic variation is still in people on the African continent, where the roots and most of the branches of the human family tree are located. The people of East Africa and all non-Africans are gathered together on one of its branches. Therefore, people outside Africa are more closely related to people from East Africa, such as the Hadza, than the Hadza or non-Africans are to people from South Africa, for example the Khoisan. **From a phylogenetic point of view, all people are therefore Africans**. In consequence, it is positively paradoxical to talk of 'the Africans' or 'the black Africans'. This is a relic of colonial ways of speaking and thinking, and, once again, it is a case of racism creating races. The skin colour of a Khoisan from South Africa is lighter than that of people who live in South-East Asia or South America along the Equator. Skin colour mainly reflects a biological adaptation to the level of solar radiation and consequently varies continuously in line with the intensity of UV-radiation on Earth.

…

M. S. Fischer et al. 112th Annual Meeting of the German Zoological Society in Jena

BRIDGING AFRICA, LATIN AMERICA AND EUROPE ON RENEWABLE ENERGY AND WATER (BALEWARE)

- Initiated on 29 May 2015 in Curitiba Brazil by D.A. M Egbe (Coordinator)
- Platform under ANSOLE
- Officially launched on 12 Dec 2016 in Arusha, Tanzania,

www.baleware.org

AFRICAN SUMMER SCHOOL INITIATIVES

- Initiated in 2014 by D. A. M. Egbe (Director of the Schools)
- **Schools on „Sustainable Energetics for Africa (SE4A)“**
- **School 1**: 27.02-03.03.2017 in Ouagadougou, Burkina Faso
  →75 participants (50 students) from 18 countries
- **School 2**: 31.07-04.08.2017, in Yaounde & Buea, Cameroon
  →70 participants (46 students) from 26 countries

- **Schools on SDG 6 (Access to potable water and sanitation for all)** in the frame of BALEWARE

➢ Presently in application (preparation) phase

➢ **School 1** planned in Kigali Rwanda

VolkswagenStiftung

Planned Events 2020

~~**23 May 2020, Africa Day 2020 Jena, Germany:** International Conference on „Jena Declaration~~“

~~**06 June 2020, UNIKIN**: 2nd ANSOLE Scientific Meeting in DRCongo (ASMCO 2020)~~

28 August 2020, University of Lesotho, Lesotho: ANSOLE Scientific Meeting in Lesotho (ASMLES 2020)

16-19 October 2020, Cheikh Anta Diop University of Dakar, Senegal: ANSOLE DAYS 2020

7 November 2020, Africa Day 2020 Jena, Germany: International Conference on „Jena Declaration“

02-05 February 2021, Sousse, Tunisia: ANSOLE DAYS 2021, 10th Anniversary of ANSOLE.

OUTLINE

1. My Research and Research Issues in Africa
2. Energy context in Africa
2. Renewable energy resources potential in Africa
3. Renewable Energy Policies in Africa
4. Training, Education & Research Programmes
5. Conclusion/Suggestions

Organic Semiconductors

- Large area & flexible substrates possible
- Large variety of materials
- Low cost

Organic materials

Organic light emitting diodes

Photovoltaic cells

Transistors and memory

Images source: Karl Leo, TU-Dresden

Renewable Energies

- ♦ Hydropower
- ♦ Geothermal Energy
- ♦ Solar Energy
  - *Solarthermics*
  - *Photovoltaics*
- ♦ Ocean tides
- ♦ Wind energy
- ♦ Bioenergy (biomasses)

Photovoltaics

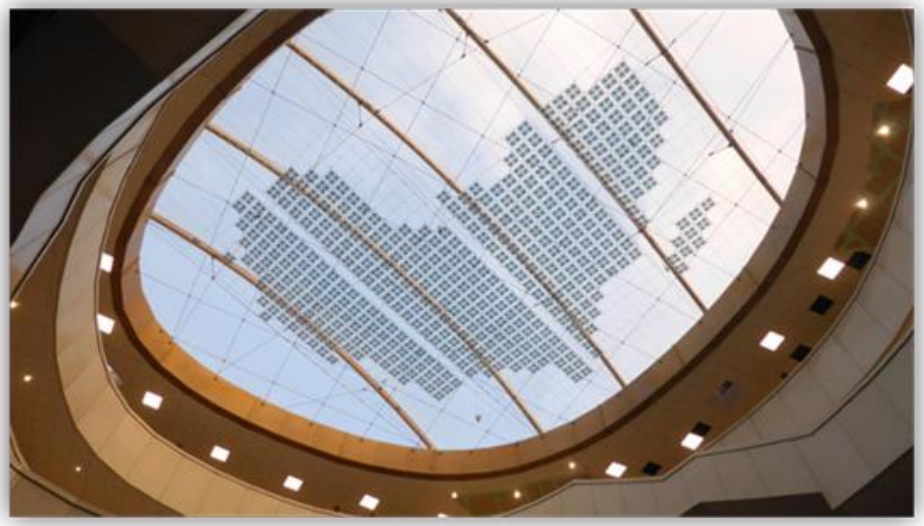
First Generation:
- Monocrystralline Si: η >16%
- Polycrystalline Si: η >12%

Second Generation
- Amorphous Si: η >8%
- CdTe: η > 8 %
- GaAs: η > 20%
- CIGS: η >12 %

Third Generation
- Grätzel-Cells: η > 11 %
- Organic Solar Cells: η >17 %
- Perovskite Solar Cells: η >20 %

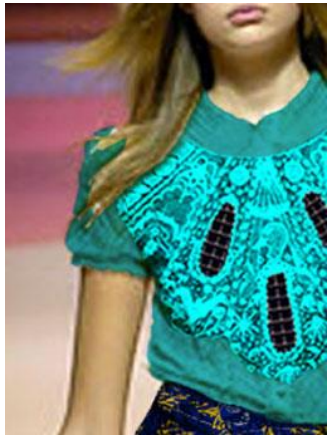
Energy Payback Time:
OPV: 100 h << 1 year
Silicon: 1-3 years
Wind: 18 months

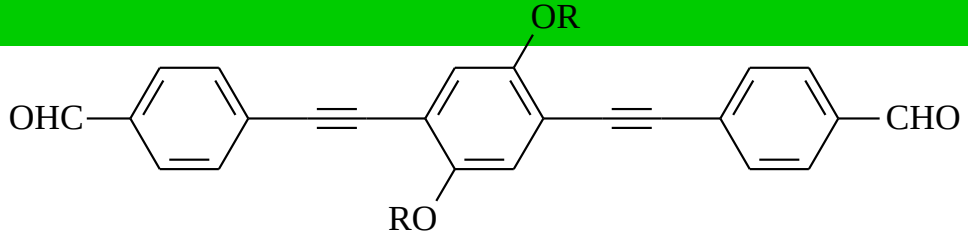
Organic Photovoltaics (OPV)



Solar charger utilizing a flexible OPV panel (*left*),[1] and OPV installation at the African Union's Peace and Security building in Addis Ababa (*right*).[2]

[1] https://infinitypv.com/products (Jan. 2018)
[2] http://www.osadirect.com/news/article/1519/ (Sep. 2015).





Science & Art

nature photonics

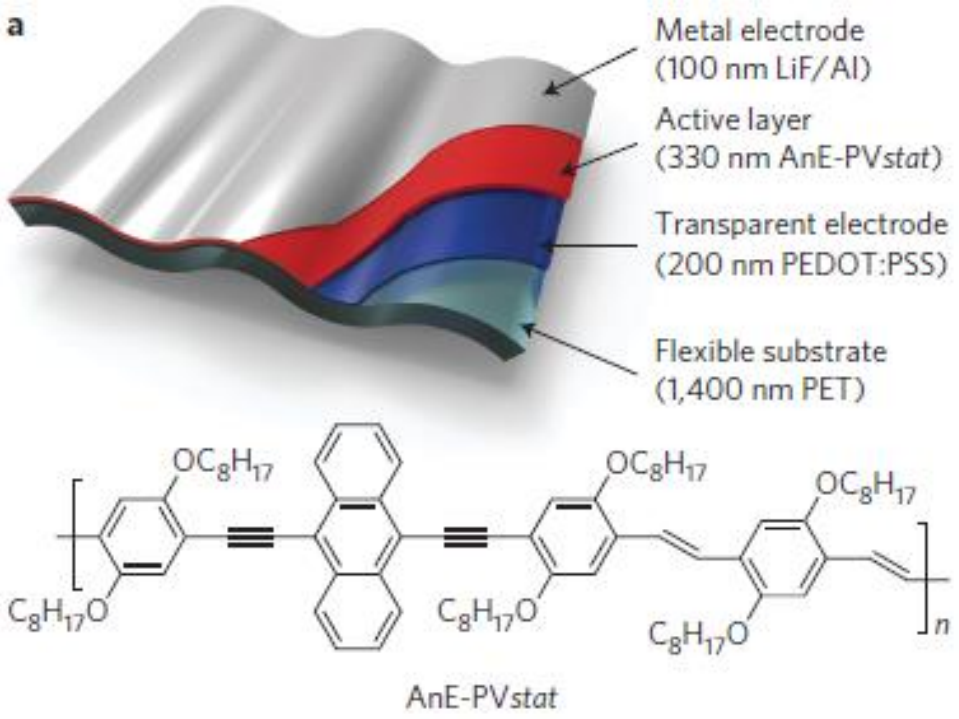
ARTICLES

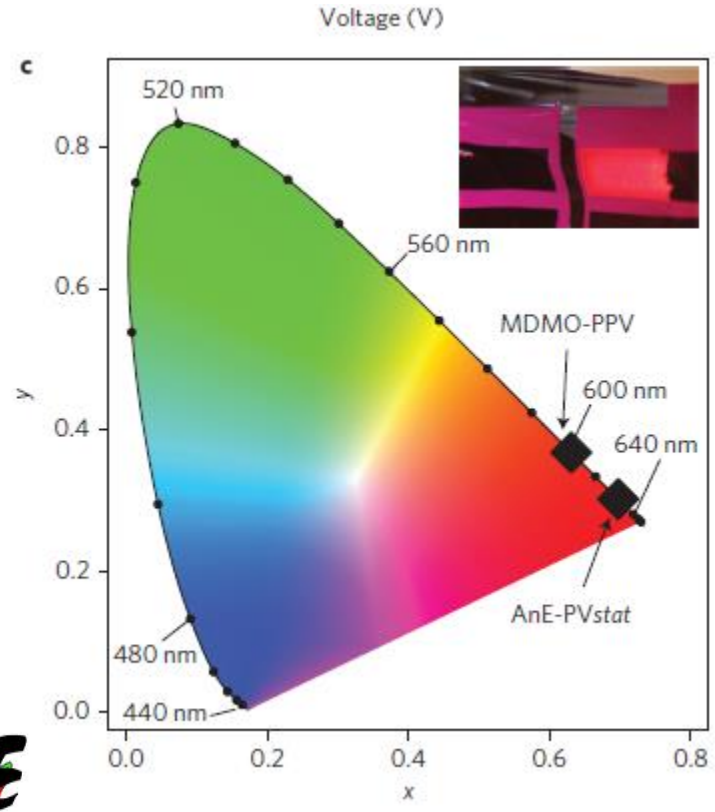
PUBLISHED ONLINE: 28 JULY 2013 | DOI: 10.1038/NPHOTON.2013.188

Ultrathin, highly flexible and stretchable PLEDs

Matthew S. White[1]*, Martin Kaltenbrunner[2,3,4], Eric D. Głowacki[1], Kateryna Gutnichenko[1], Gerald Kettlgruber[4], Ingrid Graz[4], Safae Aazou[5,6], Christoph Ulbricht[7], Daniel A. M. Egbe[1], Matei C. Miron[8], Zoltan Major[8], Markus C. Scharber[1], Tsuyoshi Sekitani[2,3], Takao Someya[2,3], Siegfried Bauer[4] and Niyazi Serdar Sariciftci[1]

We demonstrate ultrathin (2 μm thick) red and orange polymer light-emitting diodes with unprecedented mechanical properties in terms of their flexibility and ability to be stretched. The devices have a luminance greater than 100 cd m^{-2}, sufficient for a variety of optoelectronic applications including indoor displays. They can be operated as free-standing ultrathin films, allowing for crumpling during device operation. Furthermore, they may be applied to almost any surface whether rigid or elastomeric, and can withstand the associated mechanical deformation. They are shown to be extremely flexible, with radii of curvature under 10 μm, and stretch-compatible to 100% tensile strain. Such ultrathin light-emitting foils constitute an important step towards integration with malleable materials like textiles and artificial skin.





S. AAZOU (ANEX, Morocco-Austria)

Nature Photonics **2013**, *7*, 811-816

R&D in Africa

13.4%
of world's population

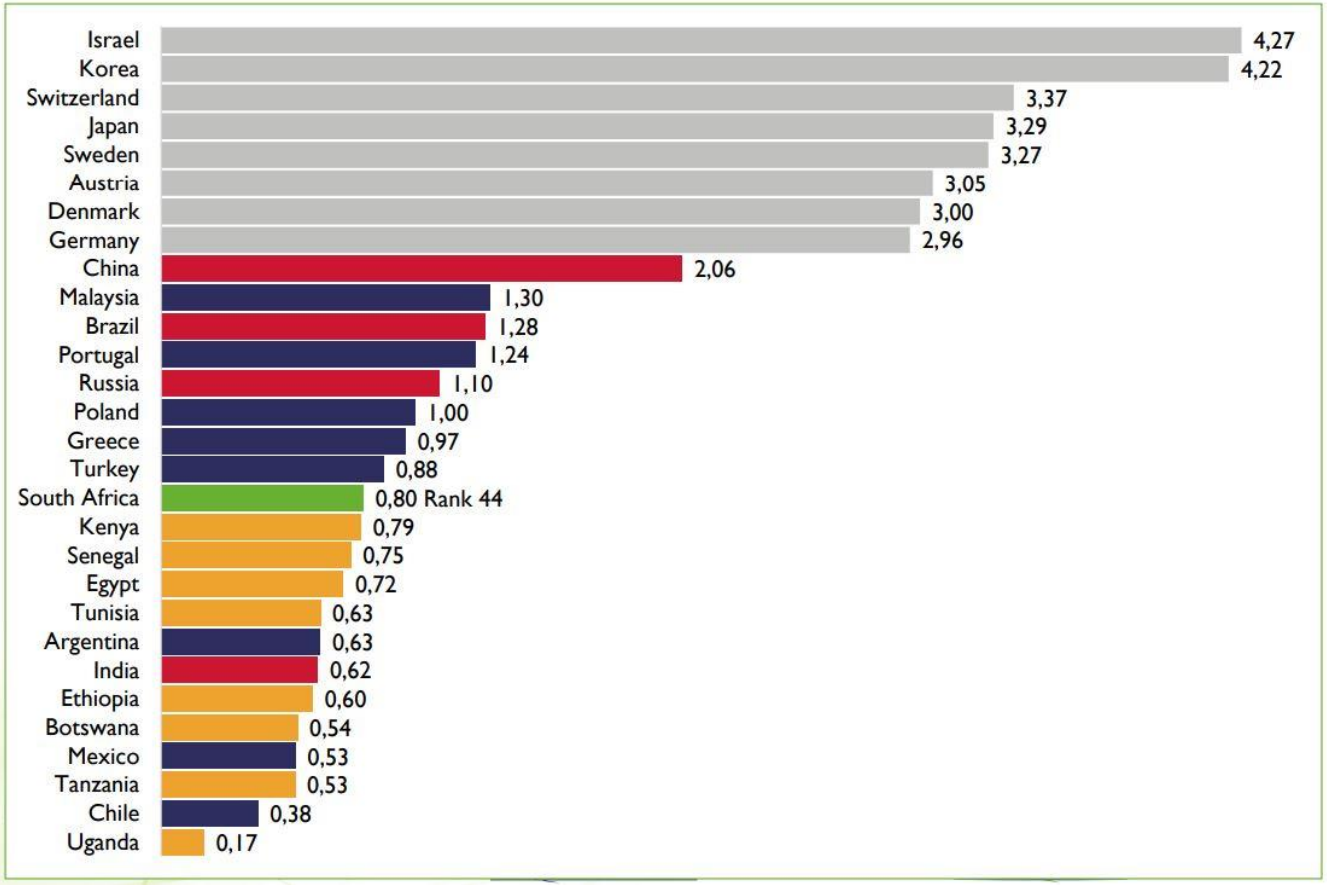
92
researchers per million inhabitants

1.4%
global scientific publications

0.41%
of GDP spent on R&D as compared **to 2.1%** for Asia **and 2.4%** for North America and Europe

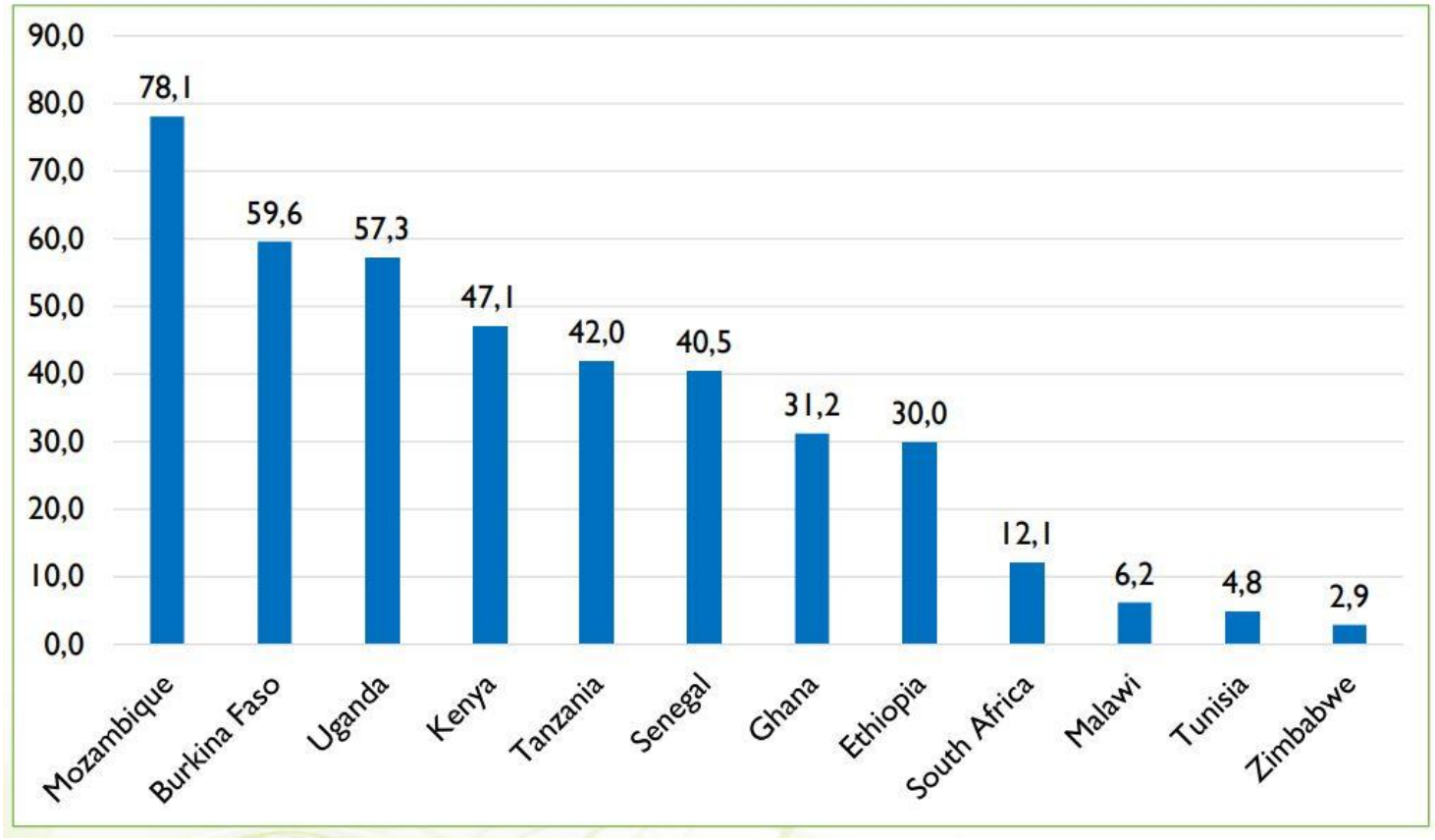
The PASET Regional Scholarship and Innovation Fund
An Africa-led initiative to bridge the skills gap in Applied Sciences, Engineering, & Technology

Investment in Research and Development as % of GDP



Skupien, S. Lecture at Africa Day 2019 in Jena Germany

Share of external research and development funding in %



Skupien, S. Lecture at Africa Day 2019 in Jena Germany

The Quest for Scientific Independence

"[W]e are still a long way behind what should be perceived as our final goal: an autonomous, self-reliant process of knowledge production and capitalisation that enables us to answer our own questions and meet both the intellectual and the material needs of African societies. The first step in this direction would probably be to formulate original 'problematics', original sets of problems that are grounded in a solid appropriation of the international intellectual legacy and deeply rooted in the African experience." (Paulin Hountondji, Benin, 2008)

Skupien, S. Lecture at Africa Day 2019 in Jena Germany

Self-perceived challenges to careers of young researchers

Challenges to their careers ...	Overall rank	Rank by age		
		39 and younger	40 to 50	Older than 50
Lack of research funding	1	1	1	1
Lack of funding for research equipment	2	2	2	2
Balancing work and family demands	3	6	3	3
Lack of mentoring and support	4	4	3	4
Lack of mobility opportunities	5	5	5	5
Lack of training opportunities to develop professional skills	6	3	4	6
Lack of access to library and/or information sources	7	7	6	7
Limitation of academic freedom	8	9	7	8
Job insecurity	9	8	8	10
Political instability or war	10	10	9	9

Source: Beaudry, Mouton, Prozesky (ed) 2018: The next generation of scientists in Africa

Necessary measures to attain international standards

-**Conducive study and research environment**:

- Available permanent and environment-friendly electrical energy
- Permanently clean and functional sanitation and clean environment
- Health and safety regulation taken serious!
- Permanent maintenance and repair entity
- Permanent easy acessibility of high speed internet
- **Online subscription to the worldwide renowned scientific journals**

-**Strong "Independent" country-based and Africa-based research funding mechanisms (at least 1 % of GDP allocated to R&D)** in addition to foreign funding mechanisms

- Early training of research student in writing of publications and research grants

-**Adopt the 4th industrial revolution (4IR) in all HE processes**

- Knowledge acquisition is not limited to a lecture room (classroom)
- The World (digital World) is the classroom of the future
- The Lecturer or supervisor takes the role of a mentor. He or she is ready and is not ashamed to learn from the student.

-**Strong regional, continental and international scientific cooperations**

-Internationalisation of the HE system by incorporation of international scientists

-**Always think of the SDGs in every action!!!**

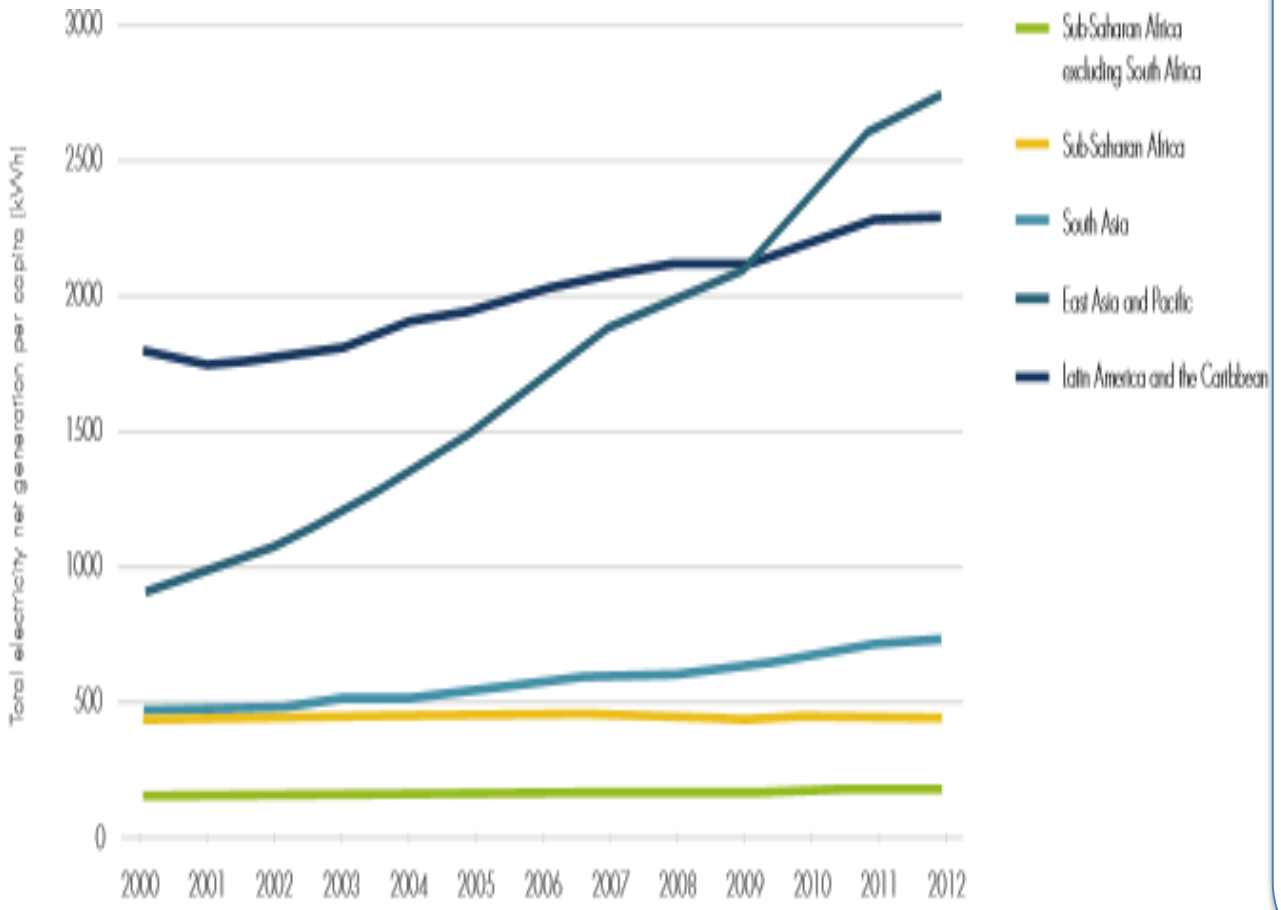
Energy Context in Africa

Slides obtained from:

Dr Daniel Yamegueu, 2iE, Ouagadougou, Burkina Faso
Prof. Yao Azoumah, PAUWES, Tlemcen, Algeria

Energy context in Africa

- The electricity generation gap between Africa and other regions is wide!
- The situation is critical in Subsaharan Africa



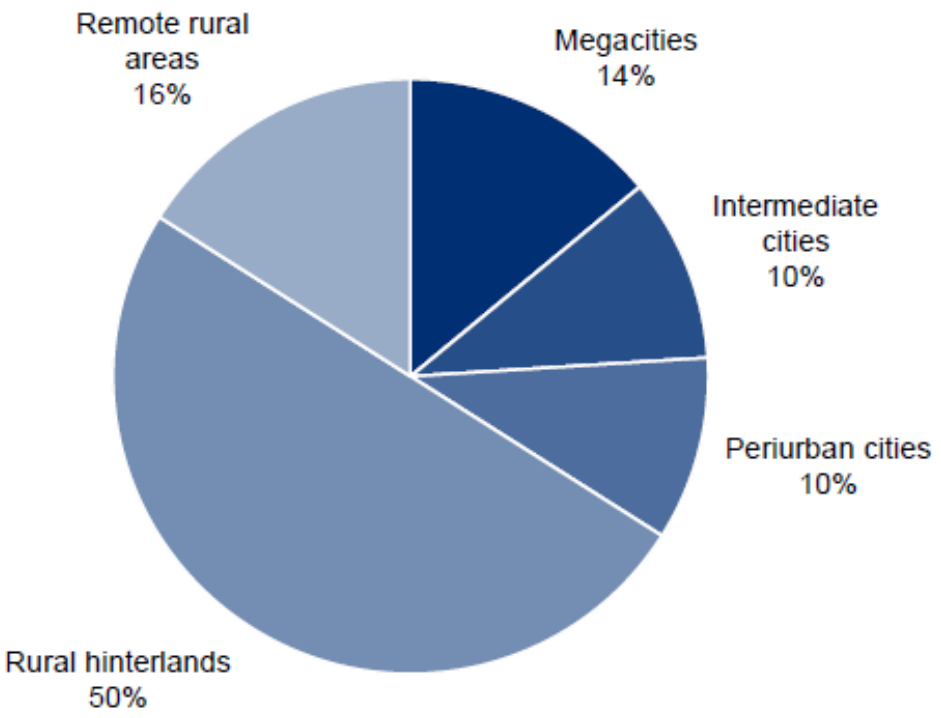
Data source: U.S. Energy Information Administration. (2012). International Energy Statistics: Total Electricity Net Generation.

- Excluding South Africa and North Africa, consumption averages around 162 kWh/capita/year in Africa
- This is very insignificant compared to a global average of 7,000 kWh/capita/year.

Energy context in Africa

Africa : unequal access to energy (rural vs urban)

Electricity access in 2014 - Regional aggregates			
Region	Electrification rate %	Urban electri-fication rate %	Rural electri-fication rate %
Africa	45	71	28
Sub-Saharan Africa	35	63	19

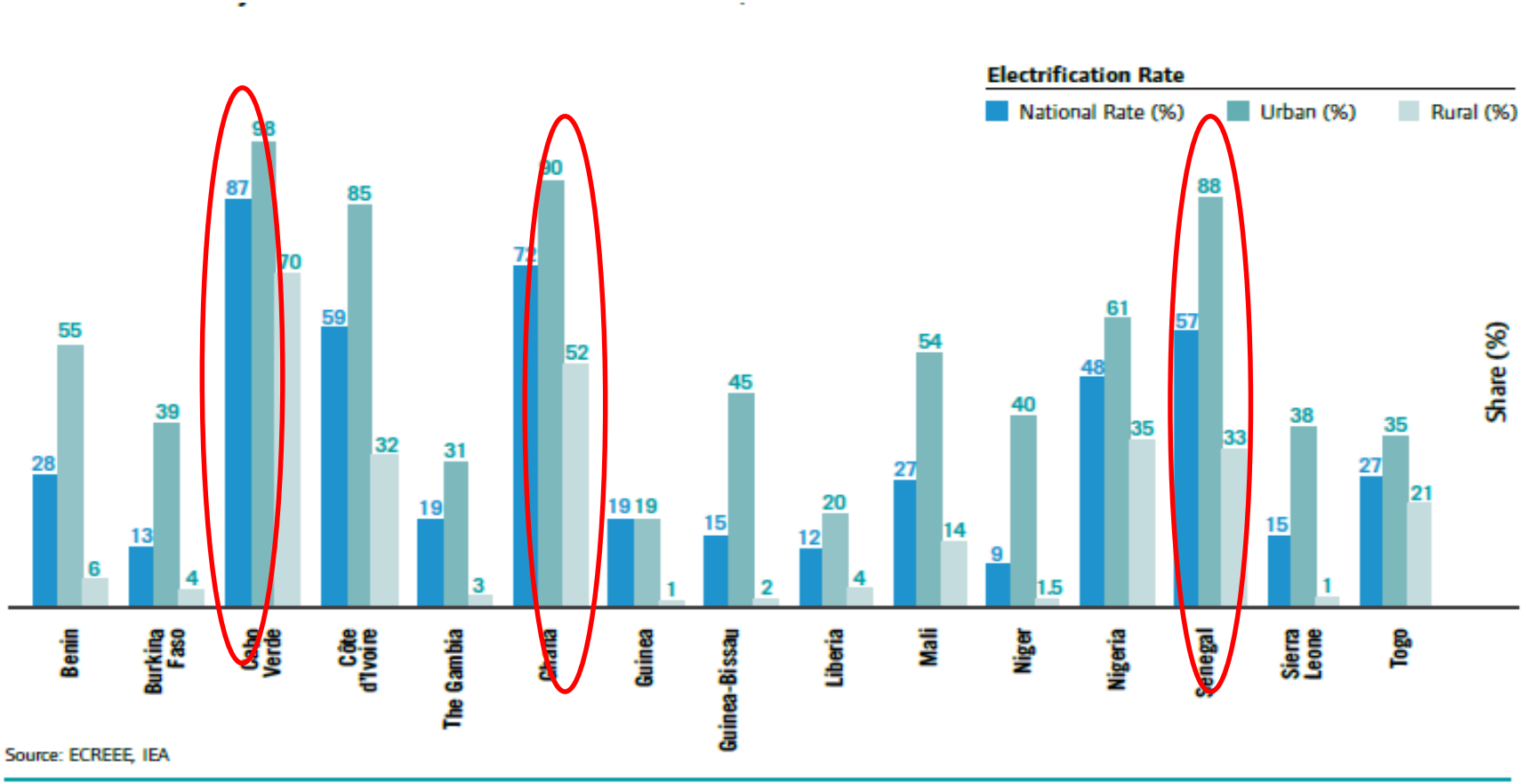


SUB-SAHARAN POPULATION DISTRIBUTION BY SETTLEMENT TYPE
SOURCE: FOSTER AND BRICENO-GARMENDIA, 2010.

Energy context in Africa

Electricity Access Rates in ECOWAS Member States, 2010-2011

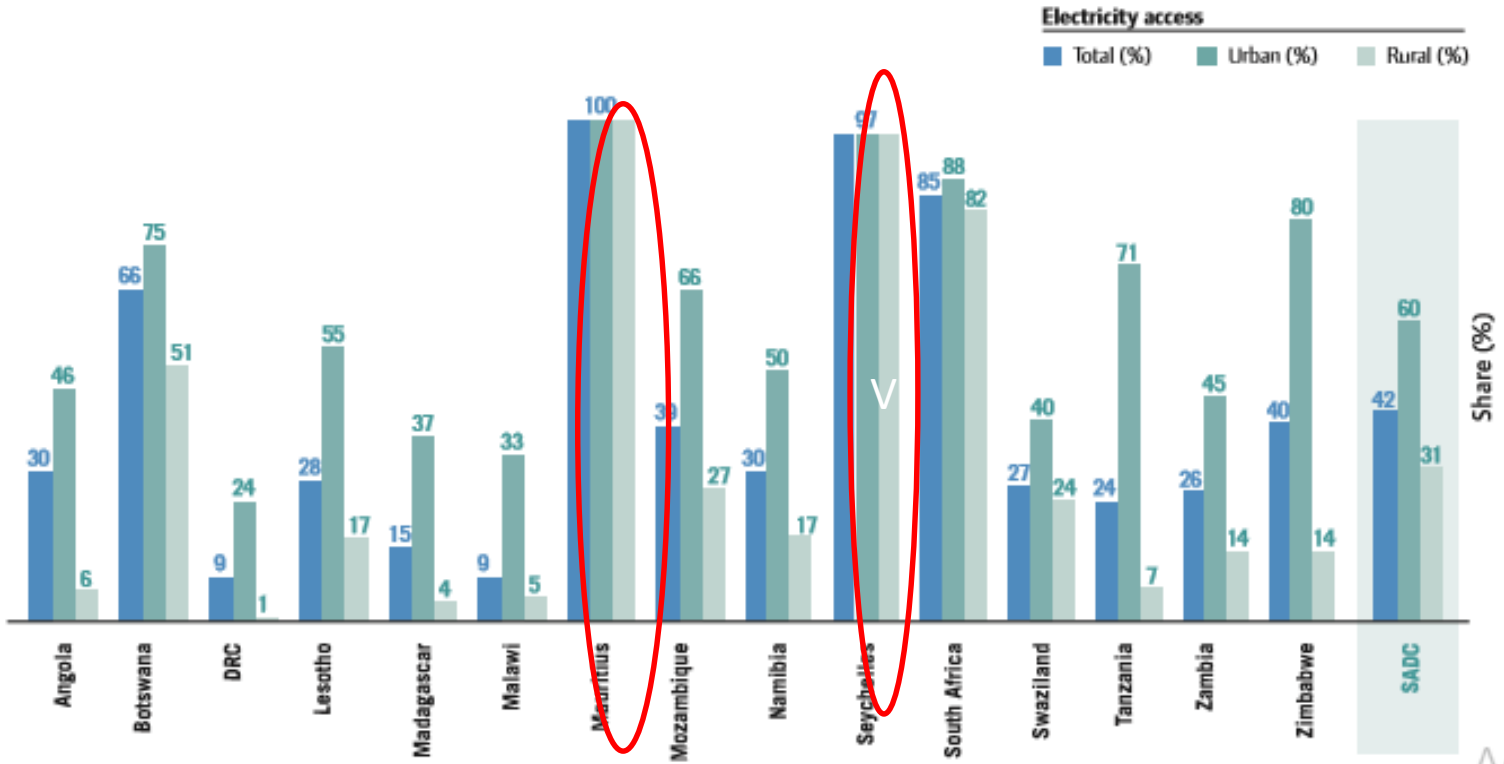
Within ECOWAS, national electricity access rates vary widely, from Niger which had an electrification rate of just 9% in 2011, to Cabo Verde, which is approaching nearly universal access.



Energy context in Africa

Electricity Access Rates in SADC Member States, 2012

Access to grid-based electricity has improved over the past decade, thanks to ambitious grid extension programmes in several countries such as Botswana, Mozambique, South Africa.



Source: See endnote 13 for this section.

Energy context in Africa

The role of Renewables

- Renewables are key to the goal of ensuring “access to affordable, reliable, sustainable and modern energy for all” included in SDG 7 – one of the 17 SDGs adopted in 2015 by the international community
- Meeting SDG 7 on energy reinforces a wide range of other key goals. Renewables contribute to environmental sustainability, create conditions to further human development by facilitating access to basic services, improving human health and enhancing incomes and productivity.
- Renewables also create new jobs and spawn new local industries.

Under the United Nations (UN) Sustainable Energy For All (SE4ALL) initiative, the international community established a target to double the share of RE (over 2015 levels) to 36% by 2030.

Renewable Energy Potential in Africa

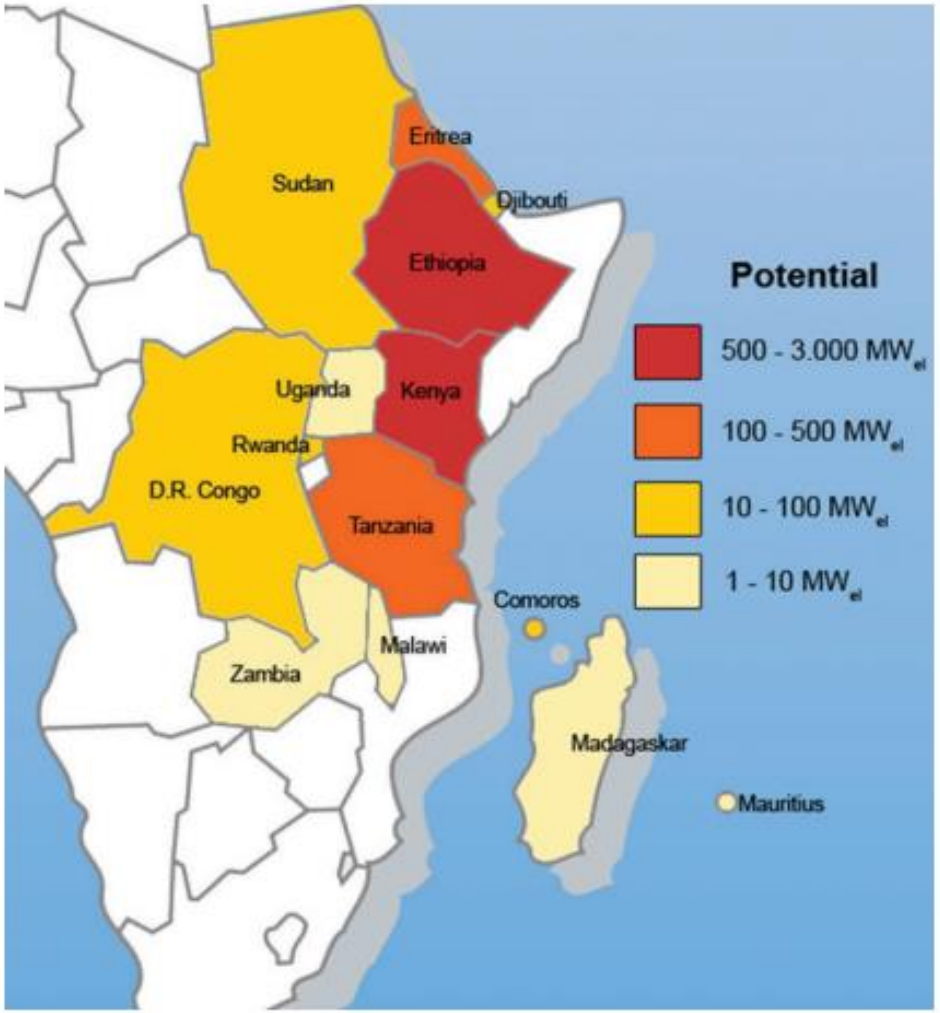
Pan African University
Institute of Water
and Energy Sciences

Energy resources in Africa

Energy potentials : renewable energy resources (geothermal)

Geothermal energy

More concentrated in Eastern Africa



PAUWES, Prof. Yao Azoumah,

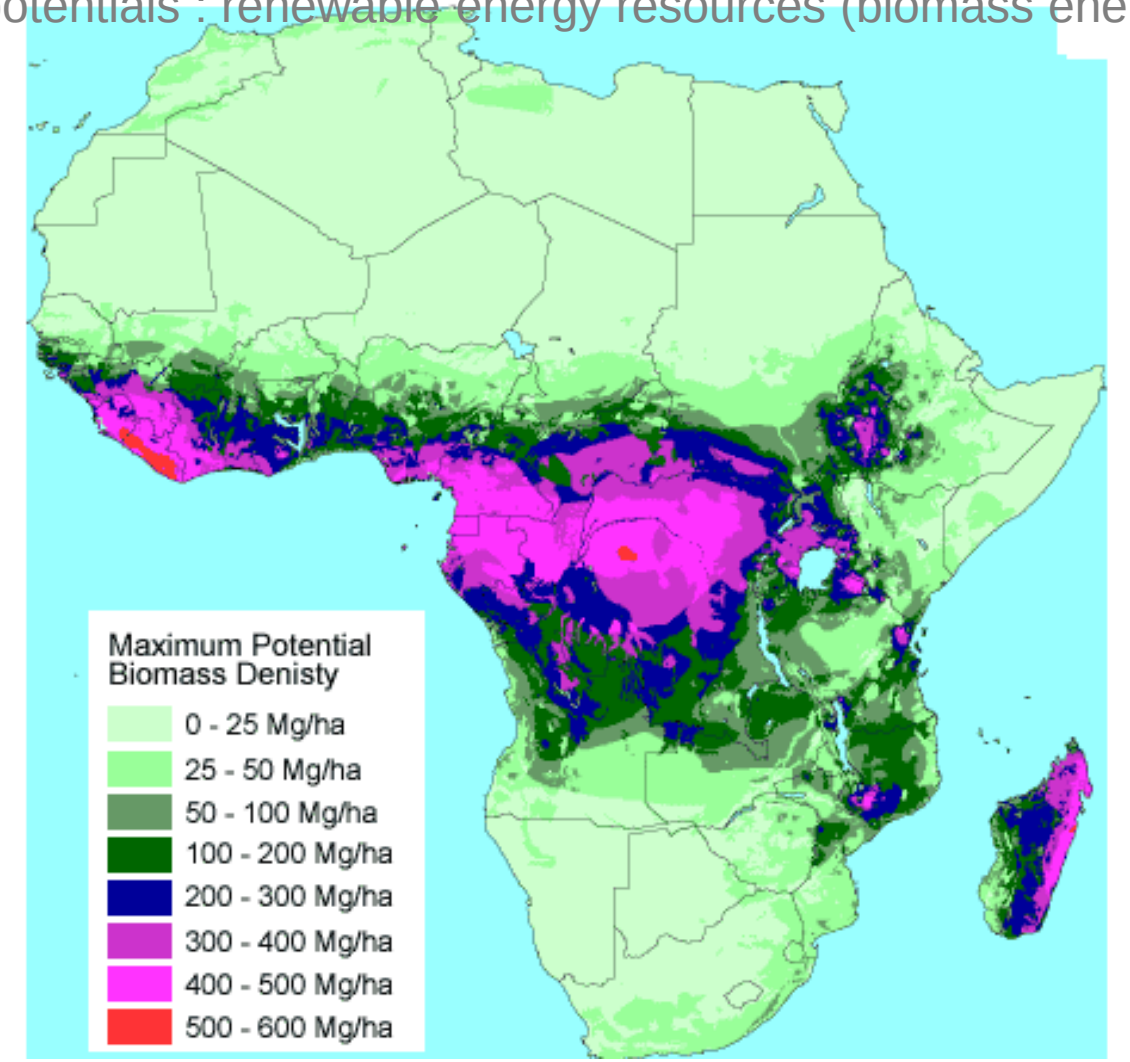
Pan African University
Institute of Water
and Energy Sciences

Energy resources in Africa

Energy potentials : renewable energy resources (biomass energy)

Biomass energy

25% of the global biomass reserves

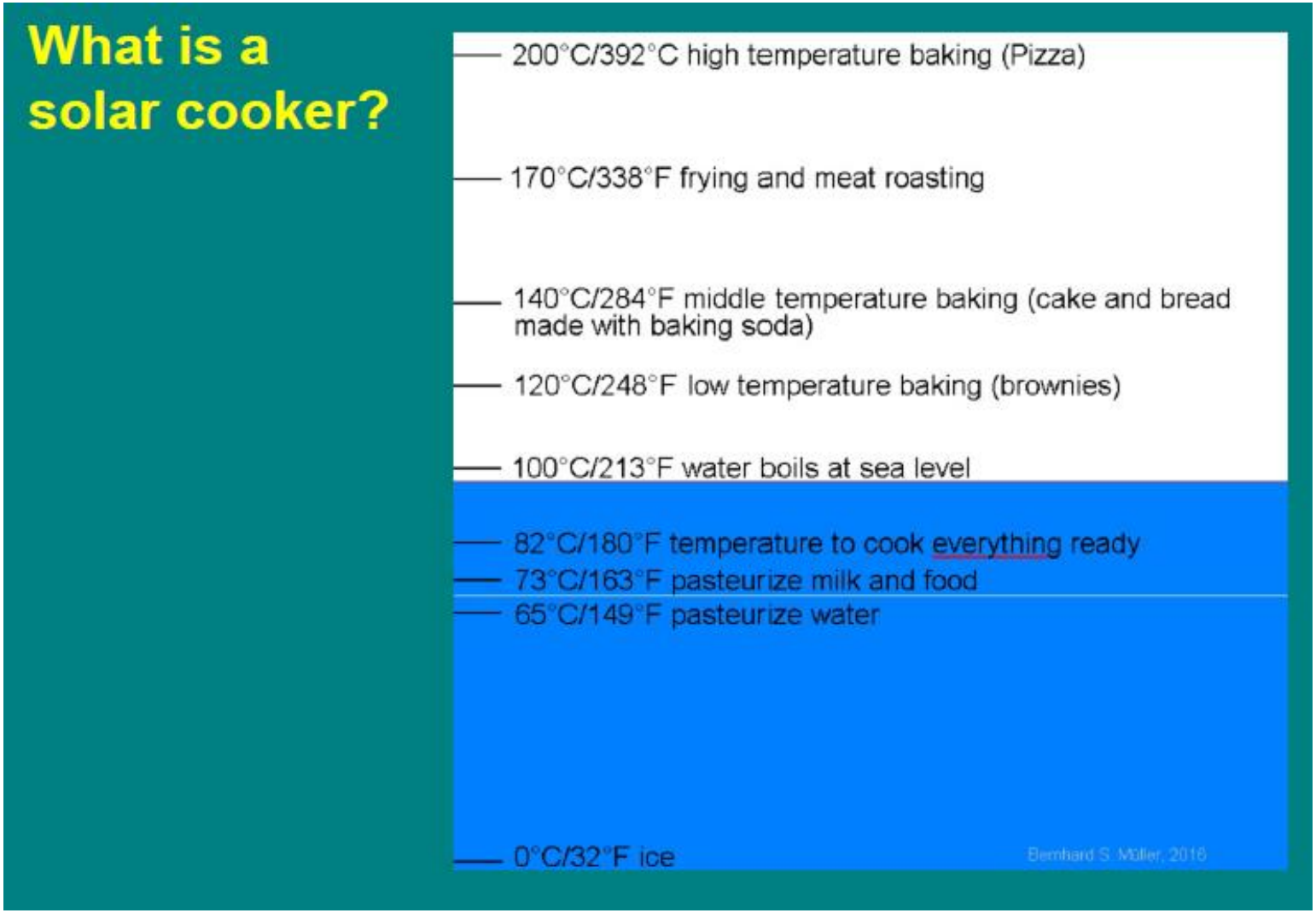


PAUWES, Prof. Yao Azoumah,

Rapid deforestation due to need for cooking wood and cooking charcoal

- Solar Cookers + Fireless Cookers and Wood-Saving Stoves can slow down deforestation.
- Reafforestation is a must!!

20. Internationale Solarkochertagung, Altötting, 20-21. April 2013



Dr. Bernd Müller, Natural Resources and Waste Management Alliance, Nairobi, Kenya

What if the sun does not shine?

The headline expresses the question number one. All of the solar cooker protagonists hear it every time they present solar cookers.

Or: What if the men come home from work after sunset and demand warm food?

With fireless cookers this can be solved easily. Cook the food in a solar cooker for one to five minutes in the afternoon and insert the pot in the fireless cooker. It continues to cook ready for several hours. Even beans, potatoes and meat!

What if the sun does not shine?

The NGO Friends of the Old (FOTO), Kisumu, Kenya, produces fireless cookers with a women initiative

Dr. Bernd Müller, Natural Resources and Waste Management Alliance, Nairobi, Kenya

21. Internationale Solarkochertagung in Altötting (25-26. April 2015)

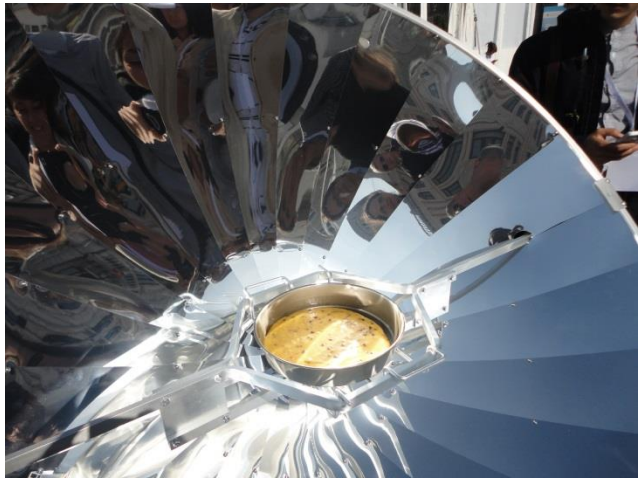
21.Int. Solarkochertagung: Ms Regula Ochsner, CEO of the swiss organisation ADES (Association pour le Développement de L´Energie Solaire) presenting the successful implementation of solar cookers in Madagascar. **www.adesolaire.org**

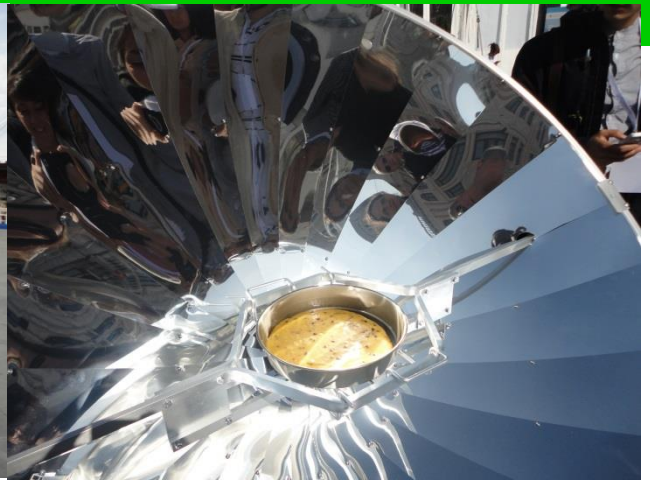

ADES
ADES


Mahajanga
Antananarivo
Antsirabe
Morondava
Fianarantsoa
Morombe
Toliara
Ejeda

TriesteNext, Trieste, Italy 26-28 September 2014

Public Educational Mission of ANSOLE





1st German Development Day,
Jena, 25.5.2013

TriesteNext, Trieste, Italy 26-28 September 2014

Public Educational Mission of ANSOLE

Use of Theater: No Bill with the Sun 2012 in Cameroon

Radio Broadcast, 2015, Cameroon

Reasons Solar Cooking is Essential During a Global Health Crisis and Beyond

1.Solar cooking reduces exposure to smoke from firewood and charcoal used for cooking and hence reduces respiratory strain and the risk of respiratory illness.
Approximately one million people die from pneumonia from cooking fires every year. People with respiratory illness are considered high risk for contracting COVID-19.

2.Solar cooking reduces the risk of exposure to and spread of disease because it reduces the need to leave homes to gather or barter for cooking fuel.
For example, solar cookers are already in the hands of many of the refugee families in Kakuma Refugee Camp, Kenya, thanks to SCI supporters, reducing the need to get additional cooking fuel.

3.Solar cooking increases energy independence.
With a solar cooker, people can cook with less dependence on supply chains, utility companies, or having an income. Free solar energy is delivered right to everyone's home every sunny day**.**

4.Solar Cookers International connects global leaders committed to health and safety solutions.
Because of SCI's commitment to advocacy, research, and strengthening capacity, SCI supporters empower a strong global network and provide many resources online, accessible anytime**.**

Source: https://www.solarcookers.org/

5.Solar cooking reduces environmental impact, saving lives.

Reports such as The New York Times article *"New Research Links Air Pollution to Higher Coronavirus Death Rates"* suggest a correlation between levels of air pollution and deaths from complications due to COVID-19. Using clean, sustainable solar cooking solutions for cooking food and pasteurizing water reduces air pollution attributed to cooking with firewood

6. Solar cooking is accessible at home

With more people at home during the day, taking precautions such as sheltering-in-place, solar cooking is a very easy way to prepare meals while still performing essential work tasks.

7. Solar cooking technology is used for solar drying and increases food security by preserving Food

8.Solar cookers are easy to construct with items you may already have in your home.

9. Solar cooking can pasteurize water and kill bacteria and viruses

Solar cookers can be used during emergencies when other resources like fresh water and power sources might not be available. This also reduces co-morbidity by reducing the number of diseases (waterborne and airborne) that a person's immune system might need to fight at once.



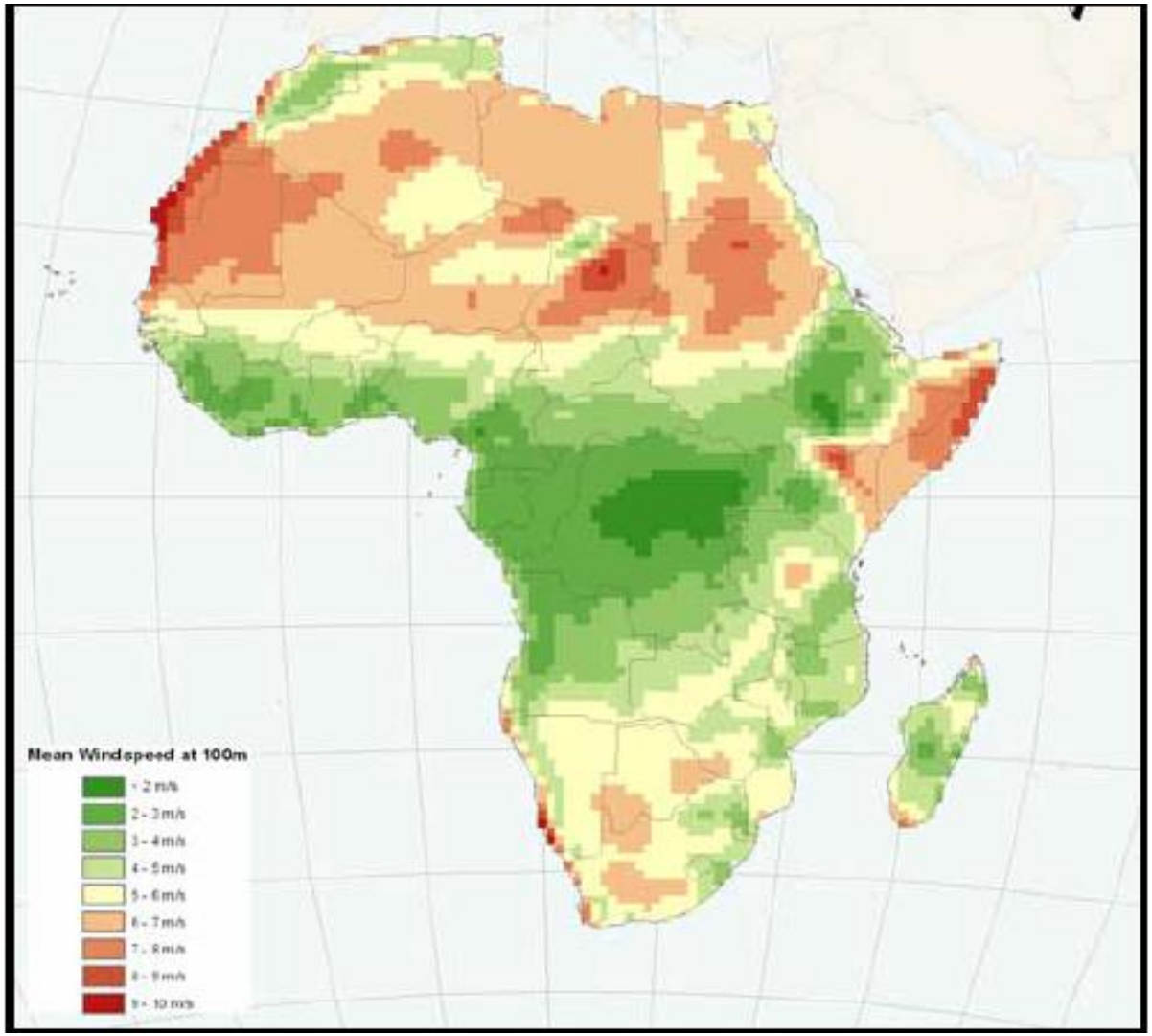
Pan African University
Institute of Water
and Energy Sciences

Energy resources in Africa

Energy potentials : renewable energy resources (wind energy)

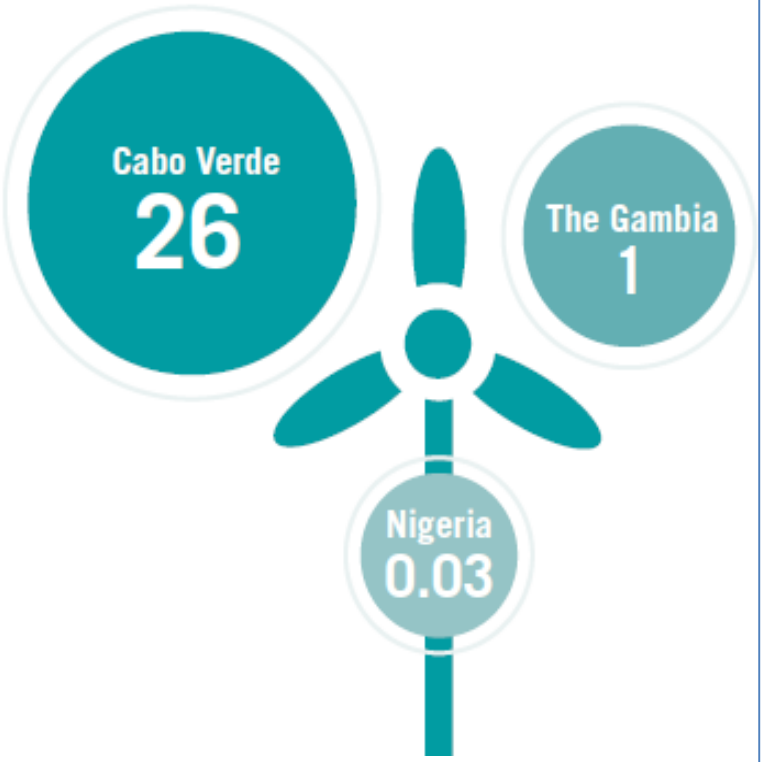
Wind energy
20% of global energy

More concentrated in northern and southern parts of the continent



PAUWES, Prof. Yao Azoumah,

Renewable energy resources potential in Africa



Power capacity(MW)

- **Potential for wind power generation is generally best along the coasts of ECOWAS member states,**
- **Mean wind speed at 50m averages above 6 m/s in many countries of Ecowas (eg. Mali, Niger, Senegal, Gambia, Ghana, Togo, etc.)**
- **Cabo verde, has been highilited (by AfDB) as having the best wind potential in west Africa,**
- **Few member states have significant experience with wind power to date, interest is growing, with several major projects having come on line recently or in the pipeline**

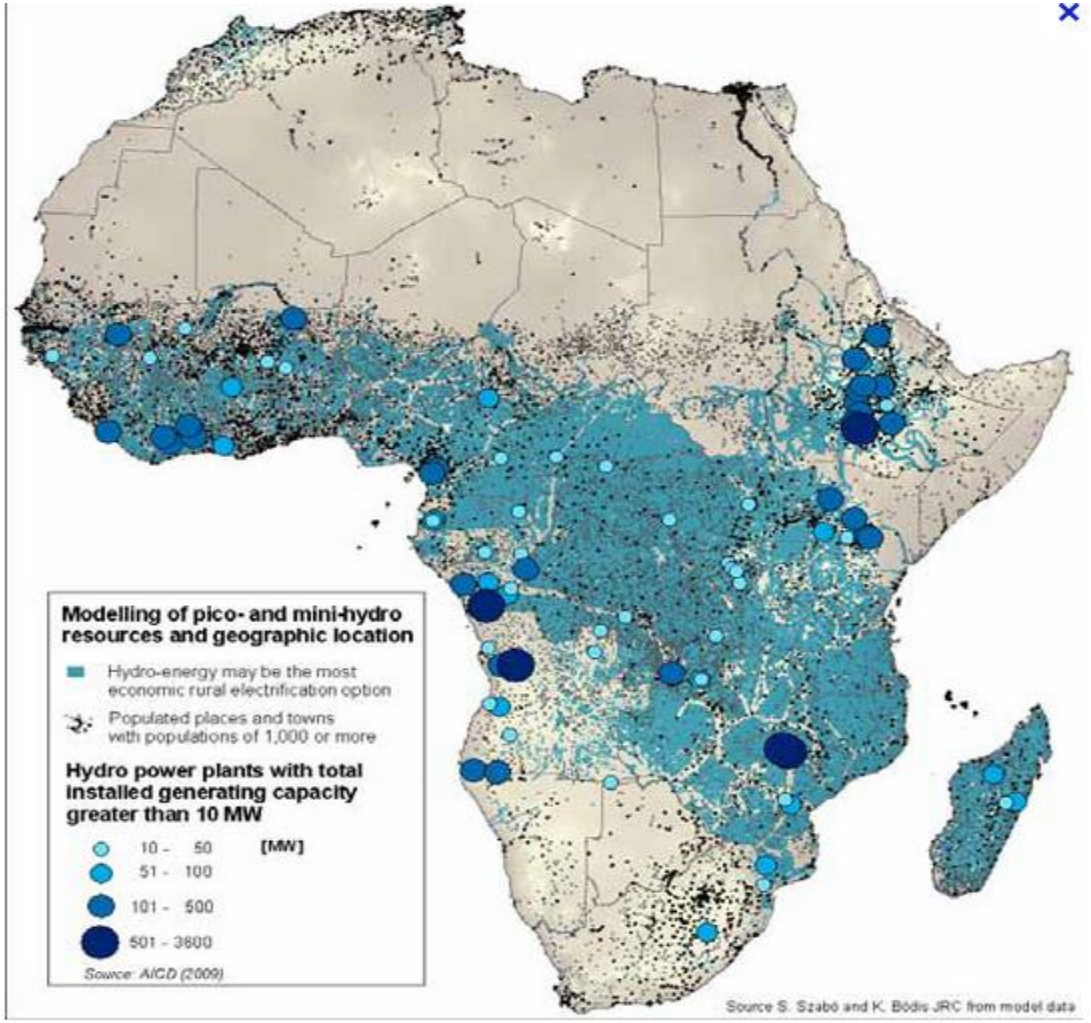
✓ D. Yamegueu, ECOSUS-AQUA PROGRAMME

Pan African University
Institute of Water
and Energy Sciences

Energy resources in Africa

Energy potentials : renewable energy resources (hydro energy)

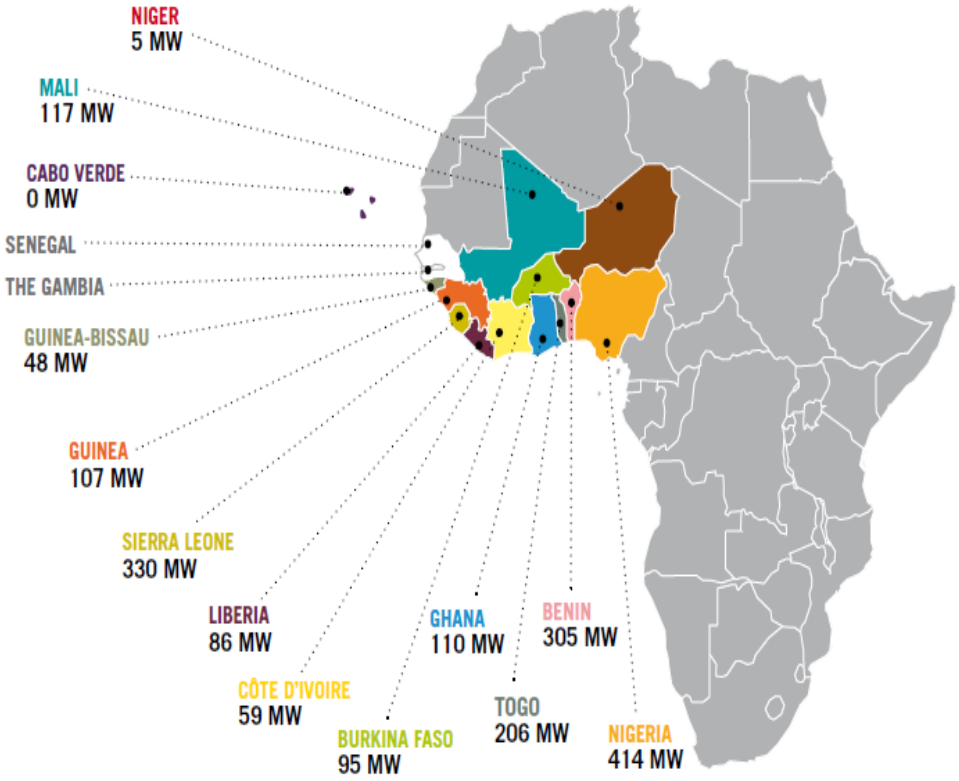
Hydro production potential of 1440 TWh/year



PAUWES, Prof. Yao Azoumah

Renewable energy resources potential in Africa

✓Hydropower / ECOWAS



Estimated Small-Scale Hydropower Potential

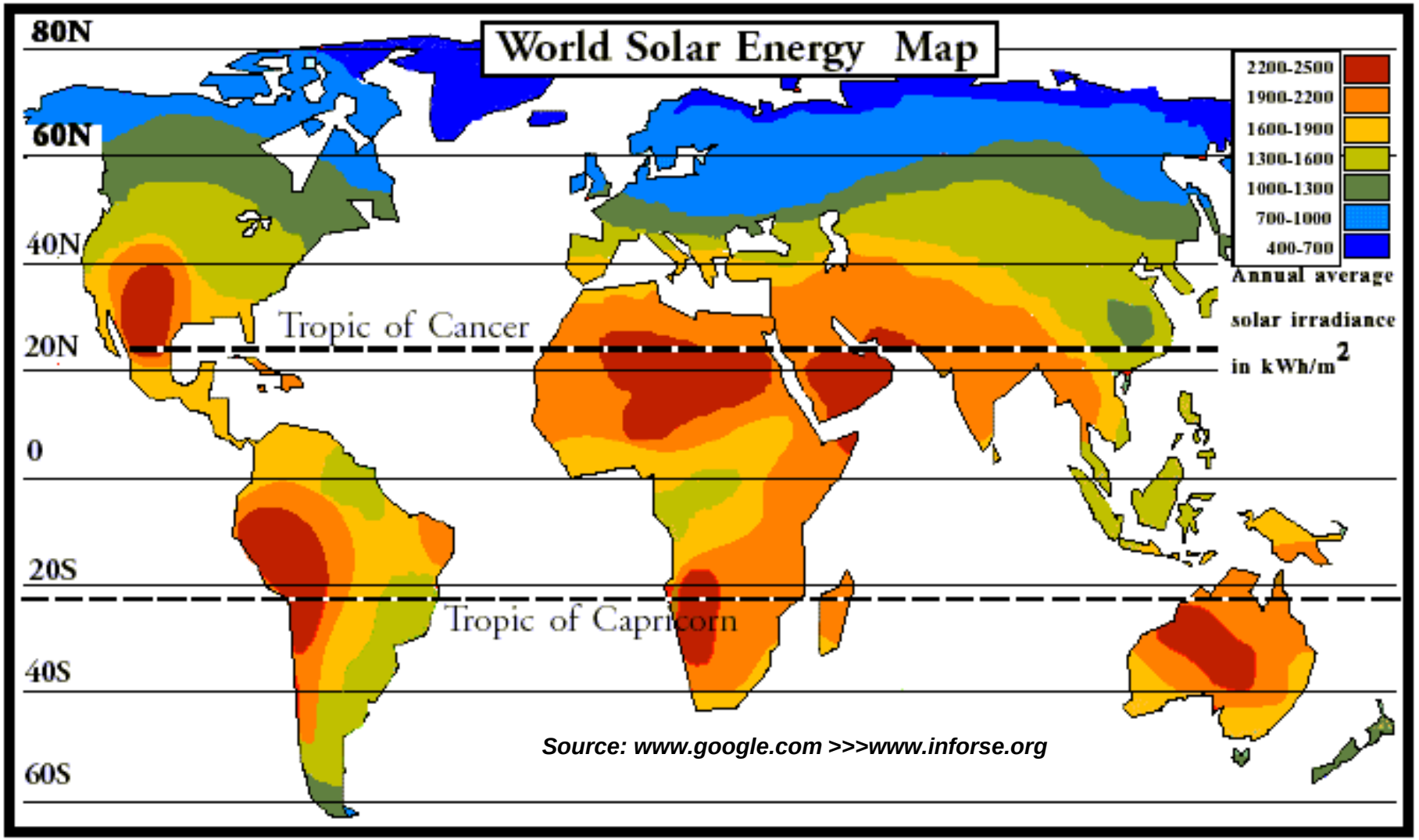
- Hydropower is the most well established and widely used RE technology in west Africa

  In most member states, Hydropower represents the only RE technology currently being implemented on a commercial scale.

- With a region-wide hydropower potential of some 25 GW, only 19% is exploited (2014)

- Ghana, Guinea, and Nigeria have particularly significant resources

- Most Member States demonstrate potential for small-scale hydropower development

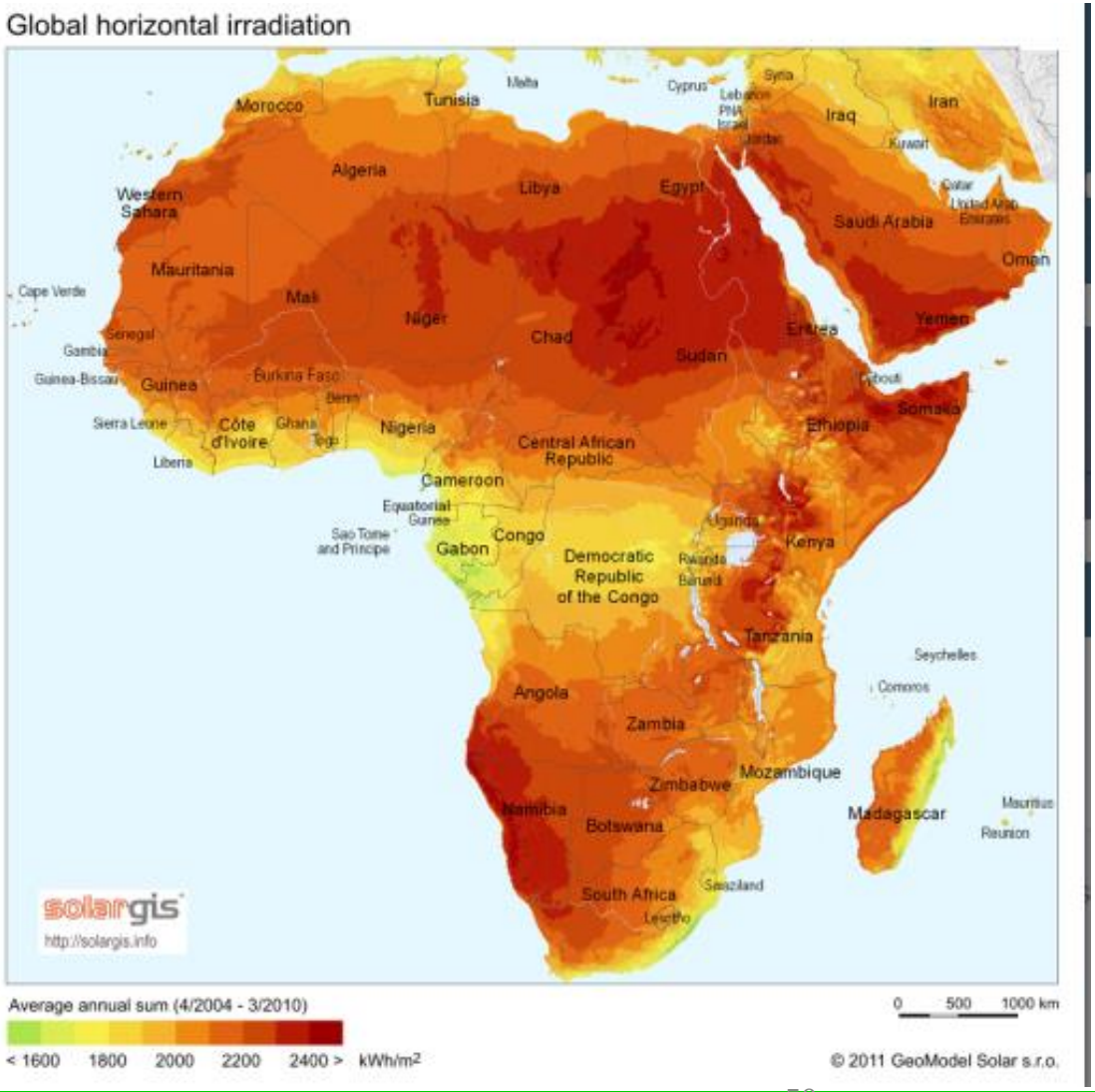


PV Technologies: silicon technology adaptable to specific African environments, Concentrated and Highly Concentrated Photovoltaics, Concentrated Solar Power, 3rd generation solar cells (Organic, DSSC, Perovskites)

Energy resources in Africa

Energy potentials : renewable energy resources (solar energy)

Solar energy: 74% of the continent receives more than 1900 kWh/m²/year



PAUWES, Prof. Yao Azoumah,

An appropriate and adaptable technology takes into account:

- Environmental and climatic conditions
  >high temperatures
  >long raining seasons,
  >dusts
  > etc.
- Societal behavior

- Purchasing power

Example of an adaptable and affordable technology

Easy transportation of a rolled up 135 W panel on a motorbike

Solamander 36 W photovoltaic panel mounted on a corrugated roof and held in place with nails

Solamander 135 W photovoltaic panel mounted on a corrugated roof

Founder of the „**Solarbier**“ concept: **Hubert Brandl**

Hallertauer Erfindung reißt den deutschen Bierhimmel auf

Mit Solarbier und exquisitem Weißbierpils lässt Hubert Brandl für Freunde des Gerstensafts die Sonne aufgehen


Solarbier
Gebraut mit der Kraft der Sonne
drink green
3l
STEN mit 24 Flaschen
SCHAFT „drink green“
Umweltbilanz pro Flasche Bier
Felsenbräu
Normale Produktion
2 g CO_2
73 g CO_2
98 % weniger Umweltbelastung
Felsenbräu: drink green!
Schmeckt gut. Jeder Schluck ein Beitrag zum Umweltschutz.
Prost!
DIE UMWELTBRAUEREI
FELSEN BRÄU
Frische aus Franken. Das Beste am Tag.
FELSEN
ROCK 33
Edel Pils
Gebraut nach dem bayerischen Reinheitsgebot von 1516.

Solar Food Concept

FRITZ MÜHLENBÄCKEREI

Natürlich aus Tirol
Starkenberger Bier

WILDKAFFEE RÖSTEREI

Hergestellt mit der Kraft der Sonne
Solar-Food
und regenerativen Energiequellen

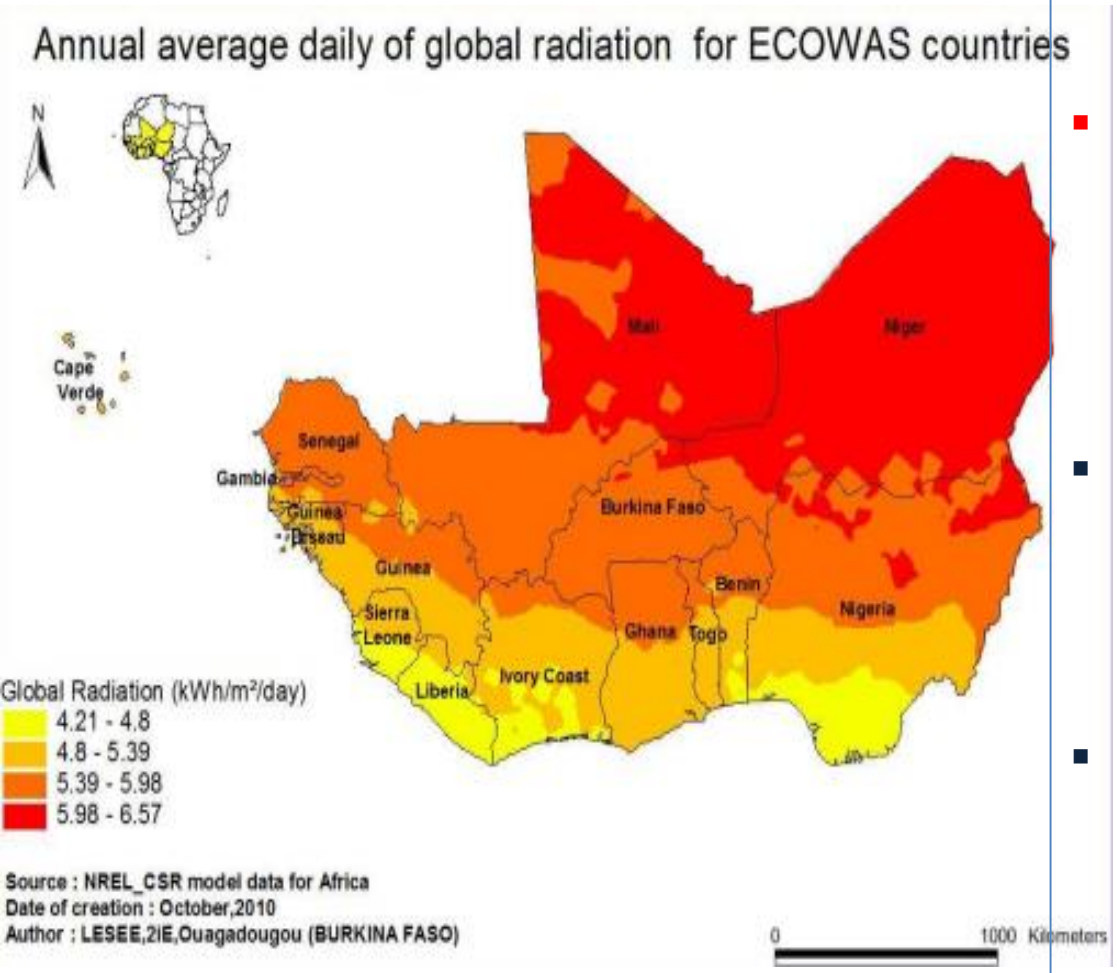
Certification institutions:

Technische Universität München

FACHHOCHSCHULE TECHNIKUM WIEN

www.solar-food.com

Renewable energy resources potential in Africa



- The resource potential for solar PV is generally good and relatively homogenous throughout all of West Africa,
- Two main technologies: PV that convert light directly into electricity, and CSP that converts sunlight into heat energy that is later used to drive an engine.
- PV technology is more modular and can be scaled for anything from household use to a large network of PV farms,
- CSP is typically considered viable only as a utility-scale plant.
- So far, no Member States have developed CSP technology

✓ D. Yamegueu, ECOSUS-AQUA PROGRAMME

Zagtouli Solar Power Plant in Burkina Faso (33 MW)
Major problem: Dust!

CSP Plant in South Africa

Renewable energy resources potential in Africa

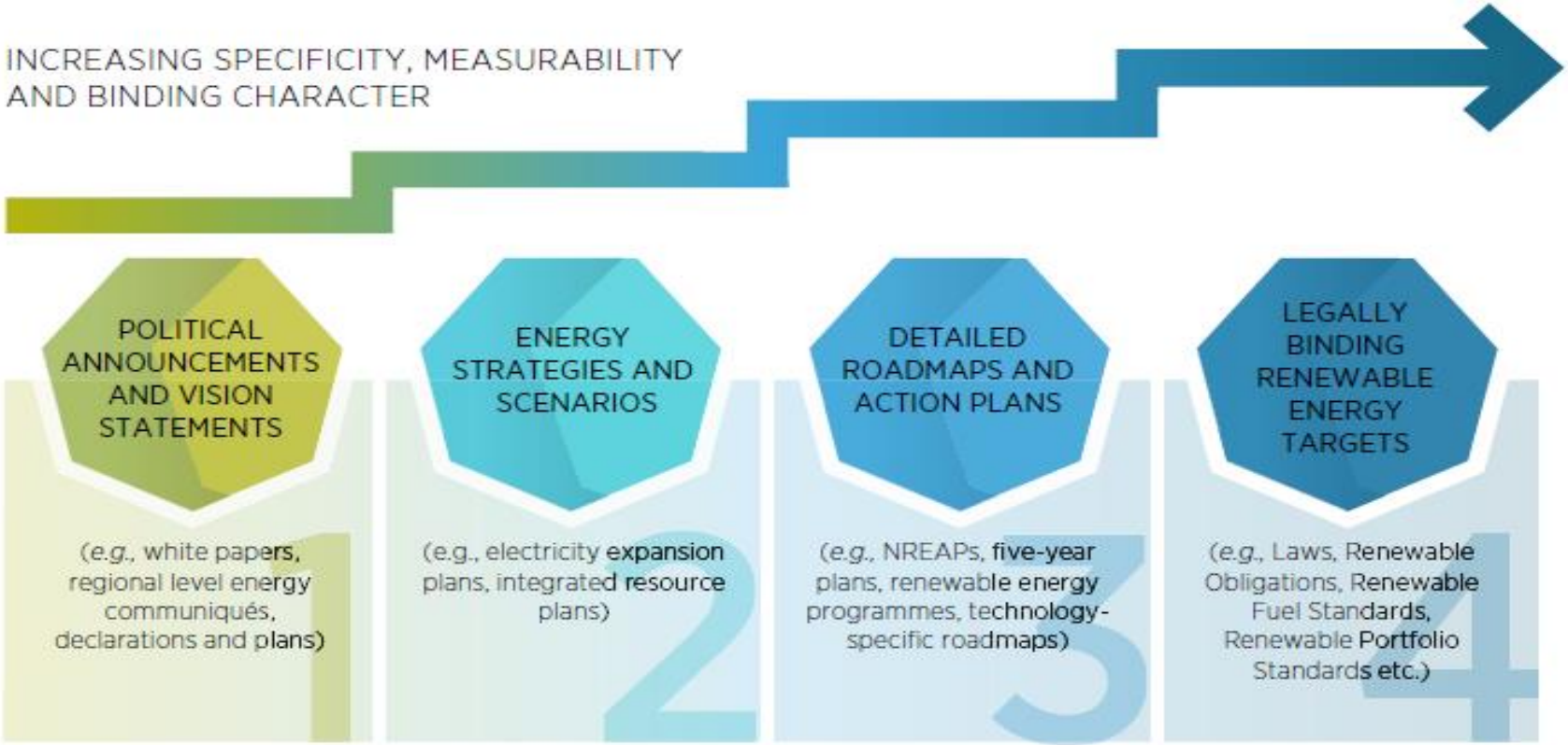
Key elements of an ecosystem for a sustainable RE deployment

IRENA, 2017

Policies in Renewable energy in Africa

African RE policies

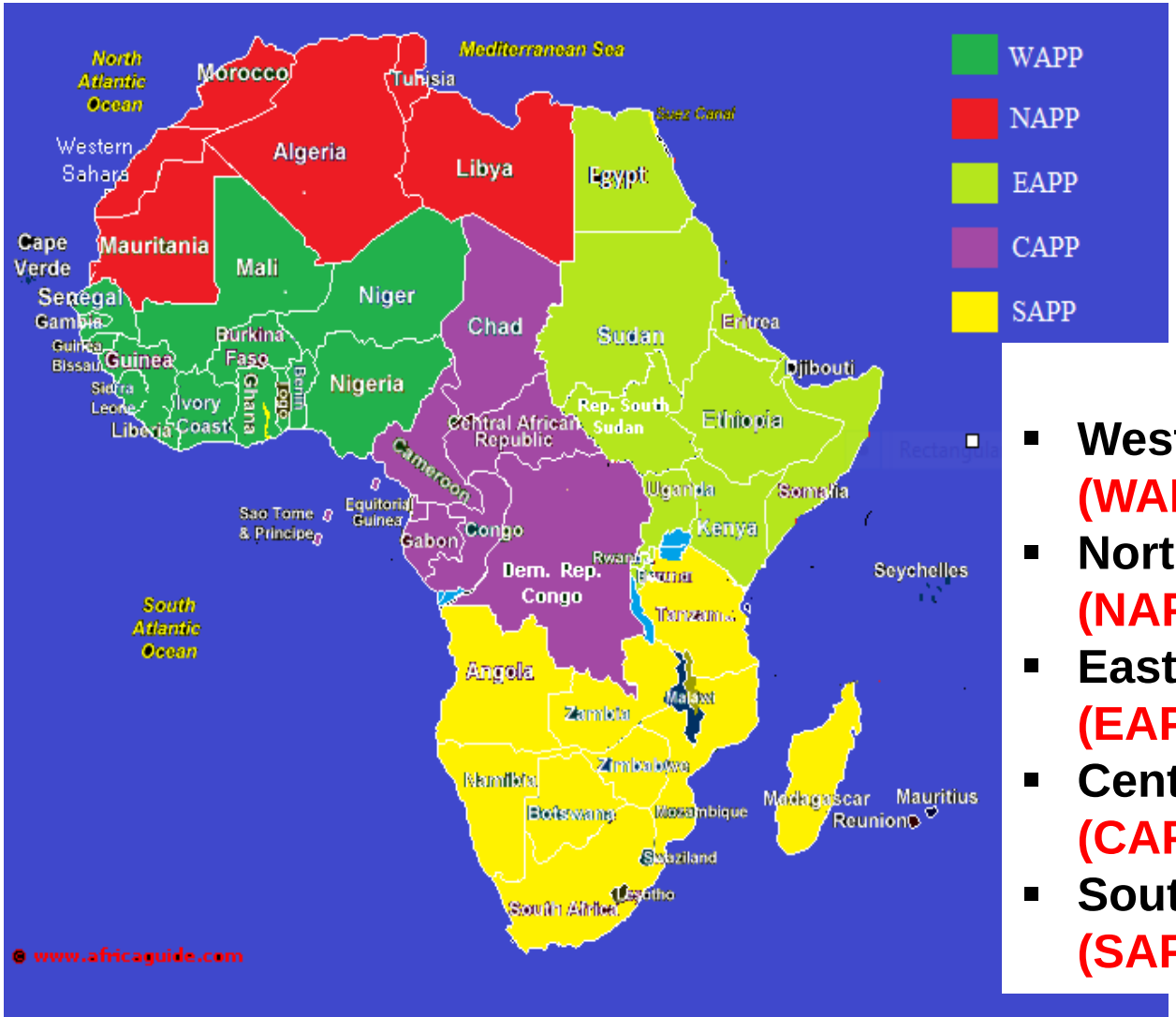
- **RE targets gain credibility and provide a trajectory for the energy transformation only if they are accompanied by specific policies and measures.**
- **By the end of 2015, RE support policies were in place in 146 countries, covering electricity generation, heating and cooling, transport, etc.**



Note: NREAP: National Renewable Energy Actions Plans.
Source: IRENA, 2015a

African RE Policies

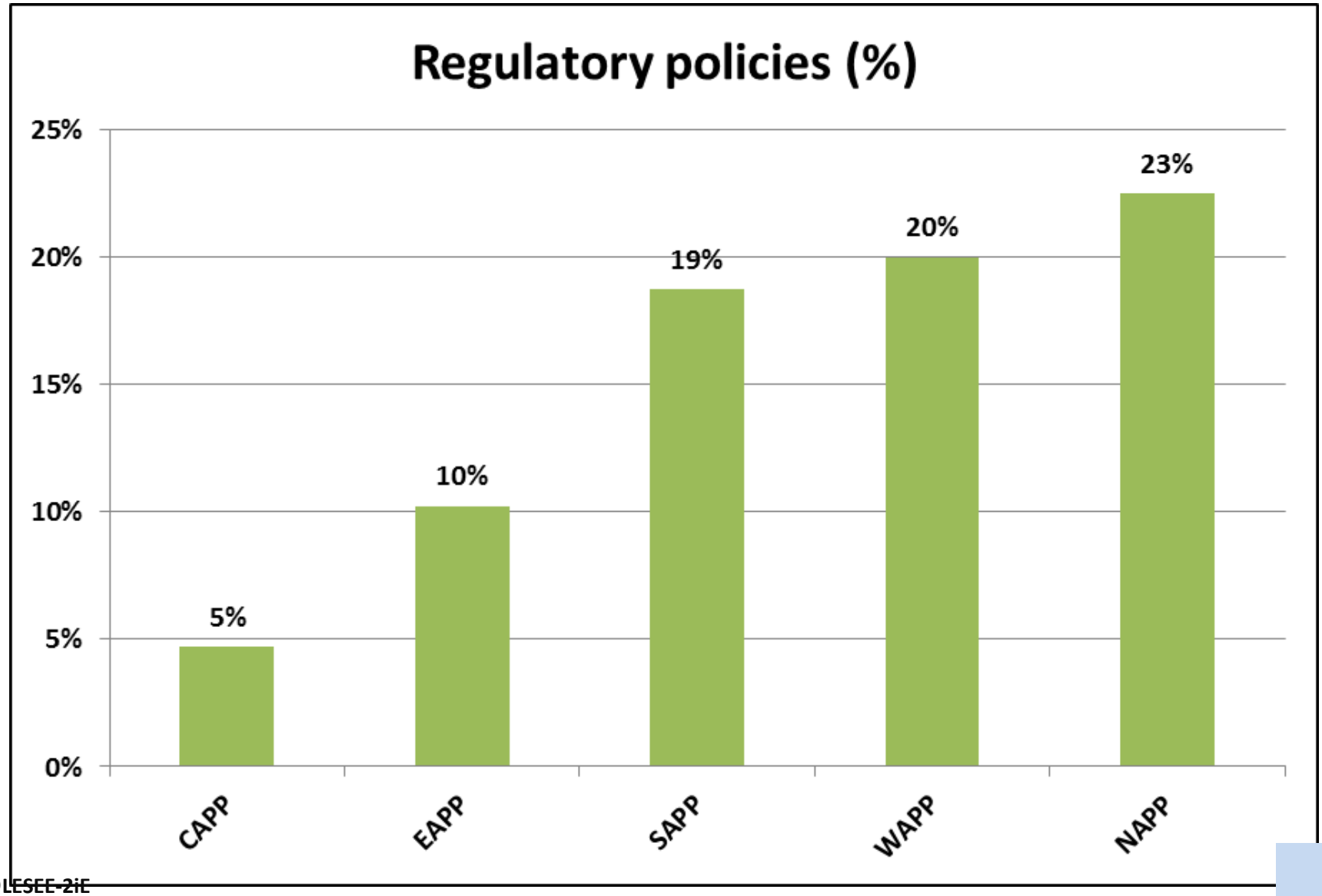
5 African Power Pools



- **Western Africa Power Pool (WAPP)**
- **Northen Africa Power Pool (NAPP)**
- **Eastern Africa Power Pool (EAPP)**
- **Central Africa Power Pool (CAPP)**
- **Southern Africa Power Pool (SAPP)**

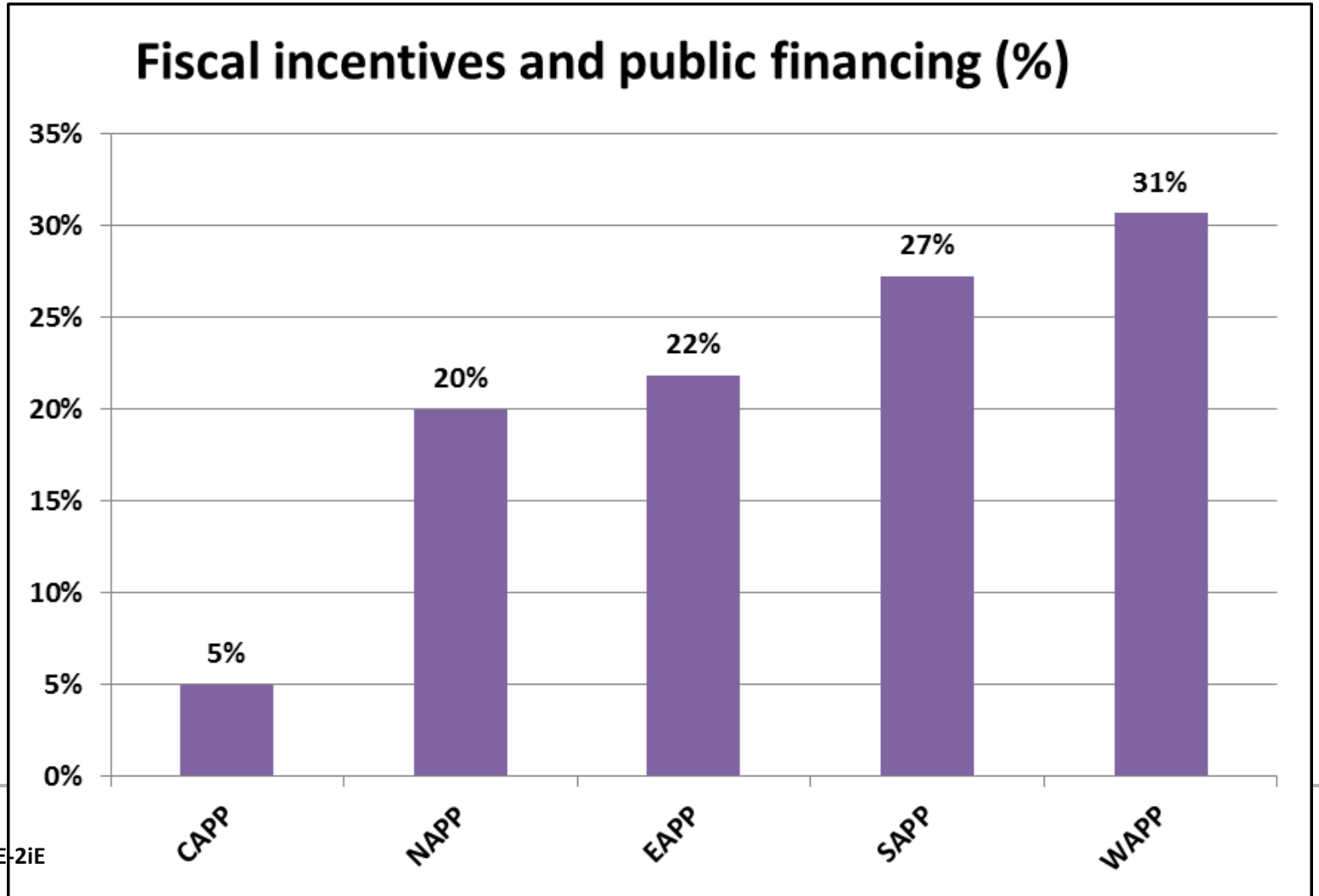
African RE Policies

❑ Comparison: Regulatory Policies



African RE Policies

❑ Comparison: Fiscal incentives and public financing



Capacity Building Activities in Renewable Energy at HE-Level

- PASET-RSIF Programme
- World Bank African Centres of Excellence (ACEs)
- MSSEESA
- ANSOLE
- Nelson Mandela Universities
- Pan African Universities (African Union)
- Various EU-funded Programmes

The PASET Regional Scholarship and Innovation Fund

PASET
Partnership for Skills in Applies Sciences, Engineering & Technology

An Africa-led initiative to bridge the skills gap in Applied Sciences, Engineering, & Technology

icipe

International Centre of Insect Physiology and Ecology

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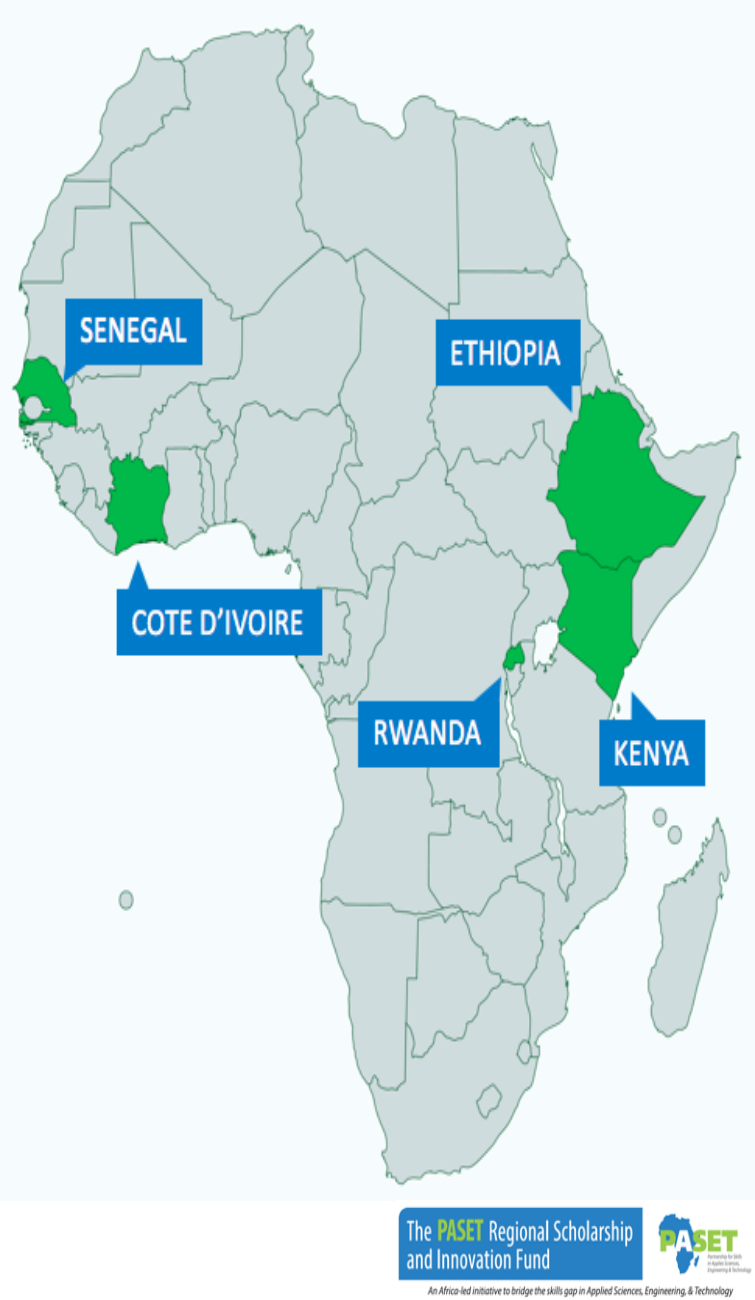
PASET
Partnership for Skills in Applies Sciences, Engineering & Technology

- The Partnership for skills in Applied Sciences, Engineering and Technology (PASET) is an Africa-led initiative to address fundamental gaps in skills and knowledge necessary for long-term, sustained economic growth in sub-Saharan Africa
- PASET was launched in 2013 by the governments of Senegal, Ethiopia and Rwanda, together with the World Bank
- The governments of Kenya and Ivory Coast have since joined the partnership.



The PASET Regional Scholarship and Innovation Fund

PASET Partnership for Skills in Applies Sciences, Engineering & Technology

An Africa-led initiative to bridge the skills gap in Applied Sciences, Engineering, & Technology

- The Regional Scholarship and Innovation Fund (RSIF) was launched in 2015 as a flagship project of PASET
- RSIF aims to build sustainable doctoral training, research and innovation ecosystems to develop transformative technologies in Africa for economic growth and development

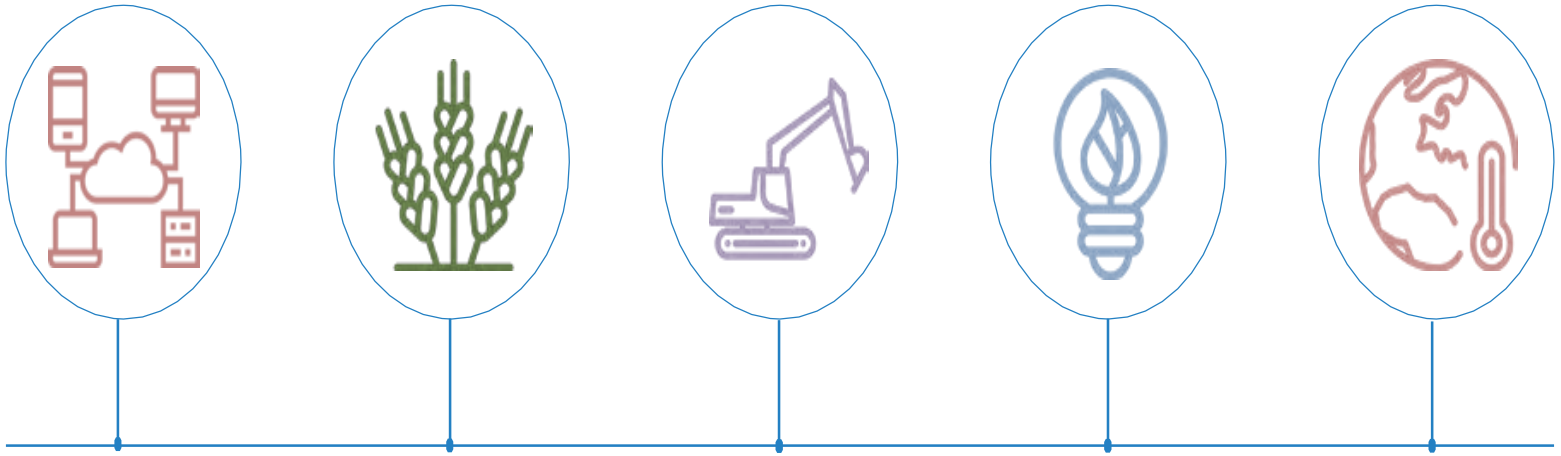
Builds the capacity of core African Host Universities to establish international-quality PhD training, research and innovation for the benefit of the region

Funds doctoral training, research and innovation in priority fields of Applied Sciences, Engineering and Technology

Develops partnerships and networks between Host Universities, international and regional research centres, universities, private sector and industry

Increases participation of women in PhD programs, research and innovation in ASET fields in sub-Saharan Africa

RSIF Priority Thematic Areas



ICTs including big data & artificial intelligence

Food security & agribusiness

Minerals, mining & materials engineering

Energy including renewables

Climate change

MSSEESA

Material Science and Solar Energy Network in Eastern and Southern Africa

- A network of 5 universities: Nairobi, Eldoret (Kenya), Makerere (Uganda), Dar Es Salam (Tanzania) and the University of Zambia (Zambia)
- Funded by ISP, Uppsala University (SIDA)
- Sharing of laboratory equipments
- Training of lab technicians
- Exchange of students and co-supervision of students
- Joint proposals
- Joint events
- The coordination rotates after 3 years (a weakness of the network!)
- **Open to new members in the sub-region**

www.msseesa.org

Contact

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