

# **Youth Innovators Design Bootcamp 2022**

**For**

**Africa Regional Science, Technology and Innovation Forum**

***Theme: Disruptive Energy and Water Technologies and Innovations for Sustainable and Inclusive Development***

**21– 25 February 2022**

**Closing date for applications: 10 February 2022**

**Date: 21-25 February 2022**

**Venue: Kigali, Rwanda**

**Format: Hybrid**



## Background

The United Nations Economic Commission for Africa and its partners are pleased to invite youths from all walks of life to the Third Bootcamp of the Africa Regional Science, Technology and Innovation Forum 2022. The third Africa Regional Science, Technology and Innovation Forum Bootcamp will focus on disruption that emerging technologies and their applications in energy and water could offer Africa. The two fields – energy and water technologies - are selected given their relationship to life under water (SDG 14) and life on land (SDG 15), and the alignment with the bootcamp's vision to empower and prepare African youths to become transformative forces in the two industries, and the society. Thus, making impact on SDG 4 (Education) and SDG 5 (Gender).

New approaches in energy and water generation, processing, management, storage, distribution and monitoring could have major implications for millions of Africans. In terms of energy, for instance, the estimated 600 million people without access to electricity and other forms of modern energy sources depend heavily on wood fuel to cook food. Many suffer from negative health consequences such as cancer, respiratory illness, increased blood pressure, low birth weights due to daily exposure to the smoke and other air pollutants generated by wood fires<sup>1</sup>. More females than males are exposed to wood smoke and the associated health hazards<sup>2</sup>. Further, Africa loses about 4 million hectares of forestry cover a year to partly meet energy needs, especially charcoal.

Advances in renewables energy, especially generating electricity from solar and wind sources are cheaper than from traditional sources (e.g. fossil fuels). Therefore, they could make electricity more affordable even for poorer countries and much easier and faster to deploy and maintain. The technological developments in renewable energy present Africa with unique opportunities to power households, institutions and communities cost-effectively and sustainably, allowing them to engage in broader and higher-level productive activities to uplift quality of life as they become more affordable than current energy sources.

The bootcamp is designed to expose youths to the value chains of different advanced renewable energy technologies such as solar, wind, battery and hydrogen. The bootcamp will also enable youths to explore innovation and entrepreneurial opportunities and industrial scale manufacturing and deployment.

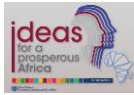
In terms of water, Africa's growing population and climate change are putting pressure on water bodies to meet the rapidly rising demand for household, agricultural and industrial water use as well as for transportation and leisure. This bootcamp will cover wider areas of focus, engaging and enabling youths to explore technology and innovation applications not only for water and wastewater treatment as most often discussed, but also water harvesting, water monitoring, water management, water recovery as well as reduction in water pollution among others to broaden their horizons.

The third bootcamp builds on the experience of the first Africa Regional Science, Technology and Innovation Forum Bootcamp held in Victoria Town, Zimbabwe, and the second bootcamp

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<sup>1</sup> Bede-Ojimadu, O., and Orisakwe, O. E. (2020). Exposure to Wood Smoke and Associated Health Effects in Sub-Saharan Africa: A Systematic Review. *Annals of global health*, 86(1), 32.

<sup>2</sup> Okello, G., Devereux, G., and Semple, S. (2018) Women and girls in resource poor countries experience much greater exposure to household air pollutants than men: Results from Uganda and Ethiopia. *Environ Int.* 119:429-437.



hosted which was organized in 2021 in Brazzaville, Congo. The third bootcamp will be organized by ECA, UNESCO, the Government of South Africa, African Materials Research Society (AMRS), UN Technology Bank for Least Developed Countries and the International Energy Atomic Agency (IAEA) and will be hosted by the Government of Rwanda. The Youth Bootcamp builds on the experience of the aforementioned schools and bootcamps.

### **Overview of Emerging Energy and Water Technologies**

Almost 600 million people in Africa do not have access to electricity and, those that do, pay also twice more than others in the rest of the world<sup>3</sup>. Overall, Africa's energy mix consists of biomass (about half), fossil fuels (22%), coal (14%) and natural gas (14%), and that energy mix has not changed much in the last three decades<sup>4</sup>. In contrast, biomass accounted for about 10% of total energy in 2000 and 6% in 2018. In addition to powering home, offices and industries, Africa should seek to participate in development, production and trade in advanced energy solutions that are increasingly powering electric vehicles, drones, mobile devices, bioelectronics and nanodevices as they promise to transform economies. Africa has abundant natural resources and talent. Most of the mineral resources of interest (e.g. copper, cobalt, lithium, etc) are in Africa and the continent has huge potential for renewable energy: solar capacity (10 TW), hydropower (350 GW), wind power (110 GW), and geothermal energy sources (15 GW). Emerging energy technologies could help unlock this potential and meet the future energy needs of Africa in an efficient and sustainable manner. More importantly, energy underpins most of the advances in other industries.

Further, water is perhaps one of the most critical and abundant resources that sustains life, industry and transportation directly and indirectly. About 71% of the earth's surface and most (96.5%) of the water is found in Oceans. The remainder of the water is in the lakes, rivers, air, soils etc. An array of human activities is supported by water bodies such as agriculture, transport, sports, fisheries and tourism.

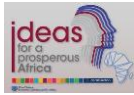
For this bootcamp, focus will be placed on innovations and technologies likely to improve quality of water in rivers and oceans, advance water production, processing, storage, distribution, conservation, and recycling that have significantly fewer negative impacts on the environment. For instance, the current pilot plant being built in Kitui County in Kenya will desalinate seawater to supply fresh, clean and safe water to 400,000 households using solar energy but without employing batteries and chemicals (near zero carbon footprint at a cost of \$15 million)<sup>5</sup>. Measures to reducing water loss, altering habits of water users and reducing water pressure could save water. A combination of traditional approaches, innovative solutions and advanced technologies can help Africa meet its water needs while preserving life under water.

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<sup>3</sup> ECA (2021) Energy Prices in Africa: Transition Towards Clean Energy for Africa's Industrialization, United Nations Economic Commission for Africa.

<sup>4</sup> IRENA (2020) Africa 2030: Roadmap for a Renewable Energy Future. International Renewable Energy Agency

<sup>5</sup> <https://www.africanreview.com/manufacturing/water-a-environment/cfm-to-install-200-solar-powered-desalination-units-in-kenya>



### **The Focus of the Bootcamp and possible questions to be answered:**

This bootcamp will focus on two major areas with broad applications – energy and water. Your applications to participate may include at least one of the following areas:

#### ***a) New and Emerging Technologies for Africa's Future***

New and emerging technologies such as digital technologies, robotics, advanced materials, nanotechnology, biotechnology, etc are driving developments in energy and water. Advances in materials are at the heart of battery revolution, water and wastewater treatment while digital technologies are key in the operation of smart grids and remote monitoring of water bodies and forests. Applications may showcase the use of emerging technologies to expand access, improve performance, reduce wastage, advance monitoring and reporting, and reduce impact on the environment, among others.

#### ***b) Innovative Business Model***

New technologies enable the redesign of existing and development of new approaches of doing things while business models drive the adoption and diffusion of new technologies and innovations. The success of 'freebie' business model (i.e. providing 'free services') in exchange for information for marketing has been driven the growth of digital applications such as search engines and online services (e.g. Google). Applications, therefore, may showcase new or innovative business models, approaches and/or systems likely to improve performance of existing technologies; develop and promote industries and businesses to advance energy and water provision especially to those underserved; improve management of water and land resources, and reduce negative impact on environment.

#### ***c) Effective Communication and Narrative for Africa's Transformation***

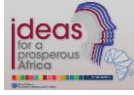
New technologies and innovations rely heavily on effective communication and narratives that enable communities and businesses to gain trust and confidence in their application. Applications may address or suggest effective communication and narratives that highlight the potential impact of emerging energy technologies, narratives that provoke or elicit social and economic solidarity, encourage action and drive change, among others.

### **Participation:**

The bootcamp is open to all youths up to the age of 30 that may or may not be in colleges and universities across Africa. Those in innovation hubs or in employment are also encouraged to submit their applications. Participants might be supported by partners abroad as well as professionals in research centres, innovation hubs, universities and institutes as well as government and business leaders. They will be welcome to serve as talent scouts, mentors, coaches and guest lecturers.

### **Where to apply:**

For registration, find the form at .....



The preliminary programme is available at .....

**Submission deadline:** 17:00 hrs East African Time of 10 February 2022.

For more further questions: Mr. Asfaw Yitna at [yitna@un.org](mailto:yitna@un.org)